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Contents

EDITORIAL NOTE

Nine papers make up this issue. The first one, titled **Particularities of the Nature of Microfinance Clientele Organised in Village Banks in the Suburbs of Ankara and Derived Assumptions on the Nature of Credit Mannequin** by Tomáš Hes, Alena Neradová and Karel Srnec, studies the lacks of development finance as a comparative tool that could on a regional as well as on an international level confront development impact of a similar product on a selected target group. Credit mannequin could from this point of view become a way how to display confectional and therefore foretellable set of characteristics of a group of clientele that could thus become etalon or reference standard. The paper attempts to identify nature of such microfinance mannequin on the market of Turkey, which belongs to last few existing countries with a great untapped microfinance markets in the world. Despite its enormous latent commercial potential, few analysis were performed in order to potrait the socio-economic character of its main protagonist: enterprising mother or grandmother operating in the suburbs of urbs. The study summarizes result of field research carried out by team of researchers from Czech University of Life Sciences and models a credit mannequin, profiling the average Turkish microfinance client in suburban areas of Central Anatolia, in the vicinity or border areas of Ankara agglomeration. The assemblage enables to depict genuine relationships of mainstream clientele towards selected topics, reaching better understanding of nature and particularities of the Turkish microfinance market and drawing conclusions on its further development.

The second paper, titled **Trade, Interdependence and its Effect on Interstate Conflict: The Case of East African Region** by Hailay Gebretinsae Beyene, examines the effect of dyadic trade on reducing disputes/conflicts has been dealt with at some length in the literature. Most of the studies assess the effect of trade on militarised interstate disputes from a global perspective. This article explores the effect of trade and economic interdependence on the likelihood of interstate conflicts in the countries of the East African region: Djibouti, Eritrea, Ethiopia, Kenya, Somalia, Sudan, Tanzania and Uganda. To examine the causal effect, binary logistic regression was used by employing Correlates of War data sets and various issues of IMF Yearbook. The study finds that there is a

reciprocal relationship between trade, economic openness and interstate conflict in the region. Economic openness across the region significantly reduces the onset of conflicts that could arise in East African countries. Trade-induced interdependence significantly decreases the likelihood of conflict in the region.

The third paper, titled **The Impacts of Zakat and Knowledge on Poverty Alleviation in Sudan: An Empirical Investigation (1990-2009)** by Mutasim Ahmed Abdelmawla, aimed at examining from an empirical point of view, the roles of zakat and knowledge in reducing poverty in Sudan during the period (1990-2009), using data collected from the Central Bureau of Statistics (CBS) and Abdelmawla (2010). Two policy variables are incorporated in the empirical model namely, the percentage spent on poor out of total zakat funds and educational attainment (proxy for knowledge). By applying the Ordinary Least Squares (OLS) technique, the results obtained signify that zakat and educational attainment impact significantly at the 1% level on reducing poverty in Sudan. The study recommends increasing educational attainment rates and improving the quality of education, which requires among other things, increasing expenditure on education at all levels, beside the care for adult literacy classes. In addition to that, raising the percentage spent on the poor out of total zakat funds is highly recommended to reduce inequality in the distribution of income. Income support should particularly be used for the part of the population with special needs.

The fourth paper, titled **Real Money Supply, Price and Fiscal Deficit in Nigeria: Evidence from Multivariate Granger Causality Tests** by Jimoh Olajide Raji, Juzhar Jusoh and Mohd-Dan Jantan, implements the Granger causality test within the context of Autoregressive distributed lag (ARDL) framework to determine the directions of causality between a pair of price level, real money supply, government fiscal deficit, interest rate and real output in Nigeria over the period 1970 to 2010. Result of the study shows that in the short run, there is a unidirectional causality running from real money supply to inflation, government deficit to price level, real output to inflation, and interest rate to inflation. The long run results indicate that bidirectional causality runs between the real money supply and price level, and also between price level and interest rate. The results suggest that pro-

cyclical has been the practice in Nigerian fiscal policy which has accounted for the country's public deficit. Therefore, there is a need for fiscal policy rule that will guide all the tiers of government to a particular level of fiscal conduct and budgetary management to the extent of making it credible over time. This result is important in that it provides the likely implications of fiscal deficits on some macroeconomic variables such as output, price level, money supply and balance of payment. Knowing these implications is likely to provide an insight into the formulation and design of appropriate fiscal policy by the Nigerian policy makers because far from the efficient provision of public goods, fiscal policy performs stabilizing role.

The fifth paper, titled **Revealed Comparative Advantage of Carpets and Textile Floor Covering Industry in Pakistan, India and China** by Bushra Yasmin and Saba Altaf, measures and compares the competitiveness of Pakistan's carpet and textile floor coverings industry with other South Asian countries China and India. The pattern of revealed comparative advantage is identified using the Balassa (1965) index for export data. The index is calculated at the sector and commodity level of the Harmonized System of classification (HS 2-digit and 4-digit level) for the periods 1996-2009 and 2004-2009, respectively. Data has been taken from UN Comtrade Statistics and the World Development Indicators. The study finds out a rising, stable and fluctuating trend in RCA at 2-digit level for India, China and Pakistan, respectively. However, test of equality of means of RCA indicates a statistically significant edge of China over Pakistan and India whereas across India and Pakistan not a significant difference emerged. It aims at discerning the challenges for Pakistan in carpet and weaving sector which may hinder the future growth of this sector. The findings imply that a favorable potential exists for higher growth of carpet industry and it can endorse the export earnings and employment keeping in view the international competitions. Moreover, the said sector can be focused for the export competitiveness in the rapidly globalized markets.

The sixth paper, titled **Determinants of New Firm Formation: Evidence from Iranian Manufacturing Industries** by Mohammad Ali Feizpour and Mahvash Moradi, is concerned with deliberating a complete picture of the determinants of firms start-up in Iranian manufacturing industries at 4-digit

industry level during the period of 2002-2006. Using the structure-conduct-performance paradigm, results of this study shows industry's barriers to entry such as capital intensity, MES and concentration affect the ability of potential entrants in negative direction. Also, industry size, price cost margin and industry growth turn out to induce entry. In addition, entrepreneurs prefer to enter in industries where advertising expenditure, business risk and small firm presence is low and skilled labor is high.

The seventh paper titled **Knowledge, Migration and Countries of Muslim World – Spatial Impacts and Prospects** by Ahmed Tarjam Ali Bisher, Abdalbast Saleh Omer Daya and Martina Prochádzková, presents an empirical examination of the spatial dependence of emigrants and immigrants on the indicators of a knowledge based economy. The article is motivated by a knowledge gap among countries of the Muslim world, worsening demographic conditions, the growing importance of knowledge in the world economy and geographical proximity. The existence of spatial distribution and autocorrelation among migrants is examined through the spatial lag and the spatial error models. Although one can assume that the presence of both – the number of emigrants and the number of immigrants have similar preconditions, with slight variables - emigrants tend to indicate the dependence on the nearest neighbours. Therefore studying of emigrants among the countries of Muslim world is done better through spatial models and is more appropriate than the estimate regression coefficients through ordinary least square regression. When looking at the knowledge economy, findings also suggest that the number of internet users and the number of journal articles influence the number of emigrants (and also number of immigrants). The human desire to leave a country is also driven by other factors, for example tariff and nontariff barriers, average years of schooling, industrial production growth rate and the number of computers in each country.

The eighth paper titled **Trade Costs and Intra-OIC Trade: What are the Linkages?** by Kenan Bagci, argues that much of the changes in the direction of exports of OIC countries can be attributed to the changes in trade costs. In this framework, this paper analyzes the role of trade costs (in aggregate as well as its various components) in determining the direction of exports from OIC countries. The estimation results show that 1% reduction

in trade costs can increase world exports by 3.8%, but it can increase exports from OIC countries up to 4.3%. When trade partners of OIC countries are considered separately, 1% fall in trade costs increases exports from OIC countries to developed countries by 4.2% and increases intra-OIC exports by 3.9%. However, 1% rise in trade costs leads to 4.5% fall in exports to these countries. These findings support the view that the current trend in trade costs is one of the major factors shaping the direction of exports from OIC countries. These findings are robust to alternative estimators of the Heckman selection model and the Poisson Pseudo-Maximum likelihood that are used to deal with the concerns over sample selection bias and heterogeneity.

The last and ninth paper titled **Macroeconomics, Investor Sentiment, and Islamic Stock Price Index in Malaysia** by A Mamunur Rashid, M. Kabir Hassan and Ng Yuen Yein, examines the level of exposure of conventional and Islamic stock price indices in Malaysia to the relative change in investor sentiment index and macroeconomic factors. The study tested two separate models: one using macroeconomic variables in quarterly time series framework and the other using macroeconomic and sentiment data in a quarterly time series framework. This study reports that interest rates, currency index and FTSE Bursa Malaysia Composite Index pose greater influence on Islamic price index when compared to industrial production, consumer price index, money supply and investor sentiment indices. The results continue an important battery of debates on the requirement of shari'ah compliant capital market for Muslims. The study unlocks room for new studies on influence of sentiment in Islamic financial industry.

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Particularities of the Nature of Microfinance Clientele Organised in Village Banks in Suburban Ankara and Derived Assumptions on the Nature of Credit Mannequin

Tomáš Hes[1], Alena Neradová[2] and Karel Srnec[3]

Development finance lacks a comparative tool that could confront development impact of a mass microfinance product on a selected target group. Credit mannequin, adjustable to selected level of sensitivity and accuracy, could from this point of view become a way how to display confectional and therefore foretellable set of characteristics of a group of clientele that could thus become etalon or reference standard. The paper attempts to identify nature of such microfinance mannequin on the market of Turkey, which belongs to last few existing countries with a great untapped microfinance markets in the world. Despite its enormous latent commercial and socio-economic improvement potential, few analysis were performed in order to potrait the socio-economic character of its main protagonist: enterprising mother or grandmother operating in the suburbs of urbs. The research compiles results of research carried out by academics from Czech University of Life Sciences and creates a model of a credit mannequin, averaging Turkish microfinance client in Central Anatolia, in the vicinity or border areas of Ankara agglomeration. The assemblage enables to depict genuine relationship of mainstream client towards chosen topics such as bancarization, household size or islamic vs classical microcredit related issues, uncovering the nature of the microfinance market in Turkey and summing up conclusions on its potential development.

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1. Introduction

1.1. Microfinance in Turkey

When compared to neighbouring countries in the region, the microfinance potential of the Republic of Turkey stays far from its fulfillment (1). Although Turkey can be considered the major and most dynamic economy of the Middle East region with an exorbitant relative number of people who are unable to access credit and financial services through formal sector (Burritt, 2003), microfinance systems are rather new to Turkey, with only few academic studies undertaken.(4)

Turkey finds itself in dire need of microfinance, currently under the supervision of to the State Planning Agency as the sector represents key policies of the Republic for employment and income distribution policies intended to help those recipients of aid expected to become service providers and producers who have not been successful.(3) According to information based on OECD sources, Turkey can be characterised by the worst income distribution among OECD members in 2010, showing similar situation in relation to poverty with 18.08% of the inhabitants living under poverty line. (3)

Income disparities betwen rural and urban environment still persist, as the on-going process of urbanisation leads to an increase of the challenges of labour supply, infrastruce and education, between others. Urbanization of Turkey, without so needed development of other subsystems leads to a creation of a specific market type without formal property titles being transformed into „gecekondu"[4] neighbourhoods, characterized by streams of unemployed labourers entering urbs from the regions. Possibly, microfinance could play an important role in influencing this phenomenon through reduction of migration pressures, stimulation of economic growth and creation of urban as well as rural employments.

The slow development of the sector is the more surprising as it can possibly tie in the long tradition of the agricultural credit cooperatives,

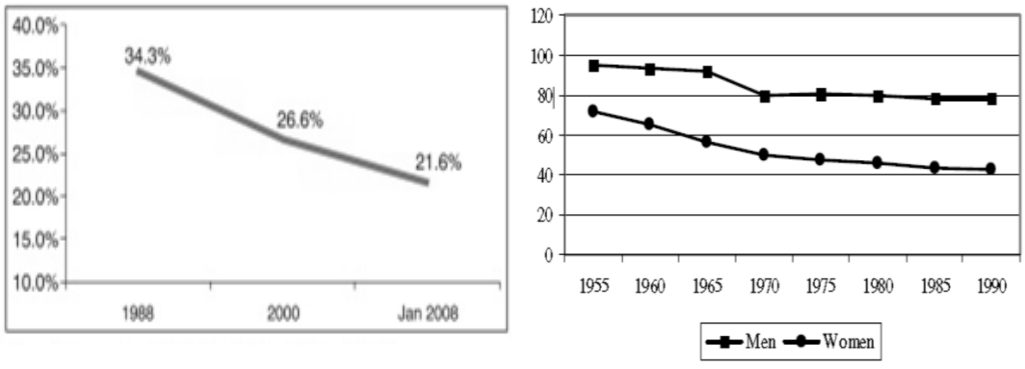
[4] Gecekondu is a Turkish word meaning a house put up quickly without proper permissions. The gecekondu phenomenon is linked with the problems of unemployment and poverty, especially in the east of the country.

governed by law passed already in 1929, which allowed communities of more than 100 households to establish credit cooperatives, which may be precursors of what is know today to be village bank model (Okan et al., 2013).

Microfinance in Turkey is in its beginnings when measuring the number of clients as well as of range of financial services and financial products.(1) The potential of this financial innovation could be substantial as SMEs form 99% of all enterprises in Turkey, being estimated at 4 million units by TAC[5], generating 35% of export and employing more than 40% of the workforce. Microfinance is expected to reduce vulnerability of microenterprises as capital permits to make use of opportunities, diversify as well as to augment income.(11)

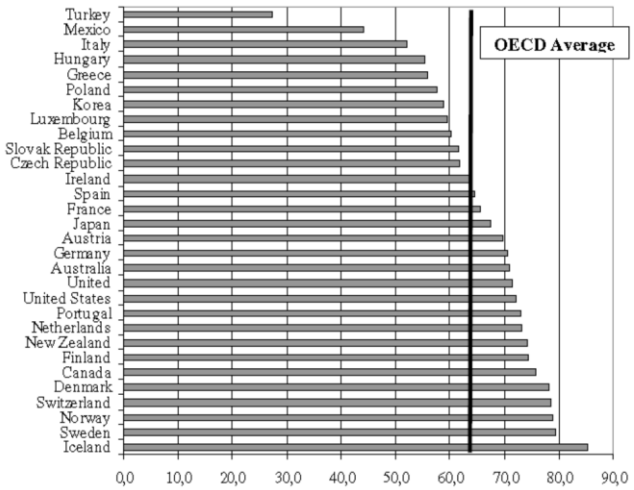
Apart from that, microfinance can become a tool of empowerment in a country where the rate of women as participants in the labor force is a curious questionmark, as social changes of the recent past did not enable more women employees to become part of labor markets, despite higher education, later marriage and changes in social attitudes towards the institution of marriage, in combination with declining fertility rates. Despite the mentioned issues, the share of women participating in in job markets decreased, from 34% in 1988 to 22% in 2008, illustrating an opposite trend than occurring among OECD countries. (13)

Figure 1: Female labor participation rates development trend in Turkey, 1988-2008 (OECD, 2008) and Labor force participation rates by gender, Turkey in 1955-1990. (Turkstat,1994)



[5] Tradesmen and Artisans Confederation

Figure 2: Female Force Participation Rates, OECD (OECD, 2008)



The lack of data related to the microfinance sector, insufficient regulatory framework as well as little support of microfinance broad spectrum of government institutions, civic society and private sector belong to the key reasons for lack of development of the microfinance sector in Turkey. (5)

1.2. Grameen Microfinance Project (TGMP)

TGMP[6] was launched in 2003, thanks to the initiative of the Foundation for Waste Reduction which applied for the first time in Turkey the Grameen Bank methodologies to microfinance clientele. TGMP thus became the key target for the survey described in this paper, as it is the most important MFI in Turkey offering standartized product countrywide. TGMP offers microloans in the sum of 200 -500 YTL (140-340 US$) priced by an interest rate of 18-20 % p.a., distributed between solidarity groups that consist of five to ten clients, mostly women, equally liable for the loan repayment. The clients employ the loans in raising livestock, retail commerce, small scale textile production and distribution of cosmetic products in the neighbourhood. The peer group pressure among the village bank members drives individuals to repay debts in such a way that the micro credit program achieves high repayment rates of 98 % (Rahman 1999).

[6] As of Oct. 2012, TGMP was operating 94 branch offices, with 60,600 clients and portfolio of 183 millions of of Turkish lira, with 303 employees.[6]

1.3. The concept of microcredit mannequin

A mannequin is a term describing a lay figure or a dummy that attempts to model the behavior of humans and thus helps to illustrate impacts of human activity, such as nuclear tests (Cooper, 2004). This capacity of mannequin to simulate future outcomes is widely used in commercial spheres, especially in retail stores and commercial centers. In military or in medical environment, where „virtual patients" are used, the role of mannequins is indispensable, due to considerable savings of lives as well as resources contributed by mannequins which enable experimentation and testing prior to implementation in reality.

The implementation of credit mannequin in development finance would enable to depict the profile of average client and thus permit to link the financial product characteristics with the averaged nature of the clientele.

2. Research

2.1. Background of the study

In September 2012, team of researchers from Czech University of Life Sciences (CULS) executed in close collaboration with TGMP and SESRIC[7], a subsidiary of the Organisation of Islamic Cooperation (OIC)[8], a survey of the village bank clientele in the outskirts of Ankara. Both organizations provided logistics as well as key infrastructure and support of their employees for the field research. The survey was centered around village bank members, mostly enterprising women working in suburbs and adjacent conurbanisations. The main aim of the project was to create a model of the average microfinance client, based on the profile derived from the survey data and so to assess the microcredit mannequin, the socio-demographic profile of the core Turkish microfinance clientele.

2.2. Research justification

The state of the art knowledge on microcredit is contested.(Kovsted et al., 2000), territorial and non-transferable due to cultural originality of

[7] The Statistical, Economic and Social Research and Training Centre for Islamic Countries
[8] Organization of Islamic Conference

every market, and fragmented into many categories. This fragmentation prevents provision of a general picture averaging the client client characteristics. For markets that only seek their characteristic profile,due to the fact that they are immature, homogeneous and untapped such as Turkey, the simulation of a credit mannequin represents a way how to callibrate assumptions and how to position and how to standartize products and services, accessing the mass markets in an efficient way during the initial phase of the market development. Credit mannequin thus is a representation of a simulated client model which displays most probable characteristics that are to be expected in similar habitat. This synthesis thus apprises the average character of the microfinance clientele in Turkey looking for socio-demographic patterns of the standard debtor. The standard debtor character implies a blueprint of the loan product.[9]

Furthermore, the research intends to understand the following issues. How can be described the socio-demographic household of an ideal client? Does religion act as an important influence for credit takers? What experience have microcredit clients with microcredit? What determinants exogenous to market forces could be distilled for the future?What are remarkable particularities of the Turkish clientele, in relation to selected assumptions? What are characteristic details of the socioeconomic traits of households of village bank clientele. What are activities estimating the potentials and threats influencing the rise of Turkish microfinance market?

Studies of this type could illuminate the situation in the Turkish labor markets, which are characterized by low female labor force participation when compared with other OECD countries and which exhibit an unexplained declining trend[10], with family related interrelationships being the explanation for the low relative number of females in Turkish labor markets.

2.3. Methodology

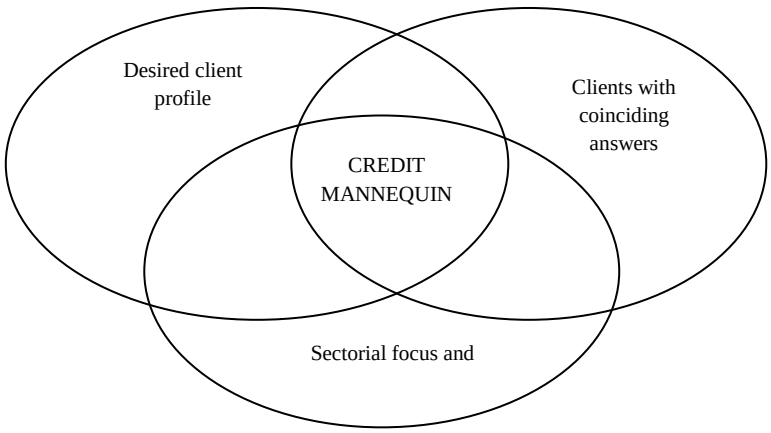
The methodology selected of this research is a qualitative, non-longitudinal approach with percentages of categories of responses

[9] This paper refines and extends previously performed research published in ILHS (12) in terms of sensitivity of the coinciding answers as well as the sectorial focus of the clientele.
[10] Explanation offered by Under-participation Trap Hypothesis.

representing the principal data that enables to formulate the client characteristics. These responses were retrieved from standardized questionnaires in which qualitative responses were converted into discrete variables. These were examined with correlational tools.The questionnaire was formed out of 30 closed format questions of dichotomous rating scale and close-ended types. The sample was completed by 117 active clients, who belonged to stable core of TGMP client portfolio and who agreed to answered question after their weekly ordinary repayment encounters under the supervision of credit officers, in their apartments, workshops or working spaces.

The inital part of the study describes the interaction of the debtors with loan in the following layers of interest: demographic, religion, household, loan experience, access and employment. The second part follows by the depicition of the model of average turkish microfinance client employing those characteristics of the answerse that coincide in 75% from all sample members. In the third part, those clients that share characteristics desirable by the MFI are selected and assorted. In the following part of the study two aforementioned profiles are compared, in order to obtain credit mannequin profile through intersection of the profiles, including the sectorial focus. The resulting credit mannequin constitutes the most suitable average client profile which could be the ideal target of the MFIs. In the last, fifth part, general assumptions are confirmed or rejected, putting the credit mannequin into context of current microfinance development in contemporary Turkey, leading to recommendations for MFIs.

Figure 3: Research architecture



3. Research results

3.1. Classification in six research domains

In the following table the questions in the survey classified in six domains are represented.

Table 1: Survey questions classified in six research domains

Dmain	Nr.	Question	Nr.	Question	Nr.	Question
Domain A: Demographic profile	1	Sex	2	Age	3	Marital status
	4a	Children	4b	Number of children		
Domain B: Household profile	5	How many people live in the household?	7	Where do you live?	6	How many of those who live in the household are economically active?
Domain C: Religion profile	28	What is your religion?	29	Does religion form important part of your life?	30	Does your religious leader prevent you from taking microcredit?
Domain D: Credit experience profile	9a	Did you use any type of credit in the past?	10	Did you use the possibility to finance your economic activities with help of microcredit more than once?	23	Does the fact that your are taker of microcredit harm your family / neighbour relationships?
	9b	In case you had any type of credit in the past, what credit did you take?	13	Is frequency of payment of installments of microcredit for you better than frequency of other credits?	25	Does the installment payment meeting influence your working activities?
Domain E: Use of credit	11	Do you at present any oportunity to use any other type of credit?	17	Does microcredit solve your financial situation?	19	Is your microcredit a groupcredit?
	12	Do you prefer islamic credit?	18	What are you using the microcredit for?	26	Do you have more active loans at the same time?
Domain F: Credit access	14	Is microcredit more expensive than any other accessible credits?	16	Do social / family conventions prevent you from being a debtor?	21	Does demand for microloans in your community exceed the supply?
	15	Is it difficult to acquire microloans?	20	Does the length of credit period adress your needs?	22	Do you have your own bank account?
	27	Do you need digger debt or are your finance needs fully covered by microcredit?				

3.2. Profiles of the group of clients with responses coinciding in more than 75% of the sample

The answers to the questions which coincided in over 75% and henceforth present significant reference for the nature of microfinance market, were the following ones:

Table 2: List of answers that coincide in over 50% of the cases

Nr.	Question	Answer	% of answers
1	Sex	Woman	100
3	Marital status	Married	90.60
4a	2-3 children	yes	76.79
17	Does microcredit solve your financial situation?	Yes	87.13
22	Do you have your bank account?	No	73.53
23	Does the fact that you are taker of microcredit harm your family relationships?	No	96.00
24	Do you recommend your economic active neighbours to take microcredit?	Yes	95.19
25	Does the installment payment meetings influence your working activities?	No	80.81

Concluding, the filtrated answers that coincide in over 75% of the cases indicate that the microfinance markets in Turkish urban-semiurban environment are formed by clients featured by the following profile traits:

Table 3: Client answers coinciding in over 75% of the cases

Questions	Profile characteristics		
1,3, 4A	**A woman**	**married**	**mother**
4B	**with 2-3 children**		
17	**declaring that microcredit solves her financial situation**		
22,23	**unbanked**		**stating that microcredit does not harm family relationships**
24,25	**recommending neighbours to take microcredit**	**saying that weekly meetings do not influence her activities**	
28,29,30	**a muslim**	**for whom religion is an important part of her life**	**while her religious leader does not prevent her from taking microcredit.**

3.3. Desired client profile

The profile of most desired clients for the MFIs was derived from the answers to those questions that are related to topics that deliver positive value to MFIs in terms of their probable willingness to include such respondents in its portfolio as clients. The profile of the desired client is derived from the characteristics of these respondents which coincide in 100% of the answers to selected questions. The selection is chosen on the base of those topics that represent an understandable contribution for any MFI, as illustrated below.

Table 4: Desired client answers that coincide in over 75% of the cases

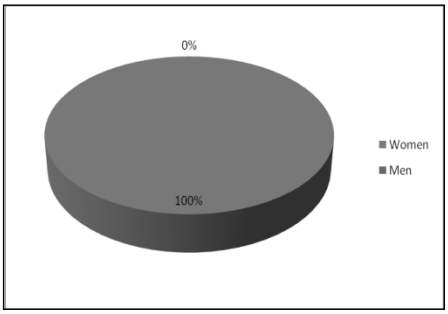
Nr.	Question	Desired nswer	% of nswers
13	Is frequency of repayment of microcredit for you more apt than frequency of other credits?	Yes	84.00
16	Do social/ family conventions prevent you from becoming a debtor?	No	89.11
23	Does the fact that you are taker of microcredit harm your family/ neighbour relationships?	No	96.00
24	Do you recommend your economic active neighbours to take microcredit?	Yes	95.19

The clientele that answered in line with the desired answers was separated from the rest and the answers to survey questions were structured in percentual charts. The responses from those who fall into the desired client profile are presented below in the respective predetermined domains.

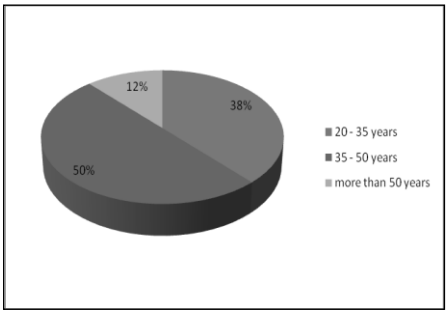
3.3.1. Domain 1: Demographic profile of desired clientele

Figure 4: Demographic profiles of answers to question 1-4B

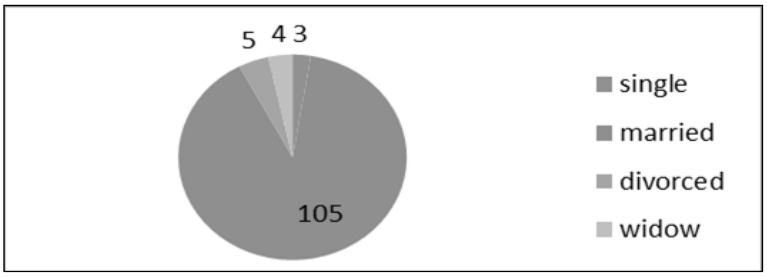
1. Sex



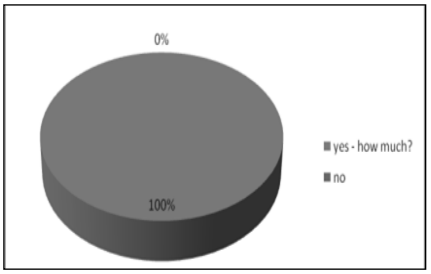
2. Age



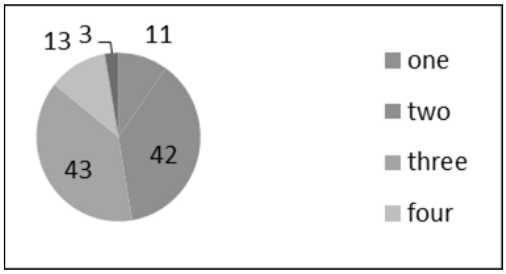
3. Marital Status



4A Children



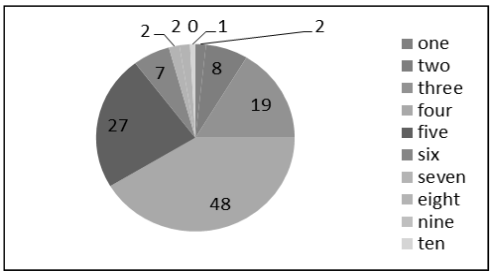
4B Number of children



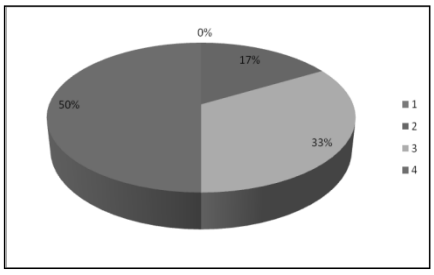
3.3.2. Domain 2: Household of desired clientele

Figure 5: Household profiles of desired answers to questions 5-7B

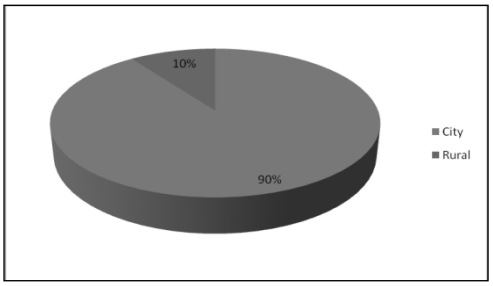
5. Number of People living in the household



6.Active people per household



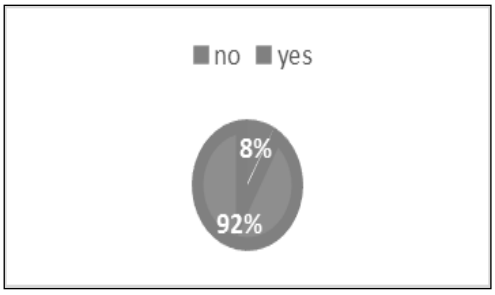
7. Urban / rural



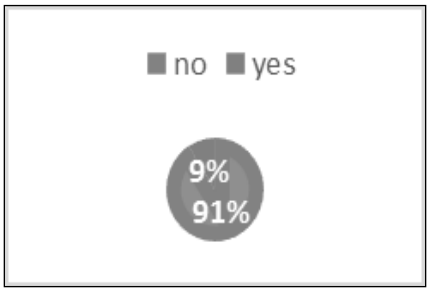
3.3.3. Domain 3: Religion of desired clientele

Figure 6: Religion related profiles of desired answers to questions 28-30

29.Importance of religion



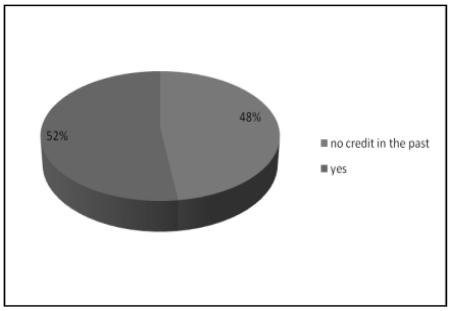
30. Prevention by religious leader



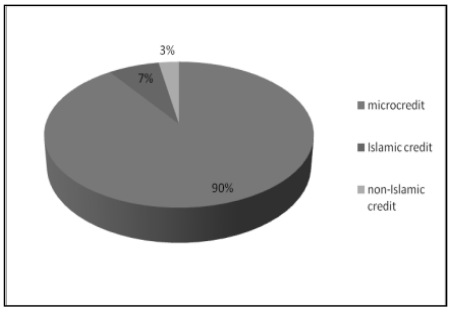
3.3.4. Domain 4: Credit experience of desired clientele

Figure 7: Credit experience profiles to questions 9A, 9B and 10

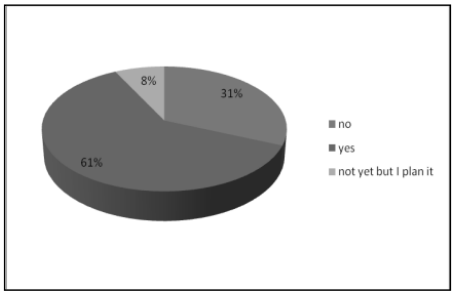
9A. Credit in the past?



9B. What type of credit?



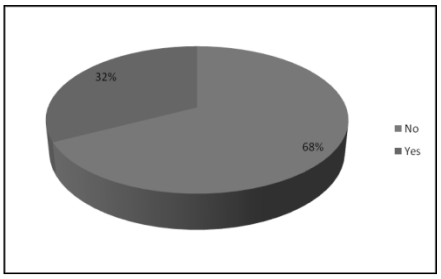
10. Microcredit more than once?



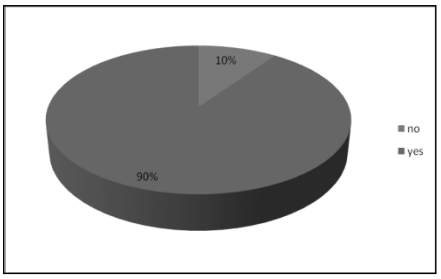
3.3.5. Domain 5: Use of credit of desired clientele

Figure 8: Credit experience of answers to questions 11,17,18,19, 26

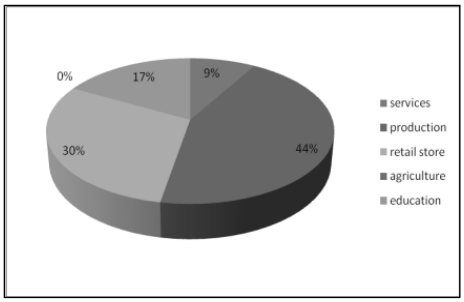
11. Opportunity for other type of credit?



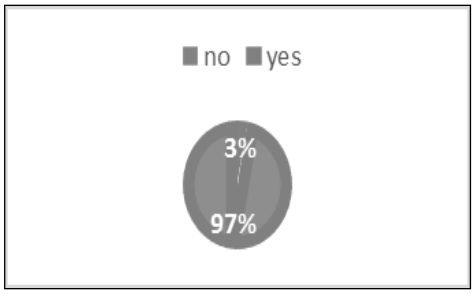
17. Is microcredit a solution?



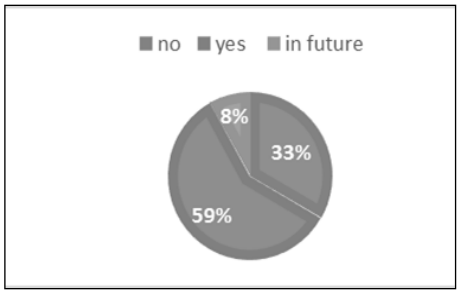
18. Use of credit?



19. Is your loan a grouploan?



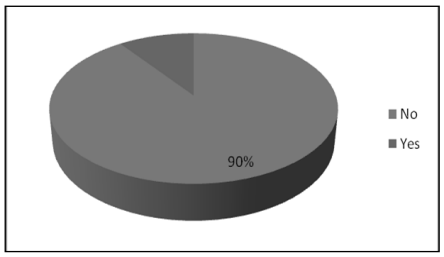
26. Are you holder of more than once loan at the same time?



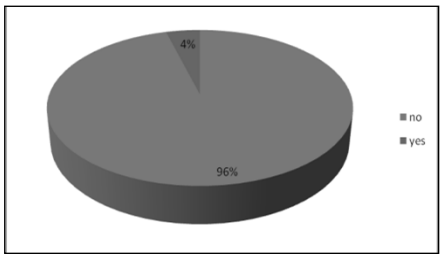
3.3.6. Domain 6: Credit access of desired clientele

Figure 9: Credit experience graphs of desired responses to questions 14,15, 20, 21,22, 27

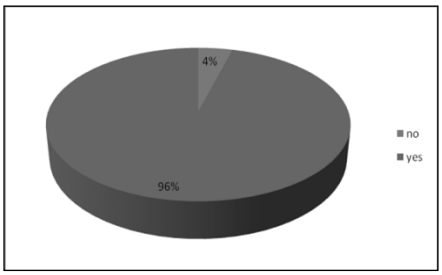
14. Is microloan more expensive than other loan?



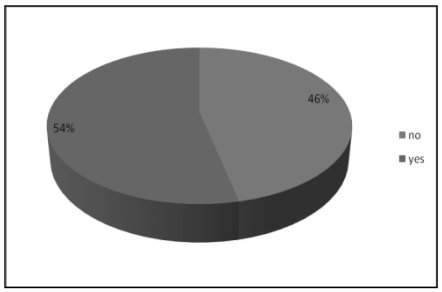
15. Is it difficult to access microloan?



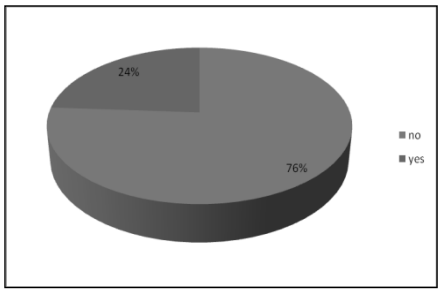
20. Does the credit period adress your real needs?



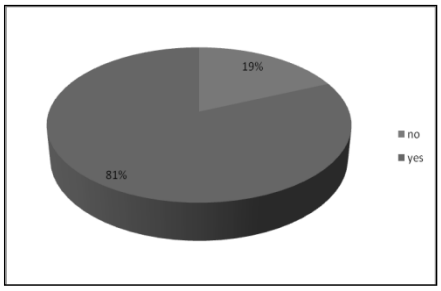
21. Does microloan demand in your community exceed the supply?



22. Do you have your own bank account?

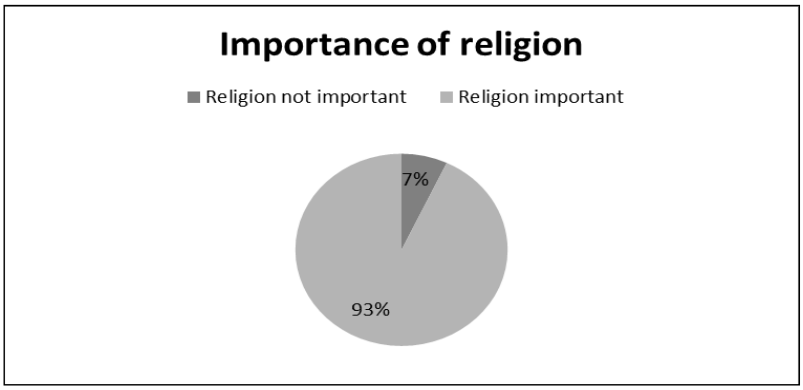


27. Do you need higher loans or are your finance needs fully covered by microloan?



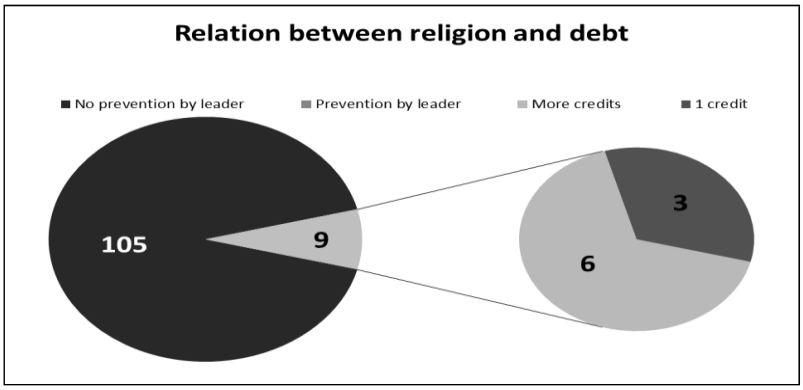
3.3.7. Importance of religion for the clientele

Figure 10: Importance of religion for the microfinance clients



3.3.8. Relation between religion and debt

Figure 11: Relation between religion and debt



3.4. Overlapping result: Credit mannequin profile

The credit mannequin is constructed by permitting the 75% co-incidence profile (3.2.) to intersect with the profile of the desired client (3.3.), resulting from the fitration of answers through both filters.[11] The result is the following ideal microfinance client profile filtered from the real personalities.

Table 6: Credit mannequin profile in verbal description

Questions	Profile characteristics			
1 – 4A	**A woman**	**aged between 20-50+**	**married**	**mother**
4B -7	**with children 2-3**	**with 3-4 people living in the household**	**of out of whom 2 are economically active**	**living in urban area**
10	**with a sole experience with microcredit**			
11-15	**who does not know if there are other credits available**	**claiming that frequency of payments is not better than other credits**	**and that microcredit is less expensive than other types of debt**	**and that microcredit is not complicated to access**
16-19	**and that social / family conventions do not prevent her from becoming a debtor**	**and that microcredit solves her financial situation**	**using the microcredit for production, retail commerce and repayment of other debts**	**in form of group credit**
20-23	**and that the length of microcredit period doesnot adress her needs**	**and that microcredit demand exceeds supply**	**unbanked**	**and that microcredit does not harm family relationships**
24,25,27	**who recommends neighbours to take microcredit**	**while weekly meetings do not influence her activities**	**who does not need bigger debt as the needs are covered by microcredit**	
28-30	**a muslim**	**for whom religion is an important part of her life**	**and her religious leader does not prevent anybody from taking microcredit.**	

[11] Unlike similar studies done in the past where 50% of the coinciding answers was set as a benchmark, this research sensitivity of coinciding answers was set to a threshold of 75%, eliminating previously identified basic education, previous experience with microcredit and use of parallel debt at a time.

3.5. Acceptance / Rejection of assumptions

3.5.1. Assumptions

We have established four assumptions in order to corroborate them. These assumptions were chosen in order to respect the particularity of the market in Turkey, which is original and differs from neighbouring microfinance markets, in particular in the relationship of the state with the civic society, as well as secularity of state and its development stage. The rejection or confirmation of the assumptions will permit to understand better the nature of the microfinance market in Turkey and thus position credit mannequin into wider context. The assumptions follow:

A. Islamic credit represents a competing financial product to village bank microloan in terms of client desirability.

B. The probability of enrollment in the microcredit programmes in Turkey is correlated with the size of household in terms of number household members.

C. Bancarization is an important pro-microfinance factor.

D. As per the findings of the research, microcredit does not represent a threat to financial stability of households.

3.5.1.1. Analysis of Assumption A.

The results were tested on interdependence through Chi-square test, which identifies the difference between the observed and expected results, while H_0 postulates the non-existing correlation between the group samples.

Figure 12:

$$\mathrm{X}^2 = \sum_{i=1}^{r} \sum_{j=1}^{c} \frac{(O_{i,j} - E_{i,j})^2}{E_{i,j}}.$$

O = the observed value
E = the expected value

We further rate the survey data in table which serves the purposes of analysis as it consists of variables that correspond to number of collected questionnaires, economically active people in the household next to suitability of the clientele, and qualify it with rates of 1 to 3 scale, converting qualitative into quantitative, ordinal data.[12]

The Chi-square test making use of the available respondent data provides us with answers that reject or confirm the assumptions.

