

ECO-ENA: Economics & ECO-Engineering Associate, Inc., Canada



**The Annual Conference of Economic Forum of Entrepreneurship &
International Business
(ACEFEIB)**

The First Annual Conference of Economic Forum of Entrepreneurship &
International Business

April 14th – April 17th, 2011

Cairo, Egypt

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Associate, Inc.

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**The First Annual Conference of Economic Forum of
Entrepreneurship & International Business**

April 14th – April 17th, 2011

Triumph Hotel, Omar El-Khayam Conference Room
Heliopolis, Cairo, Egypt

Conference Proceedings

**The First Annual Conference of Economic Forum of
Entrepreneurship & International Business**

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Cairo, Egypt

Editors

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ECO-ENA: Economics & ECO-Engineering Associate, Inc., Canada
www.eco-ena.com

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14 – 17 April 2011
Triumph Hotel, Omar El-Khayam Conference Room
Cairo, Egypt

Conference Chair

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Organizing Committee

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Organizing Company



CEHAES; the Canadian Expertise House for Advanced Economic
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Publisher:



ECO-ENA: Economics & ECO-Engineering Associate, Inc.

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ECO-ENA: Economics & ECO-Engineering Associate Inc., Canada is also a publisher that publishes scientific journals in economics, business and related fields, in addition to practitioners' papers and articles. It sponsors 8 scientific journals: the International Journal of Economic Affairs, the Journal of International Business & Economic Affairs, the Journal of ECO-Engineering, the International Journal of Financial Economics, the Canadian journal of Economic Press, the Scientific Journal of Agricultural Economics, the Scientific Journal of Mathematical Economics & Econometrics, and finally the Journal of Hospitals Management Economics. Successful papers that go through an international peer review process published in those journals are deposited into Library & Archive Canada. On the other hand, practitioners' publications are published in the Economic Affairs Magazine and the New Business Magazine of ECO-ENA, Inc.

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ECO-ENA: Economics & ECO-Engineering Associate, Inc., Canada has two main e-research centers; the International Center of Economic Affairs (ICEA) and the Center of Economic Engineering (CEE). The team work of both centers is an international experienced team work from many countries around the world.

ECO-ENA: Economics & ECO-Engineering Associate, Inc., Canada is planning to sponsor The Academic Triangle; TAT institute of executive post graduate studies in

Economics & International Business that will provide executive MBAs and executive DBAs in Economics and International Business. The TAT institute is a new under-foundation ambitious institute that will provide services all around the globe.

ECO-ENA: Economics & ECO-Engineering Associate, Inc., Canada sponsors the Annual Conference of Economic Forum of Entrepreneurship & International Business: ISSN 1925-4601 (CD-ROM) and ISSN 1925-461X ((Online): Library & Archive Canada. The conference collects successful papers in Economics & Business from all around the world and discusses them in a big symposium. The conference proceedings enable new ideas of research to reach out via a recognized worldwide outlook. The first annual conference of ECO-ENA, Inc. has been held in Cairo, Egypt under the organization of the Canadian Expertise House for Advanced Economic Studies, Cairo, Egypt. The second annual conference of ECO-ENA, Inc. has been planned to be held in Ottawa, Canada. ECO-ENA, Inc. is planning to hold the conference every year in a different country. ECO-ENA: Economics & ECO-Engineering Associate Inc., Canada also provides open seminars & lectures by international experts in the field.

ECO-ENA: Economics & ECO-Engineering Associate, Inc., Canada abides to all international ethical rules in business.

A handwritten signature in blue ink that reads "Ghada Gomaa" with a stylized flourish at the end.

Dr. Ghada Gomaa A. Mohamed
President;
ECO-ENA: Economics & ECO-Engineering Associate, Inc.
Ottawa, Ontario, Canada
www.eco-ena.com

**The First Annual Conference of Economic Forum of
Entrepreneurship & International Business**

SELECTED ACCEPTED PAPERS

Conference Proceedings Compilation © ECO-ENA: Economics & ECO-Engineering
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Dear Reader,

We are very pleased to present the proceedings of the First ECO-ENA Inc. Annual Conference of Economic Forum of Entrepreneurship & International Business to be held in Cairo, Egypt, from April 14th to April 17th, 2011.

This collection of papers includes work by researchers in fourteen countries in five continents and covers a wide variety of economic and business issues. Common themes include food security and international trade and investment. Food production and distribution is a common theme in several papers, including papers by Daniel May, with one paper as sole author and another in collaboration with Graham Tate and Leslie Worrall, from the UK, Masssoud Kheirandish and K.E. Sririmappa, as well as Fereshteh Ghiasvand Ghiasy, who submits two papers, one co-authored with Ali Asghar Mirakzadeh, from Iran, Randa Hamza and Shadwa Zaher from Egypt, Mevlüt Gül, Hilal and Yalçın Yilmaz, Yalçın Bozkurt and Gulay Hiz from Turkey and Maurizio Canavari, Abeer Besheer and Phil Wandschneider from Italy. These papers address the issues facing food producers and distributors, including access to distribution networks and international trade. Food provision, food prices and the matching of supply and demand will almost certainly form a major theme in economics in the coming years and these contributions are highly welcome in helping to develop an understanding a very complex international market, in which producers, distributors and consumers can face constant threats, both naturally occurring and resulting from risks attaching to government policies.

We also include papers by Sanita Klava from Latvia and Stuart Zhang from the UK, in the related area of land markets and land use, as well as a paper by Hamid Sepehrdoust on housing in Iran. All of these papers contribute to our understanding of the use of space and the quality of the built and managed environment. Beyond access to food, access to adequate housing and leisure facilities are crucial to survival and quality of life for the public and the provision of these services has been increasingly crucial to employment and incomes since the early stages of the industrial revolution. It is also to be remembered that the land market differs radically from other markets because the quantity of land is, if not entirely fixed, very rarely increased or reduced by human actions. This makes it ultimately a limiting factor in economic activity but also a resource which, in its raw form, does not respond well to the laws of supply and demand, leading to potentially large fluctuations in land prices and difficulties in the allocation of land to particular purposes for the long term in view of an uncertain future.

Closely related to the theme of land use is the use of water, which is also a limited geographical resource. Ahmed Salama here presents an examination of strengths and weaknesses of the Nile Basin Initiative and an analysis of the threats and opportunities relating to the water supply from a river which is shared by a number of countries. He makes a number of recommendations in relation to the conservation and management of the river's fresh water resources.

Further papers deal with vital issues relating to growth, the business and economic cycle, international finance, entrepreneurship technology, education and international trade, all major factors in long-term global and national prosperity. We are especially delighted to be able to present papers relating to small businesses and emerging enterprises in both Mexico and the Middle East and North Africa. The development

and encouragement of dynamic new business is crucial to the future of the world as an ever-changing economic environment produces new services and forms of employment, as it has done since ancient times. Here, Jose Vargas-Hernandez presents two papers, one being co-authored with Mohammad Reza Noruzi, on small and medium-sized enterprises (SMEs) in Mexico and another on emerging multinationals.

Rob Smorfitt and Charles O'Neill consider government policy in relation to SMEs, with recommendations, based on a study of the effects of government interventions on SMEs in KwaZulu-Natal, that governments should focus on general measures to develop the economy, rather than relying on selective interventions to support specific types of business, which are found to be less effective. This is also partly borne out in the case of Nigerian entrepreneurial businesses by Dr. Adeleke's study, which also finds that general issues in infrastructure, corruption and costs of plant and machinery are significant obstacles to entrepreneurial activity. In the case of Nigeria, however, there appear to be further obstacles, such as access to finance, which cause greater problems for smaller businesses than for larger concerns.

A further paper by Azhar Hj. Ahmad, Sallehuddin Mohd Nor, Jumaat Abd Moen, Che Aniza Che Wel and Ahmad Rafli Che Omar examines the relationship between big businesses and small businesses, finding a generally negative expectation of the effects of hypermarket development on smaller retailers. This illustrates a tension which is bound to arise between the desire to create efficient large business units where demand exists for them and the sometimes precarious situation of smaller businesses which may not have the means to compete on product or service range in the same market.

Staying at the level of specific business relationships, Mohamed Osman, Mahmoud Abo-Sinna, Azza Amer and Osama Emam present a method to model negotiations between suppliers and purchasers of information services, where both parties must compromise not only with each other but also between quality and cost objectives. They also provide a model for the process by which either an agreement is reached or the negotiations are ended without a deal.

One paper examines the relationship between economic performance as measured by Economic Value Added (EVA) and stock market returns. Muhammad Akbar and Muhammad Kamran Khan use a sample of companies from the Karachi Stock Exchange to establish that there is a positive relationship between EVA and stock market returns but also that there is a stronger relationship between stock market returns and past EVA, suggesting that the stock market does not react immediately to economic performance but does reflect economic performance over time.

We also present a number of papers which deal with macroeconomic topics. Rudra Pradhan's paper examines four models for predicting economic growth using artificial neural networks. Applying these models to India, Dr. Pradhan finds that they provide forecasts with a high degree of accuracy and that the inclusion of Gross Domestic Product (GDP), Foreign Direct Investment (FDI) and trade openness in an advanced neural network model provides a very good forecasting method.

Nilanjan Banik's paper deals with the subject of currency and optimum currency areas, a subject which has given rise to considerable debate and which has considerable policy implications in different parts of the world, with the focus in this case being on the Economic Community of West African States (ECOWAS). Also on

the subject of currency management, Ramli Norimah and Awang Marikan Dayang-Affizah examine the effects of three different exchange rate policies over time in Malaysia, with the conclusion that exchange rate regimes do have an effect on exports and economic growth. Another paper which presents insights into the effects of government fiscal and monetary policies relating to the money supply is the one presented here by Holger Kächelein, Endrit Lami and Drini Imami, examining the relationship between political business cycles, household expenditure, inflation and GDP growth. Monal Abdel-Baki and James Godfrey examine the effects of monetary policy on housing supply, comparing the experiences of Egypt and South Africa, thereby also contributing to the study of housing but from a different angle to the one chosen by Hamid Sepehrdoust. Mohamed Abou Elsoud also addresses macroeconomic issues, focusing on the demand for money.

By way of contrast, Essa Ahmed Al Hannom's paper on balance of payments problems in developing countries seeks a solution outside the remedies commonly offered by monetary policies and currency adjustments and based more on structural change to promote economic development. A further paper by Hebatallah Ghoneim examines the role of trade agreements in promoting exports.

Still on the subject of international currency flows, trade and economic growth, we also present papers by Jay Kathavate and Girijasankar Mallik, Hadia FakhreIDin and Mamta Chowdhury on the subject of overseas aid, while papers by Walid Abdmoulah and by Ghada Mohamed & Morrison Handley-Schachler examine the determinants and effects of FDI respectively.

Looking at banks specifically, Mohamed Hashem Rashwan examines the profitability over time of Islam Banks and other banks, finding that Islamic Banks performed relatively well before the financial crisis of 2007 to 2008 broke but underperformed afterwards, as financial problems affected the real economy which banks serve, with the effect on Islamic Banks being more evident at the phase of the crisis when industrial and non-financial service companies were most affected, consistent with a greater closeness to industry.

Tarek Sadraoui and Adnen Chokri provide a study on the relationship between publicly and privately funded Research and Development (R&D), addressing the question of whether public expenditure complements and enhances private expenditure or merely substitutes less efficiently targeted forms of research for more effective research investment. Their findings support the view that public and private R&D investments are complementary and that public spending on R&D leads to increased R&D in the private sector.

However, it must be observed that neither land nor money nor technology are of any use to a society or economy without the activity of people and that the quality of human decisions and human efforts are of vital importance to any economy, whether developed or developing. We are therefore fortunate to be able to include four further papers, besides the contributions from Prof. Vargas Hernandez, Dr. Smorfitt and Prof. O'Neill and Dr. Adeleke on SMEs, which deal primarily with human issues in industry and commerce. Hala Hattab examines creativity, innovation and entrepreneurship in the Middle East and North Africa and also highlights gender differences between male and female entrepreneurs. It will also be seen that there are some significant differences between countries in the level of originality and newness, as perceived by customers, in the products which entrepreneurs provide. There are also differences between the gender gaps in different countries. David Kirby looks

specifically at Egypt, seeking ways to improve the entrepreneurial orientation of Egyptian education, especially in university business schools. Similarly, Ahmed Alshumaimri, Wafa Almobaireek and Tatiana S. Manolova examine attitudes among young people in business school in Saudi Arabia and examine their motivations and entrepreneurial inclinations. In common with Dr. Hattab, they make a contribution to the study of gender differences in entrepreneurship, as well as to the study of entrepreneurship in general. Moving from entrepreneurial education to the education of professional workers in industry generally, Shala Al-Abiyad, Morrison Handley-Schachler and Ali Ahmed El-Hadad report on empirical research on the quality and content of the education of management accountants in Libya. The findings, that the orientation is appropriate but that there is still a quality gap should be a warning to universities and colleges generally about the risk of failing to meet the standards required by industry, commerce and government.

Hanen Sdiri and Mohamed Ayadi also examine employee education as one of the key variables in enterprises' decisions to innovate. However, they go beyond this to look at the external and internal institutional environment of the enterprise, including external co-operation agreements and engagement with international markets. While international engagement appears to be of limited significance, it is shown that both employees' education and interfirm co-operation agreements are important factors in the promotion of innovation. Also on the subject of internationalization and the workforce Mohga Bassim examines the relationship between personal globalization and equality between men and women at work, finding a positive correlation between globalization and equal opportunities.

Moving into more problematic areas of financial activity and reporting, Adnen Chokri and Zied Akrouf examine the problems of financial liberalization and bank behaviour, with an exploration of the relationships between financial regulation, interest rates, risk-seeking behavior and the transparency of bank reporting, while Norazida Mohamed and Nor Asiah Idris consider regulations and regulators which are specifically designed to deal with false financial reporting. Shrabani Saha and Rukmani Gounder examine the relationship between economic development and corruption, finding that there is a non-linear relationship between corruption and per capita income, with corruption initially increasing with income, as more opportunities for corruption become available, and then decreasing, as potential personal losses from penalties for corruption begin to outweigh personal gains from corrupt practices.

From a more positive perspective, two of the papers in this volume deal with Corporate Social Responsibility (CSR), both in the Indian context. Ashu Pasricha examines the development of CSR in the context of the historical development of Indian business and society, finding that, while the nature of business and business ownership has been changing over the past 200 years, there is still a strong engagement in CSR in the Indian private sector. Balakrishnan Muniapan looks at the concept of CSR from a Hindu perspective, relating it to the enduring concepts of dharma, representing virtue or duty, which is already found in the Vedas. Further references to the *Bhagavad-Gita* and to Kautilya's *Arthashastra* are used to develop the concept of dharma and to show how it relates to corporate activity and business leadership.

We would like to express our deep gratitude to all who have contributed to this conference and to these proceedings. We also look forward to welcoming as many of you as possible to our second conference in Ottawa, Canada in 2012.

Yours Sincerely,

A handwritten signature in purple ink that reads "M. Handley-Schachler." The signature is written in a cursive style.

Dr. Morrison Handley-Schachler
The Chair of the Conference

**The First Annual Conference of Economic Forum of
Entrepreneurship & International Business
(FACEFEIB)**

Scientific Committee
(In alphabetical order)

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Dr. Morrison Handley-Schachler
Dr. Osama Emam
Prof. Yomn El-Hamaqi

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Accepted Papers

Number	Paper	Authors
1	Effects of distrust on the formation of collaborative alliances in agriculture: a social network approach	Daniel May
2	Production and Export Potential of Saffron in Iran	Massoud Kheirandish and K.E. Sririmappa
3	Strategies and Performance of new Mexican emerging multinational enterprises	Jose-G. Vargas-Hernandez
4	A Study on Entrepreneurship and Role of Government in Enhancing Entrepreneurship by Establishing Small and Medium Enterprises, SMEs and start-ups	Jose-G. Vargas-Hernandez and Mohammad Reza Noruzi
5	Does Export-led Growth Hypothesis hold in three de facto Exchange Rate Regimes in Malaysia?	R. Norimah and A.M. Dayang Affizah
6	Banking Deregulation and Financial Stability : Lessons for Emerging Market Economies	Adnen Chokri and Zied Akrouit
7	The Role of Trade Agreement in Promoting Egyptian Exports	Hebatallah Ghoneim
8	Sustainable and efficient organizations: The case of handcrafts micro-business in Southern San Sebastian	Jose-G. Vargas-Hernandez
9	A Genetic Algorithm Based Technique for Solving the Supply-Demand Interaction in Electronic Commerce	M.S. Osman, M.A. Abo-Sinna, A.H. Amer and O.E. Emam
10	Does economic development necessarily reduce corruption?	S. Saha and R. Gounder
11	The Impact of the Interaction between Institutional Quality and Aid Volatility on Growth: Theory and Evidence	Jay Kathavate and Girijasankar Mallik

12	Efficiency Measurement of Housing Sector in Iran; Using Data Envelopment Analysis Efficiency Measurement of Housing Sector in Iran; Using Data Envelopment Analysis	Hamid Sepehrdoust
13	Challenges in Developing Entrepreneurship in Iran's Agricultural Cooperatives: A Factor Analysis	Fereshteh Ghiasvand Ghiasy
14	Forecasting Economic Growth: Using Artificial Neural Network Modelling	Rudra P. Pradhan
15	The Relationship of EVA and Stock Returns: Empirical Evidence from KSE	Muhammad Akbar and Muhammad Kamran Khan
16	Do South African Government SME focused interventions work?	Rob Smorfitt and Charles O'Neill
17	Specialization and the development of golf as an industry: a case	Congshan (Stuart) Zhang
18	The need for a Development-Oriented Approach to the BOP in LDCs	Essa Ahmed Alhanom
19	Entrepreneurship Motivations among Saudi Youths	Ahmed Alshumaimri, Wafa N. Almobaireek and Tatiana S. Manolova
20	Subsidies increase poor access: The case of wheat in Egypt	Randa Hamza and Shadwa Zaher
21	A study on profitability of beef production sector and opportunities for the new Entrepreneurs in Turkey	Mevlüt Gül, Hilal Yilmaz, Yalçın Bozkurt and Yalçın Yilmaz and Gulay Hiz
22	A need for Balanced Participatory Approach in Designing and Implementing a Knowledge Management Strategy in International Development Organizations: The Case of CIDA Egypt	Hadia FakhreIDin
23	Innovation and Entrepreneurship: Does Gender Really Matter? The Case of the Middle East	Hala Hattab
24	FDI determinants, how to explain Arab countries disconcerting record	Walid Abdmoulah

25	Studying the Variables that Separate Entrepreneurial and Non Entrepreneurial Agricultural Producer Cooperatives	Ali Asghar Mirakzadeh and Fereshteh Ghiasvand Ghiasy
26	Moslem immigrant consumers' interest for Italian food specialties certified Halal	Maurizio Canavari, Abeer Besheer and Phil Wandschneider
27	Financial Market Regulations and Legislations: The study of Malaysia, the UK and the US Statutes in relation to Financial Statement Fraud	Norazida Mohamed and Nor Asiah Idris
28	A Proposition for Strengthening Small- Scale Entrepreneurs in Nigeria for Economic Growth and Development	A. Adeleke
29	Corporate Social Responsibility: In Indian Context	Ashu Pasricha
30	A Dynamic Panel Data Analysis for Relationship Between Private and Public Investment in R&D.”	T. Sadraoui and A. Chockri
31	Personal qualities and technical administrative accountant as one of the determinants of the gap between theory and practice in management accounting	Handley-Schachler, Al-Abiyad and El-Hadad
32	Explaining the decisions to innovate: The case of Tunisian service firms	Sdiri Hanen and Mohamed Ayadi
33	Effect of policy reforms on farmers’ incentives to specialise	Daniel May, Graham J. Tate, and Leslie Worrall
34	The Land Market in Latvia after its accession to the European Union	Sanita Klava
35	Hypermarket Development in Malaysia: Between Customers’ Demand and Its Impact on the Existing Small Retailers	Azhar Hj. Ahmad, Sallehuddin Mohd Nor, Jumaat Abd Moen, Che Aniza Che Wel and Ahmad Raflis Che Omar
36	Entrepreneurship Education in Egyptian Universities: the need for an Educational Revolution.	David A. Kirby
37	Foreign Aid in South Asia: Support or Struggle to Foreign Trade?	Mamta B Chowdhury

38	The Vedanta “dharma” (duty) for CSR “karma” (action)	Balakrishnan Muniapan
39	Does ECOWAS make sense?	Nilanjan Banik
40	A new view into political business cycles: Household expenditures in Albania	Holger Kächelein, Endrit Lami and Drini Imami
41	Spillover effect, international exposure to risk and sustaining growth: Canada - USA	Ghada Gomaa A. Mohamed, Morrison Handley-Schachler, and Manoch Irandoust
42	Measuring the Money Demand Function Stability in Egypt Using Error Correction model and Cointegration	Mohamed Abou Elsoud
43	A comparison between Islamic and traditional banks: Pre and post the 2008 financial crisis	Mohamed Hashem Rashwan
44	Water and The Sustainable Agricultural Development of the Nile Basine	Ahmed Salama
45	Can monetary policy assuage housing shortages? An empirical application to Egypt and South Africa	Monal Abdel-Baki & James Godfrey
46	New Indicators for the Impact of Globalization on Gender Work Equality	Mohga Bassim

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Program

14-17 April, 2011
Triumph Hotel, Heliopolis, Omar El-Khayam Conference Room
Cairo, Egypt

Thursday, April 14th, 2011

9:00 – 10:00 a.m

Reception

10:00 – 10:30 (Presentation & Discussion) – Paper # (14-01)

10:40 – 11:10 (Presentation & Discussion) - Paper # (14-02)

11:20 – 11:50 (Presentation & Discussion) - Paper # (14-03)

12:00 – 12:30 (Presentation & Discussion) - Paper # (14-04)

12:40 – 1:00 (Panel Discussion)

1:00 – 2:00 (Luncheons Break)

2:10 – 2:40 (Presentation & Discussion) - Paper # (14-05)

3:00 – 3:30 (Presentation & Discussion) - Paper # (14-06)

3:40 – 4:10 (Presentation & Discussion) - Paper # (14-07)

4:20 – 4:50 (Presentation & Discussion) - Paper # (14-08)

5:00 (End of sessions)

6:00 – 9:00 p.m

Open Lecture

Dr. Morrison Handley-Schachler

Friday, April 15th, 2011

9:00 – 10:00 a.m

Reception

10:00 – 10:30 (Presentation & Discussions) - Paper # (15-01)

10:40 – 11:10 (Presentation & Discussions) - Paper # (15-02)

11:20 – 11:50 (Presentation & Discussion) - Paper # (15-03)

12:00 – 12:30 (Presentation & Discussion) - Paper # (15-04)

12:40 – 1:00 (Panel Discussion)

1:00 – 2:00 (Luncheons Break)

2:10 – 2:40 (Presentation & Discussion) - Paper # (15-05)

3:00 – 3:30 (Presentation & Discussion) - Paper # (15-06)

3:40 – 4:10 (Presentation & Discussion) Paper # (15-07)

4:20 – 4:50 (Presentation & Discussion) - Paper # (15-08)

5:00 (End of sessions)

6:00 – 9:00 p.m

Open Lecture

Dr. Morrison Handley-Schachler

Saturday, April 16th, 2011

9:00 – 10:00 a.m

Reception

10:00 – 10:30 (Presentation & Discussions) - Paper # (16-01)

10:40 – 11:10 (Presentation & Discussions) - Paper # (16-02)

11:20 – 11:50 (Presentation & Discussion) - Paper # (16-03)

12:00 – 12:30 (Presentation & Discussion) - Paper # (16-04)

12:40 – 1:00 (Panel Discussion)

1:00 – 2:00 (*Luncheons Break*)

2:10 – 2:40 (Presentation & Discussion) - Paper # (16-05)

3:00 – 3:30 (Presentation & Discussion) - Paper # (16-06)

3:40 – 4:10 (Presentation & Discussion) - Paper # (16-07)

4:20 – 4:50 (Presentation & Discussion) - Paper # (16-08)

5:00 (*End of sessions*)

-----*The end of the regular program of the conference*-----

Gala Dinner Gathering

Saturday, April 16th, 2011

7:00 – 10:00 at night

Triumph Hotel

Heliopolis, Cairo, Egypt

Rehana Hall

Dinner with classic Arabic Songs, Music & Egyptian Folklore

Best 3 papers Selections & the conference's best papers gifts

Top 3 papers - Election runs by the conference committee in addition to all conference delegates.

Gifts are presented by:



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The Canadian Expertise House for Advanced Economic Studies,
CEHAES, Cairo, Egypt



Trend Micro, Inc., Canada

Sunday, April 17th, 2011

(Sunday's program is not yet final)

9:00 – 10:00 a.m

Reception

10:00 – 11:00 Panel Discussion # (17-01)

11:00 - 1:00 Panel Discussion # (17-02)

The End of the Conference

6:00 – 9:00 p.m

Open Lecture

Dr. Morrison Handley-Schachler

Papers of Participants

Paper # (14-01) – Included in the conference proceedings

Effects of distrust on the formation of collaborative alliances in agriculture: a social network approach

Daniel E. May

Participant:

Daniel May

Harper Adams University College

D.May@wlv.ac.uk

United Kingdom

Abstract: Collaborative alliances have been identified as useful business strategies to help individuals to adjust in turbulent business environments. Surprisingly, the article found that this strategy was not adopted by the ex-sugar beet farmers of the West Midland of the UK in response to the reform of the Sugar Regimen introduced by the European Union in 2006. According to these farmers, this is the result of lack of trust among potential partners. The article uses the network model developed by May (2011) with the purpose of determining whether this outcome corresponds to an equilibrium caused by the existence of distrust. Policy implications are then discussed.

Paper # (14-02) – Included in the conference proceedings

Does South African Government SME focus interventions work?

Rob Smorfitt & Charles O'Neil

Participants:

Charles O'Neill

The British University in Cairo

Charles.Oneill@bue.edu.eg

Cairo, Egypt

Abstract: The objective of this paper is to determine whether the interventions introduced by the South African Government to stimulate SMEs have been successful. The paper investigates the Small and Medium Enterprise (SME) intervention policy of the South African Government against the background of the putative benefits and costs attendant upon microeconomic policy intervention. In the first section, the literature survey examined the international literature on the nature of policies to stimulate the SME sector, the debate surrounding the need for interventions, and contextualized South Africa within this framework. In the next

section the research methodology sets the conceptual framework for the empirical study that sought to determine the attitudes of entrepreneurs in the most populated province in South Africa, namely KwaZulu-Natal, to SME policy intervention and extrapolated from the various conclusions on the efficacy of the South African SME intervention policy. In the final instance, the summary, limitations, suggestions for further research as well as the recommendations flowing from the assessment of both the literature review and empirical investigation are presented in the context of how government could improve the stimulation of SMEs and subsequent employment creation.

Paper # (14-03) – Included in the conference proceedings

Measuring the Money Demand Function Stability in Egypt Using Error Correction model and Cointegration

Mohamed Abou Elsoud

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Abstract: This study aims at analyze the behavior of money demand function at narrow sense (M1) in Egypt based on annual data for the period (1991-2009), and in order to identify the determinants and the speed of adaptation and the extent of stability, to achieve this goal we constructed two models of the money demand function, in the short term, and in the long-term respect, depending on the Johansen test for the cointegration and the error correction. The study found that the demand function for real money is stable in the long term, and that real GDP and inflation rate are the most important variables affecting the level of demand for real money in Egypt during the study period, the results of estimating error correction model shows that there is a dynamic short-term between the demand for money and both the real GDP and the rate of inflation.

Paper # (14-04) – Included in the conference proceedings

A need for a balanced participatory approach in developing and implementing a Knowledge Management Strategy in International Development Organizations: The Case of CIDA Egypt

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Abstract: With the rise of globalization and the increasing demand for sustainability, Knowledge Management (KM) has been implemented widely in multinational organizations and in the private sector during the last two decades. In the public sector and in the international development domain, attempts to undertake KM initiatives have been more modest and less recorded and examined. This research is focusing on developing and implementing KM strategies in the international development organizations in an analytical way. The aim of the research is to investigate whether there is a successful model for developing a KM system that achieves an effective and successful implementation. It investigates some distinguished attempts made so far in that area world-wide and examines thoroughly the experience of one international development organization in Egypt. It comes up with a recommended model and criteria for implementation in similar entities.

Paper # (14-05) – Included in the conference proceedings

Entrepreneurship Education in Egyptian Universities: the need for an Educational Revolution

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Abstract: Throughout the world universities are being required to introduce entrepreneurship programs in an attempt to create more entrepreneurial graduate students. Though somewhat later than many other countries, Egypt is no exception as the Egyptian

Global Entrepreneurship monitor report for 2008 observes. This present paper uses existing research on Entrepreneurship Education and Entrepreneurial institutions, combined with the results of primary research on Egyptian students, to determine what the country's universities will be required to do if they are to meet the challenge. The study concludes that Egyptian universities will need to transform not only what they teach, but how they teach, whilst at the same time transforming their own institutions in order to create more entrepreneurial learning environments. The conclusions have relevance for Educational policy makers, university administrators and university academics not just in business and economics but across all disciplines.

Paper # (14-06) – Included in the conference proceedings

A comparison between Islamic and traditional banks: Pre and post the 2008 financial crisis

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Abstract: This study tests the efficiency and profitability of banks that belongs to two different sectors: a) Islamic Banks (IBs) and b) Traditional Banks (TBs). The study concentrates on the pre and post 2008 financial crisis with an aim to test if there are any significant differences in performance between the two sectors. The study applies the MANOVA techniques to analyze the financial secondary data for only publicly traded banks in the same region.

The findings of the study show that there is a significant difference between the two sectors in 2007 and 2009 and there are no significant differences in 2008, which indicates the effect of the crisis on both sectors. IBs outperform TBs in 2007 and TBs outperform IBs in 2009. This result indicates the spread of the crisis to the real economy where IBs usually operate.

Paper # (14-07) – Included in the conference proceedings

Water and The Sustainable Agricultural Development of the Nile Basine

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Abstract: Nile River is the main source of water for the Nile basin countries. The provided water does not satisfy the enormous demand of water in the region. It is expected that atleast six out of the ten countries that share the Nile water will face water stress in the early 21st century. Nile water for the downstream countries like Egypt and Sudan is considered to be of a vital national priority.

Sustainable agriculture as a way of raising food that is healthy for consumers and animals, that does not harm the environment, is humane for workers, respects animals, provides a fair wage to the farmer, and supports and enhances rural communities has become of a vital need to the Nile basin countries.

Moreover, the stochastic nature of water supply and dynamic nature of water demand imply an allocation model with certain characteristics to maintain the sustainable development of the basin countries in order to maximize the overall welfare. Thus, the need for Pareto-optimal model is a prerequisite as the unidirectional of the river, is often considered as a source of tension and conflict between countries that is difficult to solve. Our goal in this paper is to arrive at the Pareto-optimal allocation model that

maximizes the welfare of Egypt and Ethiopia without causing any significant harm to any of them. The Model that will be developed in this paper following the same methodology of D .Marc Kilgour and Ariel Dinar which is based on the idea of utilizing the water of the river by transferring it between countries within the river basin .To state differently, it allows the downstream countries that are in need for water to get it from an upstream country by compensating that country for less water available for usage ,trying to balance the growing demand of water in the Nile region for the sustainable agricultural development , which would lead to food security raising the economic welfare for the basin countries.

Paper # (14-08) – Included in the conference proceedings

Effect of policy reforms on farmers' incentives to specialize

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Abstract: A relatively new research has introduced non-economic drivers to explain farmers' strategic behavior with the objective of gaining an understanding of the way in which farmers adjust in response to policy reforms. In this context, it has been argued that these non-economic drivers remain robust through changes in policy and business environments because they represent long term enduring aspirations. The objective of this article is to test whether these drivers really remain robust to policy changes. For this purpose, a number of farmers were asked to report their attitudes towards specialization before and after the incidence of a particular policy reform. The results revealed that only few drivers remained robust, but others were strongly affected by the reform.

Paper # (15-01) – Included in the conference proceedings

The Role of Trade Agreement in Promoting Egyptian Exports

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Abstract: Globalization trends pushes developing countries to open its market for free trade. However, under the fear of domestic production break down, developing countries would divert to a second best choice which is regional Integration. Egypt laltely has joined a number of economic integration targeting improvement in its exports. The aim of this paper is to measure the effectiveness of this integration forms in changing exports in Egypt. This is achieved through regression analysis for the Gravity Model based on polled time series cross sectional data to estimate the significance of bilateral and multilateral trade agreements in promoting Egyptian exports.

Paper # (15-02) – Included in the conference proceedings

Hypermarket Development in Malaysia: Between Consumers' Demand and Its Impact on the Existing Small Retailers

Azhar Ahmad, Sallehuddin Mohd Nor, Jumaat Abd Moen, Che Aniza Che Wel, Ahmad Raflis Che Omar

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Abstract: The presence of bigger retail outlets have brought new business opportunities and moved Malaysian retailing industry to greater heights. Hence, a study was undertaken to assess the potential impact of the proposed development of hypermarkets on existing small business retailers. The assessment was based primarily on the perceptions and expressed opinions of both the customers and sampled retailers in the states of Selangor and Penang. The objectives of the study were to: 1) understand the customers' behavior on retailing and 2) assess the small retailers regarding their performance, future outlook, and actions taken amid the development of hypermarkets in their areas. From the analysis, the customers welcomed the presence of hypermarket in their area. However, there would be short-term adverse impact on most retail outlets and the degree of the impact is determined by the type of retail business. The study also provides several recommendations for existing small retailers to stay competitive.

Paper # (15-03) – Included in the conference proceedings

Personal qualities and technical administrative accountant as one of the determinants of the gap between theory and practice in management accounting

Shala Abulgacem Al-Abiyad, Morrison Handley-Schachler & Ali Ahmed El-Hadd

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Abstract: The quality of accounting information and decisions is to a large extent dependent upon the quality of the education of management accountants, both in terms of general education and in terms of specialized business education. This study examines the perceptions of academic accountants and business managers and academic accountants of the accounting education system in Libya by means of questionnaires completed by a sample of 24 managers and 25 lecturers. Respondents indicated that the emphasis in general education and business education of management accountants is largely appropriate in terms of what is presently taught. However, there is still a perceived quality gap, in that the abilities of accountants and the standards of their education in different accounting and business skills generally falls short of the level which should be required given the importance of those skills in the work of the management accountant.

Paper # (15-04) – Not Included in the conference proceedings

FDI determinants, how to explain Arab countries' disconcerting record

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Abstract: The paper aims at explaining the disconcerting record of Arab countries in terms of FDI. First we investigate the drivers of FDI outward stocks of 13 OECD countries towards 63 countries including 17 Arab countries, using the OECD FDI statistics. Conclusions are then drawn for Arab countries to explain the factors that prevent them from attracting more FDI by decomposing the gaps between FDI stock of each Arab country and that of Korea. The results regarding FDI drivers are in line with most of the theoretical propositions as well as previous empirical findings. The decomposition of FDI gaps provides valuable evidence. Some of the Arab countries are shown to exert some advantages notably in terms infrastructure, tax rates, trade openness and institutions. Contrarily, all Arab countries suffer from their economic size coupled with meager bilateral trade with FDI source countries. Finally, and most importantly, it has been found that the not explained part of FDI gap varies widely from a country to another. From a policy making point of view this distinction has major implications. Hence, focusing on policy-related variables such as tax rates, infrastructure and institutions can have substantial surge in terms of FDI in UAE, Yemen, Egypt and Sudan, while other countries should stop focusing their reform efforts on these issues since they do not explain much of their FDI deficit.

Paper # (15-05) – Included in the conference proceedings

Financial Market Regulations and Legislations: The study of Malaysia, the UK and the US Statutes in relation to Financial Statement Fraud

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Abstract: This paper attempts to explain the current Malaysian financial market regulations relevant to the financial statement process that could mitigate financial statement fraud (FSF). The paper also reviews similar provisions in the United States and United Kingdom regulations. Design/approach – This paper discusses financial statement fraud and reviews the relevant provisions in the statutes of the three countries in mitigating the fraud. The study found some similarities and differences in regulations between the countries. It seemed that a lot of provisions had been put in place and FSF always exist due to human greed. Research limitations/implications – The paper is limited to Securities Act and the most relevant regulations to the financial statement process. Also, only a few guidelines from the professional accounting bodies were reviewed. Practical implications The paper compared the relevant sections from the various Acts of the three countries. The similarities and the differences of practices may give benefit to mitigate financial statement fraud. Originality/value – Regulators and practitioners may consider the potential sections that give benefit to their country.

Paper # (15-06) – Included in the conference proceedings

Explaining the decisions to innovate: the case of Tunisian service firms

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Abstract: It is widely recognized that innovation is the major driver of economic growth and competitiveness. Due to the emergence of the information technologies, the body of the economic research has notably interested more in clarifying the dynamism that characterizes the innovation activities. But, some works focus especially on analyzing the determinants and the effects of innovation while distinguishing product innovation to process innovation. This distinction is often

regarded as a fundamental assumption but the way in which firms make the decision to innovate remains rarely tested. Based on a sample of 108 Tunisian service firms, the purpose of the paper is twofold. Firstly, we explain the way in which firms make the decision to innovate: simultaneous (one-stage model) or sequential (two-stage model). Secondly, we compare these two models of innovation decision-making. Given the multiple discrete choices setting, we use a Multinomial Probit model (MNP). We find that the two-stage model has a statistically-significant advantage in predicting the innovation. This result suggests that, in practice, the sequential model illustrate well the innovation making-decision procedures.

Paper # (15-07) – NotIncluded in the conference proceedings

A new view into Political Business Cycles: Household Expenditures in Albania

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Abstract: Over the last decades, there has been plenty of research and articles on Political Business Cycles (PBC), aiming at analyzing and explaining the use of fiscal and monetary instruments to stimulate economic growth before elections, to impress the voters. Following previous research on PBC in Albania, there is clear evidence of fiscal expansion before elections, but no significant changes in inflation and GDP, as theory predicts. Based on these results, we analyze the peoples' expectations related to elections outcomes, and the way these expectations influence their decisions to spend, and consequently the macroeconomic variables.

Paper # (15-08) – Included in the conference proceedings

The Land Market in Latvia after its accession to the European Union

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Abstract: Many authors have researched the impact of support payments on land markets. It was observed that land rental values and also land market values increase due to their impact. The impact was observed in Latvia until 2007. With the beginning

of the financial crisis, which also affected Latvia, the macroeconomic indicators made a more significant impact on the land market, although the amount of support payments increased. A sharp downturn in Latvia's land market continued until 2009, which was followed by a moderate decrease in 2010. It is forecasted that Latvia's situation will improve in the future.

Paper # (16-01) – Included in the conference proceedings

New Indicators for the Impact of Globalization on Gender Work Equality

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Abstract: One of the controversial issues associated with Globalization is its effects on the gaps between countries and inequalities within countries especially developing countries. These inequalities have different forms. They are represented for example in gender inequality and income inequality. In this paper the researcher will focus on the inequality in opportunities at work between genders. As gender equality at work is becoming an important issue for improving the work environment, productivity and economic growth. In order to study the impact of globalization on gender equal opportunity at work, a random survey study of 2021 person was conducted among men and women working in different companies in Egypt. The need for the survey study is due to the inexistence of published data. The survey study is presented together with a comprehensive statistical and graphical analysis of the results. Two indicators Personal Globalization Indicator (PGI) and Work Equal Opportunity Indicator (WEOI) are introduced in order to measure the impact of globalization on the gender work equal opportunity.

The results of the regression model shows that there is a weak positive correlation between the two indicators and this is normal as equality is also affected by other social factors like cultural and religious beliefs which promote gender equality in Egypt. In recent history, women in Egypt have participated in the work force for decades. Egyptian laws and regulations increasingly encourage women's work, and women's income contributes to the families' welfare.

Paper # (16-02) – Included in the conference proceedings

Moslem immigrant consumers' interest for Italian food specialties certified Halal

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Abstract: Recent immigration to Italy of thousands of Muslim workers and families has intensified the problem of a partial incompatibility of different food cultures. For Moslems it is difficult to avoid purchasing foods that contain forbidden ingredients, because these ingredients are common in the generic Italian food market. Halal marks have not been very visible in the Italian market until now. We reports results of a pilot study addressing the question of the interest Moslem consumers may have for the Halal certification of food products that are normal for the Italian market and are usually produced by Italian food processors. We surveyed a sample of 200 immigrant consumers and the data were analyzed trying to connect the interest for Halal certified Italian specialty foods with the principal dimensions concerning the attitudes showed towards the Italian culture and of different aspects of the lifestyle of respondents. Results of the study suggest that a consistent portion of the sample would be willing to purchase Italian traditional food products if the Halal mark would be applied to them, although with some differentiation among the different types of product.

Paper # (16-03) – Included in the conference proceedings

Innovation and Entrepreneurship: Does Gender Really Matter? The Case of the Middle East

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Abstract: It has been widely accepted that entrepreneurship and innovation play important and vital role in the economic growth and development of countries. Both are believed to be positively related, while Drucker believed that innovation is the specific tool of entrepreneurs; Schumpeter viewed the entrepreneur as innovator. Although our understanding of the relation between innovation and entrepreneurship is seldom gendered, however, there is gender difference among entrepreneurs in terms of levels of innovation.

The current research is a descriptive research aiming at broadening our understanding of the differences between men and women entrepreneurs in the Middle East using the data collected by the Adults Population Survey as part of the Global Entrepreneurship Monitor in 2008 and 2009.

The research shows that although the level of entrepreneurship in Arab countries is fairly good; the level of innovation is poor with men entrepreneurs being more innovative than women.

Paper # (16-04) – Included in the conference proceedings

The need for a development oriented approach to the BOP in LDCs

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Abstract: The main argument here is that the conventional approaches to the BOP deal with the symptoms but not with the original causes or sources of BOP difficulties in LDCs. Trying to benefit from the current world economic situation, this article proposed a development-oriented approach to bop adjustment in LDCs which refreshes and extends calls and suggestions, of few economists during the last three decades, that emphasized the need to deal with bop difficulties of these countries in the context of a structural transformation process. The suggested development-oriented approach represents a general guideline and thus supposes that the detailed policy prescription must be left to the peculiarities of every economy to determine what is needed.

Paper # (16-05) – Included in the conference proceedings

A study on profitability of beef production sector and opportunities for the new Entrepreneurs in Turkey

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Abstract: Beef sector in Turkey has encountered a significant setback due to the gradual decrease in total number of animals for the last 25 years. There is a no continuum in the policies implemented by governments. In addition, increase in the desired level of red meat production has not corresponded to the increase in population. The prices of meat have been increased due to the failure in red meat production to satisfy the demand. Recently, subsidies in livestock policies of the current government have been introduced to encourage the new entrepreneurs to invest and improve beef sector in the country.

In this study within the framework of these assessments, the present number of animals, current meat production level, fluctuations in the prices of meat and feed, improvements in carcass yield and changes in beef business policies were analyzed.

Fattening cattle in different production systems in terms of entrepreneurial profitability has also been discussed.

Paper # (16-06) – Included in the conference proceedings

A Genetic Algorithm Based Technique for Solving the Supply-Demand Interaction in Electronic Commerce

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Abstract: Bi-level programming, a tool for modeling decentralized decisions, consists of the objectives of the leader at its first level and that of the follower at the second level. Numerous algorithms have been developed so far for solving bi-level programming problem. In this paper by using genetic algorithm (GA), an attempt has been made to solve a real problem, (the supply – demand interaction in electronic commerce (EC)), taking into account the non – linear model to such problem. By applying the bi-level programming technique via genetic algorithm and a flow chart of interaction process, the study will develop an analytical process to explain how supply – demand interaction achieves a compromise solution or why the process fails. The proposed genetic algorithm utilizes the idea of the weak duality theorem, such that both primal and dual solution of the non-linear programming problem under consideration is generated simultaneously, to determine the interval in which the optimal solution is located. Finally, an illustrative numerical example, of the application problem, is given to demonstrate the obtained results.

Paper # (16-07) – Included in the conference proceedings

Do Subsidies increase poor access: The case of wheat in Egypt?

Randa Hamza & Shadwa Zaher

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Abstract: The agriculture sector in Egypt is one of the most important sectors affecting the level of economic well-being and performance. It accounts for 25% of

labor force, 14% of GDP and 20% of exported goods (CAPMAS, 2010). Wheat is the major staple crop in the country consumed mainly as bread. It constitutes 33% of total winter crop area. Today, Egypt's annual per capita consumption of wheat is estimated to be 180 Kg which is almost double the international average (AFSA, 2010). In 2010, Egypt's average wheat imports were 9.8 million MT, making Egypt the world's largest importer of wheat. The government's main policy for wheat is to increase self-sufficiency ratio and encourage more local production. Although the government introduced a number of agricultural liberalization reforms in 1987, it still kept the wheat subsidization policies of 1962 in effect. However, this policy created several market distortions and failed to efficiently achieve its main goals. This paper uses a descriptive analysis to show the trends of production, consumption and the effects of wheat subsidies from year 2005 to 2010. The main goal is to examine the different policies that will secure the Egyptian sector from future shocks; and the possible ways to improve national policies to enhance self-sufficiency and access of the poor. The analysis concludes that subsidies, as being an important policy tool for advancing development and eliminating poverty in Egypt, should be maintained by only targeting the poor through effective measures that prevent any leakage. In addition, policies that increase rural farmers' local production and competitiveness need to be introduced to avoid any kind of future supply shocks.

Paper # (16-08) – Included in the conference proceedings

Spillover effect, international exposure to risk & sustaining growth: Canada – USA

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Abstract: This paper tests the spillover effect of the foreign capital inflows on the long run growth under conditions of international economic exposure to foreign exchange rate fluctuations. The paper utilizes a simple open economy version of the Solow growth model with main features of real business cycles models. In addition, the paper uses a time series model with substitutions techniques to test the impact of the spillover impact of foreign capital inflows on the long run growth of Canada with controlling for exposure to foreign exchange fluctuations. The paper also controls for both external and internal balances. The results show that the exposure to foreign exchange rate fluctuations undermines the technological spillover impact of the foreign capital on long-run growth. It however does not affect the serial correlation impact of the spillover on the economic growth rate of Canada. The paper emphasized on Canada-USA bilateral relationship rather than Canada-the rest of the world case.

Panel Discussions

Panel discussion # (14-01) – Poverty Reduction & Development

Presenter: Prof. Yomn El-Hamaqi; Ain Shams University.

Panel discussion # (14-02) – Leadership & Entrepreneurship

Presenter: Prof. David Kirby; The British University.

Panel discussion # (15-01) – Management Development

Presenter: Prof. Hussein Saraya; Management Development Consulting.

Panel discussion # (15-02) – Financial Risk Management

Presenter: Dr. Mohamed Hashem & Dr. John Adams; The British University.

Panel discussion # (16-01) – Financial Fraud Reduction

Presenters: Norazida Mohamed, Teesside University.

Panel discussion # (16-02) – The importance of Agricultural sector & poverty reduction in Egypt

Presenters: Dr. Ahmed Salama (The British University) & Abeer Besheer (Agricultural Economic research Institute).

Panel discussion # (17-01) – Economic Crises Management

Presenter: Dr. Ghada Gomaa A. Mohamed, Ottawa University & Canadian International College.

Panel discussion # (17-02) – Political Transition & Economic Reform in Egypt: Suggestions and views.

Open discussions until the end of the program at 1:00 pm.

Open Lectures

Dr. Morrison Handley-Schachler (Financial Fraud & Crime Reductions Expert)

Lecture #1: Thursday, April 14th, 2011 From 6:00 – 9:00 pm

Accounting as Science, Art and Black Magic.

Lecture #2: Friday, April 15th, 2011 From 6:00 – 9:00 pm

Auditors: Are They Just Wasting Your Time?

Lecture #3: Sunday, April 17th, 2011 From 6:00 – 9:00 pm

Risk Management: Describing the Indescribable and Planning for Unknown Unknowns.

**The First Annual Conference of Economic Forum of
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(FACEFEIB)**

SELECTED PAPERS

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Effects of distrust on the formation of collaborative alliances in agriculture: a social network approach

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Abstract: Collaborative alliances have been identified as useful business strategies to help individuals to adjust in turbulent business environments. Surprisingly, the article found that this strategy was not adopted by the ex-sugar beet farmers of the West Midland of the UK in response to the reform of the Sugar Regimen introduced by the European Union in 2006. According to these farmers, this is the result of lack of trust among potential partners. The article uses the network model developed by May (2011) with the purpose of determining whether this outcome corresponds to an equilibrium caused by the existence of distrust. Policy implications are then discussed.

Key words: Collaborative Alliances; Networks of Collaboration; Distrust.

1. INTRODUCTION

A relatively new theoretical development has been introduced in the last decades with the objective of understanding how organizations adjust in turbulent and dynamic business environments. This development is referred to as dynamic capabilities and is defined by Eisenhardt and Martin (2000) as “*the firm’s processes that use resources –specifically the processes to integrate, reconfigure, gain and release resources – to match and even create market change. Dynamic capabilities thus are the organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve and die* (pp. 1107)”. Wang and Ahmed (2007), based on empirical academic works, argued that dynamic capabilities are characterized by three components or factors that are common across firms: (i) adaptive capability (*i.e.* a firm’s ability to identify and capitalize on emerging market opportunities); (ii) absorptive capability (*i.e.* ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends in order to innovate); and (iii) innovative capability (*i.e.* a firm’s ability to develop new products and/or markets, through aligning strategic innovative orientation with innovative behaviors and processes).

Collaborative alliances have been identified as important business strategies because they can help firms to adjust in dynamic environments. This is because they contribute in the development of dynamic capabilities as they positively affect the

development of both absorptive capacity and innovative capability. For example, Chen (2004) argued that inter-firm alliances and collaboration across firms can help

firms to acquire the outside knowledge that is needed to adjust in turbulent conditions. Hagedoorn and Duysters (2002), on the other hand, argued that the formation of strategic alliances can help firms to obtain the information that is needed to innovate in new processes and products. Finally, collaborative alliances also help farmers to adjust in turbulent business environment because they allow them to charge lower prices for agricultural goods. This is because unitary costs can be reduced by means of collaboration. That is, collaboration can reduce information asymmetries, minimise transaction costs, reduce both transport and communication costs, and purchase in volume and share inputs including seeds, fertilizer and farm equipment (Gerichhausen *et al.*, 2009; Gall and Schroder, 2006; and Lapar *et al.*, 2006).

While academic works have identified the beneficial effects of forming collaborative alliances in turbulent business environments, no work has been made to determine whether policy reforms have positively affected the formation of these alliances. The objective of this article is to fill this gap in order to test the hypothesis that policy reforms positively affect the formation of collaborative alliances in rural areas because they help farmers to adjust in the associated turbulent business environment. For this purpose, the research has been conducted in two stages. In the first stage a sample of ex-sugar beet farmers of the West Midlands of the UK was considered with the purpose of determining whether these farmers formed collaborative alliances in response to the reform of the Sugar Regime introduced by the European Union in 2006. The second stage, on the other hand, was designed to determine the nature and implications of the lack of collaboration identified in the first stage. For this purpose, the social network model developed by May (2011) was adopted in order to determine whether this lack of collaboration constitutes an equilibrium. If this is the case, then this equilibrium could prevent farmers from developing dynamic capabilities needed to adjust in response to policy reforms. In this context, breaking this equilibrium in favor of a more integrated collaborative network across farmers constitutes a major policy target. The results obtained in this stage were used to propose a number of policy recommendations.

The paper is structured as follows. Section Two describes the methodology used in the research. Section Three describes the results of the first and second stage of the investigation. Policy implications of the results are described in Section Four. Finally, Section Five concludes the paper.

2. METHODOLOGY

2.1 Methodology used in the first stage of the research

The first stage of the research was designed to complete with two objectives. The first one is to determine whether the ex-sugar beet farmers of the West Midlands region of the UK (ESBF) increased the number of collaborative alliances in response to the implementation of the Sugar Regime reform (SRR). For this purpose, some ESBF were asked to report the number of alliances that they had before and after the introduction of the reform. A simple t-student test was conducted to determine whether the averages of

the number of collaborative alliances that farmers had before (n_B) and after (n_A) the reform are statistically different. The null and alternative hypothesis established for this test is shown as follows:

$$H_0 n_A = n_B$$

$$H_1 n_A > n_B$$

The second objective, on the other hand, is to determine whether farmers' willingness to form collaborative alliances increased in response to the SRR. For this purpose, some ESBF were asked to indicate their willingness to participate in collaborative alliances in response to the SRR. In particular these individuals were asked to use a 5-Likert point scale (*i.e.* irrelevant, not very important, important, very important, and essential) to respond the following statement before and after the implementation of the SRR: "collaborative alliances formed with the objective of reducing productive costs are suitable to make your farm a successful business enterprise". A simple t-student test was conducted to determine whether the means of the Likert scores reported by the farmers in the sample for the case "before the reform (μ_B)" is statistically different from the sample mean for the case "after the reform (μ_A)". The null and alternative hypothesis established for this test is shown as follows:

$$H_0 \mu_A = \mu_B$$

$$H_1 \mu_A > \mu_B$$

The information obtained in this stage was useful to identify the existence of potential barriers preventing farmers from collaborating in response to the reform, even when being willing to collaborate. For the purpose of the present research, it is hypothesises that a barrier exists when the following conditions are both satisfied: (i) $n_A = n_B$; and (ii) $\mu_A > \mu_B$.

The sample consisted of 48 farmers which correspond to 8.1 per cent of the total sugar beet growers that operated in the West Midlands before the reform. This sample was collected in a period of six months. The data collection method was based on a combination of cluster, stratified and snowball sampling techniques. The reason for using them was that there was not a list of ESBF available in the public domain. Before adopting these techniques, different unsuccessful attempts to obtain a random sample were made.

The sample cluster was selected considering the most relevant counties of the West Midlands region in terms of the number of ESBF. They corresponded to the counties of Shropshire, Worcestershire, Herefordshire, Staffordshire and surrounding areas accounting for 48%, 15%, 14%, 12% and 11% of the total sugar beet farm holdings in 2005, respectively. The sample considered relatively similar proportions for these counties in terms of the number of farmers that participated in the investigation accounting for 46%, 15%, 13%, 15% and 13%, respectively. A similar approach was adopted by the Rural Business Unit of the University of Cambridge and The Royal Agricultural College (2004) but in terms of regions rather than counties.

The sample stratification was made considering the size of the farm in terms of the number of hectares. It was not possible to find official statistics on this variable. Nonetheless, a criterion was established based on the opinions of the 10 farmers that formed the pilot sample. The precaution was taken to include a balanced number of farmers to the classes defined by this measure.

The snowball technique was developed separately in each relevant county. As a result, it was possible to find a number of ESBF that is consistent with the sample cluster strategy defined above.

2.2 Methodology used in the second stage of the research

The second stage is based on the information collected in the first stage. In the latter it was found that farmers increased their willingness to participate in collaborative alliances after the implementations of the SRR (*i.e.* $\mu_A > \mu_B$). However, farmers did not increase collaboration in practice (*i.e.* $n_A = n_B$). These individuals argued that this is because the formation of large collaborative alliances is couple with costs that arise from distrust among potential partners. In order to determine whether this outcome is an equilibrium under distrust, the network model developed by May (2011) has been adopted. This theoretical model was used to investigate how to break this theoretical equilibrium with the purpose of promoting the formation of collaborative alliances. This model is formally shown as follows.

A collaborative alliance between farmers i and j is described by a link, given by a binary variable $g_{ij} \in \{0,1\}$ with $g_{ij}=1$ if an alliance exists between farmers i and j and $g_{ij}=0$ otherwise. A network $g = \{(g_{ij})_{i,j \in N}\}$ is a description of the collaborative alliances that exist among a set $N = \{1, \dots, N^*\}$ of farmers, where N^* is the total number of farmers. Networks g^c and g^e are the complete network (*i.e.* $g_{ij}=1$ for all $i, j \in N$) and the empty network (*i.e.* $g_{ij}=0$ for all $i, j \in N$). Let G denote the set of all possible networks, $g + g_{ij}$ denote the network obtained by replacing $g_{ij}=0$ in network g by $g_{ij}=1$, and $g - g_{ij}$ denote the network obtained by replacing $g_{ij}=1$ in network g by $g_{ij}=0$. Let $N_i(g) = \{j \in N : g_{ij}=1\}$ be the set of farmers with whom farmer i has a collaborative alliance in network g . Assume that $i \notin N_i(g)$ so that $g_{ii}=0$. The cardinality of $N_i(g)$ is denoted $\eta_i(g)$. That is, $\eta_i(g)$ is the number of collaborative alliances that farmer i has in network g . Given this definition, it always holds that $\eta_i(g + g_{ij}) = \eta_i(g) + 1$.

In order to determine the objective function of farmers, on the other hand, the following assumptions have been adopted:

(i) Farmers are price takers: It is assumed that the demand for this good is perfectly elastic. Formally, assume for simplicity and without losing generality that all the farmers in set N produce the same crop. Let $p(g)$ be the price of this crop in network g . Because farmers are price takers, it is assumed that $p(g) = p$ for all $g \in G$.

(ii) Farmers have a fixed area of land: Farmers in the short-medium run cannot respond to exogenous changes of marginal cost by increasing production because they face a land constraint given by the existence of clear property rights (*i.e.* they have a fixed area of land). This restriction is introduced as follows. Let c_i be the marginal cost faced by farmer $i \in N$. If $p = c_i$, then farmer i maximizes profits by using all its land endowment. If $p < c_i$, then the farmer maximizes profits by choosing an output smaller than that obtained when using all its land endowment. Finally, if $p > c_i$, then farmer i produces the same output than that produced when $p = c_i$ as a consequence of the land restriction. Formally, if $p \geq c_i$, then $Q_i(g) = Q_i$ for all $g \in G$, where Q_i represents the output of the crop produced by farmer i . In contrast, if $p < c_i$, then $Q_i(g) < Q_i$.

(iii) Farmers distrust their potential partners: Assume that the marginal cost faced by farmer i in network g is given by $c_i = \lambda_i - \theta_i \eta_i(g) + \phi_i \eta_i^2(g)$, where λ_i is the marginal cost faced by farmer i when this individual does not have collaborative alliances. The term $\theta_i \eta_i(g)$ represents the beneficial effect of collaborative alliances on marginal cost, where $\theta_i > 0$ reflects how strong this beneficial effect is. Finally, the term $\phi_i \eta_i^2(g)$ represents the distrust cost of collaboration. Since the ex-sugar beet farmers argued that this cost increases more than proportionally as the number of alliances increases, this cost has been assumed to be a quadratic function of $\eta_i(g)$. The coefficient ϕ_i reflects how strong the negative effect of this cost is.

Using these assumptions, the objective function of farmer i in networks g and $g + g_{ij}$ is defined as follows:

$$\pi_i(g) = p(g)Q_i(g) - [\lambda_i - \theta_i \eta_i(g) + \phi_i \eta_i^2(g)]Q_i(g) \quad (1)$$

$$\pi_i(g + g_{ij}) = p(g + g_{ij})Q_i(g + g_{ij}) - [\lambda_i - \theta_i \eta_i(g + g_{ij}) + \phi_i \eta_i^2(g + g_{ij})]Q_i(g + g_{ij}) \quad (2)$$

For simplicity it is assumed that $p = \lambda_i$ for all $i \in N$. This implies that farmers will have an incentive to form a collaborative alliance as long as $p > \lambda_i - \theta_i \eta_i(g) + \phi_i \eta_i^2(g)$. Farmers have an incentive to form a collaborative alliance when this condition is satisfied because it allows them to make super-profits. On the other hand, since $p(g) = p$ for all $g \in G$ and $Q_i(g) = Q_i$ for all $g \in G$ when $p > c_i$, farmer i will have an incentive to form a collaborative alliance with farmer j when the following expression is positive:

$$\pi_i(g + g_{ij}) - \pi_i(g) = \{\theta_i - \phi_i[\eta_i(g + g_{ij}) + \eta_i(g)]\}Q \quad (3)$$

In order to determine the stability of the network of collaboration, the Pairwise stability concept proposed by Jackson and Wolinsky (1996) has been adopted. Formally, network g is pairwise stable if for all $i, j \in N$: (i) if $\pi_i(g + g_{ij}) - \pi_i(g) > 0$, then $\pi_j(g + g_{ij}) - \pi_j(g) < 0$; and (ii) $\pi_i(g) > \pi_i(g - g_{ij})$. Condition (i) specifies that if two

farmers, i and j , do not have a collaborative alliance, then at least one of them has no an incentive to form one; and condition (ii) means that no farmer has an incentive to break an existing alliance.

3. RESULTS

3.1 Results of the first stage of the research

The results obtained in this stage revealed that before the implementation of the SRR 16 farmers in the sample had two collaborative alliances, 25 had only one collaborative alliance, and the rest did not have any sort of collaboration. In contrast, after the implementation of this reform, 17 farmers had two alliances, 28 had only one alliance, and the rest were not involved in collaboration. The t-calculated that was

obtained from this information was 0.81. In contrast, the t-table value for one-sided test, 94 degrees of freedom and 5% of significance level is equal to 1.661. Because the t-calculated is smaller than the t-table, the null hypothesis has not been rejected. As a result, it is concluded that the number of collaborative alliances did not increase after the implementation of the reform (*i.e.* $n_A = n_B$).

On the other hand, farmers assigned in average a value equal to 3.21 (variance = 0.87) to the statement “collaborative alliances formed with the objective of reducing productive costs are suitable to make your farm a successful business enterprise” for the case “before the reform”. In contrast, they assigned a value equal to 3.87 (variance = 0.85) to this statement for the case “after the reform”. The t-calculated that was obtained with this information was 3.48. Because in this case the t-calculated is larger than the t-table, the null hypothesis has been rejected. It concluded, therefore, that the farmers in the sample increased their willingness to participate in collaborative alliances in response to the SRR (*i.e.* $\mu_A > \mu_B$).

Because farmers increased their willingness to participate in collaborative alliances, but they did not increase collaboration, it has been inferred the existence of a barriers preventing them from forming alliances in response to policy reforms. The survey revealed that farmers did not increase collaboration because they did not trust their potential partners. This problem has also been identified by researchers in other studies. For example, Ortmann and King (2007) argued that the free-rider problem arises when property rights among members of the alliance are not sufficiently well defined. In this case, some individuals have the incentive to avoid bearing the full cost of their actions. Likewise, Gerichhausen *et al.* (2009) and Banaskar (2008) argued that lack of trust can negatively influence the formation of collaborative alliances.

3.2 Results of the second stage of the research

The objective of this stage is to determine whether the barrier identified in the first stage (*i.e.* existence of distrust) can generate a theoretical network in equilibrium that is consistent with that characterizing the case of the ESBF. This is shown in the following Proposition.

Proposition 1: *If $3 < \theta_i / \phi_i < 5$ for all $i \in N$, then farmers have an incentive to form cooperative alliances with at most two partners.*

Proof: Assume $\eta_i(g) = 2$. According to equation 3, a farmer will have an incentive to form a collaborative alliance with at most two farmers when the following conditions are both satisfied: (i) $\pi_i(g + g_{ij}) - \pi_i(g) < 0$ which implies $\theta_i - 5\phi_i < 0$; and (ii) $\pi_i(g) - \pi_i(g - g_{ik}) > 0$ which implies $\theta_i - 3\phi_i > 0$. But this implies $3 < \theta_i / \phi_i < 5$ which is feasible. \square

This result reveals an important fact. That is, it is the relative importance of distrust cost with respect to the beneficial effect of collaboration (*i.e.* θ_i / ϕ_i) what really determines the incentives of farmers to participate in collaborative alliances. Since $3 < \theta_i / \phi_i < 5$ is a feasible solution of the model, the argument given by the ESBF to explain the lack of collaboration in response to the SRR is supported by the network model.

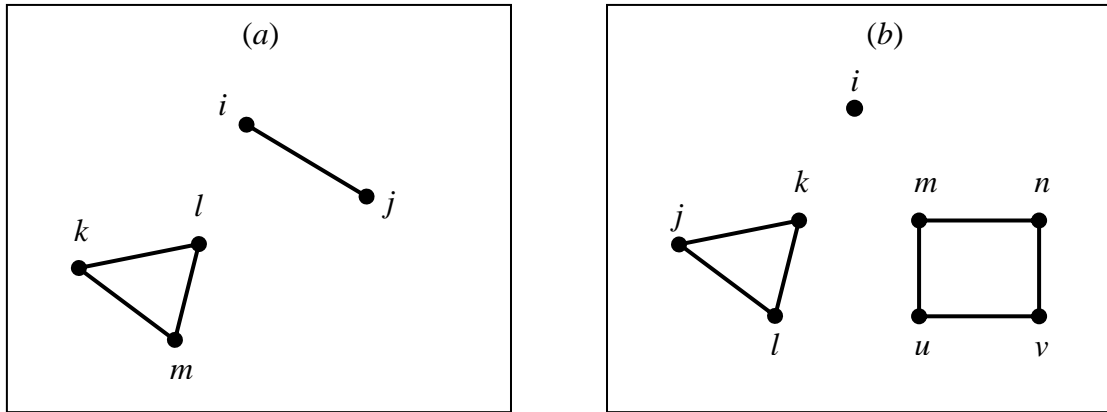
A natural question arising from this result is related to the existence of stable networks of collaboration: which networks are stable when farmers are willing to form collaborative alliances with at most two partners? In order to provide an answer, let us consider the following Proposition.

Proposition 2: *If $\pi_i(g + g_{ij}) - \pi_i(g) > 0$, then $\pi_i(g) - \pi_i(g - g_{ik}) > 0$.*

Proof: Note that $\eta_i(g + g_{ij}) + \eta_i(g) > \eta_i(g) + \eta_i(g - g_{ik})$. This implies that $\theta_i - \phi[\eta_i(g) + \eta_i(g - g_{ik})] > \theta_i - \phi[\eta_i(g + g_{ij}) + \eta_i(g)]$. But this implies that $\pi_i(g) - \pi_i(g - g_{ik}) > \pi_i(g + g_{ij}) - \pi_i(g)$. Therefore, if $\pi_i(g + g_{ij}) - \pi_i(g) > 0$, then it must be concluded that $\pi_i(g) - \pi_i(g - g_{ik}) > 0$. \square

This is an important result to determine the stability of the network. According to this proposition, if $3 < \theta_i / \phi_i < 5$ for all $i \in N$ and if a farmer has an incentive to form an alliance with another farmer, then the former does not have an incentive to break an existing one. In terms of the stability concept presented in Section 2.2, this means that condition (ii) is always satisfied when farmers have at most two alliances. Since condition (i) is also satisfied when farmers have two alliances, it is inferred that several different networks can all be stable. They include networks composed of complete components (*i.e.* sets of farmers having collaborative alliances with one another) formed by 2 or 3 farmers; incomplete components (*i.e.* sets in which one or more farmers do not have an alliance with at least on farmer that belongs to these sets) formed by 4 or more farmers; and at most one singleton (*i.e.* a farmer who does not have any alliance). Some examples are presented in Figure 1:

Figure 1: Stable networks of collaboration when $3 < \theta_i / \phi_i < 5$ for all $i \in N$



The network presented in Figure 1 (a) is composed of two complete components. One of them is formed by two farmers: i and j . The other one is formed by three farmers: k , l and m . Since farmers i and k have only one collaborative alliance, they have an incentive to form an additional alliance with any of the other farmers. However, because farmers k , l and m have all two collaborative alliances, they are not willing to form an additional alliance with either farmer i or farmer j . As a result, this network is stable. Figure 1 (b), on the other hand, is composed of one complete component (farmers j , k and l); an incomplete component (farmers m , n , u and v), and a singleton

(farmer i). Farmer i has an incentive to form an alliance with any of the other farmers because he/she does not have any alliance. However, since all the other farmers have already two alliances, they do not have an incentive to form an additional one. As a consequence, this network is also stable.

4. POLICY IMPLICATIONS

The results obtained in the last section have important policy implications when considering the trend of the current policy orientation of the European Union. As explained in the introduction, the European Union has developed important reforms of the Common Agricultural Policy by replacing distorting domestic policies by lump sum transfers called decoupled payments. It has been argued that the formation of collaborative alliances can help farmers to adjust in response to these policy changes because cooperation allows them to reduce unitary costs (Bowler, 2000). However, our results show that farmers cannot be fully benefited from cooperation when they face distrust costs. If farmers were able to reduce distrust, then they would also be able to increase collaboration because the only stable network when distrust is not present is the complete network (a formal proof can be found in Proposition 3 of May, 2011). Larger collaborative alliances, in turn, would help farmers to adapt to policy reforms more efficiently because these alliances are associated with lower production costs.

Policy makers could consider the establishment of programmes to stimulate the formation of private offices designed to assume the administrative tasks of collaboration. That is, to find partners, to find potential markets for joint production, to establish clear property rights on the resources that are shared by members of alliances, and to provide relevant information about inputs and market trends. These offices not only could be opened with the purpose of helping farmers to reduce distrust costs, but also could become alternative profitable enterprises in rural areas. Actually, the farmers that participated in the survey provided a positive feedback about this idea.

V. CONCLUSIONS

The objective of this article is to determine whether the number of collaborative alliances existing among the ex-sugar beet growers of the UK increased after the implementation of the Sugar Regime reform. It was found that only farmers' willingness to form collaborative alliances increased in response to this reform, but not the effective number of alliances existing among them. This discrepancy suggests the existence of a barrier preventing farmers from increasing collaboration. These individuals argued that this barrier corresponds to distrust among potential partners. In order to determine the effect of distrust on the architecture of the network of collaboration, this article adopted the social network model of collaboration developed by May (2011). The results revealed that when distrust costs increase at an increasing rate as the number of alliances increases, only networks formed by farmers having none, one, or two alliances can be stable. These networks are consistent with the patterns of collaborative alliances that characterize the agricultural sector of the West Midlands region of the UK.

Since collaboration helps farmers to adjust in turbulent environments caused by the implementation of policy reforms, breaking the theoretical equilibriums identified in the network model constitutes an important target for policy markets as

this can stimulate the formation of larger alliances. This is particularly important when considering the current trend of the policy orientation of the European Union. That is, the European Union has introduced important reforms of the Common Agricultural Policy. As a consequence, farmers are now competing with smaller and more unstable international prices. Larger alliances, therefore, can provide farmers the capability to adapt more efficiently in these unfavorable business environments.

Policy makers could consider the possibility of establishing private offices designed to assume administrative costs of collaboration. They not only could help farmers to reduce distrust costs, but also could become profitable enterprises in rural areas.

Finally, it is important to clarify that the article has been focused on the particular case of the ex-sugar beet farmers of the West Midlands region of the UK. It would be interesting to extend this research in order to analyze the formation of collaborative networks by other types of farmers. In addition, the development of this investigation in other countries or regions would provide valuable information that could be used to identify cross-cultural factors affecting the formation of collaborative in rural areas. All these possible extensions are left for future research.

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Moslem immigrant consumers' interest for Italian food specialties certified Halal

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Abstract: Recent immigration to Italy of thousand of Muslim workers and families has intensified the problem of a partial incompatibility of different food cultures. For Moslems it is difficult to avoid purchasing foods that contain forbidden ingredients, because these ingredients are common in the generic Italian food market. Halal marks have not been very visible in the Italian market until now. We reports results of a pilot study addressing the question of the interest Moslem consumers may have for the Halal certification of food products that are normal for the Italian market and are usually produced by Italian food processors. We surveyed a sample of 200 immigrant consumers and the data were analyzed trying to connect the interest for Halal certified Italian specialty foods with the principal dimensions concerning the attitudes showed towards the Italian culture and of different aspects of the lifestyle of respondents. Results of the study suggest that a consistent portion of the sample would be willing to purchase Italian traditional food products if the Halal mark would be applied to them, although with some differentiation among the different types of product.

Keywords: Consumer preference, food marketing, halal certification, immigration, segmentation.

1. Introduction

Higher cross-boundary mobility of people is one of the main trends emerged in the first decade of the twenty-first century. This trend is manifest in Italy, where remarkable flows of foreign citizens enter, often in transit to other European Countries. Sometimes these immigrants are motivated by the need to escape from critical, sometimes life-threatening situations in their places of origin, or they may simply be in search of better conditions of life, job opportunities, or best future perspectives for

themselves and children. While the arrival of a limited number of refugees, political or of other type, has a history lasting decades, the immigration of such large masses of people to Italy is a rather recent phenomenon – perhaps unprecedented since Italy's unity in mid 19th century. Ironically, Italy is a country that fed strong flows of

emigration toward the rest of the world among the XIX and the XX century, particularly toward Northern Europe, North and South America and Oceania.

Migrants flows into Italy have produced a series of remarkable effects on Italian society. These effects require social adaptations at several levels, e.g., political, cultural, normative, economic. One of these effects is the growth in demand for unusual food products on the Italian market (compared to traditional Italian foods), including the rise of demands from consumers with strong ties to their cultures of origin. In many cases, the Italian food industry has not yet been able to provide suitable solutions to these needs. Fischer (2004) shows that this is an international phenomenon – he has shown that the presence of immigrants influence the international commerce of agri-food products because the immigrants demand products not otherwise available in the market of the country of destination.

In this realm, a particular phenomenon is the growth of demand for goods that possess features tied in to particular religious prescriptions. Note also that, while religious food prescriptions are part of tradition of the dominant Italian Catholic culture (e.g., restrictions on meat consumption on Fridays) they have lost importance in the recent decades. Furthermore, the traditional prescriptions for the Roman Catholic Italian culture are different from those of Italian subcultures belonging to a religious matrix different from the Catholic – including followers of various Protestant and orthodox Christian, Jewish, Moslems, and Buddhists faiths and practices. These differences become more sensitive as such religions have a smaller history of integration in the Italian social fabric.

Today, in Italy, many religious minorities exist – belonging to a diverse set of confessions. However, until recently the immigrant communities with different credes have been rather limited in size and have often been represented by ethnic minorities with long histories in the Italian culture. For instance, Jewish communities in Italy date from Roman times and the Byzantine Catholics communities of Albanian origin (Arbëreshë) have settled down in some specific places in several waves of migrations, from the 15th to 18th century. In other cases the new religious minorities represent single households from mixed marriages or individual conversions. However, the migratory flows facing the largely Catholic Italian culture comprise peoples with a deeply different cultural and religious heritage. In particular, recent years have seen the arrival large numbers of immigrant workers (and their families) of the Islamic faith (King, 1993).

In the 2008 edition, the dossier Caritas / Migrantes estimates that in Italy over 51 million are Catholic Christians, while the presence of Moslem (mainly of Sunni orientation) citizens and immigrants exceeds 1,200,000 units – which is around 2% of the population. The Islamic religion therefore ranks second in terms of adherents, and it has recently slightly overtaken the number of adherents of orthodox Christianity. So, the immigration of thousand of Muslim workers and families has intensified the problem of a partial incompatibility of different food cultures. Specifically, the sacred text of Islam (the Koran or Quran) contains a series of prescriptions that the believer must observe. Among these are the prohibition of eating products containing pork, the prohibition of alcohol, and the general prohibition against using ingredients derived from animals whose butchery has not followed proper procedures. In a word, foods that comply with the Koranic requisites are defined *Halal* (admitted), while those that don't respond to the prescriptions are defined *haram* (impure).

For Italian Moslems it is difficult to avoid purchasing foods that contain *haram* ingredients, because *Haram* ingredients are common in the generic Italian food market. Many products containing fat derived from pork. Many contain small

percentages of alcohol, blood, or meat from animals which were not (of course) slaughtered according to the Koranic prescriptions (Eliasi and Dwyer, 2002). For instance, the ordinary flat bread which is part of the common “street food” in some Italy regions – the *piadina/foccacia* – often contains lard. This can represent a serious problem for a Muslim household living in Italy that wants to observe the laws of the Koran. Of course, this is especially the case of new immigrants – where both religious prescriptions and cultural traditions strongly influence consumption preferences, while language and culture may impede knowledge of the Italian food markets. In contrast, many Moslems of Italian birth and/or culture may have the language and cultural experience to navigate the Italian food markets. They may be able to carefully analyze labels and may have adopted habits of avoiding types of foods likely to contain the *haram* ingredients. These informed consumer skills are hardly possible for those people who don't have a good mastery of the language yet, are new to the Italian culture and traditions, and who are not familiar with the products are offered on the shelves of the Italian shops and supermarkets.

Overall then, for the consumer and the person responsible for food purchases in a Moslem family, the choice of food products represents a more demanding exercise in comparison to other consumers. An effect of this situation is that many Moslem food buyers prefer to shop in small ethnic grocery stores rather than in supermarkets (or generic food stores). In the last few years, in order to facilitate these shoppers, certifications that guarantee that the product complies with certain religious prescriptions have been proposed on the market. The food market already has the K-star quality mark for *Kosher* products – those that comply with the requirements of the Jewish religion. There are also a few *Halal* certification marks. While the K-star quality mark is fairly widely dispersed in the large scale Italian retail market, and while there are some *Halal* marks that are already strongly developed in other markets, they have not been very visible until now. Therefore, it is not infrequent for Moslem consumers who buy food in supermarkets to use the Kosher mark as a substitute indicator that food is not impure (*haram*).

This situation represents an opportunity for Italian enterprises as well as for those from the countries of origin of immigrant Moslems that want to meet the needs of a growing market niche created by the demographic phenomena. They may provide an “information service” to a segment of the population that needs to be informed in a fast and easy to understand way about the compliance of foods to the Islamic religious norms.

This paper reports the results of a pilot study addressing the question of the interest Moslem consumers may have for the *Halal* certification of food products available in the Italian retail food market – and particularly for *Halal* certification of foods that are

normal for the Italian market and are usually produced by Italian food processors. Together with the evaluation of the presence of a potential interest, we also try to point out what elements can be the antecedents of such interest. Understanding the antecedents would help understand how the market may evolve. The pilot study was performed in the Bologna urban area. The Bologna market is particularly suitable for many reasons: it is an area with an important food and gastronomic tradition; such tradition is mainly based upon products with a high presence of pork-related

ingredients; it is a region in which the agri-food enterprises form a remarkable share of the industrial and handicraft fabric.

2. Data and Methods

The study began with a brief literature review that highlighted that the theme is still little treated in the international scientific literature (Ahmed, 2008; Bergeaud-Blackler, 2008; Bonne et al., 2009; Bonne and Verbeke, 2008a and 2008b; Bonne et al., 2007; Okumus, 2008; Riaz, 2007). More specifically it is practically nonexistent in the Italian literature, if we exclude some occasional articles published in newspapers and magazines. For this reason, we proceeded to carry out a preliminary, exploratory and informal survey comprising a series of face-to-face interviews of a small sample of Muslim consumers. The integration of information obtained from the literature and the exploratory phase survey allowed us to set up a data collection tool (questionnaire), which was prepared in two versions: one version in Italian and Arabic languages and a version in English and Arabic language – since some immigrants have a cultural or educational background in English.

The questionnaires were designed to be completed by the respondent. For this reason we decided to adopt a structured formulation of the questions. Most of the questions were Likert-type questions, in which the respondent had to express a degree of agreement or disagreement to a statement using a 4-point scale without a central value. Other questions asked the respondent to express a choice among pre-defined multiple options. Numerical scores have been assigned to the possible answers, and, assuming that the adopted semantic scale can be considered equivalent an interval scale, the scoring is as follows: Totally disagree -3, Somewhat disagree -1, Somewhat agree +1, Totally agree +3.

The questionnaire was drafted and tested on 10 consumers. It was subsequently modified on the basis of comments and suggestions of the pilot respondents and of a small number of other reviewers. The questionnaire was administered in the period June-August 2008. Respondents were recruited at the Islamic Cultural Center in Bologna, some hypermarkets and other meeting places in the center of the city. Hence, the sample is a “convenience sample” with the usual and well-known difficulties related to this sampling technique. However, it is not clear that this sampling could be improved upon without great effort since 1) the reference population is not clearly distinguishable (Muslims come from many countries, cultures, and ethnicities), and a considerable part of the immigration is clandestine makes information obtained through ordinary demographic data sources quite unreliable.

Given the difficulties, we put great care in the respondent interception technique in order to avoid systematic bias. However, the sample is still ultimately non-random so

we cannot state that the selected sample is representative of the population of Islamic immigrants in Bologna. This because at the Islamic centre could, for instance, people with a greater commitment to the observance of the Koranic prescriptions can be more likely found or some ethnicities may be more or less likely to feel comfortable at such a centre. Moreover, during the interception near other aggregation places we necessarily relied on signals (for instance the aspect and the dressing style) of the affiliation to the Islamic religion, therefore it is reasonable to think that the quota of Islamic population that is more "secular" may be under represented in this sample.

With these caveats, we feel the sample is “good” if not statistically representative, and we feel it should be reflective of a substantial part of the target population.

Our objective was to collect at least 200 completed questionnaires and the survey was stopped as soon as this objective was reached. The questionnaires partially compiled or not valid have been 15. The data analysis methodology consists in factor analysis (principal component analysis) for the identification of interpretative dimensions of the attitude of Islamic consumers and cluster analysis for the identification of homogeneous groups of such consumers. Besides, we tried to connect the interest for Halal certified Italian specialty foods with the principal dimensions concerning the attitudes showed towards the Italian culture and of different aspects of the lifestyle of respondents.

3. Results and discussion

The analysis of the 200 valid questionnaires produced interesting results. In this paper we summarize for the sake of brevity.

The sample is 61.5% male. The age of the respondents is divided in five age brackets, and the more represented (modal) group is between 20 and 34 years old, followed by the 35 to 49 bracket. Other characteristics of the sample include: well distributed across income levels: 42% of respondents own a car; the age in which they completed their formal education varies from 6 and 30 (the calculated average, modal and median values for education are all around 18 years old). The households are mostly small in size – singles (31%) and 2-3 member households (37%) are largely prevalent. The number of household members younger than 18 years varies from 0 to 4. The Countries of origin are altogether 18, with the most frequent being Morocco, Tunisia, Egypt, and Pakistan. A large share of the respondents has lived in Italy for fewer than 8 years. Altogether, these characteristics are roughly in line with the Italian migratory phenomenon.

Table 1: Sample demographic statistics

Age brackets		Monthly income brackets		Arrival in Italy	
< 20	7.0%	< 800 EUR/month	22.0%	1970s	1.6%
20-34	45.0%	800-1200 EUR/month	31.5%	1980s	7.3%
35-49	39.0%	1200-1600 EUR/month	27.5%	1990s	33.9%
50-64	8.5%	1600 EUR/month	19.0%	2000s	57.3%
>= 65	0.5%				

Source: survey data

The most interesting variables for the study are represented by the intention to purchase different type of Italian food specialties (meat-filled pastry, Pre-cooked poultry, sausage, Ragu/meat sauces, potato chips or snacks, Piadina/Focaccia or other special breads), if certified Halal. In Table 2 we show the results referred to the hypothesis of *Halal* certified Italian filled pasta as an example.

Table 2: Responses to the statement “If the food were clearly marked Halal I would buy the following Italian product: Meat-filled pastry”

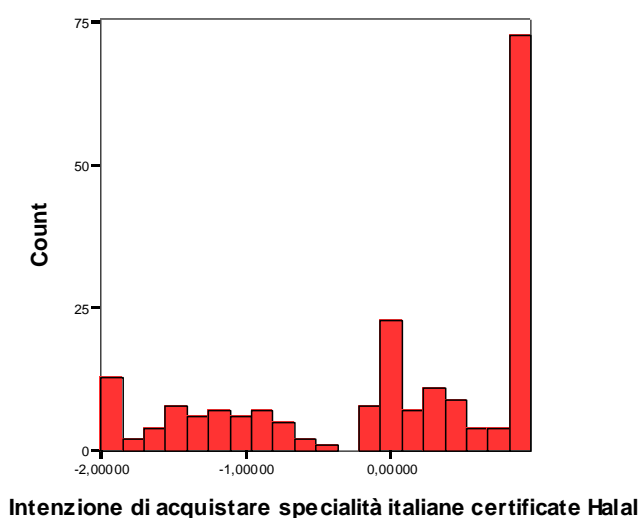
Answer	Score	Count	Percent
Totally disagree	-3	48	24.0
Somewhat disagree	-1	11	5.5

Somewhat agree	+1	34	17.0
Totally agree	+3	107	53.5
Total		200	100.0

Source: survey data

The six variables mentioned above have been summarized into a single index using principal components (PC) analysis. The PC analysis allowed us to extract a single factor we label as "Intention to purchase Italian Halal specialty", accounting for 74.6% of the overall variance in the 200 observations. The distribution of the index is illustrated in the following Figure 1.

Figure 1: Distribution of the index “Intention to purchase Italian Halal food specialty” obtained from the principal components analysis of 6 variables related to the intentions to purchase.



Note: The index is a standardized variable, therefore it has mean equal to 0 and variance equal to 1. The value 0 of the index corresponds to the average values of the 6 original variables.

Source: survey data.

Both the six variables on the intention to purchase, and the factor derived from them, have been used for dividing the sample into groups, through a k-means clustering procedure. The division into two clusters appears to be the most reliable result, and it is the classification that perfectly coincides using the two methods. The sample has been split into a group of 61 subjects (30%) that declared not to be prepared to purchase meat-based products. This group is also generally suspicious about farinaceous foods. This second group comprised 139 subjects (70%) whose stated propensity to purchase certified Italian food specialties which were certified Halal is rather high. In another model, we create 3 clusters which essentially involved splitting the favourably disposed group into two separate groups – one composed of 92 subjects (46%) with a strong intention to purchase Italian products, the other composed of 54 subjects (27%), who are favourable but somewhat more suspicious. The remaining 54 consumers (27%) are strongly against considering the purchase of

Italian food specialties, even if certified Halal. Further clustering and classifications based on a greater number of groups have been considered but provided less interesting results and are omitted here for the sake of brevity.

Additional results concern the attitudes of these consumers in relationship to different aspects of food culture and their purchasing habits. The analysis of the answers to the questions about attitudes allows us to profile respondents by using the clusters reported above. Furthermore, respondents provided an indication of their knowledge of the availability of foods Halal in nearby shops (83.5%), and the presence of the Halal mark (73%) on manufactured products available on the market. Descriptive statistics regarding the questions on attitudes are illustrated in the following Table 3.

Table 3: Attitudes of respondents

Statement		Mean	St.Dev.
Q04_atti - 4. I prefer to buy products imported from my home country	200	1.33	1.84
Q05_atti - 5. I could buy food containing some alcohol	200	-2.23	1.50
Q06_atti - 6. For me, fair price is the most important thing when I buy food	200	1.21	1.83
Q07_atti - 7. I only buy and use halal food	200	2.53	1.25
Q08_atti - 8. Outside my house I would eat non-Halal food	200	-1.73	2.05
Q09_atti - 9. I prefer to buy the cheapest food	200	0.48	1.93
Q10_atti - 10. I try to select the most nutritious foods	200	2.37	1.26
Q11_atti - 11. I only buy foods familiar to me	200	1.24	1.53
Q12_atti - 12. Eating Halal food is the most important sign of being a good Muslim	200	2.58	1.23
Q13_atti - 13. I am interested in the food typical of the region where I live now	200	0.91	1.98
Q14_atti - 14. If I saw a halal quality mark on a food package I would trust it	200	1.80	1.68
Q15_atti - 15. I ask the store keeper if food is halal	200	1.93	1.64
Q16_atti - 16. I look at the food to see if there is a sign or certificate on the package showing the food is halal	200	2.37	1.29
Q17_atti - 17. I check the ingredients in the food label	200	2.59	1.09
Q18_atti - 18. I would be more likely to buy a food if it had a special sign that certifies it is Halal	200	2.48	1.26
Q19_atti - 19. I believe that if food I eat is not Halal I will get sick	200	1.08	2.13
Q20_atti - 20. I prefer to spend my free time with people of my same religion	200	1.78	1.71
Q21_atti - 21. When I work I bring my lunch from home	200	1.02	2.09
Q22_atti - 22. When I watch TV I mostly watch Italian programs	200	0.66	1.89

Source: survey data. Possible scores: Totally disagree -3, Somewhat disagree -1, Somewhat agree +1, Totally agree +3.

Data on attitudes have been elaborated using principal components analysis, extracting 6 factors from the 19 original variables, with a level of variance explained

equal to 59%. The components' rotated matrix (calculated using the Varimax method) allows us to partially separate the incidence of the variables on the different components. A first interpretation of this elaboration allows us to identify the following factors:

- fac1_2 - Pay attention to whether the food is Halal
- fac2_2 - Trust your friends and fellow countrymen
- fac3_2 - Be open to further possibilities
- fac4_2 - Buy at a fair/cheap price
- fac5_2 - Don't "mess with" (avoid) the culture of strangers
- fac6_2 - Keep your (place of origin) habits

The factors extracted by the questions on attitudes were linked with the factor "Intention to purchase Halal certified Italian specialties" through a linear regression model. Also, their relationship with the clusters identified before were analyzed through a multinomial logit model. In both the models, results show that meaningful effects on both the cluster membership and on the factorial score of the intention to purchase exist for the factors fac1_2, fac5_2 and fac3_2. In particular, the analysis of the multinomial model identifies which variables influence the probability of the subject to belong to the cluster with high propensity to purchase *Halal* Italian specialties. The coefficient on factor fac5_2 (where positive scores highlight a higher than average distrust toward the Italian culture) has a negative sign, while the estimated coefficients for factors fac1_2

(attention that food is Halal) and fac3_2 (openness toward different experiences) show a positive sign.

The overall performance of the linear regression models is not particularly high (adj. R square 15%), while the discrete models perform slightly better (Cox and Snell Pseudo R-squares vary among 15 and 29%). As a further step, more complex and flexible models may be applied and they should be integrated with variables able to contribute to the explanation of the individual differences in behaviour (e.g., demographic variables). However, they are already useful to a first diagnosis of significance of the single variables included in the models and as a first confirmation that certain aspects may play an important role in forming the purchase intention.

Table 4 – Linear Regression Model (OLS) on the Dependent Variable: fac1_1 - "Intention to purchase Italian Halal specialty"

	Coefficient	Std. Error	Std. Coeff. Beta	t	Sig.
(Constant)	.000	.065		.000	1.000
Fac1_2 - Pay attention food is <i>Halal</i>	.245	.065	.245	3.755	.000
fac5_2 - Do not mess with the culture of strangers	-.237	.065	-.237	-3.633	.000
fac3_2 - Be open to further possibilities	.222	.065	.222	3.396	.001

Adj. R² 0.153

Source: survey data

Analyzing Table 4, it is apparent that three variables in the model are very significant. The interest for the certified Italian Halal specialties increases in the case in which the respondent assigns a higher than average importance to the fact that the food and purchased eaten is truly *halal*, or that the respondent shows a higher than average attitude to be more open to novelties. Contrarily, an attitude of suspicion toward other cultures determines a smaller interest toward the Italian specialties, even if they are certified *halal*.

4. Conclusions

The objective of the present study was to perform a first analysis of the potentialities offered by the segment of immigrants of Islamic religion in relationship to the supply of food specialties, produced in Italy but certified conforming to the prescriptions of the Islamic religion. The peculiar characteristics of this potential target market and the inherent difficulties in data collection suggest that the results obtained are to be considered with care –they cannot be said to statistically fully represent the population. However, we believe we have interviewed a significant element of the target population and results are economically meaningful, if not strictly statistically pure.

Results of the study suggest that a consistent portion of the sample would be willing to purchase Italian traditional food products if the *Halal* mark would be applied to them, although with some differentiation among the different types of product. A first analysis of data suggests that the intention to purchase is influenced by specific personality traits of the respondent, linked above all to the attitude toward the new culture which the respondents face.

In the future, this analysis can be deepened through the exploration of possible relationships among these attitudes and social-demographic variables to which can be in relationship, which are surely more interesting to the purpose of identification of a possible target segment.

In conclusion, this study, to the best of our knowledge, is the first one on this topic in Italy. Despite the limitations, the results would suggest that the identified consumer segment could be very interesting to follow over the next years. Certainly the demographic data indicates a strong growth of its size is expected. In order to further appraise the attractiveness of this consumer segment further information would be needed (e.g., size of the segment, expenditure capacity of its members, willingness to pay for Halal certified products) that could be provided only by an analysis at national level on a larger and more representative sample.

A final concern has not been addressed in this study but should be mentioned for completeness. From the point of view of the Italian food producing and retailing enterprises, the impact that the presence of certified Halal products can have on the consumers that are not Moslems must be evaluated, because: first, of the presence of a certain degree of animosity against this religion that is apparent in some layers of the Italian society, and second of the characteristics of Islamic ritual slaughtering that may generate protests by activists defending animal rights. Thus, recent news in the press (La Repubblica, 2010) has given account of an initiative of an important Italian retail chain in a store in Rome. This chain has introduced Halal marked products and an Islamic butchery in the store. These actions have aroused the attention and the applause of some groups of opinion, but also more than a few negative reactions and perplexity, besides with political polemics from other groups.

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Does ECOWAS Make Sense?

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Abstract: This paper investigates empirically the possibility of forming an Optimum Currency Area (OCA) among member countries of Economic Community of West African States (ECOWAS) region. Under OCA, member countries share a common currency (like, the Euro), while foregoing their autonomy with respect to their use of monetary policy instruments. We say that the countries are good candidates for forming an OCA if there is a long run relationship in the trend (permanent) component of output. Our results indicate existence of long run relationship in the trend component of GDP among the member countries in the ECOWAS region. Hence is the plausibility for forming an OCA.

Keywords: Monetary Union, ECOWAS, Beveridge-Nelson Decomposition

1. INTRODUCTION

Despite ongoing controversy over the hypothetical and empirical merits of regional trade agreements in and of themselves and in relation to global trade liberalization, over the last two decades, regional trade agreements have gained ever increased prominence. Around 230 regional trade agreements (RTAs), notified under the General Agreement on Tariffs and Trade (GATT) and the World Trade Organization (WTO) are in force today.¹ Rather than attempting to resolve the controversy regarding the merits of regional trade agreements, we have instead chosen to explore whether economic characteristics of the members of one such regional agreement, the Economic Community of West African States (ECOWAS), predispose the successful formation of an optimum currency area (OCA). ECOWAS was initiated in 1975, and includes Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone and Togo, as members. ECOWAS is one of the largest single regional trade groups in Africa. The idea behind ECOWAS was initially to form a Free Trade Area (FTA) among the member States before moving towards higher types of regional integration in the form of Customs Union (CU), Common Markets (CM) and Economic Union (EU).² In fact, within ECOWAS region a monetary union

¹ Source: http://www.wto.org/english/tratop_e/region_e/region_e.htm Accessed: 7/23/2009.

² In forming, a FTA, members remove trade barriers among themselves but keep their separate national barriers against trade with outside nations. In a CU, members not only remove trade barriers among themselves but also adopt a common set of external barriers. In a CM, members allow full freedom of factor flows (migration of labour and capital) among themselves in addition to having a CU. In an EU, members unify all their economic policies, including monetary, fiscal and welfare policies, while

was formed on January 10 1994. Known as the Union Economique Monetaire Ouest Africaine (UEMOA), or West African Economic and Monetary Union, it has Benin, Burkina Faso, Cote d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo, as its member. UEMOA with its well built institutional and organizational structure is one of the advanced integration scheme in Africa. The rest of the paper is structured as follows: Section 2 examines characteristics that are considered to be ideal for any RTA to sustain and flourish (read, increase income in the region through rise in trade resulting from RTA). Section 3 deals with the empirical methodology that we use to examine the hypothesis, which is – how well countries in ECOWAS, and within ECOWAS, the UEMOA region have the desirable characteristics to form a RTA. Section 4 interprets the results. Finally, Section 5 concludes with some policy recommendations.

2. ECOWAS as a RTA

From the welfare perspective becoming part of any RTA is desirable if trade creation effect resulting from the country joining the RTA outweigh the trade diversion effect. Trade creation happens when more efficient producer of one country displace the less efficient producers of another member country within Free Trade Area (FTA). On the other hand trade diversion results in displacement of more efficient producers outside FTA - losing market share to less efficient producers within FTA. Unfortunately, many times it becomes difficult to measure the exact nature of gains and losses, and hence economists based their comments about the desirability of member countries forming a RTA on the basis of some metrics. Some of these criteria are considered below-

2.1 Country characteristics:

Member countries are likely to gain if they share similar economic characteristics (Lumsdaine and Prasad, 2002). Similarities are measured in terms of economic development and geographical proximities. The more similar are the economies, the more is the likelihood of intra-industry trade. Similarity is often measured in terms of per capita gross domestic product (GDP). This is because geographically near economies with similar level of economic development have access to similar kind of technology. Consequently they tend to produce more or less similar items and tend to trade in similar commodities (closely differentiated products as in the monopolistic competition type market structure).

2.2 Symmetric Economic Activities:

Symmetric economic activities among member nations have complementary effect towards forging for deeper economic integration, like, custom and economic union. Symmetric economic activity implies that long-run movements in real output are synchronized. Such co-movements of outputs may be due to dependence of common factors such as geographical proximity and countries sharing similar industrial profile. When countries share a similar industrial profile and are located

retaining the features of a CM. An OCA is a special type of EU where the countries operate with a single currency.

closely, then the demand shocks in one country may affect other countries in the region. Symmetry in economic activity implies that there is a lesser contradiction in terms of formulating internal and external macroeconomic policies – something which is prerequisite for forming a deeper economic integration.

2.3 Extent of Trade:

If the country is more likely to trade with other member countries in the RTA, then it makes sense to join that RTA. In fact, RTA is more likely to happen when trade happens in similar commodities, that is, intra-industry trade, like Japan exporting Toyota cars to the US, and at the same time importing Ford cars from the US. The likelihood that industry association will demand more protection is less in case of intra-industry trade.

Against this background, we analyze how well the countries in the ECOWAS region, UEMOA regions (a subset of ECOWAS region), and non-UEMOA region (other countries in the ECOWAS region sans UEMOA member countries), fulfill these desirable criteria. We carry out this analysis under three broad headings-

2.4 Economic Characteristics of ECOWAS Nations:

When observed in terms of economic characteristics, countries in the ECOWAS region are generally similar in terms of - (a) per capita income – predominantly less developed countries with annual per capita income well below \$1000; (b) percentage of population living in rural areas; (c) demographic profile - very few percentage of the population belongs to the group aging 65 and above; (d) value addition of industrial sector to national income, which constitutes roughly a fourth of GDP in most member countries; and (e) development indicators measured in terms of fertility rate (total births per woman), and infant mortality rates. Except for few outliers, like, Burkina Faso, Guinea, and Sierra Leone, saving as proportion of GDP are also similar across these economies. The other thing that we observed is that within the ECOWAS region, countries that are part of UEMOA seem to be more homogenous relative to non-UEMOA group of countries. For any particular variable, we measure similarity or dissimilarity across countries in terms of first two moment conditions – mean, standard deviation and coefficient of variation, that is, ratio of standard deviation over mean (See Table 1a).

Now let us comment about the factors such as, inflation rates, fiscal deficit, external debt and level of tariffs; that might affect the value of exchange rates. A stable exchange rate in the region is desirable before group of countries contemplate about entering into an economic union. Greater variation in macroeconomic variables of the member nations will have an impact in terms of reducing efficiency of any common demand and exchange rates management policy.

For instance, if few member countries experience high inflation rates, whereas, the majority others experience recession; then an expansionary demand management policy is actually going to aggravate situation for the high inflation countries.

It is, therefore, essential to examine economic fundamentals of any aspirant country before it is allowed to become part of any monetary union. This is because a country with higher inflation rates might have other consequences. It will see a fall in the value of its domestic exchange rates. If this country is operating under a fixed exchange rate regimes where the value of its currency is pegged to French franc (say),

a continuation of domestic inflation rates will imply the relative market price of domestic currency will fall against the French franc. In this event, any effort to prevent value of domestic currency from falling further will require Central Bank of this country to raise domestic interest rates. A rise in domestic interest rate is seen as a measure to attract foreign funds. However, rise in domestic interest rates also mean a fall in domestic investment and domestic consumption, which might eventually push this economy towards recession. This is what has exactly happened in case of Thailand during the South East Asian crisis.

Similarly, in an event of fixed exchange rates a higher external debt implies plausibility about domestic currency running into speculative attacks. This might eventually lead to massive devaluation of the domestic currency. Tariff might affect exchange rate in a different way. Other things remaining equal, under flexible exchange rate regimes, a lower tariff implies an increase in demand for imports, that is, a relative increase in demand for foreign currencies. However, recent literatures have suggested that tariffs measures are highly correlated with other non-tariff measures, and hence change in tariff levels have little impact in affecting value of exchange rates (Goldberg and Pavcnik, 2004).

To sum up, if we are to go by these aforementioned variables that might in any way affect exchange rates in the ECOWAS regions then it seems except for small aberration (like, Guinea with high inflation rates and high current account deficit) other member countries have a lesser variation in terms of their economic fundamentals. In general, ECOWAS region seems to have similar economic characteristics. When countries share similar type of economic characteristics, it indicates a lower pressure to transfer funds from relatively resourceful countries to the poorer ones and hence a greater harmony in following a common fiscal and monetary policy – an indication for deeper economic integration.

Table 1a: Economic Characteristics in the ECOWAS region

Economic Characteristics	Annual Per Capita GDP (in US \$)	Population ages 15-64 (% of total)	Population ages 65 and above (% of total)	Mortality rate, infant (per 1,000 live births)	Fertility rate, total (births per woman)	Agriculture, value added (% of GDP)
UEMOA Region						
Benin	709	53.34	2.70	87.80	5.51	N/A
Burkina Faso	492	50.96	3.06	121.60	6.08	30.67
Cote d'Ivoire	1057	55.41	3.20	89.60	4.58	22.68
Guinea-Bissau	213	49.43	3.00	119.25	7.08	61.76
Mali	531	48.79	3.58	119.20	6.55	36.91
Niger	313	48.84	3.18	148.20	7.00	N/A
Senegal	915	53.82	4.26	59.90	5.30	15.87
Togo	387	53.90	3.08	69.15	4.91	N/A
Standard Deviation	295.12	2.619	0.472	30.04	0.947	1.902
Mean	558.28	51.81	3.257	101.83	5.876	17.65
Coefficient of Variation	0.528	0.050	0.145	0.295	0.161	1.902
Non-UEMOA						
Cape Verde	2925	56.80	4.21	25.00	3.45	9.09

Gambia, The	405	55.22	3.78	84.00	4.79	N/A
Ghana	690	57.74	3.66	75.95	3.95	37.39
Guinea	417	53.66	3.09	98.05	5.52	12.94
Liberia	196	50.80	2.18	157.00	6.78	N/A
Nigeria	1161	52.97	2.94	98.60	5.43	N/A
Sierra Leone	290	53.85	3.31	159.20	6.48	46.38
Standard Deviation	961.96	18.15	1.19	52.50	2.025	26.45
Mean	869.14	48.100	2.952	88.881	4.715	18.264
Coefficient of Variation	1.10	0.377	0.405	0.590	0.429	1.448

Addendum Table 1a: Economic Characteristics (Continued)

	Gross savings (% of GDP)	FDI, net inflows (% of GDP)	Industry, value added (% of GDP)	GDP growth (annual %)	Rural population (% of total population)	Inflation
UEMOA Region						
Benin	N/A	1.32	N/A	4.10	59.50	2.986567
Burkina Faso	5.90	0.42	20.61	6.39	81.30	-0.08914
Cote d'Ivoire	14.46	1.79	26.32	0.85	54.56	5.00476
Guinea-Bissau	22.79	13.79	11.46	4.20	70.32	-0.54271
Mali	13.00	3.15	24.03	5.30	68.94	4.093471
Niger	N/A	0.56	N/A	4.80	83.00	1.816013
Senegal	18.46	0.63	23.01	2.30	58.14	3.369305
Togo	N/A	2.57	N/A	4.10	59.18	-1.90905
Standard Deviation	6.319	4.458	5.758	1.728	10.861	2.455
Mean	14.922	3.028	21.086	4.005	66.867	1.841
Coefficient of Variation	0.4234	1.472	0.273	0.431	0.162	1.333
Non-UEMOA						
Cape Verde	27.63	10.72	16.86	6.09	41.96	5.187737
Gambia, The	10.03	16.07	N/A	4.50	45.26	2.119709
Ghana	27.24	3.37	25.38	6.20	51.46	12.72414
Guinea	8.49	3.26	37.48	2.82	66.54	37.39349
Liberia	N/A	-12.95	N/A	7.80	41.22	9.152292
Nigeria	33.88	4.72	N/A	5.20	51.00	4.80831
Sierra Leone	9.50	4.05	24.99	7.37	58.56	11.6142
Standard Deviation	11.346	8.938	8.497	1.711	9.210	11.896
Mean	19.461	4.177	26.177	5.711	50.857	11.857
Coefficient of Variation	0.583	2.139	0.324	0.299	0.181	1.003

Table 1b: Macro and External Sector Variables

	Fiscal Balance (Surplus+ / Deficit – as a % of GDP)	Current Account Balance (In millions of US \$)	Exchange Rates (National Currency /US\$)	Total Public External Debt as a % of GDP ¹	Average Applied Tariff (Manufactured Items) ¹	Average Applied Tariff (Ores and Metals) ¹
UEMOA Region						
Benin	-2	-300	445.59	16.5	12.1	7.4

Burkina Faso	-6	-954	445.59	17.7	12.1	7.4
Cote d'Ivoire	0.3	798	445.59	62.3	--	--
Guinea-Bissau	-17.3	-44	445.59	225.6	12.1	7.4
Mali	-1.0	-383	445.59	22.7	12.1	7.4
Niger	-0.8	-300	445.59	19.6	12.1	7.4
Senegal	-5.5	-888	445.59	18.5	12.1	7.4
Togo	-2.5	-152	445.59	70.5	12.1	7.4
Standard Deviation	5.683	543.727	0	71.591	0	0
Mean	-4.35	-277.875	445.59	56.675	12.1	7.4
Coefficient of Variation	-1.306	-1.956	0	1.2631	0	0
Non-UEMOA						
Cape Verde	-2.3	798	74.90	44.1	--	--
Gambia, The	0.3	-83	22.53	135.6	--	--
Ghana	1.8	-1033	0.97	14.9	--	--
Guinea	-8.2	-396	4346.80	105.6	--	--
Liberia	1.5	-147	42.75	181.6	--	--
Nigeria	5.6	5129	109.55	2.6	12.1	7.4
Sierra Leone	-2.5	-104	1666.67	92.9	--	--
Standard Deviation	4.35	2070.81	1637.41	65.460	0	0
Mean	-0.54	594.85	894.88	82.47	12.1	7.4
Coefficient of Variation	-8.017	3.4811	1.8297	0.7937	0	0

Note: All the figures are for the year 2007.

¹ 2006 figures.

Source: World Bank (2008) and African Union Commission (2008)

Although going by the aforementioned characteristics there are more similarities relative to dissimilarities, we find the extents of trade among various RTAs in Africa is low (See Table 2a). ECOWAS member countries trade in much greater amount with European Union relative to what they trade among themselves, and with other trading groups in Africa (See Table 2c). One reason for low value of trade among ECOWAS nations are because tradables primarily comprise of agricultural items (cocoa beans, timber, coffee, yarn, etc.) and extractive items in the form of natural resources, like, oil. Similar exports profile with respect to primary commodities discourages trade. Intra-industry trade is likely to flourish for technology intensive closely differentiated commodities, like, automobiles and computers. Disintegration of production itself leads to more trade, as intermediate inputs cross borders several times during the manufacturing process (Feenstra 1998). For example, automobile parts and finished autos are both included in trade between the United States and Canada—something clearly missing in the present context.

Table No 2a: Intra and Interregional trade (in million of US\$)

Exports to	2001	2002	2003	2004	2005	2006
Africa	3511	4109	4535	6168	7371	8974
AMU	105	132	152	189	168	232
CEN-SAD	2334	3233	3163	4531	5688	6133
COMESA	36	48	52	72	137	120

EAC	6	5	5	21	14	13
ECCAS	417	399	699	732	934	1189
ECOWAS	2242	3136	3037	4366	5497	5957
IGAD	4	3	4	6	53	10
SADC	334	534	717	971	822	1731
Import from						
Africa	3910	3746	4847	6722	8197	9213
AMU	2217	267	265	356	476	584
CEN-SAD	2969	2793	3623	5183	6463	7216
COMESA	103	142	140	168	234	183
EAC	14	23	35	40	48	59
ECCAS	73	151	131	173	228	281
ECOWAS	2696	2478	3293	4719	5835	6538
IGAD	20	31	35	52	45	56
SADC	511	487	737	1012	1186	1314

Table 2b: Percentage of Import and Export in two regions

		90-94	95-99	00-04	2005	2006	2007
Import	UEMOA Region	34.23%	37.71%	32.27%	30.46%	29.99%	32.01%
	Non-UEMOA	65.77%	62.29%	67.73%	69.54%	70.01%	67.99%
Export	UEMOA Region	24.52%	30.28%	24.18%	19.17%	19.22%	22.21%
	Non-UEMOA	75.48%	69.72%	75.82%	80.83%	80.78%	77.79%

Table 2c: ECOWAS Trade with European Union (In Million US \$)

Countries	Imports			Exports		
	2000	2001	2002	2000	2001	2002
UEMOA Region						
Benin	205	202	359	15	20	40
Burkina Faso	216	213	256	67	69	76
Cote d'Ivoire	1047	1123	1272	1605	1685	2314
Guinea Bissau	34	37	38	40	40	41
Mali	260	363	351	130	158	158
Niger	89	94	126	67	78	76
Senegal	745	894	1126	322	331	365
Togo	164	153	158	41	21	25
Non-UEMOA						
Cape Verde	174	191	204	9	8	9
The Gambia	120	84	87	4	5	7
Ghana	1131	2183	612	1179	1215	1014
Guinea	234	210	216	401	334	349
Liberia	62	63	63	43	51	51
Nigeria	3010	3095	3202	6212	4096	4026
Sierra Leone	53	77	79	1	8	17
Total	7544	8982	8149	10136	8119	8568

Source: African Union Commission (2008), and ECOWAS handbook of International Trade, (2008).

Another reason for low intra-ECOWAS trade is because of poor infrastructure in the region. As is evident from Table 3, the region is not well served by a good network of roads and railways, crucial for the movement of goods in the region. Only Nigeria and Cape Verde have somewhat more miles of paved road relative to unpaved roads. The railway network is highly fragmented, with very little addition has been made to the existing network inherited from the colonial rule. In general, railway lines coverage as percentage of total surface area is less than 0.5 percent for most African countries, which is quite low when compared to some emerging economies in Asia. For example, railway lines coverage as a percentage of total surface area for China, India, South Korea and

Vietnam are, 0.78, 1.92, 3.40, and 0.79 percent, respectively (World Development Indicators, 2008). Absence of proper road and rail connectivity with the urban market has implication on median income on rural household, as the latter group depends upon urban markets as an outlet for their produce. This has an important implication on regional income distribution. In addition, political and social conflicts in Liberia, Sierra Leone, Guinea Bissau and Niger, has also prevented national governments to divert adequate funds for development of both physical and social infrastructures.

Table 3: Roads and Railway Network in the ECOWAS Region

	Paved Roads (miles)	Unpaved Roads (miles)	Paved/Unpaved Ratio	Railways (Miles)	Railway Lines as a percentage of Total Surface Area
UEMOA Region					
Benin	2656	5604	0.46	578	0.51
Burkina Faso	2001	1050	0.19	622	0.23
Cote d'Ivoire	3579	42752	0.08	660	0.20
Guinea-Bissau	444	3906	0.11	None	None
Mali	1773	13003	0.14	641	0.05
Niger	779	9084	0.08	None	None
Senegal	4214	10366	0.4	904	0.46
Togo	2376	5143	0.46	525	0.92
Non-UEMOA					
Cape Verde	858	242	3.5	None	None
Gambia	932	1708	0.55	None	None
Ghana	9353	28208	0.33	953	0.40
Guinea	4964	25306	0.2	1086	0.44
Liberia	628	9652	0.06	490	0.44
Nigeria	26005	6100	4.26	3557	0.39
Sierra Leone	1284	10390	0.12	84	0.12

Source: Central Intelligence Agency (CIA) – The World Factbook (Various Issues).

The other factor that these West African countries need to figure about is how to ease labor mobility in the region. Because of language and institutional barriers presently labor mobility is low among the West African nations. However, this is not a major reason for concern as it requires political willingness to ease movement of

labors. Labor mobility will help to absorb any shocks arising from persistence of unemployment in any particular member States. Therefore to sustain the RTA in its present form there is a need to encourage greater flow of goods, services and labors, in the ECOWAS region.

Finally, let us examine this hypothesis whether economic activities are symmetric. We based our analysis by examining how the key economic variable, namely the outputs of the ECOWAS member countries, respond to external shocks. We considered GDP as a proxy for output. Changes in the level of output over time are due to permanent and transitory disturbances. There is a general consensus among macroeconomists that the transitory part of the GDP (also known as cycle) is of temporary in nature and is caused by demand shocks. The trend part of the GDP (also known as permanent component) is explained by supply shocks and is of permanent nature. In order to show synchronized movement in output we have to consider the permanent part of GDP and test whether there is any long term relation (read, cointegration) among them. The temporary part of GDP by definition is stationary and therefore cannot be tested for cointegration to ascertain presence of any long term relation.

3. Methodology

We use Beveridge-Nelson (1981) methodology to decompose the output data into its cyclical component and permanent component. Although vector autoregression (VAR) method as employed by Blanchard and Quah (1989) does a better job in terms of identifying structural shocks – demand and supply side shocks – in addition to identifying cyclical and permanent component of output, we stick to Beveridge Nelson methodology as unemployment data necessary to perform Blanchard and Quah decomposition are not available for the ECOWAS members. Beveridge and Nelson show that any ARIMA model can be represented as a stochastic trend plus a stationary component where a stochastic trend is defined to be random walk, possibly with a drift. For any data generating process y_t , using Beveridge-Nelson methodology, we can decompose it as follows:

$$y_t = y_t^p + y_t^s$$

$$\text{where } y_t^p = \mu t + h \sum_{r=1}^t \varepsilon_r \text{ and } y_t^s = d(L)\varepsilon_t$$

$$\text{or } y_t^p = \mu + y_{t-1}^p + h\varepsilon_t \quad (2)$$

y_t^p which is the permanent component, is a stochastic trend and is modeled as random walk with a drift μ . y_t^s is the stationary component and is a function of moving average components. The permanent and the stationary components of the time series are both proportional to the disturbance term ε_t and are thus perfectly correlated. Beveridge and Nelson (1981) defined the permanent part as that part of y_t which will be continued into the future, whereas the temporary part is purely a stationary random process.

3.1 Data

We have GDP data for each country, namely, Benin, Burkina Faso, Cote d'Ivoire, Ghana, Liberia, Niger, Nigeria, Senegal, Sierra Leone and Togo. Cape Verde, Gambia, Guinea, Mali and Mauritania are excluded from the analysis as relevant data for all time periods for these countries are not available. The results of the analysis will not change much as these countries are smaller economies, with, Cote d'Ivoire, Nigeria, Ghana and Senegal being the largest economies. The data consisted of 48 annual observations from

1960 to 2007. The data used in this study are real GDP data measured in current US dollars. The data is obtained from World Development Indicators, World Bank.

Table 4: Descriptive Statistics for Gross Domestic Product*

<i>GDP</i> [†]	Mean	Median	Standard Deviation	Maximum	Minimum
<i>UEMOA Region</i>					
Benin	1.49	1.27	1.25	5.42	.226
Burkina Faso	1.97	1.76	1.54	6.76	.330
Cote d'Ivoire	7.59	8.39	5.14	19.57	.546
Niger	1.66	1.80	.878	4.17	0.44
Senegal	3.67	3.20	2.49	11.15	6.79
Togo	.979	.927	.642	2.49	.121
<i>Non-UEMOA</i>					
Ghana	4.78	4.42	2.96	15.24	1.21
Liberia	.512	.431	.283	1.03	.132
Nigeria	35.43	28.14	34.00	165.64	4.19
Sierra Leone	.755	.696	.322	1.67	.322

* Measured in current US dollars.

[†] Figures are in billions of US dollars.

Source: World Development Indicators, World Bank.

4. Interpretation of the Results

The first step involves testing the data series for stationary. To test for nonstationarity, we used Augmented Dickey-Fuller tests (ADF). Using this test statistic, we found evidence of nonstationarity for the GDP. The result of the ADF test in Table 5 show that for all the sample countries data exhibit unit root, suggesting that these variables are not mean reverting but are I(1) processes. Specifically, we estimated the regression model

$$\Delta y_t = \beta_0 + \beta_1 y_{t-1} + \sum_{j=1}^n \alpha_j \Delta y_{t-j} + \varepsilon_t ,$$

where, y_t is the logarithm of the GDP series for each countries, and β_1 is the ADF parameter. To determine appropriate specification for the number of lagged GDP terms, we use the standard lag-length diagnostic tests, such as AIC and Schwarz Criterion. The most parsimonious specification is obtained choosing a lag-length of $n = 3$. The partial t -statistics on second and third-order lagged output were not statistically significant (P -value>0.10). Loss functions, such as AIC and Schwarz Criterion, were roughly minimized in the neighborhood of $n = 3$. Given the MacKinnon (1996) critical values of 2.61, we fail to reject the null hypothesis of a unit root at the 5% level of significance. Taking first difference of the data, we reject the null hypothesis of a unit root at the 1% level of significance. Hence, the GDP data are non stationary.

Table 5: Augmented Dickey-Fuller (ADF) Test Results

Statistic / Diagnostic	y_t^{ben}	y_t^{bur}	y_t^{cote}	y_t^{gha}	y_t^{lib}	y_t^{nig}	y_t^{nige}	y_t^{sen}	y_t^{sie}	y_t^{tog}
ADF Test ^a	0.13	0.25	2.21	0.29	2.20	.458	1.03	.318	1.19	1.58
AIC	-1.28	-1.32	-1.33	-1.28	-0.66	-0.22	-1.27	-1.31	-0.55	-1.18
Schwarz Criterion	-1.20	-1.24	-1.25	-1.21	-0.54	-0.14	-1.15	-1.23	-0.48	-1.10
Durbin Watson	2.19	1.57	1.95	1.70	2.29	1.79	1.89	1.66	1.82	1.90

Note: y_t^{ben} , y_t^{bur} , y_t^{cote} , y_t^{gha} , y_t^{lib} , y_t^{nig} , y_t^{nige} , y_t^{sen} , y_t^{sie} and y_t^{tog} represent the natural logarithm of GDP of Benin, Burkina Faso, Cote d'Ivoire, Ghana, Liberia, Niger, Nigeria, Senegal, Sierra Leone and Togo.

^aIn absolute value and compared to the MacKinnon (1991) critical value of 2.61 for a 10% level of significance.

Having identified the data as non-stationary, we take the first difference of the level data series and make them stationary. The autocorrelation and the partial autocorrelation function of the first difference of the log of output (y_t), for the ten countries were then examined. They were identified and estimated as an ARIMA process. The Beveridge and Nelson (1981) decomposition is now applied to compute the permanent and the temporary component of y_t . The results of the estimated model for each of the ten countries are summarized below³.

³ Estimation was performed using the econometric software package EVIEWS 6. Let y be the name used for the series, log of real output, in a EVIEWS session. The ARIMA (1,1,1) model was estimated using the EVIEWS commands: $y = c + AR(I) + MA(I)$.

UEMOA Region

Benin

$$\text{Identification: } \Delta y_t = \underset{(5.305)}{0.0673} - \underset{(2.076)}{0.3055} \varepsilon_{t-4} + \varepsilon_t$$

$$\text{Solution: } y_t = y_0 + 0.0673 \cdot t + 0.6945 \sum_{r=1}^t \varepsilon_r + 0.3055 \cdot (\varepsilon_t + \varepsilon_{t-1} + \varepsilon_{t-2} + \varepsilon_{t-3})$$

Burkina Faso

$$\text{Identification: } \Delta y_t = \underset{(4.6374)}{0.0650} - \underset{(24.73)}{0.850} \varepsilon_{t-14} + \varepsilon_t$$

$$\text{Solution: } y_t = y_0 + 0.065 \cdot t + 0.15 \sum_{r=1}^t \varepsilon_r + 0.85 \cdot (\varepsilon_t + \varepsilon_{t-1} + \varepsilon_{t-2} + \dots + \varepsilon_{t-13})$$

Cote d'Ivoire

$$\text{Identification: } \Delta y_t = \underset{(2.831)}{0.0751} + \underset{(2.230)}{0.3187} \Delta y_{t-1} + \varepsilon_t$$

$$\text{Solution: } y_t = y_0 + 0.1103 \cdot t + 1.4678 \sum_{r=1}^t \varepsilon_r$$

Niger

$$\text{Identification: } \Delta y_t = \underset{(1.84)}{0.0476} + \underset{(0.29)}{0.229} \Delta y_{t-1} + \underset{(0.53)}{0.1275} \varepsilon_{t-1} + \varepsilon_t$$

$$\text{Solution: } y_t = y_0 + 0.0618 \cdot t + 1.4624 \sum_{r=1}^t \varepsilon_r - 0.1654 \cdot \varepsilon_t$$

Senegal

$$\text{Identification: } \Delta y_t = \underset{(2.16)}{0.0619} + \underset{(19.22)}{0.835} \varepsilon_{t-11} + \varepsilon_t$$

Solution:

$$y_t = y_0 + 0.0619 \cdot t + 1.835 \sum_{r=1}^t \varepsilon_r - 0.835 \cdot (\varepsilon_t + \varepsilon_{t-1} + \varepsilon_{t-2} + \dots + \varepsilon_{t-10})$$

Togo

$$\text{Identification: } \Delta y_t = \underset{(2.41)}{0.065} + \underset{(1.79)}{0.261} \Delta y_{t-1} + \varepsilon_t$$

$$\text{Solution: } y_t = y_0 + 0.08796 \cdot t + 1.353 \sum_{r=1}^t \varepsilon_r$$

Non-UEMOA Region

Ghana

$$\text{Identification: } \Delta y_t = 0.05585_{(4.36)} - 0.8586_{(27.93)} \varepsilon_{t-14} + \varepsilon_t$$

Solution:

$$y_t = y_0 + 0.05585 \cdot t + 0.1414 \sum_{r=1}^t \varepsilon_r + 0.8586 \cdot (\varepsilon_t + \varepsilon_{t-1} + \varepsilon_{t-2} + \dots + \varepsilon_{t-13})$$

Liberia

$$\text{Identification: } \Delta y_t = 0.0344_{(.5853)} + 0.354_{(2.25)} \Delta y_{t-2} + 0.439_{(1.50)} \varepsilon_{t-1} + \varepsilon_t$$

$$\text{Solution: } y_t = y_0 + 0.0533 \cdot t + 2.228 \sum_{r=1}^t \varepsilon_r - 0.679 \cdot \varepsilon_t$$

Nigeria

$$\text{Identification: } \Delta y_t = 0.0813_{(2.153)} + 0.2796_{(1.923)} \varepsilon_{t-4} + \varepsilon_t$$

$$\text{Solution: } y_t = y_0 + 0.0813 \cdot t + 1.2796 \sum_{r=1}^t \varepsilon_r + 0.2796 (\varepsilon_t + \varepsilon_{t-1} + \varepsilon_{t-2} + \varepsilon_{t-3})$$

Sierra Leone

$$\text{Identification: } \Delta y_t = 0.032_{(1.97)} - 0.357_{(2.48)} \varepsilon_{t-2} + \varepsilon_t$$

$$\text{Solution: } y_t = y_0 + 0.032 \cdot t + 0.643 \sum_{r=1}^t \varepsilon_r + 0.357 \cdot (\varepsilon_t + \varepsilon_{t-1})$$

Note: Results derived using EViews 6 Software. Absolute t -statistics are reported in the bracket. All the variables are significant at 5% level of significance. In all the equation Y_0 refers to the log of real output for each of the individual countries for the base year 1960. t takes value 1 for the year 1963 and takes value 45 for the year 2007.

The permanent and the temporary components can now be easily calculated using the solution to the above difference equations. For example, in case of Nigeria

the permanent component of GDP is given as $y_0 + 0.0813 \times t + 1.2796 \sum_{r=1}^t \varepsilon_r$. y_0 is the log

value of Nigeria's GDP for the year 1960, and $t = 1 \dots 45$. The permanent component of the log output for Nigeria for the year 1963 is given as $y_{1960}^{Nigeria} + .0813 \times 1 + 1.2796 \varepsilon_{1963}$. Similarly, the permanent of the log output for Nigeria for the year 1964 is given as $y_{1960}^{Nigeria} + .0813 \times 2 + 1.2796 (\varepsilon_{1963} + \varepsilon_{1964})$. Repeating for each point in the data sets for Nigeria, starting 1963 and ending 2008, will yield the permanent component. We follow the same rule in calculating the permanent component of GDP for other countries. As one of the model specifications, that is, in case of Liberia involving an AR (2) process, we lose three initial observations (one due to differencing the data and the other related to AR(2) process). Since we want to examine cointegrating relation among permanent components of all the sample countries, t takes value 1 for the year 1963 and takes value 45 for the year 2007, to address comparability.

Once we have estimated the permanent component we can easily calculate the temporary component by subtracting permanent component from the actual data sets. As the GDP series for each country are expressed in natural log, the temporary and permanent component of GDP are also in natural log format. The permanent component and temporary components of log GDP are reported in Table 6 and Table 7 (in Appendix) respectively.

In the final step we test for cointegration or presence of long term relationship among the permanent component of GDP and examine the correlation matrix of the temporary component of GDP across the member countries. Cointegration refers to a linear combination of nonstationary variables. Hence, we need to examine nonstationarity in the permanent component of GDP in their level form. Using Augmented Dickey-Fuller tests (ADF), we found evidence of nonstationarity in the permanent component of GDP for the sample countries. The data series can now be tested for cointegration.

The identification of the cointegration between output is based on an unrestricted model (i.e. we will use a Vector Autoregressive (VAR) Model). There are ten I(1) process in the data, implying there can be, at most, nine cointegrating relations across ten countries (Johansen and Juselius, 1995). Results indicate on the basis of maximum eigenvalue and the trace tests at a 95 percent level of significance, there are three cointegrating relationship among the output variables (See Table 8).

Table 8: Johansen Cointegration Test Results

Null Hypothesis ^a	Alternative Hypothesis	Eigenvalue		5% Critical Value
λ_{trace} tests		λ_{trace} value		
$r = 0$	$r > 0$	0.84	336.38	239.24

$r \leq 1$	$r > 1$	0.80	256.28	197.37
$r \leq 2$	$r > 2$	0.75	186.17	159.53
$r \leq 3$	$r > 3$	0.57	127.23	125.62
$r \leq 4$	$r > 4$	0.49	91.16	95.75
$r \leq 5$	$r > 5$	0.39	62.41	69.82
$r \leq 6$	$r > 6$	0.34	41.00	47.86
$r \leq 7$	$r > 7$	0.30	23.38	29.80
$r \leq 8$	$r > 8$	0.17	8.11	15.49
$r \leq 9$	$r > 9$	0.00	0.17	3.84
λ_{\max} tests		λ_{\max} value		
$r = 0$	$r = 1$	0.84	80.10	64.50
$r = 1$	$r = 2$	0.80	70.11	58.43
$r = 2$	$r = 3$	0.75	58.94	52.36
$r = 3$	$r = 4$	0.57	36.06	46.23
$r = 4$	$r = 5$	0.49	28.75	40.08
$r = 5$	$r = 6$	0.39	21.41	33.88
$r = 6$	$r = 7$	0.34	17.62	27.58
$r = 7$	$r = 8$	0.30	15.27	21.13
$r = 8$	$r = 9$	0.17	7.94	14.26
$r = 9$	$r = 10$	0.00	0.17	3.84

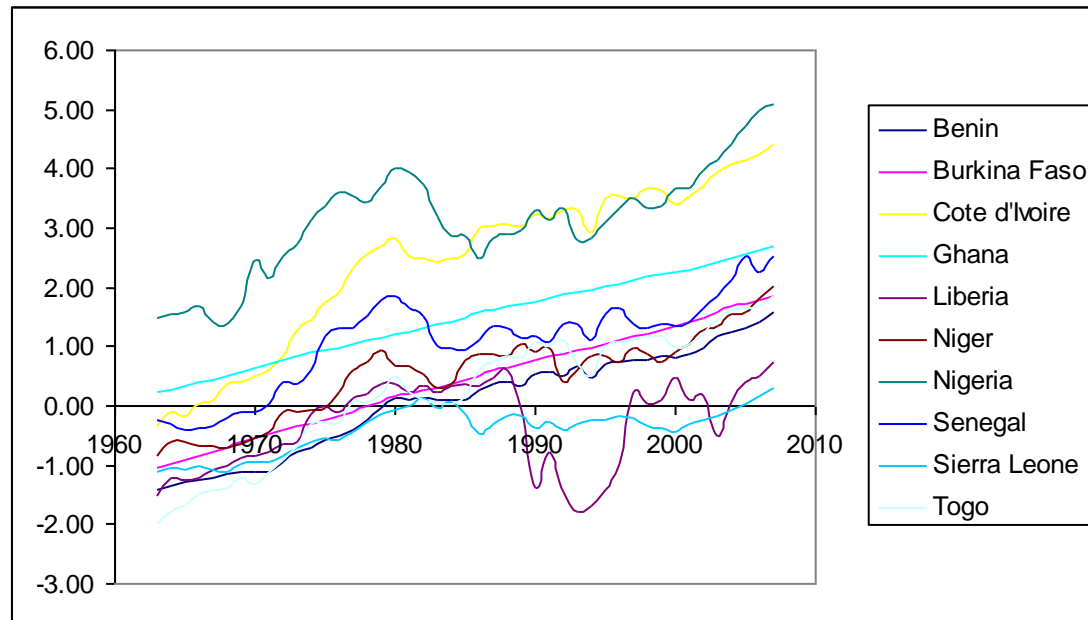
^a r is the cointegrating rank.

The relationship:

$$\begin{aligned}
& y^{Benin} - 1.63 y^{BurkinaFaso} - 0.381 y^{Cote} + 0.875 y^{Ghana} - 0.079 y^{Liberia} - 0.581 y^{Niger} \\
& + 0.268 y^{Nigeria} - 0.547 y^{Senegal} + 0.449 y^{SierraLeone} + 0.837 y^{Togo} = 0
\end{aligned}
\tag{3}$$

where y is the permanent component of log output from restrictive countries.⁴ The standard errors are reported in the parentheses. The cointegrating relationship (3) implies that the permanent components of GDP for these ten countries tend to move proportionally in the long term. The fact that there is co-movement in the permanent component of GDP is also seen graphically. Figure 1 suggests co-movement, implying a possible long-term relationship among the variables.

Figure 1: Co-movement in the permanent component of GDP



Evidence of common trend is indicative of the fact that fluctuation in real output of the ten West African nations is synchronized. Such co-movements of outputs may be due to dependence on common factors, such as geographical proximity and similar trade composition of the West African nations.

We extended this analysis of long-term association for the UEMOA and non-UEMOA group of nations. Interestingly, we figure out existence of one cointegrating relation among the supply side components of output for the UEMOA group of nations, whereas for the non-UEMOA group there is no such relation (Table 11a and 11b in the Appendix). For the UEMOA group of economies the relation is:

$$y^{Benin} - 0.637 y^{BurkinaFaso} - 0.425 y^{Cote} - 0.7266 y^{Niger} + 0.1676 y^{Senegal} + 0.6095 y^{Togo} = 0$$

(0.043) (0.069) (0.0702) (0.0426) (0.089)

The above relation suggests economies within UEMOA framework nations are more homogenous as compared with other ECOWAS nations belonging to non-UEMOA framework.

Finally, we examined the correlation matrix of the temporary component of GDP (see Table 9) and found that little or no correlation in the temporary component of GDP. This corroborates the fact that the cyclical components of GDP across member countries are not related. Economic boom in one country does not necessarily suggest recession in other member countries. However, the permanent components of

⁴ The normalized cointegrating vector in this case is (1, -1.63, -0.381, 0.875, -0.079, -0.581, 0.268, -0.547, 0.449, 0.837).

the GDP across member countries are highly correlated (see Table 10). From the above analysis a crucial

inference can be made. A common macroeconomic policy (a combination of monetary and fiscal policies) can be followed without any conflict of interest among the member countries. While fiscal policy can be used for development of infrastructure – an important component affecting long-term growth – monetary policy can be used for financing infrastructure and technology, factors affecting long-term growth potential. Because the permanent components of GDP are highly related with no relation among the temporary components, it can be concluded that in the long run there is a synchronized movement in output variables in among the ECOWAS nations, more specifically among the countries belonging to UEMOA region.

Table 9: Correlation matrix of the temporary components of GDP

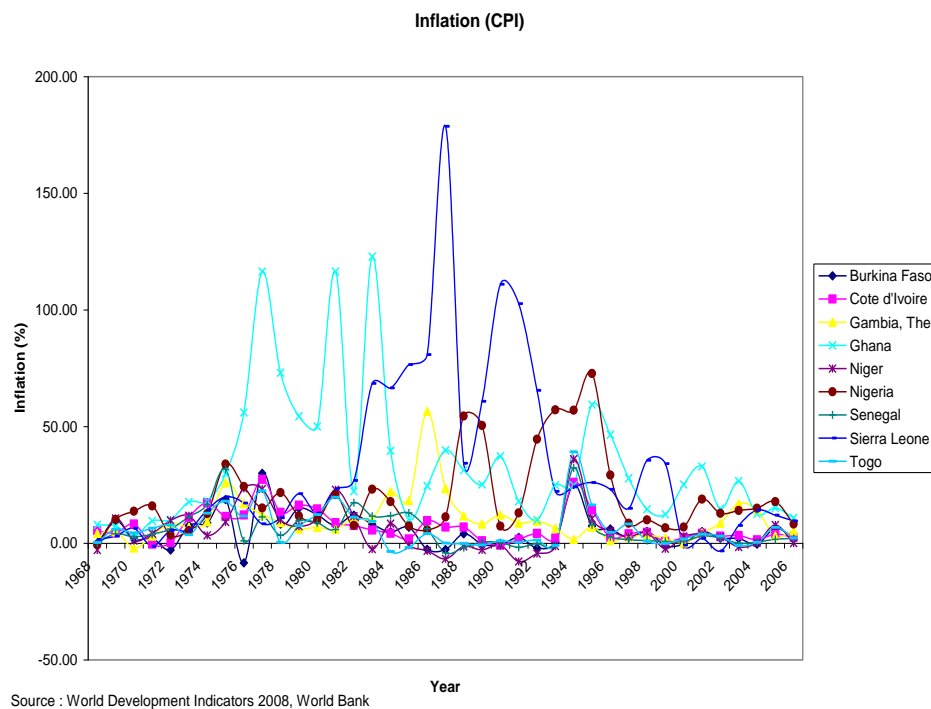
	<i>Benin</i>	<i>Burkina Faso</i>	<i>Cote d'Ivoire</i>	<i>Ghana</i>	<i>Liberia</i>	<i>Niger</i>	<i>Nigeria</i>	<i>Senegal</i>	<i>Sierra Leone</i>	<i>Togo</i>
Benin	1.00									
Burkina Faso	0.61	1.00								
Cote d'Ivoire	-0.02	0.27	1.00							
Ghana	0.27	0.63	0.75	1.00						
Liberia	-0.08	0.36	0.64	0.52	1.00					
Niger	-0.03	0.25	0.73	0.61	0.59	1.00				
Nigeria	-0.55	0.05	0.08	0.06	0.17	0.11	1.00			
Senegal	-0.66	-0.35	-0.07	-0.19	0.22	0.11	0.35	1.00		
Sierra Leone	0.49	0.08	-0.08	-0.04	-0.20	-0.20	-0.51	-0.54	1.00	
Togo	-0.01	0.27	0.99	0.74	0.65	0.72	0.07	-0.09	-0.07	1.00

Table 10: Correlation matrix of the permanent component of GDP

	<i>Benin</i>	<i>Burkina Faso</i>	<i>Cote d'Ivoire</i>	<i>Ghana</i>	<i>Liberia</i>	<i>Niger</i>	<i>Nigeria</i>	<i>Senegal</i>	<i>Sierra Leone</i>	<i>Togo</i>
Benin	1.00									
Burkina Faso	0.99	1.00								
Cote d'Ivoire	0.98	0.96	1.00							
Ghana	0.99	1.00	0.96	1.00						
Liberia	0.43	0.38	0.48	0.38	1.00					
Niger	0.95	0.92	0.96	0.92	0.56	1.00				
Nigeria	0.82	0.79	0.85	0.79	0.62	0.88	1.00			
Senegal	0.90	0.85	0.93	0.85	0.58	0.93	0.94	1.00		
Sierra Leone	0.85	0.78	0.88	0.78	0.61	0.88	0.85	0.91	1.00	
Togo	0.98	0.97	0.99	0.97	0.46	0.95	0.84	0.91	0.85	1.00

In addition, as is evident from Figure 2, ECOWAS countries (except for Ghana, Sierra Leone and Togo) have more or less similar inflation rates. Hence, conflicting issues resulting from loss of seignorage is also minimized.⁵

Figure 2: Inflation rates in the ECOWAS region



5. Conclusion and Policy Recommendations

In this paper, we have attempted to determine to what extent countries in ECOWAS regions are ready to form an OCA. We found that the ECOWAS region, in general has got some desirable characteristics for forming an OCA. The preliminary inferences are supported well by our empirical results. To identify temporary and permanent components of output we used the Beveridge-Nelson methodology. In the paper we find existence of long term relationship in the trend or permanent component of output among the West African countries. This implies that a common monetary and fiscal policy may be appropriate for these nations. That is, forming an OCA in ECOWAS region would be expected to result in monetary and fiscal policy settings that would not create relative advantages or disadvantages between the member states. The results are more robust for the UEMOA group of countries. This group seems to be more

homogenous in terms of their economic characteristics, and also tend to exhibit cointegrating relation in the permanent component of their output.

⁵ Seignorage is the revenue government obtains by financing its budget deficit through printing money rather than selling debt. This claim about minimum loss in seignorage is however not valid for high inflation countries, like, Ghana, Togo, and Sierra Leone.

However, these similarities in economic characteristics will not work in favor if some of the present problems in the ECOWAS region are not addressed. First, there is a need to build a proper infrastructure. There is a dearth of road and railway infrastructures. Secondly, the member countries should take more initiatives to trade among themselves rather than trading with more advanced economies. Many operating companies in the ECOWAS region are headquartered in developed countries. So when agreements are concluded among member countries of ECOWAS, the dominance of these trans-national corporations reduces such policy initiatives. Also, since most of the trade in the region involves primary commodities there is a need to diversify production into higher value added manufactured items. This might lead to possibility of intra-industry trade and sustain monopolistic type competition. Third, the success of integration in West Africa should be primary goal of all stakeholders therefore the ECOWAS must seek out areas of cooperation and not conflict with the UEMOA member countries. And finally, there should be some conscious effort by the relatively resource endowed economies in West Africa, such as, Nigeria, Ghana, Senegal and Cote d'Ivoire, to undertake more initiative to trade with relatively resource poor States in West Africa. At a time when direct transfer of resources sound rather implausible, trade can help to build purchasing power in the region.

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Appendix

Table 7: Permanent Component of GDP

Year	Benin	Burkina Faso	Cote d'Ivoire	Ghana	Liberia	Niger	Nigeria	Senegal	Sierra Leone	Togo
1963	-1.42	-1.05	-0.35	0.23	-1.52	-0.84	1.47	-0.25	-1.11	-2.00
1964	-1.35	-0.97	-0.11	0.28	-1.22	-0.61	1.54	-0.29	-1.06	-1.80
1965	-1.29	-0.92	-0.18	0.34	-1.25	-0.61	1.60	-0.41	-1.07	-1.68
1966	-1.25	-0.84	0.02	0.40	-1.21	-0.68	1.67	-0.37	-1.03	-1.50
1967	-1.22	-0.77	0.09	0.45	-1.09	-0.68	1.40	-0.34	-1.08	-1.43
1968	-1.15	-0.70	0.36	0.51	-1.02	-0.70	1.39	-0.21	-1.10	-1.37
1969	-1.13	-0.61	0.40	0.58	-0.86	-0.63	1.68	-0.10	-0.98	-1.23
1970	-1.11	-0.55	0.49	0.63	-0.83	-0.54	2.47	-0.08	-0.95	-1.32
1971	-1.10	-0.48	0.62	0.70	-0.78	-0.45	2.15	0.05	-0.93	-1.12
1972	-0.94	-0.41	0.85	0.77	-0.64	-0.12	2.53	0.39	-0.85	-0.91
1973	-0.78	-0.35	1.26	0.84	-0.59	-0.10	2.71	0.38	-0.71	-0.69
1974	-0.71	-0.30	1.45	0.90	-0.14	-0.08	3.12	0.61	-0.61	-0.30
1975	-0.57	-0.23	1.74	0.94	0.00	-0.05	3.36	1.20	-0.53	-0.26
1976	-0.50	-0.18	1.93	0.98	-0.11	0.24	3.60	1.32	-0.57	-0.27
1977	-0.40	-0.10	2.31	1.04	0.14	0.62	3.53	1.33	-0.45	0.06
1978	-0.23	0.00	2.55	1.10	0.20	0.74	3.44	1.51	-0.26	0.08
1979	-0.02	0.07	2.69	1.16	0.37	0.95	3.70	1.80	-0.12	0.19
1980	0.12	0.15	2.82	1.23	0.36	0.67	4.03	1.86	-0.05	0.51
1981	0.09	0.20	2.53	1.26	0.25	0.67	3.95	1.67	0.00	0.23
1982	0.13	0.25	2.49	1.31	0.34	0.53	3.74	1.52	0.12	0.09
1983	0.09	0.31	2.43	1.37	0.23	0.29	3.22	1.02	-0.03	0.08
1984	0.11	0.36	2.51	1.42	0.35	0.38	2.85	0.98	0.07	0.04
1985	0.09	0.42	2.57	1.48	0.36	0.79	2.88	0.96	-0.14	0.16
1986	0.28	0.52	3.00	1.57	0.34	0.89	2.50	1.10	-0.46	0.61
1987	0.37	0.59	3.05	1.62	0.49	0.88	2.84	1.34	-0.31	0.74
1988	0.40	0.66	3.06	1.67	0.60	0.83	2.91	1.31	-0.16	0.84
1989	0.35	0.72	3.02	1.71	-0.08	1.06	2.96	1.14	-0.18	0.80
1990	0.54	0.78	3.22	1.76	-1.40	0.90	3.29	1.17	-0.36	1.08
1991	0.59	0.85	3.17	1.83	-0.79	0.98	3.14	1.09	-0.26	1.02
1992	0.49	0.89	3.31	1.88	-1.45	0.42	3.35	1.37	-0.41	1.12
1993	0.66	0.95	3.30	1.92	-1.80	0.59	2.79	1.39	-0.29	0.69
1994	0.48	0.99	2.92	1.96	-1.70	0.84	2.83	1.11	-0.24	0.52
1995	0.70	1.06	3.50	2.02	-1.41	0.85	3.09	1.56	-0.23	1.01
1996	0.74	1.12	3.55	2.07	-0.98	0.74	3.33	1.65	-0.16	1.09
1997	0.77	1.16	3.49	2.12	0.22	0.97	3.52	1.38	-0.22	1.10
1998	0.77	1.22	3.67	2.18	0.02	0.87	3.35	1.33	-0.34	1.19
1999	0.85	1.29	3.64	2.23	0.11	0.74	3.38	1.39	-0.38	1.18
2000	0.82	1.35	3.41	2.25	0.47	0.92	3.67	1.36	-0.45	0.98
2001	0.87	1.42	3.55	2.30	0.10	1.04	3.67	1.40	-0.31	1.06
2002	0.99	1.50	3.70	2.36	0.17	1.30	3.99	1.64	-0.24	1.23
2003	1.18	1.59	3.96	2.43	-0.50	1.35	4.15	1.86	-0.15	1.45
2004	1.26	1.67	4.09	2.49	0.06	1.54	4.40	2.13	-0.08	1.62
2005	1.31	1.73	4.15	2.57	0.40	1.60	4.72	2.51	0.03	1.65
2006	1.40	1.78	4.24	2.64	0.51	1.80	4.97	2.26	0.16	1.70
2007	1.57	1.85	4.43	2.70	0.75	2.02	5.08	2.52	0.31	1.87

Table 8: Temporary Component of GDP

Benin	Burkina Faso	Cote d'Ivoire	Ghana	Liberia	Niger	Nigeria	Senegal	Sierra Leone	Togo
0.04	0.11	0.07	0.20	-0.08	0.30	0.17	0.12	0.06	0.05
0.04	0.08	0.03	0.26	-0.22	0.07	0.17	0.23	0.07	0.01
0.05	0.05	0.09	0.38	-0.15	0.21	0.17	0.36	0.05	0.00
0.05	0.00	-0.01	0.35	-0.12	0.32	0.18	0.35	0.05	-0.04
0.03	-0.03	-0.02	0.10	-0.18	0.27	0.24	0.32	0.03	-0.03
0.04	-0.07	-0.11	0.00	-0.18	0.26	0.26	0.25	-0.01	-0.05
0.02	-0.12	-0.09	0.09	-0.25	0.16	0.21	0.08	0.09	-0.09
0.01	-0.24	-0.12	0.16	-0.22	0.11	0.05	0.10	0.12	-0.06
0.00	-0.25	-0.17	0.19	-0.22	0.08	0.07	0.00	0.06	-0.14
0.05	-0.13	-0.24	-0.01	-0.28	-0.18	-0.02	-0.15	0.09	-0.18
0.10	-0.04	-0.34	0.06	-0.27	0.05	0.00	0.01	0.16	-0.21
0.13	0.01	-0.33	0.17	-0.49	0.10	0.09	-0.10	0.17	-0.28
0.18	0.17	-0.38	0.09	-0.48	0.10	-0.03	-0.39	0.14	-0.22
0.14	0.15	-0.39	0.03	-0.32	-0.18	0.00	-0.50	0.05	-0.21
0.12	0.23	-0.48	0.12	-0.44	-0.36	0.05	-0.49	0.08	-0.31
0.16	0.39	-0.48	0.20	-0.41	-0.17	0.16	-0.55	0.22	-0.28
0.19	0.49	-0.48	0.23	-0.46	-0.20	0.16	-0.63	0.22	-0.31
0.22	0.50	-0.50	0.26	-0.41	0.25	0.14	-0.60	0.15	-0.39
0.17	0.38	-0.39	0.18	-0.32	0.11	0.14	-0.51	0.11	-0.27
0.11	0.31	-0.47	0.09	-0.39	0.17	0.16	-0.38	0.14	-0.29
0.00	0.16	-0.50	0.03	-0.33	0.29	0.34	0.00	0.02	-0.34
-0.06	0.02	-0.59	0.06	-0.41	0.00	0.49	0.01	0.01	-0.37
-0.05	0.02	-0.63	0.02	-0.43	-0.42	0.47	0.13	-0.02	-0.44
0.01	0.19	-0.78	0.17	-0.42	-0.25	0.50	0.33	-0.25	-0.55
0.07	0.27	-0.74	0.00	-0.52	-0.08	0.31	0.28	-0.05	-0.52
0.08	0.30	-0.74	-0.02	-0.57	-0.01	0.22	0.30	0.21	-0.52
0.06	0.25	-0.74	-0.05	-0.16	-0.28	0.21	0.45	0.11	-0.50
0.07	0.35	-0.85	0.01	0.44	0.01	0.06	0.57	-0.07	-0.59
0.04	0.30	-0.82	0.06	-0.26	-0.13	0.17	0.64	0.01	-0.54
-0.01	-0.08	-0.90	-0.02	-0.05	0.43	0.13	0.42	0.02	-0.59
0.09	-0.10	-0.90	-0.13	-0.03	-0.12	0.27	0.34	0.03	-0.48
-0.08	-0.35	-0.81	-0.27	-0.32	-0.40	0.33	0.25	0.14	-0.54
0.00	-0.19	-1.11	-0.15	-0.59	-0.22	0.24	0.03	0.09	-0.74
0.06	-0.17	-1.06	-0.13	-0.85	-0.06	0.24	-0.03	0.10	-0.70
0.00	-0.27	-1.03	-0.19	-1.44	-0.36	0.07	0.16	0.06	-0.69
0.08	-0.19	-1.12	-0.17	-1.04	-0.14	0.12	0.29	-0.05	-0.73
0.02	-0.18	-1.11	-0.19	-0.92	-0.04	0.17	0.25	-0.03	-0.73
-0.01	-0.39	-1.06	-0.64	-1.05	-0.34	0.16	0.19	-0.01	-0.69
-0.01	-0.39	-1.19	-0.63	-0.71	-0.38	0.20	0.18	0.09	-0.78
0.04	-0.31	-1.26	-0.55	-0.75	-0.52	0.09	0.04	0.17	-0.84
0.09	-0.14	-1.34	-0.40	-0.39	-0.38	0.06	0.06	0.14	-0.88
0.14	-0.04	-1.35	-0.31	-0.83	-0.48	0.07	-0.05	0.15	-0.90
0.14	-0.04	-1.35	-0.20	-1.04	-0.40	0.00	-0.35	0.16	-0.88
0.13	-0.02	-1.39	-0.10	-1.00	-0.52	0.02	-0.03	0.19	-0.90
0.12	0.06	-1.45	0.02	-1.07	-0.59	0.03	-0.11	0.21	-0.95

Table 11a: Johansen Cointegration Test Results for UEMOA countries

Null Hypothesis ^a	Alternate Hypothesis	Eigenvalue	λ_{trace} value	5% Critical value
λ_{trace} Test				
$r = 0$	$r > 0$	0.74	110.79	95.75
$r \leq 1$	$r > 1$	0.43	52.88	69.82
$r \leq 2$	$r > 2$	0.25	28.65	47.86
$r \leq 3$	$r > 3$	0.18	16.20	29.80
$r \leq 4$	$r > 4$	0.15	7.48	15.49
$r \leq 5$	$r > 5$	0.01	0.38	3.84
λ_{max} Test			λ_{max} Value	
$r = 0$	$r = 1$	0.74	57.91	40.08
$r = 1$	$r = 2$	0.43	24.23	33.88
$r = 2$	$r = 3$	0.25	12.46	27.58
$r = 3$	$r = 4$	0.18	8.72	21.13
$r = 4$	$r = 5$	0.15	7.10	14.26
$r = 5$	$r = 6$	0.01	0.38	3.84

^a r is the cointegrating rank.

Table 11b : Johansen Cointegration Test Results for non-UEMOA countries

Null Hypothesis ^b	Alternate Hypothesis	Eigenvalue	λ_{trace} value	5% Critical value
λ_{trace} Test				
$r = 0$	$r > 0$	0.30	36.42	47.86
$r \leq 1$	$r > 1$	0.29	20.82	29.80
$r \leq 2$	$r > 2$	0.13	6.11	15.49
$r \leq 3$	$r > 3$	0.00	0.06	3.84
λ_{max} Test			λ_{max} Value	
$r = 0$	$r = 1$	0.30	15.60	27.58
$r = 1$	$r = 2$	0.29	14.70	21.13
$r = 2$	$r = 3$	0.13	6.06	14.26
$r = 3$	$r = 4$	0.00	0.06	3.84

^b r is the cointegrating rank

Towards a development – oriented approach to the BOP in LDCs

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Abstract: The main argument here is that the conventional approaches to the BOP deal with the symptoms but not with the original causes or sources of BOP difficulties in LDCs. Trying to benefit from the current world economic situation, this article proposed a development-oriented approach to bop adjustment in LDCs which refreshes and extends calls and suggestions, of few economists during the last three decades, that emphasized the need to deal with bop difficulties of these countries in the context of a structural transformation process. The suggested development-oriented approach represents a general guideline and thus supposes that the detailed policy prescription must be left to the peculiarities of every economy to determine what is needed.

Keywords: BOP, development, LDCs

1. INTRODUCTION

The current conditions that created by the financial and economic crisis, initiated a new era of discussions about many issues concerning the philosophies underlying different policies being used in handling economic problems of different economies. The macroeconomic problems of less developed countries (LDCs) and the approaches that deal with them would not be an exception in these discussions particularly in view of the increasing recognition of the need to review the role and working mechanisms of the Breton Woods Institutions (BWIs) which, for a long time, focused on the economic reforms in these countries. The bop adjustment in LDCs has been a major subject of the BWIs programs with a limited success, and sometimes failure, achieved under them particularly in attaining a viable bop position. This in turn raises questions about the philosophical ground underlying the policies package of bop adjustment that usually prescribed to these countries. As is well known, the demand side prescription which is usually given within the bop stabilization programs of the IMF is based on the conventional approaches to BOP namely, elasticities approach, absorption approach, and monetary approach. Over the course of the past decades, a number of calls and studies have been devoted to explaining the inapplicability of the interpretation and thus the treatment of these approaches to the bop difficulties in most LDCs, particularly the least developed ones. Nonetheless, the explanation of BOP disequilibrium and remedies according to the conventional approaches dominates the literature through the implementation of the IMF and World Bank programs by many LDCs.

It is true that starting from the mid-1970s, the IMF expressed growing emphasize on the structural nature of the BOP difficulties facing LDCs and therefore, recognized the necessitation of supply side policies in these economies to restore equilibrium in the external payments position. Since then, the IMF decided not to confine its programs

to the management of aggregate demand. Instead, the aim of improving the supply of resources and broadening the productive bases of these economies has become an important ingredient of its programs. This is because the improvement of the supply side will also lead to an improvement in the current account of the BOP. Therefore, similar to the World Bank's policies, the IMF has started concentrating on the investment programs, prices policies, tax reforms, etc. Nevertheless, its explanation of the structural inflexible productive bases and shortfall of supply side in these countries is simply the insufficient integration of their economies in the world economy and the over intervention of state in various economic aspects (see Lereto 1993, 135). Consequently, the liberalization of foreign trade and payments, changing relative prices, and removing prices distortions and controls are crucial for attaining resources reallocation towards export industries and import substitutes in the current account and realizing convenient environment for foreign capital to flow in the capital and financial account. However, the high priority of the IMF remained the policies of demand management.

It can be noted that the above mentioned diagnosis of the BOP disequilibrium's causes and remedies ignores the different levels of economic development and, thus, levels of diversification of productive bases among LDCs, particularly between those industrialized developing economies and poor or least developed ones which face innumerable structural obstacles. Under the circumstances of the later countries "... the restoration of equilibrium of balance of payments in any meaningful sense calls for structural shifts that can be achieved only in the process of development" (Dell and Lawrence 1980, 101). This is not to say that monetary and fiscal balances are not important. Rather, they are preconditions for healthy functioning of any economy, but viewing them as prior to other objectives in BOP adjustment is described as a too narrow view of BOP adjustment in developing countries (Dell and Lawrence 1980, 101).

The objectives of this article are: first, to shed light on the special nature of BOP disequilibrium in LDCs; second, to show the deficiency of the conventional approaches to touch the original sources of BOP difficulties in these countries and thus to cure them. Third, this article aims at introducing the guideline of what can be called a development-oriented approach to the bop in LDCs which combines and extends the general ideas that have been introduced by some economists during the last three decades.

2. WHY BOP DIFFICULTIES IN LDCs DIFFER ?

The nature of the BOP difficulties in LDCs, particularly the poorest ones, is totally different from those of developed countries. Usually, bop problems in developed economies are temporary and are not reflections of structural problems in the composition of these economies. In fact, they reflect unfavorable changes in some economic aspects such as, the fiscal and monetary imbalances, inappropriate exchange rate policies, and the effect of commercial cycles. However, the BOP difficulties of the LDCs are structural in the sense that they reflect the original imbalances, bottlenecks, and obstacles in the composition of these economies. These structural obstacles include: the dominance of subsistence and commercial activities; a narrow productive base, particularly industrial base, with weak inter-sectoral linkages and ill-adapted technology and so, low levels of income, savings, and investment; fast growth of population; small and fragmented economies; openness and external overdependence; weak institutions; poor physical infrastructure; rudimentary money and capital markets; fragile political structures.

In taking the reflections of some of these structural imbalances upon the BOP, it would be easy to note that these countries generally have weak structures of foreign trade (imports and exports) in the form of limited number of primary commodities and low value added manufactures dominating the structure of exports with, at the same time, innumerable and diversified base of imports (consumer, intermediate, and capital goods). Furthermore, the low levels of income and saving make the overseas investment income that received by these countries insignificant against high levels of investment income commitments for bridging saving -investment gap. In the capital and financial account, many of these countries are not competitors in attracting foreign investment, either direct or portfolio investment. Meanwhile, the phenomenon of domestic capital flight is exacerbating. Moreover, the economic and political environment is discouraging, the needed infrastructure is lacked, the institutions dealing with investors suffer from corruption and old methods of management and the financial systems are simple and inefficient in playing the presumed role in financing economic activities.

3. CONVENTIONAL APPROACHES TO BOP AND LDCs

The elasticities approach, pioneered by Robinson (1947), focuses on how changes in relative prices of both domestic and foreign goods can improve the balance of trade. In other words, it views the BOP difficulties as a result of the absence or weakness of a country's price competitiveness. The absorption approach, introduced by Alexander (1952), provides a simple interpretation to the nature of the BOP disequilibrium. It considers the BOP deficit or surplus as the difference between what a country produces and absorbs (spends). So, BOP deficit stems from excess expenditure over income. As a more recent approach, the monetary approach connects the BOP disequilibrium with the imbalance in money market through international reserves¹. The BOP disequilibrium, accordingly, is looked upon as a monetary phenomenon reflecting the stock disequilibrium between supply of and demand for money. An excess supply of money leads to a loss of international reserves (a deficit BOP) and vice-versa in case of excess demand of money.

The underlying theoretical basis of stabilization programs of the IMF is mixture of these three conventional approaches² to the BOP. The absorption and monetary approaches were invented inside the IMF in the first ten years of its age by Alexander (1952) and Polak (1957). The elasticities approach is being used as a ground to advise countries to devalue their currencies so as to improve the competitiveness of exports, check imports, and thus improve the BOP position. Nonetheless, the generalization of devaluation as a major device in almost all stabilization programs irrespective of the existence of the required elasticities for it to be effective refers to the cut-short exploitation of the elasticities approach. The absorption approach considers BOP, more specifically current account, as the difference between output (income) and expenditures (absorption) and hence the interpretation of the cause of BOP deficits in LDCs countries is that these countries live beyond their means. Moreover, the analysis of Alexander (1952) regarding the effects of devaluation on absorption and output provided the theoretical underpinning of devising devaluation as expenditure-reducing instrument. It should be noted that although the absorption approach reveals three options for correcting BOP deficit (reducing absorption, expanding output, or both simultaneously), stabilization and structural adjustment policies focus upon absorption reduction since "...it is generally easier to reduce absorption than to increase production" (IMF 1987, 6). The monetary approach to the BOP connects BOP deficit with monetary imbalance (excess money supply), accordingly the IMF

recommends credit contraction as an important policy for curing BOP deficit. Furthermore, the monetary approach with its initial model still constitutes the logical ground for financial programming process which specifies the exact changes and criterion of macro variables to be achieved by the country requesting IMF support (see Polak 1997).

The suggested devaluation in the elasticities approach as a therapy to BOP deficit has been criticized on grounds of its unreal assumptions, limited coverage, and partial nature. An important fact is that the applicability of elasticities approach to LDCs has been questioned on some grounds. First, the condition of an elastic demand for exports and imports is not met. World prices of primary products are determined in foreign currencies and thus devaluation of domestic currency fails to reduce the foreign currency prices (world prices) of exports. So, as Bird (1984, 100) contends, “export elasticity of demand is largely irrelevant”. Second, the assumed infinity elastic supply of exports is doubtful in LDCs as the productive capacities of these countries are mostly inflexible and economic sectors confront many bottlenecks. Moreover, the uncompetitive position of these countries is not the product of overvalued currencies, but it is the outcome of many factors such as the non advanced technologies and institutions which result in a low and uncompetitive quality, packaging, marketing, and maintenance services. This analysis of weak competitiveness causes was applied to some developed countries too. Thirlwall (1980) views the UK BOP difficulties as a structural problem related to the capacity to produce and the characteristics of goods produced and exported which are not amendable to price changes.

In addition to criticisms³ directed to the absorption approach on the grounds of its assumptions, coverage, and inferring causation from identity, the cause behind BOP deficit might be an autonomous fall in exports, autonomous increase of imports, or by autonomous deterioration of terms of trade (Thirlwall 2003, 93). On the other hand, due to the long span of time needed to increase output particularly in LDCs, if any, demand deflation appears to be more probable. But the already mentioned adverse effects of this choice will further worsen the BOP position. Over and above, the BOP disequilibrium is usually coupled with weak record of growth which therefore asserts the need for growth-oriented policies, not the opposite.

As for the monetary approach, it is criticized on the grounds of its assumptions, broadness and narrowness⁴ at the same time, and its negligence to the composition of the BOP. In LDCs’ case, monetary imbalance usually exists but it is also the product or reflection of the inflexibility and impediments facing real sectors.

4. A DEVELOPMENT – ORIENTED APPROACH TO BOP FOR LDCs

The already discussed structural interpretation of BOP disequilibrium in LDCs means that unless structural impediments in these economies are overcome, BOP disequilibrium would continue. Despite, the ascendancy of the neoclassical doctrine, particularly after the 1970s, there existed some writings that challenged it and insisted the necessitation of structural transformation for BOP disequilibrium in LDCs to be cured. The report of the BOP adjustment in developing countries during the 1970s, by Dell and Lawrence (1980), is touching in this respect. It underlines the need to address BOP adjustment in these countries in the course of the development process and thus warns the dangers of the dependency on the short-run aggregate demand reduction which may disrupt the episodes of economic development. In addition, it claims that aggregate demand reduction may restore balance provisionally but “... the obstacles will probably persist unless dealt with them explicitly and

directly and the pressures will emerge once more as soon as the development process is resumed” (Dell and Lawrence 1980, 101). Therefore, the report suggests that BOP adjustment in the long-run must be an episode of development strategy. The essential conclusion of this remarkable study was that the inflexibility of supply side and the difficulty of resources mobility, as the core cause of BOP in these countries, can be overcome via a process of industrialization (see, Dell and Lawrence 1980, chapter 4).

The study of Killick et al. (1984) tried to introduce an alternative approach to the BOP adjustment and called it real economy approach or a strategy of adjustment with growth. This attempt cope with BOP disequilibrium in LDCs depending generally on expanding supply side and restructuring demand. Despite their recognition to the difficulty of the generalization of an elaborated prescription to countries with different situations and potentials, Killick et al. (1984) went ahead and introduced a detailed policy prescription.

Thirlwall (2003) placed emphasize on the need to rectify BOP problems in a growth context through structural transformation towards producing and exporting products of high income and price elasticities within what he called it a structural approach. However, he has not given accurate and elaborated policies or procedures of this approach.

Consequently, the development-oriented approach proposed here is a general framework or an outline to the BOP adjustment. This means that it comprises no standardized prescription of policies to solve payments disequilibrium in LDCs. It is believed that the value of the development-oriented approach lies in its call to structural changes as a general solution to the BOP problems of developing countries. Under this outline the required structural changes certainly differ from country to another depending on situations and potentials. Thus, the detailed policies should be left to the peculiarities of every economy to determine what is needed. What will be introduced here are some general outline which may support Dell and Lawrence’s (1980) calls, extend Thirlwall’s (2003) general idea, and outline the key elements of the real approach of Killick et al. (1984) as follows:

The main aim of the development-oriented approach is to restore the BOP equilibrium in LDCs through bringing about a structural transformation process which boosts the productive capacity and improves productivity and thus affects the structure of external trade and payments. This structural transformation process depends mainly on a well-designed and implemented strategy of industrialization. Attention should be placed on industrial activities that have potentials, especially for exportation, and concur with the available advantages to the under study country. It follows that a critical role should be played by state to support and facilitate the process of industrialization. The successful experiences of the new industrialized countries have proved that the role of state was crucial. In fact institutionalized interaction between state and private actors is a necessary condition to realize the required changes. Nevertheless, changing the patterns of production towards industrialization does not mean that other sectors are ignored. Rather, the distinguished characters of every economy such as resource endowments and the achieved level of economic and social development determine the promising sectors on which, besides industrial sector, concentration should be placed. Taylor (1981, cited in Jha 1994, 239) suggested that modernization of agriculture sector and non-traded goods sectors would be helpful in improving inter-industry linkages and may has a positive effect on equity if it implies land reforms and other social changes. Generally, comprehensive plans of exploiting the potentials of the promising sectors (agriculture, services, or any others) by the way

of improving their output, productivity, and the inter-linkages would be fundamental to any strategy of structural transformation.

Service sector development strategy should go hand in hand with that of goods production sectors to facilitate the development of the latter and strengthen the export base of services.

Putting into effect the approach is likely to depend heavily on supply-side policies either macro or microeconomic ones, as well as to focus on overcoming key bottlenecks and constraints encountered by every sector.

In the demand side, priority should be given to changing the composition of demand, more than reducing it, towards investment at the expense of consumption. Here, restructuring expenditures of the government budget towards investment of various kinds (human, physical) and away from luxurious and wasteful expenditures is crucial. If the demand reduction is unavoidable, the burden of reduction should be borne by consumption. But, because this approach is intended for LDCs where per capita income is low and an important part of the society lives under poverty line, policies of reducing consumption should be directed, as possible, away from the people of low income levels (Killick et al. 1984, 274).

Attention should be given to increasing and restructuring exports towards manufactured and high value added products by well designed and gradual subsidy policies. At the same time, effort should be made to lessen the dependence on imports by strengthening import substitution activities.

Restructuring and modernizing the financial system are a major factor for the under study approach. However, policies of credit allocation would be a necessary condition for industrialization strategy or for promoting and modernizing any other promising sectors.

Changing educational system towards vocational and applied sciences on the one hand and programs for promoting research and development on the other are essential pivots for initiating industrialization ambitions. The improvement of productivity in the long-run needs educated, healthy, and well paid population (Taylor 1993, 8).

Foreign capital and domestic capital abroad, especially direct investment are critical in terms of the acquisition of technology and bolstering BOP. Thus, for foreign capital to be attracted, legal, regulatory, and different institutional changes should come about.

Implementing the structural approach would be of gradual and long-run nature. Therefore, accruing the expected outcomes would take a long time too. In the meantime, the BOP disequilibrium is expected to persist which entails a necessary flow of finance until the BOP reach a viable position. That is to say that the success of the development-oriented approach would depend on the extent to which the country concerned has an access to international finance. For this reason, calls for different objectives and mechanisms of the international institutions are constant, particularly for transferring financial resources between countries and compelling surplus countries to bear responsibilities with regard to deficit countries. Consequently, providing the needed funds to LDCs for BOP adjustment purposes, away from the disinflationary prescriptions, is hoped to be provided by the IMF and World Bank in the context of a new international financial and economic arrangements.

4. CONCLUDING REMARKS

The above discussion shows how bop difficulties in LDCs are of structural nature in the sense that the weak structure of different BOP accounts echo several obstacles and bottlenecks in the composition of these economies. The conventional approaches to bop appear not to touch the roots and the original causes of bop difficulties in LDCs as they place emphasis on the symptoms such as the demand pressures and the resulted monetary imbalance. The proposed development-oriented approach focuses on the extension of supply side and at the same time gives due attention to demand restructuring. Institutions' building is stressed too. An inflow of funds during the unavoidable long-run period of adjustment is supposed to come from the BWIs which are concerned with bop adjustment. In other words, it is hoped that the development-oriented approach would be adopted by the BWIs in supporting bop adjustment programs in LDCs within a new international financial and economic arrangements.

Notes

1. This approach pioneered and developed by Polak (1957), Mundell (1968), and Johnson (1972).
2. The IMF also uses the neoclassical theories as theoretical grounds for its structural adjustment programs.
3. For detailed discussion of criticisms and shortcomings addressed to the absorption approach see Taylor (2002, 60-92).
4. Bird (1984, 88) mentioned that the monetary approach is broad in the level of aggregation used and narrow in its identification of the causes of BOP disequilibrium.

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Effect of policy reforms on farmers' incentives to specialise

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Abstract: A relatively new research has introduced non-economic drivers to explain farmers' strategic behaviour with the objective of gaining an understanding of the way in which farmers adjust in response to policy reforms. In this context, it has been argued that these non-economic drivers remain robust through changes in policy and business environments because they represent long term enduring aspirations. The objective of this article is to test whether these drivers really remain robust to policy changes. For this purpose, a number of farmers were asked to report their attitudes towards specialisation before and after the incidence of a particular policy reform. The results revealed that only few drivers remained robust, but others were strongly affected by the reform.

Keywords: Specialization; stable business environments; unstable business environments; policy reforms.

1. INTRODUCTION

It is recognised the fact that supporting distorting policies of the EU have isolated the agricultural sector from international markets of agricultural commodities. Since these markets have high degree of price instability (Sckokai and Moro 2006, White and Dawson 2005, and Hennessy 1998), these policies have helped farmers to operate in relative stable business environment. This stability, however, has negatively been affected by the reforms of the Common Agricultural Policy introduced by the EU. For example, as a result of the reform of the Sugar Regime in 2006, the sugar factory located in Allscott in the West Midlands region of the UK was closed and the sugar beet growers were obligated to adjust in this turbulent business environment by replacing sugar beet with alternative crops.

Researchers have recognised the need of gaining an understanding of the way in which farmers adjust in response to these policy changes. As a consequence, a new research has been developed with the purpose of identifying economic and non-economic drivers affecting farmers' strategic behaviour (see, for instance, Zubair and Garforth, 2006; Edwards-Jones, 2006; Beedell and Rehman, 2000; and Austin et al., 1998). What is

interesting about this research, however, is that non-economic drivers have been assumed to be unaffected by policy reforms (see Rehman et al., 2007). This

assumption implies that these drivers could eventually be used to predict a priori (i.e. before the incidence of a policy reform) farmers' strategic behaviour in response to policy changes.

The objective of the present article is to determine whether non-economic drivers really remain robust through changes in the policy and business environment. For this purpose, a number of ex-sugar beet farmers in the West Midlands region of the UK were asked to report their attitudes towards the strategy of specialisation (i.e. the selection of a narrow number of crops in order to gain efficiency) before and after the implementation of the Sugar Regime reform. Using this approach it was possible to identify non-economic drivers explaining farmers' attitudes towards specialisation before and after the reform. The results revealed that only few of these drivers remained robust to this political change. However, other drivers were strongly affected by the reform. The main implication of this finding is that academic works that have identified non-economic drivers in stable (unstable) environments could not necessarily be used to predict farmers' strategic behaviour in turbulent (stable) market conditions.

The paper is organised as follows. Section 2 presents the proposed multivariate model used to identify the non-economic drivers explaining attitudes towards specialisation. Section 3 shows the methodology used in the research. Results are presented in Section 4. Finally, Section 5 concludes the paper. Section Five concludes the paper.

2. THE PROPOSED MULTIVARIATE MODEL USED IN THE INVESTIGATION

2.1 Non-economic drivers

Research on farmers' behaviour has identified different non-economic drivers that explain farmers' strategic behaviour. While this development has not considered the case of farmers' attitudes towards specialisation, it provides important key approaches that have been adopted in the present investigation to design a multivariable framework. One of these approaches is the multiple goals approach which argues that farmers do not only consider economic targets when making their optimum decisions, but also non-economic variables that can affect their behaviour (Kliebenstein et al., 1980). The pioneer researcher in this area was Gasson (1973) who showed that some of these variables constitute goals (i.e. ends or states related to what the individual desires to be or what they wish to accomplish) and values (i.e. any aspect of a situation, object or event that has a preferential implication of being good or bad, right or wrong). The seminal work of Gasson has been adopted by other researchers who have found evidence supporting the hypothesis that non-economics goals and values also explain farmers' behaviour (Solano, et al., 2001; Kliebenstein et al., 1980; and Smith and Capstick, 1976).

Researches have also considered social psychological theories to identify the underlying determinants of farmers' behaviour (see, for instance, Zubair and Garforth, 2006; Burton, 2004; Beedell and Rehman 2000; and Carr and Tait, 1991). Researches in this area have considered in particular the theory of planned behaviour proposed by

Ajzen (1985, 1991). This theory establishes that intention is a good predictor of behaviour, and that intention is determined by attitudes, subjective norms and perceived behavioural control. That is, a person will have an intention (motivation) to

behave in a particular way when she/he has an attitude toward this behaviour (positive attitude), when the people who are important to him/her think that he/she should perform this behaviour, and when the person has the conviction that she/he will successfully execute a behaviour leading to a particular outcome.

Finally, specialisation can also be explained by the existence of market barriers that prevent farmers from diversifying into profitable crops. This is a real possibility because the existence of market barriers in agriculture have been documented (Hingley 2005a, Hingley 2005b, and Fearn and Hughes 2000).

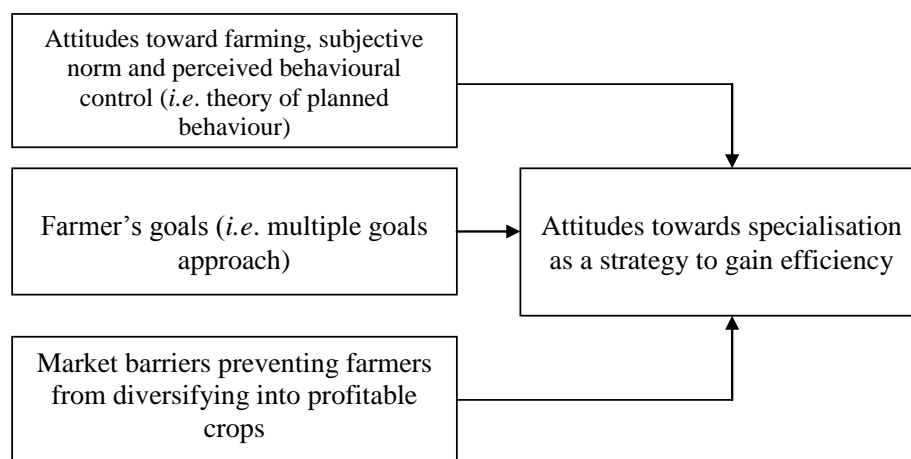
For the present research, therefore, non-economic drivers affecting farmers' strategic behaviour have been defined as farmers' goals (i.e. the multiple goals approach); attitudes, subjective norms and perceived behavioural control (i.e. the theory of planned behaviour); and market barriers.

2.2 The multivariate model

In order to identify non-economic drivers explaining specialisation before and after the implementation of the reform, the present article has adopted the model proposed by May (2010). This model is based on the contributions of Bergevoet et al. (2004) and Willock et al. (1999). These researchers developed a framework that integrates the multiple goals approach and the theory of planned behaviour with the objective of including a large range of valid variables that can explain farmers' decision making. This integrative framework is referred to as multivariate model.

The proposed multivariate model of May (2010) extends the contributions Bergevoet et al. (2004) and Willock et al. (1999) with the objective of determining whether attitudes toward specialisation are affected by non-economic drivers (i.e. farmers' goals, farmers' attitudes toward farming, perceived control, subjective norm, and market barriers). This model is shown in Figure 1.

Figure 1: Multivariate model of diversification-specialisation



Source: May (2010)

3. METHODOLOGY

The methodology used in this research is closely related to that developed by May (2010), May and Tate (2010), and Bergeovet *et al.* (2004). A questionnaire was used to collect the relevant data on: (i) the importance that the ESBF put on specialisation as a strategy to gain efficiency; and (ii) statements on farmers' goals, attitudes toward farming, perceived behavioural control, subjective norms and market barriers that prevent farmers from choosing more profitable enterprises. The farmers in the sample were asked to report their answers considering two conditions: before the implementation of the Sugar Regime reform; and after this reform. A five point Likert scale was used for questions regarding statements. An extract of the questionnaire used in the research is shown in Appendix A.

According to DEFRA (2010) statistics, the number of ex-sugar beet growers in the West Midlands region (ESBF) in 2005 was 592. The sample of the ESBF considered in the study consisted of 48 farmers which correspond to 8.1 per cent of this total, and this sample was visited in a period of six months. The statistical analysis was based on two steps:

a) Step 1: Factor analysis. A factor analysis with varimax orthogonal rotation was employed with the objective of reducing the data concerning farmers' goals (Bergeovet *et al.*, 2004). Only Factors having an eigenvalue larger than one were considered (Bergeovet *et al.*, 2004, and Kobrich *et al.*, 2003). According to Stevens (1992), for a sample of 50 observations a loading of 0.722 can be considered significant. In line with Stevens' recommendation, the present research considered a loading of 0.73 because the sample used in this study had 48 farmers. Finally, in order to carry out regression analysis, goals that resulted to be related were replaced by variables created from the factor scores (Bergeovet *et al.*, 2004).

b) Step 2: Probit analysis. A probit analysis was used to determine whether attitudes toward specialisation depend on non-economic drivers. Farmers who responded that

specialisation is an important strategy to gain efficiency were assigned a value equal to one. In contrast, farmers who responded that specialisation is not important were assigned a value equal to zero. The variable p_i summarises this information. That is, $p_i = 1$ for farmer i means that this agent reported that specialisation is an important strategy. Conversely, $p_i = 0$ for farmer i means that this agent reported that specialisation is not important. The probit model adopted to test the HN is presented as follows (see Dougherty, 2007, and Davidson and Mackinnon, 1993):

$$p_i = \int_{-\infty}^Z \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}Z^2} dZ \quad (1)$$

where Z is a linear combination of farmers' goals (F_i); farmers' attitudes toward farming (A_i); perceived control (P_k); subjective norm (N_l); and market barriers (B_m). Considering these variables, the linear combination Z is defined as:

$$Z = \beta_0 + \sum_i \beta_i F_i + \sum_j \beta_j A_j + \sum_k \beta_k P_k + \sum_l \beta_l N_l + \sum_m \beta_m B_m \quad (2)$$

The model has originally been estimated by May (2010) considering the response of the farmers in the sample for the case “after the implementation of the reform”. In the present paper this model was estimated using the same sample of this author for the case “before the implementation of this reform”. The results obtained in this article were compared with the estimation of May (2010) with the objective of determining whether the non-economic drivers affecting farmers’ attitudes towards specialisation remained robust to the policy change.

4. RESULTS AND DISCUSSION

Table 1 below reports the estimation made for the case “after the implementation of the Sugar Regime reform” (*i.e.* the estimation made by May, 2010) and the case “before the implementation of the reform”.

Table 1: Regression results

Variables	Before (<i>n</i> = 48)	After (<i>n</i> = 48)
Intercept	-1.16 (-0.77)	-5.02 (-1.36)
<i>Family farm</i>	1.31** (2.48)	1.47*** (2.73)
<i>I don't have the efficiency to produce profitable crops</i>		0.87*(1.85)
<i>I try to be among the highest producing farms</i>		1.50** (2.18)
<i>I take challenges more often than other farmers</i>		1.30 ** (2.44)
<i>I use my equity capital as a risk buffer</i>	-1.22** (-2.54)	-1.66** (-2.39)
<i>I like to try new things in my farm</i>	1.84*** (2.59)	
McFadden R^2	0.50	0.68
S.E. Regression	0.30	0.23

* $P < 0.1$, ** $P < 0.05$, *** $P < 0.01$, *z*-ratios in parenthesis.

According to this table, only the factor goal “family farm” and the attitude “I use my equity capital as a risk buffer” were robust to the policy change. Regarding the goal family farm, both estimations revealed that an increase in this goal score increased the probability of having a positive attitude towards specialisation. According to May (2010), this result reflects the opinion given by some farmers in the sample. These individuals pointed out that they preferred to specialise into few traditional crops with low profitability in order to have more free time to maintain family tradition. These farmers argued that because the productive processes of crops having high gross margin are very time demanding, they were unwilling to diversify into more profitable crops. Regarding the attitude “I use my equity capital as a risk buffer”, on the other hand, both estimations revealed that a one point increase in this variable score decreased the probability of having a positive attitude towards specialisation. According to May (2010), this result reflects different attitudes toward risk. That is, a farmer who uses equity capital as a risk buffer is probably more risk averse. Since risk aversion is associated with diversification, it is expected to find that these farmers assigned less importance to specialisation.

According to Table 1, the only driver that was significant in explaining attitudes toward specialisation before the implementation of the reform, but not after, was the attitude “I like to try new things in the farm”. Because the estimation made

for the case “before the implementation of the Sugar Regime reform” reflects a stable environment (*i.e.* farmers were protected), this driver can be considered as relevant only in stable business environments. This finding suggests that in these environments farmers have an incentive to specialise in alternative enterprises. However, since innovation is associated with a risky choice, this incentive disappears in turbulent conditions as business risk increases accordingly.

Finally, Table 1 shows that the only drivers that were significant in explaining attitudes toward specialisation after the implementation of the reform, but not before, were the market barrier “I don’t have the efficiency to produce profitable crops”, the attitude “I try to be among the highest producing farms”, and the attitude “I take challenges more often than other farmers”. For the market barrier “I don’t have the productive efficiency to the extent required to enter the market”, it was found that a one point increase in this statement score increased the probability of having a positive attitude towards specialisation. According to May (2010), this result is consistent with the opinion given by some farmers. These individuals explained that there exists important power imbalance in the relationship suppliers-retailers, a fact that has also been found by some researchers (Hingley 2005a, Hingley 2005b, and Fearn and Hughes 2000). In order to enter markets of profitable crops, retailers demand quality and efficiency that is difficult to achieve. Since diversification into profitable crops is limited by these retailers’ requirements, the farmers were obligated to choose specialisation as a second best strategy. What is interesting about this result, however, is that this market barriers appeared to be relevant only when the business environment was turbulent (*i.e.* post

reform). This can be explained by the fact that the sugar beet growers had to replace sugar beet with other available crops in response to the reform. Because this market barrier limited diversification choices for these farmers, they only had the choice of specialising in crops having low gross margin such as oilseed rape and oats. Regarding the attitude “I try to be among the highest producing farms”, on the other hand, Table 1 revealed that a one point increase in this variable score increased the probability of having a positive attitude towards specialisation. According to May (2010), this result is consistent with the argument given by Bowler (2000). This researcher argued that specialisation allows farmers to gain efficiency by means of economies of scale. Because efficiency is associated with higher production per unit of land, it is not surprising that farmers interested to be among the highest producing farms had a positive attitude towards specialisation. Because in the turbulent condition the existence of market barriers prevented farmers from diversifying into more profitable crops, survival in that condition could have been achieved by becoming an efficient farmer by means of specialisation. Finally, the attitude “I take challenges more often than other farmers” seems to reflect farmers’ attitudes towards risk. To see that, let us consider the interpretation made by May (2010) on this statement. According to Table 1, a one point increase in this variable score increased the probability of having a positive attitude towards specialisation. According to the author, an individual who is willing to take challenges more often than other farmers can be considered as less risk averse. Since diversification is associated with risk aversion, it is not surprising then that less risk averse farmers were more inclined towards specialisation. Because this statement appeared to be significant only in the turbulent condition, it was inferred that significant differences of risk aversion attitudes across farmers are relevant only in unstable business environments.

5. CONCLUSIONS

The objective of the paper is to determine whether non-economic drivers remain robust to policy changes. For this purpose, the article used a sample of sugar beet growers of the West Midlands region of the UK to identify how non-economic drivers explaining their attitudes towards specialisation were affected by the reform of the Sugar Regime implemented in year 2006. The results revealed that only few drivers remained robust to this reform. However, other determinants were strongly affected by this policy change. This finding has an important implication. That is, the factors affecting farmers' strategic behaviour in turbulent market conditions are not necessarily the same than those involved in stable business environment. As a consequence, non-economic drivers identified in stable (unstable) environments should not necessarily be used to predict farmers' strategic behaviour in turbulent (stable) market conditions.

This research has been focused on the strategy of specialisation. A similar approach could be used to analyse farmers' attitudes toward other strategies such as the formation of collaborative alliances, diversification and innovation, among others. The research could also be applied in other countries in order to identify cultural differences in the results. All these possible extensions are left for future research.

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Appendix A

Extract of the Questionnaire used in the investigation

SECTION FIVE: FARMERS' ATTITUDES

10. Please, use the scale below to best represent your attitudes associated with farming by considering two periods of time: (1) before the implementation of the Sugar Regime reform; and (2) present (i.e. after the reform).

Strongly disagree (1)	Disagree (2)	Indifferent (3)	Agree (4)	Strongly agree (5)		
Before					Closure	Present
a) Achieve low debts on my farm					- ()	()
b) My goals and objectives are clear					- ()	()
c) I try to be among the highest producing farms					- ()	()
d) I regularly negotiate with suppliers and buyers					- ()	()
e) I like to try new things on my farm					- ()	()
f) Keeping my farm up to date is very important to me					- ()	()
g) In decision-making I take the environment into consideration, even if it lowers profits					- ()	()
h) Off-farm income is important for sustaining our farm					- ()	()
i) When making an important decision I ask for a lot of advice					- ()	()
j) I take challenges more often than other farmers					- ()	()
k) I use my equity capital as a risk buffer					- ()	()
l) I try to minimize contract work					- ()	()
m) Farming is still fun and satisfying					- ()	()
n) I would seriously advise young people not to become a farmer					- ()	()
o) I'm well informed on the relevant legislation for my farm					- ()	()
p) I can further lower the cost of price of my production					- ()	()
q) Before I take important decisions I thoroughly inform myself					- ()	()
r) When I need a new loan, I always go to the same bank					- ()	()
s) I can increase the sales-price of my production					- ()	()
t) Administrative obligations consume a lot of time on my farm					- ()	()
u) I don't make plans because they don't work out in reality					- ()	()
v) The way other farmers think about my farm is important to me					- ()	()
w) I consider government policy unpredictable					- ()	()
x) Legislation spoils the pleasure in my work					- ()	()
y) The increasing amount of regulation interferes with my plans for the future					- ()	()

Explaining the decisions to innovate: The case of Tunisian service firms

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Abstract: It is widely recognized that innovation is the major driver of economic growth and competitiveness. But, some works focus especially on analyzing the determinants and the effects of innovation while distinguishing between its various types (product innovation, process innovation, radical innovation and incremental innovation). The analysis of the determinants is certainly important, but few research efforts testing the way in which firms make the decision to innovate. Based on a sample of 108 Tunisian service firms, the purpose of the paper is to explain the way in which firms make the decision to innovate: simultaneous (one-stage model) or sequential (two-stage model). We find that the two-stage model has a statistically-significant advantage in predicting the innovation. In practice, the sequential model illustrates well the innovation making-decision procedures.

Key words: Innovation, Decision making, Service sector.

1. INTRODUCTION

Innovation activities have been regarded as the major driver of economic growth and competitiveness at both micro and macro levels (Schumpeter, 1934). The literature studying this topic shows that, in the long run, innovators will be more efficient and more productive relative to non-innovators (Mansury and Love, 2008). These findings are very interesting and justify the preoccupation of firms to promote innovation. More precisely, the innovation surveys demonstrate that, in developed countries, the product/service innovation is an event that takes an important place in the activity. For example, about 80% of the U.S companies introduce at least one new service (Mansury and Love, 2008) and almost half of the Irish firms introduce an innovation (Roper and Dundas, 2004).

Indeed, firms are more incited to introduce new products so as to attract more market share and therefore they tend to avoid not only the domestic competitors but also the foreigners. For instance, in the ICT sector, innovation is vital for the survival

of the company. Furthermore, the introduction of new products allows the low-technology firm to capture additional market shares.

In the Tunisian context, firms give more importance to the academic research and technological innovation. The program called “*Pour la Tunisie de demain*”⁶ is adopted by the Tunisian government in order to help Tunisian firms to face foreign competition. Through this program, Tunisia provides significant support to promote innovation and technological development. Doing so requires the support of innovative companies, the intensification of the cooperation projects, the implementation of several techno-parks and the establishment of the information society.

Actually, innovation has been widely studied in the economic literature. Some empirical studies focus on explaining the impact of innovation on performance (Crépon et al, 1998; Mairesse and Mohnen, 2003; Roper and Dundas, 2004; Cainelli et al, 2006). Other ones analyze the determinants of innovation and the role of external linkages while introducing external control factors such as size and age of the firm (Duguet, 2003; Raymond and St-Pierre, 2010). The study of the determinants and effects of innovation distinguishes merely between two types of innovation: product innovation and process innovation. Other studies, particularly oriented towards the analysis of innovation in services, distinguish between radical innovation and incremental innovation.

In this paper, we focus on these two types of innovation: incremental innovation and radical innovation. The former signifies that innovation is going to be new to the firm but it has been already existed for the competitors. The latter assumes that the firm is the first and the sole having introduced a new service on the market.

The recent works are not delimited to the analysis of the determinants of innovation, but they are increasingly oriented to the analysis of the innovation decision-making procedure. Du et al. (2007) examine this procedure for the case of Irish manufacturing firms. However, to our knowledge this type of analysis remains rather limited for emerging countries and more precisely for Tunisia.

Following Du et al. (2007), we attempt in this paper to answer questions: how do Tunisian service firms make the decision to innovate? Are these decisions simultaneous or sequential? Broadly speaking, we consider two alternative models of the innovation decision: the one-stage model (where the innovation choice is simultaneous) and the two-stage model (where the innovation choice is sequential).

The paper is structured as follows. The second section presents a brief literature review on innovation decision. Section 3 presents the econometric models. Section 4 contains a description of the data set and the variables used in the empirical analysis. The results of the empirical analysis are presented in section 5. The concluding section synthesizes the main empirical findings presented in the paper.

2. ANALYSIS OF INNOVATION IN SERVICES

2.1 Types of service innovation

Since before, innovation has taken an important place in the economic literature. Numerous are the studies that have identified the main patterns innovation takes. According to the OECD innovation report in 2005, innovations are classified

⁶ For more details, see the report of the Ministry of Scientific Research and Competences Development in Tunisia.

into four categories: product innovation, process innovation, organizational innovation, and a marketing innovation. A product innovation is the introduction of some significant changes in the product characteristics. This category includes new goods as well as the improvements being added to an old product that has been already existed. Process innovation represents significant changes in methods of both production and distribution. The third category of innovation embodies the organizational innovations that are defined as the new organizational and management forms that firms adopt. The fourth category concerns the marketing innovation that takes the form of carrying on new commercialization method (for instance, change in the product design, product pricing method, etc.).

Gallouj and Weinstein (1997) consider products as a result of characteristics and skills series. In the same line with Gallouj and Weinstein (1997), Mansury and Love (2008) show that innovation patterns mainly developed for manufacturing industry may not apply easily to services. They insist on the fact that the traditional distinction between product and process innovation is less useful in the service context. The reasons behind this fact are related to the ambiguous nature of the services output and the simultaneous production and consumption of services.

Another research voice distinguishes between radical innovation and incremental innovation (Sundbo and Gallouj, 1998). This distinction has been the object of some empirical studies. For instance, Brouwer and Kleinknecht (1996) for Netherlands, Duguet (2006) for France, Löf et al, (2003) for Finland, Norway and Sweden, Baldwin and Hanel (2003) for Canada and finally Mansury and Love (2008) for USA.

2.2 The innovation decision

Few studies address the question how firms make decisions to innovate. Thereby, Cabagnols and Le Bas (2002) explain the determinant of the choice between three types of innovation decisions: to innovate on product, to innovate on process and to innovate both on product and process. Specifically, these authors clarify the way in which French firms orient their decisions to innovate. But, one of the issues addressed by this new literature is whether it is a one-stage or a two-stage process. Du et al. (2007) test the performance of two models of decision making: the simultaneous and the sequential model. They find that the sequential model (two-stage innovation decision) is more efficient than the simultaneous model (one-stage innovation decisions).

To model the innovation decision-making, we apply the two models proposed by Du et al. (2007) based on two forms of decision making: The one-stage model and the two-stage model. We have interest in this paper to study the innovation in the service sector and, accordingly, to assess the decision to choose between incremental innovation and radical innovation. Thereby, our one-stage model (simultaneous decision) supposes that the firm faces four alternatives innovation choices: no-innovation, radical innovation, incremental innovation and both radical and incremental innovation. However, the two-stage model (sequential decision) assumes that the firm decides first whether or not to engage in any innovation activity and then it considers what category of innovation it would participate in (see Figure 1 below).

The econometric estimation of the two models parameters is based upon certain estimation tools of the discrete choice models. Indeed, the econometric estimation procedure depends on whether the choice of an innovation is sequential or simultaneous.

Figure 1: Firms' decision tree of innovation activity

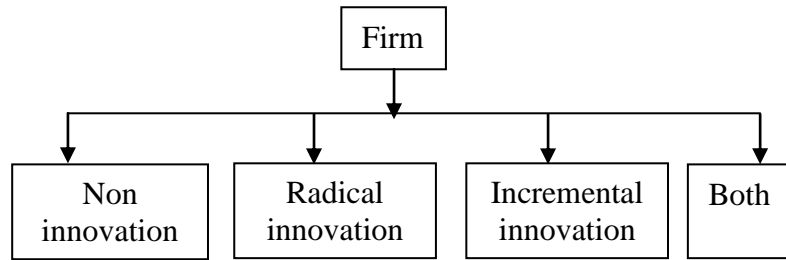


Fig. A : One-stage model

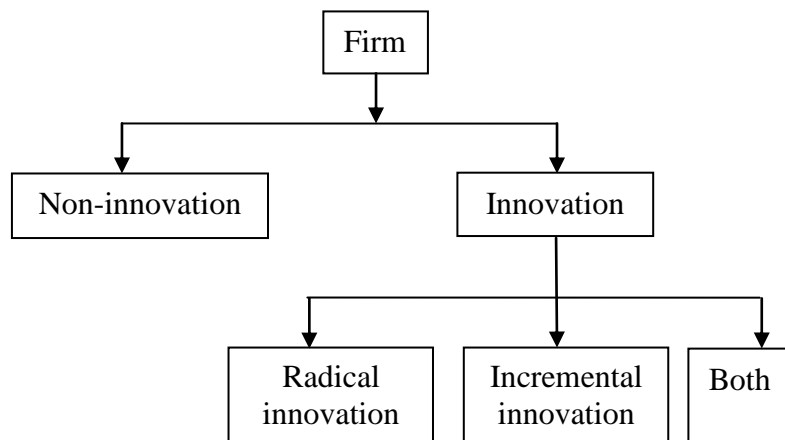


Fig. B : Two-stage model

Source : Du et al (2007)

3. MODELS AND ESTIMATIONS

3.1 One-stage model

Concerning the one-stage model, the innovation decision is considered to be a four-outcome discrete variable. To do so, we use a Multinomial Probit model (MNP) relaxing the Independence for Irrelevant Alternatives assumption.⁷

We assume that for i th firm faced with J choices, the utility U_{ij} of choice j is the sum of a deterministic component X'_{ij} and an unobserved random component ε_{ij} . The utility function is expressed as follows:

$$U_{ij} = X'_{ij}\beta_{ij} + \varepsilon_{ij}, \quad [\varepsilon_{i0}, \varepsilon_{i1}, \varepsilon_{i2}, \varepsilon_{i3}] \sim N[0, \Sigma] \quad (1)$$

⁷ For more details, see Maddala (1986).

Where $j = 0, 1, 2, 3$ represent, respectively, the firms' innovation decision involving the choice of undertaking: non-innovation, radical innovation, incremental innovation and both radical and incremental innovation.

If the firm makes choice j in particular, then its utility U_{ij} is the maximum among the 4 utilities. Therefore, the statistical model is driven by the probability that choice j is made. It's expressed as follows:

$$\begin{aligned} P_{ij} &= \Pr(Y_i = j) = \Pr(U_{ij} > U_{ik}), \forall k \neq j \\ &= \Pr \left\{ \varepsilon_{ik} - \varepsilon_{ij} \leq (X_{ij} - X_{ik})' \beta \right\} \end{aligned} \quad (2)$$

The coefficients of vector β are estimated using the maximum likelihood method. The log-likelihood can be derived by attributing, for each firm, $d_{ij} = 1$ if alternative j is chosen by the firm i and 0 if not, for the 4 possible outcomes⁸. The log-likelihood is:

$$\log L = \sum_{i=1}^n \sum_{j=0}^3 d_{ij} \log \text{prob}(Y_i = j) \quad (3)$$

3.2 Two-stage model

The two-stage model is the sequential decision of innovation. It assumes that the firm first decides whether or not to engage in any innovation activity and then it considers what category of innovation it would participate in. At the first stage, we consider a binary choice model in order to model the probability of whether or not the firm makes decision to innovate. Doing so, we use a Probit model because the dependant variable is binary.

If the decision to innovate is made (the first stage) then the firm (at the second stage) will choose which type of innovation it wants to engage in. As in the first model, we consider again an MNP with three choices: (1) radical innovation, (2) incremental innovation and (3) both. The coefficients are estimated using the maximum likelihood method.

4. DATA AND VARIABLE MEASURES

Before describing the model and results therein, it's important to examine the main characteristics of the data and the indicators used in the empirical analysis.

4.1 Data

In this paper, we use data from a survey of 108 Tunisian services firms. Data were collected through a questionnaire which has been distributed to some Tunisian service firms. The questionnaire is a modified version of the third community survey on innovation CIS III and the second European survey on innovation 1997. The survey collects information that concerns the firms' innovation activities during the period 2005-2007 and some information on the innovation patterns (Sdiri and al., 2010). It involves information about the firm's features (size of the firm, firm vintage, skills, group-belonging, etc), their expenditure devoted to R&D and innovation activities and other information concerning the main innovation objectives.

⁸ See Greene (2003).

Our sample has been stratified by NAT⁹ size (7classes by number of employees: 1-6, 7-9, 10-19, 20-49, 50-90, 100-199, 200 and over). A set of seven weights, one for each stratum, was also provided in order to obtain a representative sample.

Table 1 : Distribution of the firms according to the size

Size	Total				Radical innovation (%)	Incremental innovation (%)	Both (%)
	Number of respondents	INS' firms	Corrected weight	%			
1-6	23	12649	903.5	21.30	20	5.55	24.56
7-9	17	785	78.5	15.74	0	16.66	15.78
10-19	18	713	89.125	16.67	10	27.77	15.54
20-49	13	509	63.625	12.04	30	5.55	12.28
50-90	10	230	38.33	9.26	0	11.11	7.01
100-199	10	167	18.55	9.26	10	11.11	7.01
≥200	17	215	13.43	15.74	30	22.22	15.78
Total	108	15268	215.04	100	9.26	16.66	52.77

Table 1 summarizes the determinants of this operation and it shows that 21.39% of respondents come from small firms (number of employees is lower than 6). Furthermore, this table reveals that 9.26% of firms interviewed claim that they introduce a radical innovation, 16.66% introduce an incremental innovation and 52.77% introduce both radical and incremental innovation.

4.2 Variable measures

Innovation in services

To analyze the determinant and the patterns of innovation, most of the previous studies have measured the innovation output by the number of patents or the percentage of new product sales (Mairesse and Mohnen, 2003). But, these indicators can't be used in our case. Indeed, the number of patents is not a good indicator for the emerging countries where the number of patents is extremely limited especially for service innovation. So, we use three other innovation measures.

- First, we measure the innovation output (INSERV) by a binary variable taking the value 1 if the firm has innovated over the previous three years and 0 otherwise. This measure is obtained by asking informants to indicate if the firm has introduced or not a new or a significant improved product and/or process;
- Second and for the one-stage model, the innovation decision is measured by a discrete variable with four outcomes (InDec). In this case, the firm faces four choices: (0) non-innovation, (1) radical innovation, (2) incremental innovation or (3) both;
- Third and in the two-stage model, the innovation decision is measured by a discrete variable with only three outcomes (InDecII).

⁹ National Institute of the Statistics (INS): distribution of companies by activity and by number of employees in 2007.