Table 7: Responses to questions 11-14

	Less desirable clients	**More desirable clients**	**Marginal Row Totals**
Islamic credit preferred	9 (10.67) [0.26][13]	95 (93.33) [0.03]	104
Classical microcredit preferred	3 (1.33) [2.08]	10 (11.67) [0.24]	13
Marginal Column Totals	12	105	117 (Grand Total
The Chi-square statistic	0.106084		
p < 0.05	2.6116		

Answers to the selected questions nr. 11 and nr. 14 indicate that competition between islamic credit and village bank microcredit is not significant at present as major part of the clientele stipulated (58.60% and 79.20%) that few choices are available. The answers to question nr. 12, which show that big part of the respondents considered the term "islamic credit" a synonym for microloan provided by TGMP, seems to confirm that Shari'ah-compliant loan related literacy is negligible.

Finally, the Chi-Square test does not confirm the assumption on the level of confidence of 5% as per Table nr. 8.

3.5.1.2. Assumption B: Number of clients living in large households correlates with the microfinance enrollment potential.

We compare groups of clients with desirability characteristics[14] formed into two groups with two groups of clients, living in smaller and major

[12] 3 points: desired clients as per 3.3; 2 points: ordinary clients falling into categories of desired / less desired / undesired; 1 point: less desired client who answered 1 of the answers to questions in Table 6; 0 points: undesired client with 2 or more indicated answers to the questions in Table 6.
[13] (the expected cell totals) and [the chi-square statistic for each cell]

households. According to the results, there seems to be a statistically significant relation between the clients living in larger households (>3) and the suitability of a microfinance clientele and the assumption B is confirmed. In other words, the influence of family background cannot be accepted as a significant statistic force driving household members becoming microfinance clients, as per Table Nr. 9.

Table 8: Result of X_2 test.

	Less desirable clients	More desirable clients	Marginal Row Totals
Small Household	8 (3.35) [6.47]	5 (9.65) [2.24]	13
Large Households	18 (22.65) [0.96]	70 (65.35) [0.33]	88
Marginal Column Totals	26	75	101 (Grand Total)
The Chi-square statistic	10.0013		
p < 0.05	0.001564		

3.5.1.3. Assumption C: Bancarization is an important pro-microfinance factor.

We compare groups of clients with desirability characteristics[15] formed into two groups with two groups of clients, the bancarized and the non-bancarized ones. According to the results, there seems to be non statistically significant relation between the bancarized clients and their desirability as microfinance clientele. Therefore, we cannot confirm the assumption, as per results in Table Nr. 10.

Table 9: Result of X_2 test.

	Less desirable clients	More desirable clients	Marginal Row Totals
Bancarized	2 (3.15) [0.42]	29 (27.85) [0.05]	31
Not bancarized	10 (8.85) [0.15]	77 (78.15) [0.02]	87
Marginal Column Totals	12	105	117 (Grand Total)
The Chi-square statistic	6362		
p < 0.05	0.425091		

3.5.1.3.1. Assumption D: Financial stability of households is not threatened by microcredit.

Eventhough the body of evidence is not sufficient for wide scale generalizations, 15% of the microcredit is used in order to repay other debts, which means microcredit is not served the original purpose which is to provide investment or working capital for microenterprises, while 31% of respondents as per Figure Nr. 13 have more credit in place.

Figure 13: Number of answers related to the use of microcredit

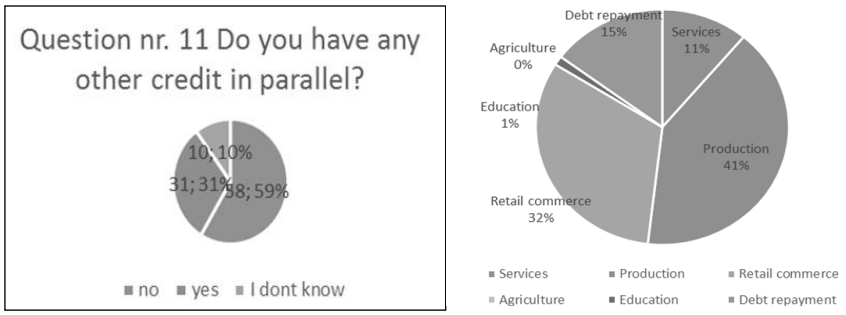


Table 10: Number of answers related to the use of microcredit

Nr. of answers	9	33	26	0	1	12

4. Conclusion

The study provides us with a counterfactual opportunity to combine assumptions on the microfinance market in Turkey with the profile of credit mannequin based on the intersection of client profiles derived from the field data, and to position the profile of the clientele in the context of contemporary markets for microfinance in Turkey. Despite constraints of the research, due to limitation of the sample as to market habitat, sex and and market selection which may lead to generalization of the results, the research and literature review to this study hint at an unexplored field of relationships in the Turkish households from the angle entrepreneurship, gender and labor markets.

Unlike similar studies done in the past, this research attempts to view the sensitivity of coinciding answers as one of the elements of the intersecting client based data which was set to a higher threshold of 75%, which eliminated previously identified elements of basic education, previous experience with microcredit and parallel use of several debts at a time.

The immediate conclusion can be drawn on basis of the survey that it cannot be confirmed that Islamic microcredit competes with classical solidarity collateral based microcredit, nor that bancarization is important for the prospect aptness to become a microfinance client. On the other hand, household size seems to be an important factor for the suitability of the clientele. Disconcerting finding can be done in the sense of uncovering the fact that 15% of the respondents intend to use microcredit for the repayment of other credits and more than a third has more credits in parallel, which may lead to the suspicion that a considerable part of microcredit may be abused and employed for other than the original target, deepening the risks of a debt trap, in combination with the on-going underparticipation trap related to surprising and a constant reduction of female employment in labour force in Turkey.

The credit mannequin modellation indicates the retail commerce sector and small scale production as the most promising markets and shows little relevance of education and age, the current price policy, average loan amounts nor repayment frequency as a source of reconsideration. Past experience can be seen as a significant characteristics to be targeted when searching for a new clientele, while marital and family status of married women with 2-3 children and a strong family background seems to be important characteristic of the credit mannequin.

This study confirms that the determination of the potential clients to become factual microfinance clients in Turkey is somehow related with the weight of the household as a specific market institutions, providing base for enterpreneurship, being the basic stone of credit mannequin's solvency and risk management philosophy, while it has not identified any concrete obstacles in terms of culture and community that will enable its smooth future development. Therefore, microfinance can be considered a tool of development based on family cohesion and by providing higher support for its progress, the State is to acquire robust grass root development tool, currently below its potential reach.

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Trade, Interdependence and its Effect on Interstate Conflict: The Case of the East African Region

Hailay Gebretinsae Beyene[1]

The effect of dyadic trade on reducing disputes/conflicts has been dealt with at some length in the literature. Most of the studies assess the effect of trade on militarised interstate disputes from a global perspective. This article explores the effect of trade and economic interdependence on the likelihood of interstate conflicts in the countries of the East African region: Djibouti, Eritrea, Ethiopia, Kenya, Somalia, Sudan, Tanzania and Uganda. To examine the causal effect, binary logistic regression was used by employing Correlates of War data sets and various issues of IMF Yearbook. The study finds that there is a reciprocal relationship between trade, economic openness and interstate conflict in the region. Economic openness across the region significantly reduces the onset of conflicts that could arise in East African countries. Trade-induced interdependence significantly decreases the likelihood of conflict in the region.

1. Introduction

The literature on the effect of trade on conflict/cooperation, or the effect of trade on peace between countries, shows that with regard to theory, there is a difference of opinion among Marxists, realists and liberals. Most of the empirical studies deal with the dyadic approach to examining the effect of trade on peace. As the findings of the vast majority of empirical studies show, integration through trade inhibits conflict between countries. In some countries policy-makers use this assertion in their dealings with issues of peace or conflict. As Goenner (2011)[2] indicates, Susan Schwab (2008:6), US representative, claimed that trade has strengthened peace in the Central American region.

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[2] Goenner states that the US trade representative Susan Schwab, in the President's 2008 Trade Policy Agenda, noted that the peace in the Central American region has been strengthened due to the favourable impact of the growth of intra-regional trade exhibited within the region. This implies that trade is seen by policy-makers as a positive factor that directly affects the peace conditions in a region.

Peace is one of the decisive factors for a country's economic growth and development, which is evidenced by the vast amount of research done on the relationship between economic interdependence and interstate conflict. Research on trade and conflict, which focuses on conflict resolution, cooperation and peace-building, is becoming a perennial topic of interest in academia. In the past few years, a significantly large number of empirical studies have been conducted with due emphasis on interstate and intraregional relations and conflict/cooperation.

Several studies on the issue of interdependence explore the cause-and-effect relationships between determinants and bilateral trade within a bloc. Various economic blocs are established in our world and various studies are undertaken to examine their validities. Hassan (2001) adopted a gravity model to examine the validity of the South Asian Association for Regional Cooperation (SAARC). The study disclosed the existence of a potential benefit that must be exploited through cooperation. To realise the potential benefit for SAARC countries, it is suggested that they liberalise trade by removing trade and non-trade barriers.

Hossain and Naser, (2008) analysed the effectiveness of trade and regional integration in the Gulf Cooperation Council (GCC). They found that the key success factor for GCC's regional integration is attributed to the execution of continuous evaluation and analysis of the progress at state level. The GCC has been examining regularly proposals that should be executed collectively and analysing thoroughly issues pertaining to GCC. They revealed that all the six member countries of GCC have exhibited almost the same level of development. Furthermore, an increasing trend is observed in intra-regional trade (imports and exports) and export of high-tech manufactured goods after the implementation of customs union. Similarly, a dramatic rising trend is observed in joint ventures, total capital investment as well as the amount of capital investment per single project after the implementation of customs union. The study revealed that FDI has increased on GCC because of an increased domestic market and stable economic growth success it achieved through the regional integration.

Ghani (2011) examined the impact of trade liberalization on the economic performance of OIC countries. The study revealed that, while trade liberalization has favourable effect on the GDP per capita of the

region in the medium term, it does not have significant effect on import and export of the region. After liberalization, it is revealed that no improvement is shown on the ratio of import, export and trade to GDP in OIC region.

It is stated that sub-Saharan Africa is one the most food-insecure regions in the world. This is attributed to the reliance of the region's 85 percent of agriculture on rain. Furthermore, 80 percent of the region's consumption is from the domestic production. Food insecurity has emerged to be a cause for political instability and civil strife in Africa. Food crisis occurred in Africa at the end of 2010 followed by a hiking price of food by 40 percent from January 2010 to February 2011. The food crisis has been associated with instabilities that food riots began in Algeria and in Tunisia in 2011, leading to removal of the regime of Ben Ali in Tunisia followed by Mubark's regime in Egypt. It is stated that as Africa's rhetoric of violent government changes, ethnic conflicts, religious crisis, civil wars become barriers for continuity of policies and their implementation. In addition to these barriers, the problems of corruption have fueled food insecurity in Africa, (Kanayo, 2012).

A significant number of authors contend that integration through trade will have a pacifying effect on the integrating nations, and argue that trade ties serve as an incentive to settle disputes before they grow into conflict/violence (Angell 1913; Doyle 1997; Mitrany 1966; Nye 1971; Russett and Oneal 2001). Other studies take the classic liberal view that foreign trade fosters mutual interdependence among national governments, manifested through economic ties; aspirations to wealth gain in the present and future; and a sense of oneness among the communities of the nations integrated (Deutsch 1957; Gartzke 1998; Haas 1960; Hegre et al. 2010; Lu and Thies 2010; Oneal et al. 2003; Polachek 1980; Rosecrance 1986; Russett et al. 1998; Russett and Oneal 2001). Other scholars are more attuned to realist international relations theory, and argue that there is a positive relationship between trade and conflict (Barbieri, 1996, 2002).

A second group of authors hold views contrary to those of the classic liberals. They contend that trade becomes a cause of conflict, harking back to neo-Marxism and Waltz's claims for neo-realism (Choucri and North 1989; Mearsheimer 1992). A third group of authors' views are based on Morgenthau's classical realism. They assert that as trade is not

an important factor, it is irrelevant to consider it in the sphere of causes of conflict. Rather, the basic causes of interstate conflict are primarily attributed to political forces. This view is found in the discussions by Gilpin (1987), Jervis (2002) and Levy (2002), and recent empirical work by Goenner (2004) and Gelpi and Grieco (2008), who are inclined towards this view in their conclusions. Other authors who argue that political relations often shape international trade ties with particular partners include Pollins (1989), Mansfield et al. (2000) and Long (2008).

Still other empirical studies on the issue of trade and conflict reveal that trade has a mixed consequences upon conflict. Gasiorowski (1986) finds that while the interdependence between countries is costly it increases conflict, and reduces conflict when interdependence becomes beneficial that results in cooperation it reduces conflict. Press-Barnathan (2006), assertes that it is the economic and political factors that play significant roles on making peace depending the importance of the issue for the particular case between the countries. Holsti (1986), Reuveny and Kang (1996), Morrow (1999), Bearce and Fisher (2002), and MacDonald (2007) view that conflict is indifferent to trade.

Other studies have attempted to examine the effect of economic integration on economic progress. Hassan et al. (2010) agree that bringing about economic integration among developing countries by removing tariff and non-tariff barriers would be gainful. Strategic regional economic integration serves as a foundation for vertical and horizontal linkages that benefit developing countries.

Still studies have dealt with the issue of structural transformation in developing countries related to their global competitiveness scenario. Studies posit that , unless developing countries take the initiative to structurally transform towards technology-supported production systems, they will lack competitiveness in the world market; the technological and industrial polarity between developing and developed countries, as well as among developing countries, will continue to widen in the future (Hassan and Islam, 2001).

Despite the challenges, Africa is endowed with enormous arable land which is the largest in the world and has significantly high prospect to reverse the prevailing food insecurity through “green revolution”. To

sustain food security in Africa and maintain peace and stability in Africa, it is suggested that enthronement of good governance; integration of land conservation plans, water management, biodiversity, and pollution controlling plans; restricting institutions that suits the realization of food security, such that encourages agricultural research and development, provision of agricultural extension services; formation and strengthening partnerships among African countries, emerging countries (China, Brazil and India), and with development partners; partnerships with international organizations to promote and strengthen the enthronement of democratic principles in Africa (Kanayo,2012).

Chazi et al. (2014) posit that Africa has been suffering from serious lack of basic infrastructure due to shortages of financial resource to develop it. Even though Africa is endowed with huge resources, which remain unexploited for centuries, many Africa countries do not have adequate infrastructure. The study disclosed that no African country is rated as AAA, which precludes it from getting debt as well as equity finance from international investors. They suggested that Islamic bonds stand out to be a panacea for the acute financial problem Africa is ever facing. They indicated that there is enormous surplus of finance in the Middle East that has been increasing because of continuous price rises, which can be utilized by African countries for their infrastructure development purposes. They asserted that Sukuku (bond certificates) is able to serve as a catalyst that enhances the infrastructure development endeavours of Africa. The literature highlighted above seems assumed the conflict or peace situation of the specified regions remaining constant. However, peace is crucial issue that should not be overlooked, which this study attempts to examine at some length as presented below.

This study examines the effect of trade and economic integration on conflict. Most of the studies used deal with the relationship between trade and conflict in a dyadic form in a global context. Moreover, the international relations literature empirically examines the relationship between trade and conflict without clearly segregating the diverse economies. It can be seen that there is some sort of aggregation of advanced and developing economies. But the factors that allow cooperation between two countries can differ, depending on the development status of the economies. In other words, the previous studies were conducted under the economic condition of heterogeneity.

Hence, this study is intended to fill a gap by focusing on a region that is considered homogenous.[3]

Given this background, the study attempts to examine the effect of trade integration on interstate conflict in East Africa, using a bilateral trade relationship approach. The overall impact of trade integration on interstate conflict is likely to depend not only on the dynamism of bilateral trade interdependence but also on global trade integration.[4] Conceptually, this is assumed to be a limitation of the study because it focuses on bilateral relationships with a focus on the East African region. The countries included in this study are those categorised as East African countries in most of the literature: Djibouti, Eritrea, Ethiopia, Kenya, Somalia, Sudan, Tanzania and Uganda.

With regard to the causes of and relationship between trade integration and interstate conflict or cooperation, the objective realities or characteristics of dyads influence vary from dyad to dyad. This can be augmented by the fact that, under the conditions of *ceteris paribus,* neighbouring countries are more likely to integrate through trade and be exposed to interstate conflicts than geographically distant countries. In fact, this is more vividly exhibited in developing countries; for example, the wars between Ethiopia and Eritrea, Ethiopia and Somalia and Kenya and Somalia. Further trade integration has a more favourable effect on those countries that are closer geographically. Countries that are

[3] World economies are classified as homogeneous and heterogeneous. "Heterogeneous" refers to a collection of economies that have different economic statuses. This includes the world economic setup of developing and advanced countries. It can be also interpreted as an aggregation of low-income, middle-income and high-income countries under one umbrella. In contrast, the term "homogenous" refers to economies that have similar economic status. In fact, even within the homogeneous group, countries' economic conditions could differ, but they fall into one broad group. In this case we can have the category of developing countries as one homogenous set of economies and developed countries as another.

[4] A study by Lee and Pyun (2009) titled "Does Trade Integration Contribute to Peace?" explains that there are at least two significant concerns to be addressed. Firstly, one should distinguish global trade integration from bilateral trade interdependence. The authors assert that if integration through trade results in a uniform increase of trade interdependence in all bilaterally trading countries, it is not important to make a distinction between bilateral and global trade integration. Nevertheless, despite the lower level of trade integration in some of the trading countries, stronger and deeper integration into the global market can be achieved. Hence, interstate conflict is not affected solely by changes in dyadic interdependence of trade, but also by changes in overall world trade integration. Lee and Pyun (2009) define the phrase "global trade integration" as "trade openness", usually proxied as the ratio of total trade to GDP at the aggregate national level.

integrated through trade will strive to resolve disputes that arise in the region in their early stages, which deters them from escalating to the status of interstate military conflicts. In relative terms, trade-driven economic integration decreases the likelihood of interstate conflict more for geographically distant states than for states in close proximity. The issue of geographic proximity is beyond the scope of this study[5].

Using a dyadic observation data set from 1950 to 2000, Lee and Pyun (2009) explored the effect of trade integration on interstate disputes that involve military action. Their empirical results reveal that both bilateral and global trade integrations have a considerable effect on promoting peace and stability between countries. Moreover, in contrast to the findings of Martin et al. (2008), there is a strong positive association between global trade openness and peace.

Given these mixed arguments on the relationship between trade and conflict/cooperation/peace, Mansfield and Pollins (2001) propose three dimensions or fronts that require attention: the theoretical basis and causal mechanisms underlying the relationship between interdependence and conflict; the conceptual definition and operational measurement of interdependence and conflict; and the boundary conditions of the effects of interdependence on conflict.

Scholars have studied the three dimensions proposed by Mansfield and Pollins (2001). Some studies were made of the first dimension, the theoretical front. In this front Morrow (1999) has developed a game theoretic model consisting of two competitor nations. The increase in trade has the power to reduce the willingness of the target nation to enter into a war. However from the initiators side the increase in trade serves as an incentive to involve into conflict and obtain better concessions using its superior bargaining power imposed on the targeted nation. This indicates the indeterminate and both cases effect of trade on conflict. In other words, when a trade is to inhibit the motivation to initiate conflict against the trade partner nation, it will have an inducing effect on the other nation to initiate conflict for the other nation. Still in this theoretical area, Gartzke et al. (2001) attempted to develop a signalling

[5] This study tries to consider the factor of geographic distance at the specified regional level of analysis, as most of the specified countries share borders. In fact, it would have added to research on the role of trade in conflict resolution had it included the global aspect. However, owing to the study's scope, analysis is limited to the regional level.

model that demonstrates that trade may reduce violent conflict while actually increasing non-violent conflict. In addition, Hegre (2004) developed an expected utility model to show that when trade is symmetrical, it has a stronger effect on conflict reduction.

With respect to the conceptual definition, some authors such as Dorussen (2006), Rowe (1999), and Reuveny (2001). Dorussen (2006) considers conflict from the gain or loss perspective that happens between the combatant states. It is asserted that conflict is extremely remote, if a state expects no gain from the use of force. McDonald (2004) attempted to examine the effects of free trade and trade separately on conflict claiming that the former has the power to remove barriers to international trade, while the latter boosts the power of the society that supports the tendency of waging war. Gartzke et al. (2001) examined questioning the vast studies that deal with trade interdependence versus conflict. Specifically, they explored the effect of capital interdependence on peace other than trade on conflict.

Furthermore, conceptual and operational issues used to be points of argument among scholars who do not split trade. Gartzke and Li (2003), and Barbieri & Peters (2003) present different operational and conceptual definitions which are not yet resolved. The arguments focus on variables that include trade openness, trade share and dependence relationship with conflict. They differently argue in their analyses as to the positive/inverse relationships between trade share, openness and conflict supported with justifications. Hegre (2005) examined the arguments of Gartzke and Li (2003), and that of Barbieri & Peters (2003) their respective stated relationships between the variables. Hegre makes a point that the discrepancy in between the two views should not be restricted to variable construction.

Moreover, other scholars have examined causal relationships by adopting different definitions for different levels of conflict. Some of those scholars, who adopted an operational definition of conflict, are Pevehouse (2006), Reuveny, (2003) and Robst et al. (2007). Pevehouse (2006) attempted to examine the effect of trade on conflict by breaking down the frequency of the degrees of hostility in to threat of force, display of force, and use of force. Robst et al. (2007) examined the effect of trade and geographic distance on conflict. This type of examination is further strengthened by Bennett and Stam (2004: 141–

144) who attempted to predict the behaviour of a state based on its internal attributes such as the level of democracy. They further examined the variation in behavioural tendencies between a state, dyad states and regions. Other scholars such as Crescenzi (2003), Bueno de Mesquita et al. (2004) and Krustev (2006), investigated whether interdependence has an effect on aggravating conflict further or increasing the duration of militarised interstate conflict, as cited in Lu and Thies (2010).

As far as the third dimension (boundary conditions of the effects of interdependence on conflict) is concerned, several studies have been conducted. Reuveny (2001) and Dorussen (1999, 2002) examined the effect of several countries' interaction on conflict. Furthermore, Robst et al. (2007) dealt with the influence of geographical distance or proximity; Benson (2005) attempted to investigate the influence of dyadic economic size; Hegre (2000) assessed the effect of dyadic development levels; and Papayoanou (1996) argues that balance of power plays significant role than mere economic integration per se in relations to conflict. Gelpi and Grieco (2008) affirmed that the belief of democratic leaders that trade boosts economic growth lets them to become averse towards initiating military conflicts than do autocratic leaders.

2. Research Design

This study investigates the impact of trade integration on conflict. In fact, the conflict equation employs several specifications. The empirical specification for this particular study to examine the effect of the relationship between trade and other variables on conflict is specified as follows:

$$Y_{ijt} = \alpha + \beta Dyadic\ trade_{ijt} + \gamma X_{ijt} + u_{ijt} \quad \textbf{(1)}$$

Different models are used to examine the role of trade integration in disputes. With respect to the dyadic trade variable, in the first model, all the variables are considered to examine the effect of trade integration and other factors in a combined form as shown below.

$$\boldsymbol{Y_{ijt}} = \boldsymbol{\alpha} + \boldsymbol{\beta_1}(Openness) + \boldsymbol{\beta_2}(Dependence) + \boldsymbol{\beta_3}(Trade\ Share) + \boldsymbol{\beta_4}(Alliance) + \boldsymbol{\beta_5}(Dem) + \boldsymbol{\beta_6}(Natcap) \quad \textbf{(2)}$$

To examine the change on the effect of the variables on interstate conflict, a second model is used in which the *polity* variable is dropped while the other independent variables are retained, as given below:

$$\boldsymbol{Y_{ijt}} = \boldsymbol{\alpha} + \boldsymbol{\beta_1}(\textit{Openness}) + \boldsymbol{\beta_2}(\textit{Dependence}) + \boldsymbol{\beta_3}(\textit{Trade Share}) + \boldsymbol{\beta_4}(\textit{Alliance}) + \boldsymbol{\beta_5}(\textit{Natcap}) \quad \textbf{(3)}$$

Further, to examine the strength of the effect of economic integration on interstate conflict when some other variables are excluded from the equation, a third model is specified. In this case, both the *polity* and *dependence* variables are excluded from the equation as shown below.

$$\boldsymbol{Y_{ijt}} = \boldsymbol{\alpha} + \boldsymbol{\beta_1}(\textit{Openness}) + \boldsymbol{\beta_2}(\textit{Trade Share}) + \boldsymbol{\beta_3}(\textit{Alliance}) + \boldsymbol{\beta_4}(\textit{Natcap}) \quad \textbf{(4)}$$

Where

$\boldsymbol{Y_{ijt}}$ is the dependent variable represented by unity under the condition that Country i and Country j are engaged in conflict against each other at the time period of t, and zero if they are not engaged in conflict against each other at the time period of t[6].

Dyadic trade $_{ijt}$ is the non-directed bilateral trade that happens between the dyad countries i and j. It measures the trade interdependence between the dyad trading countries i and j.

Xijt is the vector which comprises the other important determinants of interstate conflicts.

The independent variable, *Dispute*, represented by $\boldsymbol{Y_{ijt}}$ is used in two versions. In the first case, *Dispute* is set to 1 if a Military Interstate Dispute (MID) of any type occurred between dyads, and to 0 otherwise. In the second version, *Dispute* is set to 1 if a fatal MID occurred between dyads and 0 otherwise[7]. The first type of treating dispute is adopted for this study.

[6] Conflict can take the form of military conflict, which is classified into five levels (1 = no militarised action, 2 = threat to use force, 3 = display of force, 4 = use of force, 5 = war).

[7] For example, Kimball (2006) in his article "Alliance Formation and Conflict Initiation: The Missing Link", states that conflict initiation is scored 1 when both states in the dyad engage in a

Operationally, the study examines two-logit model specifications. The most commonly used proxy for conflict between the dyads is the measure of military conflict, which is constructed from the database of the "Correlates of War" (COW) project. This dyadic data set codes all Military Interstate Disputes (MIDs) with a level of hostility ranging from 1 to 5 (1= no militarized action, 2= threat to use force, 3= display of force, 4= use of force, 5= war). This MID dataset (version 3.02) is transformed to dyadic events with corrections made by Maoz (2005).[8]

In the literature on trade versus conflict, trade reflects three considerations. First, in the trade equation specified, the proxy trade-to-GDP ratio serves as a dependent variable though it lacks a theoretical basis. Second, in examining the effect of trade on conflict, the equations are based on the theory that trade, not its share of GDP as such, has an effect on conflict. Thirdly, trade and the higher value of dyadic GDP are treated as two distinct factors that have their own separate effects on conflict, as opposed to the trade-to-GDP ratio which conflates them (Mansfield and Pevehouse 2000; Keschk et al. 2004).[9]

In this study, the trade integration factor is considered in two models. The first model specification includes *openness*, which is the ratio of trade to GDP, which is expected to have a negative sign. The second model includes two variables, *trade share* and *dependence*, with the expectation that *trade share* is a positive sign and *dependence* is a negative sign. The empirical results are expected to be according to the theoretical predictions of the relationships among the three measures and their effects on MID onset. All three variables take on the values of the country of lower trade's *dependence*, following the weak link assumption. In fact, other researchers debate the relationship between

militarised interstate dispute where the hostility levels for both states are greater than 3, under the classification of hostility in the range between 1 to 5.

[8] The data set and the code book consulted by this study is available at http://psfaculty.ucdavis.edu/zmaoz/dyadmid.html

[9] The issues stated here also have implications for the different measuring approaches used by Barbieri (2002). Barbieri uses the ratio of dyadic trade on the aggregate trade of each country as a measure for the trade variable. It is interesting to see the different views and arguments on the conceptual relationships between trade variables and conflict; no consensus has been reached so far among scholars who have been involved in the "trade versus conflict" issue (see Gartzke and Li (2003); the replies given by Barbieri and Peters (2003) to Gartzke and Li; Oneal (2003).

dependence and dispute, owing to the application of different methodologies.[10] [11]

$$\text{OPENNESS}_{it} = \frac{\text{Export}_{it} + \text{Import}_{it}}{\text{GDP}_{it}}$$

$$\text{OPENNESS}_{jt} = \frac{\text{Export}_{jt} + \text{Import}_{jt}}{\text{GDP}_{jt}}$$

$$\text{DEPENDENCE}_{ijt} = \frac{\text{Export}_{ijt} + \text{Import}_{ijt}}{\text{GDP}_{it}}$$

$$\text{DEPENDENCE}_{jit} = \frac{\text{Export}_{jit} + \text{Import}_{jit}}{\text{GDP}_{jt}}$$

$$\text{TRADE SHARE}_{ijt} = \frac{\text{Export}_{ijt} + \text{Import}_{ijt}}{\text{Export}_{it} + \text{Import}_{it}}$$

$$\text{TRADE SHARE}_{jit} = \frac{\text{Export}_{jit} + \text{Import}_{jit}}{\text{Export}_{jt} + \text{Iimport}_{jt}}$$

In the above equations, the subscripts *ij* represent a dyadic variable, whereby the subscripts *i* and *j* denote Country *i* or *j*, such that $i \neq j$, and *t* refers to time in year of the time series. In computing each of the variables of *openness*, *dependence* and *trade share*, the lower rate has been used based on the weakest link assumption used by Gartzke and Li (2003) and others. Given this background, the following hypotheses are framed to be tested.

Hypothesis 1

H_o *:* The degree of economic openness does not reduce the likelihood of interstate conflicts.

H_a *:* The degree of economic openness does reduce the likelihood of interstate conflicts.

[10] Barbieri, 2002; Russett and Oneal, 2001. For example, to account for the variable *dependence*, Higher Dependence is used as a proxy, which is the higher difference in the trade over GDP ratio in periods *t*–1 and *t*–4, in a dyad. It is argued that the likelihood of a MID should fall as this variable rises (Russett and Oneal, 2001; Keschk et al, 2004).

[11] Many of the analyses by Barbieri are very similar to those of Oneal and Russett (1997). However, they differ in their definition of the specified dependent and independent variables. Moreover, some differences can be observed in the controls they use in their regression analyses and the number of hypotheses they test (Oneal and Russett, 1999).

Hypothesis 2

H_o : The extent of a country's trade share does not reduce the likelihood of interstate conflicts.

H_a : The extent of a country's trade share reduces the likelihood of interstate conflicts.

Hypothesis 3

H_o : The extent of a country's economic dependence on foreign trade does not have a deterrent effect on the likelihood of interstate conflicts.

H_a: The extent of a country's economic dependence on foreign trade has a deterrent effect on the likelihood of interstate conflicts.

Hypothesis 4

H_o : The extent of a country's dyadic trade share does not reduce the likelihood of interstate conflicts.

H_a: The extent of a country's dyadic trade share does reduce the likelihood of interstate conflicts.

Lagged Capability Ratio is a one-year lagged value of the ratio of the higher national capability (CINC) score in a dyad to the lower score. In other words, it is measured and computed as a composite of national capabilities (CINC) score of the more capable state in the dyad, divided by the CINC score of the less capable state (Beck et al. 1998). The relative capabilities are computed based on the COW project CINC scores (Singer et al.1972) and represent the ratio of the stronger state in the dyad to the combined capabilities of the two; the variable ranges from 0.5 (parity) to 1 (preponderance). The effect of a higher capability ratio on the likelihood of a MID is debated. There are two perspectives: that parity brings peace or that preponderance brings peace.

Demlow signifies the lower of the two democracy levels in a dyad (the difference between the autocracy and democracy scores in the Polity

data set[12], in which values range from 10 (fully democratic) to –10 (extremely autocratic) for each variable), indicating "shared" dyadic democracy. The effect of a rise in Demlow on the likelihood of a MID is expected to be positive. Hence, a rise in this variable should reduce the likelihood of a MID.[13] To examine the effect of democracy on interstate conflict, the following hypothesis is framed.

Hypothesis 5

H_o*:* An improvement in the extent of democracy in a country's political condition does not reduce the likelihood of interstate conflicts erupting.

H_a*:* An improvement in the extent of democracy in a country's political condition reduces the likelihood of interstate conflicts erupting.

Allies signifies for alliance is coded 1 if dyadic members have in common a defence treaty or military alliance or are linked by an entente or a neutrality pact, and 0 otherwise. Allied countries should face a lower likelihood of a MID than non-allied countries. The hypothesis related to this assertion is given below.

Hypothesis 6

H_o*:* Interstate dyadic alliances do not reduce the likelihood of interstate conflicts erupting.

H_a*:* Interstate dyadic alliances do reduce the likelihood of interstate conflicts erupting.

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[12] The raw data is taken from Polity IV database, which examines each country's level of democracy ranging from full autocracy (-10), to full democracy (+10) (Polity-related database, 2013).

[13] According to Oneal et al. (2003), technically, it is computed using the Polity III data (Jaggers and Gurr, 1995; 1996) to compute a summary measure of the political character of regimes (Dem_i), subtracting from each country's score on the democracy scale its score on the autocracy scale. Because a dispute can result from the actions of a single state, the likelihood of conflict should primarily be a function of the freedom of action enjoyed by the less constrained state in each dyad. Politically, this is the less democratic state (Demlow): the more democratic this state, the more constrained it is from using force, and the more peaceful the dyad will be. In general, if the democracy score of any country is greater than 6, it is considered a democracy, both institutionally and with regard to personal liberties and participation. Similarly, if the democracy score of any country is less than –6 it is considered an autocracy.

National Capability Ratio (NATCAP) like other studies conducted in similar areas of interest, this study considered the National Capability Ratio as an independent variable to represent and measure the balance of power in a dyad. The proxy measure used for this variable is the ratio of the stronger country's national capability to the sum of the two countries' national capability ratios. To measure this variable, the six values of each year's capability components are first summed up. Second, the sum of the absolute values of components of each year is converted into a share of the international system. Third, the share of the international system is divided by the number of observations (six) giving equal weight to each capability component.[14] 1 Then following Singer and Small (1995) and Kimbal (2006), national capability ratio is computed by the ratio of the stronger country's Composite Index of National Capability (CINC) index to the sum of the dyad's Composite Index of National Capability (CINC) indices. Basically, disputes may emerge or be enhanced under the condition that the stronger country intends to take over the weaker country. On the other hand, disputes may not emerge, or may be reduced, in a situation where the stronger country blocks the attacks that may come from the weaker country (Singer and Small, 1995). Actually, national capability component variable reflects the view of the realists, who argue that disputes are subdued through the predominance of power, as supported by similar studies (Bremer 1992; Maoz and Russett 1993).

Hassan (2001) asserts that assessing the effects of economic cooperation on the basis of dyadic relationships has the limitation that it disregards effects that may occur because of third-country effects. Models such as the gravity model used by Hassan (2001), based on the assumption that economic conditions in a dyad depend on the interaction of the two countries, cannot be away from a limitation as the analysis suffers from exclusion of other variables that could have significant influence. This study shares the inherent limitations as its analyses are based on dyadic relationships.

[14] The six capability components widely used in the literature to determine the national material capability ratios are energy consumption, iron and steel production, military expenditure, military personnel, urban population and total population. To compute the national capability ratio of each dyad, this study used the Composite Index of National Capability (CINC) index of each country from the National Material Capabilities data set Version 4.0. The full reference of the data set used in this study is given at the appendix section.

3. Data Analysis

The data collected from various sources has been sorted to examine the hypotheses framed above. A commonly used approach in analysis, binomial logistic regression, was run to test the hypotheses. The estimates of the coefficients of the independent variables are shown in Table 1.

In Table1, Model 1, it can be observed that all the independent variables bear the expected sign, with the exception of the country's dyadic alliance and national capability ratio, with regard to the first hypothesis – that economic openness results in the reduction of interstate disputes. The coefficient estimated for economic openness indicates that it has a reciprocal relationship with interstate disputes, which is statistically significant at less than 5% level in favour of rejecting the null hypothesis and accepting the alternative hypothesis. This implies that the more East African countries are economically open to and integrated with each other, the more remote the likelihood of interstate conflict. The influence of economic openness on interstate disputes without the involvement of the *polity* variable, as shown in Model 2, and without the involvement of the variables of *country's dependence* and *polity* in Model 3, reaffirm the result disclosed in Model 1. It is interesting to observe that when the *country's dependence* and *polity* variables are dropped in the specified models, the magnitude of influence of a country's economic openness in mitigating the onset of military dispute rises. This implies that the economic openness of a country plays a significant role in mitigating the likelihood of interstate conflicts in East African countries. This finding is consistent with those of many others who have carried out similar studies (Oneal and Russett 1997; Gartzke and Li 2003).

Trade liberalisation among a bloc of nations becomes successful and effective if the agreements among countries to reduce tariff and non-tariff barriers focus on those items for which significant trading activities are undertaken. To realise the success of economic openness in the East African region, some lessons can be learned from those regions, such as SAARC, that have some experience in this regard. Hassan's (2001) finding clearly shows that three successive conventions among the member countries of SAARC intended to open their markets and expand trade were not successful, because the agreements were mainly

on those goods and services that were barely traded among them. Hassan adds that economic cooperation can be boosted through active participation by the private sector in economic activities. Moreover, to enhance efficient utilisation of resources, the involvement of the state in the trading activity should be restricted to the minimum possible. Hassan shows that economic cooperation among the member countries of SAARC can be profitable in controlling and managing water, floods and irrigation (Hassan, 2001).

With respect to the effect of a country's economic dependence on international trade in the East African region on the possible eruption of interstate conflict, the study reveals that it has a deterrent effect, indicating that the estimated coefficient bears the expected negative sign. Moreover, the more East African countries become enmeshed through trade and enhance their economic interdependence, the less likelihood there is of interstate disputes in the region: however, the results show that it is not statistically significant, allowing acceptance of the null hypothesis. This could be attributed to the fact that most developing countries' foreign trade, with East African countries no exception, is dominated by primary products directed towards advanced countries. At present, this situation may leave little room for trade relationships between developing countries, though it highlights a potential prospect of reducing interstate disputes in the region. Hassan (2001) posits that inter-industry trade among countries in a region (such as SAARC) that have similar endowments of resources and costs is unlikely, as they have similar comparative advantages and disadvantages in most of the traded items. Despite this fact, member countries of a regional cooperation will have the benefit of obtaining supplies from neighbouring countries at lower transportation costs. Furthermore, the reduced restriction on imports and exports in these countries intensifies competition among them, leading to efficiency, improved quality and reduced costs. Regional economic cooperation stimulates better resource allocation and discourages inefficient firms that have been sheltered by tariffs and quotas.

Other studies support these findings; for example, Gartzke and Li's (2003) results are consistent with the above findings and found the *dependence* variable statistically significant, with a negative sign of the coefficient for both cases of all dyads and politically relevant dyads the study considered.

When we examine the influence of a country's economic dependence on interstate disputes by dropping the *polity* variable as shown in Model 2, the result disclosed in Model 1 of Table 1 is reaffirmed. In fact, even though there is a marginal increase and robust estimated coefficient of economic dependence, it is not statistically significant.

Similarly, as can be seen from Table 1 (Model 1), the improvement in the share of dyadic trade has the effect of mitigating the likelihood of dispute and conflict in the region. The coefficient of the *trade share* variable bears the expected positive sign and the test result indicates it is statistically significant at less than 5% level, leading to the rejection of the null hypothesis. It can be inferred that the more countries in the East African region enhance their mutual trade shares, the smaller the likelihood of interstate conflict in the region. The effect of trade share is also significant in the case of Model 1 (excluding the *country's dependence* variable), and Model 3 (excluding the *country's dependence* and *polity* variables), indicating that East African countries can reduce the likelihood of interstate conflict by enhancing dyadic trade sharing with one another. Dropping the stated variables from Model 2 and Model 3 leads to a reduction by some points in the magnitude of influence of the country's trade share on the reduction of interstate disputes. But the estimated coefficient is robust and has the expected sign, which indicates the strength of trade share in conflict alleviation in the region. The findings of studies by Gartzke and Li (2003) and Goenner (2011) are strongly consistent with this finding.

To boost the trade share of a country in a region various measures should be taken that foster inter-industry trade. To enhance the import-export of Organisation of Islamic Countries (OIC) countries, Hassan et al. (2010) suggest the need to develop financial assistance and credit facilities. Hence, it would be of great importance to consider benchmarking the policies proposed to OIC by Hassan et al. (2010) to strengthen economic integration among the East African countries. The challenges they may face while trading with one another can be minimised by setting a regional clearing house, providing export-credit arrangements and allowing each nation to accept the currencies of the member countries of the region. Furthermore, the member countries need to encourage private-sector involvement in trade and investment.

Table 1: Binomial logistic regression analysis of the relationship between trade, contingent variables and the probability of MID, on dyads 1991–2011 in the East African region

Dep. variable MID onset	Model 1	Model 2	Model 3
Country's Openness			
β	-1.036 **	-1.089 **	-1.151 **
S.E	(0.515)	(0.518)	(0.526)
Wald test	4.045	4.422	4.791
Prob.	0.044	0.035	0.029
Exp (β)	0.355	0.337	0.316
Country's Dependence			
β	-14.078	-14.277	
S.E	(21.026)	(21.015)	
Wald test	**0.**448	0.462	
Prob.	0.503	0.497	
Exp (β)	0.000	0.000	
Country's Trade Share			
β	31.098 **	29.265 **	21.186 **
S.E	(13.214)	(13.077)	(8.916)
Wald test	5.539	5.008	5.646
Prob.	0.019	0.025	0.017
Exp (β)	3.205E+12	5.122E+12	1.588E+9
Country's Dyadic Alliance			
β	2.326 ***	2.324 ***	2.656 ***
S.E	(0.744)	(0.744)	(0.749)
Wald test	9.782	9.753	12.568
Prob.	0.002	0.002	0.000
Exp (β)	10.232	10.221	14.238
Country's Polity Score (Dem/Auto)			
β	- 0.043		
S.E	(0.039)		
Wald test	1.246		
Prob.	0.264		
Exp (β)	0.958		
Country's National Capability Ratio			
β	3.442 ***	3.249 ***	3.287 ***
S.E	(0.754)	(0.739)	(0.735)
Wald test	20.852	19.331	19.983
Prob.	0.000	0.000	0.000
Exp (β)	31.237	25.767	0.001
Constant			
β	- 6.940	- 6.570	- 6.899
S.E	(1.052)	(0.995)	(1.012)
Wald test	43.554	43.625	46.517
Prob.	0.000	0.000	0.000
Exp (β)	0.001	0.001	0.001
N	1176	1176	1176

Note: The asterisks indicate statistical significance: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
Figures appearing in parentheses signify standard errors.
Data sources are given in the Appendix.

Africa in general and East Africa in particular need to explore potential financial sources to mitigate the financial constraints on boosting economic integration. With regard to the objective of economic integration, forming partnerships with already established regions within and outside the continent can have the advantage of getting financial support. This is supported by Naqvi (1998) and Hassan (1999), who contend that, to expand regional markets for the OIC countries, sub-Saharan African countries' markets should be boosted by an improvement in per capita income. This can be done by supporting sub-Saharan Africa with financial resources from the relatively wealthy countries. Sub-Saharan African countries can be assisted by granting them low interest-bearing loans, investment through equity capital and through grants.

Examining the experience of other regional blocs, Hassan and Islam (2001) found that intraregional trade within the OIC countries is not only low, but also highly dependent on industrialised countries. To boost economic cooperation among OIC countries and become beneficiaries of trade creation, they suggested removing tariff and non-tariff barriers. Structural transformation in the region would enable OIC to reap the advantages that arise from backward and forward linkages, besides enhancing the region's competitiveness. Furthermore, to stimulate intra-OIC trade and technology transfer, obtain the advantages of economies of scale, and increase both local and regional markets, it is suggested that OIC should work in partnership with WTO, APEC, EU, ASEAN and NAFTA. To speed up the move towards structural transformation and sustain economic growth in the region, the wealthier countries should invest their surplus capital in the form of long-term direct investment or short-term portfolio investment. This will develop and strengthen the region's capital markets. In the same token, apart from intraregional integration, East African countries need to work in cooperation with established international and regional blocs.