Size and age of the firm

The relationship between the innovation and firm size has been thoroughly examined in many works. In this paper, we measure the firm size (SIZE) by the total number of employees in 2007 (in log form). The firm vintage (AGE) is determined by the date of its creation. More precisely, this measure indicates the number of years during which the service firm acts in the market until 2007.

Business type

TYPEACT is a variable that measures the business type. In this paper, firms interviewed are required to answer the question whether the service is intended either to firms “Business to Business” (B2B) or to individual customers “Business to Consumer” (B2C), or to both. This variable indicates how the firm choice to target two types of customers (i.e. individuals and professionals) affects the service innovation decision.

Education level

The availability of human capital inside the plant with an appropriate level of skills and knowledge in R&D activities is considered as essential internal resources that enable the firm to innovate. In fact, the education level represents, in one hand, an indicator of the know-how and skills level of an employee within the firm and, in other hand, a major determinant for making innovation activities. In this paper, our education level measurement (QUAL) is the number of workforce qualified¹⁰ divided by the total number of employees in the firm.

Group membership

APP_GROUP is a dummy variable which takes 1 if the firm belongs to a group, 0 otherwise. When the firm is a member of a group, it has the advantage to benefit from competencies and technological experience of other firms of the group and then has an important opportunity to innovate (Paul et al. 2000). So, firms belonging to a firm group, allow it to have more information about some opportunities related to the market.

Engaging in innovation activities and cooperation for innovation

According to the innovation economic literature, the R&D investment is often considered as an important determinant for innovation activities. In this paper, and because of the unavailability of such measure, we consider a qualitative variable (ENGAG), i.e. the variable takes the value 1 if the firm questioned has developed between 2005 and 2007 at least one of innovation activities (including the intramural and extramural R&D) and 0 otherwise. These activities are identified in Table 2 below.

Cooperation for innovation plays a prominent role by enhancing the ability of the firm to innovate. In this paper, we introduce the variable cooperation (COOPER) as a binary variable indicating whether or not the firm has signed during the three years 2005-2007 cooperation contracts with external actors. This variable is introduced into the model to show that external relationships are crucial to promote innovation. The empirical results show that cooperation is positively related to

¹⁰ We consider as qualified, the percentage of the service firms' workforce with a bachelor's degree.

innovation, implying that innovation activities require cooperation agreements with public or private agencies and with the other firms too (Cohen and Levinthal, 1990).

Table 2: Innovation activities

Codes	Activities
R&Dint	Experimental R&D (R&D in house)
R&Dext	Acquisition of services of R&D (R&D external)
MACH	Acquisition of equipment related to the technological innovations
LOGC	Acquisition of software and other external technologies related to the technological innovations
FORM	Training of personnel related to the innovation process
MARK	Internal/external marketing strategy for service innovation

International orientation

According to the empirical works on the topic of innovation and international economic exchanges, we notice that not all firms are able to benefit from innovation. Thus, it is essential to moderate the relationship between innovation and performance by a firm international orientation of the firm. Thereby, the firm needs a certain level of international orientation or internationalization¹¹ in order that it can be competitive not only on the domestic market but also on the international markets. Therefore, it benefits from their new products and/or processes. In this paper, we measure the international orientation (INTER) through a binary variable that takes 1 if the firm is engaged in internationalization strategies and 0 otherwise.

The aims of innovation

In order to achieve its objectives, a firm has to take into account a certain number of actions that can incorporate the R&D and innovation activities. The introduction of the innovation objectives indicator in our regression is thus necessary. We consider a qualitative measure which is the importance (a five point's scale of likert) that a firm gives to a set of factors influencing innovation activities. In fact, firms were asked to answer five questions indicating the importance they attach to different objectives of innovation. These objectives we used in this study are: replace services that are removed (SERV_OBS), improve the service quality (QUAL_SERV), extend the line of the products (GAM_SERV), sustain the market share (PART_MAR) and decrease the production costs (RED_COUT).

5. EMPIRICAL RESULTS

Table 4 and 5 report the results of the econometric estimation of the models discussed above: sequential model and simultaneous model. These models highlight the innovation decision-making process in the Tunisian services sector. Further, they enable us to analyze the robustness of the two innovation decisions.

5.1 Test of significance of the models

More generally, the econometric specifications have a predictive power that exceeds 60% for the one-stage model and exceeds the 64% for the two-stage model

¹¹ For more details, see Kotabe et al (2002).

(Table 3). The whole significance of our models is confirmed by the R-squared of McFadden, is about 49% for the first model and about 51% for the second model. Based on both the R-squared of McFadden and the prediction percentage, we note that the two-stage model has a statistically significant advantage than the one-stage model. In practice, the sequential model illustrates well the innovation making-decision procedures. This result has been also noted by Du et al. (2007).

Table 3: Prediction statistics

	<i>Actual probability</i>		<i>One-stage model</i>		<i>Two-stage model</i>	
	Number	%	Predicted probability	%	Predicted probability	%
0 : Non-innovation	20	20.20	13	13.13	-	-
1 : Radical innovation	10	10.10	3	3.03	4	5.06
2 : Incremental innovation	16	16.16	4	4.04	4	5.06
3 : Both	53	53.54	40	40.40	43	54.43
Number of observation 1-3	79				51	
Number of observation 0-3	99		60			
Correct prediction rate			60.60		64.55	

5.2 Determinants of the innovation choice

The results of the estimation of the MNP model are presented in tables 4 and 5. Here, we analyze the main determinants affecting the choice between types of innovation.

Regarding the impact of firm size on the innovation decisions, the empirical results are divergent. In this paper, we find that firm's size has a positive and statistically effect on the probability of innovating, but at a decreasing rate. This result represents one of a number of findings in the empirical innovation literature. Similar effect has been noted by Du et al (2007) for the case of manufacturing industry. Further, our results reveal that the size of the firm is a powerful determinant that promotes more incremental innovation than radical innovation for both models (Table 4 and 5). Furthermore, our estimation results show that Business type (B2B type, B2C type or both) positively affects the probability to innovate. Providing services to a large customer encourages service firms to develop more their internal innovation. Actually, in order to cover the increasing and diversifying demand it faces, the service firm has to innovate so as to enhance its internal capacity.

An interesting result concerns the role of the cooperation variable (COOPER) (Table 5). We find that, when a firm cooperates with external partners (customers, competitors, universities, research centers...), its probability to innovate in services increases. This result is also noted by Becker and Dietz (2004). These authors show that cooperation with partners in R&D has a positive and statistically significant effect on innovation. Also, Mohnen and Therrien (2005) notice that the Canadian manufacturing firms are better off with innovation while cooperating with other companies.

Moreover, we find that the international orientation of a firm abroad can promote the probability of innovation. In the same way, Kafouros et al. (2008) show

that the internationalization process allows firms to promote their performance through the introduction of new products on the market.

Otherwise, we note that, for the both models, the variable ENGAG has no effect on the probability to innovate. However, the converse effect is noted by Du et al. (2007). The origin of the difference is related to the measure of the knowledge activities. They consider the R&D in plant (binary variable indicating whether or not the firm has developed R&D activities) as a measure of knowledge activities rather than a dichotomous variable introducing all innovation activities, including the R&D's.

For both models, our econometric estimations show significant effects concerning the importance service firms give to the innovation objectives. We find that service quality improvement, market share sustainability, and production costs reduction positively affect the probability to innovate. This result is also obtained in Sirilli and Evangelista (1998) for both manufacturing and service industries. In addition, we find that the probability of innovation would be positively affected by the extension of the services' line.

Table 4: Marginal effects of multinomial Probit model for innovation choice (first model)

Variables	Multinomial Probit Model							
	Non-innovation		Radical innovation		Incremental innovation		Both	
	dy/dx	SE	dy/dx	SE	dy/dx	SE	dy/dx	SE
Internal knowledge sourcing								
Engaging in innovation activities (ENGAG)	0.106	0.089	-0.033	0.030	-0.018	0.027	-0.05	0.102
External knowledge sourcing								
Cooperation (COOPER)	-0.186	0.071**	-0.042	0.027	0.016	0.033	0.213	0.088**
International orientation (INTER)	-0.026	0.019	-0.013	0.012	-0.000	0.012	0.039	0.028
Absorptive capacity								
Education level (QUAL)	0.054	0.110	-0.036	0.070	0.197	0.110*	-0.036	0.070
Group membership (APP_GROUP)	-0.006	0.046	0.014	0.026	0.026	0.042	-0.005	0.077
Resources								
Size (employment) (SIZE)	0.069	0.052	0.024	0.035	0.087	0.044*	-0.181	0.075**
Size-squared	-0.002	0.005	-0.000	0.003	-0.009	0.006	0.013	0.009
Firm vintage (years)	-0.007	0.005	-0.004	0.003	0.001	0.002	0.009	0.006
Business type (TYPEACT)	-0.026	0.019	-0.003	0.014	0.032	0.016**	-0.012	0.036
The objectives of the innovation								
Replace obsolete services (SERV_OBS)	0.033	0.021	-0.000	0.010	-0.005	0.011	-0.027	0.026
Improve service quality (QUAL_SERV)	-0.024	0.030	0.119	0.059**	-0.016	0.027	-0.078	0.073
Extend the line of services (GAM_SERV)	-0.009	0.022	0.033	0.024	0.025	0.016	-0.049	0.037
Sustain the market share (PART_MAR)	-0.045	0.044	-0.126	0.065*	0.013	0.021	0.158	0.086*
Reduce production costs (RED_COUT)	-0.019	0.016	-0.014	0.015	-0.036	0.013***	0.070	0.031**
Number of observation	99							
Log pseudo-likelihood	-9443.120.							
R-squared	49%							

Significance level: *** p<1%, ** p< 5%, * p< 10%

Table 5: Marginal effects of multinomial Probit model for innovation choice (second model)

Variables	Probit model		Multinomial Probit Model					
			Radical innovation		Incremental innovation		Both	
	dy/dx	SE	dy/dx	SE	dy/dx	SE	dy/dx	SE
<i>Internal knowledge sourcing</i>								
Engaging in innovation activities (ENGAG)	-0.181	0.101*	-0.032	0.026	-0.019	0.023	0.051	0.038
<i>External knowledge sourcing</i>								
Cooperation (COOPER)	0.185	0.087**	-0.036	0.033	0.014	0.027	0.022	0.047
International orientation (INTER)	0.034	0.019*	-0.012	0.012	0.001	0.012	0.010	0.019
<i>Absorptive capacity</i>								
Education level (QUAL)	0.095	0.103	-0.032	0.066	0.151	0.104	-0.118	0.128
Group membership (APP_GROUP)	0.048	0.036	-0.018	0.023	0.026	0.033	-0.008	0.044
<i>Resources</i>								
Size (employment) (SIZE)	-0.045	0.046	0.026	0.033	0.087	0.043**	-0.113	0.054**
Size-squared	0.000	0.005	-0.001	0.003	-0.009	0.005*	0.011	0.006*
Firm vintage (years)	0.008	0.004*	-0.003	0.003	0.001	0.002	0.002	0.003
Business type (TYPEACT)	0.034	0.019	-0.012	0.012	0.026	0.015*	0.010	0.019
<i>The objectives of the innovation</i>								
Replace obsolete services (SERV_OBS)	-0.022	0.016	0.001	0.008	-0.005	0.009	0.004	0.013
Improve service quality (QUAL_SERV)	0.040	0.034	0.099	0.045**	-0.009	0.023	-0.090	0.051*
Extend the line of services (GAM_SERV)	0.025	0.024	0.031	0.019	0.023	0.015	-0.054	0.026**
Sustain the market share (PART_MAR)	0.019	0.032	-0.109	0.050**	0.005	0.018	0.103	0.054*
Reduce production costs (RED_COUT)	0.029	0.015	-0.014	0.012	-0.028	0.011**	0.043	0.019**
Log pseudo-likelihood	-9.712		-5879.70					
Number of observation	99		79					
R-squared	51%							

Significance level: *** p<1%, ** p< 5%, * p< 10%

6. CONCLUSIONS

In this paper, we have used a sample of 108 Tunisian service firms in order to explain the extent to which the service firms make their decision to innovate. More precisely, we have tested the robustness of two decision-making models. The first model studies the case where the firm takes a simultaneous innovation decision (a one-stage decision). The second one tackles a sequential innovation decision (a two-stage decision).

We have used in this paper the Multinomial Probit Model (MNP). The estimation results of the MNP, using the maximum likelihood method, show that the sequential innovation decision has a positive and statistically significant effect in terms of the innovation decision predictions. Furthermore, we have found that service quality improvement, market share sustainability, and production costs reduction positively affect the probability to innovate. Also, we have obtained that the cooperation agreements with external partners have a positive effect on the probability to innovate. This finding is often noted in the innovation literature.

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Do South African Government SMEs focus interventions work?

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Abstract: The objective of this paper is to determine whether the interventions introduced by the South African Government to stimulate SMEs have been successful. The paper investigates the Small and Medium Enterprise (SME) intervention policy of the South African Government against the background of the putative benefits and costs attendant upon microeconomic policy intervention. In the first section, the literature survey examined the international literature on the nature of policies to stimulate the SME sector, the debate surrounding the need for interventions, and contextualized South Africa within this framework. In the next section the research methodology sets the conceptual framework for the empirical study that sought to determine the attitudes of entrepreneurs in the most populated province in South Africa, namely KwaZulu-Natal, to SME policy intervention and extrapolated from the various conclusions on the efficacy of the South African SME intervention policy. In the final instance, the summary, limitations, suggestions for further research as well as the recommendations flowing from the assessment of both the literature review and empirical investigation are presented in the context of how government could improve the stimulation of SMEs and subsequent employment creation.

Key words and phrases: interventions, government failure, market failure, functional interventions, selective interventions.

1. INTRODUCTION

The requirement for any form of intervention would tend to indicate that a problem pre-exists within the free market, and the intervention is therefore intended to solve the problem. Economic theory attempts to solve this problem, or failure, in order to provide a guide to the means of solving the problem. Government interventions are themselves premised on the fact that a need for such an intervention exists because of a market failure in the free market system (Stiglitz, 1989:197). However, Stiglitz (1989:202) further suggests that not all market failures can be successfully addressed through government interventions, as governments themselves are subject to the same constraints

such as insufficient information, and therefore are no better suited to intervening than the private sector is. Stiglitz (1989:197) and Hosseini (1999:20) also suggest that market failures are found in both developed and developing countries, but occur more frequently in developing countries.

Market failure is often seen as a justification for government interventions by the incumbent governing authorities (Mitchell, 2006:57). On the other hand supporters of a free market environment believe that government interventions are often the root cause of market failure to begin with. The second source of failure is government failure. Government failure could arise as a direct result of attempts by government to correct market failure, and in the process they could contribute to market failure. This, in the context of this paper, could be over-regulation by government, which would stifle SME start-up and growth rates (Montgomery & Bean, 1999:403). In certain instances, government failure can be of such enormous impact as to override the impact of market failure, to the extent that the market becomes unworkable (Hosseini, 1999:30).

For the purpose of this paper, all government interventions can either be classified as functional, generic broad based interventions aimed at businesses of all sizes, or selective, providing specific relief or assistance to a particular segment of the economy such as the SME sector (Wint, 1998:281; Unctad, Online 8 November 2008:3). The purpose of interventions by any country's government is to effect change within the economy as a whole or in part (Wint, 1998:281; Unctad, Online, 8 November 2008:3). In the next section the literature review on interventions will be dealt with, followed by the research methodology, the findings, conclusion, recommendations, limitations and suggestions for further research.

2. LITERATURE REVIEW

In order for markets in any country to function correctly, the approach from a neoclassical perspective is that markets will continue to seek equilibrium, until equilibrium is reached. The mechanism for achieving the equilibrium, is the Firm. However, the neoclassical approach sees no role for the firm once the state of equilibrium has been achieved (Boudreaux & Holcombe, 1989:147).

This has therefore lead to alternative approaches to the Theory of the Firm. In the neoclassical approach, the Firm only comes into existence after the market exists, whereas in the Knightian approach the Firm is entrepreneurial, and creates markets through specific decision making processes under uncertainty (Boudreaux & Holcombe, 1989:147). Therefore the neoclassical approach does not allow for the entrepreneurial contribution by the Firm. A simple way to differentiate the Coase approach from that of Knight, is to categorize Coase as a managerial approach and Knight as an entrepreneurial approach (Boudreaux & Holcombe, 1989:152). The Knightian approach was followed by the approach known as the Behavioural Theory of the Firm. The Behavioural Theory of the Firm takes specific cognisance of the impact of the entrepreneur during the start-up phase, when the impact of the entrepreneur is at its highest (Dew, Read, Sarasvathy & Wiltbank, 2008:38). However, while the Knightian approach embraces the decision

making process under conditions of uncertainty, the Behavioural Theory of the Firm attempts to specifically remove uncertainty, and introduces conflict resolution, organizational learning and problemistic search (Dew et al, 2008:40). The approach considers each firm to be heterogeneous and assumes that new markets and new businesses have an interdependent relationship which differs from existing businesses in existing markets (Dew et al, 2008:41).

The managerial approach attempts to remove the uncertainty upon which the Knightian approach is based. Although the managerial approach attempts to apply the Theory of the Firm to large existing organizations (Bartlett & Ghosal, 1993:23), the approach can also be applied to the SME, as all firms seek to remove uncertainty. The resource-based theory suggested that the neoclassical approach of firms being homogeneous was incorrect and the mobility of resources was incorrect (Bowen, 2007:101). The entrepreneurial theory of Knight in the context of start-up firms as well as the managerial approach of Coase can be closely linked to the present day approach of linking profitability to the Theory of the Firm.

While the Theory of the Firm states that profitability is the main objective of the firm (Mohr & Fourie, 1995:313; Salvatore, 2000:9), it can be argued that if seen holistically, government interventions should address all four factors of production, namely capital, land and natural resources, labour and entrepreneurship, in order to enhance sustainable profitability of SMEs. The requirement for interventions to address all factors of production in order to increase profitability is based on the interrelated nature of the factors of production and the potential effect of their combination on profitability. The ideal is to optimize each factor, as well as a combination of the four factors in order to maximize profitability (Smorfitt, 2008:18).

Kirzner's Theory of Entrepreneurship defined an entrepreneur as an individual that identifies disequilibrium in the economy and then equilibrates the factors of production. In the context of this continuum, this would not be equally applicable to all categories of entrepreneurs on the entrepreneurial continuum. Governments will therefore have to take note that interventions would impact differently on the different levels of entrepreneurs (Casson & Wadeson, 2007:285).

In the South African context GEM research for the period 2005 indicated that there is a need for interventions to increase the growth rate for existing businesses. South Africa dropped five places in the GEM rankings. South Africa has the lowest entrepreneurial activity rate of all the developing countries participating in the rankings. South Africa scored low on the start-up rate for survivalist businesses as well as for opportunity driven businesses, and once again was the lowest scoring member on these rankings. South Africa also has the lowest rate in the rankings for businesses that have been paying wages for a minimum of 3.5 years (Global Entrepreneurship Monitor, South African Report 2005, Online, 8 April 2007:7).

2.1 The debate regarding the need for intervention in SMEs in general

After the Second World War, the rise of large businesses, conglomerates and multinational corporations led many people to believe that there was no future for the small enterprise.

In the United Kingdom, it took the Bolton Report, published in 1971, to highlight how badly the small business sector had been handled in the United Kingdom. The report was successful, not only in quantifying the small business sector's contribution to the socio-economic structure of contemporary Britain, but also in identifying the main problems associated with it, as well as the fact that Britain was now lagging behind efforts in the small business sector in the United States of America, Germany, France and Japan.

The conspicuous lack of vocational education and training among small business owners/managers and their workforce featured prominently in the findings summarized in the report (Matlay, 1999:6).

A number of researchers indicated that not only are the numbers of small and medium enterprises increasing internationally, but that small and medium enterprises are significant creators of new employment opportunities, underlying their importance in the world economy (Warren & Murphy, 2001:1; Watson, Hogarth-Scott & Wilson, 1998:218; Small Business Profile 2002- A profile of small business in British Columbia, 2004:4). Governments are recognizing this increased importance and this is reflected in new and changed legislation favouring small and medium enterprises, clearly indicating government interventions to stimulate the SME segment of the economy (Warren & Murphy, 2002:2; State of Small Business in South Africa, 1999:11).

An alternative viewpoint comes from Hallberg (2004:4) of the World Bank's International Finance Corporation. Hallberg firstly distinguished micro enterprises as those businesses that trade in the informal sector, and small and medium enterprises as those businesses that trade in the formal sector. Hallberg (2004:5) suggested that more and more SMEs grow into large businesses as the developing economy matures towards a developed economy, rather than as a result of interventions. Hallberg suggested that evidence points to the fact that SMEs are in fact less labour intensive than large business within a sector, and that the labour intensiveness is related to the industry rather than the size of the business. Hallberg further stated that developing countries, by default will have a greater percentage of SMEs, as their economies are young and weak, and that as a country moves towards becoming a developed country, so too does the mix of SMEs to large businesses change in favour of large businesses. Hallberg (2006:6) postulated that SMEs create more jobs because there are more of them than large businesses. However if the job destruction rate is factored in, then SMEs do not create more jobs. Therefore, the only way to increase the job creation rate is by increasing the rate at which SMEs are created, rather than the rate at which micro enterprises are created. However, this argument will only stand if these SMEs survive and grow towards larger enterprises in economies that progress towards developed country status. Hallberg (2000:10) nonetheless believed that interventions are required, with a bias towards functional

interventions in order to increase the rate at which SMEs are established and to increase their survival and growth rate.

Bridge (1998:205), on the other hand, suggests that because job creation is important to governments, especially during periods of high unemployment, governments will be prepared to intervene. However, Bridge (1998:216) further suggests that the proponents of a free market system argue that the laws of supply and demand must be allowed to rule, and that interventions in the SME market are of no value. Bridge suggests that the benefits of free enterprise should be sufficient inducement to get individuals to start enterprises. However, interventionist proponents argue that this is only applicable in perfectly competitive markets, and is therefore only applicable in theory (Bridge, 1998:217). Bridge (1998:217) suggests that all legislation related to business that already exists in any country, is in itself an intervention, and that a precedent for intervention has therefore been set. He further suggests that a laissez-faire economic approach suggested by some governments is seldom, if ever seen in practice.

Matlay (2001:396) describes the interventions in Eastern Europe after the collapse of communism in terms that indicate that the local governments used functional intervention, and, according to Matlay, these efforts were successful despite setbacks caused by unsuccessful selective interventions. Wint (1998:282) also quotes the World Bank as arguing that their research indicated that economic success with a high growth rate in eight (8) countries studied appeared to be directly related to functional interventions. Wint (1998:294) further suggests that the role of government should be to manage the macroeconomic environment as it is the least obtrusive, yet is the intervention that creates the best environment for growth by creating a stable economic environment which does not suffer from widely fluctuating macroeconomic factors such as exchange rate and inflation (Smorfitt, 2008: 25).

Wint (1998:281) postulates that no government runs an economy perfectly, and therefore, by default, every country requires to intervene in their economies. Wint (1998:284) further states that developing countries generally tend to have an inadequate output of internationally competitive firms and industries, and to correct this problem requires government intervention. Pedersen (2002:2) stated that research had shown that the renewed success of certain of the Asian economies after the 1997 Asian crisis, was directly correlated to those states that were perceived as highly interventionist developmental states in respect of the number of active interventions they made. Fulop and Szirmai (2004:15), in investigating SME development in Hungary, recommended selective interventions within weak areas of the SME sector.

The evidence suggesting an interventionist approach or not appears to be contradictory. One argument is for functional intervention, while there is a similar argument for selective intervention, but the Hawaii example on the other hand indicates that business will thrive despite government intervention that has negative outcomes for business Lohmann (Online, 9 November 2003:2). This confusion is underlined by Bridge (1998:219). Hallberg (2000:3) representing the International Finance Corporation, presents the alternative view that because of market and institutional failures that bias the

size distribution of firms, intervention is required. It is clear from the cited opinions that consensus with regard to need for and the type of government interventions to stimulate SME development is still a long way off. Should the countries that introduced functional interventions (Heraty and Morley 2003:62) to stimulate businesses of all sizes, as well as the ones that introduced selective interventions to specifically stimulate SME development, be considered, it appears as though government intervention practice is still considered as essential at present (Hallberg 2000:10; Bridge, 1998:217).

SME development appears to be a popular topic on political platforms all over the world, yet reports on the monitoring of the success or failure of intervention programs are either non-existent or not available in the public domain (Curran, J., Storey, D.J., 2000:2; Atherton, A., Philpott, T., Sear, L., 2002:4). South Africa is no exception. For this reason the impact of the South African Government's intervention policy to stimulate SMEs will be empirically determined. The next section will discuss the research methodology followed in this regard.

3. RESEARCH METHODOLOGY

3.1 Research problem: To determine whether selective South African Government SME focused interventions work.

3.2 Research objectives:

1. To determine whether the South African government's selective interventions for the SME sector were successful
2. To determine whether the South African government's functional interventions impacted positively on the SME sector

3.3 Sample frame and sampling technique

The sample frame used in the study consisted of 4012 SME members of the South African Chamber of Commerce and Industries (SACCI) in KwaZulu-Natal. These members were from Ladysmith, Pietermaritzburg, Durban and Richards Bay as they represent the most concentrated business areas in the KwaZulu-Natal Province. A representative sample was selected from the Pietermaritzburg component of the sample frame (the control group) as it was reasonably expected that the group would return a higher response due to the close connections of the one researcher as past president of the Pietermaritzburg Chamber of Business. The size of the control group was 246 out of the universum of 885 in the Pietermaritzburg Chamber of Business. A control group was selected as the Pietermaritzburg Chamber of Business is rated as one of the best Chambers of Commerce in South Africa particularly at providing information to its members, and would therefore provide an excellent platform for comparative analysis to the other Chambers of Commerce and to best evaluate government marketing efforts. A representative sample of 358 was randomly selected from the remainder of the universum of 3398 (the treatment group).

for the four Chambers of Commerce. The response after numerous follow-ups were as follows: control group: 46 (18.7%) out of 246 and treatment group: 90 (25.1%) out of 358. Schuldt and Totten (1994) reported a 19% electronic response rate compared to a 57% mail response. Although the response for this e-mail based survey was within the parameters of a normal mail survey (Schuldt and Totten (1994:36), the response was too low to claim that it was a representative sample, and the empirical findings can therefore not be generalized to the population as a whole. The findings will therefore be presented with this limitation in mind and compared to the literature review in order to identify whether it corroborates the secondary data.

3.4 Nature of the research

The study is a formal cross-sectional causal study of SMEs in the formal sector in KwaZulu-Natal Province in South Africa.

3.5 Measuring instrument

The measuring instrument was a questionnaire based on the literature review. The objective was to do a qualitative causal research study on the research problem by using exploratory, descriptive, causal and evaluative questions. The questionnaire was divided into two sections, namely Part 1 which dealt with demographic information and Part 2 which dealt with business related information.

3.6 Pilot study

An initial pilot sample of five (5) SMEs was selected from the sample frame to test the validity of the questionnaire and determine whether the questionnaire functioned as expected. These results were not included in either the research control group or the treatment group.

4. FINDINGS

4.1 Analysis of data

The face validity of the questionnaire was tested by using relevant experts and the questionnaire was modified where needed. Reliability was tested by using Cronbach's Coefficient Alpha (Churchill & Iacobucci, 2002: 416). Basic summary statistical analysis was applied to the primary data, including cross tabulation, multiple linear regression and multi-collinearity testing relating to SME success factors. On completion of the statistical analysis of the primary data, the findings will be analyzed and triangulated in the context of the literature review and previous research report. The first section of the findings provided graphical and descriptive statistics related to the primary data. Bar graphs and frequency tables have been calculated using SPSS (version 15) and present an overview of the perceptions of respondents on the effect of interventions to stimulate the establishment and growth rates of SMEs. The descriptive statistics included the mean, mode, median and standard deviation where appropriate. These statistics serve to confirm

the results of the graphical statistics and frequency tables. The respondents' scores have been analysed in this manner.

The Kolmogorov Smirnov test was applied to test if the data had come from a Normal distribution or not. The hypotheses were tested using the one sample t-test and the chi-square test. Furthermore the results of the hypothesis tests were also confirmed by the descriptive and graphical statistics. The difference between members and non-members of the Chamber of Commerce with respect to the effect of interventions to stimulate the establishment and growth rates of SMEs will be tested using the Mann Whitney U test. The Kruskal Wallis test was used to test for differences across the demographics of race group and educational qualification with respect to the effect of interventions to stimulate the establishment and growth rates of SMEs.

Table 1. Respondent group frequency count

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Control	46	33.8	33.8	33.8
	Treatment	90	66.2	66.2	100.0
	Total	136	100.0	100.0	

The breakdown of the respondent groups as depicted in Table 1, was that 33.8 % of the respondents were from the Control Group (Pietermaritzburg Chamber of Commerce members) and the Treatment Group (Ladysmith, Pietermaritzburg, Durban and Zululand Chamber of Commerce members) was made up of 66.2 %.

4.2 Profile of the respondents

More males (77.9%) than females (22.1%) participated in the study. The race groups were broken into Whites (84.4%), Asian (10.3%), Black (2.9%) and Colored (2.2%). Although the sample was extracted from the universum of membership lists of the Chambers of Commerce who participated, 97.8% of the sample indicated that their business is a member of a Chamber of Commerce. The discrepancy was due to the resignation by certain businesses from the Chamber of Commerce, who had not updated the database used. A majority of 89.7% of the respondents stated that they own the business for which the questionnaire was completed and employees duly authorized to do so, completed the balance.

A majority of 56.6% of the respondents indicated that their business is a service business, followed by retail or wholesale business (21.3%) and manufacturing business (19.1%). A total of 43.4% of the respondents attended university, followed by those who passed matriculation (18.4%), qualified at a technical college (17.6%) and those who qualified at a technikon (16.2%). Most of the respondents (44.9%) had selected the Closed Corporation as a legal persona for their business while 30.9% selected a (Pty) Ltd Company. The majority of 42.6% of the respondents started or bought their business for entrepreneurial reasons, while 21.3% did so because their opportunity awareness at the

time assisted them in identifying the opportunity. A further 19.1% started their business due to circumstances beyond their control.

4.2 Response to functional interventions

As mentioned earlier, the functional interventions by government were intended to assist businesses of all sizes. Should the summary of responses to the functional interventions as depicted in Table 2, be considered, however, it appeared as though these interventions had little or no impact on the SME sector in particular.

Table 2. Summary of modal responses for functional interventions

Functional intervention	Modal responses	Percent
1. Lower interest rates	Some impact	18.4%
2. Lower inflation rates	Some impact	19.9%
3. Basic conditions of Employment Act	No impact	25.7%
4. Employment Equity Act	No impact	28.7%
5. National Credit Act	No impact	21.3%
6. Skills Development Act	No impact	33.1%
7. More stable exchange rate	Moderate impact	17.6%
8. Broader and easier access to international markets by joining WTO	No impact	39.7%
9. Reduced exchange control	No impact	36.8%

In Table 2 above, the first column indicates the functional intervention. The second column indicates the modal responses selected from the Likert scaled answers. The third column indicates the percentage of respondents who selected this response.

Hypothesis testing of responses to the nine questions related to functional interventions was conducted by use of the one-sample t-test on the different values. It was found that the mean scores leaned predominantly towards low impact for all the questions.

Correlation testing was conducted to trace correlations between demographic data collected in Questions 1-7 and the functional data collected in Questions 26-34. The following variables show a significant relationship:

- Question 2 (Race group) and Question 32 (More stable exchange rates), positive weak relationship;
- Question 5 (Delegated the task) and Question 31 (Skills Development Act), negative moderate relationship;
- Question 5 (Delegated the task) and Question 33 (Easier access to global markets), negative strong relationship;
- Question 5 (Delegated the task) and Question 34 (Reduced exchange controls), negative strong relationship and

- e. Question 7 (Economic Sector) and Question 32 (More stable exchange rates), positive weak relationship.

The respondents came from two groups, the Control Group, which comprised only members of the Pietermaritzburg Chamber of Commerce, and the Treatment Group, which comprised members of Pietermaritzburg, Ladysmith, Durban and Zululand Chambers of Commerce. Testing revealed that there were no significant differences in the responses from the two groups, nor between the gender types and race groups.

4.4 Response to selective interventions

Selective interventions by government for the purposes of this paper are interventions to stimulate growth and start-up rates of SME s in particular. Questions 14-18 addressed issues with regard to selective interventions of the South African government. Question 14 (Have you received assistance from government?) and Question 18 (If you applied, were you successful?) were used to test the veracity of the respondents. Although only 14.7% of the respondents replied in the affirmative to both theses questions, the facts are that they applied for and received access to a variety of selective interventions.

Question 15 (Are you aware of interventions?) tracked the awareness of respondents and 49.3% stated that they were aware of interventions. Question 16 further checked that those respondents who replied in the affirmative could list the interventions they claimed to be aware of. The list from the respondents to Question 16, generated a list of 99 unique responses, albeit that some were the organization name rather than the intervention name. Question 17 (Did you apply for assistance?) yielded 21.3% of the respondents who applied for interventions.

The Mann-Whitney U Test was applied to test hypotheses for those respondents who applied and were successful in receiving assistance from government, and those who were unsuccessful, and no difference between the responses from the different genders, race groups or various education levels was evident.

There are 36 financial interventions and 14 non-financial interventions comprised of 2 x mentorship, 3 x training, 4 x information and 5 x incubator interventions listed on the Department of Trade and Industries (DTI) website. This figure could be higher as organizations such as Khula and the IDC, for example have multiple short-term interventions running at any given moment in time. Therefore it must be acknowledged that there are selective SME interventions being executed by the South African government.

4.5 Were the South African selective interventions appropriate? (Questions 22 & 23)

Question 22 (if successful provide details of assistance) tracked the responses of the Control Group and Treatment Group separately. The respondents clearly indicated a trend towards positive responses from both groups, with the Control Group experiencing a greater impact on their businesses than the Treatment Group. Similarly Question 23 (Impact detail assessment) analyzed the overall impact of the 17 individual interventions

that the respondents participated in. While impact on Staff Numbers is not overly biased in favor of positive impact, Turnover, Gross profit and Net Profit are positive for both Control and Treatment Groups. The responses to these questions by both groups conclude that the interventions they applied for and were awarded, did make a noticeable positive impact on their businesses. It appears, however, as though the most effective interventions were of a financial nature. In the next section the critical success factors during the start-up phase will be dealt with in the context of the selective interventions available.

4.6 Critical success factors during start-up and selective interventions

The critical success factors during the start-up phase can be summarized as follows. These factors have an external focus. The entrepreneur must exhibit opportunity awareness, as without an opportunity there is no business (Scarborough & Zimmerer, 2000:4); Nieman, Hough and Nieuwenhuizen, 2003:20; Scarborough and Zimmerer, 2000:76). In an effort to gain competitive advantage, the differentiation factors for this business must have been defined (Porter, 1985:11, 38; Scarborough & Zimmerer, 2000:33; Nieman et al, 2003: 265, 270), the business model formulated (Nieman et al, 2003:26; Porter, 1985:38; Magretta, 2002:87) and the strategy clearly defined (Eisenhardt, 2002:88; Porter, 1986:15). A business plan pulling all the factors together, must have been completed (Scarborough & Zimmerer, 2000:32; Nieman et al, 2003:20; Kotler, 2000:76), in order to understand among other things, the amount of seed capital required as a critical resource and where to source the required seed capital (Scarborough & Zimmerer, 2000:412; Nieman et al, 2003:147). The most appropriate geographic location should also be selected during this process. If government selective interventions to encourage start-up are reviewed in the context of these critical success factors, the current situation is shown in Table 3 below.

Table 3. Critical success factors for start-ups and available interventions

	Phase	Description	Interventions
1	Start-up	Opportunity awareness	No interventions available
2	Start-up	Differentiating factors	No interventions available
3	Start-up	Business model	No interventions available
4	Start-up	Strategy	No interventions available
5	Start-up	Feasibility study	No interventions available
6	Start-up	Business plan	Only funding to use external consultant. No ongoing training programs for entrepreneurs
7	Start-up	Location	No interventions available
8	Start-up	Amount and source of seed capital	A wide variety of funding available. No single source for accessing finance or understanding which finance to use when.
9	Start-up	Decision-making ability	No interventions available

In the context of the summary in Table 3, it would appear that if the interventions are intended not only to improve the start-up rate, but to create sustainable, successful SMEs in the process, the South African government interventions are not suitable.

If government interventions to encourage growth within existing businesses are reviewed in the context of these critical success factors, the current situation is shown in Table 4 below.

Table 4. Critical success factors for growth and available interventions

	Phase	Description	Interventions
1	Growth	General management skills/experience	No interventions available
2	Growth	Strategic management skills	No interventions available
3	Growth	Organizational structure	No interventions available
4	Growth	Technical skills	No interventions available
5	Growth	Financial management skills	No interventions available
6	Growth	Leadership skills	No interventions available
7	Growth	Communication skills	No interventions available
8	Growth	Inventory management skills	No interventions available
9	Growth	Marketing skills	Only funding to use external consultant or refunding marketing costs. No training programs for entrepreneurs.
10	Growth	Contingency management skills	No interventions available
11	Growth	Poor controls and systems	NPI program
12	Growth	Growth oriented skills training	No interventions available

The overall situation is such that there are certain smaller interventions run on a short-term basis by various departments and parastatals, but no national training program for the various business skills as determined as critical success factors. In most cases, interventions are offered on the basis of providing funding for an external consultant to execute the activity, rather than to educate the entrepreneur. The same applies to the preparation of a business plan. The South African government has not implemented a clear and broad-based communication strategy to provide the public with a detailed list of sources of finance, the amounts that can be loaned from each, and the criteria to be applied when applying.

Continuity of intervention programmes is also a problem. The two examples of funds that were well accepted by the formal SME market were the Competitiveness Fund and the SME Development Program (SMEDP). The Competitiveness Fund was originally funded with EU funding but never continued by the South African government despite the high level of demand. The SMEDP fund was also put on hold due to insufficient funds. The two programs were specifically designed to aid the growth of formal sector SMEs, and yet both were curtailed. They were both financial interventions.

The literature review indicated that South Africa implemented a variety of different interventions. Seventeen functional and fifty selective interventions had been implemented.

If the research objective as to the appropriateness of the South African selective interventions is answered, it can be stated that some of those that are being implemented are obviously appropriate, if the respondents' input is considered. However, if the critical success factors for improving the start-up and growth rates of SMEs, is considered, then the strong bias toward financial interventions can be deemed to be contrary to the holistic needs of business.

It appears as though the extensive use of selective interventions by the South African government is contrary to the trend in developing countries to favor functional interventions in stead of selective interventions. This could be attributed to the dual nature of the South African economy that possesses elements of both a developing and developed country. Further research on how interventions are selected in South Africa needs to be conducted in order to assess why South Africa has a different profile in respect of intervention utilization.

5. SUMMARY, RECOMMENDATIONS, CAVEATS AND SUGGESTIONS FOR A FURTHER RESEARCH

The government's selective and functional interventions would appear to have had little direct impact on the start-up and growth rates of SMEs in the formal sector in KwaZulu-Natal, despite the fact that the interventions themselves appear to be relevant and of use to the respondent SMEs. While the dual nature of the South African economy stresses the need for interventions to level the playing field, and the intention of government appears to be serious to develop the SME sector, the desired impact of the interventions has not been achieved.

The anecdotal evidence indicates that, prior to the global financial crisis in 2008, the South African GDP growth resulted from global demand, government infrastructural spending and a range of functional interventions. This tends to endorse the Hallberg (2000:10) approach which suggests that the use of interventions is best focused on functional interventions that stimulate GDP growth rather than selective interventions.

An increase in SME start-up and growth rates would be more realistic and sustainable if based on sound economic principles of supply and demand as opposed to selective interventions which may skew the economy, and for which there may be no sound economic basis. It is not argued that selective interventions may never work, but that it should be supported by sound research and strict monitoring. In this regard a weakness in the South African SMME Strategy of 2005 is that there is no evidence that the strategy was based upon economic sectoral research or that the selective efforts were based upon research data that indicated a need or structural hole within the sector.

Specific recommendations based on the findings of this research and within the context of the caveats that will be mentioned hereafter, are the following:

- The intervention policy in South Africa needs to be reviewed in order to make it more appropriate to the unique needs of the country
- The current small business development initiatives of government should be much more intensively marketed
- The impact of SME interventions should be closely monitored to ensure optimization of resources committed to this sector
- The introduction of interventions should be based on sound research

Caveats of this research were that the representative sample sought could not be obtained due to a low response rate. The findings could therefore not be generalized to the population as a whole. The findings, however, corroborated the literature review and made a contribution to the body of knowledge in that regard. However, a Cronbach's Alpha test was done to test the reliability of the findings, and the factor was greater than 0.7, indicating that the findings can be expected to remain unchanged in a larger sample.

Question 15 revealed that only 49.3% (67 respondents) were aware of government interventions. The conclusion drawn was that government marketing of their selective interventions was not achieving sufficiently high percentage awareness among SMEs. This was deemed to be particularly significant in that the respondents are part of a formal business network being the Chambers of Commerce. Therefore it could be expected that the awareness among SME owners who are not members of a formal network, which form the bulk of the country's SMEs, would have a lower awareness and a similar study was recommended for SMEs who are not part of a formal business network.

Of all the respondents, only 21.3% (29 respondents) applied for assistance (Question 17). The low uptake is also an indicator that perhaps the selective interventions are not necessarily suitable.

The strong emphasis on youth entrepreneurship interventions by the South African government must also be queried. The literature review reveals that management experience is a critical success factor for enterprise owners (Scarborough and Zimmerer 2000:25; Nieman, Hough and Nieuwenhuizen, 2003:273) as is technical expertise (Scarborough and Zimmerer 2000:27; Nieman, Hough and Nieuwenhuizen, 2003:1; Swanepoel et al, 2000:201). The risk of failure is greatly increased when the entrepreneur does not have management or technical expertise. Therefore this intervention approach must be reconsidered.

There are 36 financial interventions and 14 non-financial interventions comprised of 2 x mentorship, 3 x training, 4 x information and 5 x incubator interventions listed on the DTI website. This totals 50 formal selective interventions aimed at the SMME sector. This figure could be higher, as organizations such as Khula and IDC, for example, have multiple short-term interventions running at any given moment in time.

Therefore, it must be acknowledged that there are selective SME interventions being executed by the South African government.

Question 22 (if successful provide details of assistance) tracked the responses of the Control Group and Treatment Group separately. The respondents clearly indicated a trend

towards positive responses from both groups, with the Control Group experiencing a greater overall impact on their businesses than the Treatment Group.

Similarly Question 23 (impact detail assessment) analyses the overall impact of the 17 individual interventions that the respondents participated in. While impact on Staff Numbers is not overly biased in favor of a positive impact, Turnover, Gross Profit and Net Profit are positive for both the Control and Treatment Groups.

The responses to these two questions by both the Control and Treatment Groups conclude that the interventions that they applied for and were awarded, did make a noticeable positive impact on their businesses. Therefore it can be concluded that these interventions, as listed in Tables 19, 20, 21 and 22 in the original study, are appropriate.

The government SMME strategy is skewed in favor of the informal sector micro business. Government interventions are generally not well marketed and would appear to be inappropriate. Certain selective interventions such as the Competitiveness Fund, were found to be very beneficial to the respondents, but the intervention was not designed by the South African government, and once the international funding ended the South African government discontinued the intervention despite the fact that this was one of the most successful interventions.

Interventions were not designed with reference to any apparent understanding of the needs of start up or growth SMEs, which resulted in poor uptake. Further research should repeat this study in other provinces in South Africa and in other countries for comparative purposes. A further need identified in the research is to establish and implement systematic and scientific research prior to the implementation of interventions in South Africa and other countries where needed.

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Forecasting Economic Growth: Using Artificial Neural Network Modeling

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Abstract: The paper presents an Artificial Neural Network (ANN) application to economic growth (GDP) forecasting in India during the period 1970-2007. In order to provide the forecasted economic growth, the ANN interpolates GDP with its determinants, namely foreign direct investment (FDI) and trade openness (OPEN) in a training data set. The study presents four different ANN models on the basis of GDP, FDI and OPEN. The first model is a univariate model based on past GDP only. The second model is a multivariate model based on GDP and FDI. The third model is a multivariate model based on GDP and OPEN. The fourth model is a multivariate model based on GDP, FDI and OPEN. In each case, forecasting performance is measured by mean squared errors and means absolute deviations. Above all, the fourth model is shown to have better forecasting performance over the rest of other three models.

Key words: Forecasting; Economic Growth; Artificial Neural Network.

1. Introduction

One of the fundamental objectives of any planning system is to achieve high economic growth, which depends upon many factors such as availability of resources, physical capital, human capital, social capital, technology, etc. In recent years, variables such as monetary aggregate (Stock and Watson, 1989) and interest rate spreads (Estrella and Hardouvelis, 1991) have been shown as good indicators of economic growth. Moreover, monetary policy affects the economy with long and variable lags, and for this reason, policy makers require reliable forecasts of economic activity. Forecasting economic growth is usually determined by current growth rates of macroeconomic aggregates. However, the availability of such data is not readily available, due to delay by publication division and often such data are subject to revisions. For this reason, central bankers supplement formal macroeconomic forecasts by exploiting the leading information contained in readily available financial and monetary variables in order to obtain more immediate information on current and future macroeconomic activity (Tkacz, 2001).

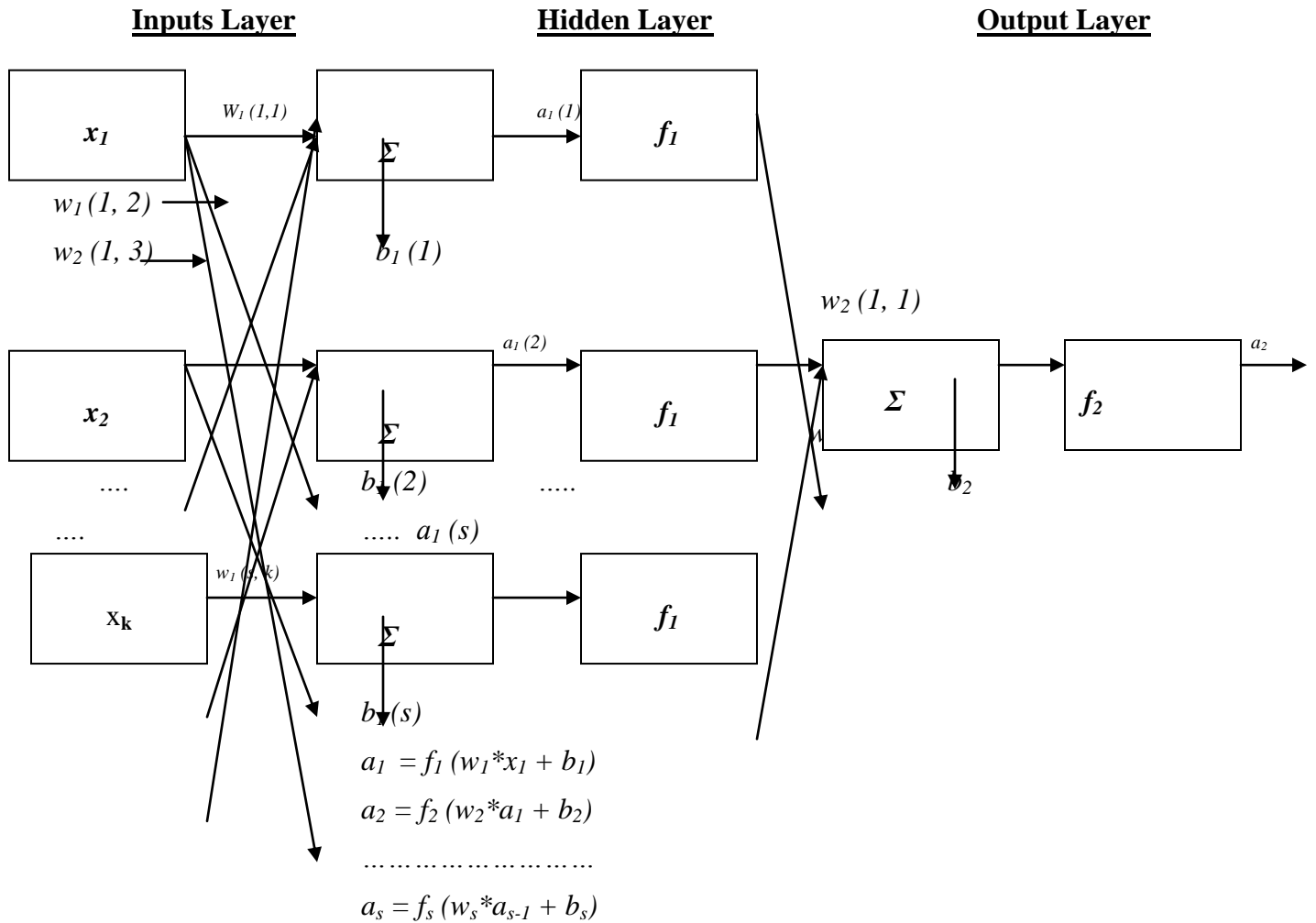
The development of endogenous growth models and the improvement in statistical data also favored the growth forecasts. Hence, forecasting economic growth becomes

an essential function in the planning system. Various technical and statistical methods for economic growth forecasting have been proposed in the last few decades with varying results (Box and Jenkins, 1970). However, with the recent developments in non-linear time series analysis, several authors have begun to examine the forecasting properties of non-linear models in economics (Marcellino, 2004; Stock and Watson, 1998; Swanson and White, 1997). Among them, Artificial Neural Network (ANN) is one of the very important one (Kiani, 2008; Zhang, 2003; McMenamin, 1997; Kaun and White, 1994; Sharda, 1994). The ANN provides an attractive alternative tool to both forecasting researchers and practitioners. The existence of several distinguishing features of ANNs makes them valuable and attractive for a forecasting task (see Zhang et al., 1998). The basic objective of this paper is to forecast economic growth of India using neural networks. The rest of the paper is organized as follows: Section 2 highlights the structure of Artificial Neural Network; Section 3 gives results and discussion; and Section 4 finally provides conclusion.

2. Artificial Neural Network Model

The Artificial Neural Network model is an information processing system that has certain performance characteristics in common with biological neural networks (Widrow et al., 1994). The basic components of these networks are highly interconnected processing elements called neurons that work independently in parallel. Synoptic connections are used to carry messages from one neuron to another and the strength of these connections varies. These neurons store information and learn meaningful patterns by strengthening their interconnections. When a neuron receives a certain number of stimuli and when the sum of the received stimuli exceeds a certain threshold value, it fires and transmits the stimulus to adjacent neurons. In short, it has developed as generalizations of mathematical models of human cognition or neural biology (Ermis et al., 2007; Aminian et al., 2006; Nasr et al., 2003; Donaldson and Kamstra, 1996).

Figure 1: Architecture of Neural Network



Note: The schematic representation of a neural network with s input vectors x with s points (k input variables); a hidden layer with s neurons and transfer function f_1 ; and an output layer with one neuron and transfer function f_2 ; w_1 : hidden layer coefficient matrix of dimension s ; $b_1(1), \dots, b_1(s)$ are biases; $a_1(1), \dots, a_1(s)$ are hidden layer outputs; w_2 : is output layer coefficient matrix; a_2 is output vector.

In general, ANN structure is composed of three layers: input layer, hidden layer and output layer. Each layer has a certain number of processing elements called neurons. Signals are passed between neurons over connection links. Each connection link has an associated weight, which, in a typical neural net, multiplies the signal transmitted. Each neuron applies an activation function (usually nonlinear) to its net input (sum of weighted input signals) to determine its output signal (see Figure 1). A neural network performance is highly dependent on its structure. The interaction allowed between various nodes of the network is specified using the structure. An ANN structure is not unique for a given problem, and there may exist different ways to define a structure corresponding to the problem. Depending on the problem, it may be appropriate to

have more than one hidden layer, feed forward or feedback connections, or in some cases, direct connections between input and output layer (Chen et al., 2005; Zhang et al., 1998; Hornik, 1991; White, 1989).

To build a model for forecasting, the network is processed through three stages: the training stage, where the network is trained to predict future data based on past and present data; the testing stage, where the network is tested to stop training or to keep in training; the evaluation stage, where the network cease training and is used to forecast future data and to calculate different measures of error. The training of the network by back propagation consists of three stages: feed forward of the input training pattern, calculation and back propagation of the associated error, weights adjustment (Nasr et al., 2003; Reed and Marks, 1999; Rojas, 1996). In this regard, for the modelling of India's economic growth, the feed-forward back-propagation ANN is employed and its procedure is outlined below.

Step 1: Evaluate the net input to the j th node and that to the k th node in the hidden layer as

$$net_j = \sum_{i=1}^n w_{ij}x_i - \theta_j, \quad net_k = \sum_{j=1}^n w_{jk}x_j - \theta_k \quad (1)$$

where i is the input node, j is the hidden layer node, k is the output layer, w_{ij} is the weight connecting the i th input node to the j th hidden layer node, w_{jk} is the weight connecting the j th hidden layer node to the k th output layer, θ_j is the threshold between the input and hidden layers, θ_k the threshold connecting the hidden and output layers.

Step 2: Evaluate the output of the j th node in the hidden layer and the output of the k th node in the output layer as follows:

$$h_j = f_h \left(\sum_{i=1}^n w_{ij}x_i - \theta_j \right), \quad y_k = f_k \left(\sum_{j=1}^n w_{jk}x_j - \theta_k \right) \quad (2)$$

$$\text{where, } f_h(x) = \frac{1}{1 + \exp(-\lambda_h x)}, \quad f_k(x) = \frac{1}{1 + \exp(-\lambda_k x)}, \quad (3)$$

and where h_j is the vector of hidden-layer neurons, y_k is the output of the output-layer neurons, $f_h(x)$ and $f_k(x)$ are logistic sigmoid activation functions from input layer to the hidden layer and from hidden layer to output layer respectively and λ_h and λ_k are the variables, which control the slope of the sigmoid function. The output of each neuron is obtained by applying an activation function $f_k(x)$. The nodes are used to perform the non-linear input/ output transformations using a sigmoid activation function. Since the actual adaptation seems to be a non-linear form, the sigmoid function influences strongly the ANN predictions in this study.

Step 3: The errors in the output and hidden layers can be expressed as follows:

The output layer error between the target and the observed output is expressible as

$$\delta_k = -(d_k - y_k)f'_k, \quad f'_k = y_k(1 - y_k) \text{ for sigmoid function} \quad (4)$$

where δ_k is the vector of errors for each output neuron (y_k) and d_k the target activation of output layer. The term δ_k depends only on the error ($d_k - y_k$) and f'_k is the local slope of the node activation function for output nodes.

The hidden layer error is expressible as

$$\delta_j = f'_h \sum_{k=1}^n w_{jk} \delta_k$$

$$f'_h = h_j(1 - h_j) \text{ for sigmoid function,} \quad (5)$$

where δ_j is the vector of errors for each hidden layer neuron, δ_k is a weighted sum of all nodes and f'_h the local slope of the node activation function for hidden nodes.

Step 4: Adjust the weights and thresholds in the output layer and hidden layer as follows:

$$w_{kj}^{t+1} = w_{kj}^{(t)} + \alpha \delta_k h_j + \eta (w_{kj}^{(t)} - w_{kj}^{(t-1)}),$$

$$w_{ji}^{t+1} = w_{ji}^{(t)} + \alpha \delta_j h_i + \eta (w_{ji}^{(t)} - w_{ji}^{(t-1)})$$

$$\theta_k^{t+1} = \theta_k^{(t)} + \alpha \delta_k, \theta_j^{t+1} = \theta_j^{(t)} + \alpha \delta_j, \quad (6)$$

where α is the learning rate, η the momentum factor, and t the time period.

In the present study, we attempt to implement ANN for forecasting economic growth. The study spans the time period from 1970-2007. This period is used to train, test and evaluate the ANN models. The training of the models is based on a 30-year training set, 1970 to 2000, while the testing and evaluation stage covers the period from 2000 to 2007. Since the purpose of this paper is to forecast future data, the back propagation algorithm is used. This method is proven to be highly successful in the training of multilayered neural nets. Before applying the BPN algorithm, there is need of normalizing the data point. The annual data are normalized in order to have values between 0.1 and 0.9. The formula used is the following:

$$(x_t - x_{min}) / (x_{max} - x_{min}) * (High - Low) + Low \quad (8)$$

where x_t is actual value, x_{min} is the minimum of the series, x_{max} is the maximum of the series, High is the maximum normalized data value = 0.9, and Low is the minimum normalized data value = 0.1. The input parameters are loaded from the configuration file. The parameters include the learning rate, the momentum, the slope of the sigmoid function, the number of hidden layers and the corresponding number of hidden units.

The software program Matlab 7.1 investigates the ANN models. The software is used to train the net, test it and evaluate it. The following procedures have been used to do the same:

- The weights are chosen randomly.
- The minimum test error is initialized to the maximum real value.
- The training data set is passed to the network more than once.

- Perform back propagation using the mean squared error as the stop criterion for learning, while never exceeding the maximum number of cycles, or perform backpropagation using a fixed number of epochs.
- The net is tested using the testing data set, and measures of the final performance of the learning and testing set are computed.
- Evaluate the testing set. In this method, the calculated values are printed in an output file, which contains actual prediction and the corresponding testing error.
- If the test error is less than the minimum test error, the weights are saved and the test error will be the minimum test error.
- Otherwise, net will be trained in a second phase and new error measures recorded.
- Finally, the network evaluation is performed, which consists of calculating the mean square errors (MSE) and the mean absolute deviations (MAD).

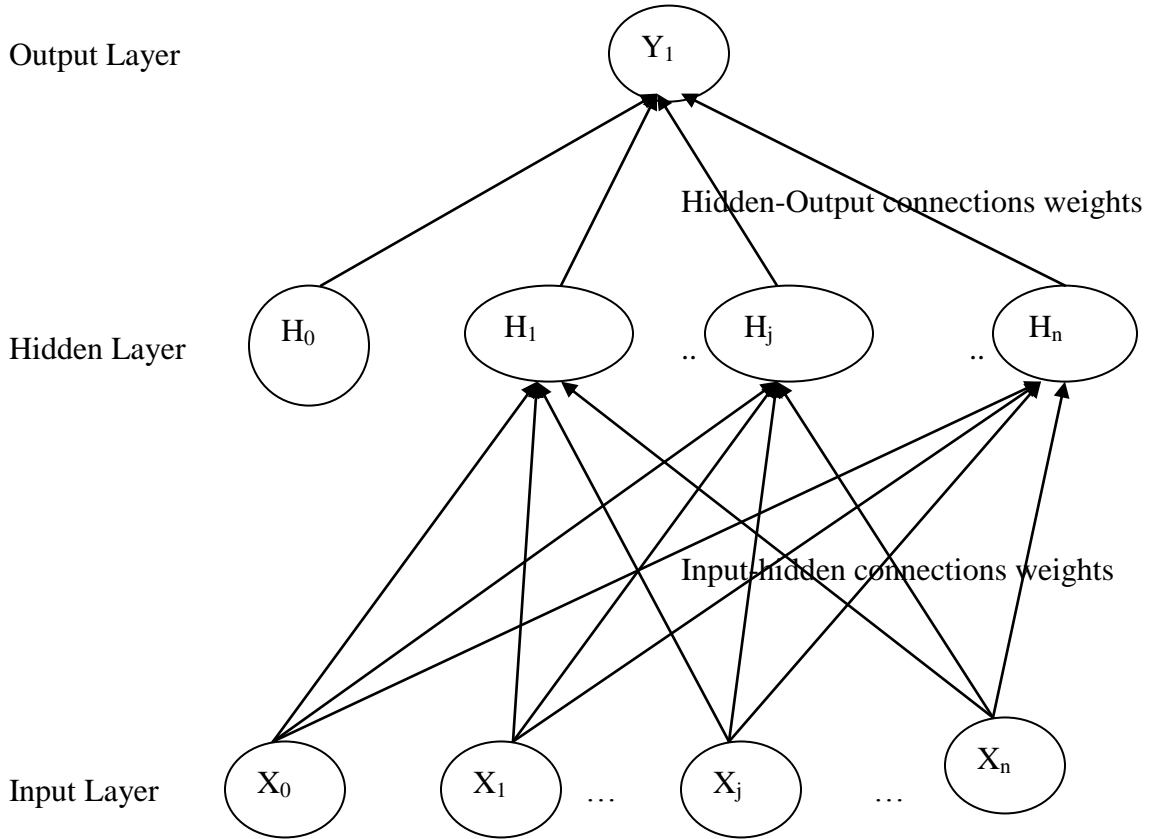
3. Results and Discussion

In this section, we report the study made on four Artificial Neural Network Models (ANNMs) and discussion of the results, based on the techniques outlined in the previous section to examine the relationship between growth and its determinants in India as given below:

Model 1: $GDP_t = f(GDP_{t-1}, GDP_{t-2}, \dots)$

Since present and future economic growth depends on previous economic growth, a univariate ANN model is implemented. ANN Model 1 represents previous economic growth as data input patterns and has the layered structure shown in Fig. 2.

Figure 2: An Architecture of Artificial Neural Network of Model 1

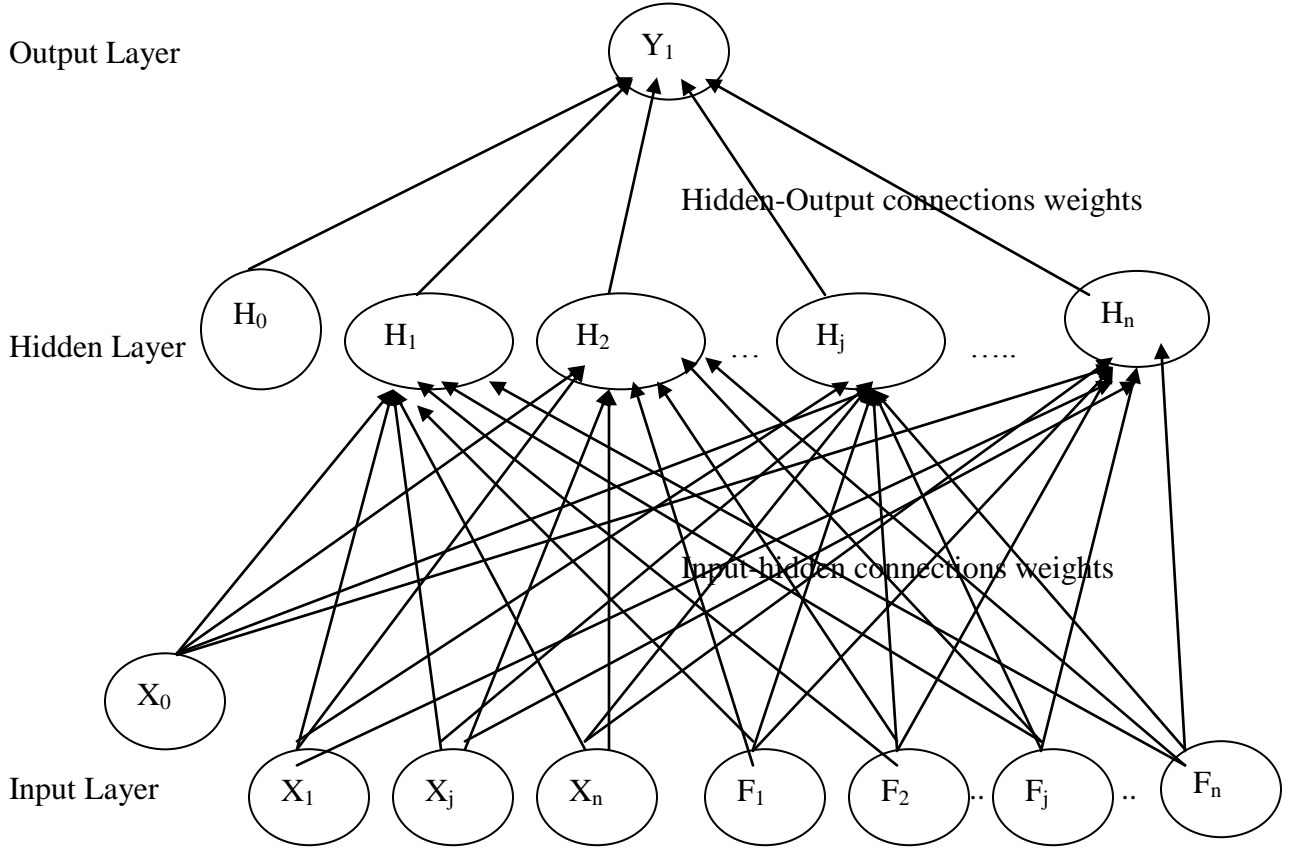


The model is fully connected, since each input unit broadcasts its signal to each hidden unit. Model I is tested for a different number of network inputs and hidden units. The parameters are selected following extensive testing by varying the values of the learning rate, the momentum parameter, the slope parameter and the number of input units. We utilize Mean Absolute Deviation (MAD) and Mean Squared Errors (MSE) as the selection criteria and choose five possible ways from a wide range of neurons, i. e. 4, 8, 12, 16 and 20. The parameter values yielding the lowest error values are shown in Table 1. Moreover, it is found that too few hidden nodes are not able to learn a complicated functional mapping, where a network with too many nodes is not able to generalize well.

Model 2: $GDP_t = f(GDP_{t-1}, GDP_{t-2}, GDP_{t-3}, GDP_{t-4}, \dots, FDI_{t-1}, FDI_{t-2}, \dots)$

The ANN model proposed in this section is a multivariate model that depends on two sets of data, FDI and previous GDP. The model laying structure is shown in Figure 3.

Figure 3: An Architecture of Artificial Neural Network Model 2

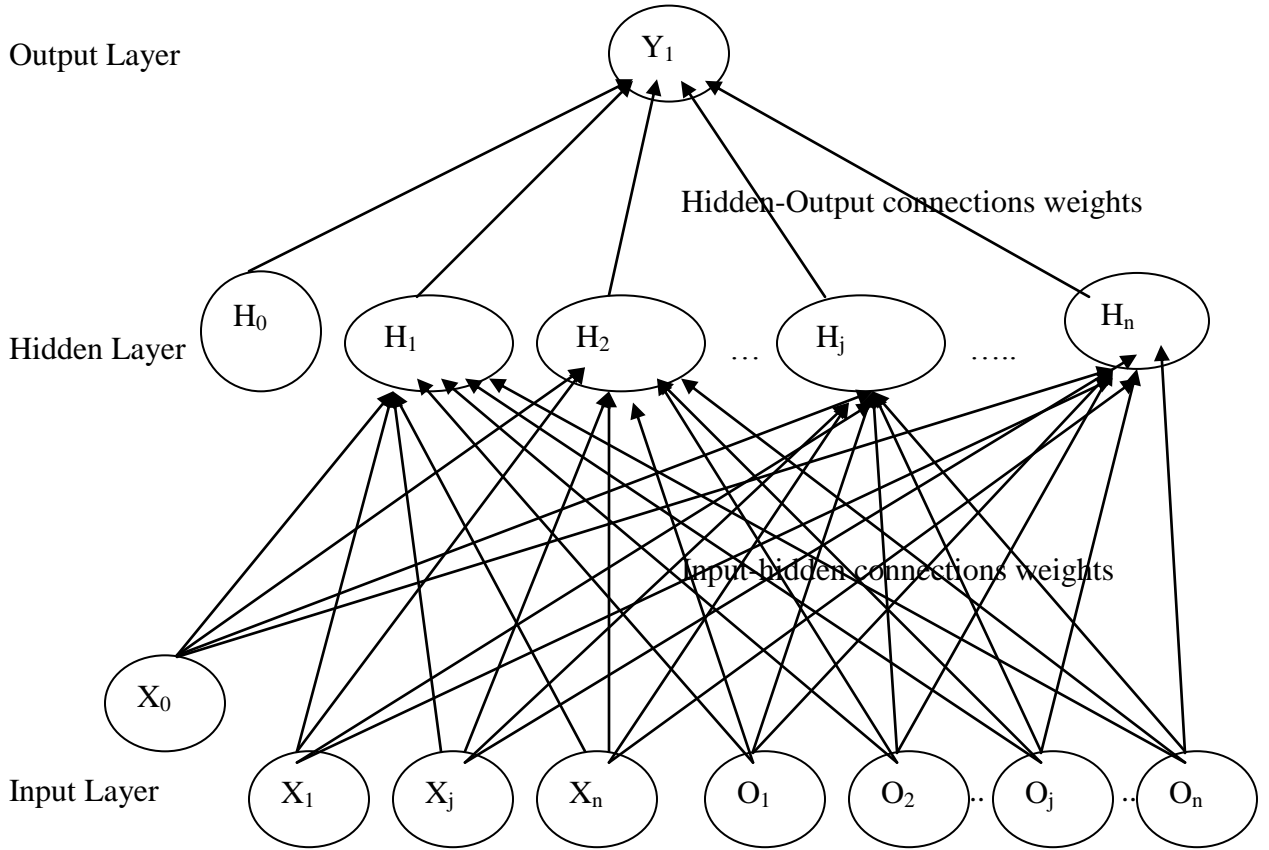


In Model II, the FDI input nodes are fully connected to hidden nodes. The outputs of all the hidden nodes are fully connected to the output node. This model is tested for different values of the learning rate, the momentum, the number of inputs and the number of hidden nodes and is found to yield the lowest error values for the parameters values shown in Table 1. This study shows that the addition of FDI in the GDP improves the forecasting precision in India.

Model 3: $GDP_t = f(GDP_{t-1}, GDP_{t-2}, GDP_{t-3}, GDP_{t-4}, \dots, OPEN_{t-1}, OPEN_{t-2}, OPEN_{t-3}, \dots)$

This ANN model is also a multivariate model and is implemented on previous GDP and OPEN input data as shown in Figure 4.

Figure 4: An Architect of Artificial Neural Network Model 3

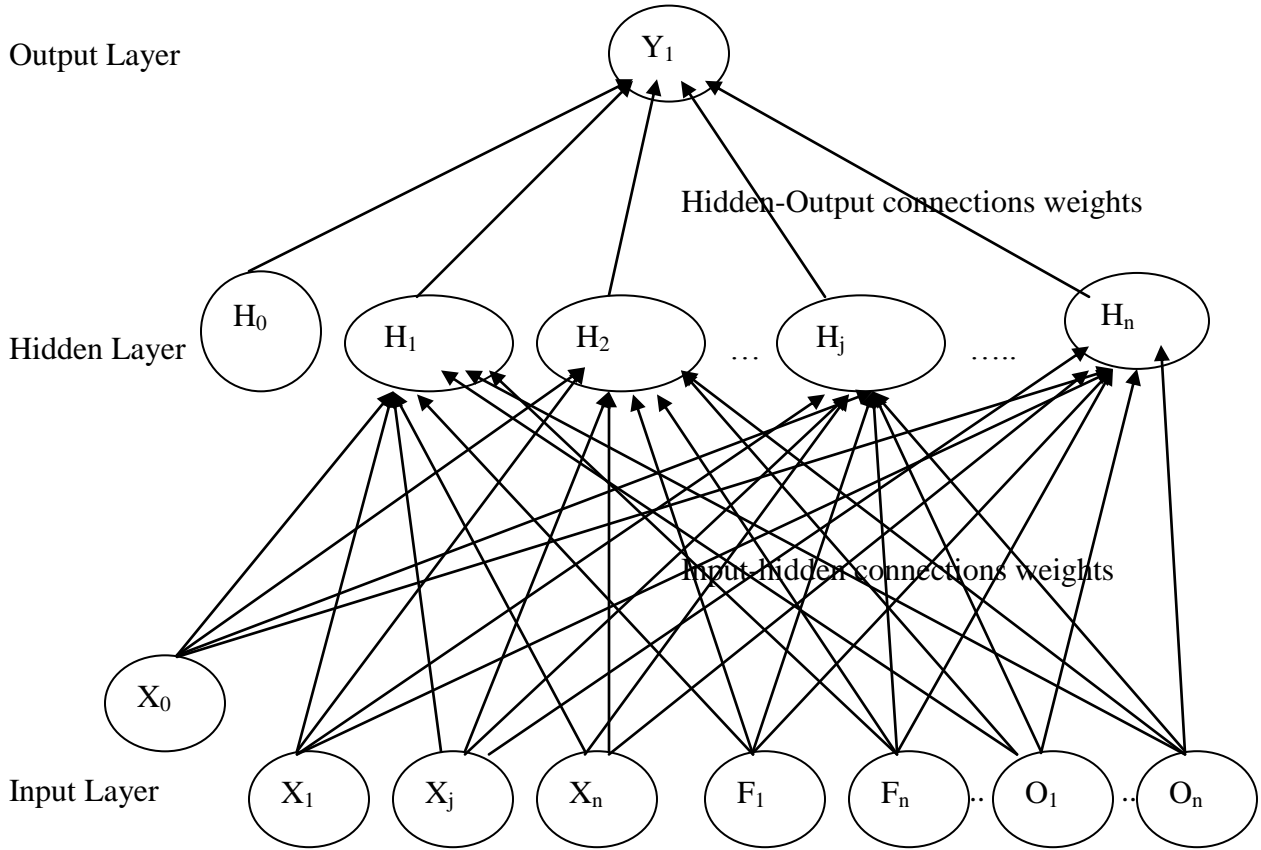


The extensive network testing using different parameters values determines the number of input units for each variable. Experiments show that the optimum GDP-OPEN model is based on GDP input units and OPEN input units fully connected to their relating hidden nodes. The learning rate parameter, the slope parameter and the momentum parameter values were regularly modified to yield the closest results to the target output. These network parameters are given in Table 1. In particular, the model III is more promising since our selected additional variables (openness) deliver more consisting results over previous forecasts horizons.

Model 4: $GDP_t = f (GDP_{t-1}, GDP_{t-2}, GDP_{t-3}, GDP_{t-4}, \dots, FDI_{t-1}, FDI_{t-2}, FDI_{t-3}, \dots, OPEN_{t-1}, OPEN_{t-2}, OPEN_{t-3}, \dots)$

The fourth ANN model is a multivariate model, based on the use of all input variables such as GDP, FDI and OPEN (see Fig 5).

Figure 5: An Architect of Artificial Neural Network Model 4



Three FDI inputs are fully connected to hidden nodes. The GDP are fully connected to hidden nodes and OPEN and FDI inputs are fully connected to hidden nodes. The parameters used in the analysis are given in Table 1. The results show a significant improvement in forecasting accuracy of this model over the previously discussed models. This indicates that combination of all macroeconomic variables (economic growth, foreign direct investment and trade openness) lead to a significant improvement in economic growth forecasts. In other words, economic growth is relatively more responsive to foreign direct investment and trade openness. It is finally found that neural networks with their ability to capture subtle non-linearity are very useful to forecast economic growth in India.

4. Conclusion

Out of various methods available for forecasting the economic growth of a country, the one relying on non-linear time series analysis and use of Artificial Neural Networks (ANNs) has shown promise and is superior to all others because of its inherent accuracy. In the present study, four different ANN models were used for forecasting economic growth in India during 1970-2007. The Mean Squared Error (MSE) and Mean Absolute Deviations (MAD) were employed as a measure of the accuracy of the model concerned.

The analysis presented confirms that ANN is a very effective tool for forecasting the economic growth. Further, it is shown that the multivariate ANN model, using GDP, foreign direct investment and trade openness yields better forecasting performance over rest of the other three models.

Table 1: Network Parameters at the Training and Testing Stage

IN	HN	Model I		Model II		Model III		Model IV	
		MAD	MSE	MAD	MSE	MAD	MSE	MAD	MSE
2	4	0.0179	0.1159	0.0491	0.1399	0.0657	0.1860	0.0158	0.0538
2	8	0.0874	0.1179	0.0677	0.1399	0.0475	0.1686	0.0128	0.0538
2	12	0.0663	0.1179	0.0507	0.1399	0.0771	0.1686	0.0227	0.0538
2	16	0.0537	0.1179	0.0537	0.1399	0.0689	0.1686	0.0218	0.0538
2	20	0.0728	0.1179	0.0673	0.1399	0.0974	0.1686	0.0218	0.0538
3	4	0.0142	0.0933	0.0766	0.1504	0.0844	0.1741	0.0121	0.0311
3	8	0.0355	0.1156	0.0657	0.1503	0.1183	0.1687	0.0106	0.0270
3	12	0.0693	0.1364	0.0805	0.1622	0.1347	0.1744	0.0123	0.0366
3	16	0.1442	0.0831	0.0587	0.1415	0.0478	0.1660	0.0116	0.0311
3	20	0.1131	0.0941	0.0694	0.1529	0.1331	0.1755	0.0116	0.0293
4	4	0.1554	0.1182	0.0741	0.1613	0.0677	0.1618	0.0127	0.0230
4	8	0.1295	0.1013	0.1226	0.1834	0.1738	0.2047	0.0098	0.0188
4	12	0.0329	0.0970	0.1157	0.1677	0.1168	0.1717	0.0082	0.0175
4	16	0.2395	0.0748	0.0787	0.1660	0.1007	0.1503	0.0098	0.0162
4	20	0.0543	0.1191	0.0767	0.1697	0.1079	0.1548	0.0095	0.0179
5	4	0.0909	0.0937	0.0833	0.1543	0.1172	0.1756	0.0085	0.0173
5	8	0.1231	0.1024	0.1325	0.1810	0.1339	0.2025	0.0099	0.0175
5	12	0.1414	0.0479	0.0891	0.1776	0.1204	0.1759	0.0102	0.0177
5	16	0.0937	0.0999	0.1072	0.1645	0.1418	0.1571	0.0097	0.0179
5	20	0.2303	0.0683	0.1545	0.1802	0.2134	0.1671	0.0123	0.0159
6	4	0.1456	0.0897	0.1268	0.1898	0.1532	0.1699	0.0083	0.0139
6	8	0.0972	0.0391	0.1163	0.1814	0.0947	0.1324	0.0070	0.0137
6	12	0.1519	0.1230	0.1277	0.1920	0.1150	0.1936	0.0086	0.0132
6	16	0.5500	0.1060	0.1142	0.1636	0.1064	0.1507	0.0083	0.0140
6	20	0.0646	0.1217	0.1415	0.2002	0.1805	0.1388	0.0090	0.0129
7	4	0.1230	0.0652	0.1765	0.2158	0.1909	0.1484	0.0092	0.0157

7	8	0.2290	0.0682	0.1443	0.2123	0.1032	0.1475	0.0088	0.0156
7	12	0.1103	0.0619	0.1847	0.2340	0.2077	0.1072	0.0092	0.0157
7	16	0.0649	0.0600	0.1005	0.2115	0.3089	0.1496	0.0094	0.0143
7	20	0.2518	0.1183	0.1664	0.2019	0.1927	0.1438	0.0103	0.0160
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8	4	0.0591	0.0613	0.2027	0.2364	0.3158	0.1061	0.0110	0.0153
8	8	0.2748	0.0586	0.1918	0.2460	0.3110	0.1060	0.0105	0.0166
8	12	0.1938	0.0529	0.2080	0.2354	0.2446	0.1173	0.0088	0.0161
8	16	0.1723	0.0488	0.1271	0.2152	0.2210	0.1099	0.0101	0.0158
8	20	0.1727	0.0822	0.1486	0.2464	0.1923	0.1060	0.0100	0.0165
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Note: IN: Input Nodes; HN: Hidden Nodes; Model I: Artificial Neural Network Modeling I; Model II: Artificial Neural Network Modeling II; Model III: Artificial Neural Network Modeling III; Model IV: Artificial Neural Network Modeling IV; MSE: Mean Squared Error; MAD: Mean Absolute Deviations.

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**Personal qualities and technical administrative accountant as one of the
determinants of the gap between theory and practice in management
accounting**

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Abstract: The quality of accounting information and decisions is to a large extent dependent upon the quality of the education of management accountants, both in terms of general education and in terms of specialized business education. This study examines the perceptions of academic accountants and business managers and academic accountants of the accounting education system in Libya by means of questionnaires completed by a sample of 24 managers and 25 lecturers. Respondents indicated that the emphasis in general education and business education of management accountants is largely appropriate in terms of what is presently taught. However, there is still a perceived quality gap, in that the abilities of accountants and the standards of their education in different accounting and business skills generally falls short of the level which should be required given the importance of those skills in the work of the management accountant.

Key words: Accounting Education, Management Accounting, Business Education.

1. INTRODUCTION

The most important functions of management accounting are to provide information to the decision makers. Most of the principles and methods of financial measurement developed after the industrial revolution to help enable firms to determine costs of production and appropriate sale prices, while also assisting in the preparation of internal and external financial reports and inventory valuation. Management accounting

information is essential for budgeting and decision making, which are required not only for the efficient allocation of scarce resources allocation but, in the commercial world, for financial survival.

The remainder of this paper will be organized into the following sections: section two discusses the literature of this study, section three develops the methodology and research hypotheses. Section four describes findings and section five is the conclusion.

2. LITERATURE REVIEW

2.1 Methodology used in the first stage of the research

The literature on decision-making can be separated in two strands, a normative strand, which seeks to develop methods of making optimal decisions, taking account of available information and organizational goals and policies, and a behavioral strand, which seeks to describe the influences on decision-making which go beyond those factors which are both rational and explicit in the decision-making process. Although the normative strand includes consideration of financial rationales (Taylor, 1981, Woodward, 1997, Steuer and Na, 2003), it does not exclude other factors such as environmental and public policy issues (Whittington and MacRae, 1986, Trumbull, 1990, Heinrich *et al.*, 2007), while the behavioral strand has tended to focus on psychological factors, although, again, other factors, such as agency problems (Berle and Means, 1932, Jensen and Meckling, 1976) or market manipulation, must be taken into account in explaining behavior which may be rational for the individual but economically sub-optimal for the organization or society.

Studies in management and decision-making have tended to be normative in scope, focusing on how the best decisions can be taken on the basis of available information and explicit policies and basing themselves on the assumption that the formulation and implementation of economically optimal decisions is possible (Poe *et al.*, 1988, de Almeida and Bohoris, 1995, French and French, 1997, Bethuyne, 1998, Brady and William, 2001, Bishop, 2006) and that information such as full life-cycle costs can be determined (Taylor, 1981, Booth, 1994, Woodward, 1997, Emblemståg, 2001, Cooper and Slagmulder, 2004, Lindholm and Suomala, 2007) with the resources available by the management accountants available. The approach to the study of accounting fits into a technocratic view of the world and assumes that where an economically optimal solution can be found, based on reasoned estimates of key variables and risk profiles, it can also be implemented in a straightforward manner. Behavioural and sociological factors have received less attention in the context of property, plant and equipment.

This focus on commercial and policy goals, however, has generally led to the exclusion of questions of how decisions are taken and which factors affect the decision process. In fact, managerial decision-makers, like all human actors, will be significantly affected by the intellectual, social, educational and political environment in the world, the nation, the company, the business unit, their profession and their social circle, as well as by their own personal instincts, views, experiences, feelings and intellectual abilities. It is also possible that the attitudes of decision makers in developed countries are different from those found in middle-income and developing countries.

The study of business, however, is not the study of calculating machines making perfectly predictable decisions based on predetermined algorithms but rather the study of groups of human beings taking decisions which are predictable only in broad outline and with some degree of uncertainty. These decisions are affected by self-interest and by straightforward errors but they are also likely to be affected by the specific educational and corporate environment within which those individuals and groups of individuals develop.

There have been a number of studies of human factors which can result in decisions which are not economically optimal. Kahneman and Tversky (1979) developed a psychological theory of choice in which value is assigned to gains and losses rather than to final assets and in which gains are not given the same weighting as losses. Kahneman and Tversky (1986) also presented both a normative and a descriptive model of risk-based decision-making, demonstrating that the normative model did not adequately account for actual choices and decision-making processes. Likewise, Thurston and Locascio (1994) built up a theory of descriptive decision analysis to remedy the limitation of current methods of analysing decision making in design. Even the establishment of codes and rules of practice and behaviour cannot be relied on to prevent bad decisions being made or to prevent disasters (Navare, 2003), as management accounting and risk management are subject to social and organizational forces (Arena *et al.* 2010).

There is also some evidence that financial accounting methods systems can affect decision-making in ways which conflict with the assumption of a single demonstrably correct economic decision being possible in relation to asset purchases and disposals. Jackson *et al.* (2009) found that depreciation method choices affected capital investment levels, even though the choice of method was not a relevant economic factor in decision making. Jackson *et al.* (2010), using an experimental method, also found that the choice of depreciation method affected the sale price that managers sought to obtain for old assets, with accelerated depreciation leading to a lower price.

However, the emphasis in studies of behavioural aspects of decision-making has tended to be on individual psychology (Kahneman and Tversky, 1979, Kahneman, Slovic and Tversky, 1982, Glöckner and Betsch, 2008) and other determinants of individual behaviour (Sprinkle, 2003), with an emphasis on purely personal decisions. However, it is essential to consider the sociological aspects of behaviour and the effects of behaviour on organizations. Neither individual decision makers nor the organizations for whom they work operate in a social vacuum and their decisions can be influenced and often constrained by social and organizational factors beyond the individual's control. Consideration also needs to be given to the effects of the law. People and organizations are governed by the dictates not only of the law but of the interpretation and application of the law by other individuals and organizations. They are also governed by what the individual has been taught, by the individual's understanding of what has been taught and by the individual's acceptance or rejection of what has been taught. It is therefore not possible to understand the behavior of accountants or the collective behaviour of corporations without some consideration of the accountant's educational experience and the set of skills and values resulting from it (Ahmad and Gao, 2004, Helliard *et al.*, 2009).

In relation to management accounting decisions, Cardinaels (2008) demonstrates the significance of individual managers' characteristics in the use of accounting

information communicated in different forms, demonstrating that managers with lower accounting knowledge make better decisions when accounting information is presented in graphical form but those with greater accounting knowledge make better decisions when the information is presented in tabular numerical form. Naranjo-Gil and Hartmann (2007) add a sociological element to the discussion of decision-making by examining the relationships between senior management heterogeneity, the use of management accounting systems and the achievement of strategic change, while Chenhall *et al.* (2010) consider the usefulness of social relationships and networks in management control systems and Vamosi (2005) discusses the importance of power structures in the interpretation of management accounting information and in the implementation of decisions.

There is, moreover, a need for research in the sociology of management accounting and into the social environments and structures in which management accounting systems are introduced and operate (Chenhall and Morris, 1986, Roslender, 1990, Scapens and Roberts, 1993, Scapens, 2006, Yazdifar *et al.*, 2008, Purdy and Gago, 2009). This must take account of rational decision-making processes by individuals in accordance with their own goals, within the organization, and not merely the rational aspects of organizational goals or irrational explanations of individual behaviour. In addition, political factors in management accounting processes must be taken into account and these may differ not only as a result of political philosophies but also as a result of differing stages of economic development (Hoque and Hopper, 1997, Uddin and Hopper, 2001, Wickramasinghe and Hopper, 2005).

However, research on the social factors in management accounting must also take account of the educational background and mental ability of those involved in decision-making, as these can lead to decisions which, though not exactly irrational, are based on incomplete or incorrect processing of information, without any influence resulting from psychological biases.

Waddock (2005) and Reckers (2006) also highlight the need for business schools to provide a proper grounding in business ethics and corporate social responsibility. Any discussion of the education of the management accountant should also consider what can be done about the clash between individual and corporate goals and therefore between optimal individual behaviour and optimal corporate policy. This is, of course, commonly dealt with by procedures which seek to provide a check on individual behavior or to require individuals to state reasons for what they do and submit their reasons to scrutiny. Emiliani (2000), however, proposes a management oath in the style of the Hippocratic oath, pledging the manager to “consecrate my life to the service of humanity” and to “practice my profession with conscience and dignity.” This may appear to be a worthy objective, in terms of seeking to turn management into a profession rather than an employment but fails to recognize the personal desires of the manager for survival, success and career advancement, as well as the absence of any professional managerial body holding a professional monopoly and capable of hearing complaints of unprofessional behaviour. Again Buttery and Richter (2003) seek contrast the ideals of corporate management with the advice of Machiavelli (1515) to the civil ruler. However, this approach fails to recognize that Machiavelli’s advice is more aimed at the acquisition and preservation of personal power than at the use of power for the benefit of the state. This is also the position with which corporate managers are most often faced, with a more

pressing need to preserve their own position than to advance towards corporate goals (see, for example, Uddin and Hopper, 2001). How this is dealt with in the corporate environment is a question which can be partly addressed at the corporate control level. However, it is also often possible to put further controls in place through legislation. It is also possible that the education and upbringing of the management accountant may have an influence on the accountant's propensity to behave in an ethically acceptable way within the organization.

The objective of this study is to contribute to the literature on the personal and social factors in management accounting quality, by examining the education and personal qualities of management accountants, specifically in Libya, as perceived by business managers and academics.

3. METHODOLOGY AND HYPOTHESIS

The aim of this study is to focus on the analysis of the gap between theory and practice in the field of management accounting in the companies mentioned, with a focus on one specific is to study the artistic qualities and skills of Management Accountant.

It is essential to state that since, skills and characteristics of employees and management accountants influence implementation of management accounting techniques this paper tends to determine importance of them. Therefore the following hypothesis was developed:

H0 there is a gap between the theory and practice in management accounting in the field of management accounting in Libyan companies that focus on the skills and qualities management.

To test the hypothesis, a questionnaire was used (see Appendix 1), containing eight questions. The research tool adopted was a questionnaire, because it is a practical approach to obtain empirical evidence for getting information about the possible existence of gap in the area in question. Both technical ability and personal character are to a large extent matters of subjective judgment and therefore it was appropriate to rely on the reported experience of individuals who were in a position to make such judgments. The target population of this survey was academics and practitioners in Libya, with practitioners being drawn from companies located in Tripoli.

Before being distributed, the questionnaire was reviewed by accounting lecturers. The final version was divided into nine questions with a varying number of sub-questions, each to be answered on a four point Likert scale, ensuring a forced choice between higher and lower score responses.

Question 1 asked about the importance of each of seven general professional skills and characteristics in a management accountant, focusing on those which can be generally attributed to the accountant's professional education.

Question 2 asked about the importance of 17 more specific personal business skills and characteristics.

Question 3 asked about the general level of attainment of each of the seven skills from question 1 by management accountants in the respondent's experience.

Question 4 asked about the general level of attainment of each of the 17 skills and characteristics from question 2 by management accountants in the respondent's experience.

Question 5 asked about the general level of training provided by the Libyan general education system in each of the seven skills and characteristics from question 1 by management accountants in the respondent's experience.

Question 6 asked about the general level of training provided by the Libyan general education system in each of the 17 skills and characteristics from question 2 by management accountants in the respondent's experience.

Question 7 asked about the level of training provided by the Libyan system of professional education for management accountants in each of the seven skills and characteristics from question 1 by management accountants in the respondent's experience.

Question 8 asked about the level of training provided by the Libyan system of professional education for management accountants in each of the 17 skills and characteristics from question 2 by management accountants in the respondent's experience.

Question 9 asked for demographic information.

The responses permitted for Questions 1 and 2 were "Very important," "Important," "Not important" and "Not useful," the final option allowing respondents to identify skills and characteristics which were of no use to professional management accountants or even counter-productive. The responses permitted for the other questions were "Very high," "High," "Low" and "Very low."

Table 1 presents the number of questionnaires distributed and returned.

Table 1: Distribution of Questionnaires

Respondents	Sent	Returned	Not Returned	%age Returned
Company Managers	24	20	4	83.3%
Lecturers	25	15	10	60.0%
Total	49	35	14	71.4%

For the purposes of statistical analysis a score of 4 was assigned to the answer "Very important," or "Very high," a score of 3 to "Important" or "High," a score of 2 to "Not important" or "Low" and a score of 1 to "Not useful" or "Very low." Overall arithmetic mean scores were calculated and an overall score assigned, with means of 1 to <1.75 being deemed to correspond to an overall response of "Not useful" or "Very low," 1.75 to <2.5 to an overall response of "Not important" or "Low," 2.5 to <3.25 to an overall response of "Important" or "High" and 3.25 to 4 to an overall response of "Very important" or "Very high."

4. RESULTS

Table 2 shows the distribution of answers on the importance of different general skills and qualities for a management accountant (question 1), arranged in descending order of perceived importance.

Table 2: Perceived importance of general skills and characteristics

no		Degrees of approval				Arithmetic mean	Standard Deviation	views
		Very important	important	Medium	Not important			
A4	Knowledge	73.3%	26.7%			3.7333	0.45774	Very important
A5	Motivation	66.7%	26.7%	\	6.7%	3.5333	0.83381	Very important
A6	Personality	53.3%	40.0%	6.7%	\	3.4667	0.63994	Very important
A3	Intelligence	53.3%	40.0%	\	6.7%	3.4000	0.82808	Very important
A1	Confidence	46.7%	33.3%	13.3%	6.7%	3.2000	0.94112	important
A7	Qualifications	33.3%	46.7%	13.3%	6.7%	3.0667	0.88372	important
A2	Contacts	26.7%	53.3%	13.3%	6.7%	3.0000	0.84515	important
	Mean	50.4%	38.09%	6.67%	4.76%	3.3429	0.72402	Very important

Table 3 shows the distribution of answers on the importance of different business-specific skills and qualities for a management accountant (question 2).

Table 3: Perceived importance of business skills and characteristics

no	Skills	Degrees of approval				Arithmetic average	Standard Deviation	views
		Very important	important	Medium	Not important			
B2	Deep thinking	66.7%	26.7%	\	6.7%	3.5333	0.83381	Very important
B11	Professional behaviour	53.3%	40.0%	\	6.7%	3.4000	0.82808	Very important
B13	Report writing	53.3%	40.0%	\	6.7%	3.4000	0.82808	Very important
B3	Employee management	60.0%	26.7%	6.7%	6.7%	3.4000	0.91026	Very important
B14	Scientific expertise	60.0%	26.7%	\	13.3%	3.3333	1.04654	Very important
B17	Use of computers	46.7%	33.3%	20.0%	\	3.2667	0.79881	Very important
B9	Problem solving	46.7%	40.0%	6.7%	6.7%	3.2667	0.88372	Very important
B8	Planning	40.0%	40.0%	20.0%	\	3.2000	0.77460	important
B4	Evaluation	46.7%	33.3%	6.7%	13.3%	3.1333	1.06010	important
B12	Reading comprehension	53.3%	26.7%	\	20.0%	3.1333	1.18723	important
B1	Assertiveness	40.0%	40.0%	6.7%	13.3%	3.0667	1.03280	important
B10	Professional appearance	40.0%	40.0%		20.0%	3.0000	1.13389	important
B7	Personal charm	26.7%	53.3%	6.7%	13.3%	2.9333	0.96115	important
B5	Listening comprehension	40.0%	33.3%	6.7%	20.0%	2.9333	1.16292	important
B16	Speaking	46.7%	26.7%	\	26.7%	2.9333	1.27988	important
B15	Social interaction	33.3%	13.3%	26.7%	26.7%	2.5333	1.24595	important
B6	Marketing	26.7%	20.0%	13.3%	40.0%	2.3333	1.29099	medium
	Mean	41.96%	52.55%	7.06%	14.51%	3.1059	0.94280	important

Table 4 shows the distribution of answers on the perceived attainment of management accountants in terms of general skills and qualities (question 3).

Table 4: Perceived attainment of general skills and characteristics

no	Characteristics	Degrees of Approval				Arithmetic average	Standard Deviation	views
		Very important	important	Medium	Not important			
C4	Knowledge	60.0%	26.7%	6.7%	6.7%	3.4000	0.91026	Very important
C1	Confidence	40.0%	40.0%	20.0%	\	3.2000	0.77460	important
C5	Motivation	33.3%	46.7%	6.7%	13.3%	3.0000	1.0000	important
C6	Personality	33.3%	40.0%	13.3%	\	2.9333	1.03280	important
C7	Qualifications	33.3%	40.0%	13.3%	13.3%	2.9333	1.03280	important
C2	Contacts	40.0%	33.3%	6.7%	20.0%	2.9333	1.16292	important
C3	Intelligence	40.0%	33.3%	6.7%	20.0%	2.9333	1.16292	important
	Mean	40.0%	37.14%	10.48%	12.38%	3.0467	0.97739	important

Table 5 shows the distribution of answers on the perceived attainment of management accountants in terms of different business-specific skills and qualities (question 4).

Table 5: Perceived attainment of business skills and characteristics

no	Skills	Quality of Performance				Arithmetic average	Standard Deviation	views
		Very high	high	low	Very low			
D2	Deep thinking	73.3%	20.0%	\	6.7%	3.6000	0.82808	Very high
D16	Speaking	46.7%	40.0%	13.3%	\	3.3333	0.72375	Very high
D10	Professional appearance	46.7%	46.7%	\	6.7%	3.3333	0.81650	Very high
D3	Employee management	46.7%	40.0%	6.7%	6.7%	3.2667	0.88372	Very high
D11	Professional behaviour	53.3%	33.3%	\	13.3%	3.2667	1.03280	Very high
D8	Planning	46.7%	33.3%	13.3%	6.7%	3.2000	0.94112	high
D14	Scientific expertise	53.3%	26.7%	6.7%	13.3%	3.2000	1.08233	high
D17	Use of computers	46.7%	26.7%	13.3%	13.3%	3.0667	1.09978	high
D1	Assertiveness	26.7%	53.3%	6.7%	13.3%	2.9333	0.96115	high
D5	Listening comprehension	46.7%	26.7%	\	26.7%	2.9333	1.27988	high
D9	Problem solving	33.3%	40.0%	6.7%	20.0%	2.8667	1.12546	high
D7	Personal charm	26.7%	46.7%	6.7%	20.0%	2.8000	1.08233	high
D4	Evaluation	33.3%	33.3%	13.3%	20.0%	2.8000	1.14642	high
D12	Reading comprehension	46.7%	20.0%	\	33.3%	2.8000	1.37321	high
D13	Report writing	40.0%	20.0%	13.3%	26.7%	2.7333	1.27988	high
D6	Marketing	20.0%	26.7%	20.0%	33.3%	2.3333	1.17514	low
D15	Social interaction	26.7%	13.3%	26.7%	33.3%	2.3333	1.23443	low
	Mean	41.96%	32.16%	9.80%	17.25%	2.9882	0.98961	high

Table 6 shows the distribution of answers on the perceived skills levels provided by the Libyan education system in terms of general skills and qualities (question 5).

Table 6: Perceived general education in general skills and characteristics

no	Characteristics	Quality of Educational Development				Arithmetic average	Standard Deviation	views
		Very high	high	low	Very low			
E4	Knowledge	53.3%	46.7%	\	\	3.5333	0.51640	Very high
E3	Intelligence	60.0%	33.3%	\	6.7%	3.4667	0.83381	Very high
E5	Motivation	53.3%	33.3%	13.3%	\	3.4000	0.73679	Very high
E2	Contacts	46.7%	40.0%	\	13.3%	3.2000	1.01419	high
E6	Personality	40.0%	40.0%	13.3%	6.7%	3.1333	0.91548	high
E7	Qualifications	40.0%	40.0%	13.3%	6.7%	3.1333	0.91548	high
E1	Confidence	40.0%	33.3%	13.3%	13.3%	3.0000	1.06904	high
	Mean	47.62%	38.09%	7.62%	6.66%	3.2667	0.80788	high

Table 7 shows the distribution of answers on the perceived skills levels provided by the Libyan education system in terms of different business-specific skills and qualities (question 6).