Alliances between two countries are considered to have a deterrent effect on the possibility of interstate conflict in the region. However, the study reveals the opposite, as shown in Model 1 of Table 1. The greater the dyadic alliance among the countries of the East African region, the higher the likelihood of conflict. The sign of the coefficient is not the expected one, even though it is statistically significant. This may demand further investigation of the effect of an alliance in disaggregated

form that deals with the specific dimensions of the alliance. Similarly, the effect of dyadic alliances is also statistically significant in the case of Model 1 (excluding *country's dependence* variable) and Model 3 (excluding *country's dependence* and *polity* variables) but the coefficients in all the models do not bear the expected usual conceptual sign.

Moreover, dropping the specified variables from the equations resulted in an increment by some points of the estimated coefficient, strengthening further its influence on interstate conflict. It is surprising to see that this finding is consistent with that of Oneal et al. (2003), suggesting that allied states have a greater incidence of disputes than do non-allied states, in which their result is statistically significant at 1%. They argue that alliances evidently do not just produce bonds of security, but also create a basis for misunderstanding and disagreement about institutions, decision-making procedures, burden-sharing and strategy. They further explain that even though an alliance has a constraining effect on the use of force in many cases, it also plays the role of creating "salience and/or the ease of interaction" (see Siverson and Starr 1991:93; Bueno de Mesquita 1982; Kinsella and Russett 2002). Furthermore, Oneal and Russett (1997, 1999) argue that forming an alliance with a major power is hazardous and risky. This is because major powers may be tempted to use force against smaller allies to enforce their spheres of influence and assert their sole interests.

On the contrary, Oneal and Russett (1997) reveal quite inconsistent findings that the formation of an alliance provides a strong support for peace by increasing the constraint on the use of force. A study by Long (2003) also shows that the coefficient for the variable measuring the *alliance* variable turned out to be positive, but not statistically significant.

As far as the *polity* variable is concerned, the study disclosed that the effect of the level of democracy in a country on the conflict is inversely related, as expected. However, the test result indicates that it is not statistically significant. Similarly, the polity score of the East African nations included in this study is in its infancy, though some countries have shown an improvement over time. Therefore, the improvements exhibited by some countries may not suffice to explain at a significant level the interstate disputes that happen in the region. There is an

encouraging pattern in this regard, which still demands much in the polity area for it to make a significant contribution on conflict.

Interestingly, a finding consistent with this is revealed by Daxecker (2011): that joint democracy is positive and significant (albeit weakly), suggesting it is more likely for rival dyads with democratic regimes to experience interstate conflict. Daxecker supports this finding with the argument that rivalries are primarily driven by the dynamics of autocratic states. This could be attributed to the utilisation of a small number of rivalries in the data set are jointly democratic, and the finding may thus be the result of outliers. However, the finding of Keschk et al (2010) is inconsistent with the finding of this study, showing that an improvement in democracy status has a constraining effect on the likelihood of interstate disputes.

Other scholars have a different view: that the presence of diversified political governance structures within a regional bloc can be a barrier to cooperation. Hassan and Islam (2001) state that there is significant variation in the political situations within the OIC countries, which range from democracy to monarchy to military rule. Such diversity in political governance could lead to contradictions and conflict among the OIC countries.

With regard to the national capability ratio, the finding reveals that it has a positive effect on interstate conflict in the region. This implies that the more the nations of the East African region boost their national capacity (power preponderance), the more conflict occurs in the region, rather than the other way round. In contrast, a study by Oneal and Russett (1997) reveals that increasing the capability ratio also reduces the incidence of disputes. The result shown in the case of Model 2 (excluding *country's dependence* variable), and Model 3 (excluding *country's dependence* and *polity* variables) strengthens further that of Model 1, thereby increasing the estimated coefficient of the national capability ratio by some points, leaving the sign unchanged.

It can be summarised from Model 1 that the degree to which the likelihood of conflict is reduced rises through enhancement of a country's trade share, followed by national capability and economic openness in descending order.

To examine the existence of multicollinearity on the independent variables, a Pearson correlation was run and the results are shown in Table 2. As can be seen from Table 2, there is no problem of multicollinearity in almost all of the cases, with the exception of dyadic countries' *economic dependence* and *trade share* variables. To avoid possible collinearity problems in this regard, the country's *economic dependence on trade* variable has been omitted from the logistic regression and Model 3 has been designed to investigate the actual effect of the independent variables on interstate conflict in the region.

Table 2: Correlation matrix between the independent variables, 1991–2011

	Openness	**Dependence**	**Trade Share**	**Dyadic Alliance**	**Polity (Dem/Auto)**	**Nat Cap Ratio**
Openness	1.000					
Dependence	- 0.103	1.000				
Trade Share	0.184	- 0.713	1.000			
Dyadic Alliance	- 0.011	0.146	0.016	1.000		
Polity (Dem/Auto)	- 0.090	- 0.011	-0.122	- 0.004	1.000	
Nat Cap Ratio	0.163	0.118	0.027	0.008	- 0.217	1.000

The test result for negative two-log likelihood and the Nagelkerke R Square are shown in Table 3, which indicates that the parameters are useful to the specified model.

Table 3: Negative two-log likelihood and the Nagelkerke R Square of the models

Model	**2-log likelihood**	**Nagelkerke R Square**
Model 1	605.158	.131
Model 2	606.428	.129
Model 3	607.668	.127

4. Conclusion

This study investigated the effect of the identified important dimensions proxied on interstate conflicts using a thorough analysis and a series of hypotheses tests. As a result the following conclusions are presented.

The study has shown that economic openness among the East African countries has a strong and significant constraining effect on the likelihood of militarised interstate conflict in the region. Moreover, the findings of this study, which deals with East Africa, are consistent with studies made at a global level.

Enhancing dyadic trade and boosting trade share among countries in the East African region will have a significant effect in reducing the likelihood of conflict in the region. This implies that trade interdependence in the region is one of the fundamental mechanisms that play a significant role in inhibiting the onset of militarised interstate conflict. However, increasing the dependence of a nation's economy on trade alone is expected to have a constraining effect on militarised interstate conflict, though it is not statistically significant in the region in the present scenario.

The dyadic alliance in the East African region is associated favourably with the initiation of conflict, with the implication that the stronger the dyadic alliance among the countries, the higher the likelihood of initiation for conflict. Hence, the alliances should be designed with utmost caution in a way that maintains some distance that keeps the integrity and freedom of making solitary decision of a nation in the region to form an alliance.

Moreover, the study reveals that the increase in democracy and national capability of the countries in the region has an accelerating effect on the likelihood of interstate conflicts. The power preponderance of a nation leads to the initiation of conflict in the region.

It can be stressed that the enhancement of economic openness and dyadic trade share will go a significant long way to inhibit the likelihood of the initiation of conflict in the region. It is high time for

the concerned bodies to give due consideration to establishing international trade-oriented strong partnerships among the East African countries to create a significant barrier to the likelihood of conflicts in the region.

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Appendix: Data Sources

Trade-related data:

International Monetary Fund, Direction of Trade Statistics, Year Book (various issues)

International Monetary Fund, International Financial Statistics, Year Book (various issues)

Economist Intelligence Unit, Country by Country: Forecasts of political and economic trends in over 180 countries (various issues)

Global Economics, Country by Country: Forecasts of political and economic trends in over 180 countries (various issues)

World Bank Book, Trends in Developing Economies (various issues)

CIA World Fact Book

International Marketing Data and Statistics (various issues)

Interstate conflict-related data:

Ghosn, Faten, Glenn Palmer, and Stuart Bremer. (2004) "The MID3 Data Set, 1993–2001: Procedures, Coding Rules, and Description", *Conflict Management and Peace Science* 21:133–154.

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Center for Systemic Peace, available at: www.systemicpeace.org

National Capability Index-related data:

Singer, J. David, Stuart Bremer, and John Stuckey. (1972) "Capability Distribution, Uncertainty, and Major Power War, 1820–1965" in Bruce Russett (ed.) Peace, War, and Numbers, Beverly Hills: Sage, 19–48. (Version 4.0)

Alliance-related data:

Gibler, Douglas M. (2009) International military alliances, 1648–2008. CQ Press. (Version 4.1)

Polity-related data:

Marshall, M.G., T. R. Gurr, and K. Jaggers. (2013) Polity IV Project: Political Regime Characteristics and Transitions, 1800–2012 (Polity IV Data Series version 2013).

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The Impacts of Zakat and Knowledge on Poverty Alleviation in Sudan: An Empirical Investigation (1990-2009)

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Poverty, ignorance, and sickness constitute the main threats to development in the Less Developed Countries (LDCs). In spite of the efforts exerted to reduce poverty and inequality, poverty is still widespread in Sudan. This study aimed at examining from an empirical point of view, the roles of zakat and knowledge in reducing poverty in Sudan during the period (1990-2009), using data collected from the Central Bureau of Statistics (CBS) and Abdelmawla (2010). Two policy variables are incorporated in the empirical model namely, the percentage spent on poor out of total zakat funds and educational attainment (proxy for knowledge). By applying the Ordinary Least Squares (OLS) technique, the results obtained signify that zakat and educational attainment impact significantly at the 1% level on reducing poverty in Sudan. The study recommends increasing educational attainment rates and improving the quality of education, which requires among other things, increasing expenditure on education at all levels, beside the care for adult literacy classes. In addition to that, raising the percentage spent on the poor out of total zakat funds is highly recommended to reduce inequality in the distribution of income. Income support should particularly be used for the part of the population with special needs.

1. Introduction

Poverty is an extremely complex and multidimensional phenomenon. A comprehensive definition of poverty was given in the World Summit for Social Development held in Copenhagen (March 1995) indicating that "Poverty has various manifestations including lack of income and productive resources sufficient to ensure sustainable livelihood, hunger and malnutrition, ill health, limited or lack of access to education and other basic services, increased morbidity and mortality from illness,

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homelessness and inadequate housing, unsafe environments, and social discrimination and exclusion. It is also characterized by lack of participation in decision-making, as well as in civil social and cultural life".

Anti-poverty programs can be broadly classified into two strategies: (a) Indirect Strategies: that formulate a macro-economic policy framework to ensure sustainable growth, higher employment, higher per capita income, and eventually reduce poverty; and (b) Direct Strategies: that target the underprivileged population and provide them necessary assistance to ensure credit access, improve health conditions, increase literacy rate and ultimately eradicate poverty (Pramanik, 1993).

The Islamic economy identifies individual differences among people as each person is endowed with different types and levels of human abilities. Thus, even though individuals are provided with equal opportunities, the economic status of two individuals may not be equal. Therefore, poverty cannot be alleviated simply through income redistribution or ensuring equitable opportunities for all. An Islamic approach to poverty alleviation would ideally involve a holistic approach including a set of antipoverty measures: (a) increasing income level with pro-poor programs, (b) achieving an equitable distribution of income and (c) providing equal opportunities for all social segments (Hassan, 2006).

Poverty is still widespread in Sudan in spite of the efforts exerted to reduce its incidence. According to the more recent survey; the National Baseline Household Survey (NBHS, 2009), 46.5% of the population of Northern Sudan is found to fall below the poverty line, with 26.5% of the urban population and 57.6% of the rural population. Out of the population of Southern Sudan, 50.6% is found to fall below the poverty line, with 24.4% of the urban population and 55.4% of the rural population.

The ultimate objective of this study is to examine from an empirical point of view, the roles that could be played by zakat and knowledge in reducing poverty in Sudan. A multiple regression model is specified using the percentage spent on poor out of total zakat funds and educational attainment as explanatory variables and the incidence of poverty (the Head Count Index) as the dependent variable. The study

employed data covering the period (1990-2009), which are collected from the Central Bureau of Statistics (CBS) and Abdelmawla (2010). The hypotheses of the study can be summarized as follows: Both zakat and educational attainment have negative impacts on the incidence of poverty in Sudan.

Poverty reduction is one of the main objectives of development policies in the LDCs. In particular, poverty alleviation is the first goal of the Millennium Development Goals (MDGs).

By applying the Ordinary Least Squares (OLS) technique, the results of the study indicate that zakat and educational attainment impact significantly on reducing poverty in Sudan. The elasticity of the head count index with respect to changes in educational attainment and zakat are estimated at (- 0.94) and (- 0.26), respectively. The study recommends increasing educational attainment rates and improving the quality of education through increasing expenditure on education at all levels, beside the care for adult literacy classes. Raising the percentage spent on the poor out of total zakat funds is highly recommended to reduce inequality in the distribution of income. Income support should particularly be in favour of the population with special needs.

The remainder of the paper is organized as follows: Section (2) reviews literature, while section (3) gives a background about the poverty profile in Sudan. Section (4) illustrates the methodology and data used in the study, while section (5) discusses the empirical results and policy implications of the findings. Finally, some concluding remarks are reported in section (6).

2. Literature Review

Poverty usually refers to deprivation of wellbeing. There are many factors that cause poverty and various approaches to explain the concept. The study conducted by Rowntree (1902) has been described as the first scientific study on poverty. He defined the poverty line by estimating the monetary requirements for a nutritionally adequate diet together with estimated needs for clothing and rent. Those whose incomes fall below this line are classified as being in primary poverty. Furthermore, households who are seen to be living in “obvious want and squalor”

were classified as being in secondary poverty, despite being above the defined poverty line.

The European Commission definition adopted in (1985) states that "the poor shall be taken to mean persons, families and groups of persons whose resources are so limited as to exclude from the minimum acceptable way of life in the member states in which they live".

Poverty can be defined as a failure to achieve certain minimal or basic capabilities, where “basic capabilities” are the ability to satisfy certain crucially important functionings up to certain minimally adequate levels (Sen, 1993).

Ravallion (1998) defined the poverty line as the “minimum cost of the poverty level of utility”. To give this definition a more practical meaning, Ravallion (1998) suggested two approaches for measuring the poverty line: one is the food Energy Intake method, which essentially amounts to a nutritionally based poverty line; the other is a “cost of basic needs” line, either starting with food and adding non-food components, or starting with a list of basic needs and costing them.

The World Bank (2000) defined poverty as “Lack of resources, bad social relations, insecurity and vulnerability, low self-confidence, and powerlessness … Income poverty can be distinguished from health poverty, education poverty, and security poverty”.

According to Hassan (2010), poverty in Islam is defined as a state whereby an individual fails to fulfill any of the five basic human requirements of life namely, religion, physical self, intellect or knowledge, offspring, and wealth. Along the same line, Khan (2013) argued that poverty in Islam is defined by five groups of activities and things which make up the human needs namely, religion , physical self, intellect or knowledge, offspring, and family and wealth. The fulfillment of these needs is considered one of the basic goals of Islam. So, poverty in Islam is related to the concept of the necessities mentioned above. An individual is considered poor if he does not possess sufficient necessities to fulfill his basic needs in each of the five foundations for good individual and social life.

There are various instruments through which poverty can be reduced or eliminated. These include among others, economic growth, micro-finance, expenditure on education and health, zakat, takaful (solidarity), good governance and Waqf. With regard to the relationship between public policy and poverty reduction, Kakwani (1993) argued that for different classes of poverty measures, any policy that aims at increasing the mean income of the population would reduce poverty for a given level of income distribution. On the other hand, he has also shown that, under mild conditions and for a wide class of poverty measures, greater inequality leads to greater poverty. Since any given public policy that aims at changing the mean income of the population may also change income distribution in either direction, the final impact of such policy on poverty can only be assessed from an empirical investigation.

The World Bank (2004) argued that despite the fact that Governments devote about one third of their budgets to health and education, very little of it goes to the poor. Even if funds are dedicated to the poor people, the weak systems of incentives and delivery largely explain the lack of a consistent relationship between changes in the structure of public spending and poverty.

Using econometric methods, Dollar and Kray (2001) examined the impact of macroeconomic stability and fiscal discipline on poverty by taking into consideration certain components of public policy such as expenditure on health and education. They took China, India and some other large developing countries as case studies for different periods, namely, 1970s, 1980s, and 1990s. Their findings suggest that many supposedly "pro-poor" policies such as public expenditure on health and education do not have any significant impact on the income of the poor. They argued that social spending in developing countries often benefits the rich and middle elapses more than the poor. Therefore, a higher share of social spending on items such as health and education will not be reflected in higher incomes for the poor. In contrast, income of the poor seems to respond systematically to pro-growth policies such as fiscal discipline, macroeconomic stability, good rule of law and openness to international trade. They concluded that these pro-growth policies should be at the heart of any program aiming at poverty eradication.

Many countries have established micro-credit (micro-finance) programs with the explicit objective of reducing poverty by providing small amounts of credit to the poor to help them finance income-generating activities through self employment (World Bank, 1996). Grameen Bank in Bangladesh, founded in 1976 as a project and then transformed into a specialized bank in 1983, is the best-known micro-credit program. By 1994, the Bank had mobilized more than two million members, 94 % of them were women, and achieved a loan recovery rate of more than 95 % (Quoted in Sayed, 2006).

Zakat is a levy of 2.5% on wealth for the amelioration of all forms of social security and charity in an Islamic community. Zakat as an instrument of equitable distribution that purifies wealth from selfish covetousness and brings about equality and social harmony out of good-will, also causes wealth to increase manifold. These conjoint blessings of social purification and economic enhancement of wealth are seen as automatic socio-economic multipliers for an economy where poverty and needs persist, and where the natural endowments of an agrarian economy cause depressed earnings. The economic causes of poverty, rather than the cause of indolence, are the targets for alleviation through Zakat, just as it is also a social spending to secure the welfare of the old, the sick and the needy. An important socio-economic area where hardly any work has been done in the literature on Zakat is the positive role it can play in poverty alleviation by removing distress and below subsistence wages for non-wage labour. The result of this positive effect of Zakat appears to be the generation of productive economic activity in the non-wage sector. If that is indeed the poverty alleviating effect of Zakat on low wage labour, then it should certainly be adopted as a serious socio-economic policy instrument and institution in economies where non-wage labour abounds (Choudhury and Hassan, 2001).

Zakat, which is one of the five pillars of Islam, can play a role in policies of redistribution of assets and opportunities, thereby reduce poverty. The impact of Zakat towards the poor is described as follows: zakat must be given as a direct transfer payment to the poor. The hope is the poor are sufficient enough to take care of their basic needs. Accordingly, they are able to establish their own means of livelihood, utilizing a combination of their own human and material resources by zakat given. The zakat distribution, therefore, not only raises the income of the poor and their capital but also raises their ability to make

responsible decisions concerning the use of their income. The improvement in the income of the poor will lead to increase in their consumption of goods and services, and raising their opportunity to access educational facilities, health, nutrition, and in general, improvement in the welfare of poor families. These improvements are commonly a major requirement in increasing the productivity of the poor (Kusuma and Sukmana, 2010).

Hassan (2014) argued that Islamic principles of poverty alleviation are based on the Islamic views of social justice and the belief in Allah Almighty. Islamic approach involves a holistic approach with set of anti-poverty measures. Poverty Eradication Scheme of Islam includes positive measures, preventive measures, and corrective measures. The positive measures include income growth, functional distribution of income, and equal opportunity, while the preventive measures include control of ownership and prevention of malpractice. The instruments of the corrective measures are compulsory transfer (Zakat), recommended transfer (charity), and State responsibility.

One of the successful examples in poverty reduction in the Case of Tunisia. According to (Friedman, 2010; World Bank, 1995), Tunisia reduced the proportion of people living on less than $1 per day from 5.9% in 1990 to 1.4% in 2005—a 76.3% drop. The country's consistent economic growth of about 5% over the past two decades and long-standing commitment to social and physical development have played an important role. Commitment to long-term infrastructure development across rural and urban areas supported better distribution of the benefits of growth. The promotion of irrigated farming covering more than 4,000 square kilometres for producing olive oil, grains and citrus fruits is also vital. Agricultural development, especially in rural areas, promoted self-sufficiency, generating employment and improving living conditions. Over the years, even during fiscal austerity, the government protected the public expenditures in social sectors, including welfare for the vulnerable and marginalized. The government has several safety nets, including: food subsidies targeted to the poor through self-selection mechanisms using quality differentiation; direct transfers, in cash and kind, targeted to the needy (the elderly, the disabled, schoolchildren and needy families); and public works programs that provide short-term jobs for unskilled workers, in both urban and rural areas, through self-targeted mechanisms, such as setting wages below the minimum wage and locating the work sites in predominantly poor areas. These interventions have helped alleviate

poverty. But despite the progress, the interventions need better targeting and the programs need to be implemented more efficiently.

3. Poverty Profile in Sudan

In spite of the efforts exerted to reduce poverty and inequality in the distribution of wealth, poverty is still widespread in Sudan as the case in many African and Arab countries. A number of surveys and studies have been conducted to raise the issues of poverty and inequality in Sudan, some of which are reviewed in what follows.

Using data of the 1992 Poverty Survey, Nur (1992) calculated the poverty indicators for urban and rural areas of Sudan on the basis of both income and expenditure. The results of his study reveal that, with the exception of the relative deprivation indices, all other poverty measures computed on the basis of expenditure in urban areas are smaller than those obtained on the basis of income. The head count index was estimated at 74.4% with expenditure and at 83.0% with income. With regard to the poverty-gap index, the average income and average expenditure of the poor are short of the poverty line by 74% and 60%, respectively. The Gini-coefficient which captures the degree of inequality, was estimated at 0.7 for income and at 0.8 for expenditure. Regarding rural areas, Nur (1992) observed that all poverty measures computed on the basis of the expenditure are smaller than those computed on the basis of income. On the basis of expenditure only 61.3% of the rural people are poor, and their average income is short of the poverty line by 58.3%. Furthermore, the Gini-Coefficients with expenditure and income were estimated at 0.551 and 0.527, respectively.

By adopting the "before and after" approach, Ali (1994) examined the effect of Structural Adjustment Programs (SAPs) and liberalization policies on poverty in Sudan. The study compared the trends in poverty between three periods, namely 1968-1978, 1978-1986, and 1986-1993, where the year 1978 marked the era before the implementation of the SAPs. The results revealed that poverty in Sudan has increased rather substantially between 1978 and 1993. The number of the poor as a proportion of total population (i.e. the head-count index) has increased from 52% in 1968 to 54% in 1978, to 78% in 1986, and further to 91% in 1993. The study concluded that the SAPs have a direct negative effect on the poor in Sudan. The compound impact of SAPs (1978-1985) and

the liberalizations policies (1990-1993) was to increase the head count index by 29%, 54% and 33% in rural areas, urban areas, and the whole of Sudan, respectively. Furthermore, the poverty gap index increased by 28%, 26% and 38% in rural areas, urban areas, and the whole of Sudan, respectively.

Ali (2004) adopted a Millennium Development Goal (MDG) framework to explore the question of the required growth and investment rates to reduce poverty by half over two alternative time horizons (10 and 15 years starting 2005) in post-conflict Sudan. The results of his study reveal that the required GDP growth rate ranges between 7.9 to 6.2 percent per annum with corresponding required investment/GDP ratios of 0.34 and 0.26 for the shorter and longer time horizons, respectively. Southern Sudan requires an investment rate of about 157% of its GDP, while the investment rate for the North is about 20% of its GDP. The above financing requirements for a country emerging from a long civil war, and aiming at reducing poverty by half within a reasonable time horizon, imply that development policy needs to be anchored on a long-term comprehensive development strategy. The major challenge for the design of relevant development policy in the context of such a strategy is obviously that of increasing the current, rather modest, investment rate. Such policies would require enhancing the domestic saving capacity of the economy, attracting foreign direct investment, and mobilizing foreign assistance. But the design of relevant policies will also need to recognize the constraints, or opportunities, already agreed to in the context of the various agreements and protocols signed in the context of the peace process.

Sayed (2006) assessed the impact of poverty alleviation programs of the NGOs working in Sudan, with reference to those implemented by the Agency for Co-Operation and Research in Development (ACORD) in eastern Sudan, where poverty is known to be widespread. Preliminary statistical results obtained suggest that there is a statistically significant difference between the mean income of the beneficiaries and that of non-beneficiaries in favor of the former group, suggesting that the intervention program implemented by ACORD has led to a significant improvement in the incomes of at least some of the beneficiaries. The Gini coefficients are estimated at 0.42 and 0.44 for the beneficiaries and non-beneficiaries, respectively, which are not significantly different from each other. Based on income and expenditure as welfare indicators

as well as the objective and subjective poverty lines, Sayed (2006) calculated the incidence, depth and severity of poverty indices. On the basis of the objective poverty line, the three poverty measures for the beneficiaries were estimated at 76%, 40% and 26%, respectively, while for the Non-beneficiaries they were 82%, 43% and 27%. On the other hand, using income as a welfare indicator the three measures for the beneficiaries were estimated at 70%, 36% and 22%, respectively, while for the non-beneficiaries they were 92%, 53% and 38%. On the basis of the subjective poverty line, with expenditure as a welfare indicator, the three measures for the beneficiaries were estimated at 78%, 42% and 27%, respectively, while for the non-beneficiaries they were 84%, 46% and 29%. On the other hand, with income as a welfare indicator, the three measures for the beneficiaries were calculated at 72%, 38% and 24%, respectively, while for the non-beneficiaries they were 94%, 57% and 39%.

Mahran (2007) made an attempt to identify the most promising public policy and related policy tools for accelerated poverty reduction in Sudan over the period (1971-2002). The analysis focused on public policies that more likely spur economic growth, improve income distribution, and reduce poverty. In addition to investment, the public policy variables considered in the analysis include government current expenditure, development expenditure, and expenditure on social services, while development expenditure is also disaggregated according to economic sector. The results for the period 1971-2002 suggest that with the exception of investment and government current expenditure, all other public policy variables considered in the analysis have had no significant effect on growth and hence on poverty reduction. These results are attributed to a host of problems that the economy has encountered during the last three decades, which culminated in its dismal performance. Based on these results, it is argued that more attention should be given to investment with emphasis on industry, a potentially more promising sector for growth. With carefully articulated forward and backward linkages between different sectors, industrial development could play a pivotal role in overall growth and in poverty reduction. Given widespread poverty, this role could be even more important for balanced regional development, which is vital in any meaningful strategy that aims at reducing widespread poverty. The emerging oil sector, together with adequate and reliable infrastructure, could play an instrumental role in this process. It is also observed that all

poverty indices are more responsive to inequality than to income growth. As such, public policies geared toward poverty reduction should focus more on improving income distribution.

The Central Bureau of Statistics of the Republic of the Sudan conducted the National Baseline Household Survey during May and June 2009 to assess the current living standards of the population. While consumption is only one dimension of welfare, it is arguably an important one that shows whether an individual has enough monetary resources to meet his needs. The poverty line for Northern Sudan was calculated at 113.8 SDG per person per month. 46.5% of the population of Northern Sudan is found to fall below the poverty line, with 26.5% of the urban population and 57.6% of the rural population falling below the poverty line. Poverty gap and severity of poverty in Northern Sudan are estimated at 16.2% and 7.8%, respectively. Khartoum is the region with the lowest poverty incidence, followed by Northern. Eastern and Central rank third, while Kordofan and Darfur are the poorest regions. Poverty levels vary greatly by state. The incidence of poverty ranges from 26% in Khartoum to 69.4% in North Darfur. Table (1) illustrates the indicators of poverty in the Northern States of Sudan.

The Southern Sudan Center for Census, Statistics and Evaluation (SSCCSE) conducted the National Baseline Household Survey (NBHS, 2009). The poverty line for Southern Sudan was calculated at 72.9 SDG per person per month. Out of the population of South Sudan, 50.6% is found to fall below the poverty line, with 24.4% of the urban population and 55.4% of the rural population. The Greater Bahr Al Gazal region is the poorest among the three regions, with 61.6% of the population classified as poor, while the Greater Upper Nile and Greater Equatoria regions have remarkably similar levels of poverty of 43.7% and 45.2%, respectively. Poverty levels vary greatly by State. The incidence of poverty ranges from one fourth in Upper Nile to three fourths in Northern Bahr Al Gazal as shown in table (2).

Table 1: Poverty Indices in Northern Sudan, 2009

State	Incidence of Poverty (%)	Poverty Gap (%)	Severity of Poverty (%)
Northern	36.2	10.5	4.2
River Nile	32.2	8.8	3.5
Red Sea	57.7	24.9	13.7
Kassala	36.3	14.7	8
Gadarif	50.1	15.9	6.7
Khartoum	26	6.4	2.4
Gezira	37.8	10.1	4.1
Sinnar	44.1	14	6.4
Blue Nile	56.5	20.6	9.9
White Nile	55.5	17.6	7.8
North Kordofan	57.9	24.6	13.1
South Kordofan	60	20.7	9.4
North Darfur	69.4	27.4	14.2
West Darfur	55.6	19.8	8.9
South Darfur	61.2	24.5	12.7

Source: Central Bureau of Statistics (2010): National Baseline Household Survey (2009), Khartoum, Sudan.

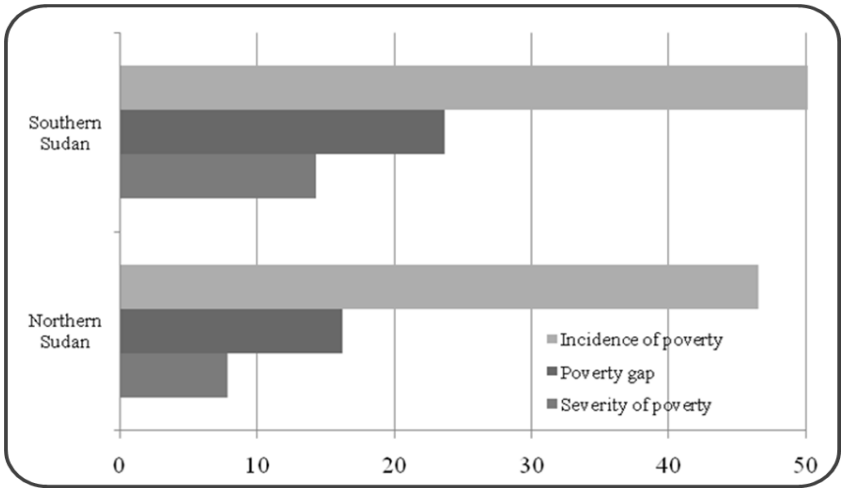
Table 2: Poverty Indices in Southern Sudan, 2009

State	Incidence of Poverty (%)	Poverty Gap (%)	Severity of Poverty (%)
Southern Sudan	50.6	23.7	14.3
Urban	24.4	8.8	4.6
Rural	55.4	26.5	16.1
Greater Upper Nile	43.7	19.9	11.7
Greater Bahr Al Gazal	61.6	30.5	18.8
Greater Equatoria	45.2	19.9	11.9
Upper Nile	25.7	9.8	5.0
Jongolei	48.3	22.2	13.1
Unity	68.4	34.6	21.7
Warrap	64.2	34.1	22.2
Northern Bahr Al Gazal	75.6	36.8	21.9
Western Bahr Al Gazal	43.2	17.6	9.5
Lakes	48.9	22.6	13.6
Western Equatoria	42.1	15.5	7.9
Central Equatoria	43.5	22.5	15.4
Eastern Equatoria	49.8	19.8	10.5

Source: SSCCSE (2010): National Baseline Household Survey (NBHS, 2009).

As shown in figure (1), all poverty indices are higher in Southern Sudan than in Northern Sudan. The severity of poverty in the South is almost as twice as that in the North.

Figure 1: Poverty Indicators in Northern and Southern Sudan, 2009



Source: CBS and SSCCSE (2010): National Baseline Household Survey (2009), Khartoum and Juba.

4. Methodology and Data

This section outlines the research methodology that will be used in the analysis of the findings. As indicated earlier, the ultimate objective of the present paper is to examine from an empirical point of view, the impacts of zakat and knowledge on reducing poverty in Sudan during the period (1990-2009). The empirical model to be estimated takes the following general form:

$$H = F(Z, E) \quad (1)$$

Where:

H: Head count index.
Z: The percentage spent on poor out of total zakat funds.
E: Educational attainment rate (proxy for knowledge).

Zakat is one of the five pillars of Islam and one of the social safety nets. Islam establishes zakat as a compulsory for all well off Muslims.

According to the Quran: "The Zakat is meant only for the poor and needy, those who collect the tax, those whose hearts are to be won over, for the freeing of human beings from bondage, for the relief of those overwhelmed by debts, for the cause of God, and for the wayfarer: [this is] an ordinance from God- and God is All- Knowing, Wise". Zakat is a unique instrument for poverty alleviation as wealth is transferred from well-off people to worse-off people. In fact, zakat can play a role in policies of redistribution of assets and opportunities, capacity building and wealth creation, and extending income support. These outcomes in turn help reduce the spread of poverty. Thus, the coefficient of the percentage of zakat spent on poor out of total zakat fund is expected to be negative.

On the other hand, knowledge is considered as a crucial input for the development, a prerequisite for employability and an instrument for fighting social exclusion. Knowledge increases the workforce productivity and hence their incomes will rise. Since income is one of the indicators of welfare, the increased incomes will help induce welfare and reduce poverty. Thus, educational attainment is also expected to impact negatively on the incidence of poverty in Sudan (Head Count Index).

Data on the variables of interest are compiled from the Central Bureau of Statistics (CBS), Khartoum, and Abdelmawla (2010). As is well known, poverty surveys at national level are conducted from time to time because they are costly. According to Elmuluthum (1999), the head count index (P_0) in Sudan in 1986 and 1993 are estimated at 78% and 88.1%, respectively. Based on the most recent survey conducted by the CBS and SSCCSE (2009), the head count index is estimated at 46.5% for the Northern Sudan and at 50.6% for the South, the weighted average of which gives an estimated (P_0) of 49% for Sudan. Based on the values of (P_0) for the years 1986, 1993 and 2009 and using the growth rate of two end points, the head count index is estimated for the period under consideration since there are no time series data available. Educational attainment rate which is proxy for knowledge, is measured by the adult literacy rate (with two-thirds weight) and the combined primary, secondary and tertiary gross enrollment ratio (with one-third weight).

The next section reports the empirical results of the study.

5. The Empirical Results

To accomplish the research objectives, we firstly begin with providing some descriptive statistics for the study variables as given in table (3), where (L) denotes adult literacy rate.

Table 3: Descriptive Statistics for the Study Variables (1990-2009)

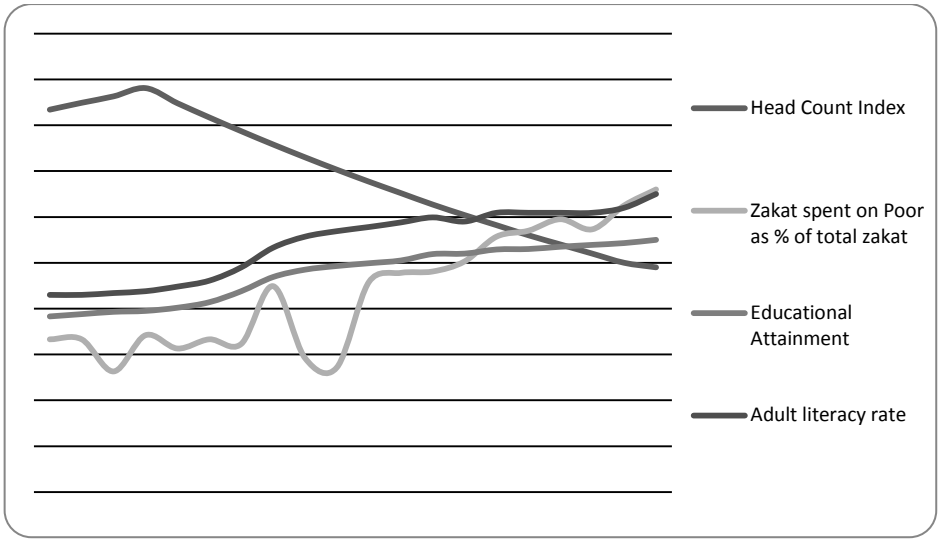
Indicator	Average	Standard Deviation (SD)	Coefficient of Variation (C.V)
H	69.1	13.3	0.192
Z	43.8	12.9	0.295
E	47.6	6.0	0.126
L	54.3	7.7	0.142

Source: Own Calculations based on data of the appendix.

It is clear from table (3) that the percentage spent on poor out of total zakat funds and the head count index in Sudan are highly volatile compared to other variables, with estimated coefficients of variation of (30%) and (19%), respectively. The average incidence of poverty is estimated at 69%, indicating that on average, over two third of the population are classified as poor. While the classification according to the average adult literacy rate puts Sudan in the medium category, the average educational attainment is below 50%, indicating that Sudan realized a low achievement in knowledge.

Figure (2) illustrates the trends in the study variables. It is clear that the incidence of poverty in Sudan is decreasing over time, while knowledge indicators exhibited steady improvements. The percentage spent on poor out of total zakat funds increased significantly after 1999, the period which witnessed the oil exports.

Figure 2: Trends in the Incidence of Poverty, Zakat and Knowledge Indicators in Sudan, 1990 – 2009



Source: Based on data of the appendix.

Before estimating the log linear form of the empirical model, it is important to test for the stationarity of the variables. The unit root test can be applied using the Augmented Dickey – Fuller (ADF) test, which is based on the t-statistic. The results are reported in table (4), where the figures inside the parentheses are the P-values.

Table 4: Results of the Unit Root Tests for the Study Variables: ADF t-Statistic for the First Difference

Variable	Intercept	Coefficient
Ln H	-4.20 (0.000)	-5.83 (0.000)
Ln Z	1.83 (0.089)	-5.02 (0.001)
Ln E	1.54 (0.145)	-2.83 (0.013)
Ln L	2.06 (0.058)	-3.10 (0.008)

Source: Own Calculations based on data of the appendix.

The results in table (4) indicate that the ADF test statistics for the coefficients of all variables are significant at 1%, indicating that these variables are stationary after differencing once, suggesting that all variables are integrated of order one.

By applying the Ordinary Least Squares (OLS) technique, we estimated the log linear form of equation (1). The estimation results are shown in table (5), where the figures inside the parentheses are the t-ratios of the estimated parameters (elasticities) and those inside the square brackets are the P-values.

Table 5: The Effects of Zakat and Educational Attainment on the Incidence of Poverty in Sudan, (1990-2009)

Estimated Coefficient (Elasticity) of			**F-Ratio**	**R^2**	**D.W.**
The Constant	**Z**	**E**			
3.82 (20.53) [0.000]	- 0.26 (- 3.81) [0.000]	- 0.94 (- 5.95) [0.000]	122.3 [0.000]	0.94	1.17

Source: Own Calculations based on data of the appendix .

The estimation results of table (5) reveal that the explanatory variables taken into consideration explain 94% of the variations in the head count index. All the expected signs are confirmed by the empirical results, and the overall model is significant at 1% as indicated by the **F-ratio**. No autocorrelation problem exists in the estimated model. The results obtained signify that zakat and educational attainment impact significantly at the 1% level on reducing poverty in Sudan. In particular, the elasticity of the head count index with respect to changes in educational attainment and zakat are estimated at (- 0.94) and (- 0.26), respectively. Thus, an increase in educational attainment by 1% reduces poverty by 0.94%, while the increase by 1% in the percentage spent on poor out of total zakat funds reduces poverty by 0.26%. These results reveal that poverty reduction in Sudan is more responsive to educational attainment than to zakat. In fact, many studies concluded that poverty reduction is less responsive to zakat in countries with low and bottom middle income countries. It is worth noting that Sudan is classified among the latter group.

Furthermore, using adult literacy rate (L) as a proxy for knowledge instead of educational attainment, the elasticity of the head count index with respect to changes in adult literacy rate is estimated at (- 0.80), providing a strong evidence that the spread of poverty in Sudan is mainly due to high adult illiteracy rates beside inequality in the distribution of income. No other significant changes occurred in the re-estimated model as shown in table (6).

Table 6: The Effects of Zakat and Adult Literacy on the Incidence of Poverty in Sudan (1990-2009)

Estimated Coefficient (Elasticity) of			**F-Ratio**	**R^2**	**D.W.**
The Constant	**Z**	**L**			
3.67	- 0.28	- 0.80	110.5		
(21.16)	(- 4.00)	(- 5.54)	[0.000]	0.93	1.27
[0.000]	[0.000]	[0.000]			

Source: Own Calculations based on data of the appendix.

Based on the above findings, the study recommends increasing educational attainment rates and improving the quality of education, which requires among other things, increasing expenditure on education at all levels, beside the care for adult literacy classes. In addition to that, raising the percentage spent on the poor out of total zakat funds is highly recommended to reduce inequality in the distribution of income. Income support should particularly be used for the part of the population with special needs.

6. Concluding Remarks

This study aimed at examining the impacts of zakat and knowledge on poverty alleviation in Sudan during the period (1990-2009). The empirical model incorporated two policy variables namely, the percentage spent on poor out of total zakat funds and educational attainment/adult literacy. By applying the Ordinary Least Squares (OLS) technique, the results obtained signify that zakat and knowledge impact significantly at the 1% level on reducing poverty in Sudan. The results further revealed that poverty reduction in Sudan is more responsive to knowledge than to zakat. The study recommends increasing knowledge

rates and improving the quality of education, which requires among other things, increasing expenditure on education at all levels, beside the care for adult literacy classes. Using Information and Communication Technologies (ICT) is of paramount importance in the educational process. Strengthening foreign relations particularly with Arab and Islamic countries can help realize this goal. In addition to that, raising the percentage spent on the poor out of total zakat funds is highly recommended to reduce inequality in the distribution of income. Policies should also give the people with special needs particular priority in the income support, medical treatment, and education.

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Appendix

Head Count Index (H), Zakat Spent on Poor as % of Total Zakat Funds (Z), Educational Attainment (E), and Adult Literacy Rate in Sudan, 1990 - 2009

Years	(1)	(2)	(3)	(4)
	H	Z	E	L
1990	83.4	33.3	38.3	43.0
1991	84.9	33.3	38.8	43.0
1992	86.3	26.3	39.3	43.4
1993	88.1	34.2	39.5	43.8
1994	84.8	31.3	40.2	44.8
1995	81.7	33.3	41.4	46.1
1996	78.7	32.3	43.8	49.0
1997	75.8	44.9	46.9	53.3
1998	73.0	29.2	48.5	55.7
1999	70.3	27.2	49.3	56.9
2000	67.7	45.8	49.9	57.8
2001	65.2	47.8	50.5	58.8
2002	62.7	48.1	51.9	59.9
2003	60.4	50.3	52.0	59.0
2004	58.2	55.7	52.9	60.9
2005	56.0	57.0	53.0	60.9
2006	54.0	59.5	53.5	60.9
2007	52.0	57.3	53.9	60.9
2008	50.0	62.5	54.3	62.0
2009	49.0	66.0	55.0	65.0

Sources:

(1): Projections based on the values of 1986, 1993 and 2009 surveys.
(2): Central Bureau of Statistics, Khartoum, Sudan (2010): Statistical Series (1990-2009).
(3), (4): Abdelmawla (2010).

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Real Money Supply, Price and Fiscal Deficit in Nigeria: Evidence from Multivariate Granger Causality Tests

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In this paper, Granger causality test is implemented within the context of Autoregressive distributed lag (ARDL) framework to determine the directions of causality between a pair of price level, real money supply, government fiscal deficit, interest rate and real output in Nigeria over the period 1970 to 2010. Result of the study shows that in the short run, there is a unidirectional causality running from real money supply to inflation, government deficit to price level, real output to inflation, and interest rate to inflation. The long run results indicate that bidirectional causality runs between the real money supply and price level, and also between price level and interest rate. The results suggest that pro-cyclical has been the practice in Nigerian fiscal policy which has accounted for the country's public deficit. Therefore, there is a need for fiscal policy rule that will guide all the tiers of government to a particular level of fiscal conduct and budgetary management to the extent of making it credible over time. This result is important in that it provides the likely implications of fiscal deficits on some macroeconomic variables such as output, price level, money supply and balance of payment. Knowing these implications is likely to provide an insight into the formulation and design of appropriate fiscal policy by the Nigerian policy makers because far from the efficient provision of public goods, fiscal policy performs stabilizing role.

1. Introduction

The choices of fiscal policy have been argued to have significant effects on the economic performance of the oil producing and exporting nations like Nigeria. This is due to the significant nature of the country's oil sector and because the income realized from oil mostly accrue to government's coffer (Sturm, Gurtner and Alegre, 2009). However, fiscal

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policy in oil producing nations has faced some challenges of how to sustain government expenditures and revenues in the future, and how to stabilize macroeconomic variables in the economy by a well fiscal plan. Reactions by the concerned authorities in response to the fiscal challenges in Nigeria have involved fiscal rules, basing budget on oil price assumptions, how to stabilize oil and incomes realized from high oil prices. In spite of these reactions, fiscal policy continues to be expanding rapidly without completely been met by the increase in the revenue generated. As a result, Nigeria periodically faces fiscal imbalances and her fiscal deficits have been increasing since 1975 (CBN, 2010).

Fiscal deficits have become an important issue in the area of public finance when considering the level of economic growth. Three major opposing views can be distinguished. Keynesian economics posited that through the multiplier, the influence of budget deficit on the macroeconomic activity is positive. In the context of endogenous growth models, if budget deficits are employed to offset expenditures that improve economic growth such as public infrastructure, research and development, education and health, then budget deficits can have positive influence on long-term growth (Barro, 1990; Lucas, 1988; Romer, 1990). Neoclassical economists put up a contrary view by arguing that budget deficits compete with the private sectors and so affect the long-term economic growth negatively. Finally, the demonstration of Ricardian equivalence approach by Barro (1989) shows that change in budget deficit has no effect on the growth of the economy. Due to these contrasting opinions, the employment of public expenditures for the enhancement of economic activity has not been encouraging. Recently, the conventional wisdom is of the view that deficits are not desirable due to their negative macroeconomic effects. This opinion serves as a guide to a country wishing to undertake sensible and careful fiscal policies for the purpose of decreasing the deficits (Keho, 2010).

According to theory, large fiscal deficits can have negative impacts on many macroeconomic variables such as domestic interest rates, investments, and trade deficits. For instance, large fiscal deficits often lead to high interest rates following the government's demand for funds. This conflicts with the financing needs of private sector to the extent that such high interest rates dampen private investment. Cebula (2000)

and Dawyer (1985) note that government deficit can exert an upward pressure on real interest rates thereby decreasing the level of capital formation, business activities in terms of investment, and the real level of output. This connection also provides a basis in support of the argument that budget deficits are positively related to long-term interest rates (Barnes, 2008). In addition, fiscal deficits may affect interest rates via the channel of reduced savings and thereby saving ratios (Cebula, 1993).

From the Ricardian equivalence perspective, an increase in government debt results in a future increase in taxes and this does not add to private sector wealth. Given this view, the public expects future increase in taxes to compensate recent government excess spending (fiscal deficits). Therefore, households reduce their consumption spending now and raise saving to smooth out the expected reduction in their future disposable income when government eventually taxes them. This implies that deficit and taxes are equivalent in their effect on consumption, investment and hence current account. Thus, the Ricardian equivalence implies that fiscal deficit has no effect on consumption, interest rates, aggregate demand and the external sector. Concerning this issue, some studies (Bernheim, 1989; Brunner, 1986; Hoelscher, 1986; Tobin and Buiter, 1980) have provided empirical and theoretical evidences against the Ricardian equivalence, while empirical results of other studies (Evans, 1985, 1987b; Fackler and McMillin, 1989) have supported the proposition.

Fiscal deficits can also have impact on other macroeconomic variables such as inflation and money supply. If an increase in aggregate demand is a result of fiscal deficit, the price levels are likely to rise and consequently, the domestic currency tends to depreciate (Evans, 1985, 1987b). The level of inflation could be high through the crowding out effect. In this case, the effect reduces the real capital stock in the economy, and retards the growth rate of output. Consequently, the price levels will rise at a given level of money supply. Another factor that could make inflationary conditions to be worse is the excessive issues of government bonds, since they form a large part of money supply. Lastly, inflationary conditions may also be worse through monetary accommodation. Given these linkages, it can be understood that higher fiscal deficits may aggravate the inflationary conditions in the economy, contributing to the domestic currency depreciation.

The role of fiscal policy in the determination of inflation can also be analysed under the so-called "monetary dominant" and "fiscal dominant" regime according to the new fiscal theory of price level (Sims, 1994; Woodford, 1994). In the former case, the classical quantity equation or monetary policy determines the price level. Government reacts to this by balancing its budget and accepts the rate of inflation as determined by the monetary policy. It plans its budget such that the present value of its future surpluses should be enough to offset the public net real debt. Under the "fiscal dominant" regime, the public budget constraint determines the price level. In this case, if the future surpluses cannot sufficiently offset the debt, the price level tends to adjust upward and reduces the real value of the public debt. To restore equilibrium, money supply reacts to price's adjustment to equate the money demand (Sims, 1994; Woodford, 1994).

Government fiscal deficits are often financed by the domestic credits from the banking system (particularly the Central Bank). Fiscal deficit financed by the banking system can increase the supply of money and general price level. This is because government fiscal deficits tend to force the central bank to monetise the deficit either now or in the future depending on the level of independence between monetary and fiscal authorities (Sargent and Wallace, 1981) or on the exchange rate regime (Turnovsky and Wohar, 1987). As the monetary authorities purchase large amount of government debt or monetize it (by printing money) in response to large deficits, the monetary base and money supply expand. Consequently, the price level increases. Hassan, Mustafa and Basher (2003) note that money multiplier provides the linkage between the monetary base and the money supply. If the multiplier is taken to be constant, the variation in money supply is equivalent to the multiplier times the change in the monetary base. Thus, the percentage change in money corresponds to the percentage change in the money multiplier plus the percentage change in monetary base. With respect to the influence of fiscal deficits on money supply, Allen and Smith (1983) have found evidence in support of the debt-monetisation hypothesis while the results of Niskanen (1978), and Burdekin and Wohar (1990) have contradicted it.

The connections among the interest rate, money supply and price level can further be understood better by supposing an economy in full-employment equilibrium according to Parkin (2014). If money supply

increases, the nominal interest rate falls. The quantity of money that people are willing to hold is less than the quantity supplied. Therefore, people try to get rid of the "excess" money they are holding by buying bonds. As people buy bonds, the real interest rate falls. As a result, consumption expenditure, investment and aggregate demand increase. With the economy at full employment, the price level rises. The rise in the price level causes the quantity of real money to decrease. In this case, the nominal interest rate and the real interest rate rise. As the real interest rate increases, expenditure plans are reduced and ultimately the initial full employment equilibrium is restored. In the new long-run equilibrium, the price level has risen by the same percent of rise in money supply (Parkin, 2014).

Far from the forgoing analysis is the argument that inflationary developments can have impact on government expenditure and revenue, components of fiscal policy, thereby leading to fiscal deficits (Aghevli and Khan, 1978; Ogunmuyiwa, 2008). According to the proponents, inflation causes the public sector services and investment to be costlier than used to be when there is no inflation. This raises the costs of providing physical and social infrastructure by the government and subsequently increases the expenditures of government. If such increase in government expenditure is not fully offset by the increase in revenue, a deficit is likely to be recorded.

Based on the linkages among the government fiscal deficit, real money supply, price level, real output and interest rates, this paper examines the directions of causality between a pair of these variables in the short and long run in the Nigerian context. The rest of the paper is arranged as follows: section 2 reviews the relevant literature while section 3 deals with the model and method of estimation. In section 4, the empirical results are presented. The final section presents the conclusion and policy recommendation.

2. Literature Review

Studies have examined the causal link between fiscal deficit, money supply and price/inflation in both developed and developing countries, and have reported mixed and contradictory results. For instance, King and Plosser (1985) reported insignificant causality flowing from government fiscal deficit to monetary base and inflation in the United

States. On the other hand, Burdekin and Wohar (1990) indicate that in the United States, deficits that are not monetized negatively affect inflation in the short-run. In Greece, Hondroyiannis and Papapetrou (1994) showed that the direction of causality between the price and public budget is bidirectional. The study of Habibullah, Cheah and Baharom (2011) for Asian countries suggests that in the long run, unidirectional causality flows from government fiscal deficits to inflation. Parida, Mallick and Mathiyazhaga (2001) report that in India, fiscal deficit and money supply cause the price level while price level has no influence on these two variables. In Nigeria, the results of Ogunmuyiwa (2008) indicate that budget deficit is caused by inflation. The results suggest that unidirectional causality flows from inflation to budget deficit. Far from this result, Olusoji and Oderinde (2011) using Toda-Yamamoto granger non-causality test from 1970 to 2006 find no clear cut proof of causation between fiscal deficit and inflation in Nigeria. Similarly, Dockery, Ezeabasili and Herbert (2012) use vector error correction model to examine a connection between fiscal deficits and inflation in Nigeria over the period 1970 to 2006. They find no significant link between fiscal deficits and inflation. However, their results indicate a positive relationship between money supply and inflation. On the impact of budget deficits on other macroeconomic variables such as inflation and money supply, some other studies (Hamburger and Zwick, 1981; Miller, 1983; McMillin, 1986; Grier and Neiman, 1987) have also reported that fiscal deficits influence inflation. On the contrary, the results of other studies such as Dwyer (1985), Barnhart and Darrat (1988, 1989), Landon and Reid (1990), and Karras (1994) have suggested that deficits have no positive significant influence on inflation.

Studies have also investigated the direction of causality between money supply and price/inflation across the developed and developing countries and have also reported conflicting results. For example, Bengali, Khan, and Sadaqat (1997) reported bidirectional causality between money (measured by combining broad and narrow money) and consumer price index for Pakistan using a quarterly data covering the period 1972 to 1990. Other studies with bidirectional causality between money supply and price include Khan and Siddiqui (1990) for Pakistan; Frenkel and Johnson (1977) for Germany, and Sergent and Wallace (1973) for Austria, Germany, Russia, Greece, Poland, and Hungary. On the other hand, Brillembourg and Khan (1979) investigated the causal association

between money and general price level in United States by employing Sims and pierce causality approach over the period 1870 to 1975 and found that money caused price level in the short run without a feedback. The result suggested that a unidirectional causality existed between the two variables.

Another study by Beltas and Jones (1993) employs Granger causality approach to examine the causality between money and inflation in Algeria over the period covering 1970 to 1988. Findings show that money causes inflation in the short run without a feed back from inflation, thus suggesting a unidirectional causality between them. On the contrary, Akhtar (2005) finds the effect of inflation on the increase in money supply to be significant and the level of inflation strongly Granger-causes the increase in narrow money supply in the short run over the period of the study. However, the flow of causality from inflation to real output level is found to be insignificant in the short run. Parida, Mallick and Mathiyazhaga (2001) use vector autoregression to investigate how fiscal deficits, money, supply, and price level are related in India from 1960-1961 to 1999-2000. Their results indicate bidirectional causality between fiscal deficits and money supply. Both fiscal deficit and money supply cause the price level while neither of these variables is caused by the price level. Another study by Vuyyuri and Seshaiah (2004) examines the causal link among budget deficit, nominal effective exchange rate, GDP, consumer price index and money supply in India using vector error correction models during 1970 to 2002. Finding indicates a bi-directional causality between budget deficit and the exchange rates, and unidirectional causality flows from GDP to budget deficit. On the other hand, no significant link is found between budget deficit and GDP, and between money supply and consumer price index.

The reviewed literatures have shown that most of the studies conducted in both developed and developing countries on the association of the government fiscal deficit, money supply and price/inflation have provided mixed and conflicting results in both short run and long run. Therefore, the validity of the results remains inconclusive and more studies are needed in this area. In addition, the current paper extends the years of study from 1970 to 2010 as these years reflect the period of fiscal imbalances following the fluctuations in the world prices of crude oil.

On the causal association between interest rate, fiscal deficit, price and money supply, some studies have been documented. For instance, Aliyu and Englama (2009) use vector autoregressive and Granger causality tests to investigate the causal links among inflation, price, exchange rate, credit and interest rate in Nigeria. Their findings indicate that inflation is not affected by monetary transmission. There is evidence that price bears no strong relationship to credit and interest rate, instead strong negative relationship is found between exchange rate and price. Hassan, Choudhury, and Waheeduzzaman (1995) examine the impacts of black market exchange rate expectations on the demand for money in Nigeria. Their findings suggest that the appropriate scale and opportunity cost variables are real income and expected inflation rates for the demand for money function in Nigeria. In addition, depreciation in black market exchange rate has significant negative effect on the country's demand for money.

In Malaysia, Sukmana and Kassim (2010) examine the importance of Islamic banks' financing and deposit in channelling the monetary policy effects to the real economy using the co-integration test, impulse response functions, and variance decomposition analysis over the period 1994 to 2007. Their findings indicate that both Islamic banks' financing and deposit are statistically significant in linking the monetary policy indicator to the real output. The study suggests that the monetary authority should also consider the Islamic banks in the implementation of monetary policy in Malaysia. In addition, it implies that the stability of the Islamic financial institutions as well as the conventional counterpart is the best way to realize an effective transmission of monetary policy in the economy. Also, in Malaysia, Kassim and Manap (2008) evaluates the information content of the Islamic interbank money market rate (IIMMR) vis-a-vis the conventional interbank money market rate (CIMMR) by considering their interactions with some macroeconomic variables such as output, inflation, exports, imports, bank loans and stock market index. Using the Toda-Yamamoto causality approach for the analysis over the period 2000 to 2006, their findings suggest that IIMMR has high information content compared to its counterpart. That is, the "best policy indicator" is the overnight Islamic interbank money market rate due to its ability to explain the movements in the macroeconomic variables. An important implication of this result is that the IIMMR can be a reliable variable for the implementation of monetary policy in Malaysia.

In a study of demand for money in Bangladesh, Hassan (1992) examines the role of the foreign interest rates, inflation rate, credit constraint, currency depreciation, and domestic income. The author shows that real income and expected inflation play significant role in determining demand for money in Bangladesh. However, no significant relationship is found between the variables (foreign interest rates and currecy depreciation) and demand for money in that country. Another study by Hassan, Khan, and Haque (1993) examines the determinants of income velocity of money in Bangladesh using a Savin-White Box-Cox parametric transformation with first order serial correlation method of estimation. Their findings suggest that income and inflation positively influence velocity while the proxy of financial development has negative effect on velocity. Their result implies that the level of financial development increases as the proxy decreases and consequently, the velocity of money increases. In addition, as the national income level increases, the velocity also increases and this informs the central bank to reduce the money supply to reduce inflation with the overall expenditure remaining unaffected in the economy. Furthermore, Hassan and Al-Dayel (1998) examines the stability of the demand for money in fifteen countries under two different financial systems, one is similar to the western financial system and the other is similar to the Islamic financial system. This study finds that the velocity of money and its variance are lower for interest-free banking system than for interest-bearing banking system. The result supports the hypothesis that interest-free money (in the Islamic financial system) is more stable than interest-bearing money (in the western financial system).

The study by Alatiqi and Fazel (2008) employs the Engle-Granger method of co-integration and the Granger causality test to provide evidence of no negative causal association between money supply and interest rates. In Pakistan, Noor-e-Saher and Herbert (2010) examine the influence of fiscal deficit on long-term interest rate during 1975 to 2008 using the method of cointegration. Result suggests that increase in the budget deficit causes an increase in long-term interest rate thus making the investment fund to be costlier. In a study of United Kingdom during 1960 to 1992, Al-Saji (1993) report that the expected rate of inflation, the real stock of money, the real fiscal deficit, the real public expenditure, and the real trade balance have significant influence on nominal and ex-ante real long term interest rates. Barnes (2008) uses cointegration method to examine how budget deficits are related to the

long-term interest rates for ten European countries. Finding reveals that for all countries, budget deficits and the long-term interest rates are cointegrated and that budget deficits affect long-term interest rates positively. On the one hand, some other studies (Al-Saji, 1992; Barth *et al*., 1985; Cebula, 1988, 1993; Cebula and Koch, 1989; Hoelscher, 1986; Knoester and Mak, 1994; Miller and Russek, 1991; Zahid, 1988) have found that government fiscal deficits lead to higher levels of interest-rate yields. On the other hand, some other studies (Barro, 1987; Evans, 1985, 1987a, 1987b; Hoelscher, 1983) have found no relation between fiscal deficits and interest rates.

The nature of midway link between budget deficit and interest rate has been argued to be very important (Noor-e-Saher and Herbert, 2010). Interest rate can serve as midway link in the study of the causality among budget deficit, money supply, price/inflation, and output. This, however, has been neglected in the previous studies of Nigeria available for review. Therefore, the current paper includes interest rate as one of the independent variables among others to gain more insight into the role of interest rate.

3. Model and Method of Estimation

Autoregressive distributed lag (ARDL) approach of Perasan and Shin (1999), and Perasan, Shin and Smith (2001) was applied for the bound testing of cointegration among the price level, real money supply, government fiscal deficit, interest rate and real output. The adoption of the approach is considered desirable because it provides opportunity to test whether or not there is long run association (co-integration) among the variables not minding whether the explanatory variables (regressors) are integrated of order 0 or 1. In this case, there is no need to pre-test the variables and this lessens the task involved in deciding the order of integration. Furthermore, the method of bounds testing is advantageous in that it possesses better properties that accommodate small sample size more than the Engle and Granger (1987), and Johansen and Juselius (1990) procedure of co-integration (Narayan and Smyth, 2005). The approach of ARDL also gives room for different optimum lags to be assigned to variables which cannot be possible while using the conventional approaches to co-integration. In addition, the ARDL approach makes use of single reduced form equation as compared to the conventional approach of co-integration where estimation of long run

associations is done within a system equation (Ozturk and Acaravci, 2010).

The steps involved in bound testing for co-integration requires the estimation of the unrestricted error correction model of the form of equation (1) where each of the variables subsequently takes turn to serve as endogenous variable after the others.

$$\Delta lnP_t = \gamma_0 + \sum_{i=1}^{k} \gamma_1 \Delta lnP_{t-i} + \sum_{i=0}^{k} \gamma_2 \Delta lnMS_{t-i} + \sum_{i=0}^{k} \gamma_3 \Delta GFD_{t-i} + \sum_{i=0}^{k} \gamma_4 \Delta lnIR_{t-i}$$

$$+ \sum_{i=0}^{k} \gamma_5 \Delta lnRY_{t-i} + \alpha_1 lnP_{t-1} + \alpha_2 lnMS_{t-1} + \alpha_3 GFD_{t-1} + \alpha_4 lnIR_{t-1}$$

$$+ \alpha_5 lnRY_{t-1} + U_t \qquad (1)$$

From the equation (1), Δ is the first difference operator, ln is the natural logarithm, K is the optimum lag, P is the price level, MS is the real money supply, GFD is the government fiscal deficit, IR is the interest rate and RY is the real gross domestic product (real output) and U is the error term. All the variables are in natural logarithm form with the exception of government fiscal deficit. Equation (1) provides the opportunity to establish whether there is long run association among the variables. To do this, Pesaran et al. (2001) bound test procedure is employed as the first step of ARDL approach to co-integration whose determination relies on Wald statistics or F-test. The null hypothesis that the variables are not co-integrated is stated as H_0: $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = 0$ against the alternative hypothesis that the variables have long run association, stated as H_1: $\alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq \alpha_5 \neq 0$. These specifications are applicable to the equation (1). The F-statistics test the joint significance of the parameter estimates. The F-test employed in the bound test has a non-standard distribution.

Perasan et al. (2001) has two levels of critical value (lower and upper) in respect of the level of chosen significance. The assumption of the lower level of critical value is that all variables are integrated of order 0 or I(0) while the upper level of critical value is of the assumption that all variables are integrated of order 1 or I(1). To take decision, the F-

statistics are compared with the two levels of the critical value, from the chosen ARDL model whether it has intercept and/or trend. According to the rules, reject the null hypothesis and accept that there is presence of co-integration if the F-statistics computed is more than the upper level of critical value. On the other hand, accept the null hypothesis that co-integration is not present if the F-statistics calculated is lesser than the lower level of critical value. If the value of F-statistics calculated is greater than the lower level but lesser than the upper level of critical value, then the test is inconclusive.

Following the establishment of the existence of long run association, Granger causality test is performed to determine the short run and long run causalities between a pair of variables. Engle and Granger (1987) incorporate the idea of co-integration into causality. Given that the variables have long run relationships according to Granger, causal association among the variables could be investigated by modelling the series where co-integration exists with augmented one period lagged error correction term. By following Narayan and Smyth (2005) a multivariate K^{th} order VECM is specified in equation (2) for Granger causality test.

$$\Delta lnP_t = \gamma_0 + \sum_{i=1}^{k} \gamma_1 \Delta lnP_{t-i} + \sum_{i=1}^{k} \gamma_2 \Delta lnMS_{t-i} + \sum_{i=1}^{k} \gamma_3 \Delta GFD_{t-i} + \sum_{i=1}^{k} \gamma_4 \Delta lnIR_{t-i} + \sum_{i=1}^{k} \gamma_5 \Delta lnRY_{t-i} + \alpha_1 ECT_{t-1} + U_{1t} \quad (2)$$

From the equation (2), (Δ) represents the difference operator, k is the optimum lag, ln is natural logarithm and U is the uncorrelated random error term for each variable's respective equation. The series where co-integration exists is augmented with one period lagged error correction term (ECT_{t-1}) with its coefficient represented by respective α. On the other hand, in any equation where there is no co-integration among the variables, the error correction term (ECT_{t-1}) is not included in the modelling of the series for Granger causality test. The term (ECT_{t-1}) is collected from the long run co-integration association. As described in equation (2), the previous values of the endogenous variable and those

of other exogenous variables are included in the regression of the endogenous variable concerned.

The data used in this study are annual time series data covering the period 1970 to 2010. The consumer price index is used as a proxy for price and the gross domestic product is used as a proxy for real output. All data including the interest rate, government fiscal deficit and money supply are sourced from the Central Bank of Nigeria statistical bulletin. To obtain the real money supply, we deflated the nominal money supply by the consumer price index.

4. Empirical Results

As a first step of the procedure, the properties of the variables are required to be examined to ensure that the dependent variable (price level) is integrated of order one or I(1) and the independent variables are either integrated of order one, I(1) or integrated of order zero, I(0). The requirements which if not met make the adoption of ARDL invalid (Perasan et al., 2001). Besides, all the variables must be integrated of order one for the implementation of Granger causality tests in spite of the advantage that bound test for co-integration can be applicable not withstanding the order of integration of the variables (Narayan and Smyth, 2005). In order to verify the preconditions, unit root tests are conducted on each variable used. Two methods of unit root test adopted are the ADF test and Phillip Perron (PP) test. The estimation of PP statistics makes use of Bartlett kernel with Newey-West Bandwidth. The two tests ensure robustness of the results. In particular, PP test corrects for higher order autocorrelation in the series and also deals with the likely problem of heteroscedasticity (Kouakou, 2011). The lags used for the estimations under the two methods are automatically selected. The results of the tests on the variables at levels are displayed in Table 1.

Results in Table 1 show that all the variables tested at level demonstrate to have unit roots under the ADF test. Their ADF statistics are lower than their critical values at 5%. Therefore, the null hypotheses that the variables have unit root at level are accepted at these critical values.

Table 1: Unit roots tests (ADF & Phillips Perron statistics) in levels

Variable	Model Types	ADF Statistics	CV	PP Statistics	CV
l_P	Constant	-0.750219	-2.936942	-0.785848	-1.660163
	Constant/trends	-1.563025	-3.526609	-2.936942	-3.526609
l_MS	Constant	-0.394369	-2.936942	-0.430920	-2.936942
	Constant/trends	-1.830444	-3.526609	-1.926402	-3.526609
GFD	Constant	-2.369044	-2.936942	-2.369044	-2.936942
	Constant/trends	-3.105876	-3.526609	-3.157048	-3.526609
l_RY	Constant	-2.329465	-2.936942	-5.437061	-2.936942***
	Constant/trends	-2.066128	-3.526609	-1.896588	-3.526609
l_IR	Constant	-1.312778	-2.938987	-1.455345	-2.936942
	Constant/trends	-1.255103	-3.529758	-2.031427	-3.526609

Note: CV is critical values at 5%, and *** is CV at 1%. All the variables are in natural log except GFD.

The results of the PP statistics confirm the results obtained from ADF test at level with the exception of real output (RY) whose constant model exhibits significance at level. With the exception of this variable (RY), the null hypotheses of presence of unit root cannot be rejected at 5% level of significance for all the variables because the PP statistics for each of these variables (RY under constant model not included) fails to be greater than their 5% critical values.

Having confirmed that all the variables are almost non stationary at level, they are therefore subjected to first differences under the two testing methods. The results of ADF and PP tests displayed in Table 2 show that all the variables become stationary after differenced once. These imply that the null hypotheses of the existence of unit root for each variable after differenced once are rejected at 5% level of significance since their ADF and PP statistics are each more than the 5% critical values. The results of the unit root tests confirm the satisfaction of the Perasan et al.'s (2001) preconditions for the adoption of the ARDL approach to co-integration since each of the variables become I(1) after differenced once, beyond which would have made the ARDL adoption invalid. Therefore, the study proceeds to test the existence of long run relationships among the variables using ARDL Bound test procedure.

Table 2: Unit roots tests (ADF & Phillips Perron) in first differences

Variable	Model Types	ADF Statistics	CV	PP Statistics	CV
l_P	Constant	-6.124223	-2.938987	-6.140571	-2.938987
	Constant/trends	-6.145869	-3.529758	-6.312910	-3.529758
l_MS	Constant	-5.672190	-2.938987	-5.686079	-2.938987
	Constant/trends	-5.598228	-3.529758	-5.613804	-3.529758
GFD	Constant	-6.745416	-2.938987	-7.917590	-2.938987
	Constant/trends	-6.173137	-3.548490	-7.778581	-3.529758
l_RY	Constant	-5.829829	-2.938987	-	-
	Constant/trends	-6.130763	-3.529758	-6.916525	-3.529758
l_IR	Constant	-8.939444	-2.938987	-8.913736	-2.938987
	Constant/trends	-8.906099	-3.529758	-8.952878	-3.529758

Note: CV is critical values at 5%. All the variables are in natural log except GFD.

In order to test whether the variables have relationship in the long run, ARDL bound test method of Perasan et al. (2001) is adopted. The null hypothesis that the variables are not co-integrated is stated as H_0: $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = 0$ against the alternative hypothesis that the variables have long run association, stated as H_1: $\alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq \alpha_5 \neq 0$. Two levels of critical values are provided with the lower level showing that all variables are I(0) while the upper level indicating that all variables are I(1). A Perasan et al.'s (2001) model with intercept and no constant is used. To take decision, the F-statistics are compared with the two levels of the critical value, from the chosen ARDL model. Each variable takes a turn to be considered as dependent variable for others. Table 3 reports the results obtained for the F-statistics computed and the Perasan et al. (2001) critical values are displayed along side the F-statistics.

Table 3: Results of bound test (F-tests) for co-integration

F-Statistics	Bound CV: 90%		Bound CV: 95%		Bound CV: 99%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
	2.425	3.574	2.850	4.049	3.817	5.122
F_P(P|MS,GFD,RY,IR) = 4.2060***						
F_{MS}(MS|P,GFD,RY,IR) = 4.5117***						
F_{GFD}(GFD|P,MS,RY,IR) = 0.4735						
F_{RY}(RY|P,MS,GFD,IR) = 1.7566						
F_{IR}(IR|P,MS,GFD,RY) = 2.7861*						

Note: * and *** represent 90% and 99% significant level respectively. CV is the critical value from Perasan et al. (2001). Null Hypothesis: there is no co-integration

According to the rules, reject the null hypothesis and accept that there is presence of co-integration if the F-statistics computed is more than the upper level of critical value. On the other hand, accept the null hypothesis that co-integration is not present if the F-statistics calculated is lesser than the lower level of critical value. If the value of F-statistics calculated is greater than the lower level but lesser than the upper level of critical value, then the test is inconclusive. By considering price level as dependent variable from the results, Table 3, the F-statistics computed equals to 4.2060 and is greater than the upper bound at 95% critical value band. This implies that the null hypothesis of no co-integration among price level (P), real money supply (MS), government fiscal deficit (GFD), real output (RY), and interest rate (IR) is rejected notwithstanding their co-integration order. When real money supply is considered as dependent variable, the F-statistics computed equals to 4.5117 which exceed the upper bound at 95% critical value band. This also implies that the null hypothesis of no co-integration among the variables is rejected when money supply takes turn as dependent variable. When government fiscal deficit and real output are individually considered as dependent variable, the F-statistics (0.4735) and (1.7566) computed for each of them respectively are each below the lower bound at 90%, 95% and 99% level of significance. This implies that the null hypothesis of no co-integration among the variables is accepted for each of government fiscal deficit and real output when served as dependent variable in an equation.

By considering interest rate as dependent variable, the results indicate that the F-statistics (2.7861) computed falls between the lower and upper bound at 90% level of significance, thus making the result inconclusive. Given that the result of interest rate is inconclusive, Kremers, Ericsson, and Dolado (1992), and Marashdeh (2005) have suggested that co-integration can also be established through the application of error correction model (ECM). Therefore, from the long run co-integration relationship, the error correction terms are obtained for the variables confirmed to be co-integrated with other variables.

The results obtained from bound test suggest the existence of long run association among the variables (price level, real money supply, government fiscal deficit, real income and interest rate). This is further confirmed by the results of error correction model where the coefficient of one period lagged error correction tern (ECT_{t-1}) is negative and

significant when price level, money supply and interest rate individually serves as dependent variable. Therefore, there must be a minimum of one-directional causality between the variables, whose direction however, is not indicated from the co-integration results. The determination of such direction is implemented by Granger causality tests involving the estimation of a multivariate form of vector error correction model (VECM) (stated in equation (2) within the context of ARDL framework. Each variable takes turn to serve as dependent variable in equation 2 and the one period lagged error correction term (ECT_{t-1}) obtained from the long run co-integration relationship is only added to the equation of price level, money supply and interest rate when each of them serves as dependent variables since they are co-integrated. On the other hand, (ECT_{t-1}) is excluded in the equation 2 when government deficit and real output serves as dependent variable since they are not co-integrated.

The results of Granger causality show the long run and short run causality in the context of the error correction mechanism. Chi-square statistics associated with the lagged regressors (independent variables) of the ECM determines the significance of the causal impacts in the short run while the t-statistics associated with the lagged ECT determines the significance of the causal impacts in the long run. The results of Granger causality obtained are displayed in Table 4. Starting with the analysis of short run effects, real money supply, government fiscal deficit, real output, and interest rate are significant at 1% level in the price equation but price is not significant in the equation where real money supply is dependent variable which suggests that there is no feedback. Therefore, there is a unidirectional causality running from real money supply to inflation in the short run.

Similarly, government fiscal deficit causes price level at 1% significant level but price is not significant in the equation where government fiscal deficit serves as dependent variable, suggesting the absence of feedback from price. For this reason, a unidirectional causality runs from government deficit to price level in the short run. Short run causality also runs from real output (significant at 1% level) to inflation without any feedback since price is not significant in the equation where real output serves as dependent variable.

Table 4: Results of Granger causality between pair of variables

Dependent Variable	**Δl_P**	**Δl_MS**	**ΔGFD**	**Δl_RY**	**Δl_IR**	**ECT$_{t-1}$**
Δl_P	-	16.889*** [0.000]	3.10E+13*** [0.000]	28.001*** [0.000]	220.419*** [0.000]	-0.997*** (-4.154)
Δl_MS	2.155 [0.142]	-	2.39E+11*** [0.000]	0.402 [0.526]	322.086*** [0.000]	-0.114*** (-10.454)
ΔGFD	2.563 [0.109]	0.160 [0.689]	-	0.205 [0.651]	2.724* [0.099]	-
Δl_RY	0.257 [0.612]	6.326** [0.012]	1.79E+12*** [0.000]	-	5.107** [0.024]	-
Δl_IR	0.105 [0.746]	0.425 [0.515]	2.94E+11*** [0.000]	0.001 [0.972]	-	-2.220** (-2.9008)

Note: Chi-square statistics in squared bracket [ ] and t-statistics in parenthesis ( ) are reported for all variables and ECT respectively. Also, 10%, 5% and 1% level of significance are represented by *, ** and *** respectively. Null Hypothesis: there is no Granger Causality.

Thus, a unidirectional causality exists between the inflation and real output in the short run. Lastly, interest rate also becomes significant at 1% level implying a causal to price level in the short run without a feedback from price level since it is not significant in the equation where interest rate serves as dependent variable. Therefore, a unidirectional causality exists between interest rate and inflation in the short run. The short run unidirectional causality result from real money supply to inflation supports those obtained by Brillembourg and Khan (1979) for United States and Beltas and Jones (1993) for Algeria while the one running from fiscal deficit to inflation supports the results obtained by Parida, Mallick and Mathiyazhaga (2001) for India.

Next is to consider the long run causality effect. The parameter estimates of one period lagged error correction terms are negative and significant in the equations of price level, and real money supply at 1% level while in the interest rate equation it is also negative and significant at 10% level. These support the initial bound test results which suggest the presence of co-integration. For government fiscal deficit and real output equations, one period lagged error correction terms is omitted in each equation when each of them serves as dependent variable since there are absence of co-integration.

From Table 4, the Granger causality results show that the lagged error correction term is significant at 1% level in the price equation. This means that variations in price level are function of disequilibrium in the long run association. That is, in the long run, real money supply, government fiscal deficit, real output, and interest rate granger cause price level. It can also be explained to imply that there are interactive running of causality from real money supply, government fiscal deficit, real output, and interest rate via the error correction term. With the real money supply as the dependent variable in another case, and its lagged error correction term is significant at 1% level, it means that price level, government fiscal deficit, real output, and interest rate granger cause real money supply in the long run. In other words, there is bidirectional causality running between the real money supply and price level in the long run. This result is parallel to the one obtained by Khan and Siddiqui (1990), and Bengali, Khan, and Sadaqat (1997) for Pakistan, Frenkel and Johnson (1977) for Germany, and Sergent and Wallace (1973) for Austria, Germany, Russia, Greece, Poland, and Hungary. The results of Granger causality in Table 4 also indicate that the lagged error correction term for interest rate as dependent variable is also significant at 5% level. This as well shows that bidirectional causality in the long run is flowing between price level and interest rate.

5. Conclusion and Policy Recommendation

The results of ARDL bound test for co-integration confirm the existence of long run relationships when each of price and money supply serves as dependent variable with their explanatory variables while the result of interest rate remains inconclusive. On the other hand, there is no cointegration when each of government fiscal deficit and real output serves as dependent variable. In the short run, unidirectional causality runs from real money supply to inflation, from government deficit to price level, from real output to inflation, and from interest rate to price. In the long run, bidirectional causality runs between the real money supply and price level, and also bidirectional causality runs between price level and interest rate. In what follows as the consequences of fiscal deficit on real money in Nigeria, the growth of real money supply influences price level. Evidently, at the early period, unidirectional causality runs from real money supply to inflation in the economy while at later period it manifested into bidirectional causality, implying that both the real money supply and price level cause each other. The roles of

real output and interest rate on inflation are also pronounced in the economy. In addition, evidences of interest rate influence show that bidirectional causality in the long run is flowing between price level and interest rate.

It can be inferred from the results that pro-cyclical has been the practice in Nigerian fiscal policy which has accounted for the country's public deficit. Therefore, there is a need for fiscal policy rule that will guide the all tiers of government to a particular level of fiscal conduct and budgetary management to the extent of making it credible over time. The results of the current study provide the likely implications of fiscal deficits on some macroeconomic variables such as output, price level, money supply and balance of payment. Knowing these implications is likely to provide an insight into the formulation and design of appropriate fiscal policy by the Nigerian policy makers because far from the efficient provision of public goods, fiscal policy performs stabilizing role.

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Revealed Comparative Advantage of Carpets and Textile Floor Covering Industry in Pakistan, India and China

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This paper measures and compares the competitiveness of Pakistan's carpet and textile floor coverings industry with other South Asian countries China and India. The pattern of revealed comparative advantage is identified using the Balassa (1965) index for export data. The index is calculated at the sector and commodity level of the Harmonized System of classification (HS 2-digit and 4-digit level) for the periods 1996-2009 and 2004-2009, respectively. Data has been taken from UN Comtrade Statistics and the World Development Indicators. The study finds out a rising, stable and fluctuating trend in RCA at 2-digit level for India, China and Pakistan, respectively. However, test of equality of means of RCA indicates a statistically significant edge of China over Pakistan and India whereas across India and Pakistan not a significant difference emerged. It aims at discerning the challenges for Pakistan in carpet and weaving sector which may hinder the future growth of this sector. The findings imply that a favorable potential exists for higher growth of carpet industry and it can endorse the export earnings and employment keeping in view the international competitions. Moreover, the said sector can be focused for the export competitiveness in the rapidly globalized markets.

1. Introduction

The global trade pattern has been changed in the pursuance of trade liberalization policies in the form of removal of tariff and non-tariff barriers, reduction in quotas and technological advancement on the part of world economies. South Asian economies such as China and India are seeking a favorable position from the trade composition perspective in the international markets. These countries possess comparative advantage in textile sector and show a noteworthy growth in changing trade patterns across the world. Pakistan has a great potential to stand

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out in this sector in the region as a prospective and overwhelming proportion of labor force is engaged in this sector. It is expected that export-led growth strategy cause a significant boost in production, employment and the productivity of labor along with the improvements in overall economic status but the political and socio-economic conditions in addition to primitive types of technology use may hinder the way to rapid progress.

Pakistan's current export structure requires structural transformation and changes in its export diversification and prototype specialization. The industrial sector in Pakistan has been playing a pivotal role in the national economy in terms of its share in GDP, exports, employment, foreign exchange earnings, investment and its contribution to the value added industry. China is one of the world's largest textiles exporters, accounting for one third of the global textile trade volume. Although the prolonged anti-dumping investigations hit the country's textile export, still textile industry in China has remained a key pillar of development in the country. It has played a vital role in proliferation of various sectors of the economy. Due to its large contribution in the economic growth, Chinese government has remained very much focused to upgrade this sector. India, another major exporter of textile goods is self-reliant and independent with lots of versatility and diversification in textile sector. Apart from providing one of the basic necessities of life i.e. cloth, the textile industry contributes about 14 % to the country's industrial output and about 17 % to export earnings. This sector stands at second in the provision of jobs to people after agricultural sector.

There is continuing debate and emerging concern about the position of these countries in the world market and the resulting edge of China for intensified competition in the labor-intensive manufactured goods. This signifies the importance of the structure of comparative advantage in selected countries; China, India and Pakistan and to find out the extent of competition among these countries in the market of selected sub-sector i.e., textile.

This study focuses on one of the important sub-sector of textile industry i.e. Carpets and other textile floor Coverings (under the category of code 57 as per Harmonized System of classification, HS). The carpet industry plays a fundamental role in determining the export bearing of Pakistan. There has been an ever increasing demand for carpets and floor

coverings both in Pakistan and around the globe. Carpets have always been a valuable asset since ages and therefore remained in vogue. This was gradually commercialized in Pakistan because of the development of export market. Commercialization gave new dimensions to this industry and it started expanding in rural areas due to the availability of cheap labor. This is one of the sectors that grew tremendously during 1970s and 80s. Among the value added goods it remained on the top of the list (Awan and Khan, 1992).

This sector started getting a set back after the issue of child labor raised by international organizations. As majority of the carpet weavers in Pakistan were estimated to be children less than 15 years of age. Although, data on the Pakistan labor force and child labor is vulnerable. Nevertheless, there is little doubt that child labor has assumed massive proportions in Pakistan. The actual total number of working children in Pakistan is probably somewhere between 2 and 19 million.[2]

Primarily, the promotion of carpet industry depends upon availability of raw material, presence of skilled weavers and the tradition of weaving art, etc. The skill and productivity of workers in carpet industry along with the availability of socio-economic infrastructure affects the competitiveness of this sector. Despite the presence of weaknesses in few areas, the carpet industry serves as a backbone for the economy of Pakistan. It has been a major source of foreign exchange earnings and contributes a lot in relief of poverty, especially in rural areas. Presently this industry is not revealing a significant export growth and there is a dire need to focus on the provision of infrastructure to support the growth of this industry.

A UNICEF-Punjab report (1992) asserted that "according to conservative estimates, one million out of 1.5 million workers in the carpet industry in Pakistan were children. A separate 1992 UNICEF/Government of Pakistan study reported that 90 percent of the

[2] The Pakistan Labor Force Survey (1990-1991) put the number of child workers in the age group 10 to 14 at two million. The Pakistan Institute of Development Economics maintains that two million is a gross underestimate because a) of serious under-reporting due to the fact that child labor is illegal, and b) working children below 10 years are not included.. A study by UNICEF (1990) estimated the total number of children at not less than 8 million. Pakistan's Secretary of Labor, Mr. Sultan Hameed, stated that the UNICEF figure was "on the high side," but appeared to accept the figure as being in the general range.

> one million workers in the carpet industry are children, many of whom began working in the industry before 10 years of age. The Human Rights Commission of Pakistan found that weaving thrives in self-contained homesteads, where labor is cheap and readily available".

Different techniques have been used in literature to determine country's competitiveness in selected industry. One of the most widely used methods involves the concept of Revealed Comparative Advantage (RCA) developed by Balassa (1965). Revealed comparative advantage (RCA), a measure of international competitiveness specifies that a country is defined as being specialized in exports of a certain product if its market share in that product is higher than the average.

A number of studies are available on measuring competitiveness in various sectors of Pakistan, but there is no empirical work done on RCA of Pakistan in carpet and other textile floor coverings industry till the year of this study conducted. For small as well as growing economies, competitiveness is essential for promoting economic development and to survive in the globalized world where carpet industry holds its own worth.

From the above given perspective, the objective of this study is to analyze the comparative advantage of the carpet industry in Pakistan and compare it with selected South Asian countries .i.e. China and India. These countries were selected for measuring and comparing RCA with Pakistan's because they are similar in size and factor endowments and core competitor of Pakistan in the world market. The study enables us to find out the competitiveness of this sector in the world market and can probe at the future potential of growth in the carpet industry of Pakistan. The Balassa Index (1965) is used to find out the comparative advantage at 2-digit and 4-digit level of Harmonized System of Classification.

The rest of the paper is organized as follows. Next section provides the literature survey followed by the methodology and data description. The empirical results of the study are reported and discussed in section 4. Last section concludes the study with some policy recommendations.

2. Review of Literature

A number of studies have been conducted to find out Revealed Comparative Advantage (RCA) using Balassa Index (1965). This section provides a brief literature review that can give a better knowledge and understanding of the pattern of RCA in different countries for different sectors.

Balassa (1977) has undertaken an analysis of the pattern of comparative advantage of industrial countries for the period 1953 to 1971. The empirical findings of this study suggest a renewal of the product cycle for US that possess an ever increasing technical lead. Based on the standard deviation of the RCA indices for different countries an association is also seen to hold between size and diversification of exports. Furthermore, Balassa's results show that the extent of export diversification tends to increase with the degree of technological development and a reversal takes place at higher levels in the trade patterns.

Leishman et al. (1999) empirically analyzed the international competitiveness for agricultural commodities by applying Revealed Comparative Advantage (RCA) for wool- exporting countries. A number of six wool producing countries are selected for measuring RCA over the time period of 37 years. RCA index for Australia, Argentina, Newzeland, South Africa, United Kingdom and Uruguay indicates that GATT Uruguay Round has changed the RCA's of countries significantly.