Table 7: Perceived general education in business skills and characteristics

no	Skills	Standard of Education				Arithmetic average	Standard Deviation	views
		Very high	high	low	Very low			
F2	Deep thinking	73.3%	20.0%	\	6.7%	3.3333	1.11270	Very high
F14	Scientific expertise	46.7%	40.0%	13.3%	\	3.3333	0.8994	Very high
F1	Assertiveness	46.7%	46.7%	\	6.7%	3.2667	0.70373	Very high
F3	Employee management	46.7%	40.0%	6.7%	6.7%	3.2667	1.03280	Very high
F11	Professional behaviour	53.3%	33.3%	\	13.3%	3.1333	0.99043	Very high
F5	Listening comprehension	46.7%	33.3%	13.3%	6.7%	3.1333	1.12546	Very high
F12	Reading comprehension	53.3%	26.7%	6.7%	13.3%	3.0667	1.22280	Very high
F17	Use of computers	46.7%	26.7%	13.3%	13.3%	2.9333	1.16292	Very high
F4	Evaluation	26.7%	53.3%	6.7%	13.3%	2.8667	1.12546	Very high
F8	Planning	46.7%	26.7%	\	26.7%	2.8667	1.18723	Very high
F15	Social interaction	33.3%	40.0%	6.7%	20.0%	2.8000	1.20712	Very high
F13	Report writing	26.7%	46.7%	6.7%	20.0%	2.8000	1.26491	Very high
F16	Speaking	33.3%	33.3%	13.3%	20.0%	2.6667	1.23443	high
F9	Problem solving	46.7%	20.0%	\	33.3%	2.6000	1.18322	high
F10	Professional appearance	40.0%	20.0%	13.3%	26.7%	2.6000	1.24212	low
F7	Personal charm	20.0%	26.7%	20.0%	33.3%	2.3333	1.34519	low

F6	Marketing	26.7%	13.3%	26.7%	33.3%	2.0000	1.19523	low
	Mean	38.03%	28.23%	8.63%	16.87%	2.8824	1.05672	high

Table 8 shows the distribution of answers on the perceived skills levels provided by the Libyan education system for management accountants in terms of general skills and qualities (question 7).

Table 8: Perceived quality of accounting education in general skills and characteristics

no	Characteristics	Quality of Educational Development				Arithmetic average	Standard Deviation	views
		Very high	high	low	Very low			
G3	Intelligence	46.7%	40.0%	\	13.3%	3.2000	1.01419	high
G4	Knowledge	60.0%	20.0%	\	20.0%	3.2000	1.20712	high
G5	Motivation	46.7%	33.3%	6.7%	13.3%	3.1333	1.06010	high
G6	Personality	46.7%	33.3%	6.7%	13.3%	3.1333	1.06010	high
G1	Confidence	40.0%	40.0%	6.7%	13.3%	3.0667	1.03280	high
G2	Contacts	40.0%	40.0%	6.7%	13.3%	3.0667	1.03280	high
G7	Qualifications	40.0%	40.0%	6.7%	13.3%	3.0667	1.03280	high
	Mean	45.71%	25.71%	4.76%	14.29%	3.1238	1.03983	high

Table 9 shows the distribution of answers on the perceived skills levels provided by the Libyan education system for management accountants in terms of different business specific skills and qualities (question 8).

Table 9: Perceived quality of accounting education in business skills and characteristics

no	Skills	Standard of Education				Arithmetic average	Standard Deviation	views
		Very high	high	low	Very low			
H2	Deep thinking	73.3%	20.0%	\	6.7%	3.6000	0.82808	Very high
H11	Professional behaviour	53.3%	40.0%	\	6.7%	3.4000	0.82808	Very high
H10	Professional appearance	46.7%	46.7%	\	6.7%	3.3333	0.81650	Very high
H13	Report writing	53.3%	33.3%	6.7%	6.7%	3.3333	0.89974	Very high
H3	Employee management	53.3%	26.7%	13.3%	6.7%	3.2667	0.96115	Very high
H8	Planning	53.3%	26.7%	13.3%	6.7%	3.2667	0.96115	Very high
H1	Assertiveness	40.0%	40.0%	13.3%	6.7%	3.1333	0.91548	high
H5	Listening comprehension	46.7%	26.7%	13.3%	13.3%	3.0667	1.09978	high
H14	Scientific expertise	53.3%	20.0%	6.7%	20.0%	3.0667	1.22280	high
H4	Evaluation	33.3%	46.7%	6.7%	13.3%	3.0000	1.0000	high
H9	Problem solving	33.3%	40.0%	13.3%	13.3%	2.9333	1.03280	high
H17	Use of computers	40.0%	33.3%	6.7%	20.0%	2.9333	1.16292	high
H12	Reading	46.7%	26.7%	\	26.7%	2.9333	1.27988	high

	comprehension							
H7	Personal charm	26.7%	46.7%	13.3%	13.3%	2.8667	0.99043	high
H15	Social interaction	26.7%	26.7%	20.0%	26.7%	2.5333	1.18723	high
H16	Speaking	26.7%	26.7%	13.3%	33.3%	2.4667	1.24595	low
H6	Marketing	13.3%	26.7%	20.0%	40.0%	2.1333	1.12546	low
	Mean	42.4%	30.98%	9.41%	15.69%	3.0157	0.96387	high

The reliability and consistency of responses was tested by calculating Cronbach's α (Table 10).

Table 10: Validity and Reliability

Cronbach's Alpha	N of Items
.998	96

Cronbach's α is 0.998, indicating a high level of consistency and reliability.

To test the hypothesis H0, that there is a gap between the theory and practice in management accounting in the field of management accounting in Libyan companies that focus on the skills and qualities management, Pearson's coefficient of correlation was calculated for each pair of questions relating to the same skills and characteristics. Results are shown in Table 11.

Table 11: Pearson Correlation Coefficients for pairs of answers relating to general and business skills and characteristics

		totalA	totalB	totalC	totalD	totalE	totalF	totalG	totalH
totalA	Pearson Correlation	1							
	Sig. (2-tailed)								
	N	15		15		15		15	
totalB	Pearson Correlation		1						
	Sig. (2-tailed)								
	N		15						
totalC	Pearson Correlation	.948***		1					
	Sig. (2-tailed)	.000							
	N	15		15					
totalD	Pearson Correlation		.994***		1				
	Sig. (2-tailed)		.000						

totalE	N		15		15				
	Pearson Correlation	.974***		.972***		1			
	Sig. (2-tailed)	.000		.000					
totalF	N	15		15		15			
	Pearson Correlation		.985***		.993***		1		
	Sig. (2-tailed)		.000		.000				
totalG	N		15		15		15		
	Pearson Correlation	.939***		.976***		.976***		1	
	Sig. (2-tailed)	.000		.000		.000			
totalH	N	15		15		15		15	
	Pearson Correlation		.995***		.995***		.990***		1
	Sig. (2-tailed)		.000		.000		.000		
	N		15		15		15		15

***. Correlation is significant at the 0.01 level (2-tailed).

All pairs of answers showed a very high correlation between desirability, attainment and education preparation, both in the general educational system and in the accounting education system. This indicates that, in the view of the respondents, the focus of management accountants' values and education in Libya is generally appropriate to the needs of industry.

However, it must still be noted that the mean answers to questions 1 and 2, relating to the desirability of different skills and characteristics were higher than the means of answers to questions about attainment and education, indicating that there is still a quality gap, even if the focus is broadly correct, which suggests that greater devotion of resources to education and better recruitment practice might be desirable.

5. CONCLUSION

This paper investigates the possibility of a gap between the perceived desirable skills characteristics of management accountants in Libya and their perceived level of attainment and education in those skills and characteristics. The results indicate that there is a strong correlation between the desirability of different characteristics and the

actual attainment and education of management accountants in those skills and characteristics.

However, there is still a gap between the overall importance of this group of characteristics as a whole and the level of attainment and education. This suggests that improvements to accounting education are still desirable.

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Appendix Questionnaire

[Contact Details]

[Date]

[Addressee Details]

Dear [Name],

We are writing to request your assistance with an academic research project related to accounting and education.

Given the importance of the rôle of the accountant in the provision of appropriate costing information to help the management of companies and other organizations in planning, directing and controlling operations, it is essential that the management accountant has the necessary qualities and skills to carry out this function. For this reason we are writing to ask for your assistance in this research on the development of accounting education and the skills of management accountants.

We would be grateful if you could assist by completing the attached questionnaire, giving your opinions on the importance of a variety of different personal and social characteristics and a variety of skills of management accountants and on the present level of attainment of these skills and characteristics.

Please return your completed questionnaire to:

Dr Shala al-Abiyad,

Your assistance will be very greatly appreciated. Any information and opinions which you provide will be treated in strictest confidence and will be used in our research in anonymized form only.

Please do not hesitate to contact me if you have any queries.

Yours Sincerely,
Shala al-Abiyad,
[dr shala al-abiyad
Al-fateh university school of economic
and political sciences
Tripoli- Libya]

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United Kingdom.

Question 1

In your opinion, how important is each of the following characteristics in a professional management accountant?

Characteristics	Degree of Importance			
	Very important	Important	Not important	Not useful
Confidence				
Contacts				
Intelligence				
Knowledge				
Motivation				
Personality				
Qualifications				

Question 2

In your opinion, how important is each of the following skills and characteristics for a professional management accountant?

Skills	Degree of Importance			
	Very important	Important	Not important	Not useful
Assertiveness				
Deep thinking				
Employee management				
Evaluation				
Listening comprehension				
Marketing				
Personal charm				
Planning				
Problem solving				
Professional appearance				
Professional behavior				
Reading comprehension				
Report writing				
Scientific expertise				
Social interaction				
Speaking				
Use of computers				

Question 3

In your opinion, to what extent do management accountants in Libya display each of the following characteristics?

Characteristics	Quality of Attainment			
	Very high	High	Low	Very low
Confidence				
Contacts				
Intelligence				
Knowledge				
Motivation				
Personality				
Qualifications				

Question 4

In your opinion, how well do management accountants in Libya perform in each of the following skills?

Skills	Quality of Performance			
	Very high	High	Low	Very low
Assertiveness				
Deep thinking				
Employee management				
Evaluation				
Listening comprehension				
Marketing				
Personal charm				
Planning				
Problem solving				
Professional appearance				
Professional behavior				
Reading comprehension				
Report writing				
Scientific expertise				
Social interaction				
Speaking				
Use of computers				

Question 5

In your opinion, how well does the Libyan education system develop people in general in each of the following characteristics in people in genera?

Characteristics	Quality of Educational Development			
	Very high	High	Low	Very low
Confidence				
Contacts				
Intelligence				
Knowledge				
Motivation				
Personality				
Qualifications				

Question 6

In your opinion, how well does the Libyan education system train people in general in each of the following skills?

Skills	Standard of Education			
	Very high	High	Low	Very low
Assertiveness				
Deep thinking				
Employee management				
Evaluation				
Listening comprehension				
Marketing				
Personal charm				
Planning				
Problem solving				
Professional appearance				
Professional behavior				
Reading comprehension				
Report writing				
Scientific expertise				
Social interaction				
Speaking				
Use of computers				

Question 7

In your opinion, how well does the academic and professional education of a management accountant in Libya develop the following characteristics?

Characteristics	Quality of Educational Development			
	Very high	High	Low	Very low
Confidence				
Contacts				
Intelligence				
Knowledge				
Motivation				
Personality				
Qualifications				

Question 8

In your opinion, how well does the academic and professional education of a management accountant in Libya train people in each of the following skills?

Skills	Standard of Education			
	Very high	High	Low	Very low
Assertiveness				
Deep thinking				
Employee management				
Evaluation				
Listening comprehension				
Marketing				
Personal charm				
Planning				
Problem solving				
Professional appearance				
Professional behavior				
Reading comprehension				
Report writing				
Scientific expertise				
Social interaction				
Speaking				

Question 9 (optional)

It would be appreciated if you could assist us by providing the following information about yourself for research purposes. If, however, you do not wish to provide this information, please leave the following sections blank.

Job Title _____

Number of Years in Post _____

Age in Years _____

Male ☐ Female ☐ Age in Years _____

Qualifications (please tick all that apply)

General Secondary Certificate ☐

First Degree ☐

Master's Degree ☐

Doctoral Degree ☐

Member of Libyan Auditors and Accountants Association ☐

Other Professional Accounting Qualification ☐

Other Professional Qualification

Financial Market Regulations and Legislations: The study of Malaysia, the UK and the US Statutes in relation to Financial Statement Fraud ----

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Abstract: This paper attempts to explain the current Malaysian financial market regulations relevant to the financial statement process that could mitigate financial statement fraud (FSF). This paper discusses financial statement fraud and reviews the relevant provisions in the statutes of the three countries in mitigating the fraud. The study found some similarities and differences in regulations between the countries. It seemed that a lot of provisions had been put in place and FSF always exist due to human greed. The paper is limited to Securities Act and the most relevant regulations to the financial statement process. Also, only a few guidelines from the professional accounting bodies were reviewed. The paper compared the relevant sections from the various Acts of the three countries. The similarities and the differences of practices may give benefit to mitigate financial statement fraud. Regulators and practitioners may consider the potential sections that give benefit to their country.

Keywords- Securities Act, Financial Statement, Fraud

1.0 Introduction

Financial statement fraud (FSF) is one of the major problems in today's financial market. In Malaysia, corporate financial scandals such as those committed by Transmile Group Berhad, Tat Sang Holding and Megan Media Holdings Berhad have diminished the firms' value and shareholders' wealth. This has possibly had a negative impact on foreign direct investments that will also erode public confidence and trust in the accounting and auditing professions (KPMG, 2007). The US Congress passed the Sarbanes Oxley Act in 2002 in the wake of businesses failures and corporate scandals that began with Enron in 2001. The purpose of the Act is to add strength to a public company's internal control mechanisms, financial reporting and audit committee. This will lead to transparent financial statements (Agami, 2007).

In relation to the financial market regulations and legislations, the Securities Act is the most relevant Act that imposed financial regulation in the country. In Malaysia, the regulatory infrastructure of capital market underwent major enhancements in the 1990s.

The legal framework for securities regulation in Malaysia is based on three principal laws, namely, the 1993 Securities Commission Act, the 2007 Capital Markets and Services Act, and the 1991 Securities Industry (Central Depositories) Act. The Capital Markets and Services Act, which repeals the Securities Industry Act 1983 and the Futures Industry Act, was adopted in September 2007 with the aim of strengthening the regulatory framework for capital markets, improving business efficacy, and enhancing investor protection. Furthermore, the Act provides for a streamlined, consolidated and more comprehensive unified legislative framework (www.estandardsforum.org). This paper attempts to focus on the provisions from the statutes relevant to the financial statement process and financial statement fraud. The next section reviews the financial market regulator of Malaysia. The third section discusses the relevant sections related to the FSF from Malaysia, as well as the US and the UK. While, the fourth section presents the themes identified from the relevant regulations in the three countries and the last section concludes the paper.

2.0 Malaysia financial market regulators

The principal enforcement regulators of the financial markets in Malaysia are the Securities Commission and Bursa Malaysia (the Malaysian Stock Exchange, formerly known as the KLSE). The Securities Commission Malaysia (SC) is charged with the responsibility to regulate and develop the financial markets in Malaysia. As a self-funding statutory body, it was established on 1 March 1993 under the Securities Commission Act 1993 (SCA) (www.sc.com.my). SC's regulatory functions include supervising and monitoring the activities of market institutions, including the exchanges and clearing houses, and regulating all persons licensed under the Capital Markets and Services Act 2007. It is the sole approving and registering authority for prospectuses of all securities (other than unlisted recreational clubs). The SC also regulates all matters relating to securities and futures contracts, as well as matters relating to take-over and merger of companies, and unit trust schemes (www.sc.com.my).

Prior to 1993, there was no single government body that was given the responsibility for overseeing the development of the Malaysian capital market. The securities industry in Malaysia was then regulated by a number of bodies such as the Capital Issues Committee (CIC), the Panel of Takeovers and Mergers, the Registrar of Companies (ROC), Foreign Investment Committee (FIC), Ministry of International Trade and Industry (MITI), Bank Negara Malaysia (BNM/Central Bank), Ministry of Finance (MOF) and even the Implementation & Coordination Unit of Parliament (Adeline Paul Raj, 2003, March 1). As of March 1, 1993, Malaysian securities industry entered into a new era with the formation of a wholly new centralized regulatory body called the Securities Commission (SC) when the SCA was brought into force. With the formation of SC, the CIC and the Panel of Takeovers and Mergers were simultaneously dissolved (Adeline Paul Raj, 2003, March 1). SC also has jurisdiction over Bursa Malaysia. When Bursa Malaysia amends its rules, it requires the approval of the Securities Commission (Simon Shim, 2006).

Next is Bursa Malaysia, which is an exchange holding company, approved under Section 15 of the Capital Markets and Services Act 2007. Bursa Malaysia operates a securities, derivatives and offshore exchanges, clearing houses for securities and derivatives and a central depository. The company also disseminates stock quotes and information related to securities listed on the exchange. It has the function of prescribing listing requirements, guidelines, and practice notes from time to time and is empowered to enforce them (www.bursamalaysia.com). Bursa Malaysia's history dates back to 1930 with the birth of Singapore Stockholders' Association (Simon Shim, 2006). It was the first sanctioned securities trading organization in Malaysia. The association was re-registered as the Malayan Stockbrokers' Association in 1937 but did not yet publicly trade shares. With the establishment of the Malayan Stock Exchange in 1960, the public trading of shares commenced (www.buzzle.com).

The Malayan Stock Exchange was renamed the Stock Exchange of Malaysia in 1964 and it continued as the Stock Exchange of Malaysia and Singapore (SEMS) after Singapore seceded from Malaysia in 1965 (www.buzzle.com). In 1973, currency interchangeability between Malaysia and Singapore ceased, and the Stock Exchange of Malaysia and Singapore was divided into the Kuala Lumpur Stock Exchange Berhad and the Stock Exchange of Singapore. The Kuala Lumpur Stock Exchange which was incorporated on 14 December 1976 as a company limited by guarantee, took over the operations of the Kuala Lumpur Stock Exchange Berhad in the same year (www.bursamalaysia.com). On 14 April 2004, the company changed its name to Bursa Malaysia Berhad, following its demutualization exercise, the purpose of which was to enhance its competitive position and to respond to global trends in the exchange sector by making it more customer-driven and market-oriented (www.bursamalaysia.com). On 18 March 2005, Bursa Malaysia was listed on the Main Board of Bursa Malaysia Securities Berhad. Bursa Malaysia's overriding objectives, in addition to discharging its statutory duties, are investor protection, transparency, high standards of conduct and governance, market integrity and that all relevant persons can participate in the Malaysian market with confidence.

Bursa Malaysia today is one of the largest bourses in Asia with just under 1,000 listed companies offering a wide range of investment choices to the world. Companies are listed either on Bursa Malaysia Securities Berhad Main Market or on the ACE Market for innovative entrepreneurs seeking to list their fledgling companies (www.bursamalaysia.com). Bursa Malaysia has power to reprimand, fine, or suspended a stock broking company and/or its defaulting dealer's representative. The company also has the power to issue a caution letter, private or public reprimand, impose a fine, suspense trading, or delist an issuer from the official list of the exchange (Simon Shim, 2006). In assisting the development of the Malaysian capital market and enhancing global competitiveness, Bursa Malaysia is committed to maintaining an efficient, secure and active trading market for local and global investors.

3.0 Literature Review

The study discussed the FSF and the relevant provisions from the statutes of the countries, namely Malaysia, United States of America and United Kingdom. Thus, the literature part discussed the concerns of FSF ranging from the (1) importance of financial statement, (2) components of FSF (3) reasons for FSF (4) types of FSF (5) indicators and perpetrators of fraud firms and (6) measures to control FSF.

Importance of financial statements: Financial statement is important to its users in making economic decisions. Hence, financial statements information should reflect the actual financial condition of the company. Razaee, (2002) suggests that, the reliability and the transparency, of financial statement would assist investors to make wise economic decisions. To date, the issue of financial statement fraud grabbed the attention of the public, investors, regulators and practitioners due to the huge losses from the reported fraud worldwide. The collapse of a few large companies such as Enron Corporation, WorldCom, Global Crossing, and Adelphia had traumatized the confidence of investors and loss of market capitalization. Three questions were raised as a consequence of these accounting scandals. Firstly, the reliability of financial information. Secondly, how severe the current market misconduct and thirdly, whether the auditors should be responsible for the financial statement process (Razaee, 2002). The figure from the US Federal Bureau of Investigation shows that, there are more than 2000 securities and corporate fraud cases in year 2004. These signified billions of dollars of losses and thousands of victims. The recent corporate frauds are presumably the transformation of white-collar crimes that has blew up in numbers, sizes, losses, and victims. Specifically, Slotter (2004 cited in Telberg, 2004) marked the trend of corporate scandals and fraud that had started with (1) savings and loans scandals (1980s), (2) health care insurance fraud (1990s) and (3) financial restatement (2000s).

Components of financial statement fraud: The components or explanation of FSF were taken from the statutes of the three countries, accounting professional bodies and academic literature. The UK Fraud Act (2006) states that “a person is guilty of fraud if he is in breach of any of the sections listed in subsection (2) that are includes (2a) fraud by false representation, (2b) fraud by failing to disclose information and (2c) fraud by abuse of position”. While, the UK Theft Act 1968 defines false accounting as “where a person dishonestly, with a view to gain for himself or another or with intent to cause loss to another which includes (1) destroys, defaces, conceals or falsifies any account or any record or document made or required for accounting purpose; or (2) in furnishing information for any purpose produce of makes use of any account, or any record or document as aforesaid, which to his knowledge is or maybe misleading, false or deceptive in a material particular.” Meanwhile, KPMG International (2006) views ‘fraud’ as a broad legal concept that generally refers to an intentional act committed to secure an unfair or unlawful gain.

Beasley (1996) gives definition of FSF as limited to two types of fraud, firstly, FSF occurs when ‘management intentionally issues materially misleading financial statement information to outside users’. Secondly, FSF due to ‘misappropriations assets by top management that includes the chairperson, vice chairperson, chief executive officer, president, chief financial officer and treasurer’. Razaee, (2002) viewed FSF as ‘a deliberate attempt by corporations to deceive or mislead financial statement users by

preparing and disseminating materially misstated financial statements'. The FSF also involves intent and deception by top management of the company with a set of well-planned schemes. The schemes may involve the six activities of (1) 'falsification, alteration or manipulation of material financial records, supporting documents or business transaction, (2) material intentional misstatement, omissions or misrepresentation of events, transaction, accounts or other significant information from which financial statements are prepared, (3) deliberate misapplication, intentional misinterpretation, and wrongful execution of accounting standards, principles, policies and methods used to measure, recognize, and report economic events and business transactions, (4) intentional omissions and disclosures or presentation of inadequate disclosures regarding accounting standards, principles, practices and related information, (5) the use of aggressive accounting techniques through illegitimate earning management, (6) manipulation of accounting practices under the existing rules-based accounting standards which have become too detailed and too easy to circumvent and contain loopholes that allow companies to hide the economic substance of their performance'.

Reasons for Financial Statement fraud: There are a few reasons that lead to the FSF. Firstly, FSF arises due to weak company's financial conditions. Reinstein et al (2006) document that; FSF begins with financial and moral problem in the company. In that case, the company's control environment became lacking, thus it encourages the inefficiency in audit works. These findings were supported by Carcello and Palmrose 1994; Dechow et al. 1996, Lys, Watts 1994 who found that financial distress, and poor financial performances are the most important reason for FSF occurrences. Therefore, the companies have a propensity to mislead the financial information and the probability of FSF is raised. In addition, the company would also commit FSF when they want to improve earning objective that will reflect the management compensation (Elliott & Elliott 2009). Beasley et al., (1999) reported that a company committed FSF in order to (1) window dress the financial performance and thus evade reporting a pre tax loss, (2) improve the value of share price to attract the company's investors, (4) meet the earning expectation as set by the security analyst, (5) meet the exchange listing requirement, (6) cover up the asset misappropriation, and (7) hide company's deficiencies. The two reasons from Beasley are highly supported by Kellogg and Kellogg (1991) who suggested that the two important reasons of financial statement fraud are to attract the company's investors and to increase the value of share price. Razaee 2002 states that, a company that commits financial statement fraud is actually lacking of the effectiveness of corporate governance. These are due to the (1) duality position as CEO who also serves as a chairperson, (2) ineffectiveness of audit committee, and (3) ineffectiveness of audit functions.

Types of financial statement fraud: A few violations related to FSF have been found in previous fraud cases. According to Chen, *et.al.* (2006), the common FSF includes (1) failure to disclose information, (2) delays in disclosure, (3) profit inflation, (4) false statements and information in prospectus, and (5) false statements in financial reports. These violations will give a serious impact to the users of financial information as well as company's shareholders. Other type of FSF is improper revenue recognition. The US Federal Bureau of Investigation (FBI) classifies improper revenue recognition as one of the top schemes of FSF. It started with financial restatement in company's financial reporting. In relation to financial restatement, it was reported that, half of the

US Securities and Exchange Commission cases involved improper revenue recognition. The improper revenue recognition has resulted in a huge effect in market capitalization. Indeed, the FBI data for year 2000, reported that, in eight out of top ten market value losses were related to improper revenue recognition (Telberg, 2004). Another type of FSF is earnings management. Earnings management is a strategy used by a company to manipulate the earning to give a better view of company's earning. Therefore, a company will disclose false information in financial statements in relation to the companies earning to achieve their objectives. Dechow, et.al. (1996) states that, a company with lower earning will typically have lower share prices. Therefore, the manipulator will use this strategy to manipulate the information to attract the investors to the company.

Indicators and perpetrators of fraud firms: Chen *et.al.* (2006) states that, the previous fraud cases show the conditions of the firm that have a poor performance, suffer more losses, lower growth and lower stock return. The perpetrators of FSF are from the company's management. They consisted of chairman, directors, general manager, chief accountant and supervisors. This was supported in Razaee (2002) study. From the sample of nine FSF cases, the perpetrators of financial statements mainly consisted of top management personnel namely the Chief Executive Officer (CEO), Chief Financial Officer (CFO) and top executives from the fraud company.

Measures to control financial statement fraud: There are two parties involved in controlling financial statement fraud, the regulators of the country and the company itself. These two parties have to play their roles to mitigate fraud. In relation to this, the US government enacted the Sarbanes Oxley Act 2002 to address the monitoring mechanism to control financial statement fraud. The company is advised to improve corporate governance, enhancing accountability and transparency of financial statements (Razaee, 2002). In the US, the FBI's financial crime investigation sought for expanded cooperation with Certified Public Accountants (CPA) in fighting the corporate fraud. They believed that the roles, the independency and the integrity of CPAs are uniquely suited to the partnership. Thus, the CPAs will be third party expert witnesses and eyewitnesses for FBI. The mode of cooperation will be dealt in the way of (1) handling the scope of problem, (2) identifying common accounting schemes, and (3) working effectively under the impact of the SOX 2002 and related rules and regulations (Telberg, 2004). Research by Chen *et.al.* (2006) suggested that, a large number of outside directors would contribute controlling financial statement fraud in the company. The large proportion of outside directors would be helpful in monitoring the firm's activity and deterring the company's fraud.

Beasley (1996) referred to outside directors as all non-employee directors. The result of the study found that, the longer the tenure of directors in the company would also help to control and mitigate the financial statement fraud. It was supported by study from Beasley (1996). He found a company with a large proportion of outside directors and longer tenure of outside directors was experienced a lower financial statement fraud. Dechow *et.al.* (1996) added that directors or chairman with shorter tenure has less company's experience and therefore unable to deter fraud in the company. Further, Fama and Jensen (1983) recommended that, outside directors should have monitoring tasks; therefore they would not plot with top managers to confiscate the shareholder wealth. Thus, it would reduce the agency problem in the company. Fama and Jensen (1983) also

discussed what are expected from the external directors. They are supposed to be (1) decision experts; (2) well understand the importance of decision control, and (3) able to work with decision control system in a company. The board of directors is possibly the highest internal control mechanism to monitor actions of top management. Beasley (1996) found that board composition plays a greater role in controlling the financial statement fraud. He also reported that, the accounting regulators and standard setters recognized the importance of directors as one of internal control mechanism for prevention of financial statement fraud. For example, two reports from the American Institute of Certified Public Accountant (AICPA) contain recommendations for board independency to mitigate the financial statement fraud in a company. Dechow (1996) suggested the establishment of internal governance process in every company. It will be a part of internal control process in relation to FSF. The purpose is to maintain the reliability of financial statements by controlling manipulation activities.

Alternatively, Razaee (2002) suggested, the executives' compensation packages (stock options and bonuses) should be eliminated. The companies' shareholder should be given proper authority to approve the executive compensation packages to avoid fraud scheme in company. Razaee (2002) also suggests a practical monitoring mechanism to control financial statement fraud. These include direct oversight functions of board of directors, the audit committee, external auditors, and regulatory agencies. Therefore, the effective roles and responsibility of board of directors in the company should be "tone at the top" and should not tolerate any misstatements in the financial statements. In addition, indirect overseeing functions by company's owner/investor, analysts, institutional investors, and investment bankers are also required to be a part of monitoring mechanism. Audit committee, also could oversee the integrity and quality of financial statement process. They should comprise of independent members of board of directors with sufficient financial expertise (Razaee, 2002). Furthermore, Razaee (2002) suggests that effective internal control structure and audit functions are important mechanism to control financial statement fraud. NCIR, (1987) as cited in Razaee (2002), documents that the management is responsible to design an adequate and effective internal control in the financial statement process. Meanwhile, the internal and external auditors must ensure that internal control designs are adequate and effective in preventing, detecting, and responding to the financial statement fraud. Internal auditors are responsible to assist management to design, maintain, and monitor the internal controls system, while external auditors are given the responsibility to detect any material misstatements in financial statements (Razaee, 2002).

4.0 Review of legislation in relation to Financial Statement fraud

In attempting to study the FSF and the related provisions, the study has reviewed the regulations from the statutes of the three countries. The study found 27 sections were formed that relate to FS and FSF. The following table shows the statutes that are related to FS and FSF provisions and the laws from the three countries:

Table 1: Statute

Statute		
The United States	The United Kingdom	Malaysia
The Securities Act 1934	The Financial and Services	The Securities Commission
The Sarbanes Oxley Act	Act 2000	Act 1993
2002	The Companies Act 2006	The Companies Act 196
The US Criminal Code	The Fraud Act 2006	The Financial Reporting
	The Theft Act 1968	Act 1997
		The Penal Code 574
		The Accountants Act 1967

In relation to the provisions from the above statutes, the study has created 9 themes of statutes requirements to financial statements and FSF. They are (1) fraud definition, (2) financial statement disclosures, (3) audit and auditor requirements, (4) auditor independence, (5) director and company's management, (6) accounting standards and procedures, (7) accounting body and regulatory, (8) code of ethics, and (9) investigation, prosecution and penalty. The provisions of these statutes were related to the corporations, directors and management, auditors and regulating the accounting standards and procedures.

Every country has its own definition on what constitute FSF. Noticeably, false representation, false accounting, breach of trust and cheating are often referred to as FSF. In order to control FSF, the 3 countries imposed provisions in relation to financial statements disclosures. The similarity is the requirement for every company to provide all financial information to their investors. This is to ensure the financial information is fully provided to companies' investors. This would be the initial prevention strategy to protect the company's investor when they are making an investment decision. Further, the U.S regulations especially Sarbanes Oxley Act 2002 (SOX 2002) really emphasized on financial statements provisions. For example, SOX 2002 added a corporate social responsibility (section 302) that requires every company to design a set of internal control in order to certify all material aspects relating to financial statement disclosures. Further, the SOX 2002 also requires the periodic report of financial statements (Section 401) that must be accordance with Generally Accepted Accounting Principles (GAAP) and are accurately presented. This provision is different from the ones in the UK and Malaysia. In both countries, internal control design in relation to financial statements process is up to the company's initiatives. However, the authorities in every country have power to require any information and conduct inspection to assess the degree of auditing compliance.

The duties of companies' directors in the U.K and Malaysia are well defined in their statutes. The directors are expected to (1) promote success of the company, (2) exercise reasonable skills and diligent and (3) avoid any conflict and disclose of any interest with regards to the companies. While in the U.S, the duties of company's director are not regarded as federal matters. Another similarity among the 3 countries is

regarding the liabilities of company's directors when making misleading statements. After experiencing a number of accounting scandals in the early 2000s, the U.S enacted the SOX 2002 to increase the shareholder's protection and reliability of corporate disclosures subject to securities laws and for other purposes. One of the provisions that could increase the auditor independence is the establishment of Public Company Accounting Oversight Board (PCAOB) in the US. The main duty PCAOB is setting guidelines for the preparation of accurate and independent audit reports for all public listed companies. Malaysia also established the Accounting Oversight Board to promote and develop an effective audit oversight framework. The board is responsible to promote investor's confidence in the quality and reliability of audited financial statements. Meanwhile, in the U.K, the Auditing Practices Board (APB) is responsible to certify public confidence in auditing process. The APB is acting as an independent regulator under Financial Reporting Council. In relation to auditor's requirement to audit the company's financial statements, the 3 countries put the provision in law as a compulsory matter.

Audit firms normally provide their clients with a variety of services, for example, (1) auditing, (2) tax planning, (3) management consultancy, (4) investment advice and (5) insolvency work. However, the US place provisions under the SOX 2002, defining scope of practice of auditors that prohibits company auditors to provide non audit services while simultaneously providing audit services to their client company. This provision is to avoid any conflict of interest when providing both services to the client company. Section 203 of the Act requires audit partner rotation every five years. In the UK, the accountants' professional rules restrict the audit firm from providing both audit and non audit services to the same client company to avoid any conflict of interest. Under the Companies Act in the UK and Malaysia, a company auditor must be an independent person. Therefore, the auditors must not be an officer or employee of the company and having any partnership relation.

In ensuring that the enforcement is effective, there are provisions in relation to investigation, inspection and penalties. For example, the US and Malaysia provide powers to Securities Commission under the Securities Act to conduct an investigation for any person who has violated the Act. With regards to the FSF penalties, the US imposes the highest penalties to the defrauder. Penalties of \$5,000,000 or imprisonment will be imposed for any person who produces misleading statement or FSF. The UK gives 10 years punishment for any person in the company who conducts fraudulent business including providing misleading statement. The penalty of FSF in Malaysia is slightly lower compare to the US and the UK. Imprisonment of 7 years or fine or both is imposed on any person who falsifies any books, documents or accounts of the company.

5.0 Conclusion

From the review of the legislations above, the study found some similarities and differences in regulations between the three countries. The similarities are mainly in terms of the requirement for disclosures of information deemed important in aiding shareholders'/investors' decision making process. Furthermore, all three countries imposed the same liabilities on company directors with regards to making misleading statements. These are to ensure that the interests of shareholders are protected. Whilst all

three countries provides powers to conduct investigations in relation to financial statement frauds, the penalties imposed upon conviction differs greatly. The US imposed the highest penalty and Malaysia imposed the least penalty. Another difference is in terms of the duties of the company directors. These duties are well defined in the statutes of the UK and Malaysia but not regarded as a federal matter in the US. However, the US put more stringent rules on auditors by prohibiting them from providing non audit services simultaneously as the audit services to their client. The auditors are also required to rotate their partners every five years. These requirements are not spelled out by the statutes in the UK and Malaysia. However, the professional bodies in both countries took it upon themselves to warn their members on the danger of possible conflicts of interests that could arise in these situations and advise the use of safeguards.

It seemed that a lot of legislations had been put in place in an attempt to prevent FSF. Whilst fraud will always exist as long as human greed exists, the governments should play important roles in mitigating FSF. Perhaps the most significant deterrent could be in terms of penalties imposed for breach of the requirements of the legislations. It should be stiff enough to put the fear of god to potential fraudsters and make it not worth their while to commit fraud. However, the regulators can only do so much as they need to balance between the needs of the investors for information and the burden on the preparers of financial statements to provide that information. Moreover, it is also not good to have information overload which would defeat the purpose of providing the information in the first place. Hence, the companies themselves should also ensure that fraudulent activities do not occur inside their organizations. This could be achieved by first of all by having sound anti fraud policies which are well disseminated throughout the organizations. Secondly, companies should educate their employees to recognize the symptoms of fraud and be encouraged to blow the whistle. To this end, the companies must also have adequate whistle blowing channels to ensure that they are done inside the organizations and not to outsiders. Misleading information in fraudulently prepared financial statements may result in wrong decision making by the investors and in turn, erode their confidence in the accounting profession. Thus, it is to everybody's benefits to continually search for ways to predict, identify and prevent FSF.

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Hypermarket development in Malaysia: Between consumers' demand and its impact on the existing small retailers

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Abstract: The presence of bigger retail outlets have brought new business opportunities and moved Malaysian retailing industry to greater heights. Hence, a study was undertaken to assess the potential impact of the proposed development of hypermarkets on existing small business retailers. The assessment was based primarily on the perceptions and expressed opinions of both the customers and sampled retailers in the states of Selangor and Penang. The objectives of the study were to: 1) understand the customers' behavior on retailing and 2) assess the small retailers regarding their performance, future outlook, and actions taken amid the development of hypermarkets in their areas. From the analysis, the customers welcomed the presence of hypermarket in their area. However, there would be short-term adverse impact on most retail outlets and the degree of the impact is determined by the type of retail business. The study also provides several recommendations for existing small retailers to stay competitive.

Key words: Retailing; Marketing; Marketing Channel

1. INTRODUCTION

The Malaysian economy is projected to grow by an average of 6% annually. This growth will be supported by domestic demand with strong private investment and consumption with the services sector is expected to sustain its growth momentum at 6.5% per year on average during the Ninth Malaysia Plan (9MP) period. The growth will come from the finance, insurance, real estate and business services as well as the wholesale and retail trade, hotels and restaurants sub-sectors (The Star, March 31, 2006).

In 2004, the performance of the retail industries is expected to increase by 10%, which is an increase of 2.6% from the previous year (New Straits Time, March 8, 2004). Currently, the retail sector alone is worth some RM57 billion, and this does not cover

distributive trade or direct selling. Retailing is now directly employing 700,000 people who constitute about 7% of the total labor force. In Malaysia, there are about 200 to 250 shopping centers taking up about 123 million sq ft. There are about 1,000 outlets of retail trade with foreign partners, based on 20% of total space in all the shopping malls (The Star, August 28, 2006). Shopping complexes not only provide better shopping experience, but also provide entertaining outing with family and friends. However, the presence of bigger retailers has posed major threats to the local small and medium retailers. With their limited resources, small retailers have difficulty in competing with these foreign retailers. This study attempts to analyze the impact of the proposed development of hypermarket on the customers and existing small retailers in the catchment areas of Bandar Bukit Tinggi in the state of Selangor and Bandar Perda in the state of Penang.

2. REVIEW OF THE LITERATURE

The Ninth Malaysian Plan (9MP) is the blueprint for the direction of Malaysia's economic and social development for the period 2006-2010, while the Third Industrial Master Plan (IMP3) maps out Malaysia's industrialization plan for the period 2006 to 2020, in the nation's quest to achieve global competitiveness. Three main sectors - manufacturing, services and agriculture – will receive special attention to further promote the transition to high value-added activities in these areas. The impetus for growth and investment is expected to come from technology and innovation driven industries. The services sector is expected to grow at 6.5% per annum with growth from the finance, real estate, wholesale & retail trade, hotels and restaurants (Bernama, March 13, 2006). In short, retailing plays a major role in the achieving the objectives of the nation's plan.

Retailing refers to the activities involved in selling goods and services directly to final consumers for their personal and non business use (Armstrong & Kotler, 2003). Retail outlets serve as the contact point between business channel members to the consumers. Retail stores come in all shapes and sizes. Boone and Kurtz (2004) define retailers into several categories: form of ownership, shopping effort, services provided and product lines. Retail outlets also vary according to the breadth and depth of the items offered to customers. For instance, hypermarkets are large stores based on a simple concept of offering consumers everything in a single outlet. Hypermarkets provide variety, quality and low prices for food, groceries and general merchandise (Kerin, et al, 2009).

Bigger retailers are still popular among Malaysian though the government tried to slow down the growth by introducing new policies, (The Star, May 9, 2002). This is because big retailers especially from foreign countries such as TESCO, Carrefour and JUSCO have brought in lucrative investments to Malaysia. The government has specified guidelines for these outlets to follow before they can set up their business in the local market. The criteria include;

- Minimum paid up capital of RM50 million (RM 3.1 = USD 1)
- Business floor area of not less than 8,000 square meters
- Provide employment opportunities for more 1,000 people

- Only operation as free standing in outskirts of city with facilities such as car parks, restaurants, rest areas and public amenities (rest-rooms, telephone, ATM machine and landscape)
- Parking convenience at the rate of 50 cars space for every 1,000 square meters
- Counter is provided every 1,000 square meters of business floor space
- Business spaces with reasonable rent rate allocated to supporting business.

Source: *Ministry of Domestic Trade and Consumer Affairs*

Retailing is continuously subjected to various external forces including customer behaviour, rival competition, legislative framework, and changes in societal status and values (Lusch, 1982). Consumers are expecting better quality products and services and this is shown when the retail trend in Malaysia is slowly moving from shop-houses to shopping complexes such as hypermarkets and departmental stores. Similarly, the UK's retail industry has experienced similar changes in the past 30 years. In fact, the presence of the superstores such as Tesco, Sainsbury and ASDA has such an influence on the industry that it is difficult to find the consumers shop elsewhere (Elms, et al, 2010).

Hypermarket started coming into Malaysia in the early 1990s. Until 2008, there are a total of 143 hypermarkets all over Malaysia. As shown in Table 1, Giant of Dairy Farm from Hong Kong has 86 stores and Carrefour has the least number of outlets in Malaysia. However, TESCO has the highest market share of 31% among the hypermarkets. This indicates that the trend of retailing in highly urbanized areas is towards shopping at complexes and hypermarkets. A study indicated that in Malaysia, 75-80 percent of shoppers use hypermarkets on a monthly basis and more than 60 percent of these shoppers use hypermarket as their main store (AC Nielsen, 2007).

Table 1: Major Foreign Hypermarkets in Malaysia

Hypermarket	Frequency	Market Share
TESCO	35	31%
Giant	86	20%
Carrefour	22	12%

Source: *Statistics Department (2008)*.

Smaller retailers in shop-houses are finding it difficult to compete with the products offering and competitive prices of large-scale retailers. Customers are shopping to hypermarkets since these outlets provide more varieties of products at cheaper prices. Lean Hing Chuan from Federation of Sundry Goods Merchants Association of Malaysia said that their members have dropped from 50,000 to 20,000 in 2009 (New Strait Times, 27 October, 2010). In addition, the government efforts to increase Malay or Bumiputera participation in retailing are also affected. Bumiputera retailing only makes up 15 percent and they are mainly hawkers and operators of sundry shops in Malay dominated residential areas. Hence, local retailers have urged the authority to stop the entry of hypermarkets in Malaysia (Wordpress, November 1, 2003).

3. METHODOLOGY

Several methods were utilized to achieve the objectives of the study. First, a descriptive study using survey method was done on the small retailers and consumers within the catchments area of Bandar Perda and Bandar Bukit Tinggi. Two sets of structured questionnaire were specifically designed for the study, i.e. retailers and consumers. Both questionnaires contain statements on the respondents' perceptions on the proposed development of the hypermarket in their areas. The retailers were identified through purposive sampling which included operators from restaurants, electrical stores, furniture stores, medicine hall/pharmacy, sundry and convenience stores. Meanwhile, the customers were identified through intercept interviews at the retail outlets in the catchment areas.

The second method used to elicit information was through personal interviews. Brief discussions were done with the officers from both local authorities, Majlis Perbandaran Seberang Perai (MPSP) and Majlis Perbandaran Kelang (MPK). The meeting was done to get inputs related to the developments of the cities and to collect maps of the catchment areas.

4. ANALYSIS

4.1 Study Areas

Bandar Perda is a new township under the administration of Seberang Perai City Council, Penang, where several development projects are currently underway. One of the major projects is a well known shopping center which is being monitored by Lembaga Kemajuan Wilayah Pulau Pinang (PERDA), a state agency. The business areas around the Bandar Perda consist of commercial properties with various types of retail establishment. Currently being developed is Bandar Perda's commercial centre which will include a mega mall. Also under construction are Aseania Mall and a five-star hotel which look set to change the landscape of Bandar Perda. Institutional facilities in this area include library, health clinics, police station and other public amenities such as sport complex, hall, and post office.

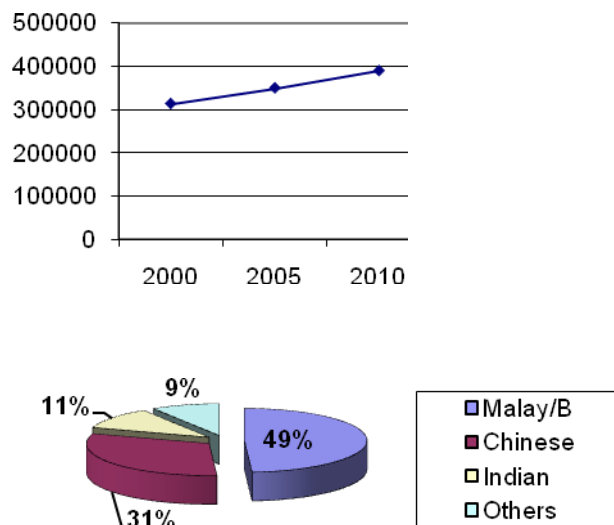
Another proposed hypermarket will be built in *Bandar Bukit Tinggi* which is under the administration of Kelang City Council, Selangor. Bandar Bukit Tinggi has many educational facilities ranging from pre-school, primary and secondary schools. Institutional facilities include library, health clinics, police station and other public amenities such as sport complex, hall and post office. The area also comprises several shop lots with various types of retail businesses such as restaurants, sundry shops, office supplies, car accessories, and workshops. As indicated in the Planning Report of Kelang City Council, there is a proposed rapid train station near the vicinity. This modern public transport facility which is scheduled to be constructed soon will make Bandar Bukit Tinggi an important business area in Kelang.

Bandar Perda houses public and private organizations. This area is full of several shop lots with various types of retail businesses such as restaurants, sundry shops, office supplies, car accessories, and workshops. Retailing competition will come from the existing small retailers which are numerous in the catchments area. The only bigger retail

outlet available in the vicinity is Carrefour hypermarket which is about 5 km away. Meanwhile, in *Bandar Bukit Tinggi* the proposed departmental store would be in direct competition with several foreign hypermarket and departmental stores already operating in the catchments area. Tesco is located one kilometer from the proposed site and Giant is conducting its business is about 1.5 kilometer within the catchments area of the proposed site. Meanwhile, Econsave supermarket is located 3 kilometer away in the area.

As of 2004, the population of Seberang Perai stood at 313,607 and by 2010 the population is forecasted to increase to 390,000. This shows an increase of 3.4% each year. In terms of the ethnic breakdown, 49% of the population is Malay, 31% is Chinese, and the other 11% is Indian. The other 9% is made up of people from other races. Figure 1 shows the population size of Seberang Perai.

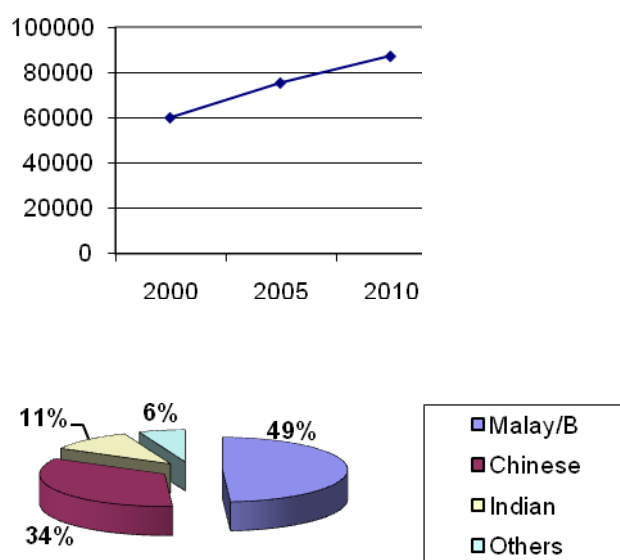
Figure 1: Population of Seberang Perai



Source: *Seberang Perai City Council*
Structural Plan of Penang 2005-1020

Bandar Bukit Tinggi is part of Pandamaran in the state of Selangor. In 2002, the population stood at 60,191 and by 2010, the population is forecasted to increase to 87,277. This shows an increase of 4.5% each year. In terms of the ethnic breakdown of Pandamaran, 49% of the population is Malay, 34% is Chinese, and the other 11% is Indian. The other 6% is made up of people from other races. Figure 2 shows the ethnic breakdown of the population in 2004.

Figure 2: Population of Pandamaran



Source: *Kelang City Council
Local Planning of Kelang 2002-2015*

4.2 Perceptions of Consumers

A total of 147 customers from Bandar Perda and 147 customers from Bandar Bukit Tinggi participated in the survey. In the study, there was more participation from the female respondents from both cities. Most of the customers interviewed in the study were Malay/Bumiputra. As shown in Table 2, an average of 16.0% of the customers made up of Chinese, and Indians made up another 13.1% of the respondents. Also, the majority of the sampled customers (61.8%) live in the catchments area. An average of 23.4% of the customers worked in the surrounding offices or factories.

Table 2: Profile of Customers

	Bandar Perda (n = 147)	Bandar Bukit Tinggi (n = 147)
Gender		
- Male	40.1%	45.6%
- Female	59.9%	54.4%
Race		
- Malay / Bumiputera	72.8%	64.6%
- Chinese	15.0%	17.0%
- Indian	11.2%	15.0%

- Others	1.0%	3.4%
Category		
- Nearby residents	68.5%	55.1%
- Office workers	22.1%	24.7%
- Others	9.4%	20.2%

The study also elicits information from customers regarding their opinions on the development of a hypermarket in their area. Ten statements were used to measure the customers' perceptions and their feedbacks were analysed using Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree). The overall responses of the customers are shown in Table 3. The results are based on the total average scores among the respondents from both Bandar Perda and Bandar Bukit Tinggi.

Table 3: Perceptions of Customers on Hypermarket

Statement	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
Hypermarket fulfills customers' needs	1.1	5.5	5.1	57.5	29.8
Hypermarket would improve development in the area	1.4	6.8	7.1	53.1	30.6
Residents do not need Hypermarket	23.5	41.8	12.2	17.8	5.1
Buy kitchen items at Hypermarket	1.4	11.1	10.9	40.8	20.9
Buy electrical goods at Hypermarket	1.4	16.3	19.4	51.4	10.4
Buy house-hold products at Hypermarket	1.7	7.4	17.4	53.5	16.3
Stop shopping at smaller retail outlets	8.3	37.1	16.3	36.1	10.1
Hypermarket has negative effects on small retail outlets	4.8	22.2	15.3	28.1	21.4
Should not develop a Hypermarket here	13.9	46.9	16.4	18.4	4.1
Still loyal toward my store	8.5	11.2	22.1	45.9	19.8

Opinions on Hypermarket

The analysis shows that the majority of the customers have positive view of the hypermarket. This is shown when 86.3% of the customers were either strongly agree or agree with the statement "Hypermarket fulfills customers' needs". Only 6.6% of them were either strongly disagree or disagree with the statement. Furthermore, they believed that the hypermarket would help develop their cities. For statement "Hypermarket would improve development in the area", 83.7% of the customers either strongly agreed or agreed with the statement. Only 8.2% of them thought otherwise. Regarding the proposed development of hypermarket, the majority of the sampled customers welcomed the idea. As shown in Table 3, 65.3% of them were either strongly disagree or disagree with the statement "Residents do not need hypermarket". Only 22.7% of them opposed the development of a hypermarket in the area.

Influence of Hypermarket on Buying Habits

The customers agreed that the hypermarket offers more varieties and sells many products. The study asked the types of products the customers would buy in a hypermarket. From the analysis, majority of the customers surveyed would prefer to purchase the different types of products offered by the hypermarket. For instance, 61.7% of customers would either strongly agree or agree to purchase kitchen items at the hypermarket. Only 12.5% of the customers would not do so.

For house-hold items, 69.9% of the customers indicated that they would buy these products at a hypermarket. Only 9.1% of them would prefer to purchase them at other retail outlets. For electrical goods, 61.8% would either strongly agree or agree to purchase these items at a hypermarket. Compared to other types of products, electrical goods received lower response from the customers. This is because some customers prefer to purchase electrical goods at specialty stores which sell only a single product line but at considerable depth. In summary, the above findings reported that majority of the customers believed that the hypermarket has a positive impact on the customers. However, with the proposed development of a hypermarket, the customers showed mix reaction on stopping to purchase their goods at smaller retail outlets. This is because, 45.4% of the customers strongly disagreed or disagreed with the statement “Stop shopping at smaller retail outlet”. In fact, 65.7% of the customers said that they would still be loyal to their original outlet.

4.3 Perceptions of Small Retailers

The study analyses the perceptions of local retailers on the future development of a hypermarket in their area. A total of 149 small retailers from Bandar Perda and 121 retailers from Bandar Bukit Tinggi participated in the study. From the study, more responses were gathered from retailers of sundry and grocery stores in both Bandar Perda and Bandar Bukit Tinggi. Meanwhile, pharmaceutical or Chinese medicine store was found to be the least with only 5% in Bandar Perda and 4.7% in Bandar Bukit Tinggi of these retailers participated in the survey. Table 4 lists the types of sampled retail outlets in the study.

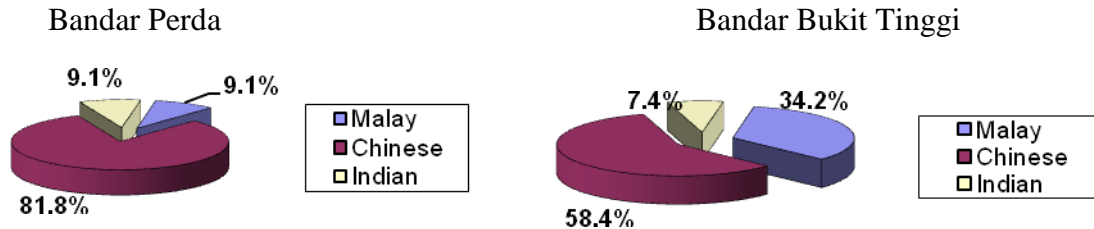
Table 4: Types of Retail Outlets

Retail Outlet	Bandar Perda (n=149)		Bandar Bukit Tinggi (n = 121)	
	Frequency	%	Frequency	%
Grocery/Sundry shop	24	16.1	21	17.4
Food / Restaurant	24	16.1	21	17.4
Electrical/appliance	17	11.4	12	9.9
Clothes	16	10.7	12	9.9
Furniture	13	8.7	9	7.4
Medicine/Pharmaceutical	7	4.7	6	5.0
Others	48	34.3	40	32.0

In terms of ownership, most of the retailers sampled were Chinese. This is typical of the retailing industry in Malaysia where the majority of retail outlets are run by the

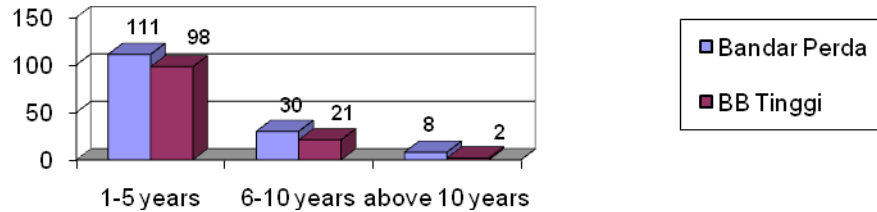
Chinese. The figures below show the breakdown of ownership of the outlets according to race.

Figure 3: Ownership of Outlets According to Race



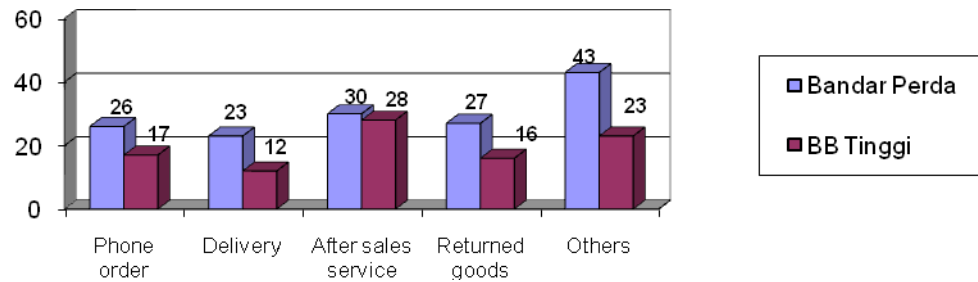
Established retailers have their own regular customers that patronize the outlets. The information regarding the years of establishment of the existing retail outlets is important since it influences the acceptance of their existing customers towards the proposed hypermarket. The majority of the retailers (80.9%) in Bandar Bukit Tinggi started their business at least 5 years ago, i.e. since 2004. Meanwhile, 74.5% of the sampled retailers in Bandar Perda started their business 5 years ago. Figure 4 shows the year of establishment among the sampled outlets.

Figure 4: Year of Establishment



Smaller outlets are known to provide extra services to their customers. Services offered are generally related to the type of retail outlet. For example, delivery service is normally provided by furniture and household shops while returned goods facility is offered by electrical stores. From Figure 5, more retailers from Bandar Bukit Tinggi (30%) offered after sales service to their customers as compare to retailers from Bandar Perda (28%).

Figure 5: Types of Services Provided



Information regarding the business trend and daily sales is important in analyzing the performance of the existing retailers amid the competition especially with the future development of the hypermarket in the immediate vicinity. As indicated in Figure 6, the general business trend among the existing small retailers in Bandar Bukit Tinggi is stable. The business performances of the existing retailers were the same in the last three years. The daily sales among the five categories (ranging between RM500 to RM5000) are quite similar. In Figure 7, the results also showed similar trends among the small retailers in Bandar Perda.

Figure 6: Daily Sales from 2006 - 2008 (Bandar Bukit Tinggi)

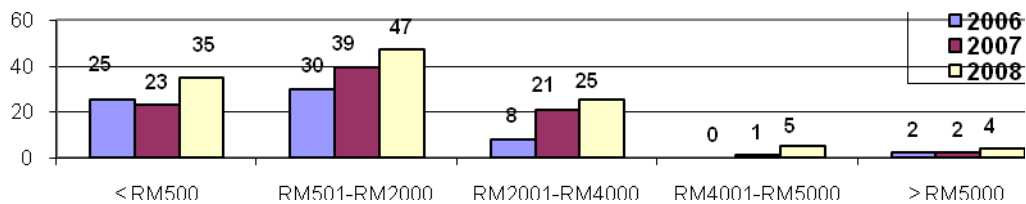
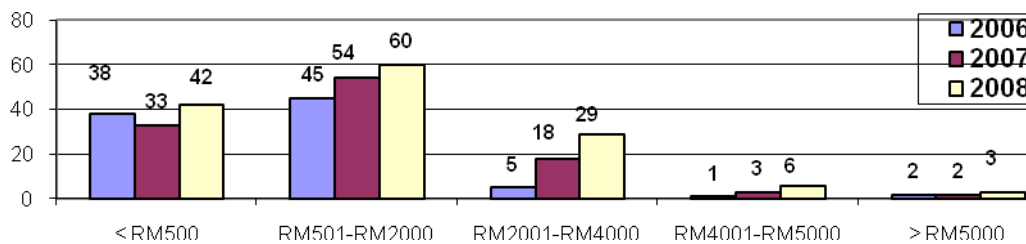


Figure 7: Daily Sales from 2006 - 2008 (Bandar Perda)



4.4 Small Retailers on the Development of Hypermarket

Issues of Operating Outlets

The sampled retailers were initially asked the difficulties that they encountered when setting up their stores. Table 2 shows the ranking of the main problems faced by the retailers when operating their retail outlet. Retailers from both cities claimed that competition would be their biggest threat in operating their business. Hence, the proposed hypermarket would further worsen the problem among the small retailers.

Table 5: Problems of Operating Outlet

Problems	Rank	
	BB Tinggi	Bandar Perda
Competition	1	1
Changes in customers' needs	2	2
Capital	3	5
Not strategic location	4	4
Workers	5	6
Supplies	6	7
Space	7	3

Impact of Hypermarket

Local retailers were interviewed to get their opinions regarding the proposed development of a hypermarket in their area. The perceptions of the respondents were analysed based on a 5-point Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree). Seventeen statements were used to measure the retailers' perceptions ranging from the impact of the departmental store on the existing retailers and future efforts undertaken by the retailers to sustain and improve their business. The overall responses from the retailers are shown in Table 6. The results are based on the total average scores among the respondents from both Bandar Perda and Bandar Bukit Tinggi.

Table 6: Perceptions of Retailers on Hypermarket

Statement	Strongly disagree %	Disagree %	Neutral %	Agree %	Strongly agree %
Hypermarket offers more varieties	0.7	5.3	5.6	66.6	21.8
Hypermarket has cheaper priced products	1.4	21.6	17.1	51.4	8.4
Hypermarket customers are different than other outlets	0.1	16.1	12.3	60.6	12
Hypermarket would be my main competitor	1.4	8.5	11.7	66.3	10.8
Hypermarket would bring more customers in the area	0.4	18.4	11.3	55.2	15.9
Hypermarket main competitor is other big retailers	2.9	6.8	13.1	65.1	12.1
Smaller outlets have problems because of too many big retailers	1.4	7.7	7.2	67.1	16.2
Hypermarket would cause traffic problems in the area	2.2	12.8	13.2	51.4	20.8
Average expenditure of my customer would decrease	8.3	27.2	21.1	40.8	6.5

My customers would increase with the presence of Hypermarket	1.4	31.5	31.1	34.5	11.6
My outlet has different attraction than Hypermarket	0.7	6.8	13.5	64.1	15.0
My regular customers would still be here	0.4	12.8	15.8	56.2	14.9
Hypermarket does not affect my sales	2.6	26.2	13.6	48.0	9.8
Presence of Hypermarket makes me work harder	0.1	13.6	15.9	51.7	18.9
Smaller retailers have own strategy to attract customers	0.2	2.2	9.3	61.8	26.8
Oppose the development of Hypermarket in the area	1.7	26.1	20.6	39.8	13.9
Location of Hypermarket should be far away from residential areas	1.7	28.7	22.8	37.0	9.9

Opinions on Hypermarket

The majority of retailers supported the idea that hypermarket is good for the customers and the local business. This is shown when 88.4% of the retailers from both cities were either strongly agree or agree with the statement “Departmental store offers more varieties”. In addition, 59.8% of them supported that the goods sold in a departmental store are much cheaper. The presence of a hypermarket would also attract more customers to come to the city. The majority of the sampled retailers agreed and strongly agreed that “Hypermarket would bring more customers in the area”. Only 18.8% of them thought otherwise. The retailers from both cities also commented on the features of a hypermarket. In terms of customers, about 72.6% of them agreed and strongly agreed that “Departmental store’s customers are different than other outlets”. Regarding competition, the majority of the sampled retailers thought that the main competitor of a hypermarket is from another bigger retail outlet.

Problems Created by Hypermarket

Obviously, the presence of a hypermarket would affect the business performance of the smaller retail outlets. The study also finds out the potential problems that the retailers would encounter when a hypermarket operates in their area.

First, the majority of the retailers thought that competition would be much stiffer with the presence of a hypermarket. About 83.3% of the retailers were either strongly agree or agree with the statement “Smaller outlets have problems because of too many big retailers”. Second, they realized that their customers would tend to spend less at smaller retail outlets. As shown in Table 6, 47.3% of the retailers were either strongly agree or agree with the statement “Average expenditure of my customer would decrease”. Third, the presence of a hypermarket would also create traffic woes in Bandar Bukit Tinggi and Bandar Perda. This is evident when 72.2% of the retailers supported the idea that “Hypermarket would cause traffic problems in the area”.

Suggestions on Future Development of Hypermarket

The retailers were asked on issues related to the setting up of a hypermarket. Basically, majority of them opposed the development of a hypermarket since it would affect their business. This is shown when 53.7% of the retailers were either strongly agree or agree with the statement “Oppose development of hypermarket in their area”. Only 27.8% of them would just ignore the situation and try their best to compete.

In terms of location, more retailers suggested that the hypermarket should not be built close to the residential areas. As indicated from the study, 46.9% of the retailers were either strongly agree or agree with the statement “Location of the hypermarket should be far away from residential areas”. Meanwhile, 30.4% of them had no problem of building a hypermarket near the residential areas.

Efforts amid Competition from Hypermarket

The retailers commented on actions that they would take in anticipating the development of a hypermarket in their area. The retailers realized that customers would be more tempted to visit a hypermarket than smaller outlets. However, they believed that they could still compete because small retail outlets are “different attraction than hypermarket” and “smaller outlets have their own regular customers”. Therefore, smaller outlets are capable of doing business amid the competition from the bigger players. This is shown when 57.8% of the retailers were either strongly agree or agree with the statement “Hypermarket does not affect my sales”.

As indicated in the findings, most of the retailers (70.6%) were either strongly agree or agree with the statement “Presence of hypermarket makes me work harder”. In addition, they need to take proper actions in order to attract the customers to their outlets. This is shown when 88.6% of them were either strongly agreed or agreed with the statement “Smaller retailers have own strategy to attract customers”. Among the efforts suggested by the existing retailers to improve their business performance include:

- Provide better services
- Conduct frequent sales promotion
- Provide after sales service
- Accept payment via credit cards

5. CONCLUSIONS

5.1 Impact on Retail Trade

The findings from the study indicate that the existing retail outlets in Bandar Bukit Tinggi and Bandar Perdana would be affected by the development of hypermarket. The responses from the sampled retailers indicated that the impact would be felt at least in the short term especially the early months of the opening of the hypermarket. The seriousness of the impact on the existing retailers is dependent on the types of retail establishments. Some retailers selling kitchen items and house hold goods might face a longer term impact from the development of the hypermarket due to the similar nature of product offering with hypermarket and consumer buying habits and preference pertaining

to the products. Clothing shop would also be affected due to the fact that their product offerings overlap with those of the hypermarket and the possibility of the store offering lower price for these products. Electrical and convenience stores appear to be the least affected by the proposed hypermarket. This is because their specialty products are quite different from those typically offered by the hypermarket. Moreover, these types of outlets are important to consumers in terms of convenient and emergency purchases (New Strait Times, Sept 2, 2003).

Interestingly, the existing retailers in general believe that the proposed hypermarket would have a positive impact on the local economy and business in the area. Consequently, this situation would improve the business activities of the sampled retail outlets. The retailers would work harder to take advantage of the extra customers brought by the hypermarket to the area. As such, the existing retail outlets are still relevant today. In fact, the former Minister of Domestic Trade and Consumers Affairs, Tan Sri Muhyiddin Mohd Yassin, had called upon the small retailers to participate in the supermarket and hypermarket activities. (Harian Metro, 11 July, 2003)

The increased competition would call for more effective and efficient management of these retail outlets. The inefficient ones might have to cease operations or merge into bigger entities. The trend is happening in other parts of the country and similarly to Bandar Bukit Tinggi and Bandar Perda as well.

5.2 Impact on Bumiputera Retailers

Bumiputera (indigenous people of Malaysia) participation in the retailing industry has been acknowledged to be low. Based on the information from the survey, Bumiputera retailers are very much under-represented in the retail trade sector in both cities. Since their number is small, the impact of the proposed hypermarket on Bumiputera retailers would be minimal.

However, the proposed hypermarket can contribute positively toward the Bumiputera's representation in the retail sector in Bandar Bukit Tinggi area. As required by the government, development of bigger retail unit needs to provide business opportunities for the Bumiputera. According to the Director of Development in the Prime Minister Department, the government policy is to increase the involvement of Bumiputera in distributive trading (Convention of Bumiputera in Distributive Trading Sector at PWTC, 19-20 September, 2000). Therefore, the contribution of a hypermarket would come in a number of ways such as:

1. encouraging to actively seek qualified and potential Bumiputera retailers to act as suppliers to the hypermarket,
2. getting small-scale Bumiputera entrepreneurs to supply speciality items such as traditional cookies and medicine to the hypermarket,
3. offering Bumiputera entrepreneurs to sell their products at business areas and kiosks provided by the hypermarket.

The government also plans to increase the participation of Bumiputera in the retailing industry under 9MP. As mentioned by the Minister of Entrepreneur and Cooperative Development, the "One District One Industry" program is designed to

encourage the participation of Bumiputera products in the market (Bernama, 23 March, 2006).

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The Land Market in Latvia after its accession to the European Union

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Abstract: Many authors have researched the impact of support payments on land markets. It was observed that land rental values and also land market values increase due to their impact. The impact was observed in Latvia until 2007. With the beginning of the financial crisis, which also affected Latvia, the macroeconomic indicators made a more significant impact on the land market, although the amount of support payments increased. A sharp downturn in Latvia's land market continued until 2009, which was followed by a moderate decrease in 2010. It is forecasted that Latvia's situation will improve in the future.

Key words: single area payment, financial results, agricultural land

INTRODUCTION

Agriculture is one of the most important industries in the national economy of Latvia that uses the main Latvia's natural resource in production, i.e. land, which together with labour, capital, and entrepreneurial skills significantly contributes to the country's GDP. In the agricultural industry, land is defined as the most important type of investment without which no business activity can be imagined. The market of agricultural land as a part of the market of real estate and land serves as an indication of the country's economic development.

It seemed that the accession of Latvia to the EU would provide both business development and an increase in the standard of living, besides, a high inflation was expected, but the large funding that will be allocated for Latvia's agriculture (small and large farms, companies) to successfully align with the EU market was mentioned as the largest gain.

Latvia's accession to the European Union positively impacted its agriculture, which was assured by several authors in their researches (Veronika Buģina and Ģirts Krūmiņš 2005; Daina Saktiņa and William H. Meyers 2005; Laimdota Straujuma and Kazimirs Špoģis 2006, Irina Pilvere 2007; Armands Vēveris, Ieva Leimane, and Agnese Krieviņa 2007; Aina Dobeļe 2007; Sanita Kļava and Irina Pilvere 2009; a.o.).

Pilvere (2008) researched the development of Latvia's agricultural industry after the accession to the EU. The author analysed the amounts of EU support and their role in

the national economy. She found that “the amount of the disbursed support over the reference period has increased 6.4 times and this rise assuringly exceeds the increase rates of other agricultural indicators demonstrating that part of the support is evidently channelled to cover the growing costs”. Straujuma and Špoģis (2006) researched the financial situation in rural areas and concluded that area payments have a positive role, although not always these payments are invested in the development of these farms.

The European Commission published a report on the prospects of agricultural industry for the period 2008-2015, explicitly pointing to the stability and even growth of this industry. It states that “despite the significant short-term setback in the wake of the economic recession, the medium-term prospects for EU agricultural income remain positive with the aggregate income in real terms and per labour unit exceeding the very favourable 2007 year by 7.5% in 2015. While agricultural income in the EU-15 would show a very moderate development, it is foreseen to display a more pronounced picture in the EU-12 supported by the continuous increase in CAP payments” (European Commission 2009a).

Several authors have researched a problem that emerged after receiving the area payments for agricultural land. There are various hypotheses that the area payments impact the market price of agricultural land.

In her research on the agricultural land market in Latvia, Julia Lebedinska, Rita Pētersone, and Inese Zariņa (2005) pointed that “the noticeable growth is in the years 2003 and 2004. Real estate analysts are considering that this is because of Latvia’s entrance into the EU. Real estate analysts are also predicting growth of agricultural land prices in the next years.” The prices of agricultural land are significantly different depending on the region where this land is sold. For instance, the prices of land are relatively much higher in Zemgale region than in the regions of Latgale and Vidzeme. This fact was also pointed by Lebedinska (2005) who said, “However agricultural land prices are very different within Latvia. The highest prices are in the central part of Latvia, where land is fertile and topography is suitable for agriculture”.

The problems of owners and real managers of agricultural land in the new member states (NMS) were researched by Laure Latruffe and Sophia Davidova (2007:452). They found that “if landowners are not satisfied with the level of rent they receive from the farm, they have the option to end their rental contract and withdraw their land, and thus endanger the corporate farm’s existence. This is an important issue for some of the NMS where corporate farms (producer co-operatives, joint-stock companies and limited liability companies) cultivate the majority of agricultural land, e.g. the Czech Republic and Slovakia”. Yet it was found in their research that “the landowners who have frequent contacts and close relations with the farm are less likely to withdraw, indicating that their payoffs depend not only on the monetary returns from cashing the direct payments but also on some nonpecuniary characteristics”. It means that there is no reason to state that mostly the EU support impacts the rental values and the market in general. These concomitant circumstances and indicators have to be analysed and ascertained.

Michael J. Roberts, Barret E. Kirwan, and Jeffrey W. Hopkins (2003) reveal in their research on the impact of government programs on agricultural land rental values in the USA that any type of support is related to production, i.e. agricultural land is used for growing crops and feed crops, while rental values are not so volatile, as the landowners

who do not farm their land cannot receive the relatively large support that is paid to real producers.

A body of authors in the European Union – Myles Patton, Joan Moss, Seamus McErlean, and Philip Kostov (2008) – declare their findings on the impact of direct payments on land rental values and state that “the results provide empirical evidence that the impact of CAP direct payments on rental values varies according to the type of payment”. Based on historical reference, the authors further point that by fully decoupling direct payments from production, i.e. farmers receive payments that are not directly related to production, a result will be achieved that the rental values are not volatile.

Pavel Ciaian, D’artis Kancs, and Johan F.M. Swinnen (2010: 13) in their research on EU land markets and the Common Agricultural Policy point that such types of support as single area payments and other ones which are paid for hectares of agricultural land that are farmed have an impact on the land market. As a result, land rents and the market value of agricultural land increase. However, the authors also point that the types of EU support are not the only factors that impact the land price. There are many and various other factors, and the significance of their impact is different in various EU countries.

Ciaian, Kancs, and Swinnen (2010: 17) point to the fact that “generally, the lower the land price, the higher is the impact of CAP policies in this respect (e.g. in the Nordic regions in Finland and Sweden). In countries such as the Netherlands and Ireland, where land prices are very high or are rapidly increasing, factors other than CAP policies appear to have a greater bearing”. As a result, it is clear that in order to understand how significant is an impact of support payments on land prices in every county, a separate study has to be done.

For instance, if we review the situation in the agricultural land market in Poland, Andrzej Zadura (2005:5) admits that “prices of agricultural land, after accession to EU, have increased but it is not expected that Poland would be able to repeat the growth of prices in some western countries (e.g. Ireland)”.

One of the economic development indicators is also a situation in the real estate market. Economic processes and indicators impacting the national economy significantly affect the market of agricultural land as well. Many economic indicators are mutually interconnected.

The paper’s hypothesis: the market of agricultural land is impacted not only by Latvia’s accession to the European Union, but also the macroeconomic processes in the country and in the whole world.

The paper’s aim is to investigate in detail Latvia’s market of agricultural land, changes in it, and to determine the extent of impacts of various factors on it after Latvia’s accession to the EU in 2004.

To achieve the research aim, the following research tasks are set forth:

- 1.To assess the impact of cadastral value of agricultural land on the market value of land;
- 2.To analyse the significance of impact of EU single area payments on the agricultural land rental values and market prices in Latvia;

3.To ascertain the macroeconomic indicators impacting the volatility of agricultural land market values.

To conduct the research, Eurostat data and information published by the Central Statistical Bureau of Latvia regarding macroeconomic indicators were used. Data on the values of transactions on agricultural land were obtained from the Land Register system at the Justice and Land Register Department, Ministry of Justice of Latvia.

Information published on the Farm Accountancy Data Network (FADN) of the Latvian State Agrarian Economics Institute was used in the present research. Information compiled by the Rural Support Service (RSS), which is supervised by the Ministry of Agriculture, on area payments in agriculture after joining the EU was also used.

The main methods used in the paper are as follows: logical comparative analysis of the scientific literature, methods of grouping, structuring, methods of dynamic time series analysis as well as the general analysis and synthesis, scientific induction, deduction methods, and statistical methods.

In the paper, Latvia's situation during the period 2004-2009 was viewed and analysed. In some cases if data for the year 2010 are already available, the research period is 2004-2010.

RESULTS

I Changes in the value of agricultural land

This chapter analyses changes in the number of transactions of agricultural land and in its cadastral value for the period 2004-2010.

Cadastral assessment is a periodic assessment of all real properties at a specific time frame. In Latvia it is called a cadastral assessment, but in the world it is a mass reassessment of real properties. During a mass reassessment, the value of real property is based on market values, using standardised procedures and calculations. The reassessed values of real properties are used for calculating real property taxes (State Land Service 2010).

One of the most significant factors affecting the cadastral value of real property is information on the real estate market. In fact, a cadastral value has to be equal to a market value or at least quite close to it.

Uses of cadastral values:

- To calculate real property taxes (the widest use)
- To calculate state fees (to register a transaction at the Land Register, to settle inheritance matters etc.)
- To calculate land rental values
- To set the price of construction sites for privatisation purposes
- To set rental rates for land belonging to the national and local government
- To calculate the necessary number of privatisation certificates for implementing the land reform (State Land Service 2010)

The cadastral value of real property is mostly impacted by the location of it – whether the real property lies in an attractive and popular territory or in a remote rural territory. Besides, its value is also affected the type of use of it (purpose of use), liens, and sizes (area, building size). It is important to note that in calculating cadastral values, only the data included in the national cadastral information system of real property are taken into account, and therefore cadastral values might differ from market values if the data do not correspond to the real condition of real property, including the type of use that is determined by the local government (State Land Service 2010).

In Latvia, the database of cadastral values is revised for all real properties each year.

The market value of agricultural land is determined by such additional factors as soil fertility that depends on the location of land. The size of land plot and the situation in the agricultural industry also have impacts on the land market in a particular region.

The State Land Service calculates the cadastral value of rural land using the following formula:

$$K_v = (P_{LIZ} \times Bv_{LIZ} + P_M \times Bv_M + (0,2 \times P_{P_Z} + P_{P_D}^*) \times Bv_{LIZ}^* + C_{maja}) \times K_{apgr} \times K_p, \text{ kur}$$

(1) where

K_v – cadastral value in LVL;

P_{LIZ} – area of agricultural land in hectares;

Bv_{LIZ} – base value of zone of agricultural land in LVL per hectare;

P_M – area of forest land in hectares;

Bv_M – base value of zone of forest land in LVL per hectare;

P_{P_Z} – area of other land in hectares;

$P_{P_D}^*$ – area of land under ponds and that of yards in hectares;

Bv_{LIZ}^* – base value of agricultural land of quality group 3 in LVL per hectare;

C_{maja} – constant rate for the impact of residential house;

K_{apgr} – correction rate for liens;

K_p – correction rate for pollution.

Cadastral values are calculated for all the cadastral objects registered at the national cadastral information system of real property (Latvian Cabinet of Ministers 2006).

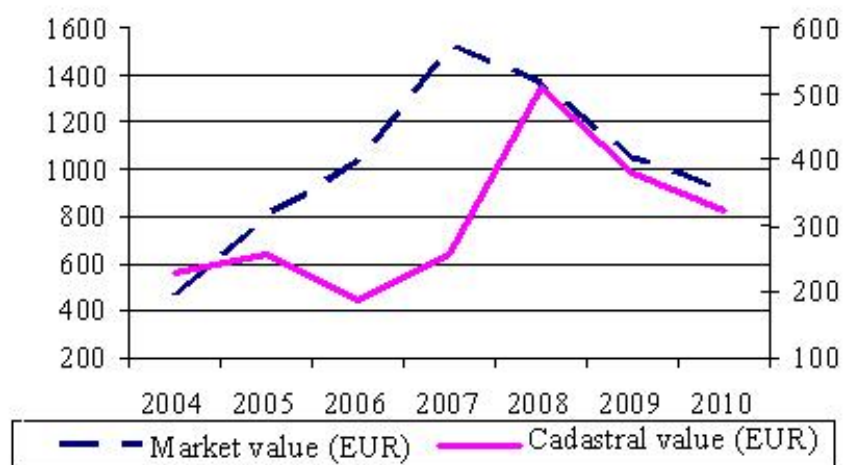


Figure 1: Cadastral and market values of land in Latvia in 2004-2010

Source: Land Register system at the Justice and Land Register Department, Ministry of Justice of Latvia

Figure 1 includes information on the cadastral values of agricultural land and its market values during the period 2004-2010.

According to Figure 1, one can conclude that a sharp increase in land value took place after Latvia's accession to the European Union in 2004. Not only the market values, but also the cadastral values that depend on a situation in the market increased.

The average cadastral value of agricultural land was EUR 230 in 2004, and the average market value was EUR 466 per hectare. The fastest increase of market values was observed from 2004 to 2005 when the market values rose 71%, reaching EUR 801 per hectare. The highest market prices on land were in 2007, reaching EUR 1525 per hectare.

Irrespective of the fact that cadastral values have to correlate with market values, the situation in the market changed very fast from 2004 to 2008 and the State Land Service could not operationally react on these changes. A mass reassessment of cadastral values was done in 2008, which can be seen in Figure 1. There is a strong correlation between the market and cadastral values of agricultural land.

A decrease in the land market occurred after the year 2008, the causes and impacting factors of which are explained and analysed in the next chapters of the paper.

Latvia is divided into regions in accordance with Regulation No.271 *On the Statistical Regions and their Administrative Units of the Republic of Latvia* accepted by the Cabinet of Ministers of the Republic of Latvia on April 28, 2004 and the statistical territorial classification of the European Union (NUTS 3) for six statistical regions:

- Rīga region (Rīga);
- Pierīga region (Jūrmala, Limbaži district, Ogre district, Rīga district, Tukums district);
- Vidzeme region (Alūksne district, Cēsis district, Gulbene district, Madona district, Valka district, Valmiera district);
- Kurzeme region (Liepāja, Ventspils, Kuldīga district, Liepāja district, Saldus district, Talsi district, Ventspils district);

- Zemgale region (Jelgava, Aizkraukle district, Bauska district, Dobele district, Jelgava district, Jēkabpils district);
- Latgale region (Daugavpils, Rēzekne, Balvi district, Daugavpils district, Krāslava district, Ludza district, Preiļi district, Rēzekne district).

Table 1 shows the ratios of cadastral and market values for agricultural land by region.

Table 1: Cadastral values as a percentage of market values

Region	2004	2005	2006	2007	2008	2009	2010
Rīga	57.1	36.7	12.3	12.9	66.7	26.7	29.6
Pierīga	60.7	29.7	20.4	14.1	38.7	35.5	35.3
Vidzeme	45.7	30.4	16.5	15.2	21.5	29.0	31.0
Kurzeme	44.4	30.2	18.5	20.1	31.9	44.3	47.8
Zemgale	53.7	30.9	19.3	18.3	38.7	45.7	33.2
Latgale	34.1	34.7	23.1	25.8	30.4	32.6	41.4

Source: Land Register system at the Justice and Land Register Department, Ministry of Justice of Latvia

The calculations in Table 1 show to what extent the cadastral values reach the market values in Latvia's regions.

Over the seven year period, the cadastral values on average account for 27-35% of the market values. In the regions of Zemgale and Rīga, agricultural land is more valuable for various reasons. In most cases, the agricultural land of Riga region is transformed into land for construction. Whereas the agricultural land of Zemgale region has the richest soils among the other regions and therefore its value is higher. Zemgale region is called “the granary” of Latvia.

An economic boom was observed in 2006 and 2007. If assessing the cadastral values as a proportion of the market values, one can see that the lowest proportions appear during these years of economic boom. Taking into consideration this situation, the State Land Service made a mass reassessment of cadastral values of land, and it can be already observed in 2008 that the cadastral values account for greater proportions of the market values; there was a 5 %-point increase in Latgale region and even a 53 %-point increase in Rīga region. For instance, the cadastral value of 1 ha of agricultural land in Rīga region in 2007 was EUR 297.2, whereas it was EUR 711.4 in 2008. In Zemgale region, the average cadastral value was EUR 278.5 in 2007, but a year later it reached EUR 695.1. It can be explained by the fact that a new zoning of land is elaborated every four years. It is used in the formula of calculating cadastral values of land. The new zoning was introduced on January 1, 2008, which determined the significant increase in the cadastral values of land.

II Impact of Single Area Payments on the Land market in Latvia

Farmers receive various types of support after Latvia's accession to the European Union. Single area payments (SAP) are one of the types of support that has a strong correlation with land rental values.

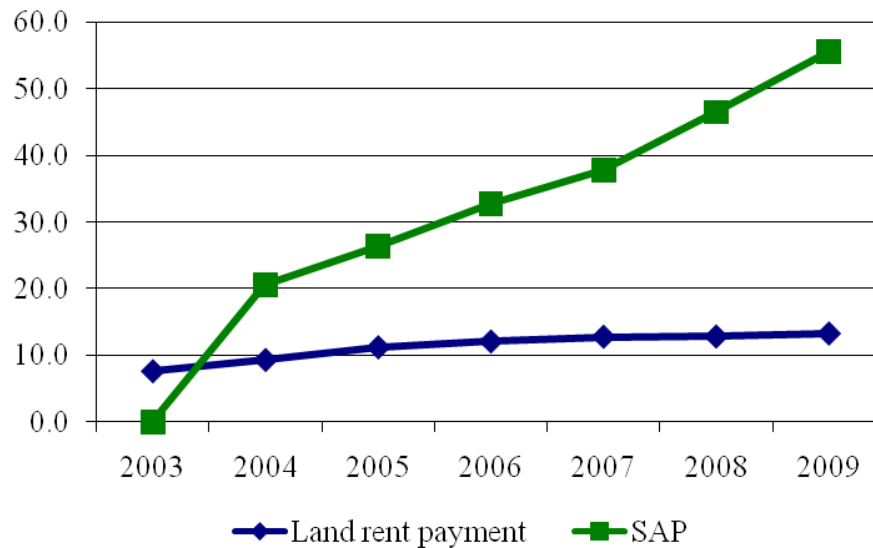


Figure 2: Land rental values and SAP in Latvia in 2003-2009, EUR

Source: author calculations according to the Farm Accountancy Data Network (FADN) and RSS data, 2003-2009.

Figure 2 shows that the single area payments impact the land rental values.

The average rental value increased from EUR 7.70 per hectare in 2003 to EUR 13.3 in 2009. The single area payments increased more than twice as much; in 2004 it was EUR 20.66 per hectare, whereas in 2009 these payments reached EUR 55.61.

By using MS Excel tools, a correlation coefficient was computed. Its value $r=0.88848$ shows that there is a strong linear positive correlation between the variables – with increase in the rate of single area payments, the land rental values also increase.

Table 2 include the calculation of average market values for agricultural land in Latvia's planning regions as well as the rates of SAP are presented for the period 2004-2010.

Table 2: Average market values of agricultural land and rates of single area payments in Latvia's regions in 2004-2010, EUR/ha

	2004	2005	2006	2007	2008	2009	2010
Rīga region	498.0	1067.2	1109.3	2312.2	1067.2	1067.2	1015.9
Pierīga region	490.2	957.1	1018.2	1747.0	1450.0	1231.8	1008.4
Vidzeme region	433.0	624.4	882.0	1202.5	1283.4	964.3	851.4
Kurzeme region	460.6	771.9	1153.8	1529.4	1801.3	1136.9	837.1
Zemgale Region	436.5	936.9	1340.1	1522.0	1797.1	1213.1	1147.3
Latgale region	481.2	450.4	677.8	839.3	813.6	679.3	570.4
Rate of SAP	20.7	26.4	32.8	37.8	46.5	55.6	65.5

Source: author, based on Land Register system at the Justice and Land Register Department, Ministry of Justice of Latvia and RSS data, 2004-2010.

According to the data presented in Table 2, one can make the following conclusions:

It is not possible to state without doubt that the average market value depends on region or year where such deals have been made, as any region has land plots of various values.

After analysing the general changes in the market values per 1 ha of agricultural land in Latvia, one can see that an upward trend is observed from 2004 to 2007 in such regions as Rīga, Pierīga, and Latgale. The market values of agricultural land continued to go up in 2008 in the regions of Vidzeme, Kurzeme, and Zemgale.

An impact of the stable increase in the rates of single area payments on the market values could be observed until the year 2007. After computing the values of correlation coefficient and analysing relationships between the market values and the single area payments, it was concluded that there is a strong linear relationship between the data over different periods. In the regions of Vidzeme, Kurzeme, and Zemgale, such a strong relationship can be observed during the period 2004-2008. It has to be noted that the mentioned regions has richer soils compared to the regions of Rīga, Pierīga, and Latgale.

The fastest decrease in the market values per 1 ha occurred from 2007 to 2008 in Rīga region where the average market value fell by 54%, and it kept falling at a slower rate even until 2010. In the regions of Vidzeme, Kurzeme, and Zemgale, the average market value compared to the previous year decreased in 2009.

III Impacts of Macroeconomic Indicators on the Land market in Latvia

To assess and analyse the impacts of economic indicators on the land market in Latvia, it is important to understand and assess the economic situation in the world since the moment when Latvia joined the European Union.

The economic growth in the world was observed since 2003. Figure 3 shows changes in GDP. GDP is one of the most important indicators of national economy that

indicates a country's economic development level and characterise its population's standard of living.

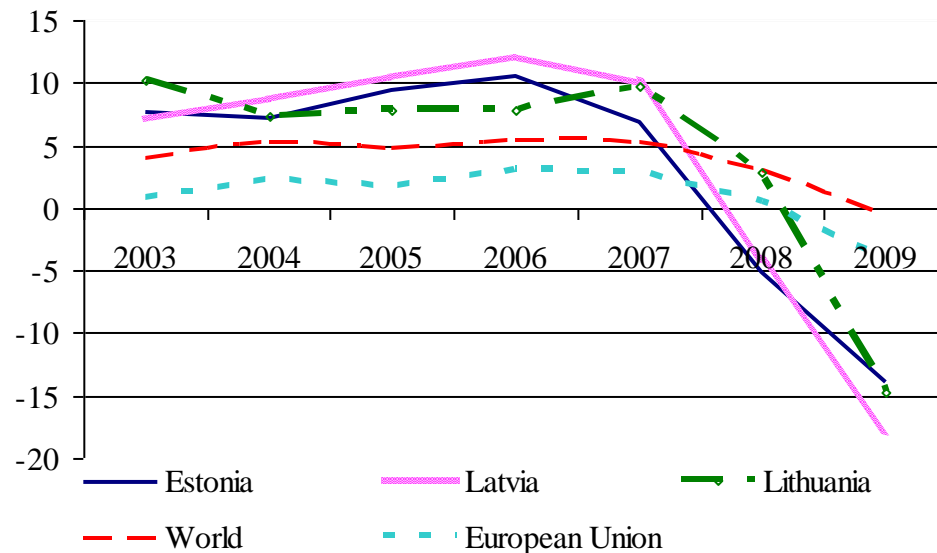


Figure 3: Annual percentage changes in GDP in the World, the EU, and the Baltic countries in 2003-2009

Source: author, based on The World Economic Outlook October 2009, International Monetary Fund

Figure 3 illustrates the GDP changes in the world, the EU, and the Baltic countries according to the data of the International Monetary Fund. One can see that there was an even GDP growth trend in the world and the EU until 2007, and a recession began in the world and EU countries in 2008. In the Baltic countries, a very deep recession was observed.

The range of GDP changes in the economy of Latvia was the widest. The GDP growth was more than 5% during the period 2003-2006, reaching the highest rate of 12.2% among the countries. In 2007, Latvia's economic growth rate decreased by 2.2 percentage points if compared to the previous year, in 2008 there was a recession in its economy, and in 2009 its GDP decrease rate was 18%. It has to be noted that it is not a unique case in the world that such a strong economic boom is followed by an even faster downturn.

In the other Baltic countries – Lithuania and Estonia – the GDP change rates were more even, however, quite sharp compared to those in the EU and the world.

In the analysis of GDP changes in the world and EU countries using MS Excel tools, a correlation coefficient of $r = 0.9876248$ was obtained. The high coefficient shows that there is a strong positive correlation between the GDPs in the world and the EU – with increase in the world's GDP, the EU's GDP increases as well or vice versa.

Latvia's Ministry of Economics publishes annual reports on the development of national economy that is based on the data computed by the Ministry. To understand the fluctuations in the market of real property, it is important to analyse Latvia's economic

situation in detail. Table 3 presents data on the country's basic economic indicators in the period from 2003 to 2010.

Table 3: Latvia: basic economic development indicators

	2003	2004	2005	2006	2007	2008	2009	2010
	(percentage change compared to previous year)							
Gross domestic product	7.2	8.7	10.6	12.2	10.0	-4.2	-18.0	-3.0
Private consumption	8.2	9.5	11.2	21.2	14.8	-11.0	-24.0	1.0
Public consumption	1.9	2.1	2.7	4.9	3.7	1.5	-9.2	-6.5
Investments	12.3	23.8	23.6	16.4	7.5	-13.6	-37.3	-30.3
Exports	5.2	9.4	20.2	6.5	10.0	2.0	-15.5	5.0
Imports	13.1	16.6	14.8	19.4	14.7	-11.2	-35.5	5.9
Consumer prices	2.9	6.2	6.7	6.5	10.1	15.4	3.5	-1.6
	(percentage change of GDP, unless indicated otherwise)							
Central government budget fiscal balance	-1.6	-1.0	-0.4	-0.5	-0.4	-4.1	-9.0	-8.5
Central government debt	14.4	14.5	12.4	10.7	9.0	19.5	36.1	55.1
Current account balance	-8.2	-12.9	-12.6	-21.5	-20.2	-13.6	-0.7	-0.8
Employment rate	61.8	62.3	63.4	66.3	68.4	68.6	64.0	59.8
Unemployment rate (percentage share of job-seekers in economically active population aged 15-74)	10.6	10.4	8.7	6.8	6.0	7.5	16.9	17.0

Source: author, based on Reports on Economic Development in 2003-2010 by Latvia's Ministry of Economics

After analysing the data shown in Table 3, one can make significant conclusions on the economic development of Latvia.

On average, the economic situation in the country improved and there was economic growth until 2006. Both private and public consumption increased to a great extent owing to the inflow of foreign capital into the country's economy. It caused a large deficit in the country's current account and at the same time Latvia's economic vulnerability increased. The country's economy developed at a fast rate.

In 2007, the lowest unemployment rate as well as the lowest central government debt – 9% of GDP was observed over the entire period of analysis.

In 2008, the world's financial crisis affected Latvia's national economy very much. The government revenues substantially decreased, and the central government budget deficit reached 9% in 2009. The country's crisis was also promoted by its foreign sector's unbalance that emerged during the years of economic boom. The GDP decrease more and more impacted the country's employment indicators and the employment rate decreased to 59.8%, while the unemployment rate reached 17% of the total economically active population in 2010.

The fast economic downturn in Latvia stopped in 2010. The annual GDP growth is still negative in 2010 if compared to 2009, however the quarterly data of 2010 indicate

increases. The economic situation improved to a great extent owing to increase in the country's export of goods and services; it rose by 18% in 2010 compared to the critical amount in 2009 when its exports decreased by 15.5% compared to 2008. This is the fastest increase of this economic indicator.

Although there is no strong correlation between the GDP growth rates and the market values of agricultural land, yet some relationships can be observed. Figure 4 shows changes in the indicator values.

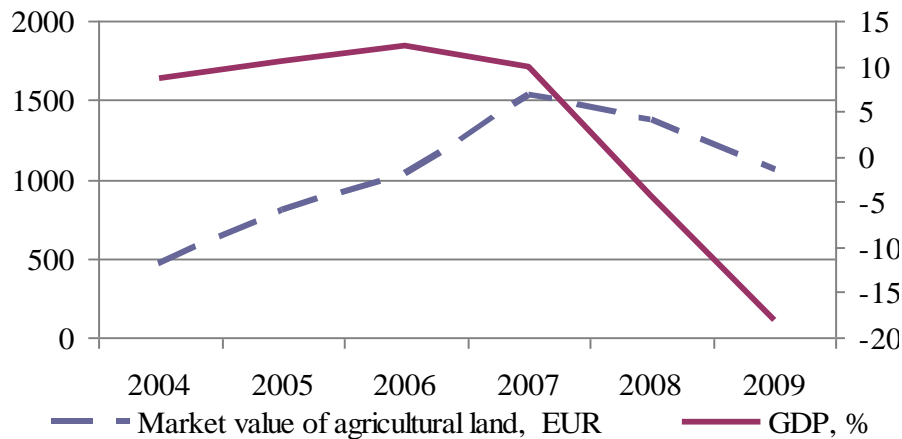


Figure 4: Latvia's GDP growth rates and the market values of agricultural land in 2004-2009

Source: author, based on Land Register system at the Justice and Land Register Department, Ministry of Justice of Latvia, and Reports on Economic Development in 2003-2010 by the Ministry of Economics in 2004-2009.

Figure 4 explicitly shows that the market values of agricultural land also decrease since 2007 when the GDP started to decline. It cannot be stated that the GDP changes have a direct impact on the land values, however the market of real property was slowed down with the beginning of the financial crisis, as banks became cautious in granting loans. Money resources got expensive, leading to a decrease in credit amounts; the money resources are less available, which is reason for a stagnation and downturn in the market of real property, including the market of agricultural land.

The above-mentioned macroeconomic situation has a direct impact on the macro-economy of the country as well. Figure 5 shows data on the economic indicators of farms.

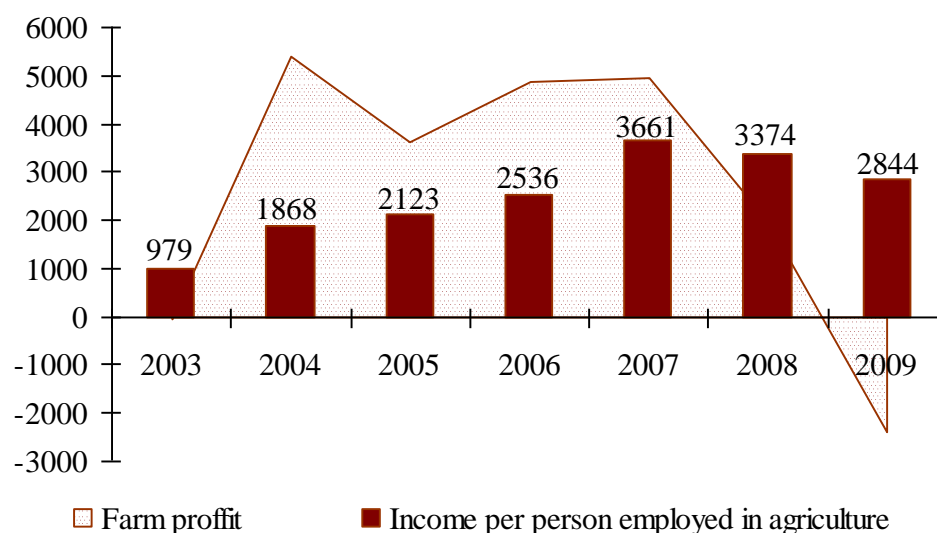


Figure 5: Economic indicators of farms in 2003-2009

Source: author, based on FADN data, 2003-2009

The calculation data in Figure 5 proves that Latvia's accession to the EU has positively affected such farm indicators as performance results of enterprises – profit and income per farm employee. In 2003, the farms performed with losses that on average were EUR 38, whereas in 2004 the farms made an average profit of EUR 5413. There was a slight decrease in their profit in 2005, but it again increased until including the year 2007.

The net incomes per farm employee indicate an upward trend since 2003 to 2007; in 2004 the income increased by 91%, while later on an annual average increase of 20% was observed. Beginning with 2008, the net income decreased, but it was a moderate decrease.

There is a strong relationship between the values of agricultural land and the net incomes per farm employee.

CONCLUSIONS

1. Several authors have researched the impact of support paid to the agricultural industry on the industry's development and made a conclusion that such support impacts the market value of agricultural land and its rental value.

2. Latvia's accession to the European Union has positively affected not only the entire national economy of the country, but also its agricultural sector. In 2003, which was the pre-accession year, Latvia's agricultural industry received a support of more than EUR 85 million; it amounted to EUR 417 million in 2009, of which EUR 84 million were the single area payments.

3. The cadastral and market values of agricultural land had upward trends since Latvia joined the EU. Irrespective of the world's financial crisis at the end of 2007, the market values of agricultural land did not reach the price level of 2003 even until the year 2010.