Mehmood (2005) analyzed the export specialization and comparative advantage/disadvantage of Pakistan's non agriculture production sectors in the context of on-going multilateral trade negotiations. The study uses RCA approach at HS-4 digit level for the period 1990-2000. The data set has been drawn from International Trade Statistics compiled by the Australian National University (AND). The data set comprises 16 product categories made up of 978 product lines. Findings show that Pakistan's top-ranking exports belong to textiles and clothing sector, consistent with the natural and human factor endowments however Pakistan has failed to move from low value added to technically intensive high value added manufacturing. Pakistan's economic well-being depends on the extent to which the non-agricultural sector

remains competitive and contributes to economic growth, exports, investment and employment.

Batra and Khan (2005) examined the structure of comparative advantage enjoyed by India and China in the global market keeping in view their similar resource endowment and size. The study estimates Balassa index of RCA for India and China at sector and product level of the Harmonized Classification System (HS-1996) both at 2 and 6-digit level for the year 2000 and 2003 using data on exports from UN Comtrade.[3] The year 2000 is taken as reference, as this is the year immediately preceding China's accession to WTO. The main objective of the study is to figure out the leading manufacturing industries in India and China in terms of their revealed comparative advantage. The study reveals that the maximum number of commodities with comparative advantage in the world market is concentrated in sectors like organic chemicals. There are also some sectors where India is comparatively disadvantageous positioned at the aggregate level but reveal significant comparative advantage at the constituent commodity level (HS-six digit).

In addition, China enjoys comparative advantage in the world market in 47 sectors and 1828 commodities out of 97 sectors and 4923 exported commodities, respectively by China to the world. The sectors of comparative advantage in China belong to the electrical and electronic equipment, manufacture of leather, toys, organic chemicals, articles of apparel and cotton. The number of sectors for which India and China enjoy comparative advantage remains roughly the same between 2000 and 2003. An important finding of the study is that some sectors are at disadvantageous at the aggregate level but may enjoy comparative advantage at the constituent commodity level.

Hanif and Sabina (2006) constructed Balassa's Revealed Comparative Advantage (RCA) index for the textile sector of Pakistan to analyze the relationship between the financial development and international trade

[3] The Harmonized Commodity Description and Coding System (HS) of tariff Nomenclature is an internationally standardized system of names and numbers for classifying traded products developed and maintained by the World Custom Organization WCO). The HS system of classification contains 21 sections, 97 chapters and 1,241 headings at the four-digit level, 930 of which are further divided in sub headings. HS-1996 (revision 1) represents a total of 5,113 separate categories of goods identified by a six-digit code.

competitiveness. Pakistan's focus of trade policy shifted from import substitution to export promotion in the seventies and turned its resources to the products showing comparative advantage. The results show that greater access to external finance has a strong positive impact on the country's textile sector competitiveness over the time period 1974 to 2004. The study concluded that if the economies of scale, technology and endowments are identical between countries, still a country with relatively developed financial institutions will have comparative advantage in the production of processed goods requiring more external finance.

Welch and Conrad (2007) evaluated the US competitive position in the cotton yarn segment using RCA index based on Balassa (1965) among the set of countries including China, India, Pakistan, and Turkey. The results disclose that United States fails to make the competitive grade in several categories and if it happens to make it, that is by narrowing margins. While the Revealed Comparative Advantage index indicates that the United States is lagging behind China, India, Turkey, and Pakistan in terms of market share in exports of yarn, fabric, etc.

Akhtar et al. (2008) analyzed the competitiveness of footwear industry of Pakistan in the global perspective using revealed comparative advantage at 2-digit and 4-digit level of HS classification for the period of 1996 to 2006. RCA indices have been calculated for Pakistan and other Asian countries i.e. China and India, since both countries are similar in size and factor endowments and greatest competitor of Pakistan. Calculations show that Pakistan's footwear industry has shifted from a situation of comparative disadvantage to competitive advantage especially since after 2003 due to increase in volume as well as in the value of footwear exports and thus there is an upward movement in comparative advantage.

At disaggregate level, Pakistan has been enjoying comparative advantage since after 2005. This study also highlights the problems faced by footwear industry and explains the role of entrepreneurs in this regard. The rising trend of RCA reveals that there is a potential for higher growth of this industry which requires strengthening of competitiveness of the footwear industry.

According to Jayawickrama and Shandre (2010), given the abundant resources, China and India have comparative advantage in a broad range of manufactured goods as compared to Singapore. From the disaggregated analysis at 2-digit level, the paper finds that the Singapore and China exports are complements, although the degree of complementarity has being declining over time. Meanwhile, Singapore and India exports are found to be stronger complements and stable over time. The results also show that China and India exports are strong substitutes. This makes the comparative advantage position of both countries more competitive. The study reported that the exports diversifications have broadened the exports net by China and India, as well.

Wei and Zhao (2012) found that the comparative advantage of Chinese manufactured products in both world and US markets are gradually increasing. This is pertinent to mention that most of the products with comparative advantage are low-technology products. While, the comparative advantage of Chinese medium-technology products in the world market has largely improved, but their RCA indexes are low and their kinds of products with very high comparative advantage are small. Finally, they concluded that the Chinese manufactured exports are of greater comparative advantage in the world market than in the US market.

Focusing on the clothing export sector, Kathuria (2013) demonstrated that the comparative advantage of India has increased from 23 products to 25 products between 1995 and 2003 and for Bangladesh, this number increased from 21 products to 29 products between 1995 and 2003. Moreover, the comparative position on the basis of a measure of structural change in exports of India and Bangladesh also pointed out towards a better standings of these countries.

This completes the review of relevant literature. Now we turn to the trends of carpet and weaving sector in selected countries.

3. Trend and Pattern of Carpet and Floor Coverings Industry: Pakistan, India and China's Perspective

A brief picture of the trends in exports of carpet and floor covering industry is provided in this section. Overall, exports of the carpet industry in Pakistan mounted and reached up to Rs. 109 million earnings in 1971-72. By 1975-76, the income from carpet export gone up to Rs. 719 million and it further increased to Rs. 1,180 million in 1977-78 and then to Rs. 2,198 million in 1979-80. In 1980-81 carpet exports touched the highest ever figure of Rs. 2,243 million. There was a slight decline after that because of recession in the world market. With the export income coming down to Rs. 1,676 million and Rs. 1,913 million in 1981-82 and 1982-83, respectively. In 1985-86 the income rose to Rs. 2,693 million. The income from carpet exports further increased to Rs. 3,419 million in 1986-87. Table 1 depicts the trend of export value for three countries over the years 1996 to 2009 at 2-digit level of HS classification.

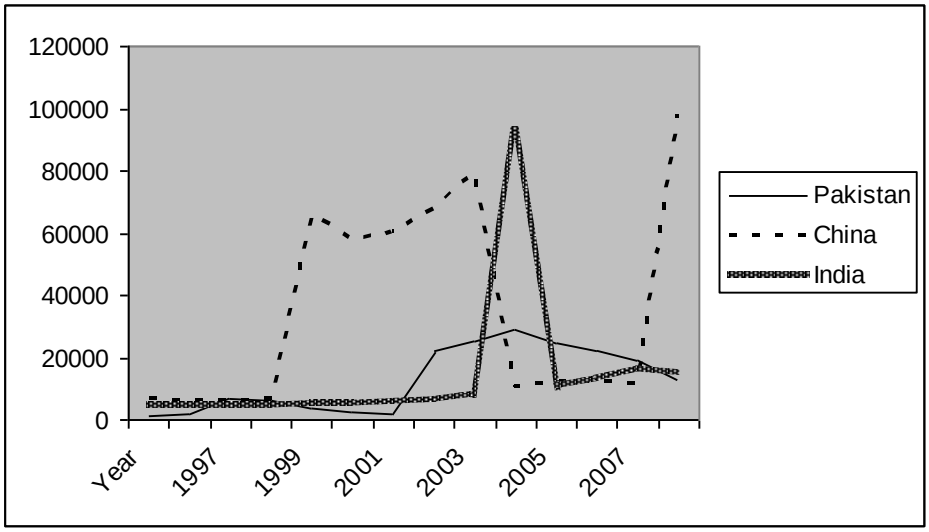
Table 1: Trends in Export of Carpets and other Textile Floor Coverings (US dollar thousands) at HS2 level

Year	Pakistan	China	India
1996	1517	6516	4221
1997	1778	6100	4554
1998	6578	6135	4416
1999	6387	6987	4212
2000	3627	65563	4709
2001	2623	57874	4907
2002	1676	60287	5570
2003	22418	67966	6374
2004	25235	79570	7731
2005	28753	10512	93222
2006	24612	12222	10686
2007	22215	12207	13200
2008	18815	11888	16185
2009	13206	97819	14912

Source: ITC, Comrade Data

China and India exhibit an increasing trend in exports while the figures for Pakistan showed first declining trend up to year 2002 and then a sharp rise that followed by a gradual rise in the export value. Pakistan's export values remained high than China and India from 2004 to 2007. The reason for lower export values afterward are less competitiveness, high interest rates and cost of inputs, non-conducive government policies and non-guaranteed energy supplies that hinders the competitiveness of Pakistani exports over other countries. Moreover, the bans on child labor, in the backdrop of ILO recommendations also hampered the growth of this sector in Pakistan, as an overwhelming proportion of labor force working in this sector is child labor. Furthermore, the enactment of Employment of Children Act of 1991 that banned the child labor put the sector's status in more vulnerable condition than ever before. China presented the highest export value among three countries with few exceptional years.

Figure 1: Trends in Carpet and Floor Coverings Export Value



4. Methodology and Data

Measuring comparative advantages may create certain difficulties since relative prices under autarky are not directly observable. Thus comparative advantage is calculated by calculating Revealed Comparative Advantage (RCA) for specific sector. There are different indices applied for this purpose, most common of which is Balassa

Index (1965) of RCA. The concept of revealed comparative advantage (Balassa, 1965) pertains to the relative trade performance of individual countries in particular commodities. The advantage of using comparative advantage index is that it considers the intrinsic advantage of a particular export commodity and is consistent with changes in an economy's relative factor endowment and productivity. Demerit of using comparative advantage index is that it is a partial equilibrium framework and provides general direction of movement and do not predict the potential future comparative advantage in particular sector of the country.[4]

This study used Balassa Index to calculate the RCA for Pakistan in rapidly growing Carpets and other textile floor coverings industry and is based on export data as per the (HS 2007) classification and is given the code 57. RCA is calculated at 2-digit and 4-digit level at aggregated and dis-aggregated classification.[5] Data has been sourced from UNCOMTRADE and World Development Indicators (WDI) covering a period of 14 years i.e. from1996 to 2009. RCA at 4 digit disaggregated level has been estimated for the years 2004-2009. The study calculates RCA indices for Pakistan, China and India.

The Balassa Index of RCA is expressed in the following way,

$$RCA_{ij} = (X_{ij}/X_{Wj}) / (X_i/X_w)$$

Where

X_{ij} = ith country's export of commodity j

X_{wj} = world exports of commodity j

X_i = total exports of country i

X_w = total world exports

[4] Revealed comparative advantage index (RCA) uses the trade pattern to recognize the sectors in which an economy has a comparative advantage, by comparing the country of interests' trade profile with the world average. It defines the pattern in comparative advantage by using the trade flows, since this pattern in comparative advantage is revealed by the observed pattern of trade flows, therefore it is called 'revealed comparative advantage. Movements in RCA are caused by economic factors, structural change, improved world demand and trade specialization (Akhtar et al, (2008).

[5] Harmonized Commodity Description and Coding System (HS) were adopted by the Customs Co-operation Council in June 1983, and the International Convention on the Harmonized System (HS Convention) entered into force on 1 January 1988 (HS 1988).

The index of revealed comparative advantage (RCA_{ij}) is interpreted in a relatively simple way. If it takes a value greater than unity i.e., RCA > 1, the country has a revealed comparative advantage in that product. More specifically, if RCA turns out to be greater than 1, that particular country has revealed comparative advantage in the production of carpets and other textile floor. Since the share of country's exports out of worlds exports of carpets and floor coverings would be higher than the total exports of selected country in world exports, the country would be competitive in the particular sector.

5. Empirical Results and Interpretation

The study measures revealed comparative advantage indices for the carpet and floor coverings industry. The analysis has been divided into two parts. The first part analyses the comparative advantage at aggregated level. The 2-digit level of Harmonized System (HS-2007) is employed to calculate RCA index at aggregated level. The second part, calculates RCA indices at disaggregate level i.e., at 4-digit level of HS-2007 classification. The purpose of calculating RCA index at disaggregate level is to work out possible differences across the industry at different level. RCA indices are measured for Pakistan and a comparison is made with India and China since both of these countries are among the major competitors of Pakistan in the export of carpets and other textile floor coverings.

5.1 Aggregate Analysis of Revealed Comparative Advantages

The estimation of Balassa Index for the years 1996-2009 presents the movement in the pattern of revealed comparative advantage. Our findings show that at HS-2 level, Pakistan has an upward moving trend in the comparative advantage for carpet industry. RCA index has remained greater than unity (RCA>1) since 1996 and is growing over the years as shown in Table 2.

The results of Table 2 show that throughout the period of study, Pakistan has never faced a situation of comparative disadvantage in this industry. The growing trend of RCA shows that Pakistan has great potential for growth in carpet and floor coverings industry. Good export performance of this sector can lead to more competitiveness if accompanied with better incentives from the government in this sector. RCA values kept

on increasing from 1996 till 2001 when RCA reached its highest value i.e. 2.05 but fell immediately in the next year that may be due to the return of Afghan refugees to their homeland as 80 percent of the workforce was comprised of Afghan refugees that time. Later on, it increased gradually but still with lower values of RCAs. The carpet industry in Pakistan needs much more attention in this regards.

Table 2: Revealed Comparative Advantage:Analysis at Aggregate Level

Year	**Pakistan**	**China**	**India**
1996	1.23	2.06	1.34
1997	1.26	1.57	3.8
1998	1.09	1.75	1.08
1999	1.15	1.62	1.11
2000	1.53	1.62	1.03
2001	2.05	1.65	2.6
2002	1.04	2.71	3.63
2003	1.62	1.32	3.74
2004	1.8	1.29	3.89
2005	1.13	1.28	4.18
2006	1.53	1.22	4.13
2007	1.44	1.3	4.35
2008	1.29	1.37	4.02
2009	1.38	1.21	4.46
mean	1.40	1.57	3.10
s. dev	0.29	0.41	1.36

Note: HS code 57 (Carpet and other textile floor coverings).
Source: Author's calculation from the UNCOMTRADE data.

Table 3: Test of Equality of Means between RCAs

Country	RCA	
	t-ratios	significance (p-value)
China-Pakistan	1.29	0.210
China-India	-4.03	0.0004*
India-Pakistan	4.58	0.0001*

Note: * indicates significance at 1 % level of significance.

In the last ten years Pakistan has emerged as one of the leading exporters of hand-knotted carpet industry accounts for 0.64 percent share of total GDP, 3.66 percent of manufacturing sector GDP and approximately 14 percent of small-scale manufacturing sector GDP. The available evidence indicates that Pakistan's carpet and rugs industry make up around 2.5 % of total exports". A more than 1.5 million people are employed in this sector and more than three million people directly or indirectly depend on its earnings [Nasir (2004)].

"Until 1970s, the carpet industry did not receive attention from the government but later on a number of carpet-weaving centers were established in the country. With the implementation of the labor laws and the factory Act of the mid-1970s, many big centers disintegrated into small units that eventually moved into residential areas to operate in private homes and sheds. The most carpet-weaving activity takes place in homes throughout the country. The upsurge in demand for hand-knotted carpets in foreign markets continued in 1980s and 1990s. However, with the slump in international economy in recent years, this demand has declined (EPB)".[6]

The lack of competitiveness in Pakistan's carpet industry has also been attached with the bans on bonded labor by ILO as child labor are mostly involved in this sector and children and women are considered as the better weavers of carpets in this industry from their efficiency and productivity concerns. The ban on child labor in 1991 in the carpet industry leads not only to the financial loss to the family but also towards a fall in production leading to lower foreign exchange earnings from this sector in the country.

Other problems hindering the export performance and competitiveness of this sector in Pakistan are pointed out as the reduction in rebates and incentives accompanied with high mark up rates that is troublesome for the carpet exporters; usage of obsolete production methods that is unable to produce carpets of outstanding quality; heavy reliance on the manual design methods while India and China use modern technologies; lack of skill development and the problems of supply chain and production capacity.

[6] Export Promotion Bureau, Pakistan hand-knotted carpets: A Golden Heritage

Although the study is mainly concerned with measuring the RCA for Pakistan in carpet and floor coverings industry, it also incorporates movements in RCA of India and China. Despite the fact that Pakistani carpets are generally superior to Indian and Chinese carpets but cheap labor, low cost raw material and low utility/financing charges in India and China gave a price edge to these countries over Pakistani products.

As depicted by the results, India is the strongest competitor with highest RCA values throughout the years of study. India has an edge over its competitors in this industry because of vast artistic skills of the weavers and low labor cost which is another advantage and favorable factor for growth. The magnificence of Indian carpet weaving and the intricate patterns substantially increased India's carpet exports and placed it prominently in the international carpet map, as depicted by the increasing RCA values.

Table 3 reports the test of equality of means between RCAs of three countries. The table postulates a significant difference of RCA among China-India and India-Pakistan, but no statistically significant difference emerged across China and Pakistan. The test suggests that India has an edge over other two countries in terms of competitiveness as a higher value for means of revealed comparative advantage is estimated for India that is also consistent with the RCA trends. Hence, India has gradually escalating in terms of competitiveness in carpet industry, while China and Pakistan are losing its competitiveness in this sector.

China has RCA in carpet and other textile floor coverings industry but it is facing a declining trend. China’s exports fell by 8.10 % and the average unit price fell by 9.98 % in 2009. Though the situation get improved later on but the financial crisis and low price of carpet exports made profitable growth of the carpet more difficult. This decline in carpet exports and average per unit price harmed the sound development of China's carpet industry.

Now, we turn towards the discussion of findings on RCA at disaggregated level.

5.2 Disaggregated Analysis of Revealed Comparative Advantage

The second part of analysis yields the measures of RCA at disaggregate level in order to capture the difference in export performance within the carpet and other textile floor coverings sub-sector for Pakistan and a comparison with China and India. At 4-digit level of HS-2007 classification, four sub sectors are selected of this industry owing to data availability. Pakistan is enjoying comparative advantage in the sector 5703 i.e. Carpets and other textile floor covering tufted. Whereas a comparative disadvantage in the other three sub sectors i.e**.** Carpets and other textile floor covering, knotted, whether or not made up (5701), Carpets and other floor coverings, of felt, not tufted or flocked, whether or not made-up (5704) and other Carpets and other textile floor coverings (5705). The results of RCA at disaggregate level are presented in Table 3, 4 and 5 for Pakistan, India and China, respectively.

Table 4: RCA at disaggregated level: Pakistan

HS codes	2005	2006	2007	2008	2009
5701	0.12	0.11	0	0.09	0.08
5703	1.11	1.14	1.58	1.4	1.1
5704	0.29	0	0.01	0	0.02
5705	0	0.74	0.03	0.01	0.2

Source: Author's calculation from UNCOMTRADE data.

Table 5: RCA at disaggregated level: China

HS codes	2005	2006	2007	2008	2009
5701	0.001	0.001	0.001	0.001	0.011
5703	0.009	0.009	0.009	0.001	0.001
5704	0.0001	0.0001	0.0001	0.0001	0.0002
5705	0.013	0.007	0.005	0.003	0.002

Source: Author's calculation from UNCOMTRADE data.

Table 6: RCA at disaggregated level: India

HS codes	2005	2006	2007	2008	2009
5701	0.012	0.001	0.01	0.014	0.013
5703	0.001	0.001	0.002	0.002	0.001
5704	0.001	0	0	0.0001	0.0004
5705	0.017	0.018	0.014	0.014	0.012

Source: Author's calculation from UNCOMTRADE data.

China and India are almost presenting the same picture as both have revealed comparative disadvantage at 4-digit disaggregate level in four sub sectors where their RCA's are less than unity (RCA<1). India has a comparative disadvantage in four sub sectors of the economy implying that India is not specialized in the export of these products since India's share of world exports of these particular commodities is less than its share of world exports of all commodities. Nevertheless, India is performing well in the overall carpet industry as is obvious from the RCA at aggregated level. China is lagging behind India in terms of RCA at disaggregated level as well and is not showing competitiveness in terms of RCA.

6. Conclusions and Policy Recommendations

This study aimed at assessing the structure of comparative advantage in Pakistan and making its comparison with India and China. Data as per HS 2007 classification was used to calculate the Balassa index of RCA. Data is collected from UN Comtrade Statistics and World Development Indicator (WDI). Balassa index is the most common approach of calculating RCA. It measures the competitiveness of a country in a particular product by comparing a country's exports of a product relative to its total exports and to the corresponding exports of all countries in the world. Index was constructed at 2 digit and 4 digit level of exports of carpets and other textile floor coverings. It also analyzed the change in scene of comparative advantage from 1996 to 2009 and at disaggregates level from 2005 to 2009, respectively. The purpose of such an analysis was to obtain an inclusive view of the comparative advantage for Pakistan in this specific sector that can enable policymakers to focus on

increasing exports further and facilitating the manufacturers so that RCA can be further enhanced.

Results suggest that Pakistan enjoys a comparative advantage at 2 digit level of classification throughout the period except for the year 2002 when value of RCA considerably reduced to 1.04, the lowest of all the periods but still exceeding the required value. The reason for such a sharp decline in RCA for that time period provided is the return of Afghan refugees under the United Nations High Commission for Refugees (UNHCR) program. India and China also reveal a comparative advantage and have RCA values greater than one throughout the period of study. India is evidently dominating the carpet industry with the highest values of RCA. Reasons behind such a high demand for Indian carpets include exclusive and unique designing. This implies that carpet business will be very challenging in the future as Pakistan has to face a tough competition from India in the global arena and the cost of production in this business is constantly going up. China showed a declining trend towards the end of 2008-09 in RCA pertaining to its low exports in these years and relatively less formal supply chain. At 4-digit level of industrial classification, none of the three countries could reveal comparative advantage in any of the sectors except for Pakistan in the category 5703.

Overall, the values for RCA index of Pakistan shows that Pakistan has a comparative advantage in this sector and has higher potential for growth and development of this sector. But the resources are not being utilized properly. Continuous government support through new schemes and training program will be helpful for handmade carpet sector. Results of the study suggest that a lot of opportunities are available for the carpet industry in terms of improving the productivity and quality of raw materials at reasonable prices. The Research & Development facilities for improving the fiber quality and development of specialized fibers/yarns are required as market always demands a diversified nature of product. Rising Inflation is a world-wide phenomenon. Owing to increase in energy prices, the cost of raw material has increased that leads to rise in the price of carpets. So the government must step in and provide subsidies to make the carpet industry of Pakistan more competitive in international market.

The policy implications flows out from the results to improve the competitiveness of carpet industry are mentioned below:

- Employing new methods of production, designing and better marketing.
- Increasing the supply network at national and international level.
- Having a better knowledge of domestic and international demand and ensuring superb quality production.
- Initiating research and development activities for quality enhancement.

In short, carpet industry is imperative for the growth of the economy. It does not facilitate the foreign exchange earnings only but it also contributes to the relief of poverty in rural areas. It is a major source of income for families who have little number of resources of livelihood, apart from the subsistence level earnings from agriculture. Families can easily join the carpet-making as an occupation as it requires lesser financial and other infrastructural facilities. Keeping in view the benefits of this industry, it is therefore essential for the government to take care of the development of this sector so that the economic problems of rural population can be solved to some extent.

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Determinants of New Firm Formation: Evidence from Iranian Manufacturing Industries

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While the importance of entry has been recognized in many studies, attention has focused almost on quantifying barriers to them, rather than investigating the determinants of entry and measuring the magnitude of this process. This notion has got less attention in Iran as a developing country. Present paper is concerned with deliberating a complete picture of the determinants of firms start-up in Iranian manufacturing industries at 4-digit industry level during the period of 2002-2006. Using the structure-conduct-performance paradigm, results of this study shows industry's barriers to entry such as capital intensity, MES and concentration affect the ability of potential entrants in negative direction. Also, industry size, price cost margin and industry growth turn out to induce entry. In addition, entrepreneurs prefer to enter in industries where advertising expenditure, business risk and small firm presence is low and skilled labor is high.

1. Introduction

In 1934 Schumpeter's "creative destruction" hypothesis made a potential revolution in economics. He commented that creative destruction is the key driver of changes in technology and industrial landscapes in a market economy. In this process, entering entrepreneurs introduce new technologies, products or services to markets and force the exit of incumbents whose offering become obsolete (Pe'er and Vertinsky, 2008). This phenomenon is also important for another reason. Entry of new entrepreneurs helps to maintain competition and hence increasing efficiency (Ilmakunnas and Topi, 1999) and represents a changing pool of potentially strong competitors, viz, the seedbed of new activities from which will emerge the successful business and industries of the future (Carree and Thurik, 1999). Thus, entry may be considered as highly

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important in increasing competitive room and consumer welfare. Nevertheless, entry rates of firms differ strongly across industries and over time (Herck 1984, Dunne, Roberts and Samuelson 1988). There has been a long-standing interest in determining features which explain these differences. In empirical studies this variation in the intensity of the selection process by which incumbents are displaced by new entrants is explained by variation in profitability and variation in the height of entry and exit barriers (Carree and Thurik, 1996). In fact, entry has been found to be positively related to growth in many studies (Orr 1974, Gorecki 1975, Duetsch 1984, Khemani and Shapiro 1986 and Highfield and Smiley 1987). Most of these studies also found lagged profits to exert a positive influence on subsequent entry, with the exception of Orr (1974). Following the recommendation of Sleuwaegen and Dehandschutter (1991) export share which is an indicator for the ability of industry in competition with foreign markets, has positive impact on entry. While the role of capital intensity as a barrier to entry is well recognized in the studies by White (1982), Duetsch (1984) and Khemani and Shapiro (1986), no such effect was specified in a survey conducted by Highfield and Smiley (1987). As a consequence, these conflicting results have not only created confusion among scholars about the response of the question "What determines entry?" but they have also made it difficult for policy makers to look at these emerging literature for policy guidance (Sutaria and Hicks, 2004). For an entrepreneur who consider to start a business it is important to know where to locate. Industrial factors can change the decision to enter or not. Furthermore, cognizance of entry determinants to shed some lights on the way of politicians is a valuable effort that has got less attention in Iran. This paper intends to give a deeper understanding of the factors affecting entry in Iranian manufacturing industries during 2002-2006.

The setup of this paper is as follows: Second section as usual refers to some previous related literature. Section III is used to provide an overview of the data set and industry selection process. In section IV, the empirical model and variables are introduced. Section V describes the results of estimation. Section VI concludes and recommends policy and suggestion for future research.

2. Literature survey

The basic valuable effort on entry can be attributed to Bain's (1949) pioneering study, who shaped the foundation for large body of research. Although, from the early 1950s up to now, investigating the relationship between entry and economic factors have received a great deal of attention but as Mansfield (1962) argued "Because there have been few econometrics studies of the birth, growth and death of firms, we lack even crude answers to the following basic question: what are the effects of various factors on the rates of entry?"

Despite this critic, evidence show many authors investigate the entry determinants and their effects. A quick glance on literature guides us to the fact that, this notion has received a great deal of attention in developed countries. The most popular remaining are for Canada by Orr (1974) and Baldwin and Gorecki (1991), Finland by Ilmakunnas and Topi (1999), Germany by Wagner (1994) and Fritsch and Falck (2007), Greece by Fotopoulos and Spence (1999), Italy by Vivarelli (1991) and Garofoli (1994), Netherlands by Kleijweg and Lever (1996), Portugal by Mata (1994), Mata and Portugal (1994) and Mata and Machado (1996), Spain by Callejon and Segarra (1999) and Arauzo-Carod and Segarra-Blasco (2005), Sweden by Davidsson, Lindmark and Olofsson (1994) and Brannas and Berglund (2001) and United States by Dunne, Roberts and Samuelson (1988), Acs and Audretsch (1989), Scott Morton (2000) and Elango and Sambharya (2004). In this part, we investigate some relevant studies in this context by details.

One of the earliest empirical studies of determinants of entry, examining Canadian manufacturing industries, was that of Orr (1974). He uses data from the 1967 CALURA (Corporations and Labor Union Returns Act) report. The entry variable is based on annual changes in the number of corporations in each of 71 three-digit industries for 1963-1967. Using a log-linear estimation method, he finds strong barriers to entry are capital requirements, advertising intensity and high industry concentration, while research and development intensity and risk are also barriers but less so. The profit and growth rate appear to be only mild incentives to enter, while the industry size had a consistently positive impact on entry.

Shapiro (1983) in his discussion of entry within the context of the theory of the multinational corporation closely follows the models of Orr that

mentioned above. In his model, Shapiro uses births and deaths of domestic and foreign manufacturing establishments in Canada from 1972-76. He estimates the model using OLS with the most success in explaining domestic entry. Deterrents to domestic entry include concentration and cost disadvantages associated with smaller scale firms, but the same is not true for foreign entry. Advertising was found not to be a deterrent to entry by either type of firm. The research and development variable, shows no significant impact on domestic entry and a positive impact on foreign entry.

Carree and Thurik (1994) use panel data of 36 Dutch retail shops from the 1977-88 period to model changes in profit and the number of new firms. They find that demand growth has a stronger effect than profitability on net entry. However both variables, as well as unemployment, have positive effects on entry. Another study in that year was yielded by, Reynolds, Storey and Westhead (1994) in which explanatory characteristics for firm formation were modeled using cross-sectional data, demand growth was the most important process explaining firm formation in five European countries and the USA. Further, the presence of small firms and economic specialization, as well as urbanization and agglomeration appear to have a consistent positive effect. Personal household wealth has a weak positive effect; the presence of a liberal political ethos and unemployment has a mixed effect; and local government spending is found to have no statistically significant effect.

Roberts and Thompson (2003) examined the entry in a transition economy. They estimated entry equations across 152 3-digit industry levels in Poland across 1991-92 and 1992-93. According to the estimation results, concentration exhibits a highly significant large negative impact on entry. Capital intensity is negative but significant only in the 1991-92. The consumer goods binary variable was insignificant in many cases. Industries with high proportion of state-owned and foreign-owned firms would also experience lower levels of entry. Among the industry incentive variables, growth shows a generally positive sign but not significant. Profitability carried largely insignificant coefficient in entry equations in 1991-92.

Arauzo-Carod and Segarra-Blasco (2005), explained that the determinants of entry are not independent of firm start-up size. Using

Spanish manufacturing industries data during the period of 1990-96 and applying OLS and Quantile Regression (QR), they examined how the entry inducing factors and the barriers to entry determine the size distribution of the new cohort. According to OLS, industry growth as an incentive has positive effect on entry but based on QR it has ambiguous effect. Price-cost margin has a negative effect on entry and the coefficient does not have increasing effect. The R&D sign is negative for OLS and there are mixed results for QR. The results show the presence of newcomers with a suboptimal scale size. It means the fewer the suboptimal size firms, the greater the effect.

As can be seen, although there are numerous studies for developed countries but this proposition has been tested in only a few studies in developing countries. Among notable studies, we can accentuate on Akram (2002) in Bangladesh who just reported the net entry of manufacturing industries at 3-digit industry levels for five census years and classified new firms in terms of ownership (e.g. public, private and joint venture). Lay (2003) in Taiwan investigated the interaction between entry and exit rates across industries namely replacement and displacement. The results show that the entry of new plants has a moderate effect to facilitate the displacement but no significant replacement effect was found. Another study in the same year was by Gaygisiz and Koksal (2003) in Turkey who used a cross-section and panel data analyses to explore the determinants of regional characteristics that are influential on new firm formation. To the best of our knowledge only one empirical study has been carried out to give an explanation on entry and it's determinants in Iran[3]. Therefore the necessity of investigating this subject in a developing country such as Iran is obvious.

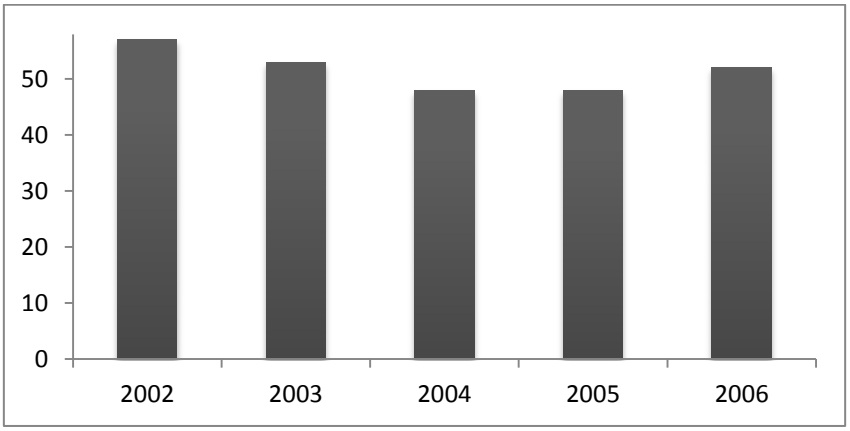
3. Data and industry selection process

The data used in this paper is collected by Statistical Center of Iran (SCI) which is the most valid source for reporting data. Our sample is derived from a combination of two different databases. The first database is used for the entrepreneurial entries which count the annual new firms in each industry. Second database compute annual incumbent firms in each industry and is used to calculate control variables.

[3] Beheshti, Senoubar and Farzaneh Kojabad (2009)

Our sample covers plants in 16 selected 4-digit Iranian manufacturing industries for the duration of 2002-2006. First of all, for selecting the sample, we include the entry of all industries at 4-digit levels. By looking at the entry of these industries, many industries have small entry. Since, industries with ten or more entry in each year are selected; hence many were omitted from further analyses. Among remained, we seek for those which have continuous entry during the five years. Accordingly, 16 industries were remained. By looking at the share of these industries in total entry, as Figure (1) shows, during the period under estimation these industries constitute near 50 percent of new entrants. They are comprise of manufacture of dairy products (1520), manufacture of bread and bakery product (1545), confectionery (1546), other food products (1548), preparation and spinning of textile fibers; weaving of textiles (1711), handmade carpet and rugs manufacturing (1724), carpet and rugs manufacturing (1726), manufacture of wearing apparel, except fur apparel (1810), manufacture of plastics products except footwear (2520), manufacture of articles of concrete, cement and plaster (2695), cutting, shaping and finishing of stone (2696), brick manufacturing (2697), manufacture of other non-metallic mineral products (2699), treatment and coating of metals; general mechanical engineering on a fee or contract basis (2892), manufacture of other fabricated metal products (2899), manufacture of parts and accessories for motor vehicles and their engines (3430).

Figure 1: Share of the 16 selected industries among all entries



4. Empirical model and variables

Various definitions are used to identify entry but all of them implicit similar concept. To get a complete picture of entry, it is necessary to introduce entry at first. Entry happens if an establishment reports some employee in the year *t* but no employee in *t-1* (Wagner, 1994) or it is defined as the number of new firms that attain some minimally effective size in a typical year (Orr, 1974). Briefly, entry occurs if a firm manufactures some products in the year *t* but no products in year *t-1*.

Entry can be modified in two notions, gross entry and net entry. One can simply count the number of new firms entering during period (gross entry) or can compute the net change in the number of firms from beginning to the end of the period. Gross entry rate is a well-established subject. For instance, Siegfried and Evans (1994) defined entry rate as the number of entrants during the period divided by the initial stock of firms in the industry, times 100. Geroski (1995), explained entry rate as the number of new firms divided by total number of incumbents and entrant firms producing in that year, although the right choice of method depends on the purpose of the study and data at hand. In this paper gross entry rate is standardize as the ratio of the number of start-ups in any industry to the total number of new entrants.

Literature on new firm formation identified wide range of models to explain entry phenomenon. The work of Orr (1974) is usually referred to as the first stylized formulation of a model of entry. According to Orr's model, entry rates in a given industry will have a positive relationship with the expected profits, and a negative relationship with the height of entry barriers specific to the industry. The size of the profit rate in the long term serves as a measure of the barriers to entry. The model takes the form:

$$ENT_{it} = f(\pi_{it} - \pi^*_i) \qquad (1)$$

Where ENT_{it} is the gross rate of entry in industry *i* at time *t*, π_{it} is the industry expected rate of profits and π^*_i represents the rate of long term profits of the industry. The higher the difference among expected profits and long term normal profits, the higher the incentive to enter. It has been argued that Orr's model is only a partial explanation of entry behavior, given that empirical evidence shows that entry rates are fairly high even in

periods where no extraordinary profits are expected. Baldwin (1995) argues that entry may occur even in a zero profit industry if entrants expect to displace less efficient incumbents. So, the poor explanatory power of this regression results imperfect picture of entry.

The present research takes the view that entry is influenced by variety characteristics of an industry in the framework of Structuralism School. The linkage among industry structure, firm conduct, and performance has been well articulated in the structure–conduct–performance (S-C-P) paradigm. Stated briefly, the S-C-P paradigm is based on the following logic: An industry's structure is comprised of technical and economic dimensions within which firms compete and influences the types of strategic choice that firms within the industry use to compete against each other. For example, entry barriers in an industry protect all firms in an industry from new entrants. Even though firms in an industry will vary in terms of resources, capabilities, size, etc., all firms in an industry face the dynamics of a particular market (e.g., competition, product differentiation costs, market demand). This industry-specific confluence of dynamics, to a large extent, influences the response of all companies within an industry. Therefore, the structure of an industry and its underlying economics influence ''competitive rules of the game as well as the strategies potentially available for a firm in an industry'' and consequently the profitability of all firms in that industry (Elango and Sambharya, 2004).

The entry model developed here presumes that entry of firms is determined by industry characteristics. To facilitate discussion, the explanatory variables have been categorized into three groups: Structure (concentration, capital requirement, minimum efficient scale, industry size and small firm presence), Conduct (skilled intensity, average wage rate, advertising as well as research and development intensity) and Performance (price-cost margin, industry growth, business risk and labor productivity). The model to be estimated is as follows:

$$E_{i,t} = \alpha_i + \beta_1 CON_{i,t} + \beta_2 CAP_{i,t} + \beta_3 MES_{i,t} + \beta_4 ISIZ_{i,t} + \beta_5 SFP_{i,t} + \beta_6 SI_{i,t} + \beta_7 AWR_{i,t} + \beta_8 AD_{i,t} + \beta_9 RD_{i,t} + \beta_{10} PCM_{i,t} + \beta_{11} IGRO_{i,t} + \beta_{12} BR_{i,t} + \beta_{13} LP_{i,t} + \varepsilon_{i,t} \quad (2)$$

The dependent variable $E_{i,t}$, is gross entry rate and the symbols of explanatory variables are as follows:

CON for concentration, CAP for capital requirement, MES for minimum efficient scale, ISIZ for size of industry, SFP for small firm presence, SI for skilled intensity, AWR for average wage rate, AD for advertising intensity, RD for research and development intensity, PCM for price-cost margin, IGRO for industry growth, BR for business risk and LP for labor productivity. α_i is the fixed effect of each industry, β_i displays the coefficient of explanatory variable that should be estimated, $\varepsilon_{i,t}$ is the error term of each industry at time *t* which is distributed with zero mean and σ_ε^2 variance, *i* represents industry and *t* shows time. The description of the variables is as follows.

Concentration: Number of firms operating in an industry and the distribution of market shares among them reflect the key structural characteristics of the industry. More concentrated industry leads to fewer entrants because it makes collusion easier and predatory behavior more feasible and potential entrants also consider the possibility that the established firms may collude to thwart their entry (Orr, 1974). Market concentration appears to deter entry in gross entry studies as well (Shapiro 1983, Chappell, Kimenyi and Mayer 1992 and Mayer and Chappell 1992). Concentration is measured by Herfindahl-Hirschman index regarding to output. This index varies between 0 and 1, which take value 0 if the market is competitive. In perfectly competitive markets, larger number of firms makes entry easy for entrants.

Capital requirement: It is well-known that for new firms it is more difficult to obtain funds than for existing firms, especially for small entrants capital requirements can be quite severe. Entry is not a cost less process, capital intensity is closely related to entry costs, because if the industry uses capital-intensive technology, the cost of the initial investment could be substantial (Kaya and Ucdogruk, 2002). Industries with higher capital intensity were, for example, found to have lower gross entry rates in studies by Dunne and Roberts (1991) and Chappell, Kimenyi and Mayer (1992). So, it may appear as a barrier to entry. It is calculated as capital output ratio. Since, equipment preparation and acquire funds occurred before starting a business, this variable take into account with one lag.

Minimum efficient scale: With high fixed costs, the scale of operation required to operate efficiently increases in order to cover the fixed costs and to keep long run average cost at the lowest level. Existing firms

operating at the efficient scale can erect barriers for entrants because of cost disadvantages of operating scales below the efficient scale. Firms operating at scales below the efficient scale are at a cost disadvantage compared to those operating at the efficient scale (Basant and Nath Saha, 2005). Also, in industries where MES is large, firms will start their activities on a greater scale as compared to industries where the MES is small. Operating at large scale requires the ability to raise amount of capital required to operate a minimum efficiently scaled plant (Mata and Machado, 1996).While Armington and Acs (2002) reported the negative impact of MES on new firm formation, Sutaria and Hicks (2004) found larger MES generate relatively faster rates of new firm formation. It is expected that MES carry negative coefficient in the entry equation. In this paper the Comanor[4] approach is used to calculate MES.

Industry size: Given MES, larger the size of the industry, better the scope for more players to enter and operate at an optimal scale and even for existing players to expand and diversity (Basant and Nath Saha, 2005). Also, the size of the sector affect the replacement effect-i.e. the larger the sector size, the more firms enter and leave sector (Louri and Anagnostaki, 1995). It is expected larger industries induce more entrants for entering and this opinion was demonstrated in a survey by Roberts and Thompson (2003). It is defined as the logarithm of employees in an industry.

Small firm presence: It seems entrants do not tend to enter industries which small firms play a dominant role. If the number of small firms increases, the degree of competition will rise. In fact, the change in small business share is the result of the height of entry barriers. In an effort by Acs and Audretsch (1989), it was suggested that firms do not tend to enter industries that are dominated by small firms and this is measured as the share of industry sales accounted for by firms with fewer than 500 employees. But in this paper it is calculated as industry output accounted for by firms with fewer than 50 employees. Since, the data for sales were not at hand, so we use output as a proxy for sales. Moreover, based on the definition of SCI, industries with fewer than 50 employees are introduced as small firms in Iran.

[4] For more information about the index see Comanor (1967)

Skilled intensity: It might be more attractive for firms to produce in industries which the share of skilled workers is high. Based on product life cycle theory, firms need a high share of skilled labor to be able to handle the high degree of uncertainty connected to the early stage of production and develop the product (Karlsson and Nystrom, 2003). This notion is also a confirmation on the results of Armington and Acs (2002).It is defined as the number of skilled, technician and engineers workers as a percentage of total employees.

Average wage rate: It is expected to be negatively correlated to the entry rate. The average wage rate reflects the demand for industry-specific skills. In high wage industries, new firms will face problems in hiring the workers they need (Taymaz, 1997). However, the reverse result was visible in Kaya and Ucdogruk (2002) effort. The average wage rate is defined as the ratio of the sum of total payments made to wage earners to the average number of employees.

Advertising intensity: High advertising expenditures make entrants less desirous. This is possible through three channels. First, high levels of advertising create additional costs for new entrants to break buyer loyalty. Secondly, the effect of advertising on firm revenues and therefore profits is subject to economies of scale, which result from the increasing effectiveness of advertising per unit of output sold and decreasing costs for each advertising exposure. Thirdly, advertising requires funds and since the returns are in the form of intangible assets formation, the certainty of returns is low (Bsant and Nath Saha, 2005). Also, advertising raise the fix cost of operating in the industry, therefore for a new entrant it is hard to overcome these expenditures. It is calculated as total expenditures on advertisement to total output.

Research and development intensity: Higher R&D expenditure discourages potential firms from entering. Mueller and Tilton (1969) suggest two reasons for R&D as a barrier, first, the existence of economies of scale in R&D process and second, accumulation of patents and know-how on the part of incumbent firms. On the other hand, R&D can be served as an indicator of product innovation which induces entry. Basant (2000) stated that firms can purchase foreign technology and product licenses rather than developing it in–house. In such cases the process of entering a market by purchase of technology and know-how may actually help entrants rather than erecting barriers. While, Orr

(1974) did not find R&D to be significant, Highfield and Smiley (1987) find it to have a positive impact. This variable is measured simply by total expenditure on research and development divided by total output.

Price-cost margin: Profit margin reflects the market power of incumbent firms and the expected profitability of potential new firms. The expected effect of PCM is ambiguous, because if the incumbents earn supernormal profits in the long run, they can create technical or strategic barriers to entry, while a high PCM encourages potential producers to enter. When a new firm overcomes the barriers to entry we expect a positive effect, especially if these firms are large (Arauzo-Carod and Segarra-Blasco, 2005). While Duetsch (1975) points out to the role of price cost margin as a barrier to entry in which impede the new firms to enter the market, Acs and Audretsch (1989) and Dunne and Roberts (1991) concluded that higher margins industries experience higher entry. But commonly it is assumed that industries with more profit attract more entrants. Following the recommendation of Fotopoulos and Spence (1999) it is formulated as value added minus payroll over total sales. Due to data limitation, total output is used as proxy for sales. Since, an entrant looks at the previous profitability of the industry and then decides to enter or not, this variable is entered in estimation with one lag.

Industry growth: Productivity growth creates new demand for the development and manufacture of new products, which means that there will be more newly established companies if productivity growth rises (Nivin, 1998). Many studies suggest that growth rate is undoubtedly an attraction to potential entrants; see, for example, Highfield and Smiley (1987), Khemani and Shapiro (1988) and Ilmakunnas and Topi (1999). It is defined as annual growth rate of each industry's output.

Business risk: Entry can be viewed as an investment decision. With various investment options available to an investor, analyzing the opportunity costs has high importance. So, this idea requires the analysis of risks which is used to capture the opportunity costs of entry. It is sometimes suggested that businessmen avert risk. What is implied is that they have a relatively high disutility for losses and a diminishing marginal utility of profit (Orr, 1974). It is assumed that for any profit rate, as the standard deviation increases, the incentive to enter decreases. For calculating risk this paper interests to use the method supplied by Louri and Anagnostaki (1995). It is measured by the standard deviation

of profitability in the last 4 years, divided by the average profitability in the same period.

Labor productivity: The level of labor productivity is relatively high in industries where investment requirements are indivisible and massive. This discourages potential firms from entering. Moreover, the level of productivity may reflect the performance of existing firms. Potential firms avoid entering into those sectors in which existing firms are very productive because of the risks of severe post-entry competition (Kaya and Ucdogruk, 2002). It is calculated as the logarithm of the ratio of value added to the average number of employees.

Table (1) summarizes the variables description, discussion of theoretical arguments and the previous empirical evidence that has been discussed in this section.

Table 1: Overview of the description, theoretical expectations and previous empirical findings on the determinates of entry

Variables	Description	Theoretical expectation	Empirical findings
CON	Herfindahl-Hirschman index regarding to output	-	-
CAP	Capital output ratio	-	-
MES	Comanor approach	-	+/-
ISIZ	Logarithm of employees	+	+
SFP	Industry output accounted for by firms with fewer than 50 employees	-	-
SI	Number of skilled workers to total employees	+	+
AWR	Sum of total payment to average number of employees	-	+/-*
AD	Expenditure on advertising to total output	-	-
RD	Expenditure on research and development to total output	+/-	+/-
PCM	Value added minus payroll over output	+/-	+/-
IGRO	Annual growth rate of output	+	+
BR	Coefficient of variation of profitability	-	-*
LP	Logarithm of the ratio of value added to the average number of employees	-	-*

*Means that a small majority of the studies tends to find this result

5. Model estimation and results

Since the data that is used in the empirical analysis have the nature of panel data, i.e. combining cross-section and time series, econometric techniques suitable for such datasets have to be used. One of the advantages of using panel data methods is that they allow the researcher to control for individual heterogeneity. In this case, we assume that each individual industry has specific characteristics that we are unable to measure with the set of variables included in our empirical model. These characteristics are denoted unobservable industry-specific effects. These industry specific effects may be assumed either random or fixed. If the individual specific effects are assumed random, this implies that they are uncorrelated with the other explanatory variables. In the fixed effects model, on the other hand, the industry specific effects are assumed to be correlated with the explanatory variables (Greene, 2003). According to Baltagi (2001), the choice between a random and a fixed effects model should be solely based on theoretical consideration. The decision to choose the fixed effects model or random effects can be done by performing the Hausman specification test which has an asymptotic chi-square distribution. Since the value calculated according to the Hausman test statistics is lower than the critical value the Hausman specification test suggest that we should choose the random effect model instead of the fixed effect model[5].

Another important test in this perspective is the panel unit root test which leads results in efficient testing power as ignoring this test will lead to a spurious regression. In this test, the null is based on the existence of unit root in series. Based on Levin, Lin and Chu (2002) and Im, Pesaran and Shin (2003) tests, the results provide evidence on the rejection of null hypothesis at 5 percent significant level. Since, all variables follow an I(0) process which confirm the stationary of variables, the necessity of using cointegration test is denied. Based on the Likelihood ratio test the model has heteroscedasticity. In this case, the best way to estimate the model is the method of Generalized Least Square (GLS). By doing this, the autocorrelation in error terms will also be removed. Table (2) demonstrates the results of GLS estimation for each group of variables.

[5] The Hausman test and issues associated with panel data are thoroughly described in Baltagi (2001) and Greene (2003)

Table 2: Results for GLS method

Variables	Coefficient	t-statistics	Prob.
CON	-16.470	-15.266	0.0000
CAP	-0.0036	-3.6328	0.0005
MES	-0.0045	-3.6418	0.0005
ISIZ	0.0286	4.2331	0.0001
SFP	-17.100	-11.438	0.0000
SI	0.028	2.8145	0.0064
AWR	0.0000	2.6130	0.0111
AD	-25.356	-2.4720	0.0160
RD	42.81	1.1631	0.2489
PCM	7.9302	5.2704	0.0000
IGRO	1.6992	3.7592	0.0004
BR	-4.2854	-5.4997	0.0000
LP	0.0004	0.3612	0.7191
F-statistic of model 1= 20.53	Prob= 0.0000	R-squared= 0.80	
F-statistic of model 2= 25.32	Prob= 0.0000	R-squared= 0.69	
F-statistic of model 3= 17.49	Prob= 0.0014	R-squared= 0.75	

Source: own calculation

As can be seen, the probabilities of F statistics are significant which indicate the models estimation are well organized. Furthermore, the sign of ten out of thirteen variables on entry rate is as expected. Our estimation result for concentration goes in line with our expectation. The coefficient of concentration is negative and significant. It is easier to enter perfectly competitive industries in which many firms produce standard products and provide business opportunity that makes entry easy for entrants. Also, performing in industries with large number of firms with small market shares compared with industries with small number of firms with large market shares is more ideal because possibilities of concerted action post entry tend to increase. Capital requirement is statistically significant in lowering gross entry rates because if entry requires high start-up costs, this makes it more difficult to enter a specific industry. In Iran capital intensity acts as a barrier to entry because financing for starting a new business is mainly done from banking system. Due to high interest rate in these systems, entrants face the problem of providing funds. Another common barrier to entry in manufacturing industries is minimum efficient scale. MES refers to build a plant at a particular size to produce goods at a reasonable cost. The results show that industries characterized by plant scale economies have significant barriers to entry because entrants are forced to make significant investments to enter these industries. Also, new entrants face

strong competitive reaction from existing incumbents who benefit from cost advantage of operating in minimum efficient scale. As expected, industry size influences entry in positive and significant way. Larger industries are more attractive for entrants because they can produce more and normally the size of an industry may have direct relation with profitability. The negative and significant coefficient of small firm presence suggests that, in fact, firms do not tend to enter those industries in which there is already a considerable presence of small firms. Based on results, industries with skilled labor have positive and significant effect on the founding of establishments. Average wage rate is significant but the sign is opposite of what was expected. The reason may be that in these industries due to high profitability entrants are not sensitive to wage rate. The advertising intensity is another source of entry barriers, because new firms need to match the advertisements level of the incumbent firms to be known and tested by consumers. Therefore the cost of entry is increased by the advertisement intensity of existing firms. Also, advertising involves costs which are sunk and for a firm that plans to start a business it is hard to overcome these expenditure and therefore it discourages them. New firms are motivated to enter to that industries where profit margin is high and cause excess profits. The growth rate of industry profitability reveals its attractiveness for potential firms because potential entrants are profit seekers. Based on theoretical hypothesis, more profitable industries persuade new entrepreneurs. Highly growing industries absorb more entrants, as it is obvious from results. Firms enter more frequently to rapidly growing industries because these industries create new demand and induce existing firms to diversify their production. Also, industries with higher growth provide more scope for new players to supply their production. In addition, in growing industries, incumbents are less likely to get involved in price war or react adversely against new foreign entrants, as all firms would have the opportunity to grow. In this case, foreign entrants may not have to fight to gain market share and it makes entrants more enthusiastic for entering. Negative and significant effect of risk is not unusual and shows that there are fewer candidates available for entering industries where risk is high. Since, risk shows variability of industry performance over time, higher risk is likely to reduce the likelihood of entry taking place. Labor productivity as well as research and development failed to emerge a significant signs.

6. Conclusion, Policy recommendation and suggestion for future studies

Despite several previous research on new firm formation and industrial factors in developed countries, this phenomenon has got less attention in developing countries such as Iran. In this paper we focus on entry determinants in Iranian manufacturing industries during 2002-2006. To analyze the effect of industry characteristics on entry mode choice we applied structure-conduct-performance paradigm. All in all, results are generally coincidence with expectations, as capital intensity, MES and concentration form significant entry barriers. Among incentives, industry size, price-cost margin and industry growth turn out to induce entry. The results also point out to the fact that, entrepreneurs prefer to enter in industries where advertising expenditure, business risk and small firm presence is low and skilled labor is high. So, the results of this paper can be served as appropriate starting points for a policy that aims to promote industries which are not of interest for potential entrants and government create rooms for entrepreneurs to encourage them for entering in these industries.

The results of this paper show the role of barriers and incentives to entry in Iranian manufacturing industries. For entrepreneurs considering whether to enter a specific industry these findings give some hints as guidance to choose. Capital requirement and minimum efficient scale as barriers that force entrants to assemble funds and discourage them from entering should get more attention. Government could arrange adequate program for financing new entrants. This is possible by improving capital market and enhances competition in banking system. Also, industries with low profitability and growth should be explored and the reasons of this trouble should place in the first stage of policy makers program. As it was shown, majority of entrants prefer to concentrate in the 16 before mentioned industries. Hence, government should support other industries and help them to make attraction for entrants by tax-exemption for example.

Consistent with previous empirical research, the findings of this study shows that the entry rates vary substantially across industries. We make an effort to give a detailed picture of those characteristics of the industries that are able to explain these differences in entry. But the hardiness of capturing data in each industry unfortunately did not let us

to attain all the influential variables, such as export and import orientation. In the future, it would therefore be interesting to perform some more studies that the determinants of entry in each individual industry will estimated separately. Hence, the theoretical models that try to explain the processes of entry need to be further developed to better incorporate industrial characteristics.

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Knowledge, Migration and Countries of Muslim World – Spatial Impacts and Prospects

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The article presents an empirical examination of the spatial dependence of emigrants and immigrants on the indicators of a knowledge based economy. The article is motivated by a knowledge gap among countries of the Muslim world, worsening demographic conditions, the growing importance of knowledge in the world economy and geographical proximity. The existence of spatial distribution and autocorrelation among migrants is examined through the spatial lag and the spatial error models. Although one can assume that the presence of both – the number of emigrants and the number of immigrants have similar preconditions, with slight variables - emigrants tend to indicate the dependence on the nearest neighbours. Therefore studying of emigrants among the countries of Muslim world is done better through spatial models and is more appropriate than the estimate regression coefficients through ordinary least square regression. When looking at the knowledge economy, findings also suggest that the number of internet users and the number of journal articles influence the number of emigrants (and also number of immigrants). The human desire to leave a country is also driven by other factors, for example tariff and nontariff barriers, average years of schooling, industrial production growth rate and the number of computers in each country.

1. Introduction

The relative importance of national prosperity such as physical resources, population growth, globalization, environment, amongst other things, has shifted over the time (López-Claros, 2011) and attention is more focused on knowledge and the knowledge based economy, leading to innovation and technical change. Intangible assets in the form of knowledge can be considered as indicators of long- term economic

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growth as well as an ultimate precondition of "Knowledge Based Economy" (OECD, 1996). Diffusion of this knowledge lies on the cooperative learning process which is achieved through the geographical (agglomeration economy) and cognitive proximity (shared values, culture and trust) (Camagni, Capello, 2009) of countries and here opens the way to study knowledge indicators through the spatial dependence. In addition, knowledge is associated with human capital therefore the knowledge based economy leans on the quality of human resources. Seen in this light, economy could reap the benefits from inward migration which allows for the movement of specialized skilled people (Porter, 1990). It might seem to be more appropriate to include into the observation only migrated skilled people. However as Daly (2006) suggests, new globalization framework demonstrating free mobility of people, goods and services operates under "free migration", where "free" does not mean only skilled but deregulated, uncontrolled and unlimited and in many cases, immigrants are frequently disadvantaged people. This fact leads to the premise that a country with high net migration flow (immigrants minus emigrants) gains not only positive but also negative repercussions from migration. When considering the perspective of economies moving towards a growth based on knowledge, the important question is - which knowledge factors encourage the human propensity to migrate?

As was mentioned above, the role of location should not be overlooked in generating, diffusing and absorbing of new knowledge on the international, national, regional or local level and this fact highlights spatial impacts on knowledge indicators. The importance of space moves the studying of the variable´s dependence away from the classic ordinary least square regression (or its modifications) towards spatial models which include spatial dependence and distribution within the explained and explanatory variables. The main goal of this article is to study the spatial influences of knowledge indicators and other independent variables, on the human propensity to migrate (seeking resources among countries in the form of knowledge and gaining a competitive advantage) across the 21 countries of Muslim World. Although a lot these countries "lie" on the poverty line, it can be assumed that in this era of information technology, these countries are also shifting toward knowledge-based economies and the resources of a knowledge based economy can influence on the number of immigrants and emigrants. Here, the paper analyses the human desire to migrate and

assumes that migrant people are seeking resources in the form of knowledge indicators from local countries (patches - areas) which have an influence on each other. Firstly, it is helpful to define migration through spatially depended movement of people who are seeking resources and trying to gain a competitive advantage. The next parts of paper are focuses on the resources which people are looking for in a knowledge based economy. Finally regression models are used to confirm or refute claims that migration depends on a) who your "nearest neighbours" are, and b) the significance of knowledge indicators.

2. Migration phenomenon and a human propensity to migrate

Migration can be planned and unplanned (Zhang et al., 2006) but generally, migration is the residential change of any type, from one domestic area to another (Goldscheider, 1971). This change of area depends on the decision making of the individual (personal values) and the population as a whole (common values) (Auger, Poggiale, Charles, 2000). One can assumes that individuals make decisions about movements due to the existing conditions in each area. Assuming you are living in a knowledge-based economy, these conditions can be determined by the gaining of knowledge and how easy it is to do so. If land is a set of areas (patches) colonised by individuals, then the population can grow or disappear in the patches (Levins, 1969). These patches are also defined by the existence of a knowledge economy. This situation is shown later on Figure 3 in analytical part of paper. We may define the countries as patches characterized through indicators of knowledge based economy and individuals who are seeking resources and make decisions about changing their areas depending on this (Auger, Poggiale, Charles, 2000). The human propensity to migrate is usually based on the cost-benefit trade-off model - trade-off between migration cost and income benefits related to relocation (Sjaastad, 1962) and it is interrelated with the decision to travel a given distance. The acceptance of the costs can depends on geographical factors such as high unemployment rate, low amenities, low social security, or other social barriers (Lemistre, Magrini, 2013). The usage of spatial models in this paper assumes that this propensity to migrate is partially influenced by migration in neighbouring countries. Spatial distribution of migration should also include the human decision to travel and to bear the distance/cost involved. In addition, spatial factors have strong effects especially on the migration of young people, because almost half of the

young population change their residence e.g. for the locations of their education (Magrini, Lemistre, 2013).

3. Essential triads towards the knowledge based economy

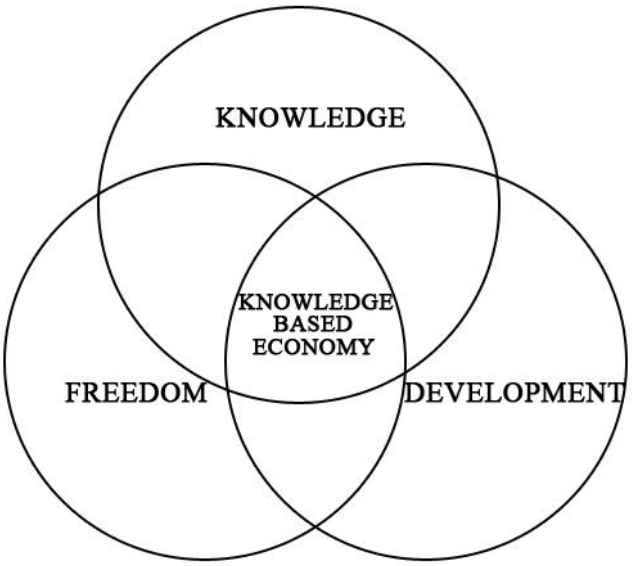
To define knowledge indicators which can have impact on the human propensity to reallocate to different areas means we should look at some assumptions we make about knowledge based economy. The economy has always been driven by knowledge (Karahan, 2012), however the concept of an economy based on knowledge as a core of long-term sustainable development has become increasingly important over the last few decades. According to the evolutionary theory, long-term growth is a result of co-evolution of knowledge, which is known by or used, supported and controlled by institutions. The process of technological learning itself is an essence of evolutionary approach in the sense of economic development (Nelson, 2007). From the view of knowledge systems, holders of knowledge (human capital) are the ones able to discover new technologies or processes (Dosi, Winter, 2000) and it basically means that knowledge can be considered as unlimited source leading to development.

Building a new generation of qualified human capital able to move processes and build the knowledge based economy, is generally considered to require expanding freedom, strengthening the foundations of education and realising comprehensive development (Mohammed bin Rashid Al Maktoum Foundation, 2011). This situation can be shown as follows:

The creative using of knowledge leads to innovations which allow individuals, corporations and nation-states, as Friedman (1999) suggests, going “farther, faster, deeper and cheaper” under the globalization. There are mainly two cultures, which played a leading role in scientific discovery and innovation in the past: the Muslim and Chinese cultures. Unfortunately several thousand years later, many Arab countries are showing a knowledge gap and low levels of cognitive performance in knowledge-related arenas (Mohammed bin Rashid Al Maktoum Foundation, 2011). Looking back at the migration issue, these patches (areas) lose their competitive advantage in a knowledge economy. As highlighted in the Arab Knowledge Report, Arab countries (a large part of the Muslim world) are still incapable of satisfying the appropriate

conditions for new generations to move towards a knowledge society. Most Arab countries have similarities with respect to the principles, values, social and political problems (Mohammed bin Rashid Al Maktoum Foundation, 2011).

Figure 1: Knowledge-freedom-development triad



Source: Self-processed

Muslim countries are similar only at first glance. For example, Turkey is the 20th largest economy in the world with a relatively young population. It also has the highest population growth among OECD countries, an urbanised population and a long tradition in science and technology (Elçi, 2011). Conversely, the region of Sub-Saharan Africa is characterized by a growing number of people living below the poverty line, partially due to the natural disasters and worsening climate change. Despite to the fact that the African Union adopted Africa´s Science and Technology Consolidated Plan of Action in 2007, low investments in science and technology has led to weak infrastructure development, low numbers of researchers and to minimum scientific outputs (Urama et. all, 2011). Many countries of the Muslim World are dependent on oil and oil production, especially the Arab region, but the volatility of oil price has driven many countries to diversify the economy and to revive science, technology and higher education. In addition, international portfolio investors benefit from diversifying their portfolio among the

Middle Eastern quality markets (Zonouzi, Mansourfar, Azar, 2014). The Arab region can be divided to three main categories: The first category is based on oil production (Oman, Saudi Arabia or United Arab Emirates), The second category have smaller oil resources but have a relatively developed higher education infrastructure (Algeria, Egypt, Lebanon, Palestina, Tunisia or Syria) and the third category have limited and underdeveloped natural resources and underdeveloped higher education infrastructure (Sudan, Yemen, etc.). Many Arab countries have considerable science and technology potential (successfully implemented IT, widespread ICT and university technologies), however this potential is diffused only through a few specialized knowledge workers, universities and public research centres (Badran, Zou´bi, 2011). Many countries in Central Asia have not adapted market economies and the research and development is inherited from the times of the former Soviet Union, their innovation performance is still declining (Mukhammadiev, 2011). So, the Muslim countries have strong interregional and also intraregional differences which can influence the knowledge gap in this part of the world.

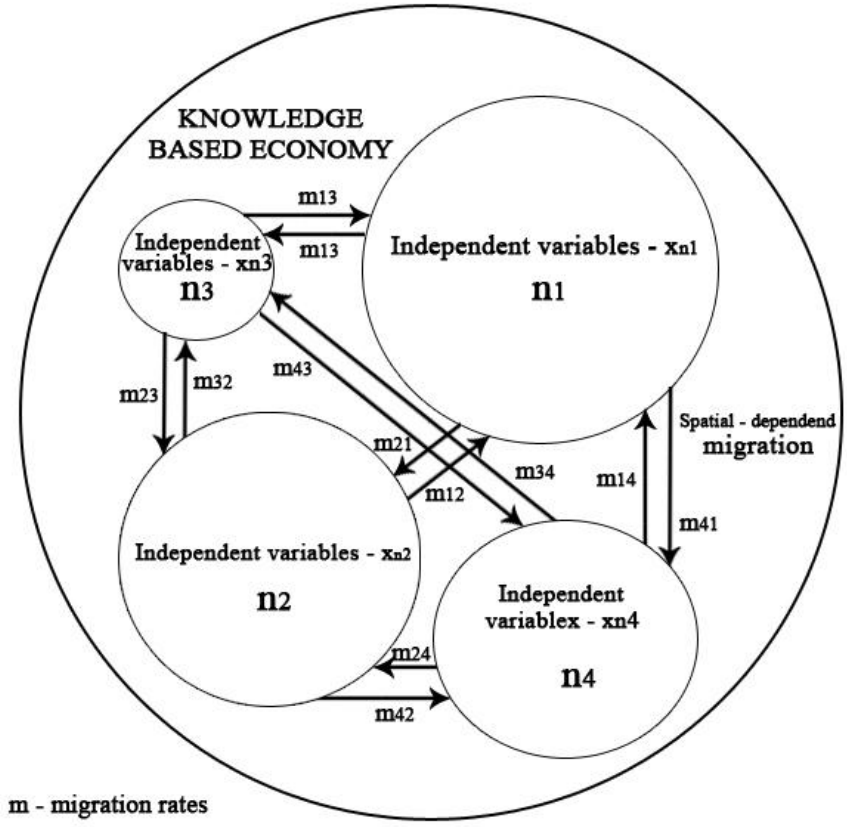
According to the OECD analysis, the knowledge society is based on the "*information society*" (knowledge-flow through communications and computer networks), "*learning economy*" (skill workers) and "*national innovation systems*" (OECD, 1996). The knowledge indicators usually result from the definition of knowledge society by OECD. Due to the fact that a lot of these factors are related to the innovative efforts, they can be divided into two groups – input and output indicators. R&D expenditures and R&D labor force (researchers, scientists or technical workers) are primarily used as input indicators [see Hagedoorn and Cloodt (2003), Furman et al. (2002), Greenhalgh and Rogers (2006)] patents and papers are, in some studies, also on the input side (Hagedoorn and Cloodt, 2003).In other papers these patents and papers are thought to be part of on the output model [see Guan, Chen (2012), Wu and Shanley (2009)]. However as Furman et. all (2012) suggests, a countries´ innovation activity can be influenced by common regional infrastructure, resource commitments and policy choices which can produce common linkages an a knowledge cluster environment. Endeavoring to take into account all possible factors, has leads to the creation of indexes such as "Knowledge Economy Index" (World Bank – 12 knowledge determinants), "Knowledge Economy Indicators"

(OECD – 32 knowledge determinants) or "Summary Innovation Index" (European Commission – 31 knowledge determinants).

4. General analysis

Looking at the knowledge-based economy, the main research question is: which variables influence the spatial number of migrants in the Muslim countries? The model situation can be expressed as follows:

Figure 2: Meta-population model under knowledge based economy



Source: Self-processed

The data examined in this paper refers to the 21 countries of the Muslim World, specifically in Sub-Saharan Africa, Central Asia, South Asia, South-East Asia and Oceania and South-East Europe. Countries have

been chosen, according to the data available, some countries were excluded because of missing data may have made an impact on the regression analysis. The dependent variables are number of emigrants (*E*) and number of immigrants (*I*) constructed using data from World Bank as independent variables. To include Knowledge-freedom-development triad factors, the empirical study uses variables from the Knowledge Economy Index[2], additional knowledge variables and one control variable. As a result, there are patches (countries) characterized by number of emigrants and immigrants on one side (dependent variables) and variables of knowledge based economy (independent variables) on the other side. All parts of the triad can be linked with pillars of the Knowledge economy index:

- Knowledge (first part of triad) can be connected with variables of "*Education*":
  - Gross secondary enrolment rate(% gross),
  - Gross tertiary enrolment rate(% gross),
  - Average years of schooling.
- Development (second part of triad) can be connected with variables of two pillars – "*Innovation*" and "*Information and communication technology*":
  - Royalty and license fees payments and receipts ((US$ mil.) per population,
  - Scientific and technical journal articles per million inhabitants – weighted by million population using sources such as Thomson Reuters, SCI and SSCI,
  - Patent applications granted by the UPSTO per million inhabitants – weighted by million populations,
  - Telephone mainlines and mobile phones per thousand inhabitants,
  - Personal computers per thousand inhabitants,
  - Internet users per thousand inhabitants.

[2] Variables included in the Knowledge Economy Index are used in their actual value to avoid distortion of data.

- Freedom (third part of triad) can be connected with variables of "*Economic Incentive and Institutional Regime*":

- Tariff and nontariff barriers – especially tariff and non-tariff barriers of each country to trade (import bans and quotas, strict labeling, licensing requirements). The World Bank calculates this score on the basis of the Heritage Foundation´s Trade Freedom score,
- Rule of law (perceptions of the incidence of violent and non-violent crime, the effectiveness and predictability of the judiciary and the enforceability of contracts),
- Regulatory quality (price controls, inadequate bank supervision and other incidences of market-unfriendly policies).

Explanatory variables are the primary variables of interest in the initial analysis. Lot of countries in the Middle East are rich in oil resources and the categorization is needed via dummy variable "oil production" (1 – significant oil producer, 0 – insignificant oil producer). The global gender gap index published annually by the World Economic Forum represents factor of gender-gap disparities focusing on four fundamental categories (economy, politics, education and health). Despite the still existing gender-gap in Muslim World, findings of Genc et. all (2012) show that woman´s education plays a crucial role in economy. The next variable to measure knowledge based economy is annual percentage increase in industrial production. A control variable GDP per capita is used which impacts on the number of emigrants and immigrants. It is no doubt that GDP and employment rates in the destination country are variables which have impact on migration flows (Strielkowski, Glazar, Ducháč, 2014). Data come from the years 2009- 2011.

Table 1 provides descriptive statistics – mean (μ), standard deviation (δ), minimum and maximum values (*min*, *max*) and net flow of migrants (immigrants – emigrants) in each country (*net*).

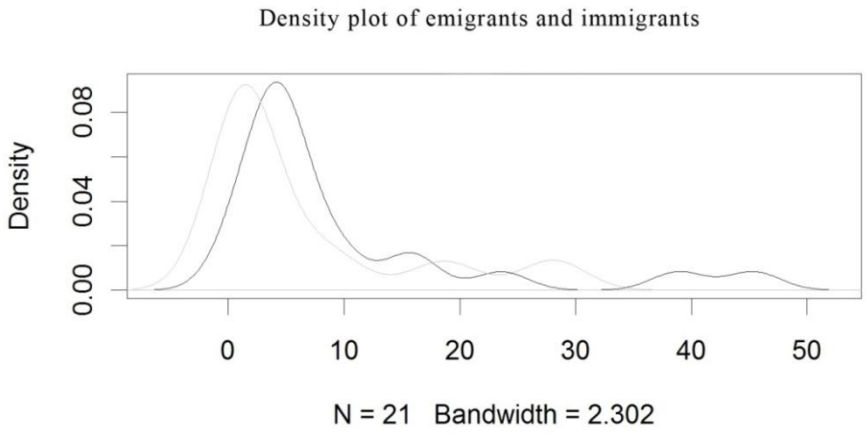
Table 1: Descriptive statistics for base case analysis

	Emigrants	*Immigrants*	*GDP per capita*	*Gross secondary enrolment rate*	*Gross tertiary enrolment rate*	*Average years of schooling*	*Royalty and license fees payments and receipts*	*Scientific and technical journal articles*	*Patent Applications*	*Telephone mainlines and mobile phones*	*Personal computers*	*Internet users*	*Tariff and nontariff barriers*	*Rule of law*	*Regulatory quality*	*The global gender gap index*	*Industrial production growth rate*	*Oil production*
μ	4,90	2,00	6,60	72,36	26,44	6,41	1,46	11,28	0,07	900,0	80,00	31,00	76,65	-0,47	-0,14	0,61	4,60	1,00
δ	12,10	9,01	7,06	26,34	14,20	2,05	10,86	29,92	1,22	472,2	143,2	19,27	8,87	0,54	0,51	0,05	2,20	0,46
mi	0,50	0,20	0,90	19,77	2,12	3,28	0,00	0,49	0,00	210,0	0,00	2,40	53,50	-1,34	-1,25	0,46	0,00	0,00
max	45,40	28,40	25,60	99,36	52,52	10,41	50,93	118,4	5,63	1930,	690,0	62,00	86,00	0,68	0,66	0,71	9,00	1,00
net (immigrants – emigrants)																		
Countries	*Albania*		-42,6	*Bosnia*	-38,2	*Iraq*	2,2	*Pakistan*	-0,2	*Sudan*	-2,8	*Yemen*						-2,6
	Azerbaijan		-14	*Algeria*	-2,7	*Morocco*	-9,1	*Saudi Arabia*	27,1	*Syria*	5,6							
	Burkina Faso		-3,3	*Egypt*	-4,1	*Malaysia*	3,1	*Sierra Leon*	-0,5	*Tunisia*	-6							
	Bangladesh		-2,6	*Kazakhstan*	-4,1	*Oman*	27,9	*Senegal*	-3,3	*Turkey*	-3,7							

Source: Self-calculated

Almost all countries have a negative migration flow with the exception of Iraq, Malaysia, Saudi Arabia and Syria. Malaysia is a leader in patent applications with positive net flow of migrants. The situation is unfavorable mainly in Albania and Bosnia Herzegovina with relative high negative migration flow. Density plot shows that the dependent variables (numbers of emigrants and numbers of immigrants) are not distributed normally. There is cluster of positive values around 5, 15 and around 30 in both cases. Residuals suggest that the use of ordinary least square regression model does not capture the studied relationship very well, probably in part as a result of dependencies among the data.

Figure 3: Density plots of dependent variables



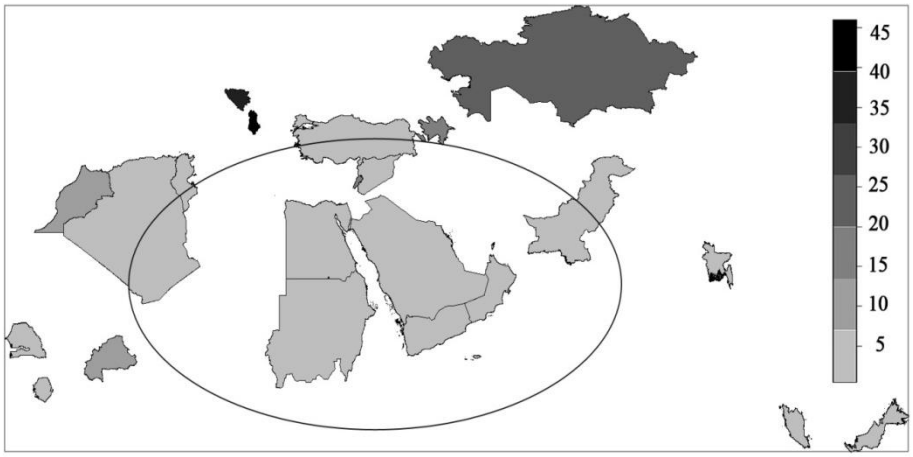
Source: Self-processed

4.1 Maps as Visual Displays of Data

Graphical displays can be considered as a method which allows patterns to be discovered visually and quickly. There can be observed results among evaluated countries that can influence their conditions (Ward, Gledisch, 2007). Countries on the following maps are shaded in increasing levels of grey for higher levels of emigrants or immigrants. The maps illustrate geographical clusters of emigrants and immigrants. There are significant disparities in the numbers of emigrants (Figure 5) and the numbers of immigrants (Figure 6) within the studied countries. Although there are some exceptions, the greatest level of emigrants tend to be registered by the countries situated in the periphery of the area (especially north) and the greatest level of immigrants tend to be

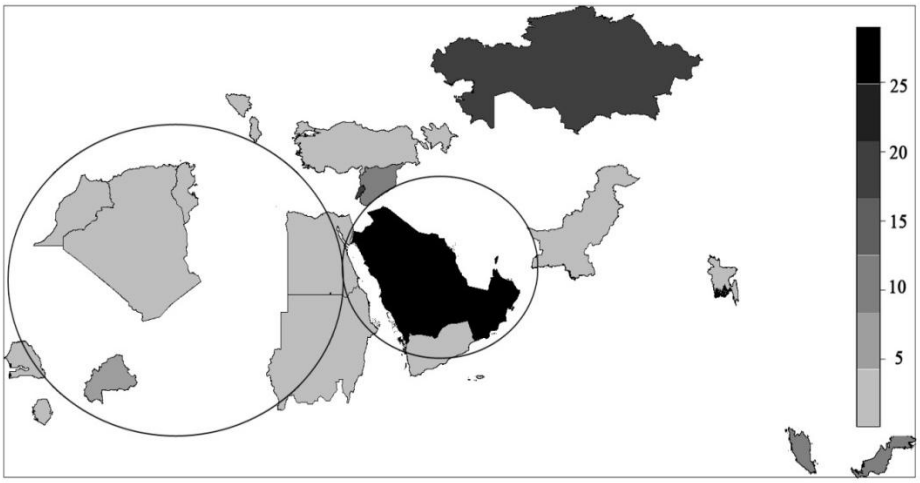
registered by countries situated at the Arabian peninsula and in Kazakhstan. There seems to be a positive spatial relationship between neighbouring areas. However, the information supplied in Figure 4 and Figure 5 is only a formal analysis of the possible presence of spatial autocorrelation in the studied sample.

Figure 4: Distribution of emigrants in countries of Muslim World



Source: Self-processed

Figure 5: Distribution of immigrants in countries of Muslim world

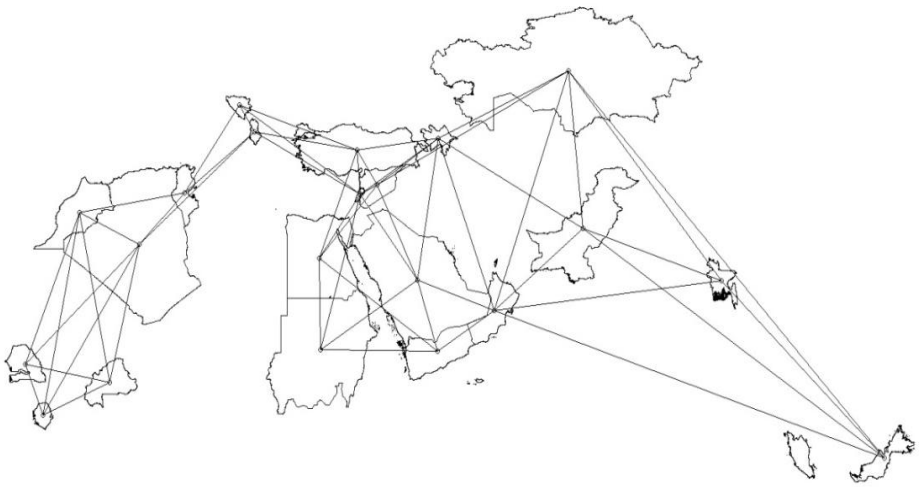


Source: Self-processed

4.2 Measuring Spatial Association and Correlation between numbers of emigrants and immigrants among neighbouring countries

Patterns observed in plotted maps indicate relations between the neighbouring countries. Gledisch and Ward (2001) use to establishment linkages among neighbouring countries, the rule of the minimum distance of 200 or fewer kilometres between them. In the case of the countries studied in this paper, some of them were excluded from observation due to the lack of data and this is one reason for the poor connectivity matrix (low number of ones in matrix). Another way to observe relations between countries is using of k-nearest neighbours rule. The paper applies 4 neighbours rule because there are a lot of "islands" in the observation (however the literature suggests 6 as optimal solution). Connections between 4-nearest neighbouring observed countries are shown on the following figure:

Figure 6: Plot of 4-nearest neighbours in observed countries



Source: Self-processed

The linear association between variable and weighted average of its neighbour's variable (correlation between y_i and y_j) can be determined by local Moran´s I statistic. The local Moran´s I statistic is often used as a test of spatial correlation by constructing a Z-score with the mean and variance components. Local Moran´s I statistic is illustrated in Table 2.

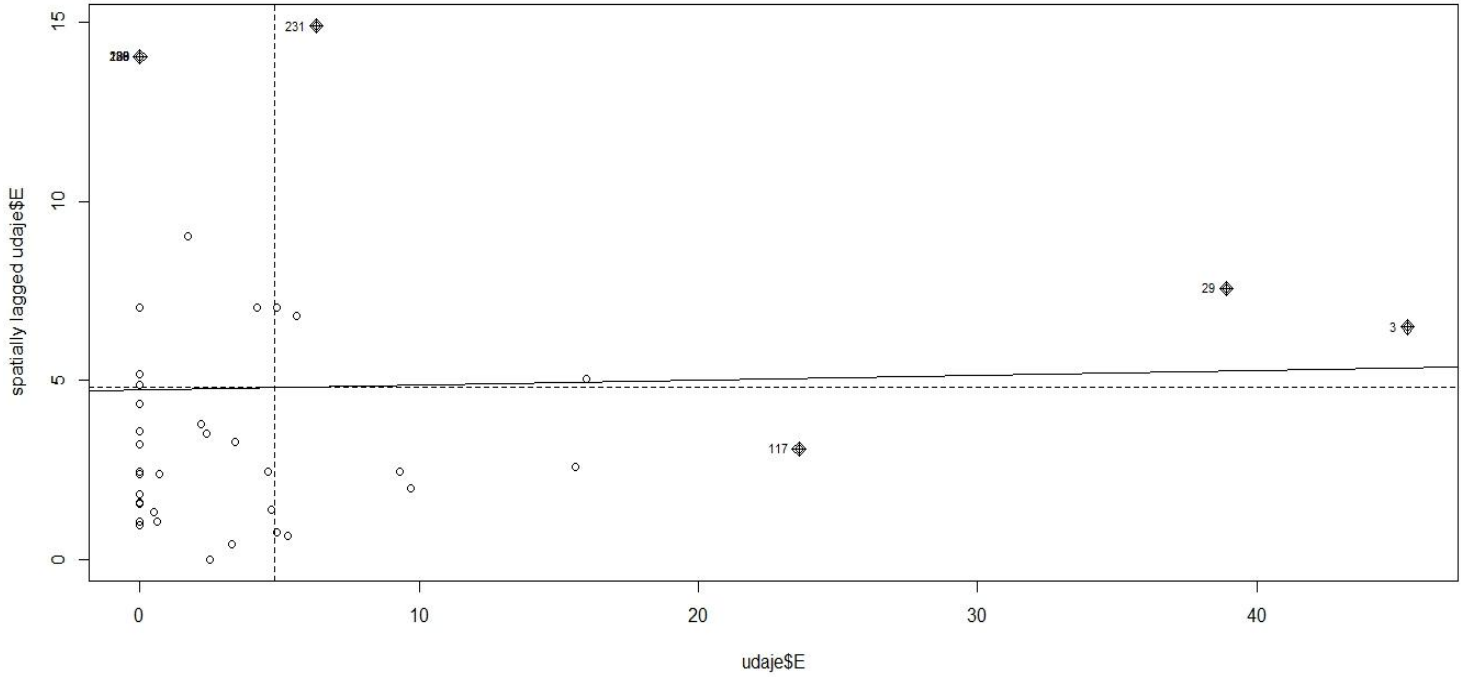
Table 2: Local Moran´s I statistics

Variable	*Moran´s I*	*p-values*
Stock of emigrants	**0,1612**	**0,0298**
Stock of immigrants	**0,1651**	**0,0355**
GDP per capita	0,12466	0,0701
Industrial production growth rate	0,1016	0,1106
Global gender gap index	0,0387	0,2178
Oil production	**0,3**	**0,0028**
Tariff and nontariff barriers	-0,0201	0,4059
Regulatory Quality	-0,1227	0,7181
Rule of law	-0,1824	0,8523
Royalty payments and receipts	0,073	0,1498
Journal Articles	0,0061	0,3276
Average years of school	-0,008	0,3634
Gross secondary enrollment rate	0,0871	0,1395
Gross tertiary enrollment rate	**0,2882**	**0,0035**
Total telephones	0,0044	0,3295
Computers	0,0691	0,1579
Internet Users	0,0508	0,2148
Index of economy freedom	-0,1202	0,7143

Source: Self-calculated

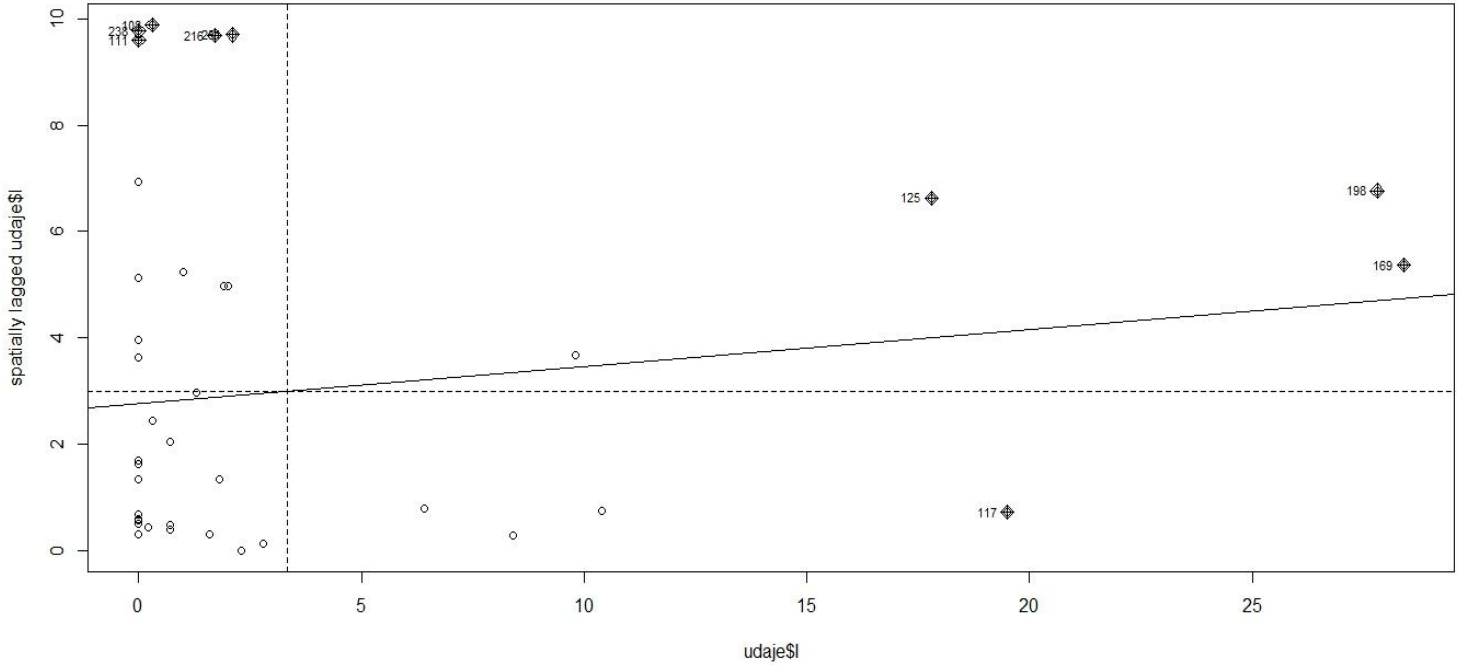
The Moran scatter plot indicates standardized values of the variable numbers of emigrants and immigrants) which are plotted on the horizontal axis and the standardized spatial lag of this variable on the vertical axis. It consists of four quadrants corresponding to different types of spatial association. Most of the countries are located in the quadrants II and III (Figures 8 and 9) and present spatial clusters of countries with similar numbers of emigrants/immigrants in the Muslim world. The intensity of emigrant´s and immigrant´s numbers in the countries follows specific spatial patterns highlighting the importance of the geographical proximity of the sample countries. Local Moran´s I statistics confirm the presence of patterns only for several independent variables (this fact should not be overlooked in the construction of regression analysis). The analysis shows existence of the disparities in the level of emigrant´s/immigrant´s numbers experienced by the observed countries, but it is investigated more deeply using the regression analysis.