4. After analysing the cadastral values as a proportion of the market values, the author observed that there are differences among various Latvia's regions. The cadastral values as a proportion of the market values were lower in the regions of Zemgale and Rīga than in the other regions, which can be explained by the fact that the agricultural land of Zemgale region has the richest soils and the agricultural land of Riga region is probably used for other purposes, for instance, it is transformed into land for construction, as it is affected by the vicinity of Rīga that is the capital city of Latvia.

5. An increase in the rate of area payments impacts the rental values of agricultural land.

6. It was not observed that the rate of area payments impacts the market value of agricultural land. Its market value depends on the region where it is purchased.

7. After analysing the macroeconomic indicators, it was observed that the market value of agricultural land strongly correlates with the country's GDP index and overall economic situation.

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A Balanced Participatory Approach in Designing and Implementing a Knowledge Management Strategy in International Development Organizations: The Case of CIDA Egypt

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Abstract: With the rise of globalization and the increasing demand for sustainability, Knowledge Management (KM) has been implemented widely in multinational organizations and in the private sector during the last two decades. In the public sector and in the international development domain, attempts to undertake KM initiatives have been more modest and less recorded and examined. This research is focusing on developing and implementing KM strategies in the international development organizations in an analytical way. The aim of the research is to investigate whether there is a successful model for developing a KM system that achieves an effective and successful implementation. It investigates some distinguished attempts made so far in that area world-wide and examines thoroughly the experience of one international development organization in Egypt. It comes up with a recommended model and criteria for implementation in similar entities.

Key words: Knowledge Management; International Development; Knowledge Management Strategy; Sustainability.

1. BACKGROUND

In today's "knowledge economy" knowledge is the most sustainable competitive advantage (Mohamed, Stankosky, & Mohamed, 2009). The talk of KM began in the 1990s, when there was a realization that the foundations of modern economies had shifted from natural resources to intellectual assets (Perrot, 2007). The more sharing of knowledge, the higher the likelihood that there would be more returns from that knowledge and the more insight developed into it (Mohamed, Stankosky, & Mohamed, 2009). Thus, knowledge is a strategic resource, which has to be managed effectively (Ho, 2009).

The purpose of managing and leveraging an organization's knowledge is to maximize its returns (Bose, 2004). KM promotes continuous improvement, facilitates innovation in business processes and products, embraces people as architects at the centre of the knowledge creation process, and enhances stakeholder relationship management (Robinson, Anumba, Carrillo, & Al-Ghassani, 2006). A KM system (KMS) is a higher level than an Information System, where the object of sharing is "information with added meaning". Thus, a KM system ensures knowledge flow from the person(s) who know(s)

to the person(s) who need(s) to know throughout the organization, while knowledge evolves and grows during the process (Bose, 2004).

In other words, KM is a kind of strategy that delivers the right knowledge to the right persons at the right time. It can also help members of the organization share information and use it to improve the organizational effectiveness (Ho, 2009). There are several benefits of KM as a strategy: it reduces the loss of Intellectual Capital (IC) from employees who leave; it reduces the cost of development of a new product/service; it increases the productivity of employees by making knowledge accessible throughout the organization and thus achieve employee satisfaction (Bose, 2004). This means KM leads to higher organizational effectiveness and efficiency.

Research in the field of KM in organizations has been focusing on technologically intensive industries (Dasgupta & Gupta, 2009). It is time to move more intensively in other areas like KM in the public sector and KM in international development. This will add value to the existing body of knowledge, as it will make some findings more generalizable and others applicable in specific areas.

This research will focus on KM in international development organizations. It will analyse the importance of KM in these organizations, then it will examine the research done in that area so far in an attempt to reach a common framework, if any. After that, it will use the case study strategy to explore the experience of one international development organization, namely the Canadian Agency for International Development (CIDA)/ Egypt in KM, in an attempt to explain the similarities and differences with other development organizations. Based on the above, the research will recommend a model to be followed by similar organizations in the future for effective KM development.

2. THE LITERATURE

2.1. What is Knowledge Management (KM)?

One of the most comprehensive definitions of KM is that it is the identification, storage, protection of knowledge for future operational and strategic benefit of the organization; this may be implicit or explicit (Perrot, 2007). This definition recognizes that KM is a process, it distinguishes between strategic and operational knowledge, and it acknowledges that knowledge contained in the organization may be implicit (tacit) or explicit (Perrot, 2007). There seems to be reasonable agreement that it is a process that facilitates knowledge exchange and sharing and establish learning as a continuous process within the organization. Therefore, it can be concluded that, "KM and learning go hand in hand" (Lopez, Peon, & Ordas, 2004).

There are various steps/stages identified by scholars and researchers to describe the KM process. There are six steps identified by Bose (2004): creating knowledge; capturing knowledge; refining knowledge; storing knowledge; managing knowledge; and disseminating knowledge. There are five components of KM identified by Ho (2009); creation, accumulation, sharing, utilization and internalization of knowledge. "It is a behaviour model that of efficient knowledge recording, sharing and diffusing ... its

ultimate goal is to apply knowledge to improve organizational competitiveness" (Ho, 2009).

Mohamed et al. propose a more comprehensive and sophisticated process: Knowledge discovery (data is transformed to information, then information is transformed to knowledge – ICT plays a major role in gathering, converting and sharing the knowledge), knowledge analysis (which includes the determination of the knowledge gap for specific development process), knowledge classification (which is about taxonomy and the ranking and prioritization of the validated knowledge, where organizations must define a unified scheme with identical vocabulary and relationships), knowledge assimilation (where creating knowledge and double-loop learning and using of knowledge occur), and knowledge presentation (which describes the form in which the organization delivers its knowledge to employees, stakeholders and partners) (Mohamed, Stankosky, & Mohamed, 2009).

Knowledge itself is embedded and flows through multiple entities within the organization; including individuals with domain-expertise, specific best known methods, lessons learned from similar experiences, documents, routines, systems and methods (Kulkarni, Ravindarn, & Freeze, 2007). To differentiate between types of knowledge, there is a profound distinction in the literature between tacit (sometimes called implicit) and explicit knowledge. Implicit knowledge is implied or inferred from observable behaviour or performance (Strang, 2010), it is the minds of individuals (Perrot, 2007). Davenport (2000) believes that some tacit knowledge can be so complex that it cannot be taught. Explicit knowledge is obvious and easily coded and stored (FakhrElDin, 2006), and thus can be easily shared and externalized (Perrot, 2007).

Nonaka and Takeuchi developed the SECI (socialization-externalization-combination-internalization) model of knowledge creation (Nonaka & Takeuchi, 1995) which describes the four modes of interaction between the two forms of knowledge (Perrot, 2007). It describes the process of transforming tacit into explicit (externalization); explicit to explicit (combination); explicit to tacit (internalization); tacit to tacit (socialization); and how these processes keep adding value to knowledge in a cyclic way (Nonaka & Takeuchi, 1995).

2.2. Enablers/pillars of KM

There is a group of scholars adopting the view that there are several factors, which need to be active to support KM initiatives. Bose (2004) believes in 4 enablers which are essential and complementary (i.e. each is insufficient without the others): culture; technology; infrastructure; and measurement. They all work together to yield sustainable success (Bose, 2004). Ho identifies 4 similar enablers of KM: strategy and leadership; organizational culture; organizational incentive system; and information technology (Ho, 2009).

Another group of researchers are stressing a more important role of certain factors in the KM process. Lopez, Peon, & Ordas (2004) concluded that KM initiatives to be truly effective must take into account the social contexts in which learning takes place. Culture is the most important aspect that needs to be re-examined in light of its role in managing the overall organizational learning structure. Organizational Culture is a

critical factor that influences KM and the effectiveness of knowledge sharing (Ho, 2009). A study of 431 US and European organizations conducted in 1997 by Ernest & Young Center of Business Innovation identified culture as the current biggest impediment to knowledge transfer (Lopez, Peon, & Ordas, 2004), as culture is most potent and most difficult to alter (Bose, 2004). Organizational culture is also confirmed as the main barrier for effective KM by Robinson et al. (2006). They state that KM is not only a technical problem involving the use of IT but a socio-cultural one involving motivating people (Robinson, Anumba, Carrillo, & Al-Ghassani, 2006).

De Long and Fahey (2000) elaborate on that point where they identify four ways in which culture influences the behaviours central to knowledge creation, sharing and use. Culture shapes the assumption about what knowledge is and which knowledge is important for sharing; it identifies the boundary between individual and organizational knowledge; it determines the social context in which knowledge will be used; and it shapes the process of new knowledge created and distributed in the organization (Lopez, Peon, & Ordas, 2004). Gupta et al. in 2000 showed that organizational learning demands a high degree of commitment at all levels of the organization, i.e. it is a culture which entails that all members have a desire to improve and learn (as cited in Lopez, Peon, & Ordas, 2004). Therefore, it is important to instil a "knowledge culture" among the individuals in the organization (Kulkarni, Ravindarn, & Freeze, 2007).

Robinson et al. (2006) stated that top management support was one of the main reasons for effectiveness of KM initiatives in 8 UK construction companies which were used as case studies to examine sustainability based on KM. They also identified "intranet being the backbone of the KM infrastructure (Robinson, Anumba, Carrillo, & Al-Ghassani, 2006). Liebowitz (1999 as cited by Ho, 2009) and Davenport (1998) confirm that support of senior management is crucial to the success of any KM project (Ho, 2009).

Ho (2009) cited Nonaka and Takeuchi (1995) stating that organizational structure can either promote or block KM. Good organizational KM incorporates a standardized system and flexible structure (Davenport & Prusak, 1998). An organizational structure should incorporate an incentive system in KM (Ho, 2009). It is important to reward employees for seeking, sharing, creating and reusing knowledge (Kaplan & Thomson Reed, 2007). Specific steps that organizations should take are: reward knowledge sharing and reuse; involve the Human Resource Department through ensuring training, awards and compensations reflect KM goals (Kulkarni, Ravindarn, & Freeze, 2007). As KM has become important for the success of organizations, the performance evaluation system has to be modified to accommodate this aspect (Ho, 2009). KM depends on the human resource capabilities (Davenport & Prusak, 1998), therefore in addition to taking employees as bases for evaluation, an organization needs to provide appropriate human resource policies, training investments and managers with information training (Ho, 2009).

Information technology (IT) is another major enabler to KM, as it has a profound effect on people's ability to share knowledge and practices effectively (Bose, 2004). This constitutes the infrastructure for IT, like databases, knowledge platforms, performance evaluation management systems and performance integration systems (Ho, 2009). The

Internet, Intranets, data warehousing, decision support tools and groupware are some of the many technologies that make up a KM system (Bose, 2004). Web-based technology is an effective enabler of the process of KM, it facilitates the collaborative process and the wide distribution of knowledge for capture and re-use (Perrot, 2007).

Mohamed et al. proved that there is a linear association between IICT and KM (2009). They concluded that the effectiveness of a KM initiative that lacks the IICTs implementation will always be limited to internal domains versus distributed transfer of knowledge when the proper technology is used (Mohamed, Stankosky, & Mohamed, 2009). However, technology and information management alone cannot be relied upon for the success of KM. Technology and tools cannot provide effective "context of use" and add value. The value comes from people and from their ability to efficiently reuse knowledge to improve performance, individually and organizationally (Kaplan & Thomson Reed, 2007). Designing KM systems can be more effective and wide-reaching when knowledge is viewed as a social and evolving artefact (Ardichvili & Yoon, 2009). Therefore, KM initiatives must be complemented by a set of organizational mechanisms that encourage and promote the sharing/reuse of organizational knowledge (Kulkarni, Ravindarn, & Freeze, 2007).

The point is, in some environments, emphasis on IICT may work better than emphasis on KM strategy and vice-versa. An emphasis on one aspect while overlooking others will result in sub-optimized development situation (Mohamed, Stankosky, & Mohamed, 2009). Therefore, both approaches should be used to complement each other. Knowledge which can be codified and knowledge which is explicit should "be stored in digital databases and made accessible to users through various electronic tools" (Ardichvili & Yoon, 2009). Knowledge which is tacit and implicit should be managed through a social approach, using "situated learning and Communities of Practice (CoP)" (Ardichvili & Yoon, 2009). Communities of Practice (CoP) are valuable sources of organizational memory. They are informal, self-organized groups of people, who share knowledge (tacit and explicit), solve common problems and exchange insights and frustrations (Strang, 2010). This can be described as using the "learning and performance architecture as a systematic integration of electronic and non-electronic approaches that facilitates both formal and informal workplace learning and support" (Ardichvili & Yoon, 2009), which leads to effectiveness and efficiency in the organizational outputs (FakhrELDin, 2006).

To sum up, there are four pillars which support KM and organizational learning efforts: Organization structure; organizational culture; technology; and leadership. All other aspects mentioned above can be placed under one of them. This coincides with the views of Dasgupta and Gupta (2009) who believe that KM is not just about managing the knowledge of the employees, but there has to be an effective management of the organization's structure, culture and processes to promote learning and creativity. They propose a model highlighting the importance of a flexible and adaptive organization structure, a culture of trust and knowledge sharing, a strong technological network and a committed leadership to promote knowledge development and learning in the organization (Dasgupta & Gupta, 2009). So, managing knowledge is complex, as it involves managing several aspects (pillars) simultaneously, and on different levels. This

requires a systemized and comprehensive process that takes all conditions and factors into consideration, i.e. a strategy.

2.3. A KM strategy

It is important to develop a KM strategy based on the establishment of a strategic framework and conducting a knowledge map (Gilmoure & Stancliffe, 2004). It entails two major steps; infrastructural evaluation and a KM system analysis (Tiwana, 2002). The knowledge map is important as it identifies the core knowledge assets and looks at the activities already taking place to identify where there is a gap of knowledge and/or information in the organization (Gilmoure & Stancliffe, 2004). This is also called "identifying the knowledge gap" and the purpose is to develop the appropriate strategy to close or minimize this gap (Wang & Belardo, 2009).

The mapping exercise is detailed, as it entails first a visualisation of the main areas of knowledge, which are required to achieve organizational objectives. Then these units are broken down to record who produces it, who needs to access it, what level of detail is required, how it is accessed at present and where and how it is stored (Gilmoure & Stancliffe, 2004). This should enable "quick wins" to be identified and implemented. It will also lead to the development of appropriate processes which will be embedded in the organization in order to have a lasting effect (Gilmoure & Stancliffe, 2004).

This exercise will be unique for each organization. Understanding the means available to support KM and explicitly designing and developing an appropriate KM infrastructure is of strategic significance (Wickermasinghe & Davison, 2004). It is important to choose the best tool(s) to fit the organizational objectives; thus it is vital not be tool or technology focused (Desouza, 2010) and to align the KM strategy with the overall organizational strategy (Ho, 2009).

A KM strategy paper goes on to set objectives and underlines the approach that will be taken. This includes many aspects like being people-based, flexible, able to cope with change, as paper-free as possible and building on current KM processes (Gilmoure & Stancliffe, 2004). The strategy should also take redundant knowledge into consideration, i.e. knowledge which is no longer needed may be a burden. There is a need to shed knowledge as it becomes redundant to prevent its negative impact on the organization (Perrot, 2007).

Based on all of the above, it is clear that it is vital to make the KM effort as specific, detailed and clear as possible. Typically, the KM strategy has to present a business case, which is a well-argued and logically structured document aiming at presenting a rationale and a detailed plan for a course of action (Desouza, 2010). Developing a KM strategy is central to operationalizing the concept of sustainability and to improving the way knowledge assets are managed and reported (Robinson, Anumba, Carrillo, & Al-Ghassani, 2006). Ideally the KM strategy should include: the objectives of the project; the costs and the risks of doing and not doing it; an action plan; how it fits the current and future goals/objectives/plans of the organization; the effect on the organization; outputs expected when the plan/strategy is completed (Desouza, 2010).

Top management commitment as well as stakeholders' involvement in the development process of the KM strategy are essential. Stakeholders' input is important in the process, as they will develop an appreciation of the process, in addition to providing ideas and more alternatives (Desouza, 2010). They will also have a sense of "ownership" for the whole initiative, once it is put forward.

2.4. KM in international development

In a highly interconnected world, the field of KM faces the challenge of making concrete and relevant contributions for the betterment of society (Laszlo & Laszlo, 2002). Now there are many international development organizations and civil societies around the globe that exert considerable effort towards leveraging intangible resources to transform them into higher sustainable development values (Mohamed, Stankosky, & Mohamed, 2009). Of course, KM is still important for the corporate environment, but it also adds value to the development sector and in particular it has a role to play in international development (Gilmoure & Stancliffe, 2004). Knowledge is now considered a critical foundation for sustainable development innovation (Mohamed, Stankosky, & Mohamed, 2009).

According to the World Commission on Environment and Development (WCED), sustainable development is the "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Mohamed, Stankosky, & Mohamed, 2009). Recently, research highlights the importance of expanding the concept of development to include issues of social and environmental sustainability through the creation of human and social capital (Laszlo & Laszlo, 2002).

To achieve sustainability, it is important to improve governance by managing both tangible and intangible assets (Robinson, Anumba, Carrillo, & Al-Ghassani, 2006). This means that KM is needed to achieve sustainability. Managing the knowledge in that domain means "doing more with less, creating a sustainable economy where present and future human needs can be met without compromising the natural environment" (Laszlo & Laszlo, 2002). In the development sector, knowledge is a community-owned asset (Batra, 2007). Developing a KM strategy – within the development context - is a way to "unlock and leverage the different types of knowledge to identify competencies required to become a forward thinking and learning organization with the ability to put sustainability principles into practice (Robinson, Anumba, Carrillo, & Al-Ghassani, 2006).

International Development Organizations have specific characteristics: high staff mobility; projects that have a duration of 3 – 4 years and are then dissolved, mix of international and local staff leading to high diversity of staff; work in different areas in one country with different sub-cultures and mix of staff leading to more diversity of staff; and a very tight budget (Batra, 2007; Ringel-Bickelmaier & Ringel, 2010). In addition, all development organizations work within the restraint of a tight regular budget that needs to be managed as effectively and efficiently as possible (Ringel-Bickelmaier & Ringel, 2010).

They also have various stakeholders. Stakeholders of a development project are those persons, groups or institutions, which have an interest in the project. These include

direct beneficiaries, project implementing agencies, their partners, service providers, donor agencies, government officials concerned with the project theme and various technical experts and resource persons (Batra, 2007).

Exchange of knowledge from successful projects helps ensure replicability, lessons learnt help prevent mistakes being repeated, therefore documenting lessons learnt and success stories is encouraged in the development sector, though not practiced regularly (Batra, 2007). It is also important within that context to "avoid knowledge drain" (Ringel-Bickelmaier & Ringel, 2010), when staff change locations or totally leave the organization.

The challenge in international development is that any KM initiative has to be inexpensive, implemented in an incremental way, and showing promise through testing the impact on pilots (Gilmoure & Stancliffe, 2004). A key issue with regard to development sector projects is how the development agencies can learn faster from the experiences of past projects (Batra, 2007).

The type of resources that are specific in international development and voluntary organizations and are essential to share in order to avoid reinventing the wheel, are training manuals, ideas for workshops, lessons plans (Gilmoure & Stancliffe, 2004), as well as tools and lessons learned. There is usually reluctance on the part of some implementing agencies to share their knowledge and information about a project and experience gained through its design and implementation (Batra, 2007). There is usually a sense that it is their effort and their work and they do not want to give the knowledge away.

In the field of international development there are various successful attempts to manage information and knowledge. The World Bank (Laporte, 2004) and various United Nation (UN) entities (UNDP, UNICEF) and some European Union organizations (OECD) are pioneers in that regard (Liebowitz, 2000; Mohamed, Stankosky, & Mohamed, 2009; Ringel-Bickelmaier & Ringel, 2010). They are specially advanced in the IT area of managing knowledge and information (FakhrElDin, 2006), they also developed tailor-made systems that respond to their specific needs in terms of information and knowledge management (Ringel-Bickelmaier & Ringel, 2010). What all these organizations have also in common, is that they implemented their KM initiative/strategy in steps, i.e. it is incremental. They started with Information management and developed gradually into KM.

The amount of information available for the sustainable development knowledge is radically affected by the advancement in ICT (Mohamed, Stankosky, & Mohamed, 2009). To record and retrieve existing knowledge, they recur to IT solutions of document and information databases as well as data warehouses (Ringel-Bickelmaier & Ringel, 2010). But KM is more than that, according to Mohamed, Stankosky & Mohamed, although some international organizations made a considerable progress in consolidating their internal IT infrastructure for leveraging knowledge, many still have their knowledge and information in disconnected repositories and databases (2009).

Mohamed et al. in 2009 identified four major factors that have a critical role in achieving more effective sustainable development. They based their assumption on a "wide range of literature review and work of various United Nations (UN) organizations. These factors are: Knowledge Management (KM), Integrated Information and

Communication Technologies (IICT) infrastructure, ICT capacity building and ICT policy (Mohamed, Stankosky, & Mohamed, 2009).

In the development field organizational knowledge sharing can be divided into two major modes, intra-organization sharing for domestic knowledge and inter-organization sharing for external knowledge. Mohamed et al.'s research showed that there is a significant linear association between inter-organization and intra-organization sharing of knowledge (2009). KM in development requires a careful blending of local knowledge, largely tacit, with the external knowledge, which is to a high extent explicit (Batra, 2007). Thus, both types of knowledge sharing have to take place and they complement each other. The strategic priority in international development should be to have intra-organizational activities must precede the inter-organizational efforts. In addition, emphasis on ICT tools is more important than emphasis on KM practices. Neither human nor technology can automatically leverage the delivery of knowledge for sustainability benefits (Mohamed, Stankosky, & Mohamed, 2009). Each step in the KM process requires a certain balance and is affected by the nature of the work of the organization.

The intranet is one of the effective tools to avoid duplication of efforts and develop an effective knowledge and information-sharing environment in international development organizations (Gilmoure & Stancliffe, 2004). It is suitable for managing explicit knowledge. Communities of Practice (CoP) are one way of sharing tacit and explicit knowledge in international organizations. They are based on thematic areas in which development agencies are specialized. They are groups of professional peers in specialized areas in which the agency is pursuing development objectives. Members of a CoP share concern or a passion for something they do and learn how to do it better as they interact regularly (Batra, 2007). The World Bank, for example, has 80 thematic groups, they exchange information and transfer explicit and implicit knowledge through the ICT facilities, having access to databases and newsletters, using internal search engines, videoconferencing (Ringel-Bickelmaier & Ringel, 2010).

The findings of Robinson et al. (2006) confirm the increasing need for international organisations to implement KM systems. The first step to achieve that (and which was undertaken by all international organizations adopting KM) is through designing and developing a KM strategy. In developing the strategy, the organizational structure in place and the extent and possibilities of the ICT available are to be taken into account (Ringel-Bickelmaier & Ringel, 2010).

A KM strategy starts with designing a "roadmap" which is intended to be used as a tool to identify weaknesses in the knowledge processes of organizations and develop appropriate action plans with appropriate measures to improve implementation of a KM strategy, i.e. the reform necessary, provide the resources to support KM and to evaluate the results of KM (Robinson, Anumba, Carrillo, & Al-Ghassani, 2006). This way sustainability can be effectively achieved (Mohamed, Stankosky, & Mohamed, 2009). Robinson et al. believe that "to realise the full potential of KM if the necessary steps to maturity are translated into action plans" (2006). Their maturity roadmap is called STEPS standing for start-up, take-off, expansion, progression and sustainability. Each stage has specific characteristics ranging from increasing awareness of KM; developing

the KM strategy and identifying barriers and risks; refining the KM strategy and increasing the KM leadership in addition to introducing performance measures; establishing evaluation criteria and introducing reward and incentive schemes; and ending with KM practices being diffused in the whole organization and linked to all business objectives as well as being embedded in the organizational culture (Robinson, Anumba, Carrillo, & Al-Ghassani, 2006).

Research has agreed on the following with regard to international development organizations: the necessity of creating an information sharing and managing culture via establishing information management systems and human resource policies that favour such a culture; creating thematic knowledge networks internally and externally; undertaking knowledge mapping activities; try to move gradually from information management to KM (Ringel-Bickelmaier & Ringel, 2010). There are two other important factor identified in the literature in all cases of successful KM implementation in the field of international development: the "supportive leadership" and a "Knowledge Management Officer (Manager)" who is responsible for overlooking and administering the implementation of the KM strategy and the KM system as a whole, e.g. in the World Bank, the OECD, the UNDP (Laporte, 2004; Liebowitz, 2000; Ringel-Bickelmaier & Ringel, 2010)

2.5. Measuring KM

"The long-term nature of returns makes it extremely difficult to measure the success of KM initiatives in terms of business benefits, which are presumed to reflect the effectiveness of a KM strategy" (Kulkarni, Ravindarn, & Freeze, 2007). However, without measurable success, support for KM is unlikely to continue. Therefore, it is important to measure the impact of KM efforts on the organization's performance (Bose, 2004). Employees need to find value in the KM activities to continue to tap into the organization's intellectual resources (Kaplan & Thomson Reed, 2007). In addition, after implementing the KM strategy, an organization needs to evaluate the effectiveness of KM.

In trying to deal with this problem, when designing a KM strategy, evaluations based on specific criteria identified from the start have to be developed. There are performance indices that can be considered which include the frequency of solving obstacles and achieving certain results (Ho, 2009). As KM leads to changes in behaviour, approaches and methods, which should be mapped and traced to organizational processes, thus their impacts can be measured and articulated (Desouza, 2010). In a way this is constructing a process performance index (Ho, 2009). This index will probably vary from industry to industry (Ho, 2009), if not from an organization to the other. Specific KM metrics will be tied to specific organizational contexts (Bose, 2004).

The balanced scorecard (BSC) is a measurement suggested by Bose (2004) to use to measure the effectiveness of the KM system. It is originally developed by Kaplan and Norton in 1996 and focuses on linking an organization's strategy and objectives to measure 4 key perspectives: financial; customers; internal processes; and learning and

growth. It is a way to translate the business strategy into specific, quantifiable goals and to monitor the organization's performance in terms of achieving these goals (Bose, 2004), and has become a popular tool of measurement in various areas of the organization.

It is therefore advisable to create an IC index that measures the successful application of IC measures in the organization (Bose, 2004). The index proposed by Bose (2004) is based on several steps: define the strategy of the organization; identify the critical success factors; choose key performance indicators; apply weights to the indicators (if necessary); use this metrics to focus management action on the key factors. It is important that these success indicators are about delivering specific tangible, business-driven performance improvements (Kaplan & Thomson Reed, 2007), and that they focus on outputs and outcomes, not on knowledge sharing activities. The same indicators would serve for monitoring and evaluation purposes of the KM strategy.

It is important to show how these measures contribute to the higher level goals. A common approach identified by Desouza (2010) is to take two steps. The first step is to tie KM outcomes to process-level outcomes. KM tools, techniques, strategies and procedures should show measurable changes to organizational processes. The second step is to tie these outcomes into the strategic-level outcomes (Desouza, 2010).

Figure 1
(Desouza, 2010)



Following the above mentioned process makes certain that one can visualize the sequence and the connection to the KM strategy. The mapping of impacts to process-level outcomes helps identify roles and responsibilities (Desouza, 2010).

2.6. Summary

Based on the literature review, there is agreement that:

1. The support of the leadership, the organizational culture, the organizational structure and the information technology leads to an effective development and implementation of a KM system.
2. There has to be a balance between the social aspect and the information technology component in the KM system adopted.

3. There has to be an entity or a person responsible for the KM in the organization.
4. Monitoring and evaluation of the KM strategy are a necessity to achieve KM success and continuation.

3. METHODOLOGY

A case study strategy is chosen as it focuses on understanding the dynamics within a particular setting (Yin, 2003), and is most suitable for exploratory research (Wickermasinghe & Davison, 2004). To ensure validity and reliability, data for the case study was collected from a variety of sources, documents, reports (of the last 5 – 8 years), interviews (with staff of projects, program, and the program support unit), focus interviews (with staff members and partners), questionnaires (on-line and paper questionnaires to staff members of program and projects and Program Support Unit) as well as personal observations.

The Canadian Agency for International Development (CIDA)/Egypt went through the exercise of initiating, designing and developing a KM strategy since 2008. The research aims at examining this strategy and identifying to what extent it reflects and/or deviates from the conclusions reached in the above analysis of the literature and past research. There is a main difference in this case, as it operates only in Egypt, whereas the examples above operate on a global (macro) level, this is a case of an international development organization working in one country, Egypt.

The research will attempt to answer the following questions:

1. Is the KM strategy at CIDA /Egypt supported by its leadership, organizational culture, organizational structure and Information Technology (IT)?
2. Is there a balance between social and IT-based knowledge sharing techniques?
3. Is there an entity/a person responsible for the administration and development of the KM strategy at CIDA/Egypt?
4. Does the strategy and implementation of KM at CIDA/Egypt include a monitoring and evaluation component?
5. Is there any additional component of the strategy which is specific to CIDA/Egypt?

By answering the previous research questions, the case study aims at trying to test the following hypothesis:

H1: The KM initiative at CIDA/Egypt has the same elements/components as the international development organizations that adopted the concept previously.

3.1. Background of the case study

The Canadian International Development Agency (CIDA) has been an active partner with the Government of Egypt, Egyptian civil society and the Egyptian private sector for almost 30 years. Although Egypt is now considered a “middle income” country, poverty continues to be a major concern, therefore CIDA’s bilateral program's

goal is to support Egypt in its efforts to reduce poverty of the country's marginalized groups, in particular women and children/youth. Early CIDA activity in Africa was dominated by lines of credit for commodities and infrastructure projects. In the 1980s, the focus shifted to providing technical assistance; supporting private-sector development and economic reform; and addressing environmental concerns.

The Egypt Country Development Programming Framework (CDPF) outlines the rationale for CIDA's Program in Egypt and acts as a guide for the Agency's activities. The previous CDPF, dating from 1993, concentrated on job creation (especially for women), civil society empowerment, and government reform. Environmental programming was also an important component of CIDA's work, in particular the preservation and improved management of Egypt's limited water resources. The current CDPF (2001-2011) renews the focus on supporting Egypt's poverty reduction efforts among the country's marginalized groups, in particular women, children and youth. Thus, CIDA Egypt goal is now to assist Egypt to achieve the Millennium Development Goal of access to good quality basic education; encourage and support small and Medium Enterprise Development to foster better employment opportunities; and gender equality, environmental sustainability, institutional capacity building and child protection are integral, crosscutting components in the program.

Anticipating budget cuts and the continuity of limited resources, in 2008 the CIDA Egypt has commissioned a study to identify and analyze the types of knowledge available within the CIDA program, assess existing and potential opportunities, and highlight organizational prerequisites to optimize the creation and dissemination of knowledge. The current CIDA Country Strategy for Egypt presents a change in scope and focus. Egypt is now considered a Country of Modest Presence, with considerably reduced budget allocations. A Forward Looking Assessment (FLA) was conducted to guide the Program in Egypt and recommend an Operational Review, which in turn recommended that the Knowledge and Information Management be vigorously activated to "capture information and knowledge acquired, tools/material developed, lessons learned and best practices/approaches tested in the operational projects, of which several are closing shortly".

Given this obvious commitment and shared understanding, it was a perfect timing for KM and the corresponding strategy and framework to be put forward. Downsizing needs were making it a necessity to overcome the potential loss of corporate memory and relevant expertise. In addition, CIDA Egypt personnel, partners and stakeholders - with no exception - believe that KM is of high importance, given the considerable tacit knowledge available within the CIDA Egypt program, which needs to be captured and utilized.

CIDA Egypt therefore developed a KM strategy, to provide a unique opportunity to gain a greater understanding of the operation of an organization, its future direction and aims, as well as an evaluation of the challenges that confront it. By focusing on identifying staff needs and issues, activities and initiatives are recommended with the confidence that these will have a clear and measurable impact upon the organization. Supplementing this 'bottom-up' research/analysis with a strategic focus ensures that the KM initiative is aligned with broader organizational directions. Taking this approach to

the development of a KM strategy allows limited resources to be targeted to the key needs within the organization and delivering the greatest business benefits, while positioning the organization for long-term growth and stability.

3.2. The KM initiative at CIDA/Egypt

The CIDA KM strategy adopts a "people-centered" approach and relies highly on human interaction (as this is where the wealth of knowledge of CIDA lies) and is supported by appropriate technical components to make it function as effectively as possible. It is designed to be flexible with potential for expansion, to make adjustments/improvements and/or changes in direction/scope possible along its implementation process.

The strategy consists of five overlapping phases: infrastructural evaluation; KM system analysis, design and development; deployment; and evaluation and incremental refinement of the KM system. All CIDA stakeholders were involved in the development of the strategy through their initial suggestions and recommendations and later on through their feedback in various forms.

The main key players for the execution of the strategy are the Knowledge Management Officer (KMO) and the KM Committee. The first is the focal point of the KM strategy and is the one in charge of implementing and managing the system. S/he is guided and supported by the KM Committee which represents the various CIDA Egypt stakeholders.

For the KM strategy to achieve its goals and objectives, it requires the support and commitment of all stakeholders on all CIDA Egypt levels: the level of the projects, the program, Head Quarters (HQ) and to an extent also other donors and partners.

The CIDA Egypt KM Strategy aims to fulfil the following objectives:

- Capturing and storing CIDA explicit and tacit knowledge with emphasis on the Egypt programme;
- sharing and disseminating knowledge between HQ, CIDA Embassy, PSU, Projects and other stakeholders and beneficiaries;
- supporting and enhancing the development and application of further explicit and tacit knowledge by users of the system;
- enhancing visibility and public awareness of the CIDA Egypt program, through leveraging collected knowledge beyond CIDA; and
- keeping the knowledge repository and the KM system updated and up-to-date.

To achieve these objectives, the KM strategy is designed based on a thorough analysis of CIDA Egypt's current and future needs, requirements, experiences and achievements.

The strategy is also based on information solicited from the literature review of the CIDA Egypt Program internal documents and the current international state of the field of KM. This included various documents/tools/activities from the CIDA Egypt program and from various CIDA Egypt projects (e.g. CIDA Annual Work Plan 2009-2010; national and international best practices in the area of KM;)

It also included the results of the "Knowledge for Change", CIDA Lessons Learned Workshop, January 26–28, 2010, including the questionnaire undertaken at the

end of the Workshop, administered to most participants (a major source of input from all CIDA Egypt stakeholders). CIDA Egypt staff and partners were represented in the workshop. The final key message reached by all participants was:

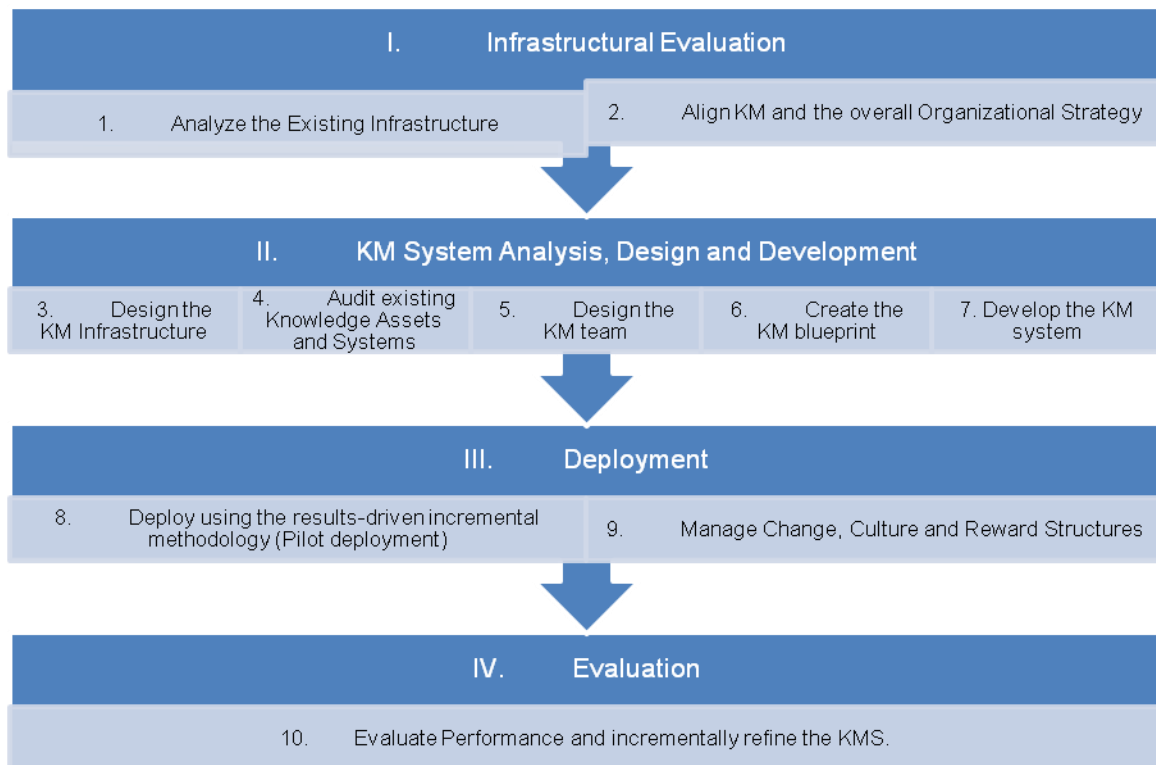
“Access to information is a right that can be effectively implemented through systematically sharing knowledge on and between all levels of the organization (CIDA) and stakeholders according to a well-defined strategy with accountability measures.”

In addition, the results of an online questionnaire administered to all CIDA Egypt employees on both the project and the program level, to complement the knowledge mapping/audit of KM needs, was included. There was also information provided by CIDA HQ regarding CIDA KM strategy and tools. Furthermore, the results of the "Creating a Culture of Learning and Knowledge Sharing" Workshop, May 19-20, 2010 were extensively used in designing and formulating the KM strategy.

The details of the stages of the KM strategy of CIDA Egypt are based on the model introduced by Tiwana (2002), it consists of four main stages and ten steps:

Figure 2

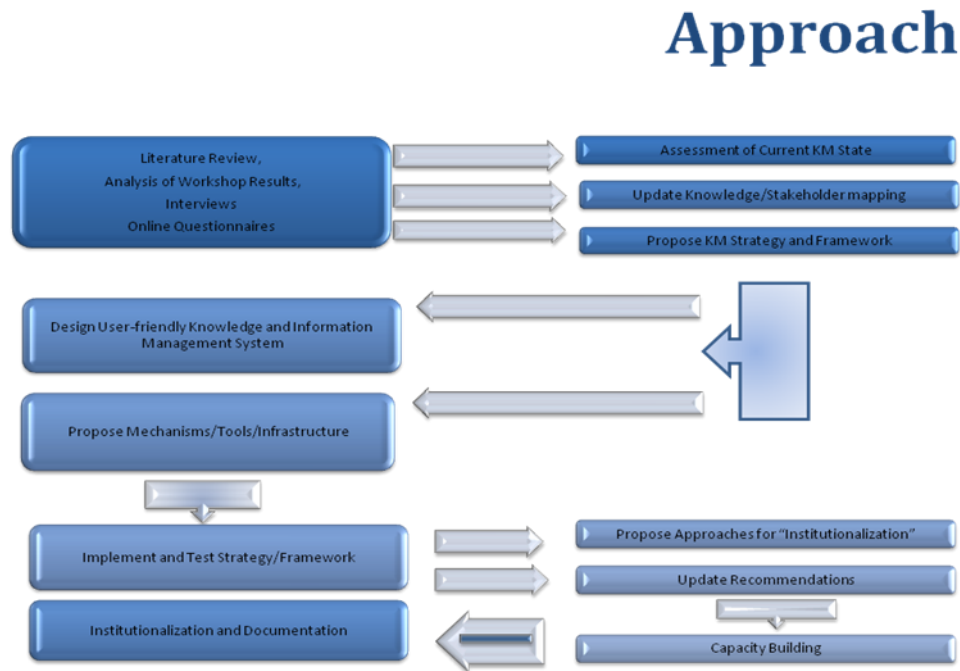
Stages and Steps of the Knowledge Management Strategy at CIDA



To implement the strategy, following is the approach adopted (Figure 2)

Figure 3

Approach of developing and implementing the Knowledge Management Strategy at CIDA



The details of the KM strategy at CIDA are as follows:

Stage I: Infrastructural Evaluation

1. Analyze the Existing Infrastructure
2. Align KM and the overall Organizational Strategy

Stage II: KM System Analysis, Design and Development

3. Audit existing Knowledge Assets and Systems

The periodical synergy group meetings are another kind of KM system which has shown high effectiveness in the last two years.

The following areas still need development in CIDA: Methods used to search for information and acquire knowledge; Storing information for long-term use; Sharing and disseminating information; communicating with other CIDA Offices/Projects; and Lessons Learned and Good Practices; Managing tacit Knowledge.

In summary, the most important gaps identified in knowledge at CIDA Egypt are:

Inaccessibility of simple delivery models and tools; insufficient and non-systematic information sharing/reporting at HQ/program/project/stakeholder/grass-root levels; end-of-Project reports/lessons learned are not properly taken into account/disseminated; they need proper format and process; lacking coordination, follow-up and recognition; not up-to-date/well-equipped websites, both on PSU and Projects levels; and, finally, slow dissemination processes.

4. *Assign the KM team*, which is responsible for:
 - Articulating the KM policy;
 - planning and monitoring the implementation of the action plan;
 - receiving feedback from users;
 - monitoring the work of the Knowledge Management Officer (KMO);
 - initiating corrective policies; and
 - coordinating KM activities between the different stakeholders through the KMO.

The team members should have the following characteristics: functional expertise; program/project expertise; ability to bring in a vision that correlates with the overall organizational wide vision; representation of core CIDA activities. At least one member should be in a position to commit the needed resources; there can be a combination between temporary and permanent team members. The KMO once appointed should also be part of the team.

5. Design the KM Infrastructure

There are five main components of the KM infrastructure: a supporting culture, an effective organizational structure, Common Knowledge, a suitable physical environment and an Information Technology Infrastructure. The design and implementation of the latter will necessitate the devotion of immediate resources, and should thus be the first step in this process.

In the CIDA Egypt case, the Web will be a key component of the KM network. This will enable initiating a "Web Protocol-based" intranet as a primary knowledge sharing platform, which is more practical in terms of direct cost, development costs, initial investment, legacy integration and cross-platform integration.

6. Create the KM Blueprint

The main objectives of the Blueprint are to: develop the knowledge management architecture; explain and select the architectural components; allow for high levels of interoperability; optimize for performance and scalability; explain the repository management; explain and incorporate requisite user interface considerations; position and scope the knowledge management system; make the build-or-buy decision (based on understanding the trade-offs); and future-proof the knowledge management system.

7. Develop the KM system, which should allow for accessibility and easy retrieval of knowledge; be clear, systematic, applicable, transparent, participatory, simple and up-to-date; be relevant to various demands and needs; be comprehensive, catering to various stakeholders, including community level, capturing both project as well as non-project activities; include an effective storage system; include a monitoring and evaluation system; exhibit higher reliance on human interaction than on technology and still be innovative, not labor intensive; have the ability to create and strengthen learning loops; provide an opportunity to work in groups (e.g. communities of practice); help participants to reach specific evidence of best practices/lessons learned; allow for sharing a variety of experiences and expertise; allow for the use of participatory, interactive and innovative methodologies; allow for synergies; have the potential and built-in mechanisms to evolve; and include simple show cases which can be documented in a variety of ways, including videos, pictures and posters.

- a. Create, Collect and Capture Knowledge at Program- and Project Levels
Creating Explicit Knowledge at Program-Level

- i. *Program Reporting*
 - ii. *Creating Communities of Practice related to Cross-Cutting Themes*
- b. Creating Tacit Knowledge at Program-Level
 - i. *Shadowing or Mentoring*
 - ii. *Knowledge Maps to identify expertise*
 - iii. *Systematic Exit Interviews*
- c. Create, Collect and Capture Knowledge at Projects-Level

It is important to improve knowledge sharing in a way that helps projects achieve better results and strengthens the CIDA Egypt Program as a whole, without creating an undue burden for the projects. This is partially done through the synergy meetings now.
- d. Creating Explicit Knowledge at Projects-Level

Lessons learned and tools successfully used should be identified and documented at least on a yearly basis, and be posted on the website, to ensure that all team members as well as external partners gain access to it.
- e. Creating Tacit Knowledge at Projects-Level: Systematic Project-Exit Documentation

For starting projects, a section on the project's contribution to KM should be in the ToR. It should describe how each project is obliged to create, store and share its knowledge with CIDA, PSU and other projects.
- f. Share and Disseminate Knowledge

The Web is a key component of the KM network. This will enable initiating a "Web Protocol-based" intranet as a primary knowledge sharing platform, which is more practical in terms of direct cost, development costs, initial investment, legacy integration and cross-platform integration.

 - 1. The Intranet
 - 2. The Website

Further areas for improvement : the site should include up-to-date information; it should ensure two main elements: search engines that are efficient/well thought-out navigation structure, and a continuous flow of new information as well as a well thought-out navigation structure and effective search.

Stage III. Deployment

- 7. Deploy using the results-driven incremental methodology

A workshop was organized to discuss the details of the KM Strategy and Framework, and solicit feedback from various stakeholders. Following the workshop, an action plan is put forward, and an incremental operation of the system is introduced. It consists of two months pilot program focusing on two projects, followed by an evaluation which is followed by full implementation after corrective measures have been made.
- 8. Manage, Change, Culture and Reward Structures
 - a. Training and development
 - b. Incentive system

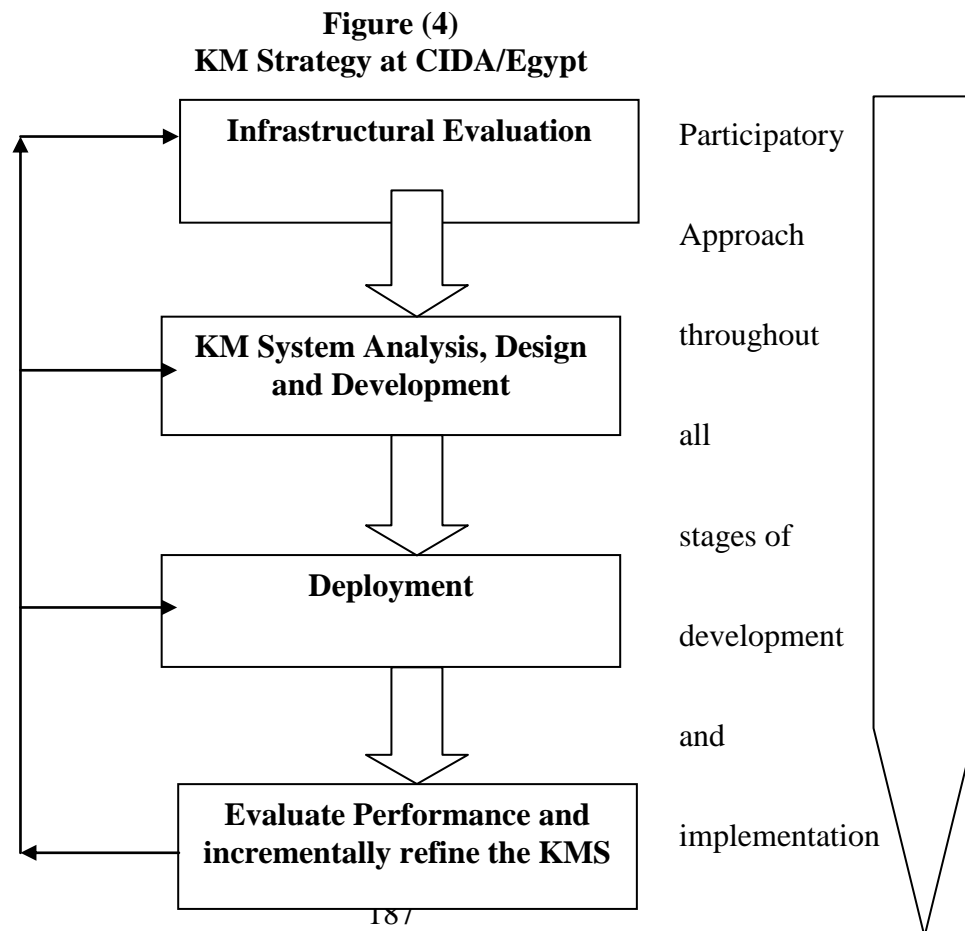
Stage IV. Evaluation

9. Evaluate Performance and incrementally refine the KMS.

Following the deployment of the KM Strategy, an evaluation of the system will take place over two months, finally culminating in the introduction of adjustments and changes to refine the system. Documentation of the KMS, including recommendations for improvements and institutionalization are to be provided.

Using insights gained from secondary research and the case study, a model for managing knowledge in international development organizations is proposed (figure 4), where the participatory approach is emphasized throughout all phases of the development of the KM strategy. This is important due to the specific nature of international development organizations, each has certain priorities and areas of focus. Therefore, the KM strategy will be different from one entity to the other, depending on the work process, the structure, the relationships between the different program components, the projects, the partners and the stakeholders.

It is important to note, that, KM efforts must include identification of knowledge-intensive work processes and work flows that are important for the type of business, and the IT systems support needed to facilitate knowledge sharing (Kulkarni, Ravindarn, & Freeze, 2007). There also has to be complementarities between KM factors and organizational factors (Kulkarni, Ravindarn, & Freeze, 2007).



4. FINDINGS AND CONCLUSION

1. The KM strategy at CIDA /Egypt is supported by its leadership. Several workshops have been conducted to develop and reinforce an organizational culture that supports and encourages knowledge sharing and development. This has been initiated by the synergy group meetings already taking place for the last two years, but it is further encouraged through the various knowledge management tools and mechanisms. The organizational structure which is specific to CIDA Egypt is flexible, as it is quite organic (close to a starburst structure), with the program and its support unit as the centre nodes, which are connected with all projects. All the projects are connected through the synergy group meetings and the thematic groups. The Information Technology (IT) has been upgraded to support the KM initiative. A new software is installed to support a more advanced intranet system.
2. There a balance between social and IT-based knowledge sharing techniques, as the KM strategy at CIDA/Egypt is people-based. The IT is important to support the people, but it is not the focus of the strategy. There are various tools that are based on people interaction like the KM harvesting events and knowledge fairs.
3. There is a KM committee and a KM Officer. The committee oversees the development and implementation of the strategy. It is a group who represent the program and the projects of CIDA/Egypt. There is leadership, advisors, project directors, KM consultant, and the KM Officer. They make recommendations, help in solving problems that occur during development and implementation and give support and guidance to the KM Officer.
4. The monitoring and evaluation component is a corner stone in CIDA's KM strategy. A logic model was developed out of the action plan. It includes the overall objectives of CIDA/Egypt and identifies ultimate, intermediate and immediate outcomes, which are reflected in activities. The latter are used to identify criteria for success for monitoring and evaluation purposes. Figure 5 is the first section of the performance measurement framework and shows how results are transformed into indicators and how they are eventually measured.
5. There is an additional component of the strategy which is specific to CIDA/Egypt. It is the participatory approach adopted throughout the development and the implementation of the strategy. This component has several effects; it is part of creating a supportive knowledge sharing culture, it leads to commitment and ownership of the strategy and its implementation by employees, it leads to more accuracy and relevance of the strategy, and is in itself a monitoring and evaluation measure along the development and implementation of the strategy.

Figure (5)
KNOWLEDGE AND INFORMATION MANAGEMENT AT CIDA/EGYPT
PERFORMANCE MEASUREMENT FRAMEWORK

Results Statements	Indicators	Baseline Outline current situation	Target Outline desired / expected situation (quantitative ... #, % or qualitative ... low / high)	Data Sources People and /or records etc	Collection Methods	Frequency	Responsibility
ULTIMATE OUTCOME							
Enhanced Knowledge Management within the CIDA Egypt Program to become a learning organization, linked more effectively with CIDA/HQ and other Stakeholders	--Extent to which the KM system benefited the Egypt Program/projects -Extent to which knowledge is shared between program/projects and HQ/ other stakeholders	None None	High High	Questionnaire Questionnaire	Questionnaire	annual	KMO/ KM committee
INTERMEDIATE OUTCOMES							
1. Improved systems/processes of <u>capturing, collecting and storing</u> of knowledge at the Program and project levels	Level of satisfaction of the systems/processes of capturing, collecting and storing of knowledge	None	High	Questionnaire	Questionnaire addressed mainly to PSU and selected Program/Project staff	Bi-annual	KMO KMS
2. Enhanced <u>access, use and application</u> of knowledge at the Program and project levels	- Level of knowledge collected and used - Ease & accessibility of system processes	Limited None	High High	Questionnaire Questionnaire	Questionnaire	Bi-annual	KMO KMS
IMMEDIATE OUTCOMES							
1.1 Knowledge Management mechanisms/tools developed and operational	- Usefulness of tools - level of satisfaction of users	None None	High High	Questionnaire	Questionnaire	annual	KMO KMS
1.2 Knowledge Management technologies developed and operational	- No. of visitors of website - No. of users logging into the intranet system	Limited None	- High - For example 30 % increase in # of hits; # of users/ year	Software Program Software Program	Tracking system Tracking system	Monthly Weekly	KMO KMS
2.1 Knowledge Management System functioning and effectively used for the CIDA Egypt Program	- Extent to which the KM system benefited the user - Level of participation in the CoPs	None None	High High	Questionnaire CoP reports/documents Questionnaire	Questionnaire Reports/documents Questionnaire	Annual	KMO KMS
2.2 Knowledge Management Culture within the CIDA Egypt Program developed and	The level of diversity of users being recognized for active participation in the system	None	High	Harvesting Workshop attendance	Records/reports of events	Annual	KMS

maintained							
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The hypothesis is accepted. The KM initiative at CIDA/Egypt has the same elements/components as the international development organizations that adopted the concept previously. It has additional components which could be used to enhance the success potential of similar organizations.

5. Limitations of the study

1. The strategy is still in the pilot phase. Results have not been achieved and evaluated yet, though it looks promising.
2. The experience of CIDA/Egypt might be unique, as CIDA headquarters is still planning its KM strategy. In all other international organizations that implemented KM so far, the start of the initiative was in the headquarters, then it was transferred and implemented in the fields after being tried out and institutionalized.

6. Recommendations for future research

1. Conduct a follow up study, i.e. completing a longitudinal study to validate results after full implementation.
2. Conduct other case studies in similar organizations in Egypt and compare results.

7. Recommendations

1. Applying KM should be a goal of international development organizations, as it is an important factor leading to sustainability, effectiveness and efficiency.
2. A KM strategy reflecting the organization's overall strategy is the first step towards achieving this goal.
3. A participatory approach in developing and implementing the KM strategy is of particular significance due to the special nature of these organizations.

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Entrepreneurship Education in Egyptian Universities: the need for an Educational Revolution

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Abstract: Throughout the world universities are being required to introduce entrepreneurship programs in an attempt to create more entrepreneurial graduate students. Though somewhat later than many other countries, Egypt is no exception as the Egyptian Global Entrepreneurship monitor report for 2008 observes. This present paper uses existing research on Entrepreneurship Education and Entrepreneurial institutions, combined with the results of primary research on Egyptian students, to determine what the country's universities will be required to do if they are to meet the challenge. The study concludes that Egyptian universities will need to transform not only what they teach, but how they teach, whilst at the same time transforming their own institutions in order to create more entrepreneurial learning environments. The conclusions have relevance for Educational policy makers, university administrators and university academics not just in business and economics but across all disciplines.

Keywords: Entrepreneurship Education; Egyptian; Universities; Educational Revolution.

1. INTRODUCTION

In their attempts to promote entrepreneurship, Governments around the world have begun to recognize the importance of education, at all levels, and in many countries there has emerged a drive to promote enterprise through the teaching of entrepreneurship in Schools, Colleges and Universities. In the United States entrepreneurship has been taught in Universities since the late 1940s, when the first recorded course was taught at the Harvard Business School. In the UK, and Western Europe, the first courses were launched much later, in the early 1980s. As in the US they were intended to encourage students to start their own businesses on graduation (Brown, 1990; Kirby, 1992). Since then there has been a global proliferation of courses (Vesper and Gartner, 1998), and an ongoing debate on the nature and purpose of entrepreneurship education. The result has been a shift away from new venture creation to a much broader concept that recognizes entrepreneurship as a way of thinking and behaving. Hence a recent report on Entrepreneurship in Higher Education (European Commission, 2008, 7) makes the point that "the benefits of entrepreneurship education are not limited to start-ups, innovative ventures and new jobs" but rather to "an individual's ability to turn ideas into action and

is therefore a key competence for all, helping young people to be more creative and self-confident in whatever they undertake”. (op.cit.).

To achieve such an objective requires, as Kirby (2006, 2007) has recognized elsewhere, a move away from the narrow paradigm for entrepreneurship that equates it with new venture creation and the tools to start and run a business. If the education system is to develop more entrepreneurial attitudes and behaviours in its students, then in most institutions of Higher Education there needs to be a “very significant transformation in not only what is taught but how it is taught” (Kirby, 2006, 50). Indeed, there needs to be a change in the purpose, content, process and place of learning (Kirby, 2007) and it is possible to agree with Chia (1996: 426) that what is needed is a “deliberate strategy which privileges the weakening of thought processes so as to encourage and stimulate the entrepreneurial imagination”.

How this is to be done is the subject of increasing debate and numerous volumes have been produced in recent years (Fayolle, 2007 a and b; Fayolle and Klandt, 2006; Greene and Rice, 2007; West, et. al, 2009) to address the issue and provide exemplification. However, it is generally agreed that there needs to be a more experiential approach to learning and the creation of enterprising environments and approaches that enable entrepreneurial aptitudes (such as creativity, need for achievement, calculated risk-taking, autonomy, etc) to be developed alongside business acumen and understanding and the more traditional skills of the graduate student (critical thinking, communication, problem-solving, time management, etc).

2. THE EGYPTIAN CONTEXT

In Egypt, there is increasing awareness of the need to promote entrepreneurship and develop an enterprise culture. As Mamdouh (2007) has observed “...Egypt’s overall business environment and its ability to create desperately needed private sector jobs, continues to be ranked below average when compared with the rest of the world; and thus there is a general agreement that Entrepreneurship is needed”. However, very little country-specific research has been undertaken and little is known about the factors influencing or retarding its domestic development. The results of the 2008 Global Entrepreneurship Monitor (GEM) Report for Egypt (Hattab, 2009), though, have identified education and training as one of the main constraining factors to entrepreneurship development in the country. More than 80% per cent of the experts consulted in the GEM National Experts’ Survey (NES) were agreed that education is one of the top three areas constraining entrepreneurship in Egypt. Indeed, of the 31 countries participating in the study, Egypt was ranked in last place in terms of the contribution of the education system and the number one recommendation of the National Experts’ panel was “reform the education system, starting from basic education”. This conclusion is reinforced by the 2009 Egyptian Competitiveness Report (ENCC 2009), which concludes that higher education is one of the main areas that requires strengthening if Egypt is to compete globally. The report calls for an improvement in the quality of education but it is not just the quality that needs improvement. As Hossam Badrawi, the former Chair of the National Democratic Party’s Education Committee, claimed in 2009. “Education in Egypt requires nothing less than a major revolution. We must move away from

demanding rote memorization to prizing problem solving, from valuing conformity to appreciating creativity and imagination, from desiring obedience to nurturing questioning”. In other words, there needs to be a paradigm shift that requires the education system to develop more enterprising graduates capable of identifying and realizing opportunities, in the process innovating and bringing about change. Clearly, innovation is one of the main “pillars” of a competitive economy and “Egypt lags far behind other countries in terms of a capacity for innovation and university-industry research” (ENCC, 2009, p. 54). Hence the need in Egypt is to create more entrepreneurial learning environments and students.

Currently Egypt has 18 states and 27 private universities producing, each year, over 300,000 graduates, many of whom fail to find employment on graduation. Indeed, some 38% of the unemployed in Cairo reputedly have “a university or above university degree”. Even so, employers claim that they have difficulty recruiting the calibre of graduates they require and it would appear that the system produces graduates who are knowledgeable but have difficulty thinking for themselves and putting their learning into practice.

3. TRANSFORMING THE PEDAGOGY

According to the 2008 Global Entrepreneurship Monitor Report for Egypt (Hattab, 2009), Egyptian early stage entrepreneurs are less likely than in most GEM countries to have a university degree and only 7.5 percent of the Egyptian population reported having taken any start-up training, the second lowest of the GEM countries. Indeed, the report concludes that the education system and lack of entrepreneurial orientation and training is the major factor constraining Entrepreneurial activity in Egypt. Not unsurprisingly, therefore, it recommends the introduction of entrepreneurship as a major in the county’s universities as well as establishing extra-curricular programmes and counseling and mentoring services. Whilst these are much-needed if students are to start a new venture (table 1), they are insufficient. Such programmes equip students with the technical skills to start and manage a business, but in the main do little to change student attitudes and behavior.

Table 1: Egyptian Student Support Needs for Starting a Business

Needs	Responses	
	Number	%
None required	7	4.7
Role Models	28	18.9
Training	104	70.3
Mentoring	49	33.1
Funding	63	42.6
Premises	20	13.5
Others	3	2.0

Source: Kirby and Ibrahim, 2011

As elsewhere, the Egyptian education system is being required to create people who can innovate – who can see opportunity and take responsibility for making things happen, in the process bringing about change. Although there is no standard definition of entrepreneurship or the entrepreneur, this is what entrepreneurs do, as the French derivation of the word (the verb "*entreprendre*" - to undertake) emphasizes. The entrepreneur is an undertaker - someone who undertakes to make things happen, and does. As a consequence, he/she disturbs the *status quo* and may thus be regarded as a change agent. In such a capacity, he/she does not just start a new venture or work for him/herself in a small firm, but may be employed in a large organization. Frequently such organizations are in the private sector but, increasingly, in the public and voluntary sectors, also (Kirby, et. al, 1991). Thus, according to Timmons (1989, 1):-

"Entrepreneurship is the ability to create and build something from practically nothing. It is initiating, doing, achieving, and building an enterprise or organization, rather than just watching, analyzing or describing one. It is the knack for sensing an opportunity where others see chaos, contradiction and confusion...."

This would imply that the education systems, including those in Egypt, need to produce people who can not just observe, describe and analyze as has been traditional, but who can see opportunity, cope with uncertainty and ambiguity, make sense out of chaos, initiate build and achieve, in the process not only coping with change but anticipating and initiating it. Certainly that is what Egypt needs at this stage in its evolution.

To affect this will mean, as elsewhere, that both the content of courses and the process of learning will need to change.

2.1 Changes to Course Content.

While students will still need to develop their business skills and understanding, more attention will need to be paid to the development of their entrepreneurial skills, attributes and behaviors. This means introducing modules and courses specifically designed to develop in them the awareness and characteristics of the entrepreneur. According to Ray (1997), these need to include, amongst others:

- communication skills, especially persuasion
- creativity skills
- critical thinking and assessment skills
- leadership skills
- negotiation skills
- problem-solving skills
- social networking skills
- time-management skills

In itself, this is not sufficient, however. To succeed it will be necessary to create a learning environment that changes the way students learn and reinforces the development not just of such skills, but of their ability to “take ownership”, and to cope with ambiguity and uncertainty, if not risk.

2.2 Changes to the Learning Process.

Ever since the ancient Greeks most formal education systems have tended to develop in their students left brain capabilities. As Lewis (1987, 41) has recognized

“In class, students are expected to acquire knowledge one step at a time, adding methodically to their storehouse of facts until they have sufficient to pass an examination. This demands left-brain skills. The problems students are given to solve more often demand an analytical rather than an intuitive approach. This, too... is a task for the left hemisphere. Written work, by which ability is chiefly evaluated, must be organized, well argued and logically structured...all left-brain skills. The students considered most intelligent and successful are those who strive after academic goals, can control their emotions in class, follow instructions, do not ask awkward questions, are punctual and hand in class assignments on time. Goal-setting, emotional restraint, time-keeping and matching your behavior to other people's expectations are all left-brain skills. Children are meant to learn by listening, keeping notes and reading books. All these, too, of course, are tasks in which the left hemisphere specializes”.

Interestingly, preliminary research by Nieuwenhuizen and Groenwald (2004) in South Africa on the brain preference profiles of entrepreneurs appears to confirm the right brain thinking preferences of successful entrepreneurs, which may well explain why so many are known not to have succeeded in the formal education system and are dyslexic (Kirby, 2003b). It may also explain why Gibb (1987), apparently intuitively, has argued that to develop entrepreneurs or more enterprising individuals, the focus of the education system needs to be shifted away from the traditional to what he terms “the Entrepreneurial” (Table 2). Thus, the challenge is to develop a system of learning (and assessment) that complements the traditional and develops in its students the skills, attributes and behaviors characteristic of the enterprising or entrepreneurial individual.

Table 2. The Focus of Learning

<i>Traditional Focus on</i>	<i>Entrepreneurial Focus on</i>
The past	The future
Critical analysis	Creativity
Knowledge	Insight

Passive understanding	Active understanding
Absolute detachment	Emotional involvement
Manipulation of symbols	Manipulation of events
Written communication and Neutrality	Personal communication and Influence
Concept	Problem or opportunity

Source: Gibb, 1987

As observed elsewhere (Kirby, 1992), of particular relevance here are the proposals of Olsen and Bosserman (1984, 53). They suggest that *“individuals will exhibit entrepreneurial behavior when they possess a combination of three attributes”*, namely:

- role orientation - emphasizing effectiveness.
- abilities - to think both intuitively and rationally.
- motivation - the driving force behind action.

To achieve these, it seems necessary to adopt an approach to learning that:-

- gives students ownership of their learning, including negotiating with their tutor their own learning objectives, the resources, activities and processes required to meet these objectives and, importantly, the way in which it will be determined whether these objectives have been met (*to stimulate motivation, reduce dependency and provide experience of role orientation*).
- involves students in problem solving in real-world situations, possibly in teams (to develop both intuitive and rational thinking, to recognize the multi-faceted nature of problem and solution and to encourage communication and co-operation).
- encourages students to formulate decisions on data that are immediate, incomplete, “dubious” and, as appropriate, personally generated (to stimulate effectiveness and the ability to cope with uncertainty).
- provides students with role models who are involved in both the learning and assessment processes (to demonstrate role orientation, ability and motivation).

Of the attributes identified by Olsen and Bosserman, possibly the most difficult to develop is the ability to think both intuitively and rationally - to develop what may be termed the “balanced brain”. As suggested already, most education systems tend to adopt left-brain approaches to learning. The emphasis has been on developing critical or vertical thinking. This is a function of the left-brain - it is objective, analytical and logical and results in one or, at most, only a few answers. In contrast, creative thinking is lateral,

imaginative and emotional resulting, through association, in more than one solution (de Bono, 1970). The two ways of thinking, summarized in Figure 1, are clearly complementary and it is apparent that in order to develop entrepreneurial capability, both critical and creative thinking are needed. If it is assumed that the brain is a computer that can be programmed, then presumably the right-brain functions can be developed. Hence, as with critical thinking, students can be trained to think creatively and to cope with ambiguity and uncertainty as these are right-brain functions as has been pointed out. Indeed, there are many techniques for encouraging people to think laterally and to look at things in new ways, but perhaps the most important is to maintain at all times an open and enquiring mind. This should be the role of education but all too frequently, however, it is not. As Lewis (1987,240) has recognized:

“Under the domination of the present paradigm, schools teach what and how rather than why. Content is all-important, and the key to success lies in the acquisition of 'knowledge' and its accurate representation to teachers and examiners. Facts are true, truth is sacred and information lasts a lifetime”.

Sadly this situation pertains not just in schools but also in most levels of education, and not just in Egypt. In an era of very rapid change, where the life of the existing body of understanding will become increasingly shorter, this situation is unlikely to continue indefinitely. Change is inevitable. However, if the Egyptian Higher Education system is to create more enterprising or entrepreneurial students, as it is being required to do, then it will need to change more fundamentally and rapidly than perhaps might otherwise have been required.

2.3 Implications

Initiating such a transformation will not be easy, not least as the country will need educators with the capability and will to make it happen, as the European Commission (2008) has recognized in a different context. However, if the transformation can be effected, and students can be exposed to this sort of teaching, then it would seem possible to change their attitudes and behavior, as elsewhere (Kirby, 2006).

As an example, in year 1 of the Business Administration degree at the British University in Egypt, all students have to study a 10 credit module in Small Business Management and Entrepreneurship. This adopts an Entrepreneurial approach and is based on Kirby (2003), which espouses an experiential approach to learning and encourages the reader to learn by doing. The intention is to encourage the students to develop their right-brain thinking skills (Kirby, 2003 and 2006) and, as entrepreneurs are activists and pragmatists, to develop these attributes in the learner, irrespective of their preferred learning styles (Honey and Mumford, 1986). Each week, students are required to analyze a case study, which they discuss in groups and their learning is then reinforced through interactive Socratic learning. Their work is assessed through continuous assessment and a two hour written examination. In the coursework, the students have to interview, in teams, an entrepreneur and write up a case study based on the interview, while the

unseen examination requires them to answer questions based on a seen case study given to them one week before the examination and their knowledge of the subject. In the main, the aim of the module is to educate students “about” entrepreneurship rather than “for” it, but a secondary and important intention is to change the way they think and behave.

Prior to embarking on the program, the students were administered the Durham University General Enterprising Tendency (GET) test (Caird, 1991). According to Cromie (2000) the GET Test is one of the most useful, comprehensive, accessible and easy to administer and score measures of entrepreneurial capacity. It is a 54-item questionnaire designed to assess five dimensions traditionally believed to be indicative of entrepreneurial personality – Need for Achievement (12 items), Autonomy (6 items), Drive and Determination (12 items), Risk Taking (12 items) and Creativity (12 items). Each item is a statement and participants are required either to agree or disagree with it. Each dimension receives a score of 0-12 (0-6 for the Autonomy dimension) with a composite score for the Test of 0-54. The complete Test takes about 10 minutes to complete and although Cromie believes it requires further work to verify its psychometric properties, it would appear to have “*criterion and convergent validity and good internal consistency*”. As Stormer et. al (1999) have demonstrated the Cronbach alphas for the GET Test yield an overall rating of 0.86, suggesting that the results of its application are reliable and credible.

At the end of the 12 week module, the students repeated the test. The results show (table3) that after just 12 weeks of exposure to a more entrepreneurial style of learning, the entrepreneurial tendencies of the students increased by slightly under 8 percent though there were some significant improvements in their motivation (need for achievement) and preparedness to take risk (calculated risk taking). The full results of the study are reported elsewhere (Kirby and Ibrahim 2010) but the findings would suggest that if a more enterprising approach to education were to be adopted across Higher Education, and in all modules, the result would be more enterprising students.

Table 3: Changes in the GET Test Scores of Egyptian Business Students

	Need for Achievement	Autonomy	Creativity	Calculated Risk Taking	Drive and Determination	Total Score
	%change + positive -negative	%change +positive -negative	%change +positive -negative	%change +positive -negative	%change +positive -negative	%change +positive -negative
Overall	+17	-4.6	-1.2	+32	+7.4	+7.6

3. TRANSFORMING THE UNIVERSITIES

Universities are not the most entrepreneurial of institutions, and Egypt's 18 State Universities, in particular, are no exception. There are numerous reasons for this, largely relating to the inherent nature of large organizations, namely:-

- the impersonal nature of relationships.
- the hierarchical structure and many levels of approval.
- the need for control and the resultant adherence to rules and procedures.
- the conservatism of the corporate culture
- the time dimension and the need for immediate results .
- the lack of entrepreneurial talent.
- inappropriate compensation methods.

Universities face all of these traditional barriers, and several more. Unlike many large private sector corporations, most have never had to be entrepreneurial and are not based on a tradition of enterprise. Accordingly, many staff believe that being entrepreneurial *"will drive out their other more fundamental university qualities, such as intellectual integrity, critical inquiry and commitment to learning and understanding"* (Williams, 2002, 19). Also, most academics see their roles as teachers and researchers and not as entrepreneurs, and many university managers are concerned about the likely negative impact on their institution's research performance if their leading academics become involved in entrepreneurial activity. Thus although some of the leading research universities are among the most successful entrepreneurially (Etzkowitz, 2003), for many in higher education the concept provokes *"an image of shady villainy, a fifth column gnawing away at the basic values that define a university, a wolf masquerading as a milch-cow"* (McNay, 2002, 20).

To create entrepreneurial learning environments, therefore, it is important to overcome these barriers and the theory behind entrepreneurship development can assist. Probably the two most valuable theoretical contributions are drawn from the Cognitive Models of Entrepreneurship Development and the Theory of Interpreneurship Development.

Cognitive theory explores the situations that lead to entrepreneurial behavior and are based on Ajzen's (1991) theory of planned behavior. According to this, individuals will activate their entrepreneurial potential if they believe they have the ability, there are environmental possibilities and there is social support. Thus, it is necessary

- for society in general and the institutions in particular to have favorable attitudes towards such an objective
- for academics to believe they have the ability to do it
- for the academic staff to believe it is intrinsically rewarding.

Meanwhile the theory of Intrapreneurship Development (as espoused by Pinchot, 1985), suggests that if established organizations are to re-discover their entrepreneurial drive, there needs to be:-

- Senior Management Commitment to Entrepreneurship.
- A Corporate Model for Entrepreneurship.
- The development of an Intrapreneurial Culture.
- The identification of Intrapreneurial Talent.
- The Monetary and Non-monetary rewarding of Intrapreneurs.
- An identifiable system for administering and evaluating projects.

Thus, if Egyptian Universities are to play a role in the promotion of Entrepreneurship in the country, theory suggests that they will need to have not just “*clear and fair policies and procedures, and to communicate them positively and enthusiastically*” as Birley (2002, 152) contends, but to address the barriers that are preventing entrepreneurship within their organization and to create an environment that is supportive of, and conducive to, its development. In order to effect this, they will need to formulate a high-level strategy that demonstrates the university’s intent, makes it clear that the university encourages this form of behaviour, provides the university’s staff with the knowledge and support to start their own businesses and creates an environment that reduces the risk. In essence, the universities will need a coherent strategy that promotes a more entrepreneurial mindset and culture across the organization (see table 4).

Table 4: Strategic Actions intended to Promote University Enterprise

Action	Activity
<i>Endorsement.</i>	At the highest level. Senior staff act as role models
<i>Incorporation.</i>	Into University, Faculty/Departmental and personal plans
<i>Implementation.</i>	Setting targets that are monitored
<i>Communication.</i>	Publication & dissemination of the strategy and consultation on it
<i>Encouragement and Support.</i>	Hard Support. – enterprise laboratories, pre-incubators, incubators, science parks, meeting rooms, computing support, office support services and seed corn funding.

	Soft Support - Training, mentoring and advice, signposting to sources of external support, ongoing technical and management support once the venture is launched
<i>Recognition and Reward.</i>	Equity sharing, promotion, etc
<i>Organization.</i>	Cross-disciplinary research and teaching groups, educational partnerships, a multi-disciplinary Entrepreneurship Centre.
<i>Promotion</i>	Business plan competitions, entrepreneurship “halls of fame”. Cases, role models

Source; Kirby, 2006b

Additionally, and importantly, they will need to be freed from the needless bureaucracy exerted by the State and be permitted to adapt and change quickly in order to take advantage of new and emerging opportunities in a rapidly changing global environment. Universities need to respond not just to local and domestic market conditions but to international demands and influences. Certainly they need to be more flexible and responsive to change but at the same time, they need to be, themselves, at the forefront of change. In the 19th century, it was access to raw materials that was the catalyst for economic and social development. In the modern knowledge economy that characterizes the 21st century it is access to new knowledge. Hence, universities need to be pioneering change through the research they undertake, the new and innovative courses they provide and the enterprising students they produce.

4. CONCLUSION

This paper has attempted to consider what Egyptian universities need to do in order to create more entrepreneurial graduates. The country is late in embarking on such an objective and while this puts it at a disadvantage in some respects, compared with competitor nations, it also has its advantages as lessons can be learned from theory and the literature generated by 20 or more years of research.

Probably the first lesson that can be learned is that Entrepreneurship Education is not simply about equipping students with the functional business competences to start a new venture on graduation. Apart from the fact that not everyone is suited to self employment the concept of entrepreneurship being synonymous with new venture creation is far too limiting. Rather it is about equipping students with a way of thinking and behaving that enables them to see opportunities and bring them to fruition, in the process bringing about change. To achieve this requires a different approach to teaching, learning and assessment than has been traditional. It requires a fundamental rethink about the purpose of higher education and a major shift in the process of learning,

whereby the students become active than passive learners, the “teachers” become facilitators of the learning process and assessment tests for ability rather than knowledge.

The second is that Entrepreneurship Education is not just for students of Business, but for all students, irrespective of discipline. The Global Entrepreneurship monitor report for Egypt (Hattab, 2009) has called for Universities to offer a major in Entrepreneurship. Clearly this is important at both the undergraduate and the graduate levels. However, if they are to play an active role in developing the country’s economy and making it more competitive, Egyptian students will need to develop the attributes of the entrepreneur irrespective of whichever discipline they are studying and whether or not they create their own venture. Egyptian employers, in both the private and the public sectors, will need employees who can see opportunity and can “Initiate, do, achieve and build” rather than those who see “chaos, contradiction and confusion” and simply “watch, analyze and describe”. Hence Entrepreneurship Education should not be limited in Egyptian university to schools and Departments of Business (Welsch and Kickul, 2001).

Third, Egyptian Universities will need not only to transform their programmes but to change the way they teach and assess. This has been done elsewhere (Hale and Pope, 1994; Stephenson and Weil, 1992), and has involved moving away from passive to active learning and enabling students not just to learn “what” but “how to”. This will not be easy especially given the class sizes in some of the state universities, and it is likely to be resisted. Most academics will not be familiar with the techniques needed and, as in the UK, some will be sceptical about its relevance, seeing it as an attack on “traditional educational values” (Stephenson and Weil, 2002, xiv). Hence, changes will be needed to the structure and resourcing of Higher Education in Egypt, and staff will need to be trained in the requisite techniques. At the same time, the Ministry of Higher Education and the Supreme Council of University Education (SCUE) will need to promote the concept and make it clear that this is a much-needed and desirable reform. Possibly this will involve incentivising the universities in the process (Kirby, 1989) and collaborating with employers, such as Shell, that have experience of working with universities in other countries to facilitate the transformation process (see, for example www.STEP.org.uk and Kirby and Mullen, 1990).

Fourth, the Egyptian universities themselves will need to be transformed into enterprising institutions. This will mean freeing them up from both external and internal bureaucracy, allowing them to be more innovative and flexible than appears to be the case at present, while at the same time, diversifying their funding base and encouraging them to interact with their external environments through both the transfer and commercialisation of knowledge. Importantly, Egyptian Universities will need to move away from close government regulation and sector standardisation as Clark (1998, xiv) has recognised. They need to search for their own special organisational identities, by risking being different and taking chances “in the market”. Indeed, they will need to believe “that the risks of experimental change...should be chosen over the risks of simply maintaining traditional forms and practices” (op.cit, xiv).

Finally, given that the country is about to embark on a programme of Entrepreneurship Education, Egyptian Universities need to initiate a longitudinal programme of rigorous research and experimentation that records the changes taking place, and monitors and documents the impact on both the students and the economy and society.

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Foreign Aid in South Asia: Support or Struggle to Foreign Trade?

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Abstract: This paper attempts to examine the effects of foreign aid on the trade competitiveness of South Asian countries over the period 1971 to 2006. Using cointegration and error correction methodology, this study investigates the long run and dynamic relationship between aid and real exchange rates of four South Asian countries to assess the aid effectiveness through the changes in competitiveness in the phase of their trade liberalisation efforts. Our results suggest that the flow of aid tends to depreciate the real exchange rates of major South Asian countries in the long run. While the econometric evidences indicate that openness in trade regime significantly improves the competitiveness of export sector in the long run, increased government consumption has different effects for different countries. The result is mixed for short run effectiveness of foreign aid in regards to the explanatory variables used in the model. In terms of policy measures, our results indicate that the nominal devaluation can be a useful means to enhancing the trade competitiveness of the countries included in this study in the short run.

Key words: South Asia, competitiveness, real exchange rate, foreign aid, cointegration.

1. Introduction

South Asian countries successfully expanded its foreign trade and able to achieve and maintain a steady average growth of 5 per cent and above in the recent years by adopting trade liberalisation from the mid 1980s. However, Economic growth does not necessary assure access to health, education, clean water and better standard of living for everyone in a country. The least developing countries in the region lack the sufficient savings, and subsequent investment, skilled labour force and infrastructure to take advantage of globalisation. International donors, therefore, provide the trade related official development support to augment the domestic savings and investment. However, the inflow of aid may exert adverse effects on the international competitiveness of foreign trade if the larger portion of aid is being used to fund the domestic consumption on non

tradable sectors. In the literature¹², this phenomenon is known as Dutch Disease. Theoretically foreign aid inflow expects to appreciate the real exchange rates (RER) and thus have an undesirable effect on overall growth prospect of an economy by lowering the competitiveness of the tradable sector as postulated by Dutch disease model. Therefore, it is imperative to examine the aid effectiveness in the context of RER movement and its effect on economic growth and poverty alleviation in the region.

Foreign aid is primarily intended to alleviate the poverty condition of the low income developing countries; however, it is difficult to measure poverty due to unavailability of socio economic data. Therefore, the aid effectiveness can be assessed by the indirect growth of gross domestic product (GDP) of a country through increased investment and foreign trade and its subsequent effects on employment and income generation and poverty alleviation. The vast majority of the studies in aid literature attempt to address the relationship between aid inflow and economic growth. However, they failed to arrive at a concurrence in regards to aid effectiveness. Also the studies on the aid and trade competitiveness nexus are limited in the aid literature to illustrate the effect of aid on the real exchange rate of a country. Thus the objective of the paper is to undertake an empirical research to examine the aid trade relationship and evaluate the aid effectiveness for four major South Asian countries.

This paper attempts to evaluate the impact of aid on trade competitiveness and resultant economic performance using data for four South Asian countries over the period of 1971 to 2006. The study is organised as follows: Section 2 presents a literature review, Section III gives some stylised facts on aid and RER for the countries selected for the study; Section IV discusses the model and methodology employed. Section V analyses the econometric results and Section VI concludes the study with some policy recommendation.

2. Literature Review

Literature on studies of aid effectiveness produced mixed results and could not arrive at a consensus. The early studies of aid effectiveness have either criticised for their methodological short comings in cross country studies or they failed to produce any conclusive results in country specific studies (Mallik, 2006). In the earlier studies, Papanek (1972, 1973) found a significant positive relationship between aid and domestic savings and consequent growth, whereas, Griffin and Enos (1970) found a negative relationship between these two variables. While Levy (1988) and Gounder (2001) found a significant positive impact of aid on investment and economic growth in Africa and Fiji respectively, Dhakal *et al.* (1996) failed to find any causal relationship between aid and economic growth in a comparative study of aid effectiveness in four South Asian countries to that of four African countries. In a recent study Burnside and Dollar (2000) concluded that aid is most effective in a good policy environment of low inflation, lower budget deficit and more liberalised trade regime. However, the study is criticised for its methodological short comings (Dalgaard and Hansen, 2001; Easterly, 2003; and Easterly *et al.*, 2003) and argued against the suggestion of providing aid only to the countries with good policy.

¹² See White and Wignaraja, 1992, van Wijnbergen, 1985 and 1986, Edward and van Wijnbergen, 1989, Elbadawi, 1999.

White and Wignaraja (1992) found the increased flow of aid to Sri Lanka causes the RER appreciation and lowers the competitiveness in the world market for its tradables. Several other studies, for example, Michaely, 1981; Van Wijnbergen, 1985 and 1986; Levy, 1988; Edward and van Wijnbergen, 1989; found Dutch Disease effect of aid in developing countries. Elbadawi (1999) also found RER appreciation for 62 developing countries in a panel study. In contrast, Nyoni (1998) illustrated an opposite effect that aid flow largely improves the competitiveness in Tanzania by having a real depreciation. Using dynamic panel analysis for CFA Franc zone countries, Ouattara and Strobl (2007) supported the view that foreign aid does not generate Dutch Disease effects for the CFA Franc Zone countries. Both studies suggest that the countries under studies can continue receiving aid to supplement their domestic savings and channel it to the productive investment to boost up its supply side responses. However, the studies on aid effectiveness for South Asia are virtually limited, this paper attempts to broaden the aid effectiveness literature by examining the impact of aid inflow on the RERs in the context of Dutch Disease analysis for four major South Asian nations.

3. Trend in Foreign Aid in South Asia

3.1 Major donors of foreign aid to South Asia

United Kingdom (UK), United States of America (USA), European Union (EU), Germany, France, Japan, Scandinavian countries and Australia have their active engagement through its foreign assistant programs in South Asia and Pacific region in response to humanitarian needs and global development agenda.

**Table 1: Top donors of Bilateral Official Development Assistance (US\$, million)
(2004-05 average)**

	Japan	UK	USA	EU	Germany	Turkey	Australia	Norway	France	Netherlands
Bangladesh	234	232	89	68						63
India	651	535	164	164	166					
Pakistan	120	92	224			63		45		
Sri Lanka	317		43		65			48		38
Philippines	706		114	20	60		38			
Thailand	765			19	31				27	

Source: OECD

US foreign aid program to the South Asian region declined from a peak in 1985 when the region started to open its trade regime to a low in 1997, after which they began to grow again. After 9/11, US assistance grew rapidly to the 'front line' states (Pakistan, India and the Philippines and Indonesia) in the region with increased non-food aid. Prior to 2001, South Asia was the smallest recipient of US non food aid. Bangladesh and India was the largest recipient of US bilateral aid before 2002. After December 2004 earthquake and Tsunami, US government pledges \$134 disaster assistance to Sri Lanka and \$17.9 million to Pakistan. US pledged another \$300 million economic assistance to Pakistan after the earthquake on Oct 2005. The largest portion of US aid to Bangladesh goes to public health, education and support of anti corruption reform. US assistance to Nepal mainly aims to establish peace process between the Moist insurgents and promote development. US increased its bilateral aid significantly to India in 2002-2003 as part of its counter terrorism efforts in the region and most recently in 2008, the largest portion of US aid to India directed to fund public health and HIV/AIDS treatment and prevention. Other major aid funds are directed to economic growth and security. The development cooperation between EU and south Asia has a long history and covers both financial and technical aid as well as economic cooperation, especially with South Asian countries.

The aid provided by the EU and other European countries are directed to promote regional stability, poverty alleviation and fighting against terrorism. Over 2002-2006, EU pledged €225 million to India, €165 million to Pakistan for the development and economic cooperation with the countries. Since 1976, EU provided total of €1500 million humanitarian aid and NGO co financing to Bangladesh, and €61.32 million to Sri Lanka for economic cooperation, rural development and as post-conflict assistance over 2003-2005.

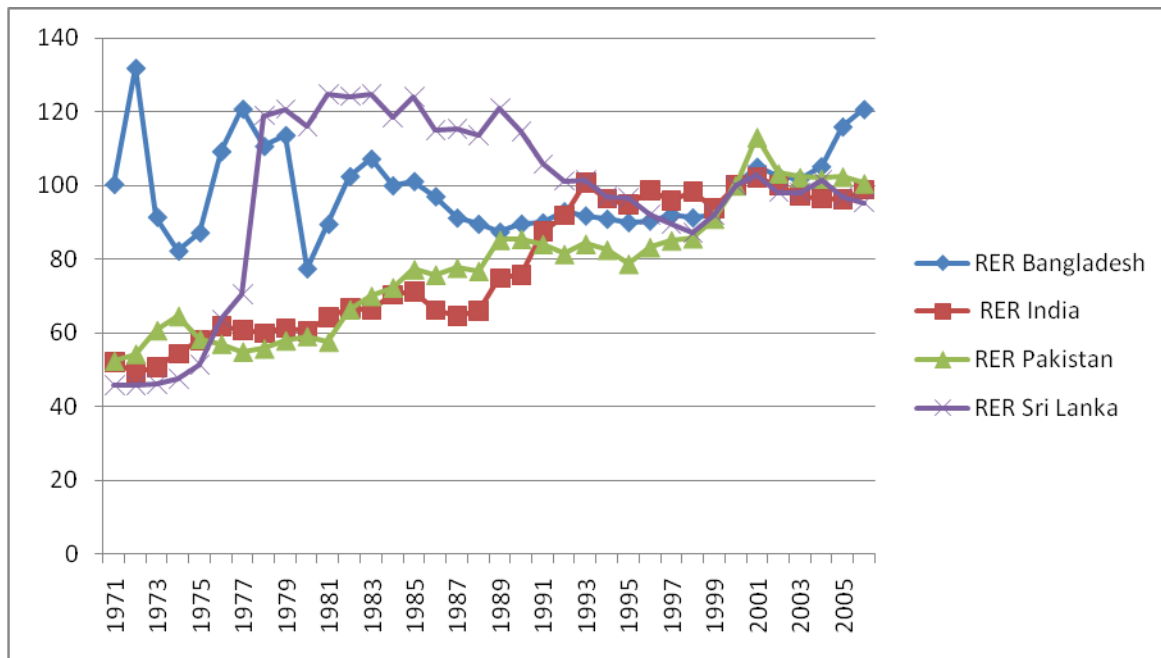
3.2 Foreign AID and Real Exchange Rates in South Asia

The measure of competitiveness, commonly used in nearly all studies of real exchange rate discussion, is the relative price of a basket of foreign goods in terms of a basket of domestic goods expressed in domestic currency value¹³. The ability to reduce the cost of tradables, hence offering tradables at a lower price than its competing countries supplying exports in the world market, not only attracts the foreign buyers away from its competitors but also increases the export volume and reduces the imports by lowering the price of import substitutes for the domestic consumers (Chowdhury, 2005). An increase in this ratio represents a real depreciation or an improvement in the international competitiveness of tradable production of the country. Real appreciation reduces the profitability of the traded sector and diverts resources from tradable sector to non tradable sector, as well as increases the domestic cost of producing tradable goods. Real exchange rate for four South Asian nations have been constructed using World Tables World Bank, International Financial Statistics, various country's Central bank and Statistical Bulletin data.

¹³ $RER = e (CPI_f / CPI_d)$, where e is the bilateral nominal exchange rate with US dollar, CPI_f is US consumer price index proxied for foreign price level and CPI_d is used for the domestic price of nontradable.

Figure 1 illustrates the depreciating trend of real exchange rates of most South Asia countries as a result of their trade liberalization effort from the mid 1980s to the end of the last decade; however, RERs of India, Pakistan and Sri Lanka show an appreciating trend whereas RERs of Bangladesh has been depreciating from year 2000 level.

**Figure 1: Real Exchange Rates in Major South Asia Countries 1971-2006
(2000=100)**



Source: Constructed by the author using aid data from the Centre for Global Development database.

4. Methodology: Cointegration and Vector Error Correction Model

4.1 The Model

We multiplied the nominal bilateral exchange rate of these four countries with US by US price level proxied for foreign price level and then deflate it with consumer price index (CPI) to construct the RERs of a country. An increase in the ratio corresponds to the real depreciation. The theory of real exchange rate postulates that while foreign aid, government consumption, trade restrictions tends appreciate the RER of a country, contractionary monetary policy or devaluation of nominal exchange rate would likely to have positive effect on real exchange rate and international competitiveness of a country.

Johansen (1991) Vector Error Correction Model (VECM) has been employed for the empirical analysis of the study due to its stronger ability to incorporate the potential long run dynamic relation and better forecasting power. The vector error correction model assuming that the variables to be integrated of order one $I(1)$ are to be selected for showing the long run relationship. In this study cointegration and error correction model

examine both the short and long run effects of aid flow (AID), government consumption to GDP (GC), terms of trade (TOT), trade openness (OPEN) as well other policy variables, such as domestic credit expansion (DC) and nominal devaluation (ND) on the competitiveness of the countries in the international market. If the explanatory variables are consistently and significantly reflected by the dependent variable RER (trade competitiveness) in the long run, then these variables should be cointegrated. If the variables are not cointegrated in the long run, then we may conclude that RER is independent of real economic activities.

As a prerequisite of the cointegration analysis we begin with the unit root test for all the variables under study using Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) test. We found that most variables used in this study are non-stationary in level, i.e., they are not $I(0)$ ¹⁴. Following the stationarity test, we test for cointegration between dependent and the explanatory variables by taking their first difference. The presence of cointegration tested by Johansen Likelihood Ratio statistics (LR) and Trace test procedure suggests the existence of long run relationship between RER and AID, GC, TOT, OPEN and independent policy variables, DC and ND.

The error correction specification for the different versions of the real model can be represented by the following equations with one period lag:

$$\ln RER_t = \lambda_0 + \beta_1 \ln AID_t + \beta_2 \ln GC_t + \beta_3 \ln OPEN_t + \beta_4 \ln TOT_t + \beta_5 \ln DC_t + \beta_6 \ln ND_t + e_t \quad \dots(1)$$

where, $\ln RER_t$ is the natural logarithm of real exchange rate, $\ln AID_t$ is the natural logarithm of the aid to GDP, $\ln GC_t$ is the natural logarithm of the government expenditure as a portion of GDP, $\ln OPEN_t$ is the natural logarithm of the sum of exports and imports expressed as a percentage of the GDP. $\ln TOT_t$ is the natural logarithm of barter terms of trade, $\ln DC_t$ is the natural logarithm of the domestic credit to GDP proxies for expansionary macroeconomic policy and $\ln ND_t$ is the natural logarithm of nominal exchange rate representing for nominal exchange rate policy and e_t is a random error term.

4.2 Data and empirical evidence

The annual data between 1971 and 2006 used for this study are obtained from the World Bank World Tables (various issues), International Financial Statistics (from IMF, Various years), numerous Central Banks' and statistical bulletin published data, which have been transformed and used to construct the annual time series data by the author.

5. Econometric Results

The long run coefficient relating to the key explanatory variables and their t-ratios are reported in Table 2 and 3 along with Johansen's Cointegration test (Johansen, 1991). The Johansen's test results indicate that all variables are cointegrated based on maximum likelihood ratio test and trace test. It also appears from the Johansen's test that we reject

¹⁴ The results of the unit root test are not presented here; however, they are available upon request from the author.

the null hypothesis of no cointegrating vector based on the sufficiently large values of the test statistics. In all the cases, the eigen-value statistics drop sharply. Thus, we can conclude that our model with six variables is a fair representation for most of the time frame.

Table 2 presents the long-run estimated relationship between RER and the independent variables. The value of real exchange rates of the countries is normalized to one and the coefficients of the explanatory variables indicating the expected signs in most of the cases. It is found that foreign aid positively and significantly depreciates the real exchange rates of all major South Asian countries which are also confirmed in the literature. Although the result is somewhat counter intuitive, but similar findings are reported by Ogun (1995) for Nigeria, Sackey (2001) for Ghana and Nyoni (1998) for Tanzania. This result may be due to the fact that the aid in these least developed countries are generally condition upon the structural reform and developmental agenda by the donor countries to facilitate the trade liberalization. This, in turn, lessens the aid induced Dutch Disease effect in the long run (Nyoni, 1998) as the flow of foreign aid to these countries are seemingly releasing the pressure on domestic resources and reducing the domestic resource investment gap.

Turning to other independent variables, increased government consumption to GDP appreciates the RERs of Bangladesh and Pakistan, whereas GC helps improve the competitiveness of India and Sri Lanka in the long run.

Table 2 Johansen's Cointegration Test: SAARC 1974 to 2005

	Hypothesis	Alternative	Eigen-value	λ -Trace	λ -max
Variables: $\ln RER$ and $\ln AID$, $\ln GC$, $\ln OPEN$, $\ln TOT$, $\ln DC$, $\ln ND$					
	$r = 0$	$r = 1$	0.89	187.32*	65.80*
Bangladesh	$r \leq 1$	$r = 2$	0.68	111.52	38.66
LR estimates	$\ln RER = 0.14 \ln AID - 0.11 \ln GC + 0.79 \ln OPEN - 1.32 \ln TOT - 0.11 \ln DC - 0.01 \ln ND$ (2.85) (1.90) (5.45) (-12.54) (-2.00) (-0.07)				
Variables: $\ln RER$ and $\ln AID$, $\ln GC$, $\ln OPEN$, $\ln TOT$, $\ln DC$, $\ln ND$					
	$r = 0$	$r = 1$	0.93	220.15*	80.13*
India	$r \leq 1$	$r = 2$	0.59	140.01	47.66
LR estimates	$\ln RER = 0.37 \ln AID + 0.91 \ln GC + 2.52 \ln OPEN - 1.90 \ln TOT - 0.04 \ln DC - 1.63 \ln ND$ (4.74) (2.74) (11.05) (-11.0) (-0.55) (-14.17)				
Variables: $\ln RER$ and $\ln AID$, $\ln GC$, $\ln OPEN$, $\ln TOT$, $\ln DC$, $\ln ND$					
	$r = 0$	$r = 1$	0.88	211.65*	64.01*
Pakistan	$r \leq 1$	$r = 2$	0.64	147.63	45.02
LR estimates	$\ln RER = 2.48 \ln AID - 1.86 \ln GC + 4.6 \ln OPEN + 4.22 \ln TOT + 2.11 \ln DC - 0.72 \ln ND$ (8.82) (-3.58) (4.87) (-6.77) (8.82) (-1.56)				
Variables: $\ln RER$ and $\ln AID$, $\ln GC$, $\ln OPEN$, $\ln TOT$, $\ln DC$, $\ln ND$					
	$r = 0$	$r = 1$	0.91	200.35*	73.85*

Sri Lanka	$r \leq 1$	$r = 2$	0.72	126.63	30.81
LR estimates	$\ln RER = 0.33 \ln AID + 0.12 \ln GC + 0.38 \ln OPEN - 0.23 \ln TOT - 0.14 \ln DC + 0.40 \ln ND$ <i>(11.33) (1.398) (4.18) (-13.21) (-2.03) (3.53)</i>				

Notes: i) *denotes rejection of the hypothesis at the 0.05 level

ii) Mackinnon-Haug-Michelis (1999) p values are used

iii) Figures in parenthesis represent the t-statistics.

This result indicates that while public spending is effective to mobilize the domestic resources towards the tradable sectors in the later mentioned countries, in contrast, government consumption has not proven to be as effective for Bangladesh and Pakistan to avoid the Dutch Disease effect of GC. It may also be noted that the prevalence of public sector corruption in these two countries are quite rampant and diverts the funds away from the productive tradable sector. Openness in trade regime found to have a significant positive impact in improving the RER in all countries which is consistent with the theoretic proposition of real exchange rate. This result suggests that openness facilitates the real exchange rate depreciation across the South Asian countries as the lifting of trade restriction increases trade volume and reduces cost price nexus and enhance economic welfare for the region. Terms of trade exerts mixed impact on the countries under study. TOT appreciates the RERs of all countries except Pakistan. With narrow export base, the exports from these countries can do better with their lower TOT, by selling higher volume attracted by the competitive price of exports.

Expansionary monetary policy, DC, negatively affects the competitiveness of all countries except Pakistan in the long run as expected by real exchange rate theory. It is interesting to note that nominal devaluation positively and significantly affects the competitiveness of Sri Lanka but appreciates the RERs of India in the long run. This could be explained as secondary adverse income effect of increased export earning on the real exchange rate. Although ND is having a negative effect on RERs of Bangladesh and Pakistan, however, the effects are not significant in the long run.

Table 3: ECM for variable $\Delta \ln RER$ for SAARC Countries

Variables	Equation 3.1 BD	Equation 3.2 India	Equation 3.3 Pak	Equation 3.4 Sri Lanka
ECM_{t-1}	-0.93* (-3.73)	-0.02* (-2.00)	-0.39* (-2.86)	-0.49* (-2.19)
$\Delta \ln RER_{t-1}$	0.57* (2.30)	0.038 (1.13)	0.45 (0.70)	0.61 (0.64)
$\Delta \ln AID_{t-1}$	-0.03 (-1.33)	0.07** (1.80)	-0.14* (-3.53)	-0.05*** (-1.63)
$\Delta \ln GC_{t-1}$	-0.80* (-6.14)	-0.28** (-1.77)	-0.15** (-1.85)	-0.13* (-1.93)
$\Delta \ln OPEN_{t-1}$	0.39* (2.74)	0.13** (1.76)	0.25** (1.88)	0.05** (1.81)
$\Delta \ln TOT_{t-1}$	0.15** (1.84)	0.27 (1.53)	- - -	0.24* (4.40)

$\Delta \ln DC_{t-1}$	-0.49* (-3.96)	-----	-0.16** (-1.74)	---
$\Delta \ln ND_{t-1}$	0.29* (2.14)	0.34 (1.96)	---	---
Constant	0.03 (1.60)	0.027 (1.36)	0.02 (1.75)	0.01 (1.53)
R^2	0.85	0.51	0.58	0.72
Adj. R^2	0.73	0.39	0.54	0.64
Standard error	0.05	0.06	0.04	0.07
AIC	-2.92	-2.50	-2.91	-2.0
F-stat	6.92	3.76	3.88	4.88

Notes: i) *, ** and *** indicate significant at 1%, 5% and 10% levels respectively
ii) Figures in parenthesis represent the t-statistics.

The final parsimonious dynamic Error Correction Models of real exchange rate are reported in Table 3 together with the most common diagnostic tests. The results are satisfactory and indicate that all equations perform well by all diagnostic tests. The adjusted \bar{R}^2 are fairly high with F-statistics suggesting the models have good fit. The lagged error correction terms for all RER equations are statistically significant at the 5 per cent level and have the expected negative signs indicating that there is a cointegrating relationship between dependent variable RER and the independent variables in the long run.

In the short run, the effect of foreign aid flow is negative for all countries indicating that the flow of aid in these countries appreciates the real exchange rates to different extents except for India. Foreign aid rather depreciates the real exchange rate of India and assists to improve the competitiveness of the country in the international trade. It may indicate that well planned channelling of aid to priority areas by Indian government assists to improve the relative price of tradables and competitiveness of the country in the short run.

Regarding other independent variables, increased GC to GDP appreciates the RERs of all countries as major portion of GC are spent on nontradables which increases the demand for and price of nontradables relative to tradables and deteriorates the competitiveness of these countries in the short run. Improvement in TOT tends to depreciate the RERs of Bangladesh, India and Sri Lanka in the short run. It is also illustrates by the ECM models that the expansionary monetary policy negatively impacts on the RERs of Bangladesh and Pakistan as increased credit flow exerts inflationary pressure on domestic goods and services and deteriorates the RERs. Nominal devaluation policy seems to have positive significant effects on the RERs of Bangladesh and India and improves the competitiveness of these two countries in the short run.

6. Policy Issues

Flow of aid in South Asian countries influencing the trade competitiveness through cost price relationship and has an indirect growth effect through domestic savings, investment and employment opportunities. Foreign aid seems to have positive

effect on trade competitiveness of four major Asian countries, which may assist the export driven growth and poverty alleviation by generating employment and income in these countries labour intensive industries. Thus the policy recommendation for the countries for which aid flow depreciates RER can suggest that the governments may continue to receive aid to supplement the domestic capital and subsequent investments. Aid can be properly utilised to fund the desired domestic investment which may release the strain on the domestic savings and revenue collection effort. However, the aid flow should be accompanied by short term policy measures to prevent the Dutch Disease effect of aid in the pursuit of trade liberalization, export led growth and poverty alleviation effort.

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The Role of Trade Agreement in Promoting Egyptian Exports

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Abstract: Globalization trends pushes developing countries to open its market for free trade. However, under the fear of domestic production break down, developing countries would divert to a second best choice which is regional Integration. Egypt lately has joined a number of economic integration targeting improvement in its exports. The aim of this paper is to measure the effectiveness of this integration forms in changing exports in Egypt. This is achieved through regression analysis for the Gravity Model based on polled time series cross sectional data to estimate the significance of bilateral and multilateral trade agreements in promoting Egyptian exports.

Keywords: economic integration, Egypt, regional agreement, gravity model, regression analysis, panel data, exports, MENA Region.

1. INTRODUCTION

“Impossible to turn back globalization; but efforts to do so we’d make us worse off.”

(Obama, B.2008, Speech in Flint, MI, in Change We Can Believe In, p.245-6)

Egypt has become a WTO member since June 1995 and since then Egypt has adopted a structural and adjustment Reform program including measures to decrease fiscal deficit, stabilize prices and replace public sector by private Sector. Moreover the government has been working on liberalizing currency, reducing tariffs and barriers in order to open its market for free trade.

Under a free trade economy, it is found that the Egyptian exports still faces a number of difficulties mainly due to lack of expertise markets to promote abroad, bureaucratic administrative procedures, high export financing and low level of port services. In addition, Export Capacity is limited due to low interest in R&D (According to World Bank 2007, R&D represents 0.23% of GDP in Egypt, in comparison to Israel 4.74%, Brazil 1.023%, India 0.802% and Turkey 0.711), high cost production due to high prices

of non traded goods, difficult access to credit, distorted export investment policies due to subsidies and government protection (Kheir-El-Din and El-Ghamrawy, 2010).

Thus under such constraints, Egypt faces difficulty to integrate more in the global world and it has to enter a number of bilateral and multilateral agreements in order to promote competitiveness and increase exports .

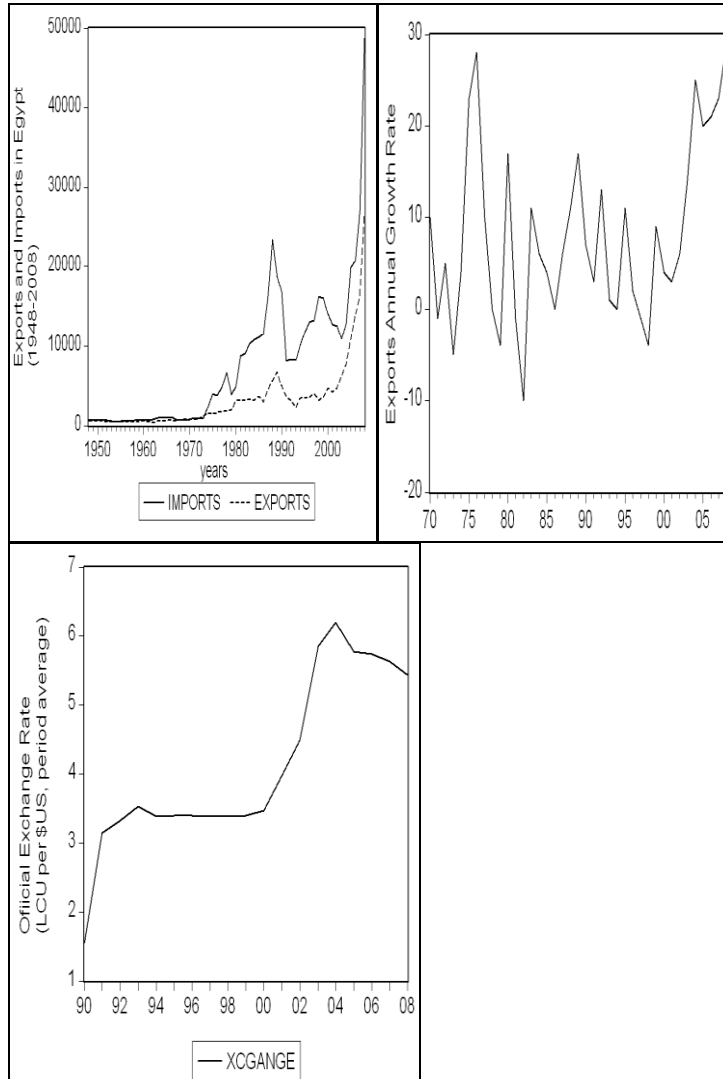
In this Paper, I would like to illustrate the contribution of trade agreements in improving the Egyptian Exports. This paper concentrated mainly on Egypt but tried to include all trade agreements Egypt has participated in to give comprehensive view on trade agreement effect. This will be done through an econometric model based on the gravity model, which was first introduced by Tinbergen in 1962 (Noble prize owner in 1969) and is one of the most popular used models to measure economic integration effect.

This Paper is composed of five main sections, the first is highlighting the performance of Egypt Exports, while the second section will be dedicated to define all trade Agreements that Egypt has joined. Then, the third section will demonstrate what are the expected benefits from trade agreement and integration according to the economic theory in trade for the Egyptian economy, while the fourth explains the opportunity of benefits for Egypt from Integration. Finally, the last section explains the gravity model and its conclusion.

2. Performance of Egypt's Exports

One of the stylized facts about the Egyptian Economic Performance is that exports have always been less than imports since 1970s. The gap between exports and imports was the largest during 1990s and has been narrowed since year 2000. Hopefully, the exports trend during the 2000s has been increasing and an increasing annual export growth rate is achieved reaching 29% in 2008 with exports volume 26,246 million dollars (see figure-1) and decreased to 23102 million dollars in 2009 . The increase in exports during 2000s was accompanied with devaluation in the Egyptian currency specially after the new regulation of floating currency. (see Figure-1)

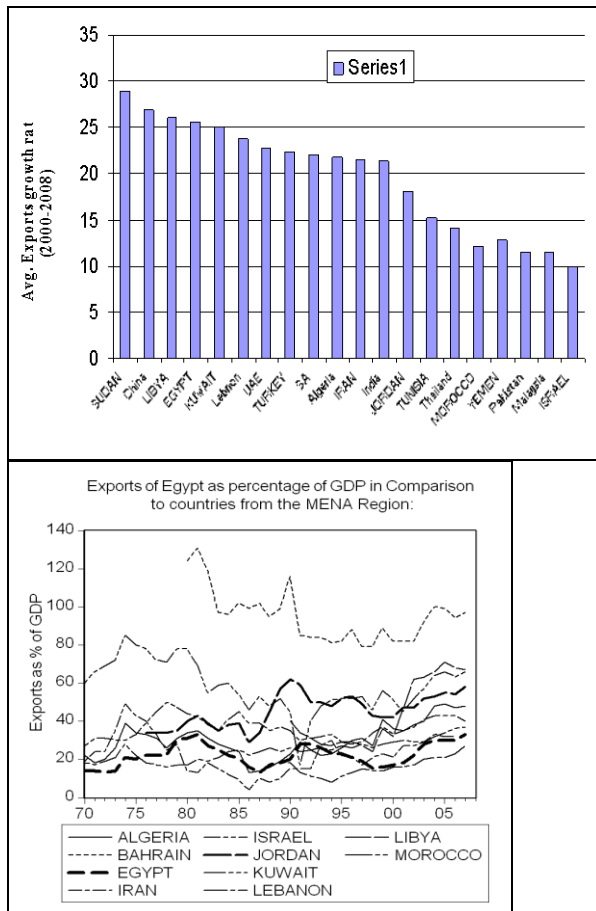
Figure (1): Exports Trend



Source: By the author based on UNCTAD Handbook of Statistics 2009 and World Bank Data (2010)

In spite of the high exports annual growth rate achieved by the Egyptian exports lately (29% in 2008) and the high position in terms of average growth rate in between during the 2000s (as shown in figure 2), Egypt exports performance is in the bottom in comparison to the exports values of the MENA Region. As presented in figure (4), Egypt's export as % of GDP is less than that of oil exporting countries such as Bahrain, Kuwait, Algeria and Libya and even less than non oil exporting countries such as Jordan and Israel.

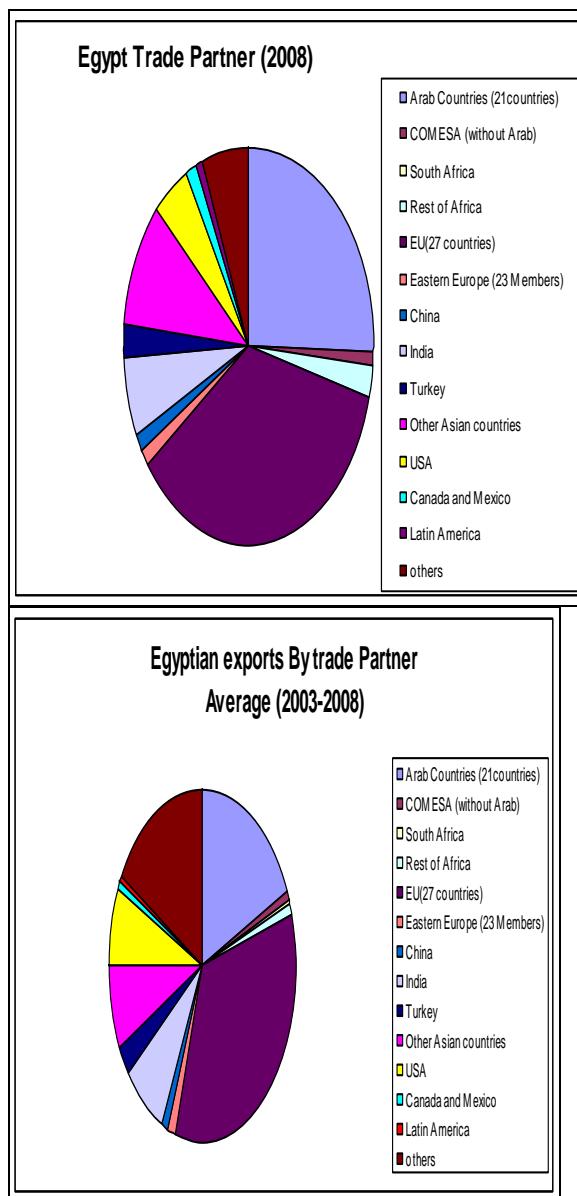
Figure (2): Egypt in comparison to MENA Region



Source: Made by the Author based on UNCTAD Handbook of Statistics 2009 and World Bank Data (2010)

According to the trade point statistics for the Ministry of Trade, European Union is the biggest exporting market for Egypt (34% of Exports for the period 2003-2008) concentrated mainly in Italy (first rank in Egypt Exports), Spain, Germany and United Kingdom. Then comes India (7.5%) and United States of America (7.4%), while the 21 Arab Countries represents 18.4% from the Egyptian total Exports (see figure 3).

Figure (3): Egypt Trade Partners

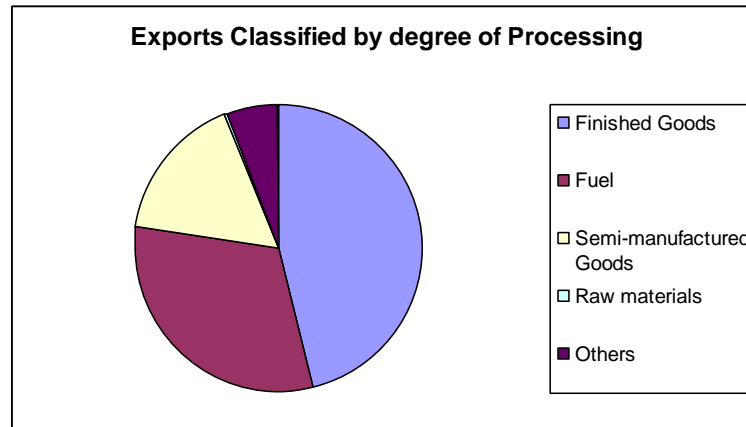


Source: Made by the Author based on Monthly Foreign Statistics Report (2009)

Investigating the structure of the Egyptian exports, it is found that the main contributor to exports is the fuel representing 30% of the exported goods in 2009 (see figure-4 and Appendix table-1). Moreover, it is remarkable that finished goods represent more than 42% of the exports. Finished Goods are concentrated mainly in metal products (such as iron, steel and aluminum), textile products, plastic products and vegetables exports. On the other hand, there are some products that Egypt nearly do not export such

as shoes, umbrella, head dressers, antiques, master pieces and weapons (Monthly Foreign Statistics Report 2009).

Figure (4): Exports by degree of Processing (Sep. 2009):



Source: Made by the Author based on Monthly Foreign Statistics Report (2009)

3. Trade Agreement for Egypt

The Far East countries' achievement in changing the world top industrial and exporting map has led all developing countries to divert their trade policy from Import substitution to export promotion policies. Egypt as other countries adopted the same policy aiming at using exports in promoting economic growth. For achieving this policy and integrating into an open economy with no barriers Egypt has applied a number of the following bilateral and multilateral trade agreement:

3.1 Bilateral Agreements

3.1.1 Free Trade Agreement between Egypt and Turkey:

This agreement is signed in December 2005, as part of the Euro-Mediterranean partnership agreement, targeting improvement of regional relationship between the Mediterranean countries. It ensures the free access of Egyptian Industrial exports into the Turkish Markets without duties once the agreement set into force. While, the Egyptian duties on Turkish Industrial exports into Egyptian markets abolishes gradually according to a schedule. Two Parties agreed on granting free quota on agricultural products and applying the Pan – Euro-med Rules of Origin on the goods exchanged among them. This agreement is still under the process of ratification. (Industrial and Trade Agreements, 2010).

3.2 Multilateral Agreements

3.2.1 PAFTA: Pan Arab Free Trade Area:

In some literature it is also addressed as Greater Arab free trade Area in some literature. It is a declaration concluded by the Social and Economic Council of the Arab League in 1997. The declaration targeted creating Free trade area between the Arab countries within ten years through decreasing 10% of tariffs yearly. Removal for all tariffs on Arab origin products were brought forward lately to 2005 (Hoekman, B. & Zarrouk, J., 2009) Out of 22 countries registered in the Arab League only 17 countries are PAFTA members and 14 countries (Egypt, United Arab Emirates, Bahrain, Jordan, Tunisia, Saudi Arabia, Syria, Iraq, Oman, Qatar, Kuwait, Lebanon, Libya and Morocco) managed to decrease Tariffs. While, Sudan, Yemen and Palestine were given exception from decreasing tariffs due to their political and economic unstable condition.

3.2.2 COMESA Agreement:

A Preferential trade area was entered into force between East and South Africa in 1982 and in 1994 was developed into a Common Market targeting 100% tariff reduction by 2000. Egypt joined the common market in 1998 targeting an improvement in social, economic and political relations within Africa. Nine countries out of the 19 member countries managed to achieve 100% tariff reductions which are Mauritius, Madagascar, Zimbabwe, Egypt, Malawi, Sudan, Kenya, Djibouti and Zambia. In spite of that Sudan still apply tariff system with Egypt. Other 10 Countries (Burundi, Comoros, Democratic Republic of Congo, Eritrea, Ethiopia, Rwanda, Seychelles, Swaziland, Uganda, and Zimbabwe.) are in the process of decreasing their tariffs (Industrial and Trade Agreements, 2010)

3.2.3 Egypt - EU Partnership Agreement:

This agreement is part of Euro-Mediterranean Partnership Agreements between the Union and its partners in the southern side of the Mediterranean Sea. It came into action in 2004 including “free trade arrangements for industrial goods, concessionary arrangements for trade in agricultural products, and opens up the prospect for greater liberalization of trade in services, and farm goods” (The EU-Egypt Association Agreement, 2010)

3.2.4 Qualifying Industrial Zones:

Qualifying Industrial Zones (QIZ) is chosen geographic zones within Egypt, which enjoy a duty free status with the United States. Industrial productions within such zones are granted duty free access to the US markets, provided that they satisfy Israeli component of 11.7%. This agreement was implemented in 2005 and targeted mainly textile industry. Lately, there were about 15 included industrial zones and 700 companies complying the rules of the agreement (QIZ Egypt, 2010)

3.2.5 Aghadir Agreement:

Aghadir declaration accomplished a free trade area between four Arab countries (Egypt, Jordan, Morocco and Tunisia) by year 2005 and targeted total elimination of tariffs by 2006. This agreement is considered a crucial step towards the economic and

social integration of the Arab Mediterranean world specially that the four countries are member of PAFTA (Peridy,N., 2007).

4. Expected Benefits of Trade Blocs: Economic Theory

In the Economic literature benefits of Trade Blocs are divided into two types the short run effect (static effect) and the long-run effect (dynamic effect)

4.1 Static Effect: The Viner Theory of Custom Union:

4.1.1 Trade Creation: occurs when some domestic production in a nation that is a member of the custom union is replaced by lower- cost imports from another member nation (Salvatore, 1999) it is a situation where an expensive supplier is replaced by a cheaper supplier which the outcome of specialization based on comparative advantage. This achieves higher efficiency and better allocation of resources and thus creates general consumer welfare.(see appendix figure 1 for more illustration)

4.1.2 Trade Diversion: occurs when lower-cost imports from outside the custom union are replaced by higher cost imports from a union member (Salvatore, 1999). Trade diversion is a situation where the cheapest producer is replaced by a producer in the custom union whose price is less after removing tariff. Thus this is a switch towards protection as production within the custom union is protected by a common tariff. Customers in this case lose as they can import the product at a lower price and the country losses at the same time the tariff revenue, however domestic producers are still some how protected. (Jovanovich, 1992,— for more illustration Appendix figure-2)

Viner showed that trade creation and trade diversion represents two opposing factors and the gain of custom union depends on the net effect of both trade creation and trade diversion.

4.2 Dynamic Effect:

According to Economic Literature, the importance of dynamic effect exceeds that of static effect and can remove any losses that can occur. In order to be aware of the real benefits of custom union one should move from the effect of trading in commodities to the effect of trading over time (Jovanovich, 1992).

4.2.1 The Increased Competition: as producers are not protected any more thus competition increases, this leads to generating rapid changes, best practices, innovation and technology (Ellsworth, 1975). These changes occur as firms would compete in product differentiation, quality, R& D as well as prices which all will be reflected on consumer's welfare (Jovanovich, 1992). For developing countries, it is well known that competition is missing in the markets which decrease efficiency and usually there are one or two powerful competitors and small firms that are not able to compete. Under custom

union, the expansion of market size enhance competition as number of firms expand and increase the opportunities for small firms, as more customers are available.

4.2.2 Access to bigger market: a custom union increases the market area of countries participating in the union, as the countries' markets pool together which gives the opportunity to even small countries to gain from specialization and large scale production (Jovanovich, 1992).

4.2.3 The achievement of economies of scale: as long as there is an access to wide markets, this enables firms to expand its production reaching the minimum average cost possible (Jovanovich, 1992). Thus countries would benefit from Custom Union, a situation of increased specialization and at the same time protection for industrial production. Integration would also improve technical efficiency as cost is reduced since production will be shifted to the least cost producers and this urge other producers to find new methods of production decrease its cost to be able to face competition (Meier, 1994).

4.2.4 Foreign Direct Investment: Investors outside the custom Union find the only way to avoid high tariffs is to build up production units in the custom union, thus they enjoy the preferential treatment within the custom union (Salvator, 1999). One of the main benefits of custom union is that it encourages foreign direct investment that represents an important source of foreign currency, technology, management skills and tax revenue for any country.

5. Opportunities of Benefits for Egypt:

In order to show the expected benefits for Egypt we should bare in mind that the economists agreed on the existence of the below factors, that if achieved the custom union would most probably be a trade creating union rather than trade diverting:

5.1 High Tariffs rate in the region: the higher the tariffs of a certain country this indicates the uncompetitiveness of the country's industries. Removing this tariff will allow high increase in trade and will be reflected as a big decrease in prices and thus consumer welfare (Salvatore, 1999). The Tariff rate in the MENA region has been so high (see table-1) in comparison to other developing regions which implies the higher the opportunities Egypt would get to integrate within the region.

Table (1): Tariff Rate in Different Developing regions:

Tariff rate	1990	2000	2008
Middle East and North Africa	26%	23%	13%
East Asia and the Pacific	13%	12%	8%
Latin America and the Caribbean	14%	13%	8%

Source: World Bank Data Bank (2010)

5.1 Egypt is just in the centre of three continents (Africa, Asia and Europe): this implies the closer geographically it is to any country of three continents, beside being boarded by Mediterranean sea and Red Sea makes Egypt feasible to trade with any country and decreases the cost of transportation. Geographical position would act itself as a natural tariff barrier as it increases transportation cost (Ellsworth, 1975). In addition, countries that are within the same region would definitely have the same consumption habits, near tradition, similar interest, parallel repair facilities which all work together to successively coordinate trade relation within a union (Balsa, 1961). That's why trade with Arab countries would be of high benefits as the language, religion, custom and tradition tie the relation between the countries.

5.2 Participating in more than one Trade Bloc: the larger the number of countries the highest the probability of trade creation and the least the probability of trade diversion (Jovanovich, 1992). It is also argued that a larger economic area incorporates the international division of labor. However, it should be considered that still very large union would create problems as for example the larger the number of countries the larger the consumption patterns, preference attitudes, diversity of systems, measures, standards and specifications (Balsa, 1961). However, the higher the number of countries implies larger market to trade and the achievement of economies of scale. In order to enlarge the number Egypt has participated in 6 different agreements to include the largest number of countries and there is even a trade agreement with MERCOSUR countries which is under negotiations by now.

5.3 Provide benefits from intensified Competition: It is well known that competition is missing in the markets of most developing countries which decrease efficiency and usually there are one or two powerful competitors and small firms that are not able to compete. Under custom union, the expansion of market size enhance competition as number of firms expand and increase the opportunities for small firms as more customers are available.

5.4 Similar Consumption Pattern: It is usual to find the consumption pattern, preference and quality standards nearly the same in developing countries which make it easier to develop a south – south trade pattern than a south-north trade pattern (Meier, 1994). Thus, developing countries started to develop economic blocs with other developing countries, as the barriers of trade with north represented in different taste and standards of quality.

6. Empirical Model: How significant is trade Agreements in Changing Exports for the Egyptian Case

6.1 Gravity Model

This section will use Gravity Model to show the significance of different trade agreement in changing Egyptian Exports. Gravity Model is one of the most popular approaches used to measure the economic integration between countries. The gravity

model was first formulated by Tinbergen 1962, Payphone 1963, Julianne 1963, and Linnemann 1966 (Berg strand, 1985. Sans, 2000. Tiiu, 2000. Insel and Tekce, 2010) and used world wide to analyze regional bloc effect. In the Arab region research area, the gravity model was used by Al-Atrash and Youssef (2000) to address how small is intra-Arab trade, Derosa (2008, p53) assessing the bilateral agreement effect with El-Maghreb Integration (for the countries Libya, Tunisia, Algeria, Morocco and Mauritania) and Insel and Tekce (2010) which analyses the trade flow of GCC countries (Saudi Arabia, Kuwait, Bahrain, Qatar, United Arab of Emirates and Oman) with themselves and other countries. Thus Gravity model is a prevalent method to estimate trade flows and that's why I have chosen this technique to estimate Egyptian export performance.

The Gravity model: $T_{ij} = A * Y_i * Y_j / D_{ij}$

According to this gravity equation, trade volume between two countries (T_{ij}) depends on the joint production of the two countries ($Y_i * Y_j$) divided by the distance between two countries (D_{ij}) and A is a constant (Kimura and Lee, 2004)

This means that:

$$T_{ij} = f(y_i * y_j / D_{ij})$$

or

$$T_{ij} = f(y_i, y_j, D_{ij})$$

In order to be able to estimate the model, I will transform it to log-regression model:

$$\ln(T_{ij}) = \alpha_0 + \alpha_1 \ln(Y_i * Y_j / D_{ij}) + \varepsilon_i \leftarrow^{eq1}$$

$$\ln(T_{ij}) = \beta_0 + \beta_1 \ln(Y_i) + \beta_2 \ln(Y_j) + \beta_3 \ln(D_{ij}) + \mu_i \leftarrow^{eq2}$$

One of the main advantages of gravity model that it has no fixed form so In order to show the bilateral and multilateral agreement effect on exports on Egypt I can add dummy variables showing to which trade bloc every country belongs:

$$\ln(T_{ij}) = \alpha_0 + \alpha_1 \ln(Y_i * Y_j / D_{ij}) + \alpha_2 D_a + \alpha_3 D_{arab} + \alpha_4 D_c + \alpha_5 D_{eu} + \alpha_6 D_{other} + \varepsilon_i \leftarrow^{eq1}$$

$$\ln(T_{ij}) = \beta_0 + \beta_1 \ln(Y_i) + \beta_2 \ln(Y_j) + \beta_3 \ln(D_{ij}) + \beta_4 D_a + \beta_5 D_{arab} + \beta_6 D_c + \beta_7 D_{eu} + \beta_8 D_{other} + \varepsilon_i \leftarrow^{eq2}$$

The Below carried model will use the first equation to show the variation in the Egyptian Exports.

Table (2): Specification of the variables used in the empirical test

Variable	Description
Tij	Export of Egypt to Country j (\$millions current) Source: Monthly Foreign Statistics Report (2009). International Trade Point. Ministry of Trade and Industry
Yi	GDP for Egypt (\$million current) Source: World Bank (2010)
Yj	GDP for country j (\$ million current) Source: World Bank (2010)
Dij	Distance between Cairo Capital of Egypt and Capital of Country j Source: Distance Calculator World. Globefeed.com.
Da	Dummy Variable for Aghadir Agreement Da = 1 for Tunisia, Morocco and Jordan and =0 for all other countries
Darab	Dummy Variable for PAFTA Da = 1 for 14 countries Under PAFTA and= 0 for all other countries
Dc	Dummy Variable for COMESA Da = 1 for 19 countries Under PAFTA and= 0 for all other countries
Deu	Dummy Variable for European Union Agreement Deu = 1 for EU countries and= 0 for all other countries
Dother	Dummy Variable for QIZ Agreement and Turkey agreement Dother = 1 for US, Israel and Turkey s and= 0 for all other countries

The data used in the regression model is a panel data based on data for 67 different countries (15 African countries, 12 Arab Countries, 13 European countries, 11 Asian countries, 2 Australian countries and 14 countries from North and South America for the period between 2004 and 2008 (sources of the data are shown in table). The gravity regression model with panel data is mainly used to answer the question: “Does belonging to one of the seven Trades agreement affects the change in exports flow?”. The Estimation is done through pooled least square method with common intercept across countries and corrected for autocorrelation after carrying the Durbin-Watson test.

6.2 Empirical Results:

From Table (3), we can conclude the following:

- According to the F-test the model is significant and $R^2=0.88$ which implies the applicability of explaining the variation of exports according to the chosen explanatory variable.
- The joint product of countries divided by the distance between countries is as expected positively related to exports. This means the larger the production for Egypt the larger the opportunity for increasing exports. In addition, Egypt tend to export more to countries with higher GDP and nearer in distance. The coefficient is also significant at even 99% confidence level.

- There is positive relation between participating in Aghadir agreement and increasing exports. However, the correlation coefficient is very small (0.049) and even not significant. This implies that the contribution in Aghadir agreement does not have effect in changing exports according to the sample data.
- Both the QIZ and Turkey agreement is not significant in explaining changes in Egyptian exports. Even when carrying even agreement alone as a dummy variable, the results were still not significant.
- PAFTA, COMESA and EU coefficients are significant only at 10% . This implies that trade blocs of these three areas has a role in changing Egyptian exports.

Table (3): E-views model results:

Dependent Variable: Exports of Egypt Method used: Pooled Least Square (corrected for autocorrelation) Sample: 2003-2008 Included Observations: 6 Number of Cross-sections used: 67 Total Panel Observations: 330	
Variable	Coefficient
Const	-8.6195 (0.000) ¹⁵
Log(GDP _i * GDP _j /D _{ij})	0.7788 (0.000)
D _a	0.2384 (0.681)
D _{arab}	1.064 (0.096)
D _c	1.2865 (0.099)
D _{eu}	1.3139 (0.10)
D _{other}	0.0976 (0.864)
R-squared	87.62%
F-statistic	325.6038
D-Wstat	1.907242

In order to improve the results and robust the model results I thought of testing another model adding a time effect for each trade agreement. As each agreement is implemented at different timing, a weight is given to each dummy variable equal to the time the trade agreement has been functioning. This means that for Aghadir Agreement at year 2006 (the year of implementation of the agreement) ta will be equal one, equal 2 at

¹⁵ P-values are added between brackets below the coefficient value

2007 and equal 3 at 2008 and zero other wise. Thus the new model will take the below function:

$$\ln(T_{ij}) = \alpha_0 + \alpha_1 \ln(Y_i * Y_j / D_{ij}) + \alpha_2 D_a t_a + \alpha_3 D_{arab} t_{arab} + \alpha_4 D_c t_c + \alpha_5 D_{eu} t_{eu} + \alpha_6 D_{other} t_{other} + \varepsilon_i$$

Table (4): E-views model results:

Dependent Variable: Exports of Egypt Method used: Pooled Least Square (corrected for autocorrelation with common intercept) Sample: 2003-2008 Included Observations: 6 Number of Cross-sections used: 67 Total Panel Observations: 330	
Variable	Coefficient
Const	-7.9415 (0.000)
Log(GDPi* GDPj/Dij)	0.7267 (0.000)
Da*ta	0.1927 (0.540)
Darab*tarab	0.3243 (0.0264)
Dc*tc	0.1038 (0.0891)
Deu*teu	0.1572 (0.0611)
Dother*tother	0.0602 (0.8107)
R-squared	87.85%
F-statistic	332.47
D-Wstat	1.894

According to the new model (the result represented in table-4) the only change, in comparison to the previous model is that the significance of the three previous significant agreements has improved, but their coefficient values have decreased:

- According to the previous model being a PAFTA country increase Egyptian exports by 1% but according to the new model it increases the model only by 0.3243%.
- According to the previous model being a COMESA country increase Egyptian exports by 1.2% but according to the new model it increases the model only by 0.10%.
- According to the previous model being a PAFTA country increase Egyptian exports by 1% but according to the new model it increases the model only by 0.15%.

To give the model more flexibility I have checked the model with fixed effects (where each cross section has different intercept) and the distance variable will be

represented alone as a separate variable and the results are represented in the below table (5) :

Table (5): E-views model results:

Dependent Variable: Exports of Egypt Method used: Pooled Least Square (with fixed effects) Sample (adjusted): 2003-2008 Included Observations: 6 after adjusting end points Number of Cross-sections used: 67 Total Panel Observations: 398			
Variable		Coefficient	
Log(GDPi* GDPj/Dij)		0.8513 (0.000)	
Da*ta		0.1901 (0.3361)	
Darab*tarab		0.0592 (0.5174)	
Dc*tc		-0.0043 (0.9541)	
Deu*teu		0.1409 (0.0480)	
Dother*tother		0.02626 (0.8639)	
Fixed Effects:			
_KENYA--C	-7.417400	_JAPAN--C	-9.782556
_NIGERIA--C	-9.339733	_INDONESIA--C	-9.652931
_NEIGER--C	-10.78365	_SINGAPORE--C	-7.357827
_MOZAMBIQUE--C	-10.51388	_MALAYSIA--C	-9.356356
_SENEGAL--C	-7.549147	_ISRAIEL--C	-11.96834
_MALAWI--C	-9.490463	_AZERBAIJAN--C	-12.60531
_ZAMBIA--C	-9.468109	_ARMENIA--C	-12.27115
_GHANA--C	-8.202430	_ALBANIA--C	-9.126092
_ANGOLA--C	-10.00403	_BULGARIA--C	-10.77867
_ETHIOPIA--C	-8.757322	_CYPRUS--C	-9.560815
_ERITERIA--C	-8.769689	_SPAIN--C	-9.019136
_SAR--C	-9.843378	_UKINGDOM--C	-10.47280
_ICOAS--C	-8.918523	_ITALY--C	-9.230511
_GABON--C	-10.70884	_BELGUIM--C	-9.476394
_UGHANDA--C	-9.470434	_DENMARK--C	-9.850006
_SARABIA--C	-8.488577	_FRANCE--C	-10.25084
_KUWAIT--C	-9.472868	_GERMANY--C	-10.39553
_DIJBOUTI--C	-6.886348	_HUNGARY--C	-12.64510
_LEBANON--C	-7.700424	_MEXICO--C	-10.83808
_LIBYA--C	-7.525421	_USA--C	-9.259070
_SUDAN--C	-7.291440	_CANADA--C	-11.49766
_MOROCCO--C	-7.921731	_ELSALVADOR--C	-11.98802
_JORDAN--C	-7.536747	_JAMAICA--C	-12.19979
_TUNISIA--C	-8.533076	_ARGENTINA--C	-10.53543
_YEMEN--C	-7.464137	_URUGUAY--C	-11.00077
_ALGERIA--C	-8.970115	_ECUADOR--C	-12.51396
_BAHRAIN--C	-9.820176	_PARAGUAY--C	-12.52583
_INDIA--C	-7.582367	_BRAZIL--C	-10.44239
_CHINA--C	-9.888731	_BOLIVIA--C	-13.87184
_TURKEY--C	-9.252398	_PERU--C	-13.63375
_THAILAND--C	-10.11912	_CHILIE--C	-12.91530
_SKOREA--C	-8.315666	_PANAMA--C	-11.04538
_PAKISTAN--C	-8.585579	_NZELAND--C	-11.87043
		_AUSTRALIA--C	-11.01432

R-squared	87.85%		
F-statistic	332.47		
D-Wstat	1.894		

Allowing for fixed effects ended up with a situation where the only significant trade agreement is the European Union with correlation coefficient 0.14. In General we can conclude that the trade agreements seem to be not the real solution for improving exports. This conclusion pushes me to demonstrate some specific reasons for each agreement that led to this low contribution in improving exports for Egypt.

7. The Reasons behind Low Regional Bloc Effect on Egyptian Exports:

7.1 Aghadir: This could return to the fact that the four countries (Egypt, Tunisia, Jordan and Morocco) are already part of PAFTA agreement thus any short run effects would have appeared after joining the PAFTA agreement. Long run effect is not gained yet as the agreement has only been active from 2006.

7.2 PAFTA: I believe that there is a larger opportunity in the Arab trade for Egypt. However, the insignificant role of promoting trade after trade would return to the following reason:

7.2.1 The High Competition Egypt faces from East Asia

East and South Asia are near regions to the Arab Countries specially the gulf Area which led to increasing trade between the two regions. According to the table below nearly 34% of UAE , 24% of Saudi Arabia, 23% of Yemen, 20% of Jordan, 19% of Kuwait, 19% of Libya, and 18% of Qatar imports are from APTA and ASEAN trade regions in Asia.

This increases the competition with the Egyptian exports especially in the last century with the increasing improvement in the Asian economies and trade. This competition is concentrated in textile industry which represents about 10% of Egypt export and a labor intensive production that attracts about 30% of the Egyptian Labor. The East Asian countries depend on textile in order to absorb the labor surplus following the Japanese model of development. The ability of Egypt to face this competition depends on its capability to improve supply chain, integrate with developed countries demand markets, upgrade manufactured capabilities and transfer technology to the industry to be able to face the low labor cost production in this manufactures in the Asian region specially China (Magder, D., 2005)

**Table (6): Selected Countries Arab Import from Asian Trade Regions
(% of countries total import):**

Countries	APTA (Asia Pacific Trade Area - 6countries)	ASEAN (Association of South-East Asian Nations-10countries)
Bahrain	13.55609	3.67036
Jordan	15.22451	4.628209
Kuwait	14.95364	4.231714
Libyan Arab Jamahiriya	14.70033	4.245828
Morocco	8.08587	1.196799
Qatar	13.97657	4.224397
Saudi Arabia	19.15452	5.010155
Tunisia	4.402201	1.859263
United Arab Emirates	26.48696	7.438368
Yemen	13.75537	9.388433

Source: Calculated by Author based on UNCTAD Handbook of Statistics

7.2.2 Exports Type:

Investigating the Arab countries comparative advantage, it is found that Egypt is known for textile, Sudan for rubber, Jordan for agricultural products, Gulf area for mainly oil . Such situation doesn't raise competitiveness nor create specialization as each country is already specializing in a certain product.

Moreover, 30% of the Exports revenue is from fuel and natural gas, it is impossible for Egypt to specialize in other products and buy fuel from other countries such as the gulf area whose income depends mainly on fuel. Thus 30% of Egyptian exports are not feasible for trade with most of the Arab countries.

However, there is a space for expanding what Egypt is specialized in, if it is able to provide a competitive product other wise the Arab countries especially with high income would divert to Asian countries that enjoy low labor cost.

7.2.3 Problems Concerning the Agreement itself:

7.2.3.1 No Unique standards for commodity quality : In 1993 EU was able to put 1400 different standard into one unique form for all countries while such situation was not successful between Arab countries (Abd El-Hamid,2003)

7.2.3.2 No Compensation Mechanisms for protecting losers: one of the main leader factors of success in the European Union is the application of compensation system for small countries. Such element is missing in Arab Common Market agreement while in EU about \$6billions are directed to the countries in the south and Ireland to eliminate negative effects of the union (Abd El-Hamid,2003)

7.3 COMESA:

Reasons of low trade with COMESA region would return to the general low economic conditions of most of the joined countries. According to World Bank Data (2010), the average GDP per capita for the COMESA countries (excluding Egypt and Zimbabwe) is equal \$2467.82 which is even less than the average of Middle East and North Africa which is \$3303 (in comparison to average income in MENA Region and in East Asia). GDP per capita is even less than \$200 in Burundi and Congo D.R and less than \$500 in seven countries (Uganda, Rwanda, Malawi, Madagascar, Eritrea , Djibouti and 2005 data for Zimbabwe) and 16 of the joint countries (including Egypt) GDP per capita is below \$2000.

The low economic conditions revealed a situation of bad infrastructure, that led to object trading development to the extent that the average cost in order to import a product in the COMESA countries (excluding Egypt and Libya) equal nearly \$216316 (in 2008) per one container (in comparison to \$1434 in MENA region and \$1011 in East Asia and the Pacific) and reach higher than \$4000 in some countries such as Rwanda and Burundi (World Bank Data Bank, 2010) and the Logistics performance index¹⁷: Quality of trade and transport-related infrastructure is on average 2.5. See below in table (7) more variables to give more view of the economic situation in the COMESA Region.

Table (7): COMESA Region Economic Performance:

Variable	Average in COMESA ¹⁸	Worst Country Performance	Average in MENA
Economic Growth Rate (2008)	5.9% (excluding Libya, Seychelles and Zimbabwe)	Djibouti (1% in 2008) Zimbabwe (-5.3% in 2005)	6%
External debt Shocks % of GNI ¹⁹ (2008)	39.9% (excluding Seychelles and Zimbabwe)	Burundi (124.7% in 2008) Zimbabwe (132.1% in 2005)	15%

¹⁶ Calculated by the author based on World Bank Data Bank (2010)

¹⁷ “Logistics Performance Index overall score reflects perceptions of a country’s logistics based on efficiency of customs clearance process, quality of trade- and transport-related infrastructure, ease of arranging competitively priced shipments, quality of logistics services, ability to track and trace consignments, and frequency with which shipments reach the consignee within the scheduled time. The index ranges from 1 to 5, with a higher score representing better performance.” World Bank Indicators (2010)

¹⁸ Calculated by the author based on World Bank Data 2010.

¹⁹ “Total external debt is debt owed to nonresidents repayable in foreign currency, goods, or services. Total external debt is the sum of public, publicly guaranteed, and private nonguaranteed long-term debt, use of IMF credit, and short-term debt. Short-term debt includes all debt having an original maturity of one year or less and interest in arrears on long-term debt.” World Bank Indicators (2010)

Inflation, consumer prices (annual %)	Range between 24411% in Zimbabwe (2007), 44.4% in Ethiopia to 8.7% in Malawi (2008)	
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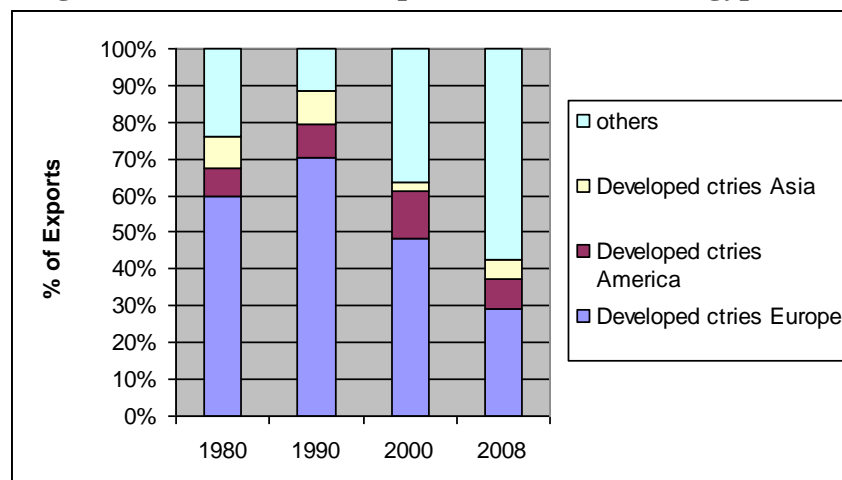
Source: World Bank Data Bank (2010)

This is beside the unstable political conditions (such as civil wars in Rwanda, Sudan, Ethiopia and Congo D.R.) which give these countries the permission of not following free trade agreements in order to support domestic production that is already affected with domestic instability. For example, Congo do not apply tax exemption on its imports, Ethiopia allow only 10% exemption, and Sudan do not allow tax exemption on 45 Egyptian (including cotton yarn and textile) and products and 30% tariff deduction on 13 Egyptian product.

7.4 The European Union :

The European Union has always been the bigger partner to Egypt as represented in figure (5). This would give a partial explanation of why the role of trade agreement is limited in our model. As it has always been the first partner, the trade agreement did not change anything the situation is the same before and after.

Figure (5): Share of Developed Economies from Egyptian Exports:



Source: Made by Author based on UNCTAD Handbook of Statistics

In addition, Egypt faces very high competition to trade to EU as EU has launched at the 1995 Barcelona Conference “The Euro-Mediterranean Partnership”. This means that all the Mediterranean Neighborhood is getting the same benefits as Egypt and the ability to expand trade depending on trading bloc theory is not an option.

Table (8): Rank of Mediterranean country according to EU Imports:

Country	Rank
Turkey	7 th
Libya	10 th
Algeria	12 th
Tunisia	32 nd
Morocco	35 th
Egypt	36 th
Syria	50 th

Source: European Commission Trade, 2010

This is beside the High Competition Egypt faces from East Asia especially in textile industry which represent more than 9% of European imports from Egypt while 14% of its imports from China (its 1st import partner) are textile (Bilateral relations statistics, 2010).

7.5 QIZ:

For the QIZ agreements, although it is older than turkey agreement it is still insignificant. This mainly could be due to the reason that QIZ agreement has an effect only on the textile industry and concentrated in 3 main zones that did not even include the biggest producer of textile products such as El-Mahla El-Kobra. According QIZ unit in Egypt, 99.6% of exports traded under the quiz agreement in the last quarter of 2009 is textile and textile articles while the rest is in vegetables (0.003%), and Pulp of wood or of other Fibrous Cellulosic Material; waste and scrap of paper or paper board ; paper and paperboard and articles thereof.

7.6 Turkey:

This returns mainly to the fact that the turkey agreement is a new agreement signed in December 2005 and effective from 2006 (the sample ends 2008).It is only one country within 53 countries in sample thus its role would not be that effective. This is beside the fact that agreement is still under ratification.

8. CONCLUSSIONS:

The Gravity Model presented in this paper demonstrated that the regional agreement of Egypt does not achieve the expected benefits and the exports expansion is tied by the ability to expand GDP and trade with high income countries (as EU FTA was the only significant dummy variable).

I believe myself that expansion in GDP and export would start through improvement in the agricultural sector as most of Egypt's comparative advantage

products returns to agriculture production such as textile (7% of total exports according to CAPMAS 2008), plantation products (7% of total exports) and food beverages and tobacco (2% of total exports) and replace the mineral products (46.6% of total exports) which is mainly petrol and gas and can end at any time.

It is also suggested in Kheir-El-Din and El-Ghamrawy (2010) that promoting exports can be done through providing preferential treatment and incentives (such as energy subsidy or tax exemptions) for only products that enjoys comparative advantage such as Cement, ceramic products, chemical products, and manufactures. In addition there should be educational program seeking increasing marketing skills, improving label productivity and promoting R&D. This is besides improving debit conditions, port services and exporting procedures.

Last, it should be noted that the free trade long run effect is more important than its short run effect. Thus the real benefit of this agreement could attracting FDI and technology. In addition, the regional agreement would be part of political dimension that the country is following such as the QIZ agreement that targets decreasing the tension with Israel and COMESA which targets creating economic activities with the Nile basin countries.

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APPENDIX I:

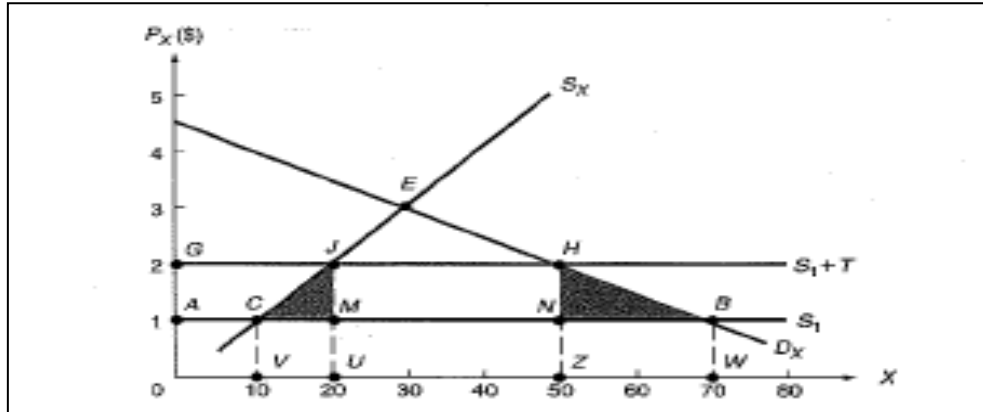
Table (1): Exports of goods:

Indicator	2008 Million \$	Share (%)	2009 Million \$	Share (%)
Mineral fuels and oils	11,599	44.3	6,935	30.0
Iron and steel	1,223	4.7	516	2.2
Textiles and clothing	1,203	4.6	1,529	6.6
Salt, sulphur and cement	566	2.2	463	2.0
Cereals	191	0.7	407	2
Cotton	363	1.4	260	1.1
Plastics and products	886	3.4	744	3.2
Edible vegetables	663	2.5	782	3.4
Articles of iron and steel	440	1.7	503	2.2
Aluminum and articles	555	2.1	401	1.7
Others	9,738	37.2	10,562	45.7

Source: Egypt's Economic Profile and Statistics (2010)

APPENDIX II:

Figure (1): Illustration for Trade Creation:

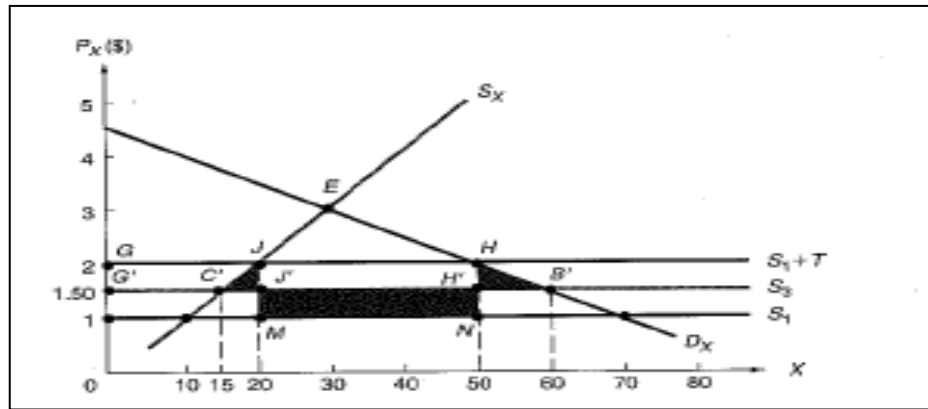


Source: Salvatore, 1999, p.

According to the graph above, D_x and S_x are the demand curves and supply curves of good X for Nation two. S_1 is the price for good X in Nation one, S_1+T is the price of imported X in Nation two as nation two imposes T amount of tariff on imports of nation one. After forming a custom Union between Nation one and Nation two, Nation two would import good X at price S_1 as tariff are removed. This would have an effect on domestic consumption and production in Nation two. For Consumption, consumers will demand more as the price decreased (consumption increase from 50 X to 70X). Domestic production will decrease from 20X to 10 X as production will shift from a high cost domestic producer (producing at J cost) to a

lower cost foreign producer (producing at C cost). This definitely means an increase in imports from JH to CB. To test the effect of custom union on welfare, we examine its effect on consumer surplus. Consumer surplus increased by the amount GHBA, producer surplus decreased by the amount GJCA and Government Revenue decreased by the amount JHNM. Thus the net gain is an addition to the society welfare represented in the two shaded triangle CJM and NHB (Salvatore, 1999).

Figure (2): Illustration for Trade Diversion



Source: Salvatore, 1999, p.

According to the graph above, D_x and S_x are the demand curves and supply curves of good X for Nation two. S_1 is the price for good X in Nation one, S_1+T is the price of imported X in Nation two as nation two imposes T amount of tariff on imports of nation one. After forming a custom Union between Nation three and Nation two, it is cheaper for country two to import from nation three instead nation one thus there is a diversion from the efficient producer to less efficient producer. This custom union will create trade as imports will increase and part of domestic production would be placed more efficient producers from nation however nation two will lose government revenue from imposing tariffs. Thus consumer surplus will increase by the area GHB'G', producer surplus will decrease by GJC'G' and government Revenue will decrease by JHNM. Thus there are gains equal to the two triangles JJ'C' and HB'H' and a loss equal to the rectangle J'H'NM. Thus, trade diversion might be positive if trade creation predominate the effect of trade diversion and might be negative if not. (Salvatore, 1999).

Innovation and Entrepreneurship; Does Gender really matter?

Case of Middle East

A descriptive study based on the Global Entrepreneurship Monitor for the 2009 cycle

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Abstract

It has been widely accepted that entrepreneurship and innovation play important and vital role in the economic growth and development of countries. Both are believed to be positively related, while Drucker believed that innovation is the specific tool of entrepreneurs; Schumpeter viewed the entrepreneur as innovator. Although our understanding of the relation between innovation and entrepreneurship is seldom gendered, however, there is gender difference among entrepreneurs in terms of levels of innovation.

The current research is a descriptive research aiming at broadening our understanding of the differences between men and women entrepreneurs in the Middle East using the data collected by the Adults Population Survey as part of the Global Entrepreneurship Monitor in 2008 and 2009. The research shows that although the level of entrepreneurship in Arab countries is fairly good; the level of innovation is poor with men entrepreneurs being more innovative than women.

Keywords: Entrepreneurship; Innovation; Global Entrepreneurship Monitor

Introduction

Despite the global interest in entrepreneurship, yet, there is no concise universally accepted definition of the term. This situation is a reflection of the fact that entrepreneurship is multidimensional concept (Audretch, 2002). One of the most common definitions is the one provided by Schumpeter (1934) as cited in Harvey, Kiessling and Moeller (2010) who defined entrepreneurship as an activity to create development through new combination linked to products/services, production processes/routines, new market, to use raw materials and the organization of the business. On the other hand, innovation is defined by Kanter (1983) as cited in Chell (2001) as the generation, acceptance and implementation of new ideas, processes, products or services.

The link between innovation and entrepreneurship has been addressed intensively since both are seen as tools to create economic growth and wealth. Brazel and Herbet (1999) indicated that the entrepreneurial event is a product of innovation, change and creativity while Drucker (2007) believed that innovation is the specific tool of entrepreneurs; it serves as the means by which they exploit change as an opportunity for a different business or a different service.

Due to transformations taking place everywhere, whether political, economic or social, more and more people are taking the route to entrepreneurship; traditionally men were more inclined than women to venture into business; and hence most of what is known about entrepreneurs, their background, motivation for starting a business and business problems faced by them are based on studies of male entrepreneurs (Hisrich & Brush as cited Garga & Bagga, 2009). Nevertheless, in the last few years women started to represent more than one third of all people involved in entrepreneurial activity (Minniti, Allen & Langowitz, 2006) and hence it was deemed necessary to study women entrepreneurship and explore the gender differences.

In Middle East, the interrelatedness between innovation and entrepreneurship is understudied as both terms are newly emerging in the region. As women entrepreneurs are still a minority and thus conducting a comparison between the two genders would enrich the literature of innovation and entrepreneurship.

Literature Review

There has been no consensus in defining entrepreneurship and innovation in the exiting literature (Zhao, 2005), however, entrepreneurship has been gaining interest at the national and international levels because it symbolises innovation and dynamism in the economy. Many authors and scholars see entrepreneurship and innovation as clearly interrelated. This section starts with presenting entrepreneurship, innovation and the interrelation between these two concepts, then moves to highlighting the gender differences as contemplated by the literature.

Entrepreneurship

There is no single universally accepted definition of entrepreneurship. This situation is a reflection of the fact that entrepreneurship is multidimensional concept (Audretch, 2002) spanning different units of observation ranging from the individual to the firm, region or industry and even nation (Grilo & Thurik, 2005) and depending largely on the focus of the research undertaken (Wennekers, Uhlaner and Thurik, 2002). According to Johnson (2001) "Entrepreneurship, in its narrowest sense, involves capturing ideas, converting them into products and, or services and then building a venture to take the product to market" (p. 138). While Schumpeter (1934) defined entrepreneurship as an activity to create development through new combination linked to products/services, production processes/routines, new market, to use raw materials and the organization of the business. Another definition was provided by Stevenson and Jarillo (1990) described entrepreneurship as the process by which individuals pursue opportunities without regard

to resources they currently control, while Gedeon (2010) views it as starting without any resources and creating new values in the realm of business, social values, government or academia.

Entrepreneurship importance stems from its effect on economic and social development within any country, in addition to providing chances for growth and wealth creation. The potential of entrepreneurship to enhance economic development has been recognised (OECD 2003), particularly in developing countries (Mahemba & De Bruijn 2003) who are not large players in world trade. Entrepreneurial activity is important to job growth (Bednarzik, 2000), has a strong positive correlation with growth (Reynolds et.al., 2002) serves as a mechanism by which knowledge spills over to a new firm in which it is commercialised while augmenting the number of enterprises and increasing competition (Carree & Thurik, 2005).

Innovation

In spite of increased attention to innovation, earlier research has not yielded a widely accepted consensus regarding how to define innovation (Goswami & Mathew, 2005). Hindle (2009) defined innovation as the combination of intensive process and entrepreneurial process to create new economic value for defined stakeholders. It is the generation, acceptance, and implementation of new ideas, processes, products and services (Kanter as cited in Chell, 2001). Schumpeter as cited in OECD (1997) defined five types of innovation:

1. Introduction of a new product or a qualitative change in an existing product.
2. Process innovation new to industry.
3. The opening of a new market.
4. Development of new sources of supply for raw materials or other inputs.
5. Changes in industrial organisations.

Businesses, whether dealing with products or services, are facing transformations like never before, not only a turbulent business environment, but continuously changing customers' needs and expectations, competition is growing due to low entry barriers, just to mention few. Thus the choice shifted from whether to innovate or not to which way the business can be innovative. The growth and survival of firms will depend on their ability to successfully adapt their strategies to changing environments (Cefis & Marsili, 2003), in such environments, innovation creates variety of competitive positions and enhances a firm's potential to succeed in the market; it gives it a competitive edge thus enabling it to outperform its competitors (Chell, 2001) and thus it is taken as axiomatic that innovative activity has been the single, most important component of long-term economic growth (Rosenberg, 2004), while the capacity of regions to support processes of learning and innovation has been identified as a key source of competitive advantage (MacKinnon, Cumbers & Chapman, 2002).

Innovation and Entrepreneurship

Creativity and innovation have long been associated with entrepreneurship (Mueller & Dato-On, 2008). In a world where ideas drive economies, it is no wonder that innovation and entrepreneurship are often seen as inseparable bedfellows (Chan, 2008).

Many scholars have shed light on the relation between these two terms. Hindle (2009), for example, argues that innovation is the combination of an inventive process and an entrepreneurial process to create new economic value for defined stakeholders and focuses on the policy implications of this duality, while Zhao (2005) saw entrepreneurship and innovation as positively related to each other and interact to help an organisation to flourish. Drucker (2007) believed that innovation is the specific tool of entrepreneurs.

Schumpeter (1934) viewed the entrepreneur as innovator who implements entrepreneurial change within markets. However, applying the 5 manifestations mentioned above, one can notice that this Schumpeterian view doesn't imply necessarily that the entrepreneur is an innovator always; it suggests that innovativeness comes from putting things together in new combinations, in taking advantage of technology to create markets that didn't exist before or after something familiar with new features or simply.

According to Cefis and Marsili (2003), firms that are both small and young are those most exposed to the risk of exit, and, at the same time those that benefit most of innovation to survive in the market, especially in the longer term.

Gender Differences in Levels of Innovation

In many countries the percentage of men entrepreneurs is higher than that of their women counterparts; however, more attention is paid recently to women entrepreneurship and several studies are being conducted to pinpoint the gender differences and if there are any particular attributes of women entrepreneurs especially all what is known about entrepreneurship and entrepreneurs are based on men.

Although previous research reveals that while there are many similarities between women and men entrepreneurs, a number of differences exist (DeMartino & Barbato, 2003), for example, women will be less present in industries where a formal education in science and technology is required and thus we would expect fewer women engaging in entrepreneurship based on technological innovations (OECD, 2004), while Wadhwa (2010) showed that there is an imbalance between the two sexes entering high-tech fields, and that imbalance is increasing over time. Nevertheless Sonfield, Lussier & Corman (2001) indicated that there are no significant gender differences in venture innovation/risk situation or in strategies chosen by business owners. Conversely, men tend to be more predisposed to start high-tech businesses (Morris, 2006), which is as well supported by Nählinder (2010) who believes that innovation is not gender-neutral; rather, it is gender-biased, since there is a general perception that women are less innovative than men.

In Middle East and North Africa, women's entrepreneurship is increasingly recognized as an important factor for economic growth and development (CAWTAR, 2007). However, their share is far lower than in the other middle-income regions of East Asia, Latin America and the Caribbean, and Europe and Central Asia (World Bank, 2007) and thus very little is known about women entrepreneurs in Arab countries as Lamsky (2005) has recognised.

Aims and Objectives

The majority of data concerning innovation have been gathered from firms in developed countries (Hadjimanolis 2000), and "the relevance of the innovation process in firms doing business in developing countries is not always properly acknowledged" (Chudnovsky et al. 2006, p. 267), likewise, little is known about entrepreneurship in emerging economies (Bruton, Ahlstrom & Obloj, 2008) not to mention the lack of information and research about gender differences in terms of innovation and entrepreneurship, especially in the Middle Eastern countries.

Between 2008 and 2009, eleven Middle Eastern countries participated in the annual cycle of the Global Entrepreneurship Monitor (GEM), which is an international research programme aimed at measurement of the national level of entrepreneurial activity by assembling relevant harmonised data from a number of countries on an annual basis. These countries vary in the level of their economic development based on the level of GDP per capita and the extent to which these countries are factor-driven in terms of the shares of exports of the primary goods in total exports according to Global Competitiveness Index. These countries are:

1. Factor-Driven: Yemen, West Bank and Gaza, Syria, Lebanon, Algeria, Egypt
2. Efficiency-Driven: Jordan
3. Innovation-Driven: United Arab Emirates

GEM utilises Schumpeter's (1942) theory of creative destruction which states that entrepreneurs distort the market equilibrium by introducing new product market combinations or innovations. Thus the combination of entrepreneurship and innovation is believed to contribute to economic growth.

Therefore, GEM tries to recognize the early stage entrepreneurs' expectations of innovation and growth. It does so in a variety of ways. First, the assessment of early-stage entrepreneurs of the unfamiliarity of their products or services relative to customers' current experiences. Secondly, the degree of competition faced by the business. Thirdly the modernisation of technologies used to produce products and services compared to last year.

The aim of the current research is to investigate the differences between male entrepreneurs and their female counterparts in Eight Arab Countries (Algeria, Morocco,

Egypt, Yemen, Palestine, Jordan, Syria and Lebanon) in terms of their innovativeness to see whether there is a significant difference in their inclination towards innovation or not.

Methodological Approach

Due to the lack of information available in the Middle East about the levels on innovation, let alone the link between entrepreneurship and innovation and whether there are gender differences, the researcher opted to conduct a descriptive research. This type of Research is designed to describe characteristics of a population or phenomenon (Zikmund, 2003) where the major emphasis is on determining the frequency with which something occurs or the extent to which two variables covary (Churchill & Iacobucci 2002).

In order to describe the levels of innovation and entrepreneurship in MENA countries, the researcher used different sources and methods for data collection:

1. Secondary data. Where the researcher relied on surveying the literature pertinent to the topic, including the statistical tables, publications issued by governmental and non-governmental organization, research papers, articles and editorials.
2. The Adults Population Survey (APS), which is the main tool for data collection used by GEM. It provided a comprehensive set of data throughout the region and allows for comparison across countries. The researcher exploited the following data:
 - a. The total early stage entrepreneurial activity rate.
 - b. Expansion mode.
 - c. Number of customers considering the product new/unfamiliar.
 - d. Number of businesses offering the same product.
 - e. The newness of technology/processes (whether it was available more than a year ago or not).
 - f. Newness of technology.
 - g. Technology level of the sector.
 - h. Technology sector.
 - i. New product/market combination.

Point a. aims at describing the level of entrepreneurship in the eight Arab countries, while point b. describes the expansion mode of this business using technology or not. Points c. to i. aims at describing the level of innovation among the entrepreneurs from both genders.

Data Analysis

The analysis of data starts by highlighting the levels of entrepreneurship in the Middle Eastern countries and then moves to discussing the levels of innovation in these countries and then moves to revealing the differences in the levels of innovation among men and women entrepreneurs.

Levels of Entrepreneurship in the Middle East

Table 1 presents the level of entrepreneurship among the Arab countries participating in the annual cycles of 2008 and 2009. The early-stage entrepreneurial activity (TEA) prevalence rate of the adult population (proportion of people aged 18-64 who are involved in entrepreneurial activity as a nascent entrepreneur and/or as an owner-manager of a new business) differs between countries, with Yemen as the second highest not only among the countries at its same level of economic development but among all the countries, with a TEA rate of 24.01% and as low as 4.66% as in the case of Saudi Arabia, which is also among the lowest rates across the three levels of economic development. The TEA rates for the Arab countries show that people at these countries are more entrepreneurially active compared to other countries either at the same or at higher levels of economic development. For example, at the level of Innovation Driven Economies, more adults in UAE are entrepreneurially active than USA or UK with TEA rates of 13.25%, 7.96% and 5.74% respectively, and these rates are lower than that of Jordan, Egypt, Algeria and Lebanon.

To conclude, despite that most of the ME countries are categorised as factor-driven economies, the rates of entrepreneurship is higher than many of innovation-driven economies.

Table 1 Prevalence Rates of Entrepreneurial Activity in the Adult Population in GEM MENA Countries, 2008 and 2009

Country per level of Economic Development	TEA involvement: setting up firm or owner of young firm (%)
Stage 1: factor driven	
<i>Algeria</i>	16.68
Guatemala	26.76
<i>Egypt</i>	13.2
Jamaica	22.73
<i>Lebanon</i>	14.98
<i>Morocco</i>	15.75
<i>Saudi Arabia</i>	4.66
<i>Syria</i>	8.46
Tonga	17.39
Uganda	33.67
<i>Yemen</i>	24.01
Stage 2: efficiency driven	
Argentina	14.68
Bosnia and Herzegovina	4.43
Brazil	15.32
Chile	14.79
China	18.84
Colombia	22.57
Croatia	5.58
Dominican Republic	17.53
Ecuador	15.82
Hungary	9.13
Iran	12.08
<i>Jordan</i>	10.24
Latvia	10.51
Malaysia	4.41
Panama	9.59

Peru	20.93
Romania	5.02
Russia	3.88
Serbia	4.9
Shenzhen*	4.75
South Africa	5.92
<i>Tunisia</i>	<i>9.43</i>
Uruguay	12.16
Stage 3: innovation driven	
Belgium	3.51
Denmark	3.64
Finland	5.17
France	4.35
Germany	4.1
Greece	8.79
Hong Kong	3.64
Iceland	11.45
Israel	6.07
Italy	3.72
Japan	3.26
Korea	7.01
Netherlands	7.19
Norway	8.53
Slovenia	5.36
Spain	5.1
Switzerland	7.72
UK	5.74
<i>United Arab Emirates</i>	<i>13.25</i>
United States	7.96

Levels of Innovation

This part discusses the levels of innovation in 8 Arab countries subject to analysis (Table 2). Although the previous literature review showed the interrelatedness of entrepreneurship and innovation, yet, it could be noticed that all the Arab countries have a low level of innovation despite the level of entrepreneurship; with insignificant differences between the levels of innovation among the countries, however, Jordan has the lowest mean, while Palestine has the highest. It is noticeable that in terms of technology sector and technology level of the sector, the rate of entrepreneurs using medium technology or working in a sector implementing medium level of technology is very low, almost approaching zero% with Egypt having a higher level, though it remains low as well.

Table 2 Levels of Innovation of GEM MENA 2008-2009

Country	Market Expansion Mode	No. of (potential) customers consider product new/unfamiliar	No. of businesses offer the same products	The technologies or procedures available more than a year ago	new technology	Technology level of the sector	Technology sector	new product market combination	Level of Innovation	TEA rate
Egypt	1.7	2.6	1.4	2.2	0.2	0.1	0.1	0.1	<i>1.054</i>	<i>13.2</i>
Algeria	1.9	2.28	1.42	2.22	0.30	0.00	0.00	0.24	<i>1.044</i>	<i>16.68</i>
Jordan	1.7	2.33	1.46	2.44	0.19	0.00	0.00	0.22	<i>1.000</i>	<i>10.24</i>
Lebanon	1.6	2.49	1.51	2.50	0.16	0.02	0.02	0.23	<i>1.064</i>	<i>14.98</i>
Morocco	1.4	2.74	1.43	2.57	0.12	0.00	0.00	0.07	<i>1.044</i>	<i>15.75</i>
Palestine	1.8	2.74	1.45	2.12	0.33	0.01	0.01	0.13	<i>1.072</i>	<i>8.6</i>

Syria	1.5	2.33	1.70	2.64	0.05	0.00	0.00	0.24	1.065	8.46
Yemen	2.1	2.03	1.52	1.86	0.38	0.00	0.00	0.27	1.017	24.01

Gender Differences

Comparing the early stage entrepreneurial activity (TEA) rate for women in MENA countries with the TEA rate for their men counterparts reveals the existence of gender gap; the difference between early stage entrepreneurial activity rates for men and women. For men the TEA rates are higher than those of women. Egypt has the largest gender gap, followed by Jordan, Syria and West Bank and Gaza while the lowest gap is in case of Algeria and Saudi Arabia (Figure 1).

Figure 2 Early-Stage Entrepreneurial Activity (TEA), Men vs. Women

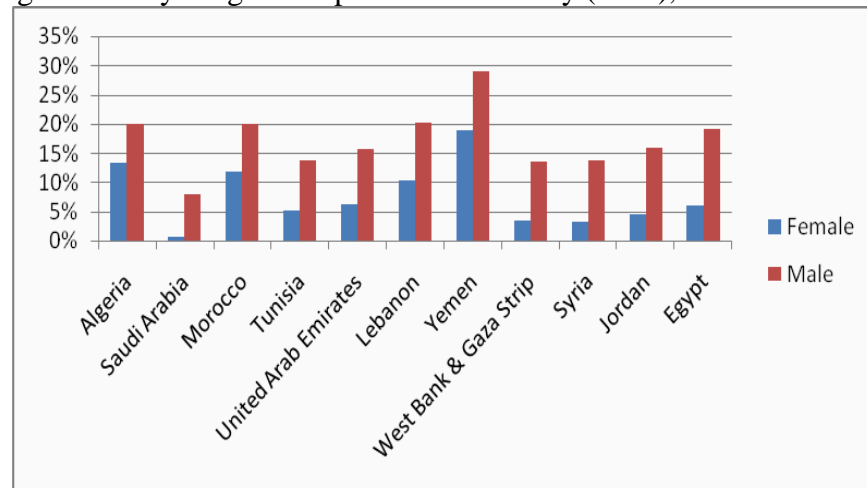


Table 3 displays the level of innovation for both men and women in Morocco, Jordan, Lebanon, Yemen, Algeria, Syria, Palestine and Egypt. Overall, it can be noticed that men entrepreneurs are more innovative than their women counterparts in the Middle East, with some variations between countries and among the variables.

Entrepreneurs of both genders in all the 8 countries exhibit an inclination towards using new technologies in their work, with Yemeni women showing the highest indication among both genders. Except Lebanon, women entrepreneurs are showing indication towards new technology more than men.

In terms of the percentage of TEA enterprises that are based on new product market combinations, the percentages of women entrepreneurs varied from as low as 7% in Morocco, to as high as 27% in case of Jordan, followed by Syria (26%), Yemen (25%) and Algeria (24%). Palestine and Egypt were at the lowest side (12% each). Men in Morocco also are the lowest in terms of this scale of innovation (7%) while Yemeni men are the highest. Among genders, women in Jordan, Syria and Egypt showed higher

indication towards basing their enterprises on new product market combinations, while in Lebanon, Yemen and Palestine, the situation reverses.

Men and women entrepreneurs are operating in No/Low technological sector; the percentage is almost 100% for both genders except in Algeria, where 1% of women entrepreneurs are operating in medium technological sectors (versus zero% for their men counterparts). While in Jordan, Lebanon, Syria, Palestine and Egypt, men are showing slightly higher inclination towards operating in medium technology sectors with rates of 97%, 99%, 99% and 92% respectively. This situation can also be seen on another scale of innovation, which is the degree of the technicality of the sector (Technology Level of the sector).

In terms of the newness and unfamiliarity of entrepreneurs' products relative to customers' current experiences, in most of countries, according to women entrepreneurs none of the customers consider the products new, in Morocco, Palestine and Egypt, 82%, 79% and 72% of customers (respectively) felt that they are familiar with the products provided by the early stage entrepreneurs, while in Yemen, 26% said they are familiar with the products compared to 38% Yemeni customers felt that some of the products are new, however, 36% of costumers in Yemen consider thy products new and unfamiliar to them, which is the highest percentage of newness in all the MENA countries, followed by Jordan, with 22% of customers considered products are new. The majority of men entrepreneurs (more than 50%), except Yemenis, perceive that their products are not new and they are close in this pattern to women entrepreneurs in their respective countries. However, in Jordan, this pattern is not followed, as women more than men recognise that their customers see their products are some how new/unfamiliar; 33% compared to 19%. In Yemen, women more than men think that their products are all new/unfamiliar; 36% compared to 29%. In Egypt, although more women than men see some of their products as new to customers (24% compared to 13%), yet more men than women see that all their products are new/unfamiliar to the customers (15% compared to 4%).

Regarding the competitiveness of the businesses, which is measured by the number of businesses who offer the same products, it can be seen that almost in all the 8 countries there are many businesses who offer same products and services as done by both women and men entrepreneurs. However, it is noticeable that more women than men (with the exception of Yemen and Syria) are offering products and services that are offered by a fewer number of businesses, while the situation reverses when there are no other businesses offer the same product except the entrepreneurs except of Lebanon where 12% of women said there are no other businesses offer similar products compared to 8% of men.

Only 4% of early stage women entrepreneurs in Yemen are planning to undertake profound market expansion, placing it at the top of countries, followed by Algeria (2%), Egypt and Morocco (1%). Women in the rest of countries are not even intending to take this sort of expansion; rather they are more inclined not to take any steps towards expanding the market at all or to have some market expansion, which doesn't involve any introduction of new technologies. Nevertheless, more men than women, although with

low percentages, are intending to expand the market profoundly, except in Morocco (0% of men compared to 1% of women). However, 36%, 35% and 34% of early stage women entrepreneurs in Yemen, Palestine and Algeria (respectively) are planning to expand the market based on the introduction and utilisation of new technologies. A reasonable percentage of women in all countries, except of Syria, have plans to expand using new technologies and on this they are more inclined towards this sort of expansion compared to men, except in Syria and Lebanon.

Regarding the modernization of technologies used for the production process, it was found out that majority of men and women entrepreneurs in almost all MENA countries are using technologies that are more than 5 years old. However, in Yemen both men and women are exploiting the very latest technology (newer than one year); 36% and 40% respectively. However, there is a reasonable percentage of men and women entrepreneurs who are utilizing the very latest technologies (new than one year).

Table 3 Innovation of Early Stage Entrepreneurs, Men & Women, MENA

	MA		JO		LEB		YEM		DZ		SY		PAL		EGY	
	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M
TEA: new technology																
Indication	17%	9%	20%	19%	13%	18%	40%	36%	35%	26%	22%	18%	35%	32%	28%	24%
No indication	83%	91%	80%	81%	87%	82%	60%	64%	65%	74%	78%	82%	65%	68%	72%	76%
TEA: new product market combination																
Indication	7%	7%	27%	20%	20%	25%	25%	29%	24%	24%	26%	24%	12%	14%	12%	8%
No indication	93%	93%	73%	80%	80%	75%	75%	71%	76%	76%	74%	76%	88%	86%	88%	92%
TEA: new Technology Level of the sector																
NO/LOW TECHNOLOGIES	100%	100%	100%	99%	100%	97%	100%	100%	99%	100%	100%	99%	100%	99%	100%	99%
MEDIUM-TECH	0%	0%	0%	1%	0%	3%	0%	0%	1%	0%	0%	1%	0%	1%	0%	1%
TEA: Technology sector																
NO/Low Tech	100%	100%	100%	99%	100%	97%	100%	100%	99%	100%	100%	99%	100%	99%	100%	92%
Medium Tech	0%	0%	0%	1%	0%	3%	0%	0%	1%	0%	0%	1%	0%	1%	0%	8%
TEA: Number of businesses offer the same products																
Many	60%	69%	64%	65%	55%	61%	59%	50%	61%	64%	58%	49%	59%	66%	64%	68%
Few	27%	21%	27%	24%	33%	31%	37%	45%	36%	31%	26%	30%	35%	25%	31%	24%
None	9%	9%	9%	11%	12%	8%	4%	5%	3%	5%	16%	21%	6%	10%	5%	7%
TEA: Market Expansion Mode																
NO market expansion	66%	72%	48%	56%	61%	58%	33%	35%	41%	48%	61%	52%	53%	54%	64%	57%

<i>Some market expansion (no new technologies)</i>	17%	19%	32%	25%	14%	24%	27%	29%	23%	26%	35%	42%	12%	14%	8%	19%
<i>Some market expansion (new technologies)</i>	16%	9%	20%	16%	13%	16%	36%	30%	34%	22%	3%	4%	35%	31%	27%	21%
<i>Profound market expansion</i>	1%	0%	0%	2%	0%	2%	4%	6%	2%	4%	0%	1%	0%	1%	1%	3%
TEA: Number of (potential) customers consider product new/unfamiliar																
<i>ALL</i>	9%	7%	22%	22%	15%	13%	36%	29%	16%	22%	16%	25%	3%	5%	4%	15%
<i>Some</i>	8%	9%	33%	19%	20%	25%	38%	32%	36%	32%	19%	20%	18%	18%	24%	13%
<i>None</i>	82%	83%	44%	58%	65%	62%	26%	39%	48%	47%	65%	55%	79%	77%	72%	72%
TEA: Were the technologies or procedures available more than a year ago?																
<i>VERY LATEST TECHNOLOGY (NEWER THAN ONE YEAR)</i>	17%	9%	10%	19%	13%	18%	40%	36%	35%	26%	3%	6%	35%	32%	28%	24%
<i>NEW TECHNOLOGY (ONE TO 5 YEARS)</i>	20%	19%	34%	17%	19%	17%	41%	37%	13%	21%	29%	24%	21%	22%	23%	30%
<i>NO NEW TECHNOLOGY (MORE THAN 5 YEARS)</i>	63%	73%	56%	65%	68%	65%	19%	27%	52%	53%	68%	71%	44%	46%	49%	46%

Conclusions and Recommendations

The current research is considered to be a descriptive research that aims at studying gender differences among Middle Eastern entrepreneurs, through utilising the Global Entrepreneurship Monitor's Adults Population Survey for 8 Arab countries. The research shows that although the levels of entrepreneurship in those Arab countries are fairly good compared to the rest of countries, however, the level of innovation among the entrepreneurs is very low especially in terms of operating in technology sector. On the other hand, although the gender gap does exist in the levels of entrepreneurship, whereas men are more entrepreneurially active than women, the levels of innovation at some measurements are higher among women compared to men. Nevertheless, the overall level of innovation among men entrepreneurs is higher than that of their women counterparts.

It is recommended that a further research to be conducted to 1) identify the reasons and hindering factors facing Arab entrepreneurs and thus deter their utilisation of technology and being innovative in general; and 2) understand the underlying reasons for gender differences among entrepreneurs and their inclinations towards innovation.

The main limitation of this research was the lack of data and previous researches discussing entrepreneurship and innovation in the Middle East in general and among genders in specific. Thus it is expected that the current research will contribute in describing this phenomenon towards increasing our understanding to it.

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**A Genetic Algorithm Based Technique for Solving the Supply-Demand Interaction
in Electronic Commerce**

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Abstract

Bi-level programming, a tool for modeling decentralized decisions, consists of the objectives of the leader at its first level and that of the follower at the second level. Numerous algorithms have been developed so far for solving bi-level programming problem. In this paper by using genetic algorithm (GA), an attempt has been made to solve a real problem, (the supply – demand interaction in electronic commerce (EC)), taking into account the non – linear model to such problem. By applying the bi-level programming technique via genetic algorithm and a flow chart of interaction process, the study will develop an analytical process to explain how supply – demand interaction achieves a compromise solution or why the process fails. The proposed genetic algorithm utilizes the idea of the weak duality theorem, such that both primal and dual solution of the non-linear programming problem under consideration is generated simultaneously, to determine the interval in which the optimal solution is located. Finally, an illustrative numerical example, of the application problem, is given to demonstrate the obtained results.

Keywords: Bi-level programming; supply-demand interaction; fuzzy decision-approach; Pareto optimal solution; genetic algorithm.

1- Introduction

Bi – level programming problem is the simplest class of multi-level programming problem, in which there are two hierarchical independent decision-makers. Each decision-maker attempts to optimize its objective function and is affected by the actions of the other decision-maker. In this paper, the supply – demand interaction in EC is considered as an application of a bi-level non-linear multi-objective decision-making (BLN-MODM) problem. Also, an attempt has been made to solve a real problem taking into account the non-linear model to such problem, by applying the bi-level programming technique via genetic algorithm.

Genetic algorithms are stochastic search algorithms based on principles of natural selection and recombination. They attempt to find the optimal solution to the problem at hand by manipulating a population of candidate solutions. The population is evaluated and the best solutions are selected to reproduce and mate to form the next generation. Over a number of generations, good traits dominate the population, resulting in an increase in the quality of the solutions. The basic mechanism in GAs is Darwinian evolution: bad traits are eliminated from the population because they appear in individuals which do not survive the process of selection.

The good traits survive and are mixed by recombination to form better individuals. Mutation also exists in GAs, but it is considered a secondary operator. Its function is to ensure that diversity is not lost in the population, so the GA can continue to explore. The notion of good traits is formalized with the concept of building blocks which are string templates that match a short portion of the individuals and act as a unit to influence the fitness of individuals. The prevailing theory suggests that GAs work by propagating building blocks using selection and crossover. The size of the population is important because it influences whether the GA can find good solutions and the time it takes to reach them [Azar et al.,1999 ; Cardon et al., 2000; coello, 1999; coello, 2000; coello and Christiansen, 1998; Gen and Cheng, 1997; Hejazi et al. 2002; Michalewicz, 1996; Osman et al. 2009; Osman et al. 2010].

Each individual in the population has a fitness value; the fitness is a payoff measure that depends on how well the individual solves the problem. In general, simple GAs use two operators loosely based on natural genetics to explore the search space crossover and mutation. There are several ways to stop a GA, for example, one method is to stop after a predetermined number of generations. The GA software package used in this paper, is GENOCOP III (GENetic algorithm for Numerical Optimization for CONstrained Problems), GENOCOP III handles linear or non-linear constraints by designing genetic operators, which guarantee to keep all chromosomes within the constrained solution space. GENOCOP III assumes a feasible starting point (or feasible initial population) to be started.

2-Statment of the Problem

In this section, the discussion will focus on different supply-demand interactions existing in the EC environment. Starting with the interaction occurring in the transacting market, the rationale of the buyer-supplier interaction with intermediary's mediation will be demonstrated. This will be followed by a discussion about the relationship between the

user and provider of the information service; the role of the Information Service Provider (ISP) as a mediator is analyzed.

2.1-The Buyer-Supplier Interaction with Information Service Provider Mediation

(Shee et al. 2000) have explained a conceptual model to explore the interactive nature of the buyer-supplier relationship in the area of EC. By taking ISP as an intermediary their model includes the buyer, supplier and ISP as three major parties, and focuses on the electronic market dealing with the relationship level and the bilateral relationship mediated by the ISP. They conclude that the rationale of interaction between buyer and supplier is rooted in individual party's objectives, which usually fall into two categories: cost and quality. This model also takes the following three items into consideration: (i) information flow; (ii) flow of goods or services; and (iii) feedback information, as shown in figure 1.

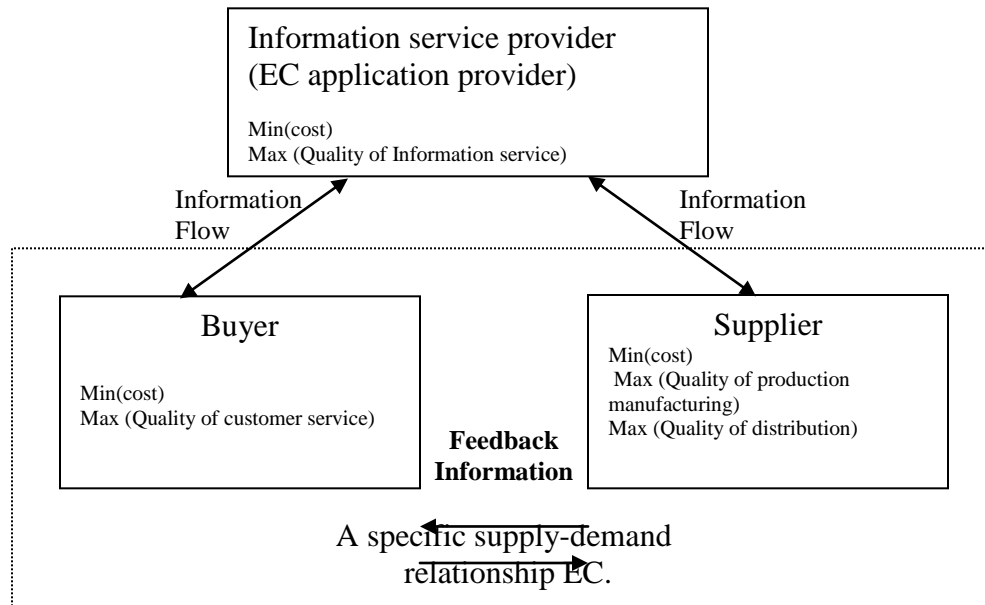


Figure 1: Interactive buyer-supplier relationship with ISP's mediation.

This conceptual model generalized the preliminary form of the supply-demand interaction with ISP's mediation inside a specific supply chain.

2.2-The Interaction between the User and Provider of Information Service

To execute a transaction, conventional intermediaries are required to perform mediating functions. The relationship defined at the direct buyer-supplier link will evolve in the world of EC, and such evolution, with the proliferation of the national information

infrastructure, will be expansive. Hence, as a result of the electronic linkage, the growth of a new intermediary, called cybermediary, is encouraged to be used to execute the mediating job and to maintain and smooth the progress of such a direct tie. The cybermediary is not constrained to participate in straightforward tasks alone, as would be the case with a traditional intermediary. Rather, the intermediary will develop and grow into a superior mixture of all of the following features: agent, coordinator, integrator, and occasionally balancer in the information technology world. Currently, the information service companies, which offer such services as network services, professional computer services, data processing services and electronic information services, are the main suppliers of EC applications and services.

3-Formulating the Supply-Demand Interaction as a BLN-MODM Problem

The formulation of the supply-demand interaction in EC as a BLN-MODM problem can be divided into four stages, as shown in figure 2, where each stage can be described as follows:

Stage 1: Problem Formulation

At this stage, the preliminary structure of the supply-demand interaction in electronic commerce problem is formed, and key variables and interrelationship among these variables are identified. Both leader and follower indicate their requirements and limitations. These requirements and limitations can be directly transformed into corresponding objective functions and resources constraints within the problem. As a result, the supply-demand interaction in electronic commerce can be formulated as the following BLN-MODM problem:

[Upper Level]

$$\underset{x_1}{Max} Q^L = [Q_1^L(x_1, x_2), Q_2^L(x_1, x_2), \dots, Q_{k_1}^L(x_1, x_2)],$$

(1-a)

$$\underset{x_1}{Min} S^L = [S_1^L(x_1, x_2), S_2^L(x_1, x_2), \dots, S_{k_2}^L(x_1, x_2)],$$

(1-b)

where x_2 solves

[Lower Level]

$$\underset{x_2}{Max} Q^F = [Q_1^F(x_1, x_2), Q_2^F(x_1, x_2), \dots, Q_{k_3}^F(x_1, x_2)],$$

(2-a)

$$\underset{x_2}{Min} S^F = [S_1^F(x_1, x_2), S_2^F(x_1, x_2), \dots, S_{k_4}^F(x_1, x_2)],$$

(2-b)

subject to

$$(3) \quad G = \{(x_1, x_2) \mid g_i(x_1, x_2) \leq 0, x_1, x_2 \geq 0, (i=1, 2, \dots, m)\}.$$

Where (Q^L, S^L) and (Q^F, S^F) are $(k_1 + k_2)$ -dimensional and $(k_3 + k_4)$ -dimensional objective functions column vectors, and leader's and follower's objective function sets, respectively. Q denotes quality and S denotes cost. The superscription L denotes leader and F denotes follower. $Q_i^L(x_1, x_2)$, $(i=1, 2, \dots, k_1)$; $S_j^L(x_1, x_2)$, $(j=1, 2, \dots, k_2)$; $Q_r^F(x_1, x_2)$, $(r=1, 2, \dots, k_3)$; $S_t^F(x_1, x_2)$, $(t=1, 2, \dots, k_4)$. x_1 and x_2 are n_1 and n_2 dimensional decision variables and are respectively controlled by leader and follower, where G be the set of feasible choices $\{(x_1, x_2)\}$.

Stage 2: Individual Problem Solving

The leader and follower would each, on their own, carry out independent problem solving procedures with regard to their problems. For example, the leader's problem consists of objective functions (1-a)-(1-b), and constraints (3). The follower has its problem with objective functions (2-a)-(2-b), and constraints (3). It is important to note that both parties have multiple objective functions since there is always a trade-off between minimizing cost and maximizing quality. This means that, both the buyer and the supplier have to individually make compromise between their own conflicting objectives. According to (Abo-Sinna, 2001), a compromise solution to a multiple objective programming problem can be reached through applying the fuzzy set theory (Sakawa [10]). The decision-maker first obtains the ideal and anti-ideal solution to their problem. For example the ideal solution to leader's problem can be obtained by solving each of his objective functions independently subject to the constraints in (3). Hence, leader's ideal solution can be represented by:

$$(4) \quad (I^L)^* = \left[(Q_1^L)^*, (Q_2^L)^*, \dots, (Q_{k_1}^L)^*; (S_1^L)^*, (S_2^L)^*, \dots, (S_{k_2}^L)^* \right]$$

The anti-ideal solution to leader's problem can be obtained, subject to the constraints in (3), by minimizing the quality objective functions, Q^L , and by maximizing the cost objective functions, S^L . Such an anti-ideal solution can be represented by:

$$(5) \quad (I^L)^- = \left[(Q_1^L)^-, (Q_2^L)^-, \dots, (Q_{k_1}^L)^-; (S_1^L)^-, (S_2^L)^-, \dots, (S_{k_2}^L)^- \right]$$

Then, the membership functions for leader's objective can be defined as:

$$\mu_i(Q_i^L) = \frac{Q_i^L(x_1, x_2) - (Q_i^L)^-}{(Q_i^L)^* - (Q_i^L)^-}, (i = 1, 2, \dots, k_1),$$

(6)

$$\mu_j(S_j^L) = \frac{(S_j^L)^- - S_j^L(x, y)}{(S_j^L)^- - (S_j^L)^*}, (j = 1, 2, \dots, k_2).$$

(7)

Now, we can get the optimal solution of the leader by solving the following Tchebycheff problem and its dual problem simultaneously based on the proposed genetic algorithm as follows (Soliman, 2002):

The primal problem

$$P: \text{Max } \lambda,$$

(8)

subject to

$$(x_1, x_2) \in G,$$

$$\left[Q_i^L(x, y) - (Q_i^L)^- \right] / \left[(Q_i^L)^* - (Q_i^L)^- \right] \geq \lambda, (i = 1, 2, \dots, k_1),$$

$$\left[(S_j^L)^- - S_j^L(x, y) \right] / \left[(S_j^L)^- - (S_j^L)^* \right] \geq \lambda, (j = 1, 2, \dots, k_2),$$

$$\lambda \in [0, 1],$$

where λ is defined as

$$\lambda = \min_{i,j} [\mu_i(Q_i^L), \mu_j(S_j^L)].$$

The dual problem associated with the problem P is defined as follows:

$$D: \text{Min } W(x_1, x_2, \lambda, \alpha) = \lambda - \sum_{h=1}^m \alpha_h g_h(x_1, x_2) - \sum_{i=1}^{k_1} \alpha_i \mu_i(Q_i^L) - \sum_{j=1}^{K_2} \alpha_j \mu_j(S_j^L),$$

(9)

subject to

$$\frac{\partial \lambda}{\partial x_b} - \sum_{h=1}^m \alpha_h \frac{\partial g_h}{\partial x_b} - \sum_{i=1}^{k_1} \alpha_i \frac{\partial \mu_i(Q_i^L)}{\partial x_b} - \sum_{j=1}^{K_2} \alpha_j \frac{\partial \mu_j(S_j^L)}{\partial x_b} = 0, (b=1,2),$$

$$1 - \sum_{h=1}^m \alpha_h \frac{\partial g_h}{\partial \lambda} - \sum_{i=1}^{k_1} \alpha_i \frac{\partial \mu_i(Q_i^L)}{\partial \lambda} - \sum_{j=1}^{K_2} \alpha_j \frac{\partial \mu_j(S_j^L)}{\partial \lambda} = 0,$$

$$\alpha_e \geq 0, \quad (e=1,2,\dots,m+k_1+k_2), \quad x_1, x_2 \geq 0, \quad \lambda \in [0,1].$$

Where α_e are the Lagrangian multipliers.

The leader can obtain its optimal solution by solving the problems in (8)-(9), and the follower can conduct similar procedure to obtain the optimal solution to his problem. After solving the problems at each side, the optimal solutions to leader and follower are $[x_1^L, x_2^L, (Q^L(x_1^L, x_2^L)), (S^L(x_1^L, x_2^L))]$ and $[x_1^F, x_2^F, (Q^F(x_1^F, x_2^F)), (S^F(x_1^F, x_2^F))]$, respectively. Once the solutions to both sides coincide, that is, $(x_1^L, x_2^L) = (x_1^F, x_2^F)$, the optimal solution is obtained, and the interaction process is completed. If this is not the case, continue with stage 3.

Stage 3: Negotiation and Compromise

Not only do the individual parties have to make a compromise between their own objectives about cost and quality, but the interaction between leader and follower is also a kind of bargaining which results in transactional decisions of the individual from a “give and take” process. The rarity of achieving an optimal solution makes this stage indispensable. A compromise solution is achieved once the leader agrees with the result. This puts an end to the interaction process. If the opposite should be the case, then proceed with stage 4. Now the solution of the leader and follower are disclosed. However, two solutions are usually different because of nature between two levels objective functions. The leader knows that using the optimal decisions x_1^L as a control factors for the follower are not practical. It is more reasonable to have some tolerance that gives the follower an extent feasible region to search for his/her optimal solution, and also reduce searching time or interactions.

On the other hand, however, the leader can specify tolerance p^L for decision x_1^L , and then the membership function for x_1^L can be formulated as follows:

$$\mu(x_1) = \begin{cases} \left[\frac{x_1 - (x_1^L - p^L)}{p^L} \right], & x_1^L - p^L \leq x_1 < x_1^L; \\ \left[\frac{(x_1^L + p^L) - x_1}{p^L} \right], & x_1^L < x_1 \leq x_1^L + p^L; \\ 0, & \text{otherwise,} \end{cases} \quad (10)$$

Such a membership function is called triangular fuzzy membership function since x_1^L is the triangular fuzzy member. It means that, for the leader, the acceptable interval of decision x_1^L is $x_1^L \pm p^L$ with the highest level of satisfaction at $x_1 = x_1^L$.

The leader goals may reasonably consider all $[I^* = (Q^L(x_1^L, x_2^L)), (S^L(x_1^L, x_2^L))]$ are absolutely acceptable and all $[I' = (Q^L(x_1^F, x_2^F)), (S^L(x_1^F, x_2^F))]$ are absolutely

unacceptable. This due to the fact that the follower obtained the optimum at (x_1^F, x_2^F) , which in turn provides the leader objective function values I' , makes any $I < I'$ unattractive in practice.

Then, the membership functions for leader's objective can be defined as:

$$\mu_i'(Q_i^L) = \frac{Q_i^L(x_1, x_2) - (Q_i^L)'}{(Q_i^L)^* - (Q_i^L)'}, \quad (i = 1, 2, \dots, k_1),$$

(11)

$$\mu_j'(S_j^L) = \frac{(S_j^L)' - S_j^L(x_1, x_2)}{(S_j^L)' - (S_j^L)^*}, \quad (j = 1, 2, \dots, k_2).$$

(12)

Also, the follower goals may reasonably consider all $[\hat{I} = (Q^F(x_1^F, x_2^F), (S^F(x_1^F, x_2^F)))]$ are absolutely acceptable and all $[\bar{I} = (Q^F(x_1^L, x_2^L), (S^F(x_1^L, x_2^L)))]$ are absolutely unacceptable.