Figure 7: Moran scatter plot for stock of emigrants in observed countries



Source: Self-processed

Figure 8: Moran scatter plot for stock of immigrants in observed countries



Source: Self-processed

5. Analysis of spatial dependence of migration

Spatial econometrics enlarges traditional regression models considering also interactions between countries, regions or cities. The main features of spatial models are spatial effects, especially spatial dependence and spatial diversity. The spatial dependence indicates situation when values of variables of a region depend on the values of the nearest region. The model for two neighbours *i* and *j* can be written according to LeSage and Pace (2009) as follows:

$$y_i = \alpha_i y_j + X_i\beta + \varepsilon_i, \quad (1)$$

$$y_i = \alpha_j y_i + X_j\beta + \varepsilon_i, \quad (2)$$

$$\varepsilon_i \sim N(0, \sigma^2) \;\; i = 1, \quad (3)$$

$$\varepsilon_i \sim N(0, \sigma^2) \;\; i = 1. \quad (4)$$

Due to the spatial structure of data, the spatial autocorrelation is usually presented together with the heterogeneity and the ordinary least square regression is insufficient to estimate regression coefficients (Anselin, 1999). The spatial diversity means, that the vector β_i is different for each observation *i* and this situation can be showed through following equation:

$$y_i = X_i\beta_i + \varepsilon_i, i = 1, \dots, n. \quad (5)$$

The above mentioned effects can lead to the structural instability of modelled relation and localization of the observation is important which can reveal the instability form (Anselin, 1999).There are two main possibilities how to examine the spatial dependence in a statistical model: spatial lag model and spatial error model. The main feature of spatial lag model is the presence of a spatially lagged dependent variable among the covariates. In other words, the values of *y* in one unit *i* are directly influenced by the values of *y* found in its neighbouring units ($y_i \sim y_j$) (Warld, Gledisch, 2007). LeSage and Pace (2009) define the spatial lag model as follows:

$$y = \rho W y + X\beta + \varepsilon. \quad (6)$$

W is a spatial weights matrix, ρ is an added spatial autoregressive coefficient, *X* is a matrix of explanatory variables, *y* is dependent

variable, β is a vector of coefficient and ε is an random error. If there is some spatially clustered pattern having an impact on the value of y for i and its neighbours, but y is not influenced directly by the value of y of its neighbours, spatial error model is more appropriate. Spatial error model is an alternative to ordinary least square regression with spatially correlated errors (Warld, Gledisch, 2007). LeSage and Pace (2009) define the spatial error model as follows:

$$y = X\beta + \varepsilon + \lambda W\xi. \quad (7)$$

Overall error is split into two components - ε as a spatially uncorrelated error term as in the case of normal regression assumption and ξ as a spatial component of error term. The parameter λ defines the correlation between errors ξ of the nearest observations due to the connectivity´s vector W.

Spatial lag model in comparison to spatial error model explains spatial dependence through adding a spatially lagged dependent variable y on the right hand side of the regression equation. In the spatial error model errors cannot be considered as another independent variable and the information about spatial clustering is included in the structure of the error process. The advantage of a spatial concept is that it supposes dependency among observations. Specific forms of spatial autocorrelation (spatial dependency among observations) can be tested through Lagrange Multiplier tests (Warld, Gledisch, 2007).

In order to reduce any potential problem of multicollinearity (VIF>5) between independent variables, some of them were excluded from observation (regulatory quality, rule of law, gross secondary enrolment rate, total telephones and index of economy freedom). GDP per capita is considered as a control variable.

5.1 Spatial dependence of emigrants numbers

Lagrange Multiplier tests of spatial autocorrelation presence.

LMlag = 0.9498, df = 1, p-value = 0.3298

LMerr = 0.5345, df = 1, p-value = 0.4647

Lagrange Multiplier test shows that the model could mirror existence of spatially lagged dependent variable as spatially correlated errors; however the p-value is still high. Local Moran´s I statistic and density plot with clusters indicate correlation of the dependent variable in the space in both cases (numbers of emigrants and numbers of immigrants). Basic characteristics of ordinary least square regression, spatial lag model and spatial error model are presented in the next table:

Table 3: Basic characteristic of compared models – dependence of emigrants

Characteristics	**OLS regression**	**spatial lag model**	**spatial error model**
Multiple R-squared	0,8531	-	-
Rho	-	-0,37163	-
p-value:	0,01335	0,34477	< 2.22e-16
AIC	148,99	149,68	130,94
Log-likelihood:	-61,49749	-60,8411	-51,47093

Source: Self-calculated

The Akaike information criterion (AIC) and log-likelihood rule indicate that the more appropriate should be the usage of spatial lag model but according to F-statistics of models (p-value<0,05), the spatial error can be considered as model that can best estimate dependence of emigrants stocks. In the spatial error model, dependence is explained only through the error terms and estimated coefficients can be implemented directly. Independent variables in observation *i* do not have impact on the outcomes in observation which are in relation with *i* and spatial error model does not need to define impacts of variables as in spatial lag models.

5.2 MLE Estimation of Models

Table 4: Models summary – dependence of emigrants

Variables	**OLS**			**SLDV**			**SEM**		
	β	**SE β**	**Pr(>|t|)**	**β**	**SE β**	**Pr(>|z|)**	**β**	**SE β**	**Pr(>|z|)**
Intercept	-30,03	36,05	0,43	-16,61	25,47	0,51	-27,54	18,16	0,13
GDP per capita (control)	-0,9	0,53	0,12	-1,04	0,35	0	-0,69	0,27	0
Industrial production growth rate	-2,1	1,13	0,1	-2,21	0,71	0	-3,14	0,74	0
Global gender gap index	-20,15	48,07	0,69	-30,5	31,22	0,33	-52,8	15,88	0
Oil production (dummy)	-0,69	4,86	0,89	-1,01	3,16	0,75	6,93	2,9	0,02
Tariff and nontariff barriers	0,54	0,27	0,07	0,46	0,18	0,01	0,81	0,23	0
Royalty payments and receipts	-0,36	0,21	0,13	-0,42	0,14	0	-0,11	0,09	0,22
Journal articles	-0,14	0,08	0,11	-0,12	0,05	0,01	-0,18	0,05	0
Average years of school	4	1,43	0,02	4,36	0,95	0	3,71	0,68	0
Gross tertiary enrolment rate	0,11	0,17	0,53	0,16	0,11	0,15	0,03	0,09	0,77
Computers	-0,03	0,02	0,1	-0,03	0,01	0	-0,06	0	0
Internet users	0,04	0,02	0,1	0,04	0,01	0	0,04	0,01	0
Rho				-0,37					
λ							-3,03		
N	21			21			21		
df	13			14			14		
Log likelihood	-61,5			-60,84			-51,47		

Source: Self-calculated

As it can be seen in Table 4, the coefficients estimates for the impact of variables are in the most cases considerably larger in the spatial error model than in the spatial lag model and ordinary least square regression. OLS model and spatial lag model probably overestimate their direct impact and OLS does not take into account supposed spatial clustering among neighbouring countries. In all models, the influence of royalty payment and receipts and gross tertiary enrolment rate on the stock of emigrants cannot be confirmed because of low statistical significance. The spatial error model corrects for the negative correlation of most

variables and emigrants numbers. The global gender gap index has the highest impact on the emigrants numbers (one unit of improving conditions for women decreases numbers of emigrants by approximately 58 people) but its significance is proved only in the spatial error model. The main difference among models can be found in Oil production that is considered as a dummy variable – 1 for substantial oil producers and 0 for others. As it can be seen in spatial error model, the impact of this variable is positive and it means that if the country is "important oil producer" then the number of emigrants rises, but on the other hand as classic regression shows, this situation is opposite – if the country is not so "important oil producer" then the number of emigrants still rises. One can assume that the existence of oil in the country brings a competitive advantage, but this advantage can lead to different conflicts and to instability in the country. From the view of a knowledge based economy, there are two opposite situations: if the number of computers is increases the emigrants' numbers decrease but if the number of internet users increases the emigrants' numbers are also increases. The impact of these estimated variables is very low and the internet coverage seems to be sufficient in most countries, with exception of the Sub-Saharan Africa. There is more interesting and influential factors on a knowledge based economy, which is significant in all models – the average years of schooling. The more skilled people are able to reach a competitive advantage and they are suitable for the international labour market and it leads to a desire for cross-countries migration. With respect to the control variable (GDP per capita), Table 4 indicates that it is statistically significant.

5.3 Spatial dependence of immigrants stock

Lagrange Multiplier tests of spatial autocorrelation presence.

LMerr = 0.9505, df = 1, p-value = 0.3296

LMlag = 0.0733, df = 1, p-value = 0.7866

Lagrange Multiplier test shows that the model could mirror rather existence of spatially correlated errors like spatially lagged dependent variable; however the p-value is still high. Basic characteristics of ordinary least square regression, spatial lag model and spatial error model are presented in the next table:

Table 5: Basic characteristic of compared models – dependence of immigrants

Characteristics	OLS regression	spatial lag model	spatial error model
Multiple R-squared	0.9164	-	-
Rho	-	0,09!6918	-
p-value:	0,001359	0,60197	0,090377
AIC	124.77	126.5	123.90
Log-likelihood:	-49.38505	-49.24904	-47.95123

Source: Self-calculated

Although the Akaike information criterion (AIC) shows that it should be more appropriate to use spatial error model, the log-likelihood rule and F-statistics of models (p-value<0.05) indicate that the choice of classical ordinary least square regression should be better and OLS regression can be considered as a model that can best estimate dependence of immigrants stocks in observed countries. In other words, in the case of stock of immigrants there are not spatial errors or spatial lag variables which can influence the model as a whole.

5.4 MLE Estimation of Models

Table 6 offers summary of three models before the modification of second order (this modification is applied mainly in OLS when insignificant variables are phased out). Although, compared to the emigrant´s dependence and despite to the local Moran´s I score for immigrants and Moran scatter plot, it seems that spatial clustering cannot be confirmed through spatial models and observations are without spatial clustering among neighbouring countries. In order to avoid possible underestimation or overestimation of the estimated coefficients and according to the MLE and AIC criterion, the OLS regression is probably a more appropriate method to explain the dependence on immigrants in the Muslim world. In addition, it can be a result of negative net migration flow in most countries (stock of immigrants is lower than stock of emigrants). All models (with or without spatial dependence) indicate significance of four variables – GDP per capita (as a control variable), oil production, journal articles and internet users. Numbers of immigrants depends on the fewer factors like numbers of emigrants, but the influence of these variables is very low with exception of the global gender gap index and average years of

schooling. In short, the existing gap between men and women has an impact on the people leaving but not on their arriving to the country. The situation is similar in terms of the average years of schooling. Table 7 shows resulting estimators and statistical significance of variables after the modification of second order. The classic linear model (OLS regression) corrects for the negative correlation of most variables and immigrants numbers with exception of GDP per capita. It means that if GDP per capita will rise then the number of immigrants to the country will also rise (1.78 units). The impact of Oil production is the highest and negative (in the case of numbers of emigrants is this impact positive), but it means that if the country is an "important oil producer" then the number of immigrants decreases. This result leads to the question why people don´t arrive in the countries with economy advantages? The situation is similar in the case of two remaining variables of knowledge based economy, although their influence is relative small.

Table 6: Models summary – dependence of immigrants

Variables	**OLS**			**SLDV**			**SEM**		
	β	**SE β**	**Pr(>|t|)**	**β**	**SE β**	**Pr(>|z|)**	**β**	**SE β**	**Pr(>|z|)**
Intercept	3,31	20,2	0,87	4,6	13,23	0,72	-3,78	13,5	0,78
GDP per capita (control)	1,89	0,33	0	1,87	0,22	0	1,86	0,23	0
Industrial production growth rate	1	0,6	0,13	0,95	0,41	0,02	0,84	0,46	0,07
Global gender gap index	7,29	27,36	0,8	5,78	17,97	0,75	12,26	17,18	0,48
Oil production (dummy)	-6,66	2,63	0,03	-7,34	2	0	-3,9	1,93	0,04
Tariff and nontariff barriers	-0,1	0,14	0,5	-0,12	0,1	0,23	-0,04	0,12	0,74
Royalty payments and receipts	-0,09	0,11	0,42	-0,1	0,07	0,17	-0,09	0,07	0,18
Journal articles	-0,11	0,04	0,04	-0,1	0,03	0	-0,09	0,03	0
Average years of school	-0,35	0,78	0,67	-0,22	0,55	0,69	-0,63	0,49	0,2
Gross tertiary enrolment rate	0,1	0,1	0,32	0,1	0,06	0,11	0,11	0,07	0,14
Computers	0	0,01	0,76	-0,03	0	0,63	-0,02	0	0,73
Internet users	-0,2	0,09	0,06	-0,21	0,06	0	-0,21	0,07	0
Rho				0,1					
λ							-1,7		
N	21			21			21		
df	13			14			14		
Log likelihood	-49,39			-49,25			-47,95		

Source: Self-calculated

Table 7: OLS regression for immigrants – model´s summary after the modification of second order

Variables	**OLS**			
	β	**SE β**	**t value**	**Pr(>|t|)**
Intercept	3,63434	1,90422	1,909	0,07442.
GDP per capita (control)	1,78024	0,18702	9,519	5,43e-08 ***
Oil production (dummy)	-4,55477	1,87247	-2,432	0,02711 *
Journal articles	-0,08353	0,03105	-2,69	0,01611 *
Internet users	-0,23136	0,06449	-3,587	0,00246 **
Multiple R-squared	*0,8753*			
Adjusted R-squared	*0,8441*			
p-value	*4,69E-07*			
Significant codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1				

Source: Self-calculated

6. Conclusion

This article has examined spatial depended migration among countries of Muslim world which is partially influenced by knowledge-based economy indicators. Decision making of individuals about movement between different colonised areas (patches - countries) seems to be related to new national propensity drivers – knowledge. It means that there is a trade of between migration costs and income benefits which are reached also through knowledge indicators. The visual displays of data present the existence of geographical clusters of emigrants and immigrants numbers – there is a likely positive spatial relationship between neighbouring areas. Although, we can found the spatial pattern of emigrant´s numbers among countries which are situated in the periphery of the area (north) and the spatial pattern of immigrant´s numbers among countries which are situated at the Arabian Peninsula and in the Kazakhstan, the quantitative research confirms spatial autocorrelation only in the case of emigrants. The intensity of spatial dependence highlights the importance of the geographical proximity of the sampled countries. Due to the spatial structure of data, this paper presents the spatial dependence and spatial diversity through the spatial models because the ordinary least square regression can overestimate or

underestimate the regression coefficients. Findings also suggest that the significant explanatory variables coverage the essential triad towards the knowledge based economy: average years of schooling (knowledge), tariff and nontariff barriers (freedom), journal articles, number of computers and internet users (development). The presence of multicollinearity caused the exclusion variables such as regulatory quality, rule of law, gross secondary enrolment rate, total telephones and index of economy freedom from the observation. Models show that the highest impacts on the emigrant´s stock have variables average years of schooling and the global gender gap index. The importance of average years of schooling indicates that the more skilled people are able to reach a competitive advantage and they can migrate through the international labour market. Although, results show the significance of knowledge indicators in the case of both – leaving and arriving people, their estimated regression coefficients are relative small and one can assumes that there are other "stronger" determinants which has impact on the human desire to migrate.

Several policy recommendations can be drawn from this study. Firstly, the negative migration flow in the most countries of the Muslim Word can lead to worsening demographic situation. There is a need to reduce the number of emigrants and use significant variables of knowledge based economy to raise the number of skilled immigrants (wide spreading of information and telecommunication technologies). Secondly, there is need to decrease tariff and nontariff barriers which are part of "freedom" presented in triad towards knowledge based economy. Thirdly, the findings of the study also suggest that the number of emigrants depends on the number of emigrants in neighbouring countries and it means that the improvement of indicators of knowledge based economy in the nearest neighbours can reduce the number of emigrants in each country of selected area.

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Trade Costs and Intra-OIC Trade: What are the Linkages?

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There is direct evidence that both trade costs between OIC and developed countries as well as among OIC countries are falling and their shares in total exports of OIC countries are expanding. In turn, there was an upward trend in trade costs between OIC and non-OIC developing countries and a fall in their share in total exports of OIC countries. This paper argues that much of the changes in the direction of exports of OIC countries can be attributed to the changes in trade costs. In this framework, this paper analyzes the role of trade costs (in aggregate as well as its various components) in determining the direction of exports from OIC countries. The estimation results show that 1% reduction in trade costs can increase world exports by 3.8%, but it can increase exports from OIC countries up to 4.3%. When trade partners of OIC countries are considered separately, 1% fall in trade costs increases exports from OIC countries to developed countries by 4.2% and increases intra-OIC exports by 3.9%. However, 1% rise in trade costs leads to 4.5% fall in exports to these countries. These findings support the view that the current trend in trade costs is one of the major factors shaping the direction of exports from OIC countries. These findings are robust to alternative estimators of the Heckman selection model and the Poisson Pseudo-Maximum likelihood that are used to deal with the concerns over sample selection bias and heterogeneity.

1. Introduction

Since the initiation of the General Agreement on Trade and Tariffs in 1947, a dramatic fall in tariffs, quotas and other non-tariff barriers has been observed in the world trading system. Particularly in manufacturing goods, significant reductions were observed in tariff rates. Substantial improvements in transport and logistics over the years have also contributed to the fall in trade costs around the world. However, international trade remained more costly than domestic trade. This is not only due to costs of transporting goods to far distances, but

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also at-the-border and behind-the-border costs that can be reduced by appropriate policies. This fact accordingly shifted the attention from reducing policy barriers to promoting trade facilitation.

Member countries of the Organization of Islamic Cooperation (OIC) have equally benefited from this transformation, albeit at varying levels depending on their transport infrastructure, composition of export goods and their distance to export markets. The current 57 OIC countries are dispersed over a large geographical region and at different levels of economic development. The mixed nature of the group of the OIC countries reflects high levels of heterogeneity and divergence in the economic structure and performance of these countries. This also reflects the great potential for trade between the member countries. This potential being partly utilized by the member countries, intra-OIC exports increased significantly from $132 billion in 2005 to $362 billion in 2012, whereby the share of intra-OIC exports in total OIC exports increased only 2.8 percentage points to reach 16% in 2012. However, during the same period the share of developed countries increased even further compared to intra-OIC trade while the share of non-OIC developing countries naturally decreased.

Enhancing the intra-OIC trade is one of the key targets of the OIC Ten Year Program of Action as well as several other strategic documents of the OIC. Despite the great importance given to the issue, there is no serious technical document evaluating the progress achieved and prospects for further development. In this respect, this paper provides a brief account of trade costs in OIC countries and analyzes the decomposition of trade costs in OIC countries as well as its impacts on direction of exports from OIC countries. Thereby, it aims to contribute to the efforts in understanding the significance of major barriers for the expansion of trade within the OIC region.

This paper utilizes a new global data set of bilateral trade costs prepared jointly by the World Bank and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) based on trade and production data, covering 202 countries for the time period 1995-2011. According to the World Bank and UNESCAP research, trade costs are influenced to varying degrees by distance and transport costs, tariff and non-tariff measures, and logistics. The data also stress the importance of

supply chains and connectivity constraints in explaining the higher costs and lower levels of trade integration observed in developing countries.

International trade literature widely utilizes standard gravity model to estimate the impacts of trade costs (and its components) on trade. The pioneering work of Jan Tinbergen (1962) initiated a vast theoretical and empirical literature on the gravity equation for trade. In its simplest form, the gravity equation for trade states that the trade flow between two countries is proportional to the product of the GDPs of these countries and inversely proportional to their distance, which broadly interpreted to include all factors that might create trade resistance. Gravity equation can be used to attribute changes in trade flows to changes in domestic economic activity and changes in bilateral trade costs. Jacks et al. (2008) show the role of trade costs in explaining trade booms and trade busts. As also explained in the Appendix, where the components of trade costs are described, there has been quite a number of attempts to quantify the impacts of specific components of trade costs on total trade flows, including, among others, Hummels (2007) on transport costs, Hoekman and Nicita (2008) on tariffs and non-tariff measures and other trade restrictions, Anderson and Marcouiller (2002) on contract enforcement, Glick and Rose (2002) on monetary unions, Freund and Weinhold (2004) on information costs, and many of these studies utilized gravity model in their estimations.

Similarly, attempts were made to understand the role of specific factors on the direction of trade. Gros and Gonciarz (1996) used gravity model to predict the direction of the trade of Central and Eastern Europe (CEE) and Hanink and Owusu (1998) examined the direction of trade within the Economic Community of West African States (ECOWAS) by using a Tobit regression. In a different context, Hallak (2006) estimates the impact of quality on the direction of trade and provides important insights on the linkages between quality of goods and where they flow.

In this framework, this paper attempts to understand the factors behind the changes in direction of trade and argues that much of the changes in the direction of exports of OIC countries can be explained by the changes in trade costs. After decomposing the trade costs within OIC countries, this paper also utilizes a gravity model estimation to find out the relative importance of trade costs in affecting the direction of trade from OIC countries. Accordingly, it is found that 1% fall in trade costs

increases exports from OIC countries to developed countries by 4.2% and increases intra-OIC exports by 3.9%. However, 1% rise in trade costs leads to 4.5% fall in exports to these countries. Given the fact that trade costs have been falling among OIC countries and between OIC and developed countries but rising between OIC and non-OIC countries, these findings support the view that the change in trade costs is one of the major factors shaping the direction of exports from OIC countries.

The rest of the paper is organized as follows. A short discussion on trade policy in OIC countries as well as on average trade costs is provided in the next section. Section 3 conducts an empirical analysis on the components of trade costs in OIC countries and finally section 4 analyzes the role of trade costs for direction of exports from OIC countries. Brief information on the main components of trade costs is provided in the appendix.

2. Trade Policy and Average Trade Costs

While countries try to increase their exports, they also use trade policy measures including tariffs and non-tariff barriers to discourage the importation of foreign products in order to spur industrial growth and economic diversification. Accordingly, a combination of support measures for particular sectors is generally designed to protect them from foreign competition in the domestic market and boost their export performance at the same time. Such trade policies affect economic activity and well-being not only in the country enacting these policies but in their trade partner countries as well.

The average level of protectionism applied in OIC countries with the averages of the world and other major economies on most-favoured nation (MFN) tariffs[2] in 2012 is provided in Figure A2 in appendix. On aggregate, by applying an average of 11.3% tariff rate, OIC countries reveal a more protectionist picture when compared to the world average of 8.9% and average of developed countries 5.2%. This ratio more than triples the tariff rates applied by the United States. Traditionally, agricultural products enjoy higher protectionism. In these products, OIC

[2] In current usage, MFN tariffs are what countries promise to impose on imports from other members of the World Trade Organization (WTO), unless the country is part of a preferential trade agreement (such as a free trade area or customs union). This means that, in practice, MFN rates are the highest (most restrictive) that WTO members charge one another.

countries remained the most protectionist group with 16.6% tariff rates, which is higher than the world average of 14.9% and average of non-OIC developing countries 13.9%.

Costs related to policy barriers are only part of total trade costs. Until recently, overall estimates of bilateral trade costs were not available and the applied international trade literature has commonly been using gravity model to identify the sources of trade costs. The seminal work of Anderson and van Wincoop on the determinants of trade costs estimated the overall trade costs based on the assumptions on the likely components of the total costs. For developed countries, the authors found 170% trade costs, consisting of 21% transportation costs, 44% border-related trade barriers, and 55% wholesale and retail distribution costs (2.70=1.21*1.44*1.55).

Recently, the World Bank and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) prepared jointly a new global data set of bilateral trade costs based on trade and production data, covering 202 countries for the time period 1995-2011. Based on this new dataset, it can be recognized that although tariffs in many countries are now at historical lows, overall trade costs remain high (Figure A3). [3] While developing countries tend to exhibit higher trade costs, OIC countries, on average, display even higher trade costs than non-OIC developing countries. On the other hand, trade costs in OIC countries (177% ad valorem) were on average two times higher than those in developed countries (89% ad valorem) in 2010.

Normalizing ad valorem equivalents equal to 100 in 1995 makes it possible to see the rate at which trade costs have evolved over time in different country groups. On average, trade costs have fallen most quickly in developed countries (around 20%). They have fallen considerably more slowly in OIC countries, which decreased only around 9% to 90.9 in 2010, which is still better than the performance of non-OIC developing countries. The fall in trade costs of non-OIC developing countries accelerated in 2010 and index value decreased to 91.7 (Figure A4). Moreover, agricultural products tend to exhibit significantly higher trade costs and it did not decreased over the period

[3] In order to avoid any potentially misleading aggregation, the averages are calculated by using the bilateral trade costs with 20 largest export partners for each country.

under consideration, which is consistent with the continued existence of major policy barriers. There was only a modest decrease in manufacturing from 183% ad valorem to 171% ad valorem (Figure A5). When the changes in bilateral trade costs between different country groups are compared, it is observed that average trade costs among the OIC countries remained around 260 during the period under consideration and this figure was very close to the average trade costs between OIC and developed countries (Figure A6). In 2010, average bilateral trade costs among OIC countries were 261 ad valorem, whereas it was 256 and 319 between OIC-developed countries and OIC-non-OIC developing countries, respectively. There is a clear upward trend in the trade costs between OIC and non-OIC developing countries, which increased from 292 in 1995 to 335 in 2009. On the other hand, average trade costs among developed countries followed a declining trend throughout the period under consideration and fell from 141 in 1995 to 113 in 201.

Table 1 summarizes the bilateral trade costs between different country groups for the year 2010. For all group pairs, agricultural products are the most costly item in trade. Even among the developed countries, 1 unit worth of agricultural product incurs additional 2.1 unit costs until it gets to final consumer. This is only 1.1 in manufactured items for the same country group. For the OIC countries, average trade cost in agricultural products is 3.2 more than the unit value of that product. This number is around 2.5 for manufacturing products. Trade among OIC countries are less costly compared to trade between OIC and non-OIC developing countries, but it is very close to trade between OIC and developed countries. Trade between non-OIC developing countries and developed countries is on the other hand less costly than trade between OIC and developed countries.

Table 1: Trade Costs Between OIC, Developed and Non-OIC Developing Countries (2010)

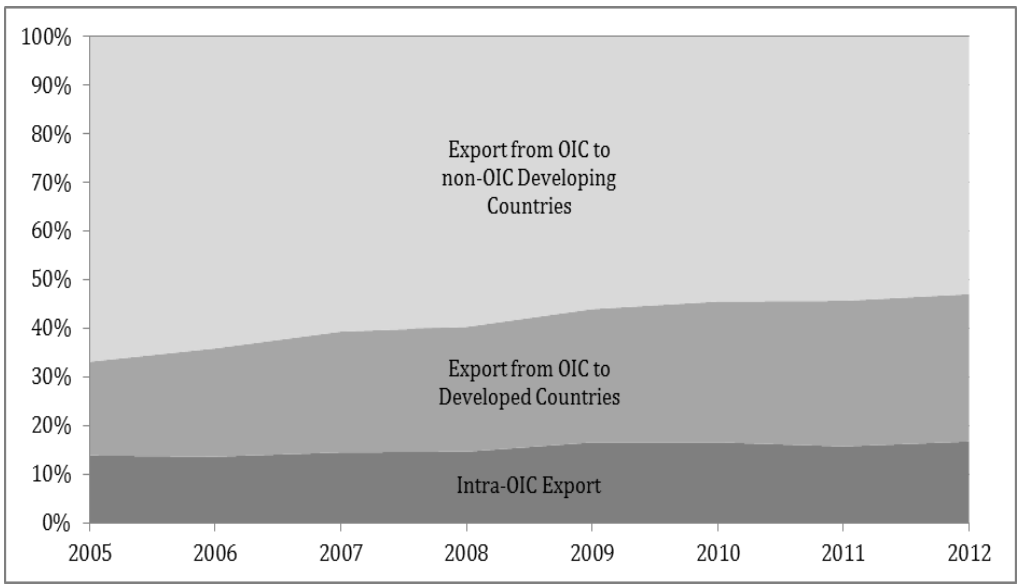
	OIC			**Developed**		
	Agriculture	Manufacturing	Total	Agriculture	Manufacturing	Total
OIC	317.4	248.3	261.1	327.1	243.6	256.3
Non-OIC Developing	332.6	297.6	318.6	289.0	219.9	229.6
Developed	327.1	243.6	256.3	210.0	111.1	112.6

Various trade policy measures and trade costs are likely to have some implications on the export market diversification of OIC countries. In this context, Figure 1 depicts the shares of different country groups for the period between 2005 and 2012. While intra-OIC export has increased around 3 percentage points, export of OIC countries to developed countries increased around 10 percentage points during this period. Congruently, the share of non-OIC developing countries in total exports of OIC countries decreased around 13 percentage points. Higher trade costs to non-OIC developing countries and relatively lower trade costs to developed countries may have played a major role in this transformation. In this framework, this paper aims to test this proposition in order to find out whether change in trade costs play any role in changing direction of exports in OIC countries.

3. Decomposition of Trade Costs

The analysis in the previous section provides only sketchy information on trade costs. An in-depth analysis is needed to understand the factors that contribute to the levels of trade costs observed among the OIC countries. In this section, an econometric estimation will be carried out in order to analyze the relative significance of each component of trade

Figure 1: Share of Country Groups in Exports from OIC Countries



costs. These components are related to both policy preferences as well as natural barriers.

The data provided by the World Bank and UNESCAP on trade costs are not balanced. Therefore, in order to maximize the number of observation, the data for the year in which the highest number of observation are available is chosen, and that year is 2005. With respect to control variables, various observable components of trade costs are considered based mainly on the information provided in the appendix. Transportation costs rely mainly on distance and technology. In order to capture this kind of costs, distance, common border as well as logistics performance index and air connectivity index have been included to the estimation. As policy barriers, tariffs and entry costs (starting a business) are added to the estimation to capture costs associated with tariff and non-tariff barriers. Information costs are also considered as an important component of trade costs. Accordingly, common language indicators, both official and ethnological, are included. Contract enforcement and other legal barriers are captured with a dummy variable on common legal origin. Different currencies are also linked with higher trade costs. Therefore, a dummy variable for countries sharing a common currency is included. Regulatory costs are captured with the number of documents to export, which shows the degree of red tape for exporters. Finally, dummy variables for countries having regional trade agreements and for landlocked countries are considered to have important impact on trade costs. More information on data and sources are provided in Table 2.

The following equation is then estimated by using OLS:

$$\ln(trade\ costs_{ij}) = b_1 + b_2 ln(distance_{ij}) + b_3 \ln(tariff_{ij}) + b_4 ln(entry_{ij}) + b_5 docs_{ij} + b_6 border_{ij} + b_7\ lang\_off_{ij} + b_8 lang\_ethno_{ij} + b_9 comleg_{ij} + b_{10} currency_{ij} + b_{11} RTA_{ij} + b_{12} ln(ACI_{ij}) + b_{13} ln(LPI_{ij}) + b_{14} landlocked_{ij} + e_{ij} \quad \text{(Eq. 1)}$$

Table 2: Data and sources

Variable	Definition	Year	Source
Trade Costs	Estimates of trade costs between countries I and j.	2005	World Bank and UNESCAP
Distance	Great circle distance between the two principal cities of countries i and j.	-	CEPII
Tariff	Geometric average of unity plus the trade-weighted average effectively applied tariff applied to i to j's exports and by j to i's exports.	2005	TRAINS
Entry Costs	Geometric average of the cost of starting a business in country i and country j.	2005	Doing Business
Documents to Export	Geometric average of number of document required for export in country i and country j.	2005	World Bank
Common Border	Dummy variable equal to unity if countries i and j share a common land border.	-	CEPII
Common Language (Official)	Dummy variable equal to unity if countries i and j share a common official language.	-	CEPII
Common Language (Ethno.)	Dummy variable equal to unity if countries i and j share a common language (ethnographic basis).	-	CEPII
Common Legal Origin	Dummy variable equal to unity if countries i and j were colonized by the same power.	-	CEPII
RTA	Dummy variable equal to unity if countries I and j are members of the same RTA.	2005	De Sousa (2012)
Common Currency	Dummy variable equal to unity if countries i and j have a common currency.	-	CEPII
ACI	Geometric average of country i's and j's scores on the Air Connectivity Index.	2007	World Bank
LPI	Geometric average of country i's and j's scores on the Logistics Performance Index.	2007	World Bank
Landlocked	Dummy variable equal to unity if one of the countries i and j is landlocked.	-	CEPII

Since trade costs data are a bilateral geometric average, following Arvis et al. (2012), independent variables that are uni-directional are transformed also by taking the geometric average of the two directions. Consequently, only one direction for each bilateral pair is retained.

The regression is estimated for trade costs in all products as well as in manufacturing and agricultural products separately, together with a more parsimonious version the model. The findings for the complete (columns i, iii, v) and parsimonious (columns ii, iv, vi) versions are presented in Table 3. Robust standard errors are calculated to measure the level of significance due to suspect of heterogeneity. Column (i) of the table shows the results for all products. Accordingly, larger distance, higher tariff rates and entry costs as well as being landlocked tend to increase trade costs. On the other hand, sharing common border, common currency, regional trade agreements, better air connectivity and logistics performance are all factors leading to lower trade costs among the OIC countries. One would also expect negative impacts of common languages and common legal origin, but apparently their impacts are captured by other variables included into the regression.

With regard to manufacturing products (column iii), same indicators have significant impact in same direction as in the case of all products, except documents to export as a proxy for red tape. Tariff rates are again found to have significant effect. When it comes to agricultural products (column v), distance, tariff rates and red tape are all again found to be significant components of trade costs. On the other hand, common border and regional trade agreements are the factors that lead to lower trade costs in agricultural products. Estimating the model for these three product groups in a more parsimonious way after ignoring relatively weaker components of trade costs (common language and legal origin) does not alter the results significantly (columns ii, iv, vi) and yields similar results.

Among the thirteen independent variables, six of them are time-varying variables, therefore policy relevant indicators. Other factors like distance or being landlocked only explain the natural barriers to trade. However, among these variables, some of them can also be considered policy relevant indicators, such as common currency, common legal origin and even common official language. Since these indicators hardly change over time, they are not considered to be policy-relevant indicators within the context of this study.

Table 3: Estimation Results

	Total		**Manufacturing**		**Agriculture**	
	(i)	**(ii)**	**(iii)**	**(iv)**	**(v)**	**(vi)**
Distance	0.163+	0.164+	0.227+	0.226+	0.188+	0.185+
	(5.980)	(6.083)	(8.172)	(8.23)	(4.627)	(4.667)
Tariff Rates (Applied)	0.113**	0.112**	0.125**	0.126**	0.157***	0.160***
	(2.261)	(2.299)	(2.174)	(2.277)	(2.615)	(2.69)
Entry Costs	0.066***	0.066***	0.049**	0.050**	0.040	0.041
	(2.939)	(2.98)	(2.057)	(2.128)	(1.379)	(1.42)
Documents to Export (Number)	0.176*	0.165*	0.068	0.051	0.308**	0.302**
	(1.810)	(1.733)	(0.630)	(0.483)	(2.319)	(2.388)
Common Border	-0.357+	-0.354+	-0.340+	-0.344+	-0.158**	-0.162**
	(-5.129)	(-5.000)	(-4.384)	(-4.422)	(-2.004)	(-2.071)
Common Currency	-0.402+	-0.392+	-0.426+	-0.406+	0.018	0.031
	(-4.751)	(-5.019)	(-4.423)	(-4.482)	(0.175)	(0.3)
Regional Trade Agreement	-0.218+	-0.227+	-0.218+	-0.211+	-0.159**	-0.144**
	(-4.050)	(-4.780)	(-3.789)	(-4.212)	(-2.122)	(-2.353)
Air Connectivity	-0.160*	-0.162**	-0.155*	-0.147*	0.032	0.041
	(-1.864)	(-1.976)	(-1.706)	(-1.717)	(0.301)	(0.379)
Logistics Performance	-0.883+	-0.883+	-0.899***	-0.940+	-0.180	-0.232
	(-3.516)	(-3.632)	(-3.097)	(-3.380)	(-0.532)	(-0.706)
Landlocked	0.206+	0.214+	0.237+	0.236+	0.036	0.024
	(4.766)	(5.231)	(4.936)	(5.02)	(0.542)	(0.373)
Common Language (Official)	0.044		0.055		0.009	
	(0.716)		(0.849)		(0.105)	
Common Language (Ethno.)	-0.059		-0.039		0.018	
	(-1.027)		(-0.632)		(0.232)	
Common Legal Origin	-0.002		0.008		0.020	
	(-0.047)		(0.193)		(0.425)	
Constant	4.416+	4.427+	4.070+	4.141+	3.364+	3.447+
	(7.845)	(7.966)	(6.569)	(6.858)	(4.311)	(4.607)
R-squared	0.487	0.486	0.514	0.513	0.360	0.360
No. of Obs.	571	571	510	510	293	293

Note: Numbers in parenthesis are t values.
Significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01, + p<0.001

In order to compare relative contributions of different factors to overall trade costs, and to come up with some policy recommendations, standardized regression coefficients (betas) are calculated. These coefficients show the change in standard deviations of the dependent variable due to a standard deviation change in each control variables. In this way, the relative strength of a control variable in affecting the total trade costs will be possible to measure. The results are presented in Table 4. Figure 2 also shows the relative impact of different factors on trade costs in figure.

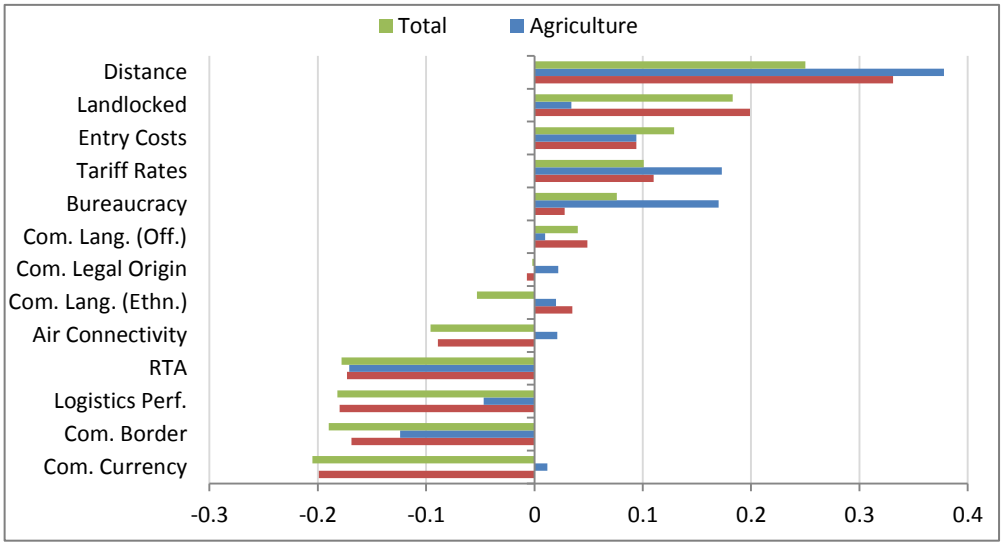
Table 4: Estimation Results - Standardized Regression Coefficients

	Total	**Manufacturing**	**Agriculture**
Distance	0.250+	0.331+	0.378+
Tariff Rates (Applied)	0.101**	0.110**	0.173***
Entry Costs	0.129***	0.094**	0.094
Documents to Export (Number)	0.076*	0.028	0.170**
Common Border	-0.190+	-0.169+	-0.124**
Common Language (Official)	0.040	0.049	0.010
Common Language (Ethno.)	-0.053	0.035	0.020
Common Legal Origin	-0.002	-0.007	0.022
Common Currency	-0.205+	-0.199+	0.012
Regional Trade Agreement	-0.178+	-0.173+	-0.171**
Air Connectivity	-0.096*	-0.089*	0.021
Logistics Performance	-0.182+	-0.180***	-0.047
Landlocked	0.183+	0.199+	0.034

When trade costs in all industries are considered, policy related indicators are all significant. Distance remains one of the most significant factors in explaining trade costs among OIC member countries. One standard deviation increase in distance is associated with 0.25 standard deviation increase in trade costs. Similarly trade with landlocked countries increases trade costs by 0.18 standard deviation. Higher cost of starting a business and tariff rates are the other factors that increase trade costs among OIC countries by more than 0.1 standard deviation. Common border, common currency, regional trade agreement and logistics performance including air connectivity are the factors that reduce the trade costs among OIC countries.

Except bureaucracy indicator, the same variables have statistically significant impact on trade costs in manufacturing products. Distance, tariff rates and trading with landlocked countries are even bigger contributors of trade costs in manufacturing products. Sharing a common border and common currency, on the other hand, reduce trade costs within OIC countries. Better logistics performance and connectivity with partner countries again help to shrink trade costs.

Figure 2: Relative impact of different sources of trade costs; standardized regression coefficients against the indicator measuring the cost component



Note: Distance, tariff rates, common border and regional trade agreement are statistically significant in all groups; entry costs, air connectivity, logistics performance, landlocked and common currency are significant in total and manufacturing; bureaucracy is significant in total and agriculture.

The beta coefficients for agriculture show that trade costs are particularly sensitive in relative terms to geographical proximity, tariff rates, bureaucracy, common border as well as regional trade agreements. Non-tariff barriers play a significantly more role in agricultural industries, but such barriers are not easy to capture. An indication of the importance of non-tariff measures is the noticeably lower R-squared values for agricultural products as compared with manufactured goods, which indicates that a significant part of the variation in trade costs is

being driven by factors outside the model, surely including various types of non-tariff measures.