Then, the membership functions for follower's objective can be defined as:

$$\mu_r^{\setminus}(Q_r^F) = \frac{Q_r^F(x_1, x_2) - \bar{Q}_r^F}{\hat{Q}_r^F - \bar{Q}_r^F}, \quad (r = 1, 2, \dots, k_3),$$

(13)

$$\mu_t^{\setminus}(S_t^F) = \frac{\bar{S}_t^F - S_t^F(x_1, x_2)}{\bar{S}_t^F - \hat{S}_t^F}, \quad (t = 1, 2, \dots, k_4),$$

(14)

Finally, in order to generate the satisfactory solution, which is also a non-inferior solution with overall satisfaction for all decision makers, we can solve the following Tchebycheff problem and its dual problem simultaneously based on the proposed genetic algorithm as follows (Soliman, 2002):

The primal problem

$$\begin{aligned} P' : & \text{Max } \lambda, \\ \text{subject to} \\ & (x_1, x_2) \in G, \\ & [x_1 - (x_1^L - p^L)] / p^L \geq \lambda, \\ & [(x_1^L + p^L) - x_1] / p^L \geq \lambda, \\ & \mu_i'(Q_i^L) \geq \lambda, \quad (i = 1, 2, \dots, k_1), \\ & \mu_j'(S_j^L) \geq \lambda, \quad (j = 1, 2, \dots, k_2), \end{aligned}$$

(15)

$$\mu_r^\backslash(Q_r^F) \geq \lambda, \quad (r = 1, 2, \dots, k_3),$$

$$\mu_t^\backslash(S_t^F) \geq \lambda, \quad (t = 1, 2, \dots, k_4),$$

$$\lambda \in [0, 1].$$

The dual problem associated with the problem P' is defined as follows:

$$\begin{aligned} D': \text{Min } \Psi(x_1, x_2, \lambda, \alpha) = & \lambda - \sum_{i=1}^{k_1} \alpha_i \mu_i'(Q_i^L) - \sum_{j=1}^{k_2} \alpha_j \mu_j'(S_j^L) - \sum_{r=1}^{k_3} \alpha_r \mu_r^\backslash(Q_r^F) - \sum_{t=1}^{k_4} \alpha_t \mu_t^\backslash(S_t^F) \\ & - \sum_{h=1}^m \alpha_h g_h(x_1, x_2) - \sum_{a=1}^{n_1} \alpha_a \mu_a(x_1), \end{aligned} \quad (16)$$

subject to

$$\begin{aligned} & \frac{\partial \lambda}{\partial x_b} - \frac{\partial \sum_{h=1}^m \alpha_h g_h(x_1, x_2)}{\partial x_b} - \frac{\partial \sum_{i=1}^{k_1} \alpha_i \mu_i'(Q_i^L)}{\partial x_b} - \frac{\partial \sum_{j=1}^{k_2} \alpha_j \mu_j'(S_j^L)}{\partial x_b} - \frac{\partial \sum_{r=1}^{k_3} \alpha_r \mu_r^\backslash(Q_r^F)}{\partial x_b} - \\ & \frac{\partial \sum_{t=1}^{k_4} \alpha_t \mu_t^\backslash(S_t^F)}{\partial x_b} - \frac{\partial \sum_{a=1}^{n_1} \alpha_a \mu_a(x_1)}{\partial x_b} = 0, \quad (b = 1, 2), \\ & 1 - \frac{\partial \sum_{h=1}^m \alpha_h g_h(x_1, x_2)}{\partial \lambda} - \frac{\partial \sum_{i=1}^{k_1} \alpha_i \mu_i'(Q_i^L)}{\partial \lambda} - \frac{\partial \sum_{j=1}^{k_2} \alpha_j \mu_j'(S_j^L)}{\partial \lambda} - \frac{\partial \sum_{r=1}^{k_3} \alpha_r \mu_r^\backslash(Q_r^F)}{\partial \lambda} - \\ & \frac{\partial \sum_{t=1}^{k_4} \alpha_t \mu_t^\backslash(S_t^F)}{\partial \lambda} - \frac{\partial \sum_{a=1}^{n_1} \alpha_a \mu_a(x_1)}{\partial \lambda} = 0, \end{aligned}$$

$$\alpha_e \geq 0, (e = 1, 2, \dots, k_1 + k_2 + k_3 + k_4 + m + n_1),$$

$$x_1, x_2 \geq 0, \lambda \in [0, 1].$$

The follower can now try to optimize the above problems, and then submit the solution to the leader. If the leader accepts the solution, a compromised solution $[x_1^C, x_2^C, (Q^L(x_1^C, x_2^C))^C, (S^L(x_1^C, x_2^C))^C, (Q^F(x_1^C, x_2^C))^C, (S^F(x_1^C, x_2^C))^C]$ is reached, and the interaction process is finished. Or in other words, the conflict resolution is successful. If this not the case, then go to the next stage.

Stage 4: Post-negotiation

Both leader and follower, especially the leader, have to consider at this stage whether to continue the interaction process or not. The so-called interaction failure results

from the termination of the interaction, when either one of the parties lacks the incentive to go on. Otherwise, the parties involved have to decide whether to repeat the negotiations (e.g. to change relative tolerance, preferred level of satisfaction) or restart the entire process (e.g. to review the rationality and the accuracy of the original problem which leads to modification).

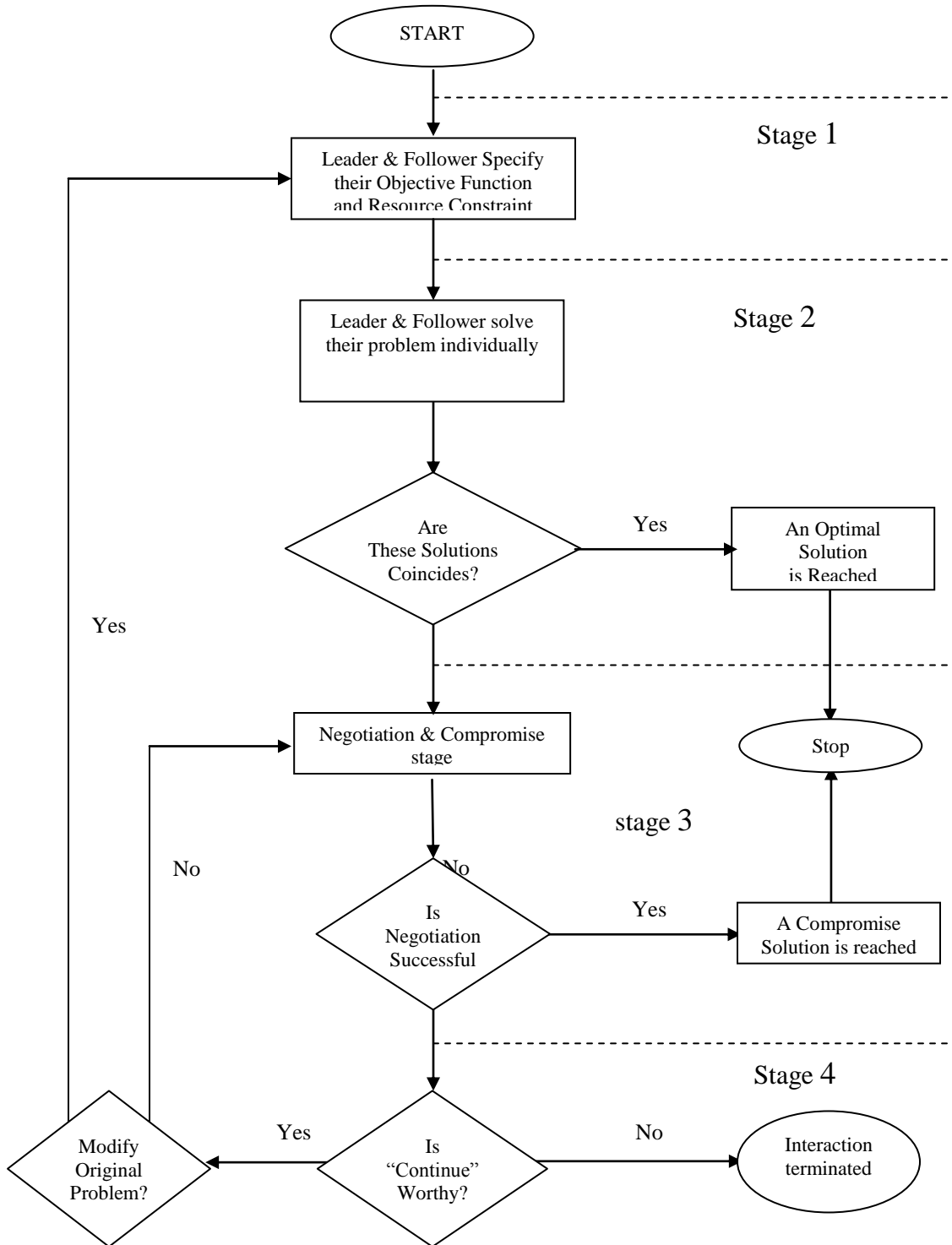


Figure 2: The flow chart of the supply-demand interaction in electronic commerce.

4-An Algorithm

In this section, a genetic algorithm for solving the supply-demand interaction in electronic commerce is as follows:-

- Step 1 : The leader formulates his/her problem.
- Step 2 : The follower formulates his/her problem.
- Step 3 : Find the ideal and anti-ideal solution for the proposed problems.
- Step 4: Formulate the Tchebycheff primal and its dual problems corresponding to the decision-maker problems .
- Step 5: Solve the Tchebycheff primal and its dual problem of the leader problem
- Step 6: Solve the Tchebycheff primal and its dual problem of the follower problem.
- Step 7 : If $(x_1^L, x_2^L) = (x_1^F, x_2^F)$, then the optimal solution is obtained, go to the step 15 .
Otherwise go to step 8 .
- Step 8 : The leader describes his/her control decision variables and its tolerance.
- Step 9 : The leader formulates his/her membership functions $\mu_i'(Q_i^L), \mu_j'(S_j^L), \mu(x_1)$.
- Step 10 : The follower formulates his/her membership functions $\mu_r^{\setminus}(Q_r^F), \mu_t^{\setminus}(S_t^F)$.
- Step 11 : The follower solves the Tchebycheff primal and its dual problem.
- Step 12 : If the leader accepts the solution, then a compromised solution is reached, go to step 15. Otherwise go to step 13 .
- Step 13: Ask the leader if continue is worth, go to step 14. Otherwise go to step 15.
- Step 14: The leader and the follower have to modify their problems (e.g. to change relative tolerance, preferred level of satisfaction), go to step 1 .
- Step 15 : End .

5-An Illustrative Numerical Example

To demonstrate the solution method for the supply-demand interaction in electronic commerce, let us consider the following example. Supposing A company commissions B company to develop an EC system on its behalf. In regard to the system development both parties must have related personnel participation. Thus speaking from the perspective of company A, there must be an input of compatible personnel to cooperate with B company system analysis and designers, so as to allow B company to understand A company system function requirements. B company must input personnel with specialized knowledge and skill. In order to facilitate a smooth process, mutual personnel exchanges and on-site working must take place. For example, B company system analysis and designers must go to A company and engage in discussion and business process analysis, and provide customer query and consultation services, in order to resolve its key customer information system requirements. With regard to A company,

related personnel visits to B company are required for education and training in the system management and technical maintenance. In regard to the cost of the employee engaging in on-site working, apart from it is original subordinate enterprises having to pay for the related personnel costs, the company hosting the on-site working must also pay for the extra personnel costs .In this example, we have established leader as A company (the user of information service) it is manpower participation is x_1 , and B company is the follower (the information service provider), it provides the manpower participation is x_2 .The " man-hour" is a unit of manpower. Both leader and follower have two objective functions. Speaking from the minimum objective, both leader and follower wish that manpower costs be minimized . Each variables prior coefficient is its manpower cost per unit where a single unit is represented by "1000 dollars" . From the perspective of the maximum objective, both leader and follower wish that the system has the highest level of quality. This problem can be presented using the following BLN-MODM problem as follows:

Stage 1:

[Upper level]

$$\begin{aligned} \underset{x_1}{Max} \ Q_1^L(x_1, x_2) &= \underset{x_1}{Max} [(x_1 - 1)^2 + x_2^2], \\ \underset{x_1}{Min} \ S_1^L(x_1, x_2) &= \underset{x_1}{Min} [-x_1^2 - x_2^2], \\ \text{where } x_2 &\text{ solves} \end{aligned}$$

[Lower level]

$$\begin{aligned} \underset{x_2}{Max} \ Q_1^F(x_1, x_2) &= \underset{x_2}{Max} [2x_1 + (x_2 + 4)^2], \\ \underset{x_2}{Min} \ S_1^F(x_1, x_2) &= \underset{x_2}{Min} [-(x_1 - 3)^2 + 4x_2], \end{aligned}$$

subject to

$$(x_1, x_2) \in G = \{(x_1, x_2) \mid x_1 + x_2 \leq 4, x_1, x_2 \geq 0.\}$$

Stage 2:

First, the leader solves his/her problem as follows:

1-Find individual optimal solutions by solving (4)-(5), we get:

$$(Q_1^L, S_1^L)^- = (0, 0),$$

2- By using the membership functions of the leader problem, the leader solves the primal and dual problems based on the proposed genetic algorithm as follows:

$$P_1 : \underset{\lambda}{Max} \ \lambda,$$

subject to

$$\begin{aligned}
&(x_1, x_2) \in G, \\
&x_1^2 + x_2^2 - 16\lambda \geq 0, \\
&(x_1 - 1)^2 + x_2^2 - 17\lambda \geq 0, \\
&\lambda \in [0, 1].
\end{aligned}$$

Whose solution is

$$(x_1^L, x_2^L) = (0, 4), (Q_1^L, S_1^L) = (17, -16), [\lambda = 0.51].$$

The dual problem associated with the problem P_1 is defined as follows:

$$D_1 : \text{Min} W_1 = \lambda - \alpha_1(x_1 + x_2 - 4) + \alpha_2 x_1 + \alpha_3 x_2 - \alpha_4(-x_1^2 - x_2^2 + 16\lambda) - \alpha_5(-(x_1 - 1)^2 - x_2^2 + 17\lambda),$$

subject to

$$\begin{aligned}
&-\alpha_1 + \alpha_2 + 2x_1\alpha_4 + 2(x_1 - 1)\alpha_5 = 0, \\
&-\alpha_1 + \alpha_3 + 2x_2\alpha_4 + 2x_2\alpha_5 = 0, \\
&1 - 16\alpha_4 - 17\alpha_5 = 0, \\
&\alpha_j \geq 0, (j = 1, 2, \dots, 5), \\
&x_1, x_2 \geq 0, \lambda \in [0, 1].
\end{aligned}$$

Whose solution is

$$\begin{aligned}
&(x_1, x_2) = (2, 2), \lambda = 0.6, \\
&\alpha_1 = 0.25, \alpha_2 = \alpha_3 = 0, \alpha_4 = 0.0625, \alpha_5 = 0, W_1 = 0.59.
\end{aligned}$$

Second, the follower solves his/her problem as follows:

1-Find the individual optimal solutions by solving (4)-(5), we get

$$(Q_1^F, S_1^F)^* = (64, -9), (Q_1^F, S_1^F)^- = (16, 8).$$

2- By using the membership functions of the follower primal problem, the follower solves the primal and dual problems based on the proposed genetic algorithm as follows:

$$P_2 : \text{Max } \lambda,$$

subject to

$$\begin{aligned}
&(x_1, x_2) \in G, \\
&-(x_1 - 3)^2 + 4x_2 + 17\lambda \leq 8, \\
&2x_1 + (x_2 + 4)^2 - 48\lambda \geq 16, \\
&\lambda \in [0, 1]
\end{aligned}$$

Whose solution is $(x_1^F, x_2^F) = (0.3, 1.88)$, $(Q_1^F, S_1^F) = (35.17, 0.23)$, and $\lambda = 0.27$.

The dual problem associated with the problem P_2 is defined as follows:

$$D_2 : Min W_2 = \lambda - \alpha_1(x_1 + x_2 - 4) + \alpha_2 x_1 + \alpha_3 x_2 - \alpha_4(-2x_1 - (x_2 + 4)^2 + 48\lambda + 16) \\ - \alpha_5(-(x_1 - 3)^2 + 4x_2 + 17\lambda - 8),$$

subject to

$$\begin{aligned} -\alpha_1 + \alpha_2 + 2\alpha_4 + 2(x_1 - 3)\alpha_5 &= 0, \\ -\alpha_1 + \alpha_3 - 4\alpha_4 + 2(x_2 + 4)\alpha_5 &= 0, \\ 1 - 48\alpha_4 - 17\alpha_5 &= 0, \\ \alpha_j &\geq 0, (j=1,2,\dots,5), \\ x_1, x_2 &\geq 0, \lambda \in [0,1]. \end{aligned}$$

Whose solution is

$$(x_1, x_2) = (2.5, 0), \lambda = 0.85, \alpha_1 = 0, \alpha_2 = 0, \alpha_3 = 0.000000102, \\ \alpha_4 = 0.0121951, \alpha_5 = 0.0243902, W_2 = 0.262.$$

Now since $(x_1^L, x_2^L) \neq (x_1^F, x_2^F)$, then go to stage 3.

Stage 3:

1-We assumes the leader control decision x_1^L is around 0 with tolerance 2.

2-By using (10)-(14) the follower solves the following Tchebycheff problem and its dual problem based on the proposed genetic algorithm as follows:

P' : Max λ

subject to

$$\begin{aligned} (x_1, x_2) &\in G, \\ -x_1 + 2\lambda &\leq 2, \\ x_1 + 2\lambda &\leq 2, \\ (x_1 - 1)^2 + x_2^2 - 13.06\lambda &\geq 3.9, \\ x_1^2 + x_2^2 - 12.36\lambda &\geq 3.4, \\ 2x_1 + (x_2 + 4)^2 + 28.79\lambda &\geq 64, \\ -(x_1 - 3)^2 + 4x_2 + 6.5\lambda &\leq 7, \\ \lambda &\in [0,1] \end{aligned}$$

Whose solution is

$$(x_1^C, x_2^C) = (0.0001, 3.146), \text{ and } \lambda = 0.5255.$$

The dual problem associated with the problem P' is defined as follows:

$$D' : \text{Min} \psi = \lambda - \alpha_1(x_1 + x_2 - 4) + \alpha_2 x_1 + \alpha_3 x_2 - \alpha_4(-x_1 + 2\lambda - 2) - \alpha_5(x_1 + 2\lambda - 2) + \\ - \alpha_6(-(x_1 - 1)^2 - x_2^2 + 13.06\lambda + 3.9) - \alpha_7(-x_1^2 - x_2^2 + 12.36\lambda + 3.4) + \\ - \alpha_2(-2x_1 - (x_2 + 4)^2 - 28.79\lambda + 64) - \alpha_9(-(x_1 - 3)^2 + 4x_2 + 6.5\lambda - 7),$$

subject to

$$-\alpha_1 + \alpha_2 + \alpha_4 - \alpha_5 + 2(x_1 - 1)\alpha_6 + 2x_1\alpha_7 + 2\alpha_8 + 2(x_1 - 3)\alpha_9 = 0,$$

$$-\alpha_1 + \alpha_3 + 2x_2\alpha_6 + 2x_2\alpha_7 + 2(x_2 + 4)\alpha_8 - 4\alpha_9 = 0,$$

$$1 - 2\alpha_4 - 2\alpha_5 - 13.06\alpha_6 - 12.36\alpha_7 + 28.79\alpha_8 - 6.5\alpha_9 = 0,$$

$$\alpha_j \geq 0, (j = 1, 2, \dots, 9),$$

$$x_1, x_2 \geq 0, \lambda \in [0, 1].$$

Whose solution is

$$(x_1, x_2) = (2.0916667, 1.9), \lambda = 0.2321, \alpha_1 = 0.12, \alpha_2 = 0.0008, \alpha_3 = 0,$$

$$\alpha_4 = 0.13, \alpha_5 = 0.082, \alpha_6 = 0.04, \alpha_7 = 0, \alpha_8 = 0, \alpha_9 = 0.008, \psi = 0.5633.$$

So the compromise solution is

$$(x_1^C, x_2^C) = (0.0001, 3.146), \text{ and } \lambda = 0.5255 (\text{over all satisfaction for all decision makers}).$$

$$(Q_1^L, S_1^L)^C = (10.89711, -9.897), (Q_1^F, S_1^F)^C = (51.0655, 3.5899).$$

6- Summary and Concluding Remarks

This paper has applied the bi-level programming technique and a genetic algorithm for solving the supply – demand interaction in electronic commerce, taking into account the non – linear model to such problem, the study has developed an analytical process to explain how supply-demand interaction achieves a compromise solution or why the process fails. Also, an illustrative numerical example has been given to clarify the proposed solution method.

However, there are many other aspects, which should be explored and studied in the area of multi-level optimization such as:

- 1-A bi-level integer non-linear multi-objective decision-making under fuzziness based on genetic algorithm.
- 2-Due to the fact that input data of parameters are often imprecise of fuzzy in most real-world situations, models and algorithm for three-level non-linear multi-objective decision-maker problem with fuzzy parameters in the constraints.

- 3-On the basis of the proposed method, other membership functions such as piecewise, exponential, hyperbolic; hyperbolic-inverse functions may be needed for practical and interaction reasons.
- 4-A three-level integer non-linear multi-objective decision-making under fuzziness based on genetic algorithm.

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Specialization and the development of golf as an industry: a case

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Abstract: *“The most important economic (new) theory in this century is Yang’s work (the new-classical economics theory)” - James M. Buchanan. The aim of new-classical economics is to resurrect the spirit of classical economics, largely abandoned by neo-classical economics, modernising it by incorporating into it the method known as inframarginal analysis.*

This research attempts to apply new-classical economics theory to the industrial world. To that end, this study sets out to prove that the development of specialisation is the main power that has helped the golf industry to become one of the world’s most successful businesses.

Key word: Golf, New-classical economics, Economies of specialisation

1. New-classical vs. Neo-classical

The movie *Modern Times* by Charlie Chaplin (1936) is an early image of the specialisation and division of labour. This movie portrays Chaplin as a factory worker, or labourer, working on an assembly line. His only work is to screw the nuts onto pieces of machinery at an ever-increasing rate. The reason for the assembly line going ever-increasingly fast is because the capitalist, the factory owner, wants to improve productivity. Finally, the worker suffers a mental breakdown and is sent to a hospital. However, our view of the specialisation and division of labour today has changed a great deal from that image. For example, people visit a professional doctor, go shopping in specialised market, and find a specialist for car repairs. From a manufacturer’s point of view, when the company recruits workers, the management prefers the most “appropriate” candidates. In most situations that mean workers who are familiar with the proposed position, have the relative experience and training, or are suitable candidates for training. In other words, employers prefer workers possessing the preferred specialisation skills.

When college students study the principle of economics, one of the first concepts they will learn is “average cost” and one of the more important ideas associated with this is “economies of scale”, one of the cornerstone concepts in the Neo-classical economics framework.

“Economies of scale” describes the firm’s experience of costs per unit of output falling as the scale of production increases (Sloman 2007). One of the methods to

improve the extent of economies of scale is through specialisation and the division of labour. Sloman describes this as:

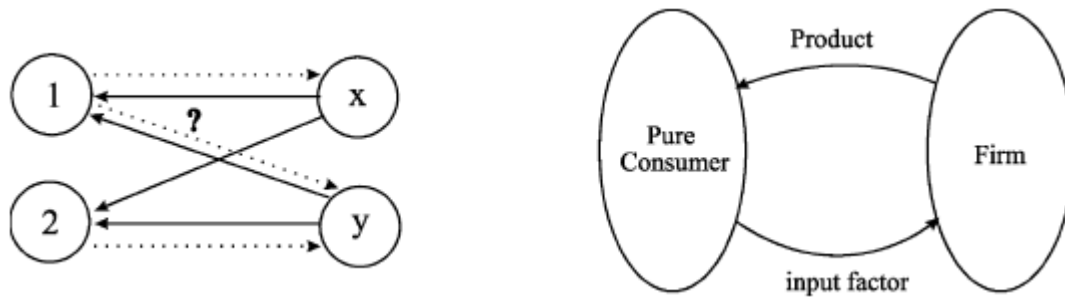
“In large scale plants, workers can do simpler, repetitive jobs. With this specialisation and division of labour less training is needed; workers can become highly efficient in their particular job, especially with long production runs; there is less time lost by workers switching from one operation to another; and supervision is easier.” (Sloman 2007, Page 90)

The term “division of labour and specialisation” first appears in Adam Smith’s work. However, as Yang (2003) pointed out, the phrase “economies of scale” never appeared in any of Adam Smith’s works or papers. Furthermore, Yang (2003) pointed out that the Neo-classical economics introduced by Alfred Marshall and the classical economics introduced by Adam Smith contradict each other in many places. One typical example of this is: “there is no sense that with the expansion of the scale of the organizations, the extent of specialisation and division of labour will increase.” Yang (2003) uses the following example to argue:

“For instance, suppose each consumer has one unit of labour which he sells to either or both firms. Two scenarios are possible. In scenario 1, consumer 1 and 2 each sells one unit of labour to firm x and y, respectively; and in scenario 2, each consumer sells 0.5 unit of labour to each firm. In scenario 1, each individual is specialised whereas neither is specialised in scenario 2. Yet, within the neo-classical framework, both scenarios result in the same equilibrium output for the firms as the total inputs the firms employ are the same, so the level of individual specialisation does not make any difference to productivity.” (Yang 2003, Page 27-28)

One of the reasons leading to the contradiction is the start point of these two frameworks. Yang (2001, Chapter 1) Using the following figures to illustrate the neo-classical framework, in figure 1 the numbers 1 and 2 stand for two different consumers who do not have to make production decisions. The letters x and y stand for two different firms make products x and y. The solid lines represent goods sold and the dotted lines represent the labour and other essential factors moving from consumer to firms. Not only Yang, but also other authors of the main economic textbooks like Sloman (2007) and Gillespie (2007) draw similar graphs to illustrate the relationship between firms and individuals.

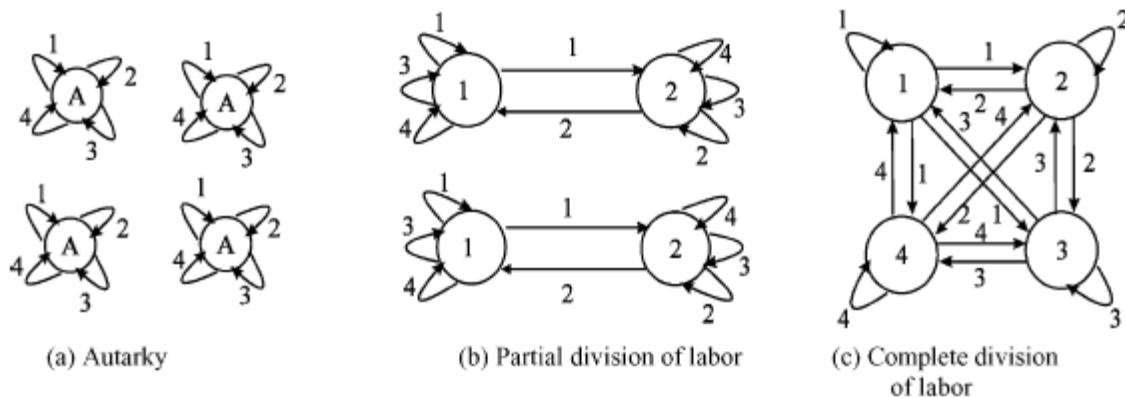
Figure 3 - Neoclassical analytical framework



Yang (2001) further argued that in the neo-classical framework, consumers and firms are separated. Consumers must buy goods from firms, thus their levels of self-sufficiency are limited. It is also held that production efficiency only depends on the scale of the enterprise and different levels of specialisation by workers may produce the same equilibrium outcome.

However, according to the new-classical framework the real world is more like the figure below. In each panel, there is an economic system with four consumer-producers, each of whom consumes four kinds of goods and can choose to produce one to four kinds of goods. (Cheng 2004)

Figure 4 New classical analytical framework



In panel (a), the economy only consists of four separate units. Each consumer-producer is self-sufficient, in other words there is autarky in all four kinds of goods. Therefore, there is no market and no market transaction cost exists. Under this circumstance, each individual's extent of specialisation and social productivity is relatively low.

In panel (b), each consumer-producer produces only three kinds of goods. They will buy the fourth kind from the market through trade. There are two markets in existence and transaction costs are incurred. Compared with panel (a), panel (b) requires partial division of labour and specialisation and will exhibit higher levels of productivity.

In panel (c), each individual firm is completely specialised in producing one single kind of goods. Markets for all four goods now emerge. Thus, every firm's level of specialisation is higher than the other two panels. As a result production concentration,

the degree of market integration²⁰, the degree of trade dependence and commercialization, productivity, and aggregate transaction costs tend to increase.

From the figure, it could be argued that the driving force of development is the division of labour and specialisation. Moreover, according to classical economics thinking the level of individual specialisation will boost the efficiency of production. (Young 1928)

Yang (2001) claims that one of the main issues for the new-classical framework is to solve the trade-off between transaction costs on the one hand and the economies of the division of labour and specialisation on the other. Yang and Zhang (2003) claim that Marshall's assumption about the isolation of firms and individuals making economies through specialisation are meaningless. Scale and specialisation are not necessarily connected. Greater specialisation only indicates that the scope of the firm narrows down but the scale of firm may enlarge or shrink.

Furthermore, in the example, if the transaction cost of a unit falls, the economies of specialisation are likely to outweigh the aggregate transaction costs caused by the division of labour. As a result, the economy will evolve from autarky in (a) to partial division of labour (b), then to complete division of labour (c).

2. Inframarginal analysis

Neo-classical economics suggests using marginal analysis to find the maximum utility according to the different levels of input. In contrast, the New-classical economics suggests using inframarginal analysis. To understand what inframarginal analysis is Yang and Zhang (2003) used a straight forward example to explain. When students apply to colleges or universities, they could study, for example, economics, physics, or language as a major. If they choose economics, it means they will give up the courses of physics and language. The choices they now have are macroeconomics, microeconomics, econometrics etc. This decision making process includes inframarginal analysis and marginal analysis.

Generally, there are two steps to making the decision for choosing the major. First, analyse the total utility of each major (inner solution) by using marginal analysis. Second, compare the total utilities and choose the highest one (corner solution) by using inframarginal analysis.

At the first stage, in choosing a major, we need to know the total utilities of each major. For example, if scoring each major we may study by using marginal analysis, the factors we need to consider, maybe including: the graduation rate, the employment rate after graduation and personal interest etc. After the consideration, we may score each major as: physics 8, language 9 and economics 10.

If the final decision based on the score is economics, it means saying "YES" to economics but saying "NO" to the other two majors. This kind of binary question to choose an answer between "0" and "1" belongs to an inframarginal decision.

After we have made a decision about which major, the next step is to decide how much time we will allocate to each course, based on our time, energy and the importance of each of the available courses. In this step, time and energy are a cost and the benefit of

²⁰ The number of producers for each kind of goods has decreased from four to two.

each class is the utility. This is the marginal decision, to solve the trade off about allocating limited resources to maximise the utility.

A similar situation happens when making a life plan or a career plan. The first question in addition to what I want to do is what I am capable of doing and what I am good at doing. Generally, the result of the analysis is to do something we are capable of and would like to do, which is the corner solution. The result is to concentrate on the job we can do and would like to do and not follow up on work we can't do or would not like to do. In contrast, marginal analysis suggests that, within the restriction of cost, we should do more work we are good at and do less work we are not good at. In other words, find the inner solution only. Clearly, the latter method is not the economical and proper way for career planning types of decision making.

3. Economies of specialisation

Economies of specialisation are more relevant to the production process than economies of scale. If the producing functions indicate that the average or marginal productivity increase as the extent of specialisation increases, it means the producing process will benefit from the economies of specialisation (Yang 2003). The difference between the “level” and the “extent” of specialisation is that the “level” means the time input for specialisation. To compare, the “extent” means the skill and talent input for the specialisation. However, this paper uses either “level” or “extent” to indicate the “quantity” of specialisation.

On the other hand, the division of labour describes more the structure of an organization. If an organization allocates the work force across different jobs, it is division of labour. Therefore, specialisation and division of labour are two sides of the specialisation process. In short, the division of labour focuses more on the organization but specialisation focuses more on individuals. This paper will focus more on specialisation.

Compared with the economies of specialisation, economies of scale describe the average or marginal productivity increases as the level of input increases. Frequently, the economies of specialisation have the same features as economies of scale. However there are differences in these two concepts.

Firstly, compared with the economies of scale, the extent of specialisation and the economies of specialisation spring from the activity of individuals. The reason is that the economies of specialisation come from the accumulation of experience in a particular activity or as the saying goes - “practice makes perfect”. However, this experience and technique does not necessarily transfer between individuals easily. For example, the technique of a world class golfer could not be taught to someone in a few days, it needs much time to practise.

Secondly, the method to attain economies of scale and economies of specialisation are different. To compare, suppose there is a large company, every single staff member in the company has many roles. Therefore, the extent of specialisation of this individual staff is low. If this company has the characteristic of benefiting from economies of specialisation, the productivity should be very low. Conversely, if the company has the characteristic of benefiting from economies of scale, the productivity should be high. Economies of scale could be achieved by recruiting different professions.

produces product X, the PPF will shift to C_2 . The value to measure the diseconomies of specialisation is the difference between B and R. To measure the value, draw a random straight line passing through point O, this line will cross either B and C1 or B and C2. On the line, the cross node between B and C1 or B and C2 is the value of the difference. In this (a) case, the maximum value is seen where the straight line crosses the point R. Generally, the transformation curve of self-sufficiency is over the curve which shows the specialisation. The graph indicates that if $a < 1$, then diseconomies of specialisation exist and a self-sufficient mode of production is more efficient than specialisation, or the self-sufficient mode has higher productivity than specialisation.

If $a = 1$, the PPF curve for one self-sufficient person is D. The PPF for two self-sufficient people and the same division of labour is E. Therefore, there is no difference between the two models of production. If $a > 1$, the PPF curve is (b). The reason that the PPF shape is a different value is due to the marginal rate of transformation (MRT) (Yang 1999) or opportunity cost. Pindyck (2005, P597) defines the marginal rate of transformation as “Amount of one good that must be given up to produce one additional unit of a second good.” The greatest command shape of PPF is like (a) as a convex curve. To explain the meaning of a PPF like (b), as a concave curve, Anderson (2006, P37-38) used the following example:

“As an economy specialises more and more into one product, the opportunity costs of producing that product increase, because we are using more and more resources that are poorly suited to produce it. With increasing production of butter (x), workers from the gun (y) industry will move to it. At first, the least qualified (or most general) gun workers will start making butter. The move of these workers has little impact on the opportunity cost of increasing butter production: the loss in gun production will be small. This cost of successive units will increase as more specialised gun manufacturers are attracted.”

When $a > 1$, the individual product transformation curve will be curve F. Curve G is the sum of two individual product transformation curves if they both are unspecialised in their production. The curve G is the PPF for a self-sufficient economy. If one of them produces two products but the other one specialises to produce Y, the original F will shift to H1. If the other one specialises to produce X, then F will shift to H2. The combination of H1 and H2 shows the PPF after the division of labour when $a > 1$. Meanwhile, the total transformation curve for the division of labour is over the curve for self-sufficiency which means that the economies of division of labour equal the economies of specialisation. The point S represents the greatest division of labour when $a > 1$. At this point, the difference of curve H and G is the value of economies of specialisation. Thus, in this situation, the figure indicates the outcome of using specialisation and division of labour over self-sufficiency. In other words, the specialisation model of production is more economical than the self-sufficient model.

It can therefore be said that if $a > 1$ the higher extent of specialisation will lead to higher productivity. Furthermore, Young (1928) introduced the idea that the narrowing down of activities could lead to the improvement of the extent of specialisation. To

summarize, if $a > 1$, the narrowing down of activities leads to the improvement of the extent of specialisation and the improvement of the production output.

3.2 Roundaboutness of production

The core idea of Marxist theory about historical materialism is that: “The mode of production of material life conditions the general process of social, political and intellectual life.” (Marx 1970) Based on this idea, Marx identified the production mode used by humans as: primitive communism, ancient society, feudalism, capitalism and communism. However, these five phases more describe the process of history than point us to a way of living and production. Therefore, the Austrian School Economist Eugen Ritter von Böhm-Bawerk made the criticism that historical materialism has not been systemized enough.

Another argument against Marx is that not only humans but also other living things have their mode of production of materials for life. The Austrian Economist pointed out that living things other than humans live by direct consumption, in other words living directly from nature. In contrast, humans have the ability to get their materials for living indirectly or in a roundabout way.

This idea of roundaboutness, or roundabout methods of production, is first introduced by Austrian School Economist Eugen Ritter von Böhm-Bawerk. He describes the process whereby capital goods are produced first and then, with the help of the capital goods, the desired consumer goods are produced.

Another definition for roundabout methods of production is by Arnold (2008) in Page 624 of his work as “the production of capital goods which enhances productive capabilities to ultimately bring about increasing consumption”. To further explain the roundabout method of production, Arnold used the following example:

“A firm using a roundabout method of production first directs its efforts to producing capital goods and then uses those goods to produce consumer goods. Take as an example the direct method and the roundabout method for catching fish. In the direct method, a person, Charlie, uses his hands to catch fish. In the roundabout method, Charlie weaves a net (a capital goods item) and then uses the net to catch fish (consumer goods). Let’s suppose that by using the direct method, Charlie can catch 4 fish per day. Using the roundabout method, he can catch 10 fish per day (by using the net). Further suppose that it takes Charlie 10 days to weave a net. If Charlie does not weave a net and instead catches fish by hand, he can catch 1,460 fish per year. If, however, Charlie spends 10 days weaving a net, he can catch 3,550 fish the first year. Thus, the capital-intensive roundabout method of production is highly productive.”

If the capital goods element, or roundaboutness of production, becomes large then the scope for specialisation is increased.

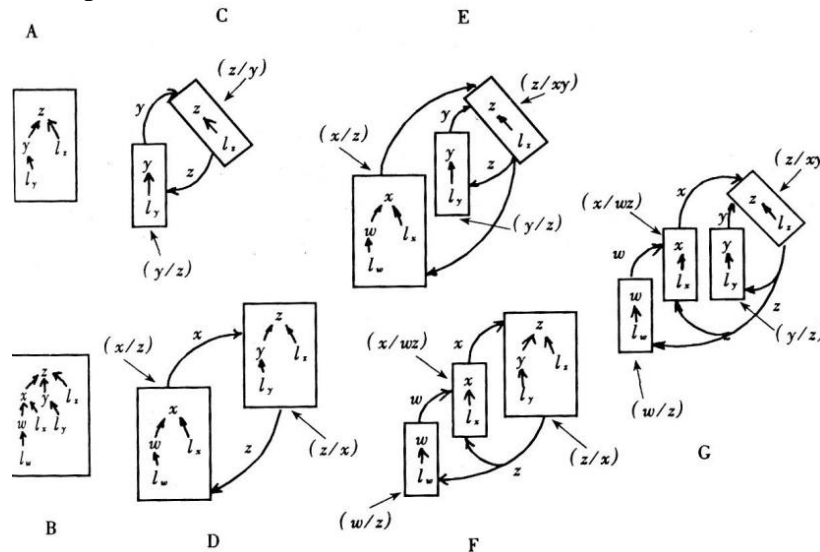
3.3 Intermediate goods

Intermediate goods or producer goods are goods used as inputs in the production of other goods, such as partly finished goods. Also, they are goods used in the production

of final goods (O'Sullivan 2010). For example, sugar could be a final product to sell in a supermarket. It could also be intermediate goods for candy production.

Furthermore, the intermediate goods are not only the goods we make ourselves for supporting our final product, it could be buying from the market. In the fisherman's example, suppose that after 10 days fishing work the net broke because it is his first hand made net. Charlie goes to the bar and talks to his friend (A) about everything he is going through. His friend tells him there is another man (B) in the town who could weave a very durable net. Charlie goes there and buys one. The net made by B also is intermediate goods.

The following graph illustrates the structure of an industry by examine the length of “roundaboutness” and the number of intermediate goods.



Let us suppose it is describing a farmer growing a crop. In this scenario, the only thing needed is the crop. Figure A shows the self-sufficient model of production. The farmer spends his labour (l_z) to produce the crop (z). At this stage, no tool is involved in the production procedure. The length of the roundaboutness is 0 and the number of intermediate goods is 0.

number of intermediate steps before the final product is made. Therefore, to make a rake (y), he has to spend some extra time on it (ly). The length of the roundaboutness is 0 and the number of intermediate goods is 1.

To further improve his productivity, he decides to use a tractor (figure B). Let us suppose the farmer has the ability to build a tractor. The first thing he has to deal with is the raw materials, the metal for example. To get the proper materials (w), he spends lw . Then he spend lx on w and finally makes a tractor (x). After that, the tools, tractor (x) and rake (y), are involved in the crop (z) production. The length of the roundaboutness is 0 and the number of intermediate goods is 3. Compare with figure A, the number of intermediate goods is increased. Therefore, the extent of specialisation in B is higher than A.

At the self-sufficient stage, there is no market existing and the productivity is high at the third level. However, taking into account the total time that the farmer has to spend on work to produce his implements and tractor, $lx + ly + lz + lw$, the model that he makes everything by himself is not efficient.

To make it more efficient, farmer “A” later may find his expertise is in cultivating the crops. Meanwhile, farmer “B” finds he is more expert in making rakes. In figure C, farmer A and B are specialised to make the product they are good at, A spends lz to produce crops (z) and B spends ly to produce rakes (y). Then, B exchanges crops (z) with rakes (y) from A. The length of the roundaboutness is 1 and the number of intermediate goods is 2. Therefore, compared with structure A, the social extent of specialisation is improved and both productivity and efficiency are increased.

Illustrating the improvement in the social extent of specialisation, in figure G all the farmers has found the kind of production they are good at. The specialised raw material supplier, tractor maker and rake maker appear. To fulfil their own needs, they exchange their products with the specialised crop grower for crops. In this structure, the length of the roundaboutness is 3 the number of intermediate goods is 3. The following table compares the figures.

Table 4 the comparison

Figure	A	B	C	D	E	F	G
length of the roundaboutness	0	0	1	1	2	2	3
number of intermediate goods	1	3	2	3	3	3	3

Comparing figure A with figure G, the intermediate goods and the length of roundaboutness are all improved. According to Young’s theory, the extent of specialisation is improved. Furthermore, the longer length of roundaboutness and more intermediate goods MAY lead to the improvement of productivity.

4. Case: Specialisation and the development of golf as an industry

To examine the extent of specialisation in the golf industry, three factors of a golf course have been chosen, the narrowing down activities of land usage, the length of roundaboutness of work force in the course and the number of intermediate goods and machinery.

4.1 Data requirement

The data for analysing the narrowing down activities of land has come from history books and articles concerning the development of golf along with time spent in research observing golf courses in various places.

The data for analysing the length of roundaboutness of the work force, principally education and training mainly comes from ground research into golf education organizations in UK and China, interviews with golf club managers and the history record of golf development.

The data for analysing the number of intermediate goods to make available state of the art maintenance machinery mainly comes from ground research concerning golf machinery, an interview with a machinery manufacturer and the study of machinery hand books. The example of manufacturing a tyre is from the internet.

The data for analysing the high efficiency and adaptability output of golf today is mainly from personal research into the Chinese and world golf industry, interviews with golf scholars and industry leaders.

4.2 Golf land

Golf is a sport with a written history extending back to the 15th century (Miller, 2005) or even earlier. Beginning as an ancient stick and ball game the modern sport of golf originated in the east coast of Scotland. By the 1700s, the golf courses in Scotland, known as the links²¹, usually belonged to the local town rather than to local landowners (Hamilton, 1998). There were dozens of different purposes of the usage of the land. For example, Hamilton (1998) described in his work:

“... The turf of the links could be sliced off ... were used by the townsfolk for roofing, or after drying as a form of fuel. On the links, women laid out clothes to dry and bleach; fishermen dried their nets and the citizens could pasture their cattle and sheep. Other users of the links were owners of travelling fairs. ... The links might also be used for burials after epidemics or battles and Musselburgh Links were used for this melancholy purpose after the battle of Pinkie.” (Page 5)

In contrast, today's golf courses have very clear property rights about the land and the buildings. The golf courses either directly own the land or indirectly own (rent) the land. Using South east Scotland as an example, the number of golf courses is 88 (Visit Scotland 2010). Of these, 6 courses are owned by the local council, the other 82 are

²¹ A Links is any rough grassy area between the sea and the land and the word itself is derived from the Anglo-Saxon word 'hlinc', of about 931 AD, meaning a ridge. Later the word was used to denote any common grassy area in a town and now the term 'The Links' is used to refer to any golf course.

privately owned. Golf courses are generally fenced off to prevent golfers playing without paying. The only entrance will lead to the reception and payment area.

Thus, in the 15th century golf was only one activity carried out on mainly communal land sustaining 6 or more activities. In the modern day, the land is dedicated to golf usage and the number of activities only 1 or 2 (golf or social activities in a small area). There are only a few special usages for a golf course in particular area. For instance, if the golf course (or more likely a driving range) is close to an exhibition centre, it could be used as a temporary parking place for events; if the golf course is close to an airfield, it could be the emergency landing area.

The narrowing down of the usage of the land benefits golf in the following ways:

1. Clear property rights improve the operational efficiency. The land owner has authority to decide on the best land usage for his purpose. The legal system may support him to achieve his purpose. As explained by Yang (2006), this improved efficiency to transact business (transaction efficiency) could facilitate the improvement of the extent of specialisation.
2. The narrowing down of activities decreases land damage, reducing the maintenance cost and improving the turf quality for golf.
3. The narrowing down of land usage brings into focus what is needed for good golf land maintenance. The experience of maintaining golf land over a period of time gives a basis for accumulated knowledge and development of improved maintenance techniques. Historically, this improvement in technique and accumulation of experience became a corner stone for the expansion of golf across the world.
4. The narrowing of activities has stimulated the emergence of new tools and machinery for maintenance, giving opportunity for the introduction of new techniques.

4.3 The workforces on the golf course

When golf first appeared in Scotland, the golf courses were shaped and kept by nature. The grasses were domestically grown. The landscape was sculpted by wind and water. Thus, the course kept changing through the years. Hamilton, 2003 and Miller, 2005 have recorded in their works the early history of golf that the golf courses were not stable, the wind being strong enough to make the sand dunes, on which they were often laid out, and move.

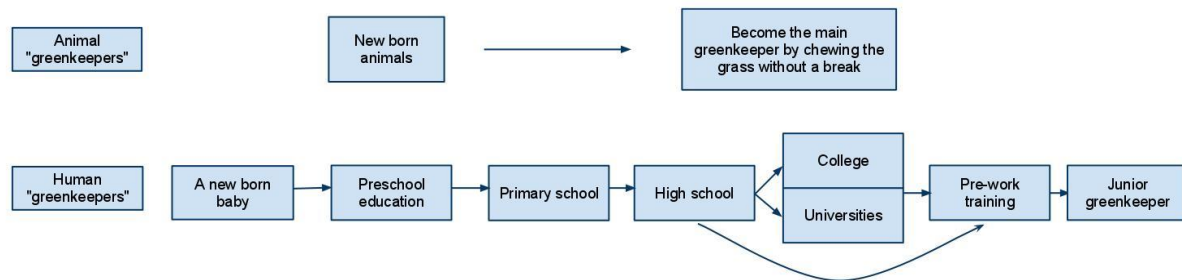
Due to the multi-purpose nature of the land usage, people did not maintain the quality of the land and grass. One of the purposes of a golf course for local people at that time was grazing animals. The sheep and cattle therefore became the main greenkeepers. Meanwhile, wild animals like rabbits and sometimes rats helped to keep the grass short. The sandy soil, which is the main property of soil on links, became exposed if an animal focused on eating the vegetation in one area. After a period of time, the exposed sandy area became a bunker, a hazard for golf players. At the same time, their droppings fertilized the grasses and sufficient rainfall provided needed moisture and watering in of nutrition. However, in the modern day, the influences on a golf course are mainly human. To examine the extent of specialisation between humans and nature, a previous section

mentioned that both “extent” and “level” describe the “quantity” of specialisation. However, here “extent” and “level” more describe the time and talent input for the specialisation process.

To examine the “talent” and “time” for human input into the specialisation process let us take an example from China. Today, there are more than 50 institutes in China offering golf related courses or subjects. In China, people who want to find a position in a golf club require either 2 or 3 years’ experience working in a golf related position or have a qualification from an education institution. Furthermore, most of the educational institutions that offer golf training have an agreement with certain golf courses. After 1 or 2 years classroom study of theory and background knowledge, all the students will be sent to the targeted golf courses for further practical training. To achieve a high extent of specialisation, the students spend both talent and time to qualify. By comparison, the sheep or rabbits of olden times had plenty of time and a talent to eat but no talent to be trained in specialisation.

Supposing we consider people working on a golf course as a “tool”, the length of the roundaboutness is long and the number of intermediate goods is many. From primary school to college, the graduate student from each level is one of the intermediate goods. The length of the roundaboutness is the number of degrees or certificates they obtain. The following figure compares the length of the roundaboutness of animal greenkeeping in 15th century and the greenkeeper today

Figure 7 Comparison of the length of roundaboutness



If we consider the greenkeeper training as a producing process, it is very clear that the “producing” process for a human greenkeeper is much complicated than an animal greenkeeper. So we can say the length of the roundaboutness for a human is much longer than an animal.

To summarize, according to Young’s theory, the extent of specialisation of workforces in golf course has increased through time.

Specialised workforces have affected the productivity of golf in the following aspects:

1. The long roundaboutness chain means switching jobs is expensive. It helps the technique and knowledge about golf maintenance to be inherited and developed. The hundreds of years of knowledge and technique accumulation have enabled the expansion of golf as an industry.

2. Highly specialised workers reduce working error thereby improving productivity.

4.4 Golf machinery

As the number of people playing golf increased, the traditional greenkeeping methods could not cope with the pressure of heavy usage anymore. To improve the productivity, machinery began to be employed by the golf courses. At the beginning, simple agricultural tools like rakes and sickles were employed. However, today, petrol or diesel powered lawn mowers have become the main method. Due to the range of the grass needing to be maintained, larger lawn mowers have been developed. For instance, 7 unit fairway mowers are widely used in improving work efficiency and the quality of the turf.

Agricultural development gives another clue as to why golf courses employ machinery. A description found in Adam Smith's work examines the relationship between agriculture and specialisation. Smith (1785) contended that the industrial sector benefited more from specialisation than the agricultural sector, mainly because of productivity differences. When Cheng (2004) examined Smith's viewpoint of the agricultural and industrial sectors, Cheng concludes:

“The theory explains economic structure by the different balance points in trading off economies of division of labour against coordination cost of the division of labour, instead of by tastes, income, or exogenous technical condition. An extension of theory implies that a decline in income share of the agricultural sector occurs not because of a change in tastes, in income, or in exogenous technical conditions, but because the agricultural sector has a higher coordination cost of the division of labour compared to the benefits derived from the division of labour, and it can improve productivity only by importing an increasingly larger number of industrial goods whose production takes advantage of a high level of division of labour in the manufacturing sector where transaction costs are more likely to be outweighed by economies of division of labour.” (Page 140)

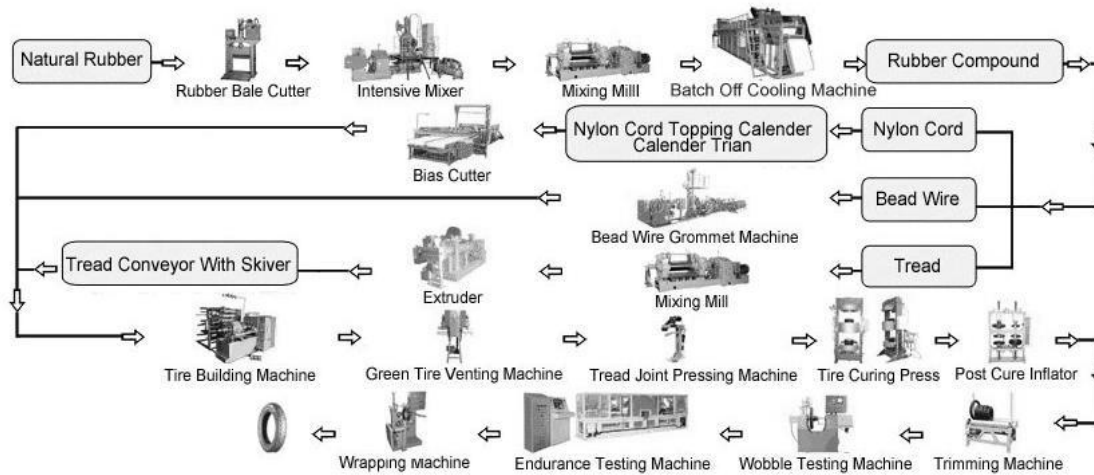
To improve the extent of specialisation in the agricultural sector, the only way Smith (1785) and Cheng (2004) suggest is to import machinery from the manufacturing sector which has a high level of division of labour or a high extent of specialisation. Like the agricultural sector, the golf sector needs to import machinery to improve its productivity through greater specialisation.

To consider the number of intermediate goods to produce the machinery used by golf courses, let us use figure 4. Consider z as the quality of maintenance the golf course needs to be achieved by work. In figure A, the worker could create a rake or shears first and use the new tool for grass keeping. When it comes to structure C, the specialised tool makers first appear. Compared with A, the extent of specialisation improves because both the length of roundaboutness and the number of intermediate goods are increased. Ultimately, the producing process of useful tools could be like structure G.

However, the production process for high-tech machinery is not as easy as a rake. The producing of each part of the machine could be more complicated than structure G. It is impossible to list the all roundaboutness processes and intermediate goods of the machine needed because that is countless. A figure below shows how a tyre, for use on

the mower, is manufactured and the finishing of each step could be seen as an item of intermediate goods. From this example, imagine how complicated is the chain to build a complete mowing machine.

Figure 8 Tyre manufacturing



In conclusion, the reason that the machines make for a higher extent of specialisation is:

1. The machines have the effect of narrowing activities. For instance, most “key” golf machinery like mowers are only used on golf courses and other super-high quality requirement grassland because the running costs and quality are too high for general use.
2. From the example of tyre producing, it is clear that the production of machinery has a longer length of roundaboutness and more intermediate goods compared with hand tools. To produce specialist golf equipment, raw materials are used, e.g.: metal for screws, blades, engine, etc. Before the final grass mower is assembled, these parts are the intermediate goods.

4.5 The output

According to Yang (2000, 2003), Zhang (2003) and figure 5, the higher extent of specialisation will lead to a higher output if the production curve is concave. In other words, if the products have the features of economies of specialisation during the producing process, the gross output of specialised sectors will grow over the gross output of unspecialised sectors.

In the real world, we could find the same situation explained by the theory. To begin with, golf courses could only be found in the east-coast of Scotland and at that time golf only could be played during the autumn from August to October (Dodd 2010).

However, highly specialised golf course design management makes for high adaptability. Due to specialised golf course characteristics, not only links could be made into a golf course but also parkland, moorland and heather land. Additionally, the use of

highly specialised machinery helps these designs become reality. Today, we can find golf courses everywhere around the world. No matter whether in a mountain area 3,100 metres above sea level (Yulong Mountain golf course, Yunnan) or the centre of the Eurasian Continent. Xuelianshan golf course, Xinjiang is 2,250km away from the ocean making it the most distant from the ocean golf course in the world.

Moreover, the highly specialised golf industry also maximizes the turnover of the golf club. According to on the ground research and interviews in golf courses in Beijing, Shanghai and Yunnan province in China, the number of visitors per day can reach 500. In practice that means a 4 person team teeing off from the first tee every 5 minutes from 6am to 6pm. Due to the high density of operation, maintenance work can only be carried out for 1 hour before the opening hour or in the gap between two teams playing, which is hard to accomplish without highly efficient machinery.

High adaptability and high efficiency contributes to golf being one of the wealthiest sports in the world. Since its emergence as a major spectator sport in 1920s, golf has provided lifelong recreational opportunities and enjoyment for millions of people. Based on US research, the U.S. golf economy generated \$76 billion of goods and services in the year 2005, with a total economic impact of \$195 billion, creating approximately 2 million jobs with a wage income of \$61 billion. At the centre of any golf economy lays the golf facilities, the largest component in terms of revenues. The revenue that flows through a golf facility comes primarily from green fees, membership fees, range fees, golf car rental. Based on the U.S. research, the U.S. golf facilities generated \$28.1 billion in revenues in 2005. Golf facility revenue is quite impressive on its own, but is even more so when compared to other popular sports. For example, in the US in 2005, all spectator sports, including baseball, basketball, football, and hockey brought in revenues of \$24.4 billion. The gaming industry had annual revenues of approximately \$26.5 billion, and fitness and recreational sports centres had annual revenues of \$16.8 billion.

The table below shows a comparison of golf in past times and today.

Table 5 Comparison of golf development

	Golf back to 15th century	Golf today
Land (the scope of activities)	Public used with many different purposes. (wide)	Owned or rented by the golf course. Generally golf only. To keep the course in a good condition, lots of chemicals are used. (narrow)

Labour (the length of roundabout production)	Animals and a few humans involved in modification work. (Short)	Human only. The staffs working on the golf course either have a number of years of experience or receive training in grass management. (Long)
Machinery (the number of intermediate goods)	Simple agricultural tools like rakes. (Few)	Hi-tech equipment from grass mowing to irrigation systems. (Many)
General outcome	<i>Golf courses only found in the east- coast of Scotland.</i>	<i>Golf courses found everywhere in the world. Meanwhile, has become one of the wealthiest games in the world.</i>

In summary, the development of golf is also the process of specialisation improvement. Through the development of specialisation, golf has had a massive improvement in adaptability and productivity, which leads to its appeal as a sport, as well as its popularity around the world, and has helped golf become one of the wealthiest sports in the world.

5. Conclusion

Compared with the neo-classical theory, the concept of new-classical theory is based on more ancient roots but the application is more modern by using inframarginal analysis. The target for the new-classical theory is not to bring a revolution to economic theory but to provide a new framework to re-consider the existing economic theories. The new theory suggests removing the assumption by the neo-classical economists that the producer and consumer are absolutely isolated. Meanwhile, the new theory suggests removing the concept of economies of scale by using the economies of specialisation and considers the general equilibrium of transaction costs. The new-classical theory can explain in more depth some of the development that neo-classical theory could not explain, for instance, the emergence of the company, the emergence of currency and economic development.

Apart from golf, many industries or sectors have emerged because their extent of specialisation and improved division of labour, for example, the pizza shop, the mobile phone manufacturers and even the educational institutions. Consequently, for many industries there is a need to consider:

Firstly, specialisation and division of labour as one of the most important factors requiring attention;

Secondly, recognition that economies of scale are not the only way to reduce average costs and increase profit;

Thirdly, for entrepreneurs, the scale of the organization is not the only goal to aim for.

In conclusion, the application of specialisation and division of labour can bring a fresh slant on decision making and the day to day management process.

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Measuring the Money Demand Function Stability in Egypt Using Error Correction Model and Cointegration

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Abstract: *The study aims at analyzing the behavior of the money demand function at narrow sense (M1) in Egypt based on annual data for the period (1991-2009), in order to identify the determinants and the speed of adaptation and the extent of stability. To achieve this goal we constructed two models of the money demand function, in the short term, and in the long-term, using the error correction model and the Cointegration Johansen test. The study found that the real money demand function is stable in the long term; real GDP and inflation rate are significant variables in affecting the level of demand for real money in Egypt during the study period, while the error correction model results show that there is a dynamic short-term relation between the demand for money and both the real GDP and the rate of inflation.*

Keywords: Egypt; Money Demand; Econometrics; Cointegration; Error Correction model

1. INTRODUCTION

The study of money demand determinates is an important subject in both developed and developing countries when the policy makers decide to choose the suitable monetary policy in order to achieve the macroeconomic objectives such as: economic growth, piece stability, low level of unemployment,...etc. The contemporary economics literature has many researches in the subject of the demand for money whether in theory or practical. These studies adopted one or more of the following approaches: the first approach viewed money as a store or the balance of precaution, and it tried to focus on the variables that could affect the inventory composition, while the second approach includes the empirical studies that tried to explain the demand for money since the eighties of the

last century as a result of the spread and evolution of financial innovations. The third approach depended on the theoretical considerations in justifying the introduction of scale variables like consumption expenditure rather than income in the demand functions for money. The fourth approach adopted McKinnon hypothesis (Mackinnon, 1991) to include monetary variables in the money demand function as a result of the international financial markets intervention. The fifth approach used Cointegration technique that associated with the error correction model for testing the relationship between non-stationary time series variables of the demand for money (Khatib, 2000: 1-2)

For this study we adopt the fifth approach in analyzing the properties of the demand for money in Egypt during the period (1991-2009) to identify its main determinates, and testing the stability of money demand function in both short and long terms. This could help the monetary authorities to use the suitable policy to achieve price stability and financial sector stability in order to satisfy the requirements of economic growth.

The study methodology depends on the econometrics approach to measure the stability of the demand for money, by constructing two econometrics models of the demand for money, one for short-term and the other for the long term. The study is based on annual reports data that issued by the Central Bank of Egypt; the concept of the demand for money in this study is the narrow sense (M1), which includes the sum of currency in circulation outside banks and demand deposits.

This paper has the following structure; the next section introduces the Specification of money demand model. Section two estimates the static money demand function in the long term. Section three estimates the dynamic money demand function in the short term, and section four explains how to use the Johansen test to identify the possibility of the existence of cointegration between the variables of the money demand function.

2. MODEL SPECIFICATION

According to the Cagan (1956) the real money demand is related to real income and real interest rate, where real income represents the demand for money that arises from the exchange or the volume of transactions, while the interest rate represents the opportunity cost for holding money. Traditionally in developing countries that have incomplete financial markets, they replace the inflation rate to the interest rate.(Choudhry, T.,1995).

The money demand function takes the simplest following formula:

$$(M/P)^d = f(Y, r) \quad (1)$$

Where : $(M/P)^d$ is the real money demand, (Y) is the real income or real wealth, (r) is the real interest rate.

Cambridge and Keynes approaches assumed that there is a positive relationship between the demand for money and real income, where the demand for money increases due to increasing in the transactions volume represented by the real income variable as a proxy. In addition they assumed there is an inverse relationship between the demand for money and the interest rate or inflation rate (P^e). In the other side Friedman (1956) stated that in the long term there is a stable relationship between the demand for real money and both of the level of real income or real wealth, and the opportunity cost for holding money represented by the expected rate of inflation or interest rates.

Rewriting the Equation (1) in logarithmic linear form as follow:

$$\ln (M/P)^d = B_0 + B_1 \ln Y_t + B_2 \ln r_t + e_t \quad (2)$$

Some empirical studies estimated the demand for money by adding additional variables such as (Bahamani-Oskooee, 1991 & Augustine and Shwiff, 1993) who added the real exchange rate as explanatory variables, while (Asseery, 1997) added the short and long-term interest rates as one of the explanatory variables, in addition (Arestis and Demetiades, 1991) added dummy variable in function to take a privacy performance of the economy into consideration during the study period.

We can rewrite the demand for money as follow:

$$m_t = a_0 + a_1 y_t + a_2 \Pi_t + \delta \quad (3)$$

Where: $\ln (M/P)^d = m_t$, $\ln Y_t = y_t$, $\ln(P^e) = \Pi_t$, (δ) error terms

3. MONEY DEMAND ESTIMATION IN LONG TERM

We estimate equation (3) by implementing the multiple linear regression model (OLS), the results shown in table (1). In this model we use the expected inflation rate substituted to the actual inflation rate, and we include a dummy variable to take the performance of

the Egyptian economy during the period that witnessed the decline in economic growth rates and the real demand for money.

Table (1)

Variables	Coefficients	T-stat
constant	-3.32	
y_t	0.985	4.63*
Π_t	-1.63	-2.848*
<i>dummy</i>	-0.256	-2.403*
R	0.978	
R^2	0.973	
Adj. R^2	0.968	
F- stat.	12.8	
D.W	2.03	

*At 0.05 significant level

It is clear from the above table the compatibility of the parameters of independent variables with the economic theory, where the real demand for money has positive relation with the real income and negative relation with the inflation rate. Moreover the periods (1995-2000) and (2006-2010) that witnessed a decline in the growth rate has a negative effect on the growth of the demand for money. The estimated elasticity of demand for real income is (0.985) and for the inflation rate is (-1.63), and R^2 shows the explanatory variables are responsible for (97%) of the changes that occur in the real demand for money.

4. MONEY DEMAND ESTIMATION IN SHORT TERM

The eighties of the last century witnessed a revolution in time series analysis as representative of the unstable behavior of the macroeconomics variables. The error correction model by Engle and Granger (1987) falls in this context to be applied in the dynamic demand for money in the short term. This model allows identifying the behavior of the demand for money in the short term. In order to constructing the error correction model we have to verify that the variables in the demand for money model are cointegrated with the same degree (above zero). (Attia, 2000: 621-623)

Unit root test of Augmented Dickey-Fuller (ADF) used for testing the cointegration degree between variables, in simple way; we use the following equation to test the hypothesis of the unit root for all variables in the demand for money function:

$$\Delta X_t = \alpha_0 + \alpha_1 t + \alpha_2 X_{t-1} + \sum_{i=1}^{n-1} \alpha_{3i} \Delta X_{t-i} + \eta_t \quad (4)$$

Where: (Δ) shows the 1st differences, (t) is time, (n) the degree of self-regression.

Table (2) shows the unit root test results, where we reject the cointegration hypothesis with degree zero for all variables at 5% significant, which means variables are unstable in its levels but it stable in its first differences.

Table (2)
Unit root test for the variables of money demand function

Variables	Change rate	1 st differences
m	-2.346(3)	-3.2(1)
y_t	-1.941(1)	-2.9(0)
μ_t	-1.678(1)	-4.2(3)

*Critical values of ADF test for sig. (-4.047) at 1%, (-3.464) at 5%, (-3.158) at 10%,
For differences, (-2.727) at 1%, (-1.964) at 5%, (-1.627) at 10%

*we depend on AIC criteria to determine the lagged periods (between brackets)

This means accepting the null hypothesis which states that: the variables of money demand function have unit root, while we reject this hypothesis for variables' first differences; this means that the variables are Cointegrated with the first degree I (1), while the variables' first differences are Cointegrated with degree zero I (0); and thus it is possible for these variables to be Cointegrated in a framework of the demand for money function.

There are two main cointegration methods. The first method is Engel and Granger method (1987), the second method is Johansen-Juselius (1990) Engel and Granger method tests the cointegration regression residuals, while Johansen technique tests the multivariate Cointegration procedure to determine the number of cointegration vectors. In both methods lagged variables are included to eliminate the autocorrelation problem.

The estimation of the cointegration regression residuals ($\tilde{\theta}$) (in equation 3) by ADF is equal to (-3.461) while the T-table is equal to (-2.591) at significant 1%, this means we reject the null hypothesis which states: the regression residuals have unit root, this

indicates these residuals are stable at zero degree I (0), and the demand function variables are cointegrated.

From above we conclude the following:

- The money demand function variables are unstable in its level, and when applying the partial-Adjustment model, it will suffer from identification problem.
- There is a short term dynamic relation between variables, which allow describing it by the error correction mechanism model.

According to Hong (1994) there are many lagged periods for all independent variables will taken and only one lagged period for the error term, gradually we delete the insignificant variables. When we apply the two steps error correction model as proposed by Granger, we get the following estimated model:

$$\Delta m_t = 0.04 + 0.324 \Delta y_t - 0.76 \Delta \pi_t - 0.32 \text{ Dummy} - 0.31 e_{t-1} \quad (5)$$

(0.021) (0.152) (0.319) (0.102) (0.103)

$$\text{Adj. } R^2 = 0.651 \quad \text{LM}_{(1)} = 1.741 \quad \text{LM}_{(4)} = 3.843 \quad \text{F-stat.} = 18.34$$

Where: the values between brackets are (standard of Error)

It is clear from the results; there is a dynamic short-term relation between the demand for money in Egypt and each of the real GDP and the rate of inflation. Because the estimated error has negative sign and statistically significant; it is possible explain it as it measures the percentage of imbalance in the demand for money that can be corrected from one time period to another.

It obvious from equation (5) that the demand elasticity of money in the short term is equal to (0.324) for real income, and (-0.76) for the inflation rate, while the error correction factor equal (0.31); which means (31%) of the imbalance in the demand for money in Egypt can be corrected from one time period to another.

5. JOHANSEN COINTEGRATION TECHNIQUE

Engel and Granger test could be sufficient if we concern about examining the effect of error correction on the money demand for the following two periods (*for example t, t-1*), while if we concern about the structural of money demand as a whole, we have to use

Johansen technique. It's better to use the Maximum Likelihood method that suggested by Johansen-Juselius (1990) when there are more than two variables in the equation, and where it possible to have more than one cointegration vector.

To determine the vectors numbers, Johansen suggested two tests:

- 1- The trace test: it examines the hypothesis: there is at least (q) cointegration vector, against the unrestricted model ($r=q$).

The statistic potential ratio for this test is obtained from the following relation:

$$\lambda_{Trace}(r) = -T \sum_{i=r+1}^P \ln(1-\lambda_i) \quad (6)$$

Where $\lambda_{r+1}, \dots, \lambda_p$ is the lowest value of self-vectors ($p-r$)

The null hypothesis states that, there are at least q vector equals to or less than r ($r \geq q$) where $r=0, 1, 2, 3$

- 2- The value of self-maximum test (λ_{max}): that calculated from the following relation

$$\lambda_{max}(r, r+1) = -T \ln(1-\lambda_{r+1}) \quad (7)$$

The null hypothesis states that : there are (r) cointegration vectors, against the alternative hypothesis that states: there are ($r+1$) cointegration vectors.

Table (3) shows the results of the two tests, where we reject the null hypothesis that stated: there is no cointegration vector, while we accept the alternative hypothesis that states: there are numbers of cointegration vectors at 5% significant level.

Since the calculated value of the potential ratio equals to (35.76) which is above the critical value (18.12), and the calculated value of the potential ratio (14.21) is less than the critical value (16.54), this means that we accept the null hypothesis that stated: there is at least one cointegration vector at 5% significant level.

Table (3)

Null hypothesis	trace test (critical value)	value of self-maximum (critical value)	Trace	value of self-maximum	Vector value
$r \leq 0$	32.45	18.12	55.62	35.76	0.45
$r \leq 1$	26.98	16.54	24.76	14.21	0.23
$r \leq 2$	12.43	11.41	9.86	7.95	0.14
$r \leq 3$	4.76	2.34	1.02	1.02	0.04

*Critical values at 5% significant level and it obtained from. (Osterwald&Lenum,1992)

In addition that, the value of self-maximum test shows the presence of the only vector of cointegration as follow:

$$m_t = -3.12 + 1.23 y_t - 2.45 \Pi_t - 0.5 Dummy \quad (8)$$

(0.039) (0.056) (0.048)

Log likelihood= 621.31

It is obvious from the cointegration vector estimation, the income demand elasticity for money in the long term is equal to (1.23), while the elasticity of demand for money in the long term for the inflation rate equal to (-2.45).

From the previous results we can say that the whole structure of the demand for money in Egypt is Cointegrated with the real GDP and the rate of inflation; the result means there is a static combination between the demand for money, GDP, and inflation rate, in spite of the fact that each variable is not static alone.

This result confirms there is a long term equilibrium relationship between these variables, which means that these variables do not move away from each other so much and show similar behavior.

6. CONCLUSION AND RECOMMENDATION

This study aimed at analyzing the demand for money function (M1) in Egypt as one of the basic indicators of monetary policy, where the stability of money demand is essential for the effective management to face of the fluctuations that come from the real sector of the economy. The results of quantitative analysis was conducted with the demand for money function in Egypt in both the short and long term, the demand function for real money is stable in the long term, and that real GDP and inflation rate are the most significant variables affecting the level of demand for real money in Egypt during the study period. The error correction model results show that there is a dynamic short-term relation between the demand for money and both real GDP and inflation rate. The estimated demand elasticities for real money shows that a dynamic long-term elasticities (1.23), and (-2.45) for each of real GDP and inflation rate elasticities exceed a dynamic short-term elasticities (0.324), and (-0.76), respectively, in addition the income effect on

the money demand in the short term exceeds the impact of inflation, while the opposite happened in the long term.

Finally we can recommend the following:

- The policy makers have to use the interest rate as an instrument control and (or) to stabilize the demand for money.
- The policy makers have to be aware of the adjustment speed in the demand for money, if the desired goal is matching the achieved results with the objectives planned.
- With the reforms undertaken by the monetary authorities in Egypt, they must make an annual periodic review to ensure the continuation of the process of stabilization.
- The monetary policy should aim at price stability, and it should not be used to reduce the rate of interest or unemployment at the expense of prices stability. Moreover it should not be a stable rate of exchange at the expense of price stability.
- The high significant of Income elasticity of the demand for money in the long term, indicates the strong relationship between real GDP and the monetary sector, this is an important indicator and it has to follow up any monetary policy targeting inflation.

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development of the basin countries in order to maximize the overall welfare. Thus, the need for Pareto-optimal model is a prerequisite as the unidirectional of the river, is often considered as a source of tension and conflict between countries that is difficult to solve. Our goal in this paper conduct a SWOT analysis to show the effectiveness of the NBI and to arrive at the Pareto-optimal allocation model that maximizes the welfare of Egypt and Ethiopia without causing any significant harm to any of the Nile Basin riparian countries. The Model that will be developed in this paper following the same methodology of D . Marc Kilgour and Ariel Dinar which is based on the idea of utilizing the water of the river by transferring it between countries within the river basin. To state differently, it allows the downstream countries that are in need for water to get it from an upstream country by compensating that country for less water available for usage ,trying to balance the growing demand of water in the Nile region for the sustainable agricultural development, which would lead to food security raising the economic welfare for the basin countries.

Key words: Agricultural sustainability, water, and welfare.

1. INTRODUCTION

River Nile is one of the world's longest trans-boundary rivers flowing a distance of more than 6,700 KM from its farthest source at the headwaters in Rwanda and Burundi reaching the Mediterranean Sea in Egypt. Its basin covers approximately 10% of the African continent and ten riparian countries, which include Burundi, Democratic Republic of Congo, Egypt, Ethiopia, Eritrea, Kenya, Rwanda, Sudan, Tanzania, and Uganda, share The River Nile.

The Basin contains a rich and varied range of ecosystems. Since the Nile waters do not stop at administrative or political boundaries, the river basin has been of great importance as regards to human settlement, development of a rich diversity of cultures, civilizations for centuries. As of today, the Nile is a crucial resource for the economic development of the Nile basin States and a vital source of livelihood for 160 million inhabitants as well as 300 million people living in the ten riparian countries. It's estimated that in the next 25 years, the population in the Nile basin will be 600 million.

Consequently, the Nile basin States jointly recognized that the best way to utilize, protect and manage the Nile basin in an integrated sustainable way through close co-operation among all the countries within the natural, geographical and hydrological unit of the river whereby all interests of upstream and downstream countries are considered and served. However, this cooperative management of the Nile River Basin is one of the greatest challenges of the water agenda. Nevertheless, it is an important catalyst for greater regional integration, economic, political, knowledge integrations with benefits far exceeding those derived from the river itself.

The recognition of the cooperative management of the Nile by the Nile Basin States signed the Nile Basin Initiative in 1999 which reflects various aspects of integrated water resource management, where all the Nile basin states except Eritrea unite to pursue long-term sustainable development, improved land use practices and management of the Nile water resource for the benefit of all without discrimination.

Recognizing the common concerns and interests of the riparian countries, the NBI had a

shared vision “to achieve sustainable socioeconomic development through the equitable utilization of, and benefit from, the common Nile Basin water resources”. The policy provides a basin- wide cooperative water resource management framework and also defines the following primary objectives.

- 1) Develop the water resources of the Nile Basin in a sustainable and equitable way.
- 2) Ensure prosperity, security, and peace for all its peoples.
- 3) Ensure efficient water management and the optimal use of the resources.
- 4) Ensure cooperation between the riparian countries, seeking win-win gains.
- 5) Target poverty eradication and promote economic integration.
- 6) Ensure that the program results in a move from planning to action.

The Nile Basin Trans-boundary Environmental Analysis identified various environmental concerns related to water resources including, deforestation that has led to losses of biologically important habitats, high rates of soil erosion leading to sedimentation of rivers, lakes, and reservoirs; localized water pollution arising from agriculture, industry, and mining. However, some of these problems like deforestation and erosion are just symptoms of big underlying root causes for the water none-sustainability like poor government developmental policies, which were never identified.

Poverty and population growth were also singled out to cause additional pressures on natural resources and this has been compounded by a lack of awareness of land-water interactions and the functioning of critical ecosystems.

The problems of water management fragmentation within each Nile basin states, weak human and institutional capacity to manage the Nile waters in an integrated manner, uneven distribution of water professionals within the basin as well as the inadequate interaction among water professionals in the Nile basin countries.

The lack of socio-economic Development and Benefit Sharing due to the complexity and variability of the river basin’s hydrology as well as the differences of Nile Basin countries’ economies, the social economic Development and Benefit Sharing through an integrated approach to water resources management, environmental conservation and regional sustainable development.

The inefficient use of water for agricultural projects, the unavailability and the inefficient use of water for agricultural production is one of the major problems facing the NBI counties. Therefore creating a framework that will enable stakeholders from the Nile Countries to work together to promote basin-wide cooperation and awareness, enhance understanding and build capacity on the common irrigation and water-harvesting issues was a main objective of the NBI.

The benefits of the cooperative Nile waters management and development fall into four categories:

- Environmental benefits derived from integrated river basin management.
- Direct economic benefits derived from more optimal basin-wide planning and sustainable development of water resources.
- Regional political benefits, in terms of increased stability and diminished tensions over river control issues.
- Indirect economic benefits, in apparently unrelated sectors, that are enabled by increased economic productivity and interaction, and decreased regional tensions.

Resources are particularly scarce; there is a growing concern among scholars that

escalating tensions could lead to violent conflicts over water in the near future if steps towards cooperation are not implemented. This issue is of particular concern within Africa where agriculture is economically predominant, yet it is the only continent where the growth in food production is lagging behind population growth. The effect of water shortages will threaten food security which could potentially lead to the outbreak of violence in the absence of comprehensive international management.

Population growth, poverty, ecosystem degradation and water scarcity are serious threats to political stability in the Nile Basin nations.

In the coming years, the combined effects of climate change and population growth will continue to strain the earth's finite freshwater resources, which was recognized as a basic human right. According to several studies by the Intergovernmental Panel on Climate Change, the flow of the Nile River is expected to decline 2040-2069.

The Nile River is the region's only renewable source of freshwater. Rapid population growth is straining water resources, and more people means more water is needed for food production and other uses. Along with population growth, another important trend to watch within the region is the expanding economic growth. This can lead to the ability of a state to pursue new development projects which were previously not within the scope of its capabilities.

However, the economic trends may disproportionately benefit local populations at the expense of outlying regions and neighboring states. A closer examination, of major demographic and economic trends in Egypt, Sudan, and Ethiopia forecasts major changes and raising the awareness of the socioeconomic sustainability in the Nile Basin.

While academic works have identified the beneficial effects of forming collaborative agreements in Nile basin region. The objective of this paper is to test the hypothesis that a fair water sharing agreement can be achieved where are the best interests of the riparian countries are served to maintain the sustainable agricultural development as a base of the economic development.

The paper is structured as follows. Section Two describes SWOT analysis of the NBI, Section Three introduces an econometric application for water distribution, the results of the hypothesis of utilizing the water of the river by transferring it between countries within the river basin of the investigation. Policy implications of the results are described in Section Four. Finally, Section Five describes the policy recommendations and concludes the paper.

2. METHODOLOGY

2.1 Methodology used in the first stage of the research SWOT analysis of the Nile Basin Initiative

This section adapts a SWOT analysis technique to summarize the Nile Basin Initiative. The criterion for evaluation is based on the framework concept of integrated water resource management. The perspective we have adopted is that of sustainable development of the water of the Nile for the benefit of all riparian states.

22.Strengths:

1. NBI focuses on multi-country, multi-sector program of collaborative action, exchange of experience, and trust and capacity building designed to build a strong foundation for regional cooperation and sustainable management of the Nile water.
2. NBI is intrinsically geared towards achieving the Millennium Development Goals and Sustainable Development.
3. NBI is developing knowledge based and essential tools for integrated water resource management through capacity building in each Nile Basin Countries
4. It has led to the development of the Decision-Support System for information sharing
5. NBI aims at building confidence, trust, collaborative relationships among everyone who has a stake in how water resources in their country are developed, allocated, and managed and stakeholder involvement.
6. The project is promoting broad-based stakeholder participation including dialogue, collective analysis, action, and monitoring for feedback and learning.
7. NBI has managed to create a strong stakeholder commitment and ownership of its projects among all member countries by creating project management location units in each country
8. NBI has Strategy for Addressing Environmental and Social Safeguards through an Environmental Management Plan.
9. NBI has strong donor support from giant institutions like the World Bank, GTZ, for implementing its projects.
10. It has framework for following up its projects through consolidated annual and quarterly interim financial reports.
11. NBI promotes regional cooperation important for increasing a range of direct benefits to riparian states, which include electricity production; environmental conservation and Water shed protection.
12. The NBI has set up governance, institutional structures and processes to provide permanent mechanisms for constructive dialogue, planning and development among riparian's, focused on the sharing of water and water's benefits

2.3.Weakness:

- 1) Lack of institutional depth like thin staffing which is insufficient to respond the increasing and emerging demands placed on the institution in the area of strategic planning, resource mobilization, or responding to basin management issues.
- 2) Inadequate capacity to develop regional databases and to analyze water resource information.
- 3) There is a lack of coordination and linkages with some NBI stakeholders like the Lake Victoria Basin Commission.
- 4) The planning of NBI projects didn't incorporate the local knowledge of the indigenous people in the Nile basin states.
- 5) Despite the fact that the NBI is trying to develop and generate hydroelectric power along the Nile for the benefit of all people, the initiative is not part and partial of the

World Commission of Dams which provides comprehensive guidelines for constructing dams on international trans-boundary rivers.

6) Theoretically NBI is bottom up but practically, is strongly top-down.

7) NBI is the most complex and ambitious river basin project ever and this may result into misinterpretations and wrong analysis of the whole project.

2.4.Opportunities:

1. Continued support of the World Bank to the NBI projects present “hope” for the achieving the NBI goals in future. Further more, financial and in kind contribution of member will help sustain NBI functions.
2. Establishment of Institutional Strengthening Project (NBI-ISP) is hoped to provide solutions to the challenges facing the NBI. For example, it will allow the NBI to undertake an institutional design processes to prepare the Nile Basin Institution for new challenges in absence or presence of CFA.
3. Finalizing a Cooperative Framework Agreement (CFA) will help create a permanent river basin organization (RBO).
4. More involvement of NGOs and civil society will involve the overall effectiveness and efficiency of the implementation of the NBI projects
5. Since the Nile basin countries are part of the African Union, NBI project has an opportunity of benefiting from the New Partnership for Africa’s Development (NEPAD) which aims at providing an overarching vision and policy framework for accelerating economic co-operation and integration among African countries.

2.5.Threats:

1. Long-term challenge for operational integration across the basin because of different sets of policies and procedures among NBI institutions like ENTRO and NELSAP-CU.
2. Nile Basin Water Treaty of 1929, which limits effective utilization the Nile-waters
3. History of tensions and instability in the region, both between states and internal states. Thus, when one country refuses to cooperate, it can have significant consequences on the NBI goals.
4. Increasing population coupled with poverty creates pressure on resources of the Nile
5. NBI countries are in different development stages with 6 out of the poorest 10 nations of the world and this threatens the initiative’s path towards achieving its goals.
6. The World Bank Polices possesses future uncertainty of the NBI projects due to its historical bad record in achieving its goals in the countries its funds.
7. Corruption and aid money disappearing into private pockets can ruin all planning
8. Climate change and water stress can force governments to act individually trying to exploit as much as possible for their people.

3.Methodology used in the second stage of the research

This section adapts an analysis technique for the efficient allocation and management of the water within the Nile river basin using the process of water allocation through joint cooperation as per the NBI Initiative1999, optimization models and the market solution.

3.1 A-The Optimization Model

The optimization model, the so-called the water allocation system (WAS) is developed in order to allocate water for the purpose of maximizing the net benefits that accrue to consumers who are subject to certain constraints. “*Shadow value*” is a system that is used when the maximization of benefits involves one or more constraints. Scarce resources have positive values even if their direct cost of production is zero, this positive value is called a “scarcity rent”, so to sum up:

- (1) In any location, the shadow value of water used is equal to the direct marginal cost of production plus the scarcity rent.
- (2) At a given location, water will be produced only when the shadow value of water exceeds the marginal cost of production at that location.
- (3) When the water is transported from one location to another, the shadow value of water at the second location cannot exceed the first location shadow value by more than the cost of transportation.
- (4) The activity that is profitable at the margin using shadow values should be increased, while the activity that loses money at the margin should be reduced.

Districts within a country, or between two or more countries are characterized by interdependent water demands, water supplies, water costs and related water infrastructure, could apply the WAS model. The geographical region that is under management is divided into a number of districts. Within each district, the annual renewable amount of water from each source, such as the pumping cost, is taken into consideration. The demand curves for water are used for household, agriculture and industrial use. Recycling of water waste and inter-district conveyance is allowed. The environmental issues are carried in many ways:

- (1) Water extraction is going to be restricted to annual renewable amounts.
- (2) A charge could be imposed on household and industry as well.
- (3) Recycled water use in agriculture can be restricted.

The model allows the infrastructure experimentation that will be accomplished in the future, such as the creation of seawater desalination plants in the districts that has a seacoast.

The WAS model is considered a powerful tool for analyzing the various costs and benefits of the various infrastructure projects, in addition, the model allocates the available water to maximize the net benefits and it also provides the analyst with optimal water allocations as well as shadow values. Beyond the uses for more efficient water allocation and management, the WAS model could be used for the purpose of assisting in the water negotiations and achieving cooperation through “win-win” criterion:

- (1) The WAS model is used to reveal the water value at different locations so it enables the water disputes to be expressed in monetary terms, which might facilitate their solution.
- (2) The WAS model is used by each negotiating party to evaluate the impact of different proposed water agreements for itself and for others, so this should aid negotiations.
- (3) The WAS model shows that cooperation in managing shared water resources could be beneficial, if it is used on a regional scale. The cooperation involves the trading of water permits that is short-term to enable one party to use another party’s water at specified

locations .Such trading takes place at the shadow values provided by the WAS model's output and would lead to a joint benefits wherever the parties valued water in a different manner, further benefits could be available from the construction of joint infrastructure . The WAS-type approach shows that such disputes are merely matters of money and should be seen as that, so the WAS-type solution could be used without waiting for the solution of the disputed parties as payments could be placed in an escrow fund while countries continue to negotiate.

3.2. Market Trading System for Water and Customary Law

The idea of setting up a free market for trading water has been introduced as a solution to the disputes over water between neighboring nations but this market solution is a complex one because it is fraught with danger so it requires the intervention of the international law .The market solution aims at setting up a trading system through which countries that are considered rich in water sell some to those countries in need .Markets always ensure peace and efficiency as the countries which pay for water will not waste a resource that they have paid for, on the other hand, the market solution helps in the settlement of water disputes as compensation can be sought in a court if a country infringes on the property of other .But, we must take into consideration the fact that water is unlike any other natural resource (except air) is ambient, which means that it moves and doesn't respect any borders so there is no entity can control it . Ownership rights should be clear before the market work .The severe problem that always arise is that how to determine ownership of a resource.

In order to govern the right of nations over shared water resources, the customary international law was developed because there is no legal agreement between nations that share a common river .There are two types of international claims .First, the downstream nations which claim absolute integrity of the river by blocking the upstream nations from doing anything that might affect the quality and quantity of water flowing to them . Second, the upstream nations claims their absolute territorial sovereignty by which they can do whatever they want with the water regardless of its effect on downstream nations . The equitable utilization is said to be the solution for all these claims, it is a concept that oblige each nation to recognize the right of others for using water from a common source . Under this concept, countries decide on the quantity of water that is allocated to each nation by taking into consideration some standards as the amount of land that could be irrigated and the historic patters of usage in addition to the objective factors as the need for more water due to a growing population in certain nations.

We get to know that the customary law has an advantage over the market solution as it recognizes the unique nature of the river water, as despite of determine who owns what? It states a rule for sharing of the water with the river basin .On the other hand, the customary law has two disadvantages .First, it is too vague to determine the fair share of each nation .Second, there is no way to enforce the law so in a case of violation; the only available way is the vendetta law.

-Water as an Economic Good

Water is considered by many researchers to be an economic good due to the scarcity of resources. The economic value of water is very much related to the economic laws of supply and demand of that scarce resource. Water is regarded as a never diminishing asset, thus the question of equitable utilization imply an obligation not to cause significant harm to any country. Water resource allocation according to the economic value; is subject to *Efficiency* and *Equity*. The equitable and efficient distribution of water between countries that share common water resources differs due to the difference between countries in valuing that scarce resource, thus the allocation of water resources should be based according to these values.

The literature of international water disputes proposes several principles in order to solve these disputes within an international water basin:

- 1- The theory of absolute territorial sovereignty: is known as “Harmon Doctrine”, which gives the right to upstream countries to do whatever they like with the water flowing in their territory without taking into consideration the harm it causes to other downstream countries.
- 2- The theory of absolute integrity of the river: it maintains that upstream countries shouldn't interfere in the natural flow of water which passes through their territory in a manner that might have any impact on the flow of water downstream.
- 3- The theory of limited territorial integrity: it states that each country could use the water of the river but this usage is subject to certain restriction in favor of other countries.
- 4- The theory of community of interests: it ignores the national boundaries and regarded the entire basin as a geographic and economic unit.

All these principles couldn't be considered a solution to the water scarcity problem as there aren't ways of enforcement. Thus, any country could violate these principles and seek its own benefit regardless of others. So we need a practical solution in order to maintain joint welfare for all countries sharing common water resource.

3.3 Data Description

The stochastic nature of water supply and dynamic nature of water demand imply an allocation model with certain characteristics in order to maximize the overall welfare. Thus, the need for Pareto-optimal model is a prerequisite as the unidirectional of the river, is often considered as a source of tension and conflict between countries that is difficult to solve. In this paper we will try to arrive at the Pareto-optimal allocation model that maximizes the welfare of a down stream country (Egypt) and an upper stream country (Ethiopia) without causing any significant harm to any of them. There are several relevant factors that contribute the equitable utilization of water in both countries, which include:

A- Renewable water supply

Water supply is the water available for a community or region that originates from various sources and delivered through many delivery systems. There are other sources of supply such as surface water, ground water, agriculture drainage water, reused treated waste water and desalination of sea water. All riparian countries recognize that cooperative development was the best way to bring mutual benefits to the region, and thus joined in a dialogue to create a regional partnership to achieve sustainable development of the Nile.

1- Surface water

There are two conditions in order to allocate the surface water efficiently. First, we must hold a balance between potential users due to the different competing claims of different competing users. Second, we must take into account the surface water flow variability, as the supplies of surface water are not constant over time.

2- Renewable ground water

Ground water considered causing less pollution than surface water. It is extracted from aquifers underground that widely differs in size as well as the recharge rates. Ground water is classified according to the depth of the source to deep and shallow source, but at certain times the extraction of this deep underground water is a necessity. Ground water has a depletable nature, thus if in a certain aquifers the recharge fell short , the supply is exhausted. The efficient allocation of groundwater requires declining demand over time. In addition, pumping of groundwater stops when the supply runs out or when either marginal cost of pumping exceeds marginal benefit of the ground water or exceeds other sources marginal cost.

3- Agricultural drainage water

A pump could drain water or a drainage stations in the large scale cultivations to deliver back the water to the main canal. Drainage has three kinds:

- (1) The drains that carry freshwater that is used on the land or returned to the canal.
- (2) The drains that pick the saline up from the groundwater and is used after mixing with the water of the canal.
- (3) Drains that is polluted by wastes of the industrial and domestic usage. Drainage water should be used where it is produced rather than discharging it downstream and thus facing difficulty of managing efficiently. Drainage re-use system increases the overall efficiency of the system by around 65%.

4- Reused treated wastewater

In agricultural land, the wastewater treatment levels for the application range from zero (discharge of raw sewage) to a highly treated water that is produced from newly constructed wastewater treatment plants. Trained operators who monitor the wastewater

stream for health risk levels, usually runs these plants. Wastewater reuse rules for agriculture in the Middle East follow the world health organization (WHO).

5- Desalination of seawater

Wealthy countries prefer this source of fresh water especially countries that own an oil reserve like gulf countries. Desalination is the process through which dissolved salt is separated from saline water and becomes available for usage. Desalination is a good option for countries that have huge amounts of saline water and could not find a way to use it.

B-Water demand in Egypt

Water resources are the sources of water that are potentially useful to humans. Uses of water include agricultural, industrial and household and municipal uses. In general, the demand for water increases due to the large consumption of these sectors in addition to the growing population size.

The demand for water can be increased rapidly due to the expansion at various sectors especially the industrial sectors compounded by the population growth. While recession of various sectors, and the initiated policies concerning the water and its uses can cause a sharp decline in water usage. Since water has been widely accepted as an economic good, so it must have a value assigned to it, which has three main economic effects:

- 1- It reduces the overall water demand, as people tend to consume less water when they pay for it, they become more conservative in their consumption behavior.
- 2- As a consequence, a decline in water use leads to an increase in the supply.
- 3- The efficient use of water leads to a market-driven reallocation of water usage across various sectors, as a result of pricing policies that encourage responsible distribution.

Also, the climatic change has a great impact on the availability of water. A recent study on the vulnerability of Egypt's Mediterranean coast and the Nile Delta to sea level rise concluded that the impact of climate change on the Nile Basin could not be predicted but that there are indications that the impacts will be significant and severe. Any decrease in the total supply of water, associated with an increase in consumption due to the high population growth rates and the rise in the standards of living, will have dangerous impacts. Climate change may bring substantial reductions in the national grain production.

1- Agriculture

The agriculture sector is considered the most dominant water user as about 70 percent of the world's freshwater is used in this sector. The heavy use of agriculture water is in the developing world. Thus, due to the global water shortage and the reduction of the global water resources in the developing world, the reduction of water means a reduction in food which in turn leads to people dying from malnutrition and starvation. Irrigation is considered the biggest user of agriculture water as farmers in developing countries consume double their counterparts in industrialized countries while getting

crop yield three times less. Therefore, if farmers use water efficiently, the use of global water reduction is estimated to be 20-30 percent.

2- Industry

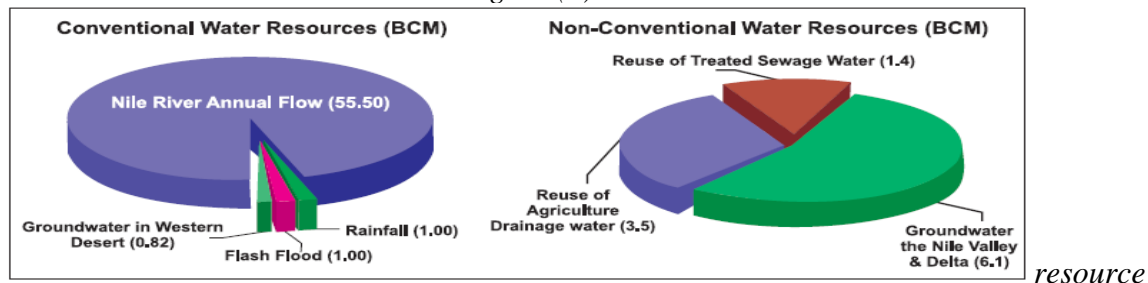
The industrial sector is considered to be the second largest user of water accounts for 20 percent of the global freshwater usage. It is concentrated in the industrialized countries, while most of the developing and part of the industrialized countries consume less than 16 percent of their freshwater in the industrial sector. Dams and reservoirs are used to store the majority of this water to be utilized for irrigation and electrical power generation later. The industrial sector water used for industrial processes is about 35 percent, power generation consumes about 65 percent and the rest is used for thermal power generation. However, the industrial water storage in reservoirs can lead to excessive evaporation loss of water. Since the 1970s, it is noted that the water lost due to the reservoir evaporation is more than the amount that is consumed by the industrial and domestic sectors combined. Therefore, by the use of covered reservoirs, we could reduce the amount of water lost through improving the industrial water usage efficiency.

3- Domestic and Municipal

Domestic water use is considered to be a small percentage of global water use and it is defined as the amount of water available to the population residing in cities and towns. Most countries are consuming 0-30 percent of the freshwater regardless of their developmental status.

The requirement of water needed for municipal use was 4.5 km³ in 2000, some of this water is consumed and the rest returns back to the sewerage system or to the groundwater by seepage. The domestic water use requirement is estimated to be around 6.6 km³ in 2025.

Figure (1): water



s of Egypt

Source: International Commission on Irrigation and Drainage (ICID), New Delhi

C- Total water withdrawal per capita

The two main problems that face Egypt are the increasing population that results in decreasing per-capita water availability and increasing overall demand, and changing conditions particularly technology and climate that affect both water demand and supply. In reality, Egypt is unlikely to reach a satisfactory level of water use because of absolute

constraints on availability. Thus, in the absence of inexpensive desalination, the only alternative is therefore a declining per-capita use of water. This can happen by declining benefits resulting from continued inefficient use of water in traditional ways or with constant or improving benefits resulting from improving water-use efficiency and changing water policies.

Implementing efficient methods of irrigation is very important as over 60 percent of the water used each year in the world is consumed for irrigating crops. Nowadays, some farmers are using “surge-flow” technique in order to replace the traditional flooding and channeling irrigation. “Night time” irrigation is another technique used by many farmers which reduces evaporation and increases efficiency. “Low-pressure sprinklers” improve efficiency by 60-70 percent compared with high-pressure sprinklers. “the low-energy precision application” which is tubes extending down from the sprinklers right on to the crop, could push the efficiency almost up to 100 percent. All these techniques grow the crops with less of water but with greater efficiency. Figure (2) shows the total water withdrawal per capita in Egypt. In 2001, the amount of water withdrawal per capita has reached its peak due to the continuous inefficient use of water and the reliance on one source of water.

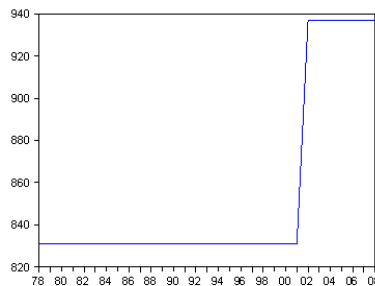


Figure (2): total water withdrawal per capita
Source: manually on E-views

D-Dependency ratio

For 5,000 years, the Egyptian civilization has sustained itself utilizing water in the Nile River valley. Thus ancient Egypt has a historical right on the Nile River, which is nowadays the reason for the conflict with the Nile basin countries. Indeed, Egypt depends on the Nile as the main source of water supply. It is important to note that the agriculture sector consumes the larger amount of water in Egypt. Figure (3) shows the dependency ratio on water in Egypt.

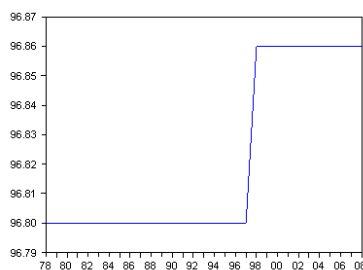


Figure (3): dependency ratio
Source: manually on E-views

Agriculture lost its position as the dominant economic sector during the 1970s, as agriculture exports contribution to GDP continued to decline (from 87 percent in 1960, to 11 percent in 2001)

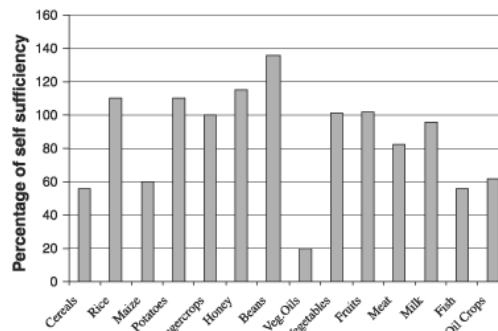


Figure (4): self-sufficiency of crop yield

Source: International Commission on Irrigation and Drainage (ICID), New Delhi

According to the national council for production and economic affairs, the Aswan high dam which is completed in 1971 had proved its successful control of floodwaters and the continuous insurance of water supplies, but on the other hand, the consumption of water had been excessive and should be controlled. The drawbacks of the Aswan high dam is that some valuable land was lost below the dam due to the fact that the flow of the Nile silt was stopped and also the problem of increased salinity still exist.

E- Population

The quantity and quality of water is imposing limits on Egypt's economic development, due to a number of challenges such as rapid population growth, deterioration of water quality, water scarcity and fragmentation of water management among various institutions, and the cost of water resource services recovery. Population growth is the most severe challenge facing Egypt's economic development. In addition, due to the rapid degradation of surface and ground water quality less water is now available for the various uses. Therefore, the deterioration of the quality of water has resulted in loss of biodiversity, human health hazard and the irreversible pollution of groundwater that is affecting the sustainability of agricultural production.

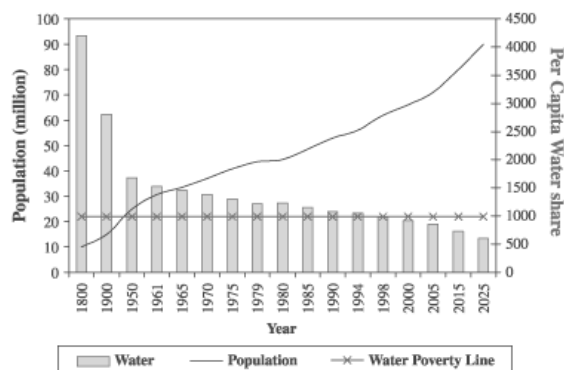


Figure (5): per capita water share and population growth

Source: International Commission on Irrigation and Drainage (ICID), New Delhi

Water Balance

The water balance is an accounting of the inputs and outputs of water. Thus, the water balance of a place, whether it is an agricultural field, watershed or continent is mainly determined by calculating the input, output, and storage changes of water at the Earth's surface. In our model, the applicant is equating the water supply with water demand in order to arrive at the equitable utilization of water in Egypt (see table 1).

Table (1):

Supply	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
1-surface water	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5
2-ground water	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
3-agricultural drainage water	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
4-reused treated waste water	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
5-desalination of sea water	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
Total	61.025	61.025	61.025	61.025	61.025	61.025	61.025	61.025	61.025	61.025
Demand										
1-agriculture	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4
2-industrial	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
3-municipal and domestic	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
4- evaporation	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Total	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2
Supply ²²	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
1-surface water ²³	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5
2-ground water ²⁴	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
3-agricultural drainage water ²⁵	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
4-reused treated waste water ²⁶	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
5-desalination of sea water ²⁷	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025

²² COMPUTED MANUALLY

²³ AQUA STAT (Food and Agricultural Organization)

²⁴ AQUA STAT (Food and Agricultural Organization)

²⁵ AQUA STAT (Food and Agricultural Organization)

²⁶ AQUA STAT (Food and Agricultural Organization)

Total	61.025	61.025	61.025	61.025	61.025	61.025	61.025	61.025	61.025	61.025	61.025
Demand ²⁸											
1-agriculture ²⁹	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4
2-industrial ³⁰	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
3-municipal and domestic ³¹	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
4- evaporation ³²	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Total	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2	57.2
Supply	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
1-surface water	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5
2-ground water	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
3-agricultural drainage water	4	4	4	4	4	4.4	4.8	5.1	5.4	5.7	8.0
4-reused treated waste water	2.971	2.971	2.971	2.971	2.971	2.971	2.971	2.971	2.971	2.971	2.971
5-desalination of sea water	0.1	0.1	0.1	0.1	0.1	0.06	0.06	0.06	0.06	0.06	0.06
Total	63.871	63.871	63.871	63.871	63.871	64.231	64.631	64.931	65.231	65.531	67.831
Demand											
1-agriculture	59	59	59	59	59	57.8	58.1	58.5	59.05	59.3	60
2-industrial	4	4	4	4	4	1.1	1.1	1.15	1.15	1.15	1.2
3-municipal and domestic	5.3	5.3	5.3	5.3	5.3	5.4	5.6	5.8	6.1	6.5	6.6
4- evaporation	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Total	70.4	70.4	70.4	70.4	70.4	66.4	66.9	67.55	68.4	69.05	69.9

Empirical analysis

The model that will be developed in this paper follows the concept of compensation that is widely used in the field of economics. Before proceeding with such methodology, the applicant tries to assess the water scarcity problem in Egypt and test the necessity of the application of the compensation model as the only possible solution left to Egypt in order to solve its water problems with its upstream countries in the Nile Basin by using simple econometric concepts, the applicant will be able to arrive at the required results which will in turn facilitate the second stage, which is the application of the compensation model. As we noted earlier, the compensation model allows the downstream countries that are in need for water to get it from an upstream country by compensating that country for less water available for usage. In the first stage of the model, the applicant is going to construct a simple model in order to assess the water demand per year in Egypt and get an idea about the various factors that affect the demand and causes its rapid increase. The factors that are supposed to affect demand the most are namely; average supply per year, total water withdrawal per capita, dependency ratio, population and population density (the explanatory variables). Therefore, our null hypothesis is that the average demand per year in Egypt is not affected by those variables while the alternative hypothesis is that the average demand per year in Egypt affected by at least one of those variables. The model includes 31 observations as shown in table (3).

²⁷ AQUA STAT (Food and Agricultural Organization)

²⁸ COMPUTED MANUALLY

²⁹ Ministry of Water Resources and Irrigation

³⁰ Ministry of Water Resources and Irrigation

³¹ Ministry of Water Resources and Irrigation

³² Ministry of Water Resources and Irrigation

The regression equation is:

$$\text{Average demand per year (Y)} = -\beta_0 + \beta_1 \text{ Average Supply Per Year} - \beta_2 \text{ Total Water Withdrawal Per Capita} + \beta_3 \text{ Dependency Ratio} + \beta_4 \text{ Population} - \beta_5 \text{ Population Density} + \varepsilon_i$$

$$H_0: \beta_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$$

H_1 : at least one of the β 's $\neq 0$

$$\text{Average demand per year (Y)} = -20613.20 + 0.258025 \text{ Average Supply Per Year} - 0.023843 \text{ Total Water Withdrawal Per Capita} + 213.5914 \text{ Dependency Ratio} + 0.164138 \text{ Population} - 0.177884 \text{ Population Density} + \varepsilon_i \quad (1)$$

Table (2)

Dependent variable: average demand per year.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-20613.20	1120.712	-18.39295	0.0000
SUPPLY	0.258025	0.198883	1.297371	0.2063
WITHDRAWAL	-0.023843	0.004226	-5.642042	0.0000
DEPENDENCY	213.5914	11.67286	18.29812	0.0000
POPULATION	0.164138	0.058641	2.799012	0.0097
DENSITY	-0.177884	0.060152	-2.957250	0.0067
R-squared	0.991647			
Adjusted R-squared	0.989977			
S.E. of regression	0.586804			
Sum squared residuals	8.608459			
F-statistic	593.6114			
Probability(F-statistic)	0.000000			
Mean dependent variance	61.42581			
S.D. dependent variance	5.861241			
Durbin-Watson stat	2.213404			

Source: manually on E-views

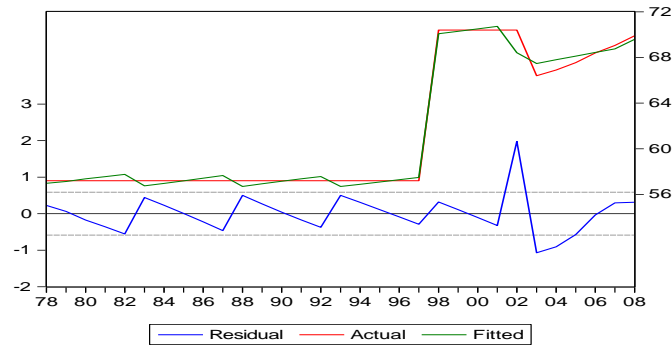


Figure (6): residual plotting of the regression equation
Source: manually on E-views

Table (3)

Correlation between the variables:

	Average demand per year	Average supply per year	Total water withdrawal per capita	Dependency ratio	Population	Population density
Average demand per year	1.000000	0.914553	0.650557	0.988232	0.800733	0.805658
Average supply per year	0.914553	1.000000	0.814907	0.932152	0.838362	0.825728
Total water withdrawal per capita	0.650557	0.814907	1.000000	0.728219	0.729256	0.715605
Dependency ratio	0.988232	0.932152	0.728219	1.000000	0.825564	0.838105
Population	0.800733	0.838362	0.729256	0.825564	1.000000	0.985664
Population density	0.805658	0.825728	0.715605	0.838105	0.985664	1.000000

Source: manually on E-views

Interpreting the results:

The regression R^2 is defined as the fraction of the sample variance of Y_i that is explained by the explanatory variables. The goodness of fit is mathematically measured by this equation $R^2 = 1 - (ESS/TSS)$, but this way of analyzing R^2 usually creates a problem as it makes the addition of any variable will increase R^2 . To state differently, as a new variables is added and ESS is minimized, we are thus minimizing over a larger set of variables and then the new ESS will be smaller (at least not larger). So if a new variable

is added, the corresponding R^2 cannot decrease but is more likely to increase. Thus, the researcher could just add new variables to increase R^2 without considering the importance of the variable added. To avoid such problem, the researchers use another type of goodness of fit called adjusted R^2 or R^2 adjusted for degrees of freedom. It is considered a better measure of goodness of fit as it permits the tradeoff between increased R^2 and decreased degrees of freedom. Thus the adjusted R^2 is considered to be a modified version of R^2 that usually does not increase when new explanatory variables are added. In our model, this problem does not exist as both the R^2 and the adjusted R^2 is very high around 99 percent; which means that the explanatory variables namely; average supply per year, total water withdrawal, Dependency ratio ,population and population density; explains variation in the dependent variable namely; average demand per year by 99 percent.

Testing for Multi-co-linearity

Multi-co-linearity means the existence of linear relationship among the explanatory variables of the regression model to identify multi-co-linearity can take many forms. It could be shown through the high R^2 with low values for T-statistics, as it is possible to find a model with insignificant regression coefficient (low T-values) while having a significant F-statistic (high F-value). Moreover, the high values for correlation coefficients is another way and it is considered good to get the correlation between each pair of variables and check for among the explanatory variables for high values. In addition, regression coefficients sensitive to specification is considered another way, as multi-co-linearity could exist even if there is not high correlation between two explanatory variables and this is because there may be three or more variables nearly linear. Also formal tests for multi-co-linearity are used as a procedure for identifying the severity of multi-co-linearity but many econometricians' claims that these tests are meaningless. There are some methods used in order to get rid of multi-co-linearity such as obtaining additional or new data, using extraneous or prior information, transformation of data, combining time series and cross-sectional data and omitting a highly collinear variable. Indeed, applying such methods depends on the severity of the co-linearity problem and the data nature. In our model, the problem of multi-co-linearity does not exist as the probability (F-statistic) is significant.

Testing for Autocorrelation

Autocorrelation usually occurs in regression analysis of time series data When Y value in one period is correlated with its next period value. Thus autocorrelation is the correlation of a series with its own lagged values. To state differently, it is the correlation between Y_n and Y_{n-1} , which is the correlation between two adjacent Y values .The most popular test for detecting serial autocorrelation is the Durbin-Watson statistic (d-statistic) developed by the statisticians Durbin and Watson and it is the ratio of the sum of squares differences in successive residuals to the RSS. The advantage of the d-statistic is that it is based on the estimated residuals that are usually computed in the regression analysis. Autocorrelation problem does not exist in our model since the Durbin Watson test is equal to 2.213; which means that there are no autocorrelation between the variables.

Testing for Heteroskedasticity

Heteroskedasticity occurs mainly in models with cross-section data. It is usually caused by a relationship between the disturbance variable and one or more variables or their variances, and it can also be caused by the data. Thus, Heteroskedasticity can be found in models with time series data because when trends do occur in the observation of the time series data so they may induce trends in the variables variances as well and this may in turn induce a similar trend in the variance of the disturbance term . The applicant apply white- test to check whether there are a problem of Heteroskedasticity or not. Indeed, it is obvious that the model does not have the problem of Heteroskedasticity and this is shown in the output and graph of the test which yield significant variables.

Table (4): Heteroskedasticity (White-Test): Consistent Standard Errors and Covariance.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-20613.20	2088.824	-9.868327	0.0000
SUPPLY	0.258025	0.389434	0.662564	0.5137
WITHDRAWAL	-0.023843	0.007974	-2.990254	0.0062
DEPENDENCY	213.5914	21.76580	9.813166	0.0000
POPULATION	0.164138	0.090743	1.808824	0.0825
DENSITY	-0.177884	0.099971	-1.779363	0.0873
R-squared	0.991647			
Adjusted R-squared	0.989977			
S.E. of regression	0.586804			
Sum squared residuals	8.608459			
F-statistic	593.6114			
Probability(F-statistic)	0.000000			
Mean dependent variance	61.42581			
S.D. dependent variance	5.861241			
Durbin-Watson stat	2.213404			

Source: manually on E-views

Cointegration test

Cointegration is the phenomenon through which two or more series have the same stochastic trend in common; in this case, regression analysis can reveal long-run relationships among time series variables. Two or more time series with stochastic trends can move closely together over the long-run so that they appear to have similar trend component. Thus, two or more series that have a common stochastic trend are co-integrated. The co-integration relationship is used for forecasting. There are three methods in order to decide whether two variables can be modeled as co-integrated;

- (1) Graph the series to see if they appear to have a common stochastic trend or not;
- (2) Use expert knowledge and economic theory
- (3) Perform statistical tests for co-integration. Indeed, the three methods should be used in practice.

Table (5): Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob.**
None *	1.000000	1045.266	3.841466	0.0000

Trace test indicates that there is one co-integrating variable at the 0.05 level.

Unit root test

The applicant now turns to the Unit Root Test. The reason behind using several unit root tests is the size and power of these tests. The size of a test is the significance level which is the probability of committing type I error while power is the probability of rejecting the null hypothesis when it is false and it is calculated by subtracting the probability of type II error from 1 (type II error is the probability of accepting null hypothesis when it is false), the maximum power is 1. The null hypothesis of most unit root test is that the time series under consideration has a unit root; that it is non-stationary, while the alternative hypothesis is that the time series is stationary.

H0: time series is non-stationary

H1: time series is stationary.

The size of the test: the DF test is considered sensitive to the way through which it is conducted, thus the three DF test varieties are a pure random walk, a random walk with drift and a random walk with drift and trend. Suppose the true model is a pure random walk but we estimate a random walk with drift and conclude that the time series is stationary on a 5 percent level, this could be a wrong conclusion because the true significance level in this case is much larger than 5 percent. The distortion of the size could result from excluding moving average (MA) components from the model.

The Power of the test: most DF tests have low power as they tend to accept the null hypothesis of unit root test more frequently than is warranted. Thus, these tests may find a Unit Root even if none exist. There are many reasons behind this;

- (1) the power usually depend on the time span of the data more than the size of the sample, thus for a given sample size n ; the power is greater for large span;
- (2) if $p \approx 1$ but not exactly 1 , the unit root test declare a non-stationary time series.;
- (3) these tests assume a single unit root , thus they assume that the time series is $I(1)$, but if the time series is integrated of order higher than 1, say $I(2)$, there will be more than one unit root; and (4) if there are structural breaks in the time series , the unit root test may not catch them.

Transforming the non-stationary time series

In order to avoid the spurious regression problem that arises from regressing a non-stationary time series on one or more non stationary time series, we need to transform non stationary time series to stationary time series. The transformation process depends on whether the time series are difference stationary process (DSP) or trend stationary process (TSP). In a difference stationary process, if the time series has a unit root, the first differences of such time series are stationary, thus the solution is to take the

first difference of the time series. A trend stationary process is stationary around the trend line, thus to make such time series stationary, we need to regress it on time and the residuals from this regression will then be stationary. It should be noted that if a time series is a difference stationary process but we treat it as trend stationary process, this is called under differencing while on the contrary, if a time series is a trend stationary process and we treat it as a difference stationary process, this is called over differencing. Indeed, the consequences of these specification errors can be serious depending on the way through which the serial correlation properties of the resulting error terms are handled. In fact, most macroeconomic time series are difference stationary process rather than trend stationary process.

The spurious regression is the reason behind the need for determining whether variables contain stochastic trends or not. Any variable could have no trend, only stochastic trend, only deterministic trend or both stochastic and deterministic trends.

The Dickey-Fuller Test for a Unit Root

Because p is skewed toward values less than 1 when $p=1$, a traditional t-test with the null hypothesis that $p=1$ against the alternative hypothesis $p<1$, often result in rejecting the null hypothesis. The consequence of the failure to account for the true disturbance nature will lead you to think that $p<1$, while it is equal to 1. Therefore the two statisticians David Dickey and Wayne Fuller used methods to salvage the t-test statistic, by computed correct critical values for the t-statistic instead of the misleading critical values that we get from the t-tables. Thus the convenience of this form is that the null hypothesis of a unit root ($p=1$) becomes a test that the coefficient on $Z_{t-1, (p-1)}$, is zero. We could obtain the needed t-statistic directly from the standard regression output, as it is the t-statistic for this test that regression packages always report. As we rule out that $|p| > 1$ as implausible, the dickey-fuller test is considered to be a one-sided test in which the alternative hypothesis is $(p-1) < 0$. Thus, if the t-statistic is negative, we reject the null hypothesis of a stochastic trend. By applying the augmented dickey-fuller unit root test to the average demand per year, average supply per year, total water withdrawal per capita and dependency ratio, the output is as follows

Table (6)

Average demand per year : Exogenous: none

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.282059	0.0000
Test critical values:	1% level	-2.647120	
	5% level	-1.952910	
	10% level	-1.610011	

Average supply per year : Exogenous: none

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.642585	0.0007
Test critical values:	1% level	-2.647120	
	5% level	-1.952910	

	10% level	-1.610011	
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Total water withdrawal per capita : Exogenous: none

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.291503	0.0000
Test critical values:	1% level	-2.647120	
	5% level	-1.952910	
	10% level	-1.610011	

Dependency ratio:Exogenous: none

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.291503	0.0000
Test critical values:	1% level	-2.647120	
	5% level	-1.952910	
	10% level	-1.610011	

Population:Exogenous: second difference, none

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.595768	0.0009
Test critical values:	1% level	-2.660720	
	5% level	-1.955020	
	10% level	-1.609070	

Population density: level.Exogenous: constant, linear trend

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.899648	0.0000
Test critical values:	1% level	-4.339330	
	5% level	-3.587527	
	10% level	-3.229230	

Source: manually on E-views

The average demand per year, average supply per year, total water withdrawal and dependency ration has a unit root at the first difference, $I(1)$. While, population has a unit root at the second difference, $I(2)$ and population density has a unit root constant and linear trend. Thus, the applicant could not apply the regression model and thus ordinary least square (OLS) method is inapplicable too. The applicant applies the autoregressive distributed lag model.

Autoregressive Distributed lag model (ARDL)

An Autoregressive Distributed lag model or ARDL model refers to a model with lags of both the dependent and explanatory variables. Thus our estimated ARDL equation is as follows:

$$D(\text{average demand per year}) = \beta_0 + \beta_1 D(\text{average supply per year}) + \beta_2 D(\text{total withdrawal per capita}) + \beta_3 D(\text{population}) + \beta_4 D(\text{population density}) - \beta_5(\text{average demand per year})(-1) + \beta_6(\text{average supply per year})(-1) + \beta_7(\text{total withdrawal per capita})(-1) + \beta_8(\text{population})(-1) + \beta_9(\text{population density}) + \epsilon_i$$

(2)

The applicant asserted that the differenced variable is used to model the change in a variable from one time period to the next which is used with lagged variables to model the short run:

$$\Delta y_t = y_t - y_{t-1} \quad (3)$$

In econometrics usually the long and short run are modelled differently. The long-run equilibrium is defined as when the variables have attained some steady-state values and are no longer changing. In the long-run we can ignore the lags as:

$$y_t = y_{t-1} = y_{t-2} = y^* \quad (4)$$

Thus, to obtain the long-run steady-state solution from any given model we need to remove all time subscripts including lags, set the error term equal to its expected value of 0, remove the differenced terms and arrange the equation so that all X and Y terms are on the same side. For example given the following model, we can use the previous rules to form a long-run steady-state solution:

$$\begin{aligned} \Delta y_t &= \alpha_0 + \alpha_1 \Delta x_t + \alpha_2 y_{t-1} + \alpha_3 x_{t-1} + u \\ 0 &= \alpha_0 + \alpha_2 y^* + \alpha_3 x^* \\ \alpha_2 y^* &= -\alpha_0 - \alpha_3 x^* \\ y^* &= -\frac{\alpha_0}{\alpha_2} - \frac{\alpha_3}{\alpha_2} x^* \end{aligned} \quad (5)$$

Estimation equation:

D (average demand per year) = - average supply per year (-1) - total water withdrawal per capita (-1) - population (-2) + population density + D (average supply per year) + D (total water withdrawal per capita) - D (population) - D (population density)
(6)

Table (7)

Variable	Coefficient	Prob.
SUPPLY(-1)	0.594730	0.0025
WITHDRAWAL(-1)	-0.031102	0.0229
POPULATION(-2)	-0.296623	0.1700
DENSITY	0.358145	0.0948
DEMAND(-1)	-0.253317	0.0211
D(SUPPLY)	3.329994	0.0000
D(WITHDRAWAL)	0.009703	0.5718
D(POPULATION)	-0.431236	0.8993
D(DENSITY)	-0.172647	0.3100
R-squared	0.768244	
Adjusted R-squared	0.675541	
S.E. of regression	1.472905	
Sum squared residuals	43.38899	

Mean dependent variance	0.437931
S.D. dependent variance	2.585801
Durbin-Watson stat	1.576170

Source: manually on E-views

The general form of the autoregressive distributed lag (ARDL) form estimated from equation (1):

$$D(\text{demand}) = 0.594730 * \text{supply}(-1) - 0.031102 * \text{withdrawal}(-1) - 0.296623 * \text{population}(-2) + 0.358145 \text{ density} - 0.253317 \text{demand}(-1) + 3.329994 * D(\text{supply}) + 0.009703 * D(\text{withdrawal}) - 0.431236 * D(\text{population}) - 0.172647 * D(\text{density}) \quad (7)$$

By omitting the difference variables from the equation;

$$0 = 0.594730 * \text{supply}(-1) - 0.031102 * \text{withdrawal}(-1) - 0.296623 * \text{population}(-2) + 0.358145 \text{ density} - 0.253317 \text{demand}(-1) \quad (8)$$

Hence,

$$0.253317 \text{demand}(-1) = 0.594730 * \text{supply}(-1) - 0.031102 * \text{withdrawal}(-1) - 0.296623 * \text{population}(-2) + 0.358145 \text{ density} \quad (9)$$

Therefore,

$$\text{Demand}(-1) = [1/0.253317][0.594730 * \text{supply}(-1) - 0.031102 * \text{withdrawal}(-1) - 0.296623 * \text{population}(-2) + 0.358145 \text{ density}] \quad (10)$$

This is the long-run steady state trend. There are three significant explanatory variables at the five per cent level or lower. Moreover, the diagnostic tests do not suggest any particular problems with the specification. Indeed, the restrictions of the short and long-run homogeneity imply that the short and long-run elasticity sum to zero.

Price of Water

The price of any good is determined by the fundamentals of delivery and distribution of this good among its users. In any market, buyers and sellers of a particular good interact together and hence the price of the good is determined that will be affected by the supply and demand factors and thus shift either up or down according to the change of supply and demand. In order for the prices and quantities traded in the market to be efficient there should be suitable level of competition, few externalities and reasonable property rights. This is how an efficient market for a particular good should work.

In a narrow sense, the price of water is defined as the price that the users of water are willing to pay for a given volume of water delivered to them per unit of time. This definition of water applies to the users (customers) that get the water from third party, for example businesses or homeowners that are supplied through the public utility of water and farmers that pay for the water they received from centralized irrigation systems. On

the other hand, there are other kinds of users, self-providers, that cover the majority of the worldwide freshwater withdrawal, such as rural homeowners and individual farmers that use the water wells, the industrial facilities that divert water from surface streams or use their own water wells or power plant that withdraw water from reservoirs of surface water and huge agricultural corporations. Neither of the two groups of users, customers and self-providers, pays the water real price, which should be theoretically equal to the real value of water.

The pricing of water gives us an important insight into the implication of the equity and efficiency of water usage and thus introduces the concept of investment in water supply systems which include:

- 1- Investments required in the existing systems in order to increase the capacity of the system.
- 2- Investments required for the expansion of the existing system.
- 3- Investments required for the protection of existing water supplies.
- 4- Investments required for shifting from one source of water supply to another source.

The costs of today investments will have its benefits in terms of future consumption values.

Water Transfer

The Model that will be developed in the second stage of the model in this paper follows the same methodology of D .Marc Kilgour and Ariel Dinar (1999). The model developed by Kilgour and Dinar is based on the idea of utilizing the water of the river by transferring it between countries within the river basin. To state differently, it allows the downstream countries that are in need for water to get it from an upstream country by compensating that country for less water available for usage .They introduce two important concepts in their paper to guarantee efficient optimal allocation that the applicant will be following . First, The Flexible Water Allocation Rule which is a new approach that offers a better economic understanding of the allocation process of the total river water flows which make the development of principles guaranteeing efficient Pareto-optimal allocation possible .Second, the concept of The Efficient Schedules, which is a formula that produces efficient allocation for every possible level of flow volumes.

A- Assumptions and Definitions

We characterize each country according to:

- 1- Water contribution parentage to the Nile River.
- 2- Position on the Nile river basin (an upstream or downstream country).
- 3- The country's need for water, which is its demand for water.

The water demand function for country j is denoted by:

$$P_j = f_j(q_j) \quad (10)$$

Where p_j is country j water demand prices, while q_j is country j water consumption amounts. Thus country j is consuming q_j units per year and it would buy extra units of water up to $p_j(q_j)$. so if consumption is already large, the extra water needed will be very small, but it will still be some positive value.

Q_j units per year denote country j water contribution to the Nile river basin. There are two scenario's for country j . either to consume $q_j = Q_j$ units per year, which means that there will be no transfer of water between countries as each country will consume all the water it contributes. Or, on the other hand, there will be countries, which consume less water than the amount it contributes to the Nile river basin, and others may be consuming more.

Country j position relative to the Nile river basin countries is of great importance, as each country's contribution is equal to its own contribution plus the flow contribution not consumed by upstream countries.

To complete the model of water sharing scheme between countries, we should state all transfers between countries other than water, for now we assume that there are only money transfers, thus beside the three components of an individual country (water demand, flow contribution, geography), each upstream country receives an amount x_j from its downstream country, which compensates upstream countries for less water usage.

One of the main goals of this model is to determine ways for sharing water that leads to maximizing welfare of countries involved. We assume that there are only two goods, water and money. So a country's total welfare is equal to its consumption surplus plus its net transfers (net money transfers, x_j). thus the total welfare is denoted by the following equation:

$$\text{Welfare} = \text{Consumption Surplus} + \text{Net Transfers}$$

$$= \int_0^{q_i} f_i(q) dq + X_i \quad (11)$$

We should differentiate between *source*, *non-source* and *outlet* country. A source country is the one from which the flow originates; the non-source country is the country where flow is received from one or more countries, while the outlet country is where the flow finally arrive without flowing anywhere else. A source country has the advantage of withdrawing water from the Nile river basin first.

B-Application: Two Countries Problem (Egypt and Ethiopia)

We assume that there are two countries, Egypt (downstream country) and Ethiopia (upstream country). The sharing process takes place when Ethiopia (upstream country) decides not to consume all its flow volume of water but instead pass some of it to Egypt (downstream country), and Egypt decides to compensate Ethiopia with a money transfer.

Let Q which represents a country water contribution to the Nile river basin; also denote the total flow of water from Ethiopia to Egypt. Thus, the amount of water consumed by Ethiopia denoted by q_u should satisfy

$$0 < q_u < Q$$

And the amount of water consumed by Egypt denoted by q_d , should satisfy

$$0 < q_d < Q - q_u$$

Thus Egypt (downstream country) consumption amounts are equal to:

$$Q_d = Q - q_u$$

So the consumption of Ethiopia (upstream country) is less than its contribution only when Egypt (downstream country) compensates Ethiopia for this amount through money transfers denoted by x .

So the consumption of both countries and the net transfers maximizes welfare somehow. So what is required is a function for $(q(Q), x(Q))$.

C- Water Consumption and Compensation Schedules

A schedule is used as a method for identifying the amount of water consumed and the money received by each country, a schedule is denoted as $S=(q, x)$. The main goal is to differentiate between schedules according to their favorability for each country and for the Nile basin countries as a group.

The welfare of any country is affected by its consumption of water (q) and its money transfers (x). For any schedule that offers a higher welfare level for a one country, it should offer a lower welfare level to the other. So the welfare of Ethiopia (upstream country) is given by

$$W_u(q_u, x) = \int_{q_u}^Q dq + x$$

And the welfare of Egypt (downstream country) is given by

$$W_d(q_d, x) = \int_{q_d}^Q dq - x$$

Thus $W_j(S)$ measures the well-being of j 's country, so country's j prefers schedule S' to schedule S'' if $W_j(S') > W_j(S'')$, and is indifferent between schedule S' and schedule S'' if $W_j(S') = W_j(S'')$. a schedule is efficient when the water has the same price in every country so as not to transfer water from countries with low price to countries with high price, for certain payments.

In order to identify the optimal schedule (q, x) that is needed for the compensation process, we need to determine who owns the water? We assume that the source state (Ethiopia, upstream country) owns the water and thus consumes its flow volume Q . we

assume as well that there are no money transfers from Egypt (downstream country) to Ethiopia (upstream country). Thus $(q, x) = (Q, 0)$ is the status quo schedule. The main goal is to identify the schedules that are preferred to both countries as the status quo schedule, so we need to identify all schedules (q, x) that satisfy $W_u(q, x) \geq W_u(Q, 0)$ and also the schedules where $W_d(q, x) \geq W_d(Q, 0)$. the schedule that satisfy these conditions are preferred by both countries.

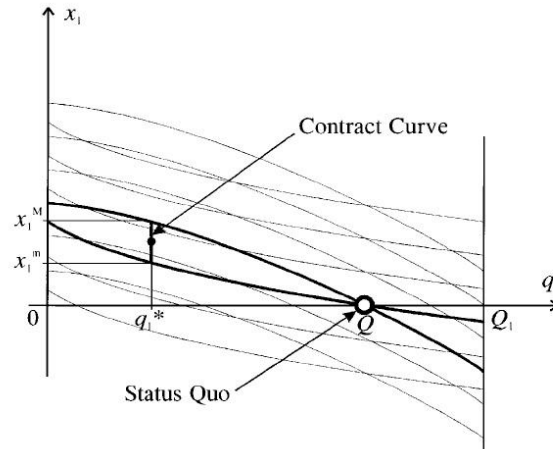


Figure (7): status quo

Figure 7 shows the indifference curves for both countries (upstream and downstream). Upstream country prefers the higher indifference curves while downstream countries prefers lower indifference curves, which implies that the schedule that is preferred by both countries to the status quo lies above upward country indifference curve and below downward country indifference curve. So the efficient consumption of water satisfy $q_1 = q_1^*$, which is the maximum separation between the indifference curves, it is called Contract Curve. So we could argue that the efficient schedule is characterized by the maximum separation of the primary indifference curves.

4-Policy recommendations

The NBI should actively collaborate with the African Union in general and New Partnerships for Africa's Development (NEPAD) so as to get some support and vibrant recognition. It should be noted that the goals of NEPAD conquer well with those of the NBI.

Due to the deficiency of local traditional knowledge in the overall planning of the NBI, we recommend that the NBI should consider incorporating indigenous knowledge which represent the long-standing traditions and practices of the Nile. It should be noted that the Nile basin has got a complex cultural diversity, which could be useful for integrated water resource management in combination with the scientific approach being agitated by the NBI.

Since one of the projects of NBI is building dams to generate electric power , it can be

feared that these projects could have devastating impacts on the environment, national security and the structural distribution of the nearby societies. So, we recommend that the NBI should seek to harmonize within the World Commission on Dams so that it can adopt proper guidelines for the construction of dams along the Nile. This will be vital in protecting dam-affected people and the environment, and to ensure that the benefits from dams are more equitably distributed.

Due to the fact that population pressure is one of the driving forces leading to environmental degradation in the Nile basin, we recommend that NBI should have a separate project focus on population control within the basin states.

To increase a sense of belonging, level of participation and ownership of the NBI projects, we recommend that “handouts” in terms of donations from the core funding institutions should be limited. Therefore, the Nile basin countries should try to build the capacity for soliciting their own funds for the NBI. This money could be got *inter alia* by reducing public expenditure, curbing corruptions.

Given the complex of the project, we recommend that the NBI should come up with a strong multi-disciplinary monitoring and evaluation team to following up all implemented projects. This team should be well equipped with modern techniques ranging from Geographical Information Systems (GIS) among others. We also recommend that the NBI should carry participatory land use planning in communities located near the river putting much consideration on land capability and suitability.

NBI should also carry out a livelihood analysis especially in communities along the Nile so as to come up with poverty eradication projects which are socially acceptable, applicable, economically viable and affordable. These will improve the welfare of the majority of the people at household level and this will act as an incentive towards sustainable utilization of the Nile basin resources.

Rather than building capacity in only scientific skills with regards Nile water resource management, we also recommend that the local knowledge base and management skills of the same should also be upgraded so as to have a strong foundation for integrated water resource management.

Since the NBI promote efficient use of the Nile water through proper irrigation methods, we recommend that the NBI should take caution about the salinization problem that may arise thus leading to soil degradation and consequently poor agricultural yields. In addition, NBI should educate communities on how to use less agriculture inputs especially nitrogen and phosphate fertilizers that can cause water pollution.

NBI riparian countries should obtain a socioeconomic sustainability plan adopting the development corridors application to make the best use of the natural resources and climate diversity.

NBI Governments should exercise substantial rationalization and control of the water usage. Optimizing the use of the available water resources through carrying out improvements to save 10 billion cubic meters annually of the wasted water in AKOBA – ETHIOPIA). Jonglei canal is considered an important integration project between Egypt and Sudan with the objective to get of 4.7 billion cubic meters of the Nile water annually to be shared between Egypt and Sudan. To develop 104 modern irrigation facilities. The Jonglei canal project is expected to satisfy the high demand of water in Egypt and Sudan.

NBI riparian countries should adopt an electric power generation network to make the best use of the river resources.

NBI riparian countries need to apply new irrigation methods to suit the diversification of cropping patterns to minimize water losses.

Implement demand management measures such as improving extension policies, public awareness, pricing and regulate measures that improve efficiency and conserve water resources.

Small-scale agriculture improvements could be a solution to the water stress that includes the harvest of water in shallow wells, the use of pumps, drip irrigation for crops and other technological innovations.

Improve water storage capacity.

5. Conclusions

In this paper, we conclude that the Nile basin Initiative represents the most comprehensive and complex management plan ever attempted for sustainable development of an international trans-boundary river. The NBI tries to deal with all potential problems occurring at people-environment and development interface in the Nile basin through a multi-disciplinary, socio-cultural, economic, political and geographical environment, which is an important attribute of achieving sustainable development as well as the Millennium Development Goals. We also conclude that the various projects, which are being implemented by the NBI, reflect a “joint commitment and obligation” of the Nile basin states.

We also conclude that NBI is a paramount regional partnership as regards trans-boundary river basin management. This joint venture among the Nile basin states has created a “regional environmental-development interface think-tank” which is a vital mechanism for paving way to greater integrated water resource management that could result into mutual benefit of sustainable development to all without discrimination. This has been done through regional, economy, and knowledge integration.

NBI has challenges, weakness and threats as it can be clearly noticed in the SWOT analysis. We recommend that the NBI should capitalize on its strengths and opportunities to work out the challenges it faces.

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Appendix

Year	Average Demand Per Year ³³	Average supply per year ³⁴	Total water withdrawal per capita ³⁵	Dependency ratio ³⁶	population ³⁷	Population density ³⁸
1978	57.20	61.025	830.9	96.80	42.000	46.69
1979	57.20	61.025	830.9	96.80	43.000	46.69
1980	57.20	61.025	830.9	96.80	44.433	46.69
1981	57.20	61.025	830.9	96.80	45.565	46.69
1982	57.20	61.025	830.9	96.80	46.755	46.69
1983	57.20	61.025	830.9	96.80	48.001	53.44
1984	57.20	61.025	830.9	96.80	49.302	53.44
1985	57.20	61.025	830.9	96.80	50.655	53.44
1986	57.20	61.025	830.9	96.80	52.063	53.44
1987	57.20	61.025	830.9	96.80	53.516	53.44
1988	57.20	61.025	830.9	96.80	54.981	60.22

³³ COMPUTED MANAUALLY

³⁴ COMPUTED MANAUALLY

³⁵ AQUA STAT (Food and Agriculture organization)

³⁶ AQUA STAT (Food and Agriculture organization)

³⁷ CAPMAS

³⁸ AQUA STAT (Food and Agriculture organization)

1989	57.20	61.025	830.9	96.80	56.415	60.22
1990	57.20	61.025	830.9	96.80	57.785	60.22
1991	57.20	61.025	830.9	96.80	59.078	60.22
1992	57.20	61.025	830.9	96.80	60.305	60.22
1993	57.20	61.025	830.9	96.80	61.489	66.22
1994	57.20	61.025	830.9	96.80	62.664	66.22
1995	57.20	61.025	830.9	96.80	63.858	66.22
1996	57.20	61.025	830.9	96.80	65.076	66.22
1997	57.20	61.025	830.9	96.80	66.313	66.22
1998	70.40	63.871	830.9	96.86	67.573	72.79
1999	70.40	63.871	830.9	96.86	68.860	72.79
2000	70.40	63.871	830.9	96.86	70.174	72.79
2001	70.40	63.871	830.9	96.86	71.518	72.79
2002	70.40	63.871	937.0	96.86	72.894	72.79
2003	66.40	64.231	937.0	96.86	74.296	79.95

2004	66.90	64.631	937.0	96.86	75.718	79.95
2005	67.55	64.931	937.0	96.86	77.154	79.95
2006	68.40	65.231	937.0	96.86	78.602	79.95
2007	69.05	65.531	937.0	96.86	80.061	79.95
2008	69.90	67.831	937.0	96.86	81.572	79.95

New Indicators for the Impact of Globalization on Gender Work Equality

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Abstract: *One of the controversial issues associated with Globalization is its effects on the gaps between countries and inequalities within countries, especially developing countries. These inequalities within countries can have different forms. They are represented for example in gender inequality and income inequality.*

In this paper the researcher will focus on the inequality at work between genders, as gender equality at work is becoming an important issue for improving the work environment, productivity and economic growth. In order to study the impact of globalization on gender equal opportunity at work, two indicators are introduced and a random survey study of 2021 person was conducted among men and women working in different national and international companies in Egypt.

The two indicators introduced are Personal Globalization Indicator (PGI) and Work Equal Opportunity Indicator (WEOI), in order to measure the impact of globalization on the gender work equal opportunity. The need for the survey study is due to the inexistence of published data. The survey study is presented together with a comprehensive statistical and graphical analysis of the results.

The results of a regression model shows that there is a weak positive correlation between the two indicators in Egypt and this is normal as equality is also affected by other social factors and values in Egypt, like cultural and religious beliefs which promote gender equality. In recent history, women in Egypt have participated in the work force for decades. Egyptian laws and regulations increasingly encourage women's work, and women's income contributes to the families' welfare.

Key words: Personal Globalization Indicator (PGI), Globalization, Work Equal Opportunity Indicator (WEOI), and Gender Equality.

1. INTRODUCTION

Arguments are made that openness to trade lead to growth and increase of Foreign Direct

Investments (FDI). In theory Globalization and trade lead to growth and reducing the economic and social gap between countries. However there has been evidence in recent years that the gap has increased in some poorer countries. Similar arguments are found in the literatures for the inequality within a country as well as for the gender inequality.

In recent years researches were conducted and measures were developed by different international organizations, notably the United Nations Development Programme (UNDP) in order to measure women development, participation and equality between men and women. The UNDP for example developed the Gender Development Index (GDI), Gender Empowerment Measure (GEM), Gender Gap Index (GGI) and Gender Inequality Index (GII).

In spite of the importance of these indices, none of them measures the equal opportunities available for men and women at work. The importance of the gender equal opportunities at work is that on the micro economic level equal opportunities at work improves the work environment between the organization members and makes the workers more satisfied, and helps in improving productivity. On the macro economic level, gender inequality at work reduces economic growth.

Two indicators are presented in this research to evaluate the impact of globalization on gender equal opportunity, the Personal Globalization Indicator (PGI) and Work Equal Opportunity Indicator (WEOI). In the Personal Globalization Indicator (PGI) the researcher defines different levels for personal engagement in Globalization. The indicator is applied to the responses to a questionnaire. Based on their responses to the questionnaire, each respondent is given a level indicating the person's level of engagement in Globalization. The higher levels of Personal Globalization Indicator (PGI), indicates more engagement in Globalization.

The Work Equal Opportunity Indicator (WEOI) is based upon several variables related to equal gender opportunity at work. Weights were assigned to the different responses and

Based on the data collected from the survey study, correlation analyses have been conducted. A questionnaire was designed and included questions on education, experience, employment, income, and equality, and respondents were from a wide range of local and international companies.

In this paper the researcher conducted a pilot study on 400 respondents to verify the validity and reliability of the questionnaire and subsequently conducted a random survey for 2021 person among men and women in Egypt. The large sample used of 2021 is larger than the size of sample which achieves a 95% confidence level. This size has been selected in order to achieve a higher confidence level in the results for the diversified range of questions and to obtain better agreement between the sample and population.

The need for the survey study was due to the inexistence of published data that examines the gap between men and women in work equal opportunities in Egypt.

2. METHODOLOGY

Two new indicators are introduced to measure personal engagement in globalization (PGI) and Work Equal Opportunity (WEOI). A questionnaire was developed to examine the components of these indicators and weights were assigned to every response.

The questionnaire covered a wide range of questions related to development and work environment in national, international and mixed companies. The questionnaire included items on education, experience, employment, income, and equality and attracted responses from working women and men of different backgrounds covering all the spectrum of working force.

A pilot study was conducted for a sample size of 400 respondents. This is slightly larger than the sample size for large population to achieve 95% confidence. The data collected from this pilot sample were analyzed using SPSS program to examine the Reliability and the Validity of the questionnaire and each of the two indicators introduced in this study.

Subsequently, a larger sample of data from 2021 respondents have been collected and analyzed. This size has been selected in order to cover the wide variations in the population and to achieve a higher confidence level in the responses to the different questions and hence obtain better agreement between the sample and population.

A regression model is introduced to test the impact of engagement in globalization on work equal opportunity.

3. CONSTRUCTING THE PERSONAL GLOBALIZATION INDEX (PGI) AND THE WORK EQUAL OPPORTUNITY INDEX (WEOI).

The objective of developing the indicators is to study the impact of engagement in globalization as indicated by the Personal Globalization Indicator (PGI) on the gender equality at work as indicated by the Work Equal Opportunity Indicator (WEOI). Both of these indicators have been introduced for the purpose of this research.

3.1 The Personal Globalization Indicator (PGI)

The Personal Globalization Indicator (PGI) indicates the level of engagement of each respondent in Globalization is based on a group of variables related to globalization as shown in table 1 in the appendix.

The pilot sample used to test the reliability and validity showed that the reliability towards the Personal Globalization Indicator (PGI) is 80.5% and the validity test showed that the data is valid. The test indicates the significance of the relation between the "PGI" and each of the variables.

Weights are assigned for each type of response and these are added in order to determine

the person's level of engagement in Globalization. The higher levels indicate more engagement in Globalization. For the large sample of 2021 persons, the respondent's levels are found to lay between 0 and 25, with the statistical mean of 13.9.

Two levels of personal engagement in globalization were considered, where the level from 0 to 14 is ranked as low level of Globalization engagement, while the level from 14.1 to 25 is ranked as high level of Globalization engagement. 50.5% of the respondent's are found to be in the lower level of Globalization and 49.5% of the respondent's are found to be in the higher level of Globalization.

Female engagement in the low level of Globalization is found to be higher than male, 28.1% and 22.5% respectively. On the other hand, male engagement in high level of Globalization is higher than female 28.9% and 20.6% respectively. The female represents approximately 55% in low Globalization of the sample, while in high Globalization level represents approximately 42%.

3.2 The Work Equal Opportunity Indicator (WEOI)

The Work Equal Opportunity Indicator (WEOI) is introduced to measure the gender level of equality at work. The pilot sample test of reliability and validity of the Work Equal Opportunity Indicator showed that the reliability towards the Work Equal Opportunity Indicator (WEOI) is 93.5%. Also the validity test showed that the data is valid which means the significance of the relation between the "WEOI" and each of the variables.

Seven of the questions in the questionnaire are directed towards measuring the gender equal opportunity in different areas of work. Weights are assigned to each question and the responses evaluated. The variables used and the weights assigned for each of these variables are shown in table 2 in the appendix. Each weights for each response are added together in order to determine the person's assessment of equality at work.

The respondent's levels are found to lay between 0 and 28, with a statistical mean of 21.31. The level below the mean (i.e. from 0 to 20) is considered to indicate that "women and men don't have equal opportunity at work ", while the level above the mean (i.e. from 21 to 28) is considered to indicate that "women and men have equal opportunity at work". Based on this, it is found that 34.5% of all responses indicate that women and men don't have equal opportunity at work, while 65.5% indicate that women and men have equal opportunity at work. It is interesting to note here that the analysis showed that female and male respondents who agreed that there is equality at work have a similar percentage of 32.2% and 33.3% respectively.

The effect of Globalization level as indicated by PGI on the WEOI is examined.

4. THE REGRESSION MODEL

Regression Models for the Relationship between the Personal Globalization Indicator (PGI) and Work Equal Opportunity Indicator (WEOI):

The random sample included respondents working in a wide range of local and international companies. Table 1 shows the classification of the different type of companies according to their degree of engagement in Globalization as defined in this research paper.

The following two regression models are for the relationship between the Personal Globalization Indicator (PGI) and the Work Equal Opportunity Indicator (WEOI) for both the full sample and for the sample companies engaged in Globalization.

a. Regression Model for All Respondents in the Sample.

In order to measure the degree of the relationship between the Personal Globalization Indicator (PGI) and the Work Equal Opportunity Indicator (WEOI), a regression and model is developed.

The model assumes that there is a relation between the two variables, where the Personal Globalization Indicator PGI represents the independent variable, X and the Work Equal Opportunity Indicator represents the dependant variable, Y.

Determining the Simple Linear Regression Model

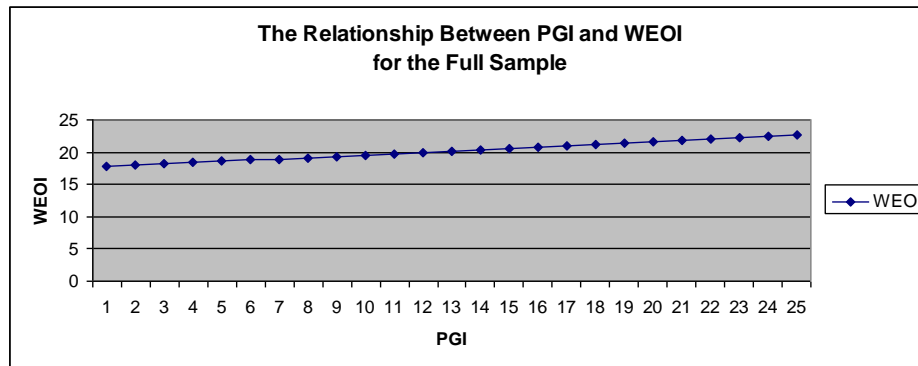
The objective of the linear regression model presented in the following discussion is to show the relationship and correlation between these two variables PGI and WEOI. Table 3 in the appendix shows the descriptive statistics for the collected data from the questionnaire.

The regression model takes the form:

$$\text{WEOI} = 17.548 + 0.269 \text{ PGI}$$

The positive value of coefficient of the Personal Globalization Indicator indicates a direct relationship i.e. when the PGI increases, so does the WEOI, as shown in the diagram below.

Figure 1



Correlation Analysis:

Table 4 shows that the relationship between the two variables is significant. To examine the strength of the relationship, Pearsonian Product-Moment Correlation Coefficient is used. The correlation between the two variables is shown in the same table and discussed below.

The Correlation Coefficient can take on any value between $-1 \leq r \leq 1$. The value 1 indicates a perfect positive relationship. In table 4 the Correlation Coefficient is 0.201 which is weaker on the scale from 0 to 1.

The value of Coefficient of Determination R^2 for this analysis is shown in the "Model Summery" table 7 in the appendix to be equal to 0.04. This means that 0.04 of the change in WEOI is explained by the change in Globalization as indicated by PGI. The small value of R^2 for the relation between PGI and WEOI indicates that equality in Egypt is affected by cultural and values of religious beliefs which promote equality between genders. In recent history, women in Egypt have participated in the work force for decades. Egyptian laws and regulations increasingly encourage women's work, and women's income contributes to the welfare of their families.

Analysis of Variance (ANOVA) Test of Significance for the Regression:

The ANOVA procedure measures the amount of variation in the model. Table 5 in the appendix shows the results of the SPSS.

In order to examine the relationship a hypothesis testing is carried out. The null hypothesis assumes that there is no relationship between the Personal Globalization Indicator (PGI) and the Work Equal Opportunity Indicator (WEOI). This means that μ equal to zero. The alternative hypothesis assumes that there is a relationship between the Personal Globalization Indicator (PGI) and the Work Equal Opportunity Indicator (WEOI).

The null hypothesis: $H_0: \mu = 0$ No relationship between PGI and WEOI.
and,

Alternative hypothesis: $H_A: \mu \neq 0$, there is a relationship

The value of α is selected at 5% to test the hypothesis that $\mu = 0$. Then $F_{0.005, 1, 2019} = 3.84$ produces a decision rule stating that we should reject the null hypothesis since the F-value 84.6 exceeds 3.84.

Therefore, we can conclude with 95% confidence that the Personal Globalization Indicator (PGI) has a relationship with the Work Equal Opportunity Indicator (WEOI).

Test for the Population Parameters for the PGI and WEOI:

Our statistical sample results suggest that there is a relationship between the (PGI) and (WEOI). This relationship is indicated by the non zero value for the Regression (slope) Coefficient of $b_1 = 0.269$ and the Correlation Coefficient of $r = 0.201$.

A t-test is used to examine if the relationship found for the statistical sample, applies also to the population. To examine the relationship between the two variables the following test of hypothesis has been conducted.

Null hypothesis $H_0: \beta_1 = 0$ No relationship between PGI and WEOI
and, Alternative hypothesis: $H_A: \beta_1 \neq 0$ There is a relationship

Table 6 in the appendix represents the coefficients of the parameters, the t- test, and the test of significance.

Alpha value of 5% is chosen and therefore from the t-distribution tables $t_{0.05, 2020} = \pm 1.96$.

Since the calculated value in table 6, $t_{\text{test}} = 9.201$, the null hypothesis that $\beta_1 = 0$ is rejected. Therefore we can conclude with 95% confidence that a relationship exist between PGI and WEOI.

Also, the value of the significance $p = 0.000$ shows that there is a significant relationship between the population and the sample.

Similar argument can be made for the constant. The table shows that the t- test = 39.897 and the significance is equal to .000 (i.e. less than .005 and is rounded off).

b. Regression Model for Respondents in Companies Engaged in Globalization:

For more detailed analysis the researcher selected the 622 respondents working in companies engaged in globalization. For example, respondents working in Egyptian Companies Franchisers, Agents, and Licensees, Egyptian Companies with branches

abroad or extensive exports, Foreign Companies Associated with Egyptian Partners, and Foreign Companies which have branches in Egypt.

The following analysis is conducted in order to examine the relationship between the Personal Globalization Indicator (PGI) and the Work Equal Opportunity Indicator for the companies engaged in Globalization (WEOI_G). The subscript (G) denotes companies engaged in globalization.

Determining the Simple Linear Regression Model

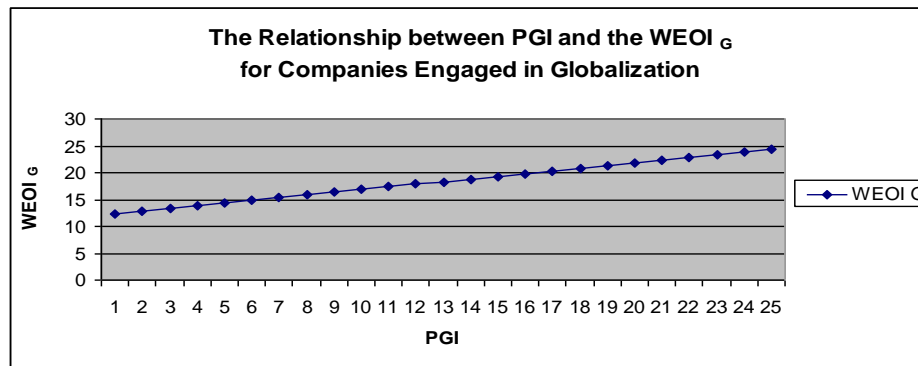
The objective of this regression model is to show the relationship and correlation between the two indicators. Table 8 in the appendix shows the descriptive statistics of the collected data from the questionnaire.

The regression model will take the form

$$\text{WEOI}_G = 11.763 + 0.505 \text{ PGI}$$

The positive value of the coefficient of PGI indicates a direct relationship which means that as the PGI increase, the WEOI_G for companies engaged in Globalization increases as represented in the following figure.

Figure 2



To examine the strength of the relationship between PGI and WEOI_G for companies engaged in Globalization, the Pearsonian product-moment correlation coefficient is used as shown in table 9 in the appendix. The correlation between the two variables is shown in the same table and discussed below. Also, the table shows that the relationship between the two variables is significant.

Correlation Analysis:

In table 9 in the appendix the correlation coefficient is shown to be 0.316 on the scale from 0 to 1 which is better than the correlation coefficient of 0.201 for the whole sample.

The value of R^2 for this analysis is shown in the "Model Summery" table 12 in the appendix. From the table, R^2 is equal to 0.1. This means that 0.1 of the changes in the $WEOI_G$ for companies engaged in Globalization are explained by the change in Globalization. This indicates that the increase in equality due to Globalization is limited.

Analysis of Variance (ANOVA) Test of Significance for the Regression:

The ANOVA procedure measures the amount of variation in the model. Table 10 in the appendix shows the results of the SPSS analysis.

The value of α is selected at 5 percent to test the hypothesis that $\mu = 0$. The tabulated value of $F_{0.005, 620} = 3.84$ produces a decision rule stating that we should reject the null hypothesis since the F-value 68.701 computed above exceeds the tabulated value of 3.84. This means that we can conclude with 95% confidence that the Personal Globalization Indicator (PGI) has a relationship with the Work Equal Opportunity Indicator for companies engaged in Globalization ($WEOI_G$).

Test of the Population Parameters for the PGI and $WEOI_G$ for Companies Engaged in Globalization:

Our statistical sample results suggest that there is relationship between the (PGI) and ($WEOI_G$) for companies engaged in Globalization. This relationship is indicated by the non zero value for the regression (slope) coefficient of $PGI = 0.505$ and the correlation coefficient of $r = 0.316$.

The test of hypothesis for companies engaged in Globalization is

The null hypothesis $H_0: \beta_1 = 0$ no relationship between (PGI) and ($WEOI_G$)

And,

The alternative hypothesis $H_A: \beta_1 \neq 0$ there is a relationship.

Table 11 in the appendix shows the coefficients of the parameters, the t- test, and the test of significance.

Alpha value of 5% is chosen and therefore from the t-distribution tables $t_{0.05, 621} = \pm 1.96$.

The null hypothesis that $\beta_1 = 0$ is rejected, since the calculated value in the above table for t-test = 8.289. Therefore we can conclude with 95% confidence that a relationship

exist between PGI and $WEOI_G$ for companies engaged in Globalization. Also, the value of the significance $p = 0.000$ shows that there is a significant relationship between the population and the sample.

Similar argument can be made for the constant. The table shows that the t -test = 9.884 and the significance is equal to .000 (i.e. less than .005 and is rounded off).

5. Conclusion and Recommendation

Two new indicators are introduced in this study, the Personal Globalization Indicator (PGI) which indicates the level of engagement of each respondent in Globalization, and Work Equal Opportunity Indicator (WEOI) which measures the gender level of equality at work.

The two indicators showed that the relation is significant at 95% and applies for the full sample of all companies and also for a sample for the companies engaged in Globalization. ANOVA testing shows that there are significant relation between the samples and the population in both cases. Also, the relationship is a positive.

In general however, the Coefficient of Determination of 0.1 for Companies engaged in Globalization and that of 0.04 for all Companies; indicate that the increase in gender work equal opportunity due to Globalization is limited. This result can be expected in Egyptian society as equality has been generally accepted for decades as part of the Egyptian culture and has been present in the working environment before Globalization.

However, with a 25 – 30% inequality at work the results call for re-education and law enforcement. It is essential to note here that for the purposes of this research, the measured variables are related to work equal opportunity only.

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Appendix

Table 1: Personal Globalization Indicator (PGI) Variables

	Variable	Content	Weight	Validity and Reliability Test	
				Alpha	Spearman's Sig. (2- tailed)
1	Company Type	No Work	0	0.8057	.000
		Public company	1		
		Private company	2		
		International	3		
2	Company Classification in relation to Globalization	No Work	0	0.8036	.000
		Local Companies	1		
		Egyptian Companies Franchisers, Agents, and Licensees	2		
		Egyptian Companies with branches abroad or extensive exports	3		
		Foreign Companies Associated with Egyptian Partners	4		
		Foreign Companies which have branches in Egypt.	5		
3	Classification of the respondent's job	No Work	0	0.79	.000
		Local Jobs	1		
		Partially Created Jobs Due to Globalization	2		
		Created Jobs Due to Globalization	3		
4	Branches Abroad	No	1	0.7976	.000
		Yes	2		
5	Use of computers at work	No	0	0.7906	.000
		Yes	1		
6	Use of computer per week	Don't use the computer	0	0.7733	.000
		Once	1		
		2-4	2		
		4-6	3		
		More than 6	4		
7	Use of the internet	No	0	0.7844	.000
		Yes	1		
8	Use of the internet per week	Don't use the internet	0	0.7592	.000
		Once	1		
		2-4	2		
		4-6	3		
		More than 6	4		
9	Use of internet for entertainment, work or both	Don't use the internet	0	0.7594	.000
		entertainment	1		
		work	2		
		both	3		
10	Having internet at home	No	0	0.7939	.000
		Yes	1		
11	Use of the mobile phone	No	0	0.8069	.000
		Yes	1		

Alpha Cronback = 0.8050

Table 2: Work Equal Opportunity Indicator (WEOI) Variables

Variable		Response	Weight	Validity and Reliability Test	
				Alpha	Spearman's Sig. (2- tailed)
Do men and women in your line of work have equal opportunities in the:	a- Selection & Employment	Yes	4	.9327	.000
		Often	3		
		Some times	2		
		No	1		
	b-Work Assignments	Yes	4	.9331	.000
		Often	3		
		Some times	2		
		No	1		
	c- Training	Yes	4	.9240	.000
		Often	3		
		Some times	2		
		No	1		
	d- Evaluation	Yes	4	.9211	.000
		Often	3		
		Some times	2		
		No	1		
	e- Salaries	Yes	4	.9203	.000
		Often	3		
		Some times	2		
		No	1		
	f- Incentives	Yes	4	.9223	.000
		Often	3		
		Some times	2		
		No	1		
	g- Promotion	Yes	4	.9208	.000
		Often	3		
		Some times	2		
		No	1		

Alpha Cronback = 0.9350

Table 3: Descriptive Statistics for PGI and WEOI

	Mean	Std. Deviation	N
WEOI	21.3127	7.40820	2021
PGI	13.9703	5.51533	2021

Table 4: Correlations between PGI and WEOI

		WEOI	PGI
Pearson Correlation	WEOI	1.000	0.201
	PGI	0.201	1.000
Sig. (1-tailed)	WEOI		0.000
	PGI	0.000	
N	WEOI	2021	2021
	PGI	2021	2021

Table 5: ANOVA ^b Test for PGI and WEOI Model

Model	Sum of Squares	df	Mean Square	F	Sig
Regression	4461.241	1	4461.241	84.655	.000a
Residual	106399.1	2019	52.699		
Total	110860.4	2020			

a. Predictors (constant), PGI.

b. Dependent Variable: WEOI.

Table 6: Coefficients ^a of PGI and WEOI

Model	Un-standardized Coefficients		Standardized Coefficients	t	Sig
	B	Std. Error	Beta		
(Constant)	17.548	.440		39.897	.000
PGI	.269	.029	.201	9.201	.000

a. Dependent Variable: WEOI.

Table 7: Model Summary ^b

R	R Square	Std. error of the Estimate
0.201 ^a	0.04	7.25940

a. Predictors (constant), PGI.

b. Dependent Variable: WEOI.

Table 8: Descriptive Statistics for PGI and WEOI_G

	Mean	Std. Deviation	N
WEOI _G	21.3810	6.93966	622
PGI	19.0466	4.34051	622

Table 9: Correlation between PGI and WEOI_G

		WEOI _G	PGI
Pearson Correlation	WEOI _G	1.000	0.316
	PGI	0.316	1.000
Sig. (1-tailed)	WEOI _G		0.000
	PGI	0.000	
N	WEOI _G	622	622
	PGI	622	622

Table 10: ANOVA ^b Test for PGI and WEOIG Model

Model	Sum of Squares	df	Mean Square	F	Sig
Regression	2983.327	1	2983.327	68.701	.000 ^a
Residual	26923.369	620	43.425		
Total	29906.696	621			

a. Predictors (constant), PGI.

b. Dependent Variable: WEOIG.

Table 11: Coefficients ^a of PGI and WEOIG

Model	Un-standardized Coeff.		Standardized Coeff.	t	Sig
	B	Std. Error	Beta		
(Constant)	11.763	1.190		9.884	.000
PGI	.505	.061	.316	8.289	.000

a. Dependent Variable: WEOIG.

Table 12: Model Summary ^b for PGI and WEOIG

R	R ²	Adjusted R ²	Std. error of the Estimate
0.316 ^a	0.100	0.098	6.58975

a. Predictors (constant), PGI.

b. Dependent Variable: WEOIG.

Do Subsidies increase poor access: The case of wheat in Egypt?

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Abstract: The agriculture sector in Egypt is one of the most important sectors affecting the level of economic well-being and performance. It accounts for 25% of labor force, 14% of GDP and 20% of exported goods (CAPMAS, 2010). Wheat is the major staple crop in the country consumed mainly as bread. It constitutes 33% of total winter crop area. Today, Egypt's annual per capita consumption of wheat is estimated to be 180 Kg which is almost double the international average (AFSA, 2010). In 2010, Egypt's average wheat imports were 9.8 million MT, making Egypt the world's largest importer of wheat. The government's main policy for wheat is to increase self-sufficiency ratio and encourage more local production. Although the government introduced a number of agricultural liberalization reforms in 1987, it still kept the wheat subsidization policies of 1962 in effect. However, this policy created several market distortions and failed to efficiently achieve its main goals. This paper uses a descriptive analysis to show the trends of production, consumption and the effects of wheat subsidies from year 2005 to 2010. The main goal is to examine the different policies that will secure the Egyptian sector from future shocks; and the possible ways to improve national policies to enhance self-sufficiency and access of the poor. The analysis concludes that subsidies, as being an important policy tool for advancing development and eliminating poverty in Egypt, should be maintained by only targeting the poor through effective measures that prevent any leakage. In addition, policies that increase rural farmers' local production and competitiveness need to be introduced to avoid any kind of future supply shocks.

Key words: Wheat, Egypt, Policy distortions, Subsidies and Competitiveness.

1. INTRODUCTION

Food security is a vital topic for development. It is a crucial step in achieving a number of Millennium Development Goals. It constitutes a major factor in combating poverty and hunger, in improving health conditions and in achieving environmental sustainability. According to the World Food Summit of 1996, food security was defined as a state when "all people" are physically and economically capable of accessing

“sufficient, safe (and) nutritious food (of their preference) to maintain a healthy and active life” (WHO). In a rapidly globalizing world, developing countries are struggling to improve their national agricultural sectors, where a high percentage of the population is employed, and meanwhile liberalizing their markets and allowing international competition. However, with the increasing threats of global warming and food shortages, developing countries as well as international organizations are re-examining the proper policies to achieving food security to the poor.

The above mentioned definition of food security sets out three criteria for its fulfillment; namely: availability, access and nutritional value. These criteria, under free trade theories, assume that countries that have surplus in major nutritional food staples would be willing to trade their surplus with developing countries that suffer from the shortage at affordable prices and at all times. In reality, there may be a number of problems in applying this strategy. International as well as national distribution of food patterns do not guarantee that major nutritional food staples go to the poorest and neediest people under market forces. Moreover, unprotected national agricultural sectors in developing countries lead to the further impoverishment of their rural communities whose main occupation is agriculture.

Historically, wheat has been the most important food staple in the world. Its nutritional value as a major inexpensive source of energy and protein makes it also the main food staple for the poor. Influenced by the world’s climate changes, the annual production of wheat has suffered fluctuations causing price instabilities that affected many countries around the globe. It was the poor who were most influenced by the price and quantity volatility in the international wheat market.

Egypt is the world’s biggest wheat importer, with 9.8 million metric tons according to the United States Department of Agriculture’s estimate’s for 2010. Egypt is also one of the countries with the highest per capita consumption of this food staple. This shows an alarming situation for the Egyptian consumer’s vulnerability to the changes in the international wheat market. Therefore, the Egyptian government committed to wheat subsidization policies that enhanced access of the poor. It also increased the local retail market price of wheat to international market levels to encourage local farmers to increase production and improve the country’s self-sufficiency ratio. Although local production increased substantially during the period of 1998 to 2004, the prevailing system was highly favorable to urban consumers while putting farmers and rural inhabitants at a great disadvantage (Nino, Krenz and Sidiik, 1998). Moreover, several leakages occurred that led to the inefficient allocation of factors of production and governments resources. Therefore this paper argues that in order to improve the country’s self-sufficiency ratio and improve national policies to improve access of the poor, more effective policy tools should be undertaken to ensure that subsidies reach those who deserve it. Moreover, subsidization of wheat inputs needs to be considered to encourage farmers to increase production.

This paper is divided into two chapters. Chapter one is an analysis of the current policies. It reviews the effects of reforms and trade liberalization on the wheat sector. Then it studies the outcomes of the current system on the creation of several distortions

affecting three main entities namely; the consumer, the farmer and the private sector. As for chapter two, it deals with the alternative possible solutions that affect both the consumer and the producer. Finally the paper concludes with the recommendations and policy reformulations that would better target the poor and encourage domestic production.

A glimpse on the Egyptian situation

The vulnerability of Egypt's condition comes from indigenous as well as exogenous factors. As mentioned earlier, Egypt is one of the highest countries in per capita consumption of wheat. This is attributed to a number of factors. First, the continuous increase in population and its impact on the increased demand for food. Second, the government subsidies of bread that makes its end price almost 66% lower than the market price, makes bread the ultimate cheapest source of protein and energy for the poor (Abdellatif, 2000). Third, the rising inflation in food prices especially in the last two years (CIA World Factbook), caused consumers to substitute other food products to subsidized bread. Also, due to the low prices of bread, peasants use it as feed for farm animals (Abdellatif, 2000). Finally, rural-urban migration increases the urban poor's demand for the subsidized bread.

As for the exogenous factors, they are extended to the fact that the Egyptian wheat market is highly dependent on wheat imports for domestic production and consumption as shown in table 1. During 1998 Egypt had to import more than 40% of the wheat consumed in the country (CAPMAS, 2001). Therefore, any fluctuations in international wheat prices affect the local market dramatically and cause supply shocks (Ibrahim, Ibrahim, 2003). This was evident when Russia, a major wheat exporter to Egypt, encountered droughts and fires during the year 2010. The Egyptian market was shaken as a result, and food security became a hot topic.

Alarming reports conveyed that the problem of the Russian wheat is not but an indication of the future instability in international wheat and grain production due to supply shortages, climate changes and growing demands in recipient countries. This led a number of exporting countries to issue restrictions or bans on exports to secure their national markets. As a result, the Egyptian government announced that it targets increasing local production over the next decade to improve the country's self-sufficiency ratio and achieve better food security situation especially to the highly vulnerable sectors of the society; the poor. In order to achieve the country's targets, an in depth analysis of the current policies and their effects on the levels of production and consumption in the wheat sector, need to be undertaken.

Table 1

TY Imports						
Country	2005/06	2006/07	2007/08	2008/09	2009/10- Dec	2009/10- Jan
Algeria	5,476	4,874	5,904	6,359	5,300	5,300
Bangladesh	234	1,731	1,555	2,882	2,600	2,600
Brazil	5,823	7,704	7,136	6,367	6,500	6,500
Egypt	7,771	7,300	7,700	9,900	8,300	8,800
EU-27	6,758	5,137	6,942	7,740	70	6,500
Indonesia	4,981	5,596	5,224	5,423	5,500	5,500
Iran	1,105	700	200	9,300	50	4,500
Iraq	4,996	2,912	3,424	3,868	3,800	3,800
Israel	1,663	1,458	1,186	260	2,100	2,100
Japan	5,469	5,747	5701	5,156	5,300	5,300
Korea South	3,884	3,439	392	3,371	3,700	3,700
Libya	1,722	994	1,567	1,677	1,650	1,650
Mexico	3,549	3,610	3,136	3,341	3,300	3,100
Morocco	2,418	1,801	4,191	3,759	1,800	1,800
Nigeria	3,678	3,265	2,677	3,550	3,500	3,500
Peru	1,644	1,367	1,452	1,385	1,500	1,500
Philippines	2,954	2,754	2,266	3,201	30	300
Sudan	1,659	1,323	160	1,712	1,500	1,500
Tunisia	1,263	1,433	2,372	1,772	1,500	1,500
Venezuela	1,691	1,765	1,492	1,500	1,525	1,525
Yemen	2,187	2,420	1861	2,786	2,300	2,300
Others	34,507	39,966	36,600	40,650	34,205	35,240
Subtotal	108,846	110,250	110,517	135,936	117,780	118,115
Unaccounted	2,684	1,952	2,918	384	2,979	2,534
United States	2,299	3,394	312	3,460	3,100	3,100
World Total	113,829	115,596	116,447	142,480	123,859	123,749

Source:USDA/2010

2. ASSESMENT OF CURRENT POLICIES

2.1 Wheat under the reform era 1987 – 1990

Egypt started introducing agricultural reforms since 1987. The Egyptian wheat and flour economy is roughly structured into two distinct subsectors; a private sector and a public sector. The private sector is only allowed to process imported wheat to produce unsubsidized bread and flour. The public sector however mainly processes local wheat to produce subsidized Baladi bread and flour. This division does not favor local Egyptian farmers since they lack access to the more profitable and competitive private market, and are only allowed to operate through official government channels (Nino, Krenz and Sidiik, 1998). On the other hand, this system hinders the potential of private mills to compete and make profit in a free and dynamic market.

2.2 Wheat under trade liberalization 1991 - present

The Egyptian agriculture system started to be partially liberalized since 1987 and continued to undergo more reforms during the following two decades. The government permitted increased competition within the sector and liberalized the fino flour by the beginning of 1992. Free markets were opened for the sale of fino flour and bread. In 1993 all the remaining restrictions on fino flour production and trading were removed. Restrictions over exchange and sales of bran and wheat prices were leased. Therefore, during the period of 1991 to 1996, both consumption and production of grain and flour imports increased. By the end of 1997, nine new private mills were allowed to operate alongside the already existing public mills (ibid, 2000). Also, the government offered farmers higher prices for their produced wheat.

These reforms had a number of significant advantages on local production. The wheat area plant was doubled and yields increased by 48%. Also wheat production almost tripled (Kherallah, Lofgren, Gruhm and Reefer, 2000). This rise in production during the period 1996 and 2000, led to a considerable improvement in wheat self-sufficiency ratio from 21% in 1986 to 47% in 1996.

However, higher demands endured and imports increased from 6 to 7 million tons per year. Also the gap between the imported wheat and domestic production grew between the periods 2007/2008 and 2009/2010 as shown in table 2. Moreover, the government continued its control and intervention in most of the exchange and sale activities in the sector. During the period between 1998 and 2004, the operating system was highly biased towards urban consumers and placed farmers and rural inhabitants at a great disadvantage. This in fact did not achieve the main aim of government's heavy subsidization of the sector, which was to secure the access of lower income consumers to a strategic good.

Table 1

Wheat	2007/2008	2008/2009	2009/2010
Production	8,275	7,883	7,864
Imports	8,310	8,320	8,325
Imports from US	2,404	2,350	2,360
Total Consumption	16,562	15,970	15,934

Source: USDA, Foreign Agricultural Service.

2.3 Distortions of current policies

The current policy adopted by the government has significant distortions that have huge impact on the consumer, the farmer and the private sector as follows:

For Consumers

As mentioned above, the government's main objective for bread subsidies was to provide affordable nutritional food staple to the poor as well as to protect them from international market price instabilities. Therefore, it kept the wheat market under state monopoly with regards to the Baladi bread, which is an 82 % extract of wheat and is considered to be the preference of the poor. (Abdellatif, Kherallah&Gruhn, 2000).

Accordingly, public mills became the main producers for Baladi subsidized bread. However, the government did not tailor specific distributional policies to target the poor. Therefore, a considerable percentage of the subsidies leaked to urban middle and upper class consumers.

For Farmers:

In an attempted plan to move towards self-sufficiency in local production of wheat, the government increased its reliance on locally produced wheat to cover its need for the production of Baladi bread. Therefore it increased the price at which it purchased wheat from local farmers. This along with the introduction of high yielding seeds and modern irrigation technologies encouraged farmers to grow more wheat resulting in improving the country's self-sufficiency ratio from 21 % in 1986 to 47% in 1996. It even hit 59% over the period from 2001 to 2003 (Croppenstedt, 2005) and then declined to around 55 % in 2010. After the significant decline in the recent years and the shock the country's food security encountered due to the wheat shock in 2010, the government announced that it targets a self-sufficiency ratio of 70% to be achieved over the next decade¹.

However, in adopting more liberal policies in the agricultural sector, many input subsidies to the farmers were removed to shift the agricultural sector into a more market oriented one. The result was that the production cost for farmers increased considerably. Meanwhile, in major wheat exporting countries in Europe and North America, governments adopt protective policies to their agricultural sectors where farmers receive considerable subsidies in major crops including wheat and therefore the international market price for wheat is greatly distorted. The Egyptian government however purchases the local wheat from farmers at a price equivalent to that of the international market yet does not provide the farmers with equal subsidies. This in many cases creates a repellent environment for local wheat plantation.

For the private sector:

About 90% of the land cultivated with wheat is owned by small and medium scale farmers. With limited financial resources, disguised unemployment and primitive irrigation methods, the productivity of the wheat sector is measured to be 20% less than the efficient level (Croppenstedt, 2005).

The introduction of private investors into the wheat market created possibilities for generating new dynamics in this sector. Andre Croppenstedt argues that large scale investments in the sector and specifically increases in land area has the highest effect on increasing output. He estimated that a 1feddan increase in land results in a 44% increase in output. Yet, the monopoly and control of the government over the locally produced wheat discourages large investors and businesses from entering this sector and thus not allowing for significant increases in land and production.

On the other hand, local producers are only allowed to sell their crops to the government denying them many advantages that they can earn if they sell to private sector. Private Mills can offer farmers higher market prices than that offered by the

government. They also provide small farmers with credit loans for the plantation season which alleviates some of the hardships the farmers experience because of increased input prices. Finally, private buyers collect the crop from the farms releasing the farmers from the transportation costs they incur when they deliver to public mills. However, as mentioned above, the private sector is only allowed to import its needs from foreign markets and is banned from purchasing local wheat.

3. ALTERNATIVE SOLUTIONS

3.1 For end consumers

As mentioned before, the system of current subsidies is urban biased and there is no fairness in the distribution of the subsidized bread. Two main factors are the main causes for this inequitable system. First, the government sells a higher percentage of the subsidized 82% wheat flour in Cairo and Alexandria, where most of the beneficiaries are of middle and higher income levels and hence are not the targets of the subsidies. Therefore, a standardized effective policy followed by a number of developing countries is to apply rationing coupons with a certain quota of the subsidized bread to be only distributed to the lower income citizens. This ensures that the goal of subsidies is achieved. This policy will also gradually rationalize both quantities and prices that will alter the patterns of increased consumption to lower levels. Some economists argue that the government might not be able to reach all the neediest citizens; Abdellatif therefore suggests that one option is to distribute this wheat to poor children at schools. This will ensure that children receive the sufficient nutritional amounts of the wheat they need. Also, one of the recommended policies is to adopt a work for food program to the lowest paid workers. This could be applied through the private sector as a social corporate responsibility measure that will also enhance the health and nutrition conditions of the poor.

3.2 For producers

The restrictions of the government on local wheat and private mills cripple significant further developments to this sector. However, as the government's target is to increase the local production of wheat over the next decade to achieve a higher self-sufficiency ratio, it should stimulate more private investments and address the distortions that currently act conversely. Therefore, wheat plantation needs to become a considerably more profitable business to farmers. This could be achieved through redirecting subsidies towards the factors of production specific to this crop, such as fertilizers and pesticide. Meanwhile, the price of the end product should be freed to market forces allowing the private mills and bread producers to purchase wheat from local farmers. These two factors together help stimulate farmers to prefer wheat production as it would incur lower cost and higher selling price which will ultimately increase profitability.

Similarly, private mills should be allowed to produce Baladi bread and sell it at market prices in urban areas. This will free the market price of Baladi bread for both middle and higher income consumers who enjoy a bread price elasticity of demand. It

will also release the government's burden to supply large quantities of Baladi bread to urban consumers.

V. CONCLUSIONS

Wheat is the most vital food staple in Egypt. This is reflected in the country's high per capita consumption levels that are almost double the international averages. As the world's highest importer of wheat, Egypt became significantly dependent on foreign markets. Although it adopted agricultural reform policies since 1987 that directly increased the local production of wheat, the country continued to experience increasing demands on wheat imports. This situation threatened the country's food security when Russia, a main exporter to Egypt, banned its exports due to fires and droughts.

As a result, the government announced its intention to increase the local production of wheat and to increase the self-sufficiency ratio to avoid future shocks. However, the government needs to revisit the current policies with regards to the wheat sector and apply a number of modifications to achieve these targets. The main issues it needs to address are policies that should enhance production and rationalize consumption through ending state monopoly of this sector.

The policies that need to enhance productions are those directed towards farmers and private mills. In order to encourage more investments in wheat plantation, this crop needs to be significantly profitable to farmers. This can be achieved through government subsidization to factors of production which will minimize the cost to farmers. Meanwhile, farmers should be allowed to sell their crops to the private sector. Also, private mills should be permitted to process and sell the state monopolized Baladi bread in urban markets for middle and higher income consumers.

As for the policies that should rationalize consumption, they need to be directed to avoid subsidy leakages. Ration coupons that are aimed to the lowest income consumers should be introduced to ensure the efficiency of the subsidization measures that are biased under the current policies towards urban middle and high income groups. The government can also introduce other social oriented subsidy policies such as food for education and food for work programs where through corporate social responsibility programs by the business sector.

Last but not least, by following a comprehensive rather than partial liberalization reform system for the whole wheat sector, the fruits of the reform would be more effective. Hence the efficiency of the subsidy system and the encouragement of local production would be significant to both wheat consumers and producers. Accordingly, Egypt can then successfully increase its self-sufficiency ratio and reduce its dependence on the international unstable wheat market.

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Spillover effect, international exposure to risk and sustaining growth: Canada – USA

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Abstract: This paper tests the spillover effect of the foreign capital inflows on the long run growth under conditions of international economic exposure to foreign exchange rate fluctuations. The paper utilizes a simple open economy version of the Solow growth model with main features of real business cycles models. In addition, the paper uses a time series model with substitutions techniques to test the impact of the spillover impact of foreign capital inflows on the long run growth of Canada with controlling for exposure to foreign exchange fluctuations. The paper also controls for both external and internal balances. The results show that the exposure to foreign exchange rate fluctuations undermines the technological spillover impact of the foreign capital on long-run growth. It however does not affect the serial correlation impact of the spillover on the economic growth rate of Canada. The paper emphasized on Canada-USA bilateral relationship rather than Canada-the rest of the world case.

Keywords: Foreign exchange rate fluctuations, the economic growth, Canada, Time series analysis, Time series Substitutions techniques.

INTRODUCTION

The efficient allocation of resources through the international movement of capital and the global application of technological experience are both key factors in world economic development. Foreign Direct Investment (FDI) is a key driver for both these factors.

In this paper we focus on the effects of FDI on technology transfers via the technology spillover effect, whereby technological developments transferred under the influence of the foreign corporate investor become embedded in the host country's industry. Our aim is to present and test a model for the spillover effect, taking account of exposures to foreign exchange rate risk arising from reliance on foreign capital.

Technology spillover effects can occur through a number of different mechanisms. Technological know-how can be learnt by employees through their work for a foreign-invested firm, with benefits of the technology being shared between labour and capital, in addition to the benefits of technology driven productivity being shared between labour

and capital. Technology can also be passed on through the demonstration effect, whereby local labour becomes aware of new technologies and applies them in domestically owned businesses.

Arrow (1959) presents the basic reasoning behind the prediction of knowledge spillover effects by arguing that the benefits of knowledge cannot be fully appropriated by its creator, because it can neither be efficiently used while being kept private nor sold for its full value on an exclusive basis. He also discusses the role of knowledge in further knowledge creation, drawing attention to the fact that, in the same way that physical goods can be used as either instruments or raw materials for the further production of goods, knowledge can also be used in the production of further knowledge. Romer (1986), agreeing with Arrow that new knowledge cannot be entirely kept secret or appropriated by its discoverer, presents evidence that indicates that there are increasing returns on the contribution of new knowledge to the economy.

Knowledge or technology spillovers occur where knowledge and ideas are acquired free of charge or at less than their maximum economic value by one firm from another, whether in the same industry or a different industry (Griliches 1992, Kaiser 2002). While spillover effects occur within the domestic economy independently of any foreign investment, the possibility of spillovers can be increased by the introduction of ideas from a more alien environment through the involvement of foreign firms (Blomstrom *et al.* 1994).

Spillover effects do not appear to be inevitable, with Khawar (2003) finding an absence of spillovers from FDI in Mexico and Hadad and Harrison (1993) likewise finding no evidence of technology spillovers or overall productivity improvements in Morocco. Aitken and Harrison (1999), Khawar (2003) and Elmawazini *et al.* (2005) all found that overall the effect of FDI was to lower productivity in domestically owned firms, because of competition for skilled labour and the effects of loss of market share on overhead recovery. Liu (2008) finds that spillover effects from FDI exist both within and between industries but are more powerful in the long term, with early losses in productivity offset by longer term technology transfers. The extent of spillover effects is partly dependent on the ability of domestic labour to absorb technological lessons from outside (Borensztein *et al.* 1998, Qi and Li 2008).

This paper presents a model to analyze the productivity gains from technology spillovers from FDI and then tests the model in the context of US investment in Canada.

The paper is structured as follows: Section II presents the theoretical framework and the optimal solution of the model. Section III presents the empirical analysis. Section IV presents the results of the paper. The conclusion follows section IV.

II. THE THEORETICAL MODEL

II.1. the Model Framework:

(1) Assuming that firms produce a single commodity Y_t by means of domestic capital K_{Dt} , Labor L_t , and effective foreign capital as a percentage of the domestic capital δ_t , and $\delta_t = A_t K_{Ft} / K_{Dt}$, where A_t is a factor of productivity and K_{Ft} is the foreign capital stock.

(2) Assuming that the technology is Cobb-Douglas with constant return to scale:

$$Y_t = K_{Dt}^\alpha \delta_t^\beta L_t^\theta, \quad (\alpha + \beta + \theta) = 1, \quad \alpha > \beta \quad (1)$$

(3) Assuming that labor equals the size of the population and it is normalized to 1 for simplicity.

(4) Domestic residents save a certain fraction of their income and the saving rate s is constant:

$$S_t = s \cdot (Y_t - r_w K_{Ft}). \quad (2)$$

Where, S_t is the saving, $(Y_t - r_w K_{Ft})$ is the national income, and r_w is the interest rate paid on foreign capital. The r_w is exogenous because of the smallness assumption.

(5) The Y_t is devoted to the private consumption C_t , including $r_w K_{Ft}$, the private domestic investment I_t , and the net export NX_t :

$$Y_t = C_t + I_t + NX_t \quad (3)$$

(6) Assuming perfect capital mobility and $r = r_w$, where r is the domestic interest rate.

(7) With imposing the external balance condition; the current account deficit $(-NX_t + r_w K_{Ft})$ equals the foreign capital inflows F_{ft} :

$$F_{ft} = -NX_t + r_w K_{ft} = -NX_t + r K_{ft} \quad (4)$$

(8) Investment adds to the stock of the domestic capital:

$$\dot{K}_{Dt} = I_t \quad (5)^{ii}$$

The dot above the variable means the change of the variable over time.

(9) Foreign capital inflows add to the stock of foreign capital:

$$\dot{K}_{Ft} = F_{ft} \quad (6)$$

(10) This open economy is vulnerable to two opposite changes: I. The change of the effective foreign capital as a percentage in the domestic capital δ_t over time because of its imported technology, and II. the vulnerability of the inflows of foreign capital to foreign exchange rate fluctuations. The first change captures the spillover effect of the effective foreign capital in the economy over time while the second change captures the international exposure to risk.

The following two equations explain those two changes:

$$(i) \quad \delta_t = A_t \lambda_t, \quad (\lambda_t = K_{Ft}/K_{Dt}) \text{ is determined by the following equation:}$$

$$\dot{\delta}_t = \delta_0 + gt + e_t, \quad (7)$$

Where, δ_0 and g are positive constants, t refers to time, and e_t is the random disturbance,

$$e_t = p e_{t-1} + \varepsilon_t, \quad I > P \geq 0 \quad (8)$$

$$\varepsilon_t \sim N(0, \sigma_\varepsilon^2).$$

If $P = 0$, then, $e_t = \varepsilon_t$, and the foreign technology shock is a white noise, assuming here that the shock comes from the imported technology of the foreign capital.

(ii) F_{ft} is exposed to the movement of the foreign exchange rate as follows:

$$F_{ft} = a + b \dot{R}_t + \mu_t \quad (9)^{iii}$$

Where R is the foreign exchange rate, defined as the number of domestic currency units bought by one foreign currency unit, a & b are constants, and μ_t is a white noise,

$$E(\mu_t) = 0, \quad Cov(\mu_t, \mu_s) = 0 \text{ for any } t \neq s$$

II.2. the Optimal Solution:

Equations 4, 6, 7 and 8 give the following equation:

$$\dot{\delta}_t = g \lambda_t + A_t (F_{ft}/K_{Dt}) - \delta_t (I_t/K_{Dt}) + \lambda_t \dot{\varepsilon}_t \quad (10)$$

Where, g is the growth rate of the foreign technology augmenting into the foreign capital, g is constant for simplicity.

According to equation (10), the change of the effective foreign capital as a percentage of the domestic capital that captures the change in the spillover effect of the foreign technology into the economy depends positively on both the percentage of the foreign capital to the domestic capital, and on the effective capital flows as a percentage of the domestic capital, and depends negatively on the investment ratio to the domestic capital. In addition, it depends on the movement of the foreign exchange rate (this effect can be captured by substituting equation (9) into equation (10).)

On the other hand, equations (1), (3), and (4) lead to equation (11):

$$\dot{Y}_t/Y_t = \alpha(I_t/K_{Dt}) + \beta(\dot{\delta}_t/\delta_t). \quad (11)$$

According to equation (11), the growth rate of the output depends positively on both the growth rate of the domestic capital stock and on the growth rate of the effective foreign capital to the domestic capital stock.

With assumptions of perfect competitions; α is the domestic capital share in the output and β is the effective foreign capital -as a percentage of domestic capital- shares in output. With the inspiration of the Solow residual, we can figure out the value of the growth rate of δ .^{iv}

Equation (10) with equation (11) indicates that the growth rate of the output is also affected by the determinants of the growth of δ . Thus, the business cycle can happen because of changes in the spillover of the imported foreign technology in addition to fluctuations in the foreign exchange rate. Thus, domestic business cycles are affected by external fluctuations in an open world both positively and negatively. We, however, assume that the spillover effect of the effective foreign capital may counteract the effect of the exposure to international risk.

With targeting the internal balance; the fluctuations of the Y_t equals zero. Thus, equation (11) becomes:

$$\alpha(I_t / K_{Dt}) + \beta(\dot{\delta}_t / \delta_t) = 0 \quad (12)$$

Accordingly, equation (13) arises:

$$(\dot{K}_{Dt} / K_{Dt}) = -(\beta / \alpha) (\dot{\delta}_t / \delta_t) \quad (13)$$

With imposing (9) and (10) into (13), we can figure out that with targeting an internal balance, a change in the rate of the domestic capital stock is accompanied by a change in the rate of the effective foreign capital into the domestic capital or any of its determinants in equations (9) and (10) in the opposite direction. In different words, with targeting an internal balance; thus, the accumulation of the foreign capital decreases the domestic investment and vice versa. Thus, to smooth the business cycle of this economy over time and according to the assumptions of the model; the internal balance condition in equation (13) must be held.^v

III. THE EMPIRICAL MODEL

III.1. Data:

Quarterly data from 1971:Q3 to 2010:Q3 are attained for the GDP, GDP deflator, foreign capital flows, exports, imports, the price index of exports, the price index of imports, the gross national income, the lending rate, the long term government bond rate, the fixed domestic capital, the net inventory, the foreign exchange rate per US dollar for Canada, in addition to same variables of USA from the International Financial Statistics Yearbook (2011), IMF. Raw data are used to derive the economic growth rate of Canada, the real domestic investment of Canada, the real domestic capital stock, the real investment/ real domestic capital stock ratio, the real foreign capital inflows of Canada, the real foreign trade of Canada, the relative real national income (Canada/USA), the relative inflation

rate (Canada/USA), the relative lending rate (Canada/USA), the relative real foreign trade (Canada/ USA), and the economic growth rate of USA. Values of δ , α , β , and the foreign capital stock has been calculated as described in the footnotes i and iii consecutively.^{vi} Also, data for λ is derived by calculating the foreign capital stock. Derived data of USA is used to control for the determinants of the foreign exchange rate movement over time and to control for the business cycles of USA over time. Calculated data depended on strong assumptions of perfect capital mobility between Canada and USA and perfect competition conditions.

Intensive data check for possible existence of unit root and heteroscedasticity were run for all data series by using Philips-Perron unit root test and Q-statistic test. No evidence was found for unit root in any of the data series. However, evidence of heteroscedasticity was found in all data series. Accordingly, the paper utilized the ARCH method in all regressions.

III.1. The Empirical Models:

Three models are used to establish empirically the impact of both the exposure to foreign exchange rate fluctuations and the spillover effect of the foreign capital inflows on Canada's economic growth rate. These three models depend on equations 9, 10, and 11 in the theoretical model of this paper and their determinants.

The first model captures the exposure to the foreign exchange rate fluctuations as follows:

$$RFK_t = C_0 + A(L) RFK_{t-1} + C_1 emovement_t + B(L)\varepsilon_t,$$

Subject to:

$$Instrument_t = [relativeincome_t, relativeinflation_t, relativeinterest_t, relativetrade_t, growth_t, USgrowth_t].$$

Where, RFK is the real foreign capital inflows, $emovement$ is the change rate of the foreign exchange rate over time, $A(L)$ [$1 + a_1L + a_2L^2 + \dots + a_qL^q$] and $B(L)$ [$1 + b_1L + b_2L^2 + \dots + b_qL^q$] are polynomials in lag operator L , ε is a white noise disturbance term, t refers to time. The instrument controls for the relative real national income (Canada/ USA), the relative inflation rate (Canada/ USA), the relative lending rate (Canada/ USA), the relative real foreign trade (Canada/ USA), the economic growth rate of Canada and the economic growth rate of USA) consecutively. The first four-variables included in the instrument are chosen to control for the main determinants of the fluctuations of the foreign exchange rate over time, the fifth variable included in the instrument included to control for the Canadian business cycles over time, and finally the sixth variable in the instrument is included to control for the US business cycles over time.

The second model captures the spillover effect as follows:

$$\dot{\delta}_t = C_0 + A(L) \ddot{\delta}_{t-1} + C_1 \lambda_t + C_2 RFKR_t + C_3 DIR_t + B(L) \varepsilon_t,$$

Where, $\dot{\delta}_t$ is the change rate of δ calculated from the theoretical model of this paper, λ is the real foreign capital stock/ real domestic capital stock ratio, $RFKR$ is the (real foreign capital inflows/ real domestic capital stock) ratio, and DIR is the (real domestic investment/ real domestic capital stock) ratio.

The third model explains the behavior of the economic growth rate of Canada as follows:

$$growth_t = C_0 + A(L) growth_{t-1} + C_1 M\dot{\delta}_t + B(L) \varepsilon_t,$$

Subject to:

$$Instrument = [fiscalpolicy_t, monetarypolicy_t, DIR_t].$$

Where, $M\dot{\delta}_t$ is the modified $\dot{\delta}_t$ that depends on results of the first and the second models, $fiscalpolicy_t$ is the change rate of the real government spending of Canada over time as a proxy variable of a fiscal policy, $monetarypolicy_t$ is the change rate of the government of Canada long run bond rate as a proxy variable for a monetary policy. The first and the second variables included in the instrument to control for the fiscal policy and the monetary policy consecutively. The DIR variable included to control for the real domestic investment ratio. The DIR variable is included in the instrument to avoid the multicollinearity between the $M\dot{\delta}_t$ and the DIR .

III.2. The Empirical Analysis:

The first model is regressed by using the ARCH method with an instrument. The second model is also regressed by using the ARCH method. Intensive specifications for best fit models have been run until ARMA (5,5). The forecast of the first best fit model captures the exposure to foreign exchange rate risk. The variable $MRFK_t$ refers to the forecast of the best fit first model that refers to the modified real foreign capital inflows captures the risk of the foreign exchange rate movement. The forecast of the second best fit model captures the spillover effect of the foreign capital into the domestic capital. The variable $M\dot{\delta}_t$ refers to the forecast of the best fit second model that refers to the modified $\dot{\delta}_t$ captures the spillover effect. The result of the best fit first model and the best fit second model are illustrated in table III.1, columns 2 & 3 consecutively. Column 4 of table III.1, however shows the result of the best fit second model by including the $MRFK_t$ instead of RFK_t in the second model to control for exposure to foreign exchange rate fluctuations. The result of the best fit model in the forth column shows then the best fit $\dot{\delta}_t$ with controlling for both the exposure to risk and the spillover effect. The forecast of this new model illustrated in column 4 is represented in the variable $MM\dot{\delta}_t$. Finally, columns 5 & 6 in the same table show the impact

of the $Mdeltydotdely_t$ and $MMdeltydotdely_t$, respectively on the economic growth rate of Canada respectively after controlling for the fiscal policy, the monetary policy, and the DIR as explained in the section III.1.

**Table III.1: The results of the three empirical models under different possibilities:
Data: (1971:Q3 – 2010:Q3):**

The model	Model 1	Model 2-1	Model 2-2	Model 3-1	Model 3-2
	RFK_t	$delydotdely_t$	$Mdeltydotdely_t$	$growth_{t1}$	$growth_{t2}$
C	1.448806 (0.0673)*	-0.026722 (0.0000)***	-0.108703 (0.0000)***	0.831206 (0.0000)***	0.827500 (0.0000)***
$emovement_t$	0.012813 (0.0000)***				
RFK_{t-1}	0.979891 (0.0000)***		8.697182 (0.0190)**		
$delyddotdely_{t-1}$		0.527720 (0.0000)***			
$delyddotdely_{t-3}$		0.167938 (0.0000)***			
$lambda_t$		-26852.04 (0.0000)***	-25275.93 (0.0000)***		
$RFKR_t$		1.448839 (0.0030)***			
DIR_t		0.023889 (0.0000)***	0.069874 (0.0051)***		
$MRFKR_t$			8.697182 (0.0190)**		
$growth_{t-1}$				0.433551 (0.0000)***	0.431194 (0.0000)***
$growth_{t-5}$				-0.104672 (0.1041)*	-0.105133 (0.1034)*
$Mdeltyddotdely_t$				0.176922 (0.0761)*	
$Mdeltyddotdely_{t-1}$			0.923782 (0.0000)***		
$MMdeltyddotdely_t$					0.170271 (0.0585)*
e_{t-1}	-0.471251 (0.0000)***	-0.213862 (0.0002)***	-0.750445 (0.0000)***		

e_{t-2}		-0.116681 (0.0020)***			
e_{t-5}		-0.107007 (0.0000)***	-0.210096 (0.0000)***		
$Adj R^2$	0.801112	0.109888	0.10815	0.180130	0.179490
$D.W. Stat.$	1.996762	2.186640	1.997027	2.022733	2.016285
AIC	0.290770	-0.017946	0.717027	2.001934	2.014505
SC	0.543835	0.215653	0.911692	2.196599	2.209170

- *** means significant at ρ -value $\leq 1\%$, ** means significant at $1\% < \rho$ -value $\leq 5\%$, and * means significant at $5\% < \rho$ -value $\leq 10\%$.
- Method used for regression is: ML:ARCH (Marquardt) – Normal distribution.
- Best fit models criteria depend on both the diagnostic checks and the lowest values of AIC & SC criteria.

It is obvious from table III.1; columns 5 and 6 that after controlling for the exposure to foreign exchange rate fluctuations, the impact of the spillover effect of the foreign capital inflows becomes more positively significant on the economic growth rate of Canada. However, it does not change the cyclical movement of the growth rate for both the first lag and the fifth lag of the economic growth rate of Canada. The plausible interpretation is that the cyclical movement in the Canadian economic growth rate could most likely have arisen because of the technological spillover effect of the foreign capital inflows rather than from its exposure to US dollar fluctuations over time.

SUMMARY & CONCLUSION

This paper presented a theoretical model of an open economy version of the Solow growth model with features of real business cycle models under the assumption of perfect capital mobility. The theoretical results show that the economic growth rate of a small open economy can be affected by both the real domestic investment ratio and the real foreign capital inflows ratio, in addition to factors of technological spillover effect and exposure to fluctuations of the foreign exchange rate. An empirical time series analysis that depends on substitution techniques arise from utilizing three empirical models show that the impact of the technological spillover effect of the foreign capital inflows on the Canadian economy can have a better positive significant impact on the economic growth rate after controlling for exposure to foreign exchange rate risk. The control of the exposure to risk however does not affect the cyclical movement in the Canadian economic growth rate which can be interpreted as that the cyclical movement of the economy can be related to factors of spillover effect of foreign capital inflows.

Our results show that economic growth is positively affected by changes in the effective share of foreign capital in the economy, adjusted for productivity resulting from technological capacity attaching to inward FDI.

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ⁱ <http://www.commodityonline.com/news/Egypt-looks-at-pvt-equity-to-boost-agriculture-24514-3-1.html>

AFSA Is the Alexandria food stuff association

ⁱⁱ Assuming the depreciation rate is zero for simplicity.

ⁱⁱⁱ View Jeff Madura, International Financial Management for the equation of the economic exposure to risk.

^{iv}

$\dot{\delta}_t/\delta_t$ can be found as follows:

Since, $Y_t = K_{Dt}^\alpha \delta_t^\beta$, Thus,

$\ln(Y_t) = \alpha \ln(K_{Dt}) + \beta \ln(\delta_t)$,

Thus,

$\beta \ln(\delta_t) = \ln(Y_t) - \alpha \ln(K_{Dt})$, thus,

$\ln(\delta_t) = (1/\beta) \ln(Y_t) - (\alpha/\beta) \ln(K_{Dt})$.

And since all data of the right hand side of this equation are known, then, we can derive (by the inspiration of the Solow residual) the value of $\ln(\delta_t)$.

And since,

$\dot{\delta}_t/\delta_t = \ln(\delta_t) - \ln(\delta_{t-1})$ by logic, and by knowing data of $\ln(\delta_t)$, the data of $\ln(\delta_{t-1})$ can be derived easily and hence, the change rate of δ can be derived.

^v With more substitutions for the determinants of the equations, more implications can be arisen. The paper rather focuses on explaining some specific concepts related to the interrelations amongst the exposure to the fluctuations of the foreign exchange rate, the spillover effect of foreign capital inflows and the status of the business cycle translated into the changes of the economic growth rates.

^{vi} The foreign capital stock is calculated from foreign capital inflows in Canada by using the following equation: *The foreign capital stock* = $e^{-(\text{the US lending rate})} \cdot \text{the foreign capital inflows}$. The US lending rate is used as a proxy of the foreign interest rate for Canada as a discount rate.

$\alpha = [(\text{Canada lending rate}) \cdot (\text{real domestic capital})] / (\text{real GDP})$,

$\beta = [(\text{US lending rate}) \cdot (\text{real domestic capital} / \text{real foreign capital stock})] / (\text{real GDP})$.

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