4. Role of Trade Costs in Direction of Exports from OIC Countries

This paper argues that trade costs are one of the critical determinants of changes in the direction of exports from OIC countries. As depicted in Figure 1, the share of developed countries in total OIC exports increased around 3 percentage points and the share of intra-OIC export increased 10 percentage points. However, it decreased 13 percentage points for non-OIC developing countries. During the same period, trade costs between OIC and developed countries declined the most, while it increased between OIC and non-OIC developing countries. There was a declining trend in trade costs between OIC countries only during the recent years.

In order to test the role of trade costs in changes at direction of exports from OIC countries, the standard gravity estimation is used, which already became a key instrument for researchers interested in the effects of trade-related policies.[4] In its most basic form, the gravity model can be written as follows:

$$lnX_{ij} = \alpha + \beta_1 lnGDP_i + \beta_2 lnGDP_j + \beta_3 lnTC_{ij} + e_{ij} \qquad \text{(Eq. 2)}$$

Where X_{ij} indicates exports from country i to country j, GDP is gross domestic products of country i and j, TC_{ij} represents trade costs between the two countries, which is commonly represented by the geographical distance as an observable proxy and e_{ij} is a random error term. The α term is a regression constant, and the β terms are coefficients to be estimated. The literature typically specifies this function in terms of observable variables that are believed to influence trade costs, using a simple log-linear specification. In addition to the geographical distance between countries, dummy variables are included for countries that share a common land border, for country pairs that share a common official language, for country pairs that share a common currency, if countries i and j were once in a colonial relationship, if one or both countries are landlocked, and for country pairs that were colonized by

[4] More information on the theoretical foundation and estimation techniques of gravity models can be found at De Benedictis and Taglioni (2011).

the same power. This formulation is typical of the gravity model literature, in which each of these factors has been found to be among the determinants of bilateral trade. However, this specification is by no means exhaustive and it is also common to observe various indicators of trade-related policies that are included in the gravity model estimation to find out the relative impacts of these policies.

In baseline estimation, this paper uses (Eq.2) as the standard gravity model. However, in order to evaluate the various components of trade costs on exports of OIC countries, the following extended model will be estimated:

$$lnX_{ij} = \alpha + \beta_1 lnGDP_i + \beta_2 lnGDP_j + \beta_3 lnDIST_{ij} + \beta_3 LANG_{ij} + \beta_3 BRD_{ij} + \beta_3 lnTAR_{ij} + \beta_3 CUR_{ij} + \beta_3 LEG_{ij} + \beta_3 lnLPI_i + \beta_3 lnLPI_j + \beta_3 LOCK_i + \beta_3 LOCK_j + \beta_3 RTA_{ij} + e_{ij} \quad \text{(Eq. 3)}$$

Where $DIST_{ij}$ is the geographic distance between country pairs, $LANG_{ij}$ is a dummy variable for country pairs that share a common official language, BRD_{ij} is a dummy variable for countries that share a common land border, TAR_{ij} is the weighted average of tariff rate effectively applied by county j for exports from country i, CUR_{ij} is a dummy variable for country pairs that share a common currency, LEG_{ij} is a dummy variable for country pairs that have a common legal origin, LPI is logistics performance index, $LOCK$ is is a dummy variable for landlocked countries and RTA_{ij} is a dummy variable if country pairs are together part of a regional trade agreement. These variables are selected mainly based on the findings in the literature and in the previous section on the determinants of trade costs in OIC countries.

Cross-sectional data is used for the year 2005. Sources of data are provided in Table 2. Ordinary least squares (OLS) estimates are employed to test the hypothesis. Standard errors are robust to arbitrary patterns of heteroskedasticity in the data. Table 5 provides the estimation results for baseline model for the whole sample (column a), exports from OIC countries to all other countries (column b), exports from OIC to developed countries (column c), intra-OIC exports (column d) and exports from OIC to non-OIC developing countries (column e).

In general, the findings for different country groups are similar. Economic size of exporting countries play more significant role than that of the importing countries. For the exports from OIC to developed countries (column c), 1% growth in GDP of developed countries leads to an increase in their imports from OIC countries at a rate of 0.65%, which is significantly higher compared to other comparison groups.

Table 5: Gravity Estimation Results – Baseline Estimation

	(a) WS	**(b) OIC2W**	**(c) OIC2DVD**	**(d) OIC2OIC**	**(e) OIC2DVG**
GDP (Exp.)	0.724+	0.763+	0.722+	0.870+	0.746+
	(96.775)	(35.318)	(16.085)	(23.020)	(22.403)
GDP (Imp.)	0.393+	0.356+	0.649+	0.261+	0.272+
	(51.323)	(21.212)	(15.665)	(6.943)	(9.792)
Trade Costs	**-3.782+**	**-4.277+**	**-4.195+**	**-3.929+**	**-4.524+**
	(-110.364)	(-56.077)	(-23.825)	(-29.586)	(-40.472)
Constant	24.061+	26.809+	22.939+	24.953+	29.143+
	(86.858)	(43.926)	(14.897)	(22.921)	(34.732)
R-squared	0.773	0.671	0.678	0.666	0.666
No. of Obs.	13486	3524	1159	1054	1311

Note: OLS estimation results. T-values are reported in parenthesis.
Significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01, + p<0.001

In general, the findings for different country groups are similar. Economic size of exporting countries play more significant role than that of the importing countries. For the exports from OIC to developed countries (column c), 1% growth in GDP of developed countries leads to an increase in their imports from OIC countries at a rate of 0.65%, which is significantly higher compared to other comparison groups.

Trade costs carry higher importance for OIC countries (column b) compared to other countries (column a). When the relative importance of trade costs for OIC countries are estimated for their different trade partners, trade costs matter most in their trade with non-OIC developing countries (column e). 1% reduction in trade costs between OIC and non-OIC developing countries increases their trade by 4.5% (column e), which is 4.2% in the case of developed countries (column c) and 3.9% in the case of OIC countries (column d). This finding in effect supports the

hypothesis postulated earlier. Declining trade costs with developed countries is linked with the increase in the share of export with developed countries and increasing trade costs with non-OIC developing countries is associated with declining share of trade with non-OIC developing countries. Falling trade costs among OIC countries has also contributed to the increase in the share of intra-OIC export.

In addition to the aggregated impacts of trade costs, impacts of different components of trade costs can also be calculated. As shown in previous section, there are various components of trade costs, albeit not exhaustive, that can be separately included into the gravity estimation model in order to estimate the impact of these components on trade. Table 6 presents the findings of the extended model as depicted in (Eq. 3). As in Table 5, Table 6 also provides the estimation results for the whole sample (column a), exports from OIC countries to all other countries (column b), exports from OIC to developed countries (column c), intra-OIC exports (column d) and exports from OIC to non-OIC developing countries (column e).

In the whole sample, all standard variables of gravity equation are statistically significant. Economic sizes of trading partners, common border, common language, common currency, common legal origin, regional trade agreement, and better logistics performance of trading partners positively affect the trade between the countries. On the other hand, distance, tariff rates, and being landlocked negatively affect the trade flows.

In the case of exports from OIC countries to the world, same variables have similar impact on the exports of OIC countries. Tariff rates appears to have more impact on trade of OIC countries, a 1% decrease in tariff rates increases exports of OIC countries 0.2%, which is only 0.08% in the whole sample. Therefore, tariff reductions should be more often on the agenda of OIC countries to increase their trade with other countries. However, this is particularly important for the intra-OIC trade. As provided in column d, 1% reduction in tariff rates will increase intra-OIC trade 0.3%, compared to 0.27% with non-OIC developing countries (column e). Peculiarly, though the impact is negative, tariff rates applied by developed countries appear to have no impact on exports from OIC to these countries.

Table 6: Gravity Estimation Results – Extended Model Estimation

	(a) WS	(b) OIC2W	(c) OIC2DVD	(d) OIC2OIC	(e) OIC2DVG
GDP (Exp.)	1.023+	1.017+	1.161+	1.077+	1.019+
	(62.964)	(35.026)	(20.184)	(16.635)	(14.860)
GDP (Imp.)	0.839+	0.687+	1.087+	0.677+	0.791+
	(49.464)	(22.195)	(16.884)	(9.839)	(11.185)
Distance	-1.126+	-1.097+	-0.623+	-0.864+	-1.114+
	(-36.518)	(-17.896)	(-3.754)	(-7.777)	(-9.046)
Tariff	-0.076***	-0.198+	-0.127	-0.316+	-0.269***
	(-2.777)	(-3.883)	(-1.063)	(-3.375)	(-2.884)
Border	1.598+	1.170+	1.002	0.801***	1.688+
	(12.472)	(5.131)	(1.069)	(2.586)	(3.613)
Language	0.694+	0.432+	0.253	0.327	1.264+
	(11.029)	(3.778)	(0.917)	(1.484)	(4.167)
Currency	0.785***	0.746**	2.920***	0.792**	(omitted)
	(2.766)	(2.484)	(3.163)	(2.394)	(omitted)
Legal	0.456+	0.262***	1.096+	0.353**	0.325*
	(9.128)	(3.061)	(6.307)	(2.089)	(1.877)
RTA	0.247+	0.783+	-0.509**	1.956+	0.453
	(3.682)	(6.296)	(-2.114)	(6.011)	(1.272)
Landlocked (Exp.)	-0.315+	-0.694+	-0.396*	-1.049+	0.385
	(-4.899)	(-5.600)	(-1.660)	(-3.433)	(1.402)
Landlocked (Imp.)	-0.678+	-0.438+	-0.662**	-0.250	-0.685***
	(-10.991)	(-4.156)	(-2.479)	(-1.150)	(-2.694)
LPI (Exp.)	0.998+	0.752+	1.158+	1.605+	1.618+
	(21.022)	(8.906)	(5.215)	(7.293)	(7.577)
LPI (Imp.)	0.381+	0.768+	-0.205	0.427*	0.537*
	(6.258)	(6.709)	(-0.677)	(1.773)	(1.808)
Constant	0.913***	2.477+	-6.609+	-0.971	-0.650
	(2.948)	(3.895)	(-3.776)	(-0.633)	(-0.526)
R-squared	0.652	0.625	0.530	0.514	0.447
No. of Obs.	10312	2874	1048	860	1056

Note: OLS estimation results. T-values are reported in parenthesis.
Significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01, + p<0.001

Common border and common language are relatively less important for OIC countries compared to the whole sample, but they appear to be particularly strong for exports to non-OIC developing countries. Common currency increases exports from OIC countries around the same magnitude in the whole sample, but it seems to be particularly important in their export to developed countries. Sharing common currency with developed countries leads to an increase in exports to these countries at almost 3%. This can be potentially explained by the fact that sharing a common currency with a developed country implies higher financial stability and lesser uncertainty, which then boosts trade between these countries. Common legal origin also seems to be less important for OIC countries in general, but in their export to developed countries, this indicator again carries relatively more significant importance. This fact again can be explained by the fact that sharing a common legal origin with an already developed country is considered to be a higher standard of legal status, and that facilitates trade through better handling of legal and contractual matters.

Regional trade agreements, however, are particularly important for the development of exports from OIC countries and it is particularly important for exports among OIC countries. Regional trade agreements lead to an increase in intra-OIC exports around 2%. This impact appears to be even stronger for exports to non-OIC developing countries, but the coefficient is not statistically significant. Another hard-to-explain result pops up on the importance of RTAs for export from OIC to developed countries, as it indicates a negative relationship. Export from and to landlocked countries have also negative impact on trade. Finally, countries with better logistics can export and import more compared to other countries.

The results clearly reemphasize that trade costs are among the most important factors that affect the exports from OIC countries. When intra-OIC export is considered, tariff rates and regional trade agreements appear to have a particularly strong impact. Therefore, efforts should be increased to reduce tariff rates and enhance economic integration through trade agreements.

5. Robustness Check

OLS estimation methodology is the most common estimation technique for a variety of gravity models. However, in order to verify the findings, two alternative estimators are used. These are the Heckman selection model estimator and the Poisson Pseudo-Maximum Likelihood (PPML) estimator. The sample selection correction introduced by Heckman (1979) deals with the problem of zero trade flows which are common in bilateral trade flows. Since OLS estimator drops such observations, this may lead to sample selection bias and inconsistent parameter estimation.[5] There are a number of gravity model studies of bilateral trade using the selection model to deal with zero flows, such as Rose (2000) and Hillberry (2002). Moreover, Silva and Tenreyno (2006) suggest that, at least when there is evidence of heteroskedasticity, the Poisson pseudo-maximum-likelihood estimator should be used as a substitute for the standard log linear model. Simple Breusch-Pagan / Cook-Weisberg test for heteroskedasticity rejects the hypothesis of constant variance and OLS estimation already reports estimates that are robust to arbitrary patterns of heteroskedasticity in the data. PPML estimator can also take into account the zero trade flows and used in the literature, such as Anderson and Yotov (2012) and Arvis and Shepherd (2013).

In this framework, these two alternative estimators are used in the baseline estimation model due to potential issue of selection bias due to zero trade flows and suspect of heteroskedasticity in the data. The coefficient estimates from the Heckman and PPML estimators are provided in Table 7. The findings of Heckman selection model estimator are quite similar to that estimated by OLS in Table 5. Trade costs are more critical for exports from OIC countries compared to whole sample and among the export partner groups of OIC, the highest impact is observed for non-OIC developing countries and the estimated impacts are almost equivalent to those presented in Table 5.

[5] Helpman et al. (2008) also developed a model of international trade that yields a gravity equation with a Heckman correction combined with an additional correction for firm heterogeneity.

Table 7: Gravity Estimation Results – Baseline Estimation with the Heckman Selection Model Estimator

(i) Baseline Estimation with the Heckman Selection Model Estimator					
	(a) WS	**(b) OIC2W**	**(c) OIC2DVD**	**(d) OIC2OIC**	**(e) OIC2DVG**
GDP (Exp.)	0.717+	0.763+	0.723+	0.867+	0.749+
	(91.773)	(35.192)	(16.701)	(23.023)	(22.081)
GDP (Imp.)	0.390+	0.356+	0.650+	0.261+	0.274+
	(51.517)	(20.959)	(15.547)	(7.165)	(9.527)
Trade Costs	-3.748+	-4.282+	-4.200+	-3.912+	-4.549+
	(-122.765)	(-54.860)	(-26.507)	(-31.700)	(-34.175)
Constant	24.018+	26.822+	22.943+	24.906+	29.218+
	(94.681)	(45.834)	(16.393)	(26.501)	(32.178)
No. of Obs.	15192	4033	1267	1176	1590
(ii) Baseline Estimation with the Poisson Pseudo-Maximum Likelihood Estimator					
	(a) WS	**(b) OIC2W**	**(c) OIC2DVD**	**(d) OIC2OIC**	**(e) OIC2DVG**
GDP (Exp.)	0.549+	0.694+	0.719+	0.688+	0.643+
	(36.760)	(16.080)	(12.050)	(15.336)	(10.066)
GDP (Imp.)	0.600+	0.579+	0.602+	0.444+	0.536+
	(28.754)	(13.149)	(7.865)	(8.511)	(10.709)
Trade Costs	-1.808+	-2.206+	-2.031+	-2.355+	-2.781+
	(-22.950)	(-13.413)	(-9.985)	(-12.578)	(-23.662)
Constant	14.740+	15.491+	14.046+	17.925+	19.314+
	(22.655)	(10.244)	(6.398)	(14.111)	(14.961)
R-squared	0.779	0.557	0.552	0.510	0.716
No. of Obs.	14637	3977	1266	1165	1546

Note: OLS estimation results. T-values are reported in parenthesis.
Significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01, + p<0.001

However, the coefficient estimates are significantly different under Poisson compared with OLS. In particular, the trade costs coefficient is smaller in absolute value. This result is typical of Poisson gravity regressions, and largely reflects the impact of heteroskedasticity on the original OLS estimates, according to Silva and Tenreyro (2006). Their explanation is that the expected value of the logarithm of a random

variable depends on higher-order moments of its distribution and, therefore, if the errors are heteroskedastic, the transformed errors will be generally correlated with the covariates.

Even with lower coefficients, the main message is retained. Trade costs constitute a larger hindrance in exports from OIC countries compared to other countries. %1 fall in trade costs increases exports from OIC countries by 2.2%, which is only 1.8% in the world. Exports of OIC countries increases to developed countries by 2%, compared to 2.4% to other OIC countries and 2.8% to non-OIC developing countries. Therefore, as estimated earlier by using OLS estimator, trade costs carry larger significance for OIC countries in their trade with non-OIC developing countries. The upward trend in trade costs with non-OIC developing countries, therefore, can explain the fall in the share of non-OIC developing countries in total exports of OIC countries.

Concluding Remarks and Policy Recommendations

It is generally observed an upward trend in intra-OIC export since 2005, but there is even a stronger trend in exports from OIC to developed countries. Trade costs between OIC and developed countries were constantly lower than trade costs among OIC countries, which in turn were lower than the costs between OIC and non-OIC developing countries. There is also direct evidence that trade costs between OIC and developed countries as well as among OIC countries are falling and at the same time their share in total exports of OIC countries are rising. There was a rather upward trend in trade costs between OIC and non-OIC developing countries and a decline in their share is observed. This paper argues that much of the changes in the direction of exports from OIC countries can be attributed to the changes in trade costs. In this framework, this paper conducts first an empirical analysis on the determinants of trade costs in OIC countries and then estimates the relative impacts of trade costs for trade between various trade partners of OIC countries.

The findings on the decomposition of trade costs reveal that as also put by Anderson and van Wincoop (2004), the "death of distance is exaggerated". Distance remains the largest contributor of trade costs. Aside from constantly falling trade-policy barriers and transport costs, trade costs continue to remain large. The findings also indicate that

direct policy instruments (tariffs and the tariff equivalents of quotas) are less important than other policies (transport infrastructure investment, regional trade agreements and common currency). The findings suggest several policy recommendations for OIC countries to reduce trade costs and promote intra-OIC trade. Important ones can be summarized as follows.

- First and foremost, tariff and non-tariff barriers should be reduced. They significantly increase the trade costs among OIC countries. Regional trade agreements are also found to positively contribute to the reduction of trade costs. In this context, already initiated Trade Preferential System for OIC countries (TPS-OIC) should become operational to reduce trade barriers and improve regional integration.
- Another factor in increasing trade costs in OIC countries is higher costs of starting a new business. If exporting companies are not able to cost-effectively establish offices in partner countries, their ability to compete in these markets will be negatively affected and they will be discouraged to enter these markets. Therefore, special efforts should be made to reduce costs of starting a new business and all related entry costs to facilitate trade among the OIC countries.
- Being a critical factor in trade, logistical infrastructure in OIC countries is not sufficiently developed. This in turn significantly increase trade costs and makes the firms that wish to export relatively uncompetitive compared to the firms that export from countries with relatively well developed logistical facilities. Air connectivity also facilitates the movement of people and goods in a relatively shorter period of time. If countries are connected with many destinations, their communication, delivery and other formalities in terms of export will be much easier and a facilitating factor in trade. Therefore, logistics infrastructure in OIC countries should be developed to facilitate trade among OIC countries as well as with other partners.
- Significant barriers are also observed in official formalities. Such formalities typically include customs declarations, applications for import/export permits, and other supporting documents such as certificates of origin and trading invoices. Higher number of documents required for export, being used as a proxy for such formalities, not only discourage exporters, but also open the door

for bribery and corruption. Therefore, all the formalities related to export should be transparent and easy to submit. In this context, the implementation of a single window system should be promoted to facilitate trade which enables international traders to submit regulatory documents at a single location and/or single entity.

- There are also natural barriers to trade, which are not easy to address. For example, landlocked countries constantly face challenges with regard to accessibility to international markets. Advanced transportation modalities can help to improve this accessibility, but such modalities require large amount of investments. Particularly small landlocked developing countries lack such resources. However, through other trade facilitating activities, cost of trade from such countries can be reduced and their integration to international markets can be supported.
- Common currency can naturally reduce trade costs through elimination of transaction costs and exchange rate uncertainty as well as increase in price transparency. However, establishing common currency areas is a challenging task requiring a highly developed level of economic integration. While it appears to be a hard-to-achieve target for OIC countries, any progress towards this direction will definitely improve socio-economic integration among OIC countries.
- Trade costs can be reduced unilaterally, regionally or multilaterally, either by further reducing traditional trade barriers or by taking effective trade facilitation measures. Achieving global agreement has been difficult, despite the inclusion of trade facilitation in multilateral trade negotiations. However, much progress has been achieved by national measures. On the other hand, there has been substantial progress in regional agreements, most obviously in Europe. By introducing Trade Preferential System (TPS-OIC) OIC countries are also targeting to reduce trade barriers among the OIC countries. However, they require stronger commitment and willingness to promote trade among them.

After analyzing the determinants of trade costs in OIC countries, relative impacts of trade costs for trade between various trade partners of OIC countries are estimated. The estimation results shows that trade costs are relatively more important for trade of OIC countries compared to world

average. 1% reduction in trade costs can increase world exports by 3.8%, but it can increase exports from OIC countries up to 4.3%. When trade partners of OIC countries are considered separately, trade costs have the largest impact on exports from OIC to non-OIC developing countries. As provided in Table 5, 1% fall in trade costs increases exports from OIC countries to developed countries by 4.2% and increases intra-OIC exports by 3.9%. However, 1% rise in trade costs leads to 4.5% fall in exports to these countries and given the fact that trade costs shows an increasing trend with these countries, the fall in the share of non-OIC developing countries in total exports of OIC countries can be explained by higher trade costs with these countries. Still, if necessary measures taken, the increase in exports to these countries will be much higher than the increase in other export partners.

It should be noted that world trade takes place increasingly in parts and components, with each country specializing in particular stages of a good's production sequence. A key feature of this vertical specialization is that imported inputs are used to produce a country's export goods, which also reflects an international division of labour. An important driving force for growing vertical specialization has been trade barrier reduction. Despite several re-export and border crossings, reductions in trade barriers yield a multiplied reduction in the cost of producing a good sequentially in several countries. In order to be able to take larger share in this form of production and trade, it is required to have efficient and fast transport and trade mechanisms in place in addition to appropriate factors of production.

Assuming the process of vertical specialization will continue, understanding the source and nature of trade costs remain crucial. However, the analysis and policy implications for trade costs are more complex than for traditional trade barriers such as tariffs or quotas. Moreover, some behind-the-border trade costs may involve intangible factors such as concerns about security or they may be constant instruments of national political debates. Such concerns and debates should be underpinned with firm understanding of the nature and consequences of trade costs. Various measures of trade facilitation can naturally be recommended, but this requires strong political willingness and commitment, and effective involvement of private sector.

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APPENDIX

Components of Trade Costs

Trade costs broadly include all costs incurred in getting a good to a final user other than the marginal cost of producing the good itself: transportation costs, policy barriers, information costs, contract enforcement costs, costs associated with the use of different currencies, legal and regulatory costs, and local distribution costs (Anderson and van Wincoop, 2004). Therefore, in an increasingly globalized and networked world, trade costs matter as a determinant of the pattern of bilateral trade and investment, as well as of the geographical distribution of production and they are an important determinant of a country's ability to take part in regional and global production networks (Arvis et al., 2013).

Transport costs are mainly determined by infrastructure, distance and commodity characteristics. Higher distance and poor infrastructure are associated with an increase in transport costs. Infrastructure is an important determinant of transport costs, especially for landlocked countries. Improved transportation with greater speed and reliability played a major role not only in trade growth over the past decades, but also in reorganizations of global networks of production. Studies examining customs data consistently find that transportation costs pose a barrier to trade at least as large as, and frequently larger than, tariffs (Hummels, 2007).

Policy barriers are restraints imposed by governments on the free movement of goods and services that seek to distort the pattern of trade between countries. The most common barriers to trade are tariffs and quotas. Tariffs as a tax on imports raise the price of imported goods relative to domestic goods. Quotas, on the other hand, are applied to reduce the quantity of a product that is imported. Another common barrier to trade is an export subsidy, which is designed to support domestic producers with more competitive prices in international markets. In addition to import quotas and export subsidies, there are many other forms of non-tariff barriers to trade, including rules of origin, special licenses, unreasonable standards for the quality of goods, bureaucratic delays at customs, export restrictions, countervailing duties, sanitary and phyto-sanitary measures, etc. Direct evidence on border

costs shows that tariff barriers are now low in most countries, on average less than 5% for rich countries, and with a few exceptions are on average between 8% and 12% for developing countries.

Producers need to conduct market research in order to locate opportunities in other markets. In this context, **information costs** are another aspect of trade costs where costs incur while traders search for suitable trading partners and communicate with them to negotiate the terms of the transaction. Moreover, they need to ensure their goods conform to quality standards and other regulations in foreign markets as well as locate suitable trading partners and organize transportation and distribution. A wide range of empirical studies have used proxies, such as internet mass, communication costs, common language, to try and capture the importance of information costs, communication costs and links between countries and found significant results in explaining bilateral trade and trade costs.

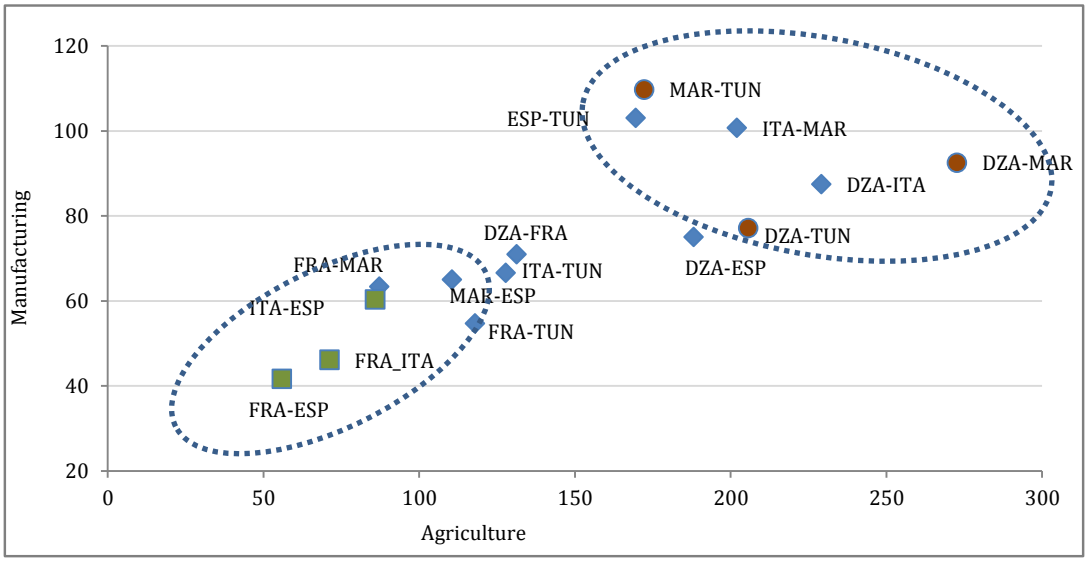
Firms also seek security in making and **enforcing contracts** and resolving disputes in their commercial relationships. Good enforcement procedures enhance predictability in commercial relationships and reduce uncertainty by assuring investors that their contractual rights will be upheld promptly by local courts. When procedures for enforcing commercial transactions require too much time and effort or when contractual disputes cannot be resolved in a timely and cost effective manner, such forms of insecurity will limit trade. For example, Anderson and Marcouiller (2002) show that imperfect enforcement and other forms of insecurity reduce the international trade of Latin American countries by as much as their tariffs. Improvements in contract enforcement would stimulate the gains from trade.

Costs associated with the use of different currencies may also be substantial. Exchange rate risk increases transaction costs and reduces the gains to international trade. Exchange rate uncertainty discourages firms from selling in foreign markets due to a lack of price transparency. Firms will need to incur additional cost by hedging the risks associated with exchange rate fluctuations. On the other hand, monetary unions improve the economic environment in which firms operate, mainly through elimination of transaction costs and exchange rate uncertainty and increase in price transparency. Greater nominal exchange rate stability, lower transaction costs, and price transparency reduce

information costs and thereby enhance competition and increase international competitiveness of enterprises (Bagci, 2013).

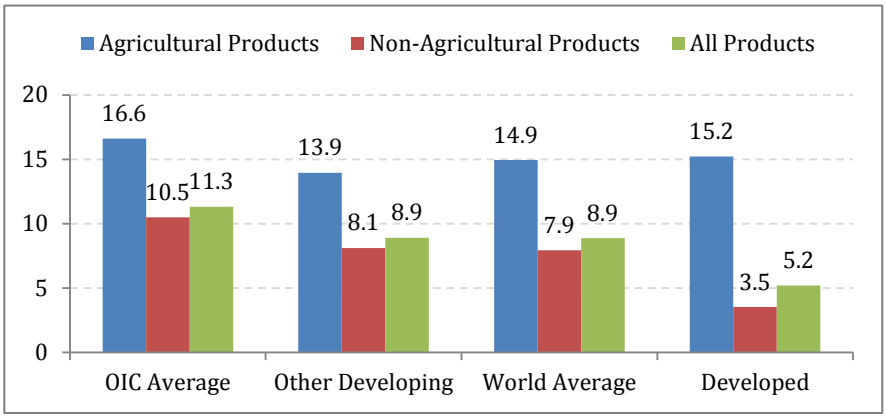
Legal and regulatory costs and local distribution costs are other components of total trade costs. Therefore, in contrary to common perception on the relevance of tariffs for trade costs, special efforts should be made to facilitate trade through reducing various barriers to trade that limit the flow of goods across borders. For example, as shown in Figure A1, three OIC countries in North Africa have significantly higher costs among themselves compared to the countries at the European side of the Mediterranean. Despite geographical proximity, common language, cultural similarities and other favorable factors, bilateral trade costs for Maghreb countries tend to be higher than the bilateral trade costs for EU countries as well as the bilateral trade costs between Maghreb and EU countries. Here comes the importance of trade facilitation. If policies are not designed in a way to facilitate trade between countries, despite other supportive conditions, bilateral trade will not increase due to relatively high trade costs. This is clearly proven at the European side of the Mediterranean.

Figure A1: Comparison of Bilateral Trade Costs for Maghreb Countries (2009)



Note: Country codes are: DZA-Algeria, ESP-Spain, FRA-France, ITA-Italy, MAR-Morocco, TUN-Tunisia

Figure A2: Average Tariff Rates



Source: World Tariff Profiles, WTO/ITC/UNCTAD.

Figure A3: Average Trade Costs, 1995-2010

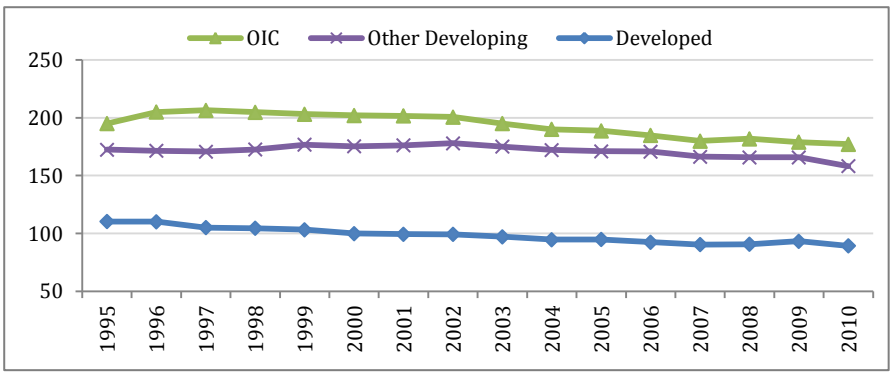
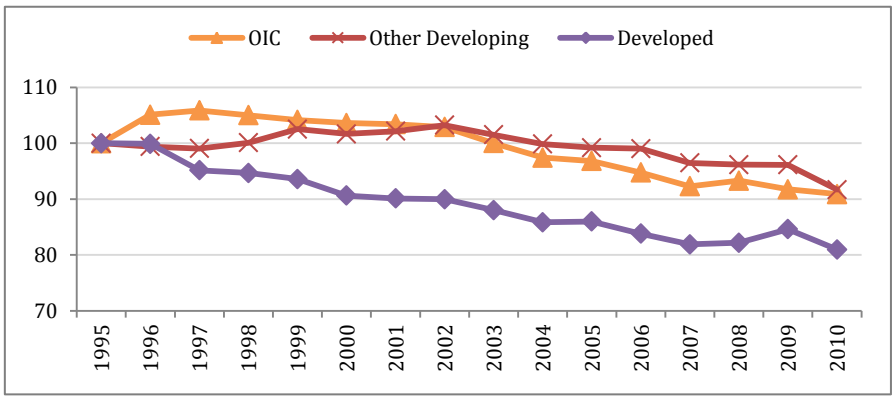


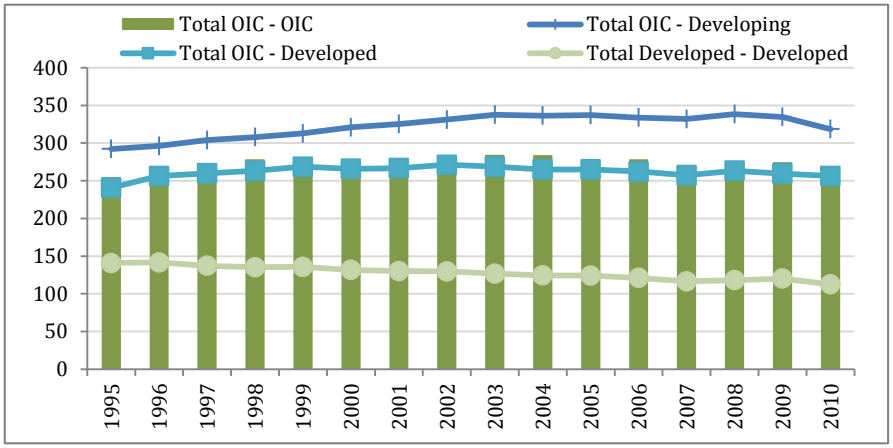
Figure A4: Average Trade Costs, 1995=100



Source: WB-UNESCAP Trade Costs Database.

Figure A5: Average Trade Costs in OIC Countries

Figure A6: Average Bilateral Trade Costs



Source: WB-UNESCAP Trade Costs Database.

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Macroeconomics, Investor Sentiment, and Islamic Stock Price Index in Malaysia

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Asset prices are strongly connected to macroeconomic variables even in the presence of investor sentiment. On the other hand, if investor sentiment is a significant determinant in Islamic stock market, it will raise critiques on the need of Shariah compliant markets. Consequently, newer studies should investigate the need of separate capital markets for Muslims. This study examines the level of exposure of conventional and Islamic stock price indices in Malaysia to the relative change in investor sentiment index and macroeconomic factors. The study tested two separate models: one using macroeconomic variables in quarterly time series framework and the other using macroeconomic and sentiment data in a quarterly time series framework. This study reports that interest rates, currency index and FTSE Bursa Malaysia Composite Index pose greater influence on Islamic price index when compared to industrial production, consumer price index, money supply and investor sentiment indices. The results continue an important battery of debates on the requirement of *shari'ah* compliant capital market for Muslims. The study unlocks room for new studies on influence of sentiment in Islamic financial industry.

1. Determinants of Islamic Stock Prices

Researchers in behavioural finance establish strong influence of investor sentiment on asset prices (Baker & Wurgler 2006). Earlier studies investigated the influence of investor sentiment on asset prices of different sizes of companies (small versus large firms), various countries (developed versus emerging), and various sectors (finance, industrial and properties) (Brown & Cliff 2004; Fauzias, Izani & Rashid 2013).

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These studies reported strong positive connection between investor sentiment and stock prices. Stock price tends to shoot upward during the state of higher investor sentiment. Investor sentiment is widely determined by the overly optimistic or pessimistic behaviour of the investors. Investor sentiment is also strong when investors rely on noise and invest in stocks that are difficult to arbitrage (Qiu & Welch 2006). The primary proxy to measure investor sentiment came from survey-based studies. Most recent studies employed a combination of surveys and secondary data to measure investor sentiment index.

Islamic finance industry has been growing at a double digit rate every year (E&Y 2013; Hassan, Rashid, Imran & Shahid 2010). The industry is operated on the Islamic *shari'ah.* Islamic *shari'ah* prohibits interest (*riba*), and production and use of alcoholic goods, investment in pornography and anything that oppresses basic human rights (Hassan & Rashid 2010). Islamic finance prohibits investment that involves excessive uncertainty *(gharah)* and gambling *(mysir).* Islam also prohibits trading on goods that do not have physical existence (Chapra 1985). Islam advocates the value of entrepreneurship, production through integrity and hard work, and prefers equity than debt (Farooq 2007). Consequently, partnership, mutual solidarity and brotherhood are the symbols of Islamic economic system. It is prohibited by Quran and Hadith for Muslims to act on rumours. As it is clearly found from Surah Hujuraat (Quran 49:6) where Allah (*swt*) is saying, "O you who believe! If a Faasiq (liar — evil person) comes to you with any news, verify it, lest you should harm people in ignorance, and afterwards you become regretful for what you have done". It is found in Sahih Muslim that the Prophet (*pbuh*) said, "It is enough sin for a man to speak of everything that he hears". During the day of the Prophet (*pbuh*) when *Sahabat* (*ra*), the companions of the Prophet (*pbuh*), migrated from *Mokkah* to Ethiopia, there was a rumour that many people became Muslim in *Mokkah*, and the *Sahabat* went back to *Mokkah* to see them. However, they later found that it was simply a rumour, and they met with persecution at the hands on *Quraysh*. Finally, in the Kitab al-Buyu, the book of transaction, (Book 10 of Sahih Muslim), explains that Islam prohibits any sort of speculation for the purpose of individual gain at the cost of information disequilibrium or asymmetric information in business. Hence, Muslims, when they are investors or performing some business activities, must verify the information they get, and they must not work on overly optimistic or pessimistic expectations.

Investor sentiment is defined as the propensity to speculate (Barberis, Shleifer & Vishny 1998). Any kind of speculation, either intentional or partaking, is considered *haram* (not permissible) in Islam. Another common concept of investor sentiment is that sentimental investors value rumours more than fundamentals (Baker, Wurgler & Yuan 2010), which is also against Islamic principles. Long-run significance of investor sentiment may also indicate that irrational investors outperform rational investors (Black 1986). Theoretically, *Shari'ah* compliant stock investment cannot have a long-run significant connection to investor sentiment. Islamic finance should rely on fundamentals, not on rumours. However, if investor sentiment has significant influence on Islamic *Shari'ah* stock index, it will probably close the gates for Islamic capital markets. We considered Bursa Malaysia as the ideal scenario as it constitutes the largest number of *Shari'ah* compliant stocks, which is over 80% of the total listed companies, and Malaysia is considered in the top three Islamic markets, alongside Saudi Arabia (KSA) and the United Arab Emirates (UAE) according to Ernst & Young (2013).

The 30 constituents in FTSE Bursa Malaysia *Hijrah* Index have gone through different screening processes that are different from FTSE Bursa Malaysia Composite Index by FTSE Bursa Malaysia, Securities Commission's *Shari'ah* Advisory Committee (SAC) and Yasaar Limited. Therefore, the factors which influence Malaysian Islamic stock market performance ought to be structurally different than the conventional stock market index. Islamic capital markets are still emerging and the studies on performance of Malaysian Islamic stock market are very rare, especially from the standpoints of the factors and impacts. We investigate the asset prices in Islamic stock markets in Malaysia using the *Hijrah* index as the dependent variable and a number of factors from the conventional, behavioural and macroeconomic determinants. We employed investor sentiment as one of the determinant to investigate whether sentiment is a strong determinant of Islamic finance in Malaysia or not. If sentiment is a strong determinant in the long-run, we can conclude that there is a strong need to redesign the capital markets for the Muslims. Table 1 summarizes the factors explaining the changes in stock prices in different countries. These factors are examined in the conventional setting where Islamic stock prices are not involved.

Table 1: Factors influencing asset prices in financial markets

Study by	**Factors**
Chen, Roll & Ross (1986)	Industrial production, inflation and long-term government bonds
Fama & French (1993), Maio & Philip (2013)	Market capitalisation and book-market ratio Fama-French three factor model
Maysami & Koh (2003)	Gross domestic product in Singapore
Fama & Schwert (1977), DeFina (1991)	Inflation rate
Geske & Roll (1983), Mukherjee & Naka (1995) Khil & Lee (2000), Ibrahim & Azizi (2003), Shabri et al.(2001), Ibrahim (2003)	Economic policy, inflation rate
Dhaka et al. (1993), Fama (1981)	Money supply in the United States
Mukherjee & Naka' (1995), Abdullah & Hayworth (1993)	Interest rate in Japan
Hussin, Muhammad, Abu & Awang (2012)	Interest rate in Malaysia
Baker and Wurgler (2006); Baker et al. (2010); Brown and Cliff (2004)	Investor sentiment in the United States and the markets of Europe and Canada.
Finter, Niessen-Ruenzi and Ruenzi (2012)	Investor sentiment in Germany

Table 1 presents a number of factors across a number of countries/markets from two competing paradigms: the efficient market and the behavioural finance. In recent years, researchers combine traditional factors with a sentiment index from behavioural finance to explain the movement in stock prices. However, the reach of studies in Islamic stock market has been very limited in this aspect. Dynamic relationship between Kuala Lumpur *Shari'ah* Index (KLSI) and Kuala Lumpur Composite Index (KLCI) was a matter of research for many years. According to Albaity and Ahmad (2008), Kuala Lumpur *Shari'ah* Index and Kuala Lumpur Composite Index tend to move in the same direction. It is quite usual as over 80% of the stocks that are in the composite are also *Shari'ah* compliant. Yusof and Majid (2007) provided strong evidence that interest rate did not connect well with the Islamic stock market volatility. This is in line with Islamic principle that interest rate (riba) is not significant in explaining stock market volatility.

However, as the composite index is strongly connected to Islamic index in Malaysia, and as the composite index and interest rates are connected strongly, it would be interesting to revisit the relationship between interest rate and Islamic stock index. Albaity (2011) found that monetary policy and inflation rates are important determinants of stock prices in Malaysia. Isa, Hassan and Azrul (2012) indicated that rate of inflation, money growth, interest rates, industrial production, foreign currency reserves, exchange rates, and monetary policy have positive relationship with *Shari'ah* Indices in Malaysia.

Studies on investor sentiment in Malaysia has appeared recently in various studies (Fauzias, Rashid, Ibrahim & Bai 2014; Nor, Ibrahim & Rashid 2013). These studies constructed investor sentiment index using a combination of survey and market-data based proxies. Later, the index was used to analyse the performance of stock indices, bank deposit, currency index and foreign direct investment in Malaysia. These studies reported strong positive relationship between investor sentiment index and the conventional stock indices. It indicates that in the state of the higher investor sentiment the stock market indices increase in value, and vice versa. If *Shari'ah* composite index strongly connected to conventional stock market index, we expect a strong positive connection between the proxy of investor sentiment and the *Shari'ah* stock index. The other macroeconomic variables that were considered alongside investor sentiment included money supply, gross domestic product, interest rate, and currency index.

2. Empirical Design

Hanif et al (2013) used OLS in determining the impact of financial sector variables on *Sha'riah* compliant cross-section stock return in Pakistan. Gupta et al (2013) also used OLS in determining the returns in Dow Jones Islamic stock market. This study introduces two proxies to represent investor sentiment in Malaysia. Consumer Sentiment Index (CSI) and the Business Condition Index (BCI) are quarterly publications of Malaysian Institute of Economic Research (MIER) that presents the expected consumption patterns of Malaysian consumers and expectations related to business activities of the Malaysian entrepreneurs in quarter in advance. The consumer sentiment index has been widely used in the extant literatures. Michigan consumer sentiment index has been a widely used proxy for investor sentiment (Schmeling 2007,

2009). This study is the first of its kind to introduce the entrepreneurial sentiment alongside the consumer sentiment. However, since two indices are different in structure and norms, we conduct separate analysis having these proxies in different models instead using factor analysis or principal component analysis, which is suggested in many existing studies on Malaysia (Fauzias et al. 2013).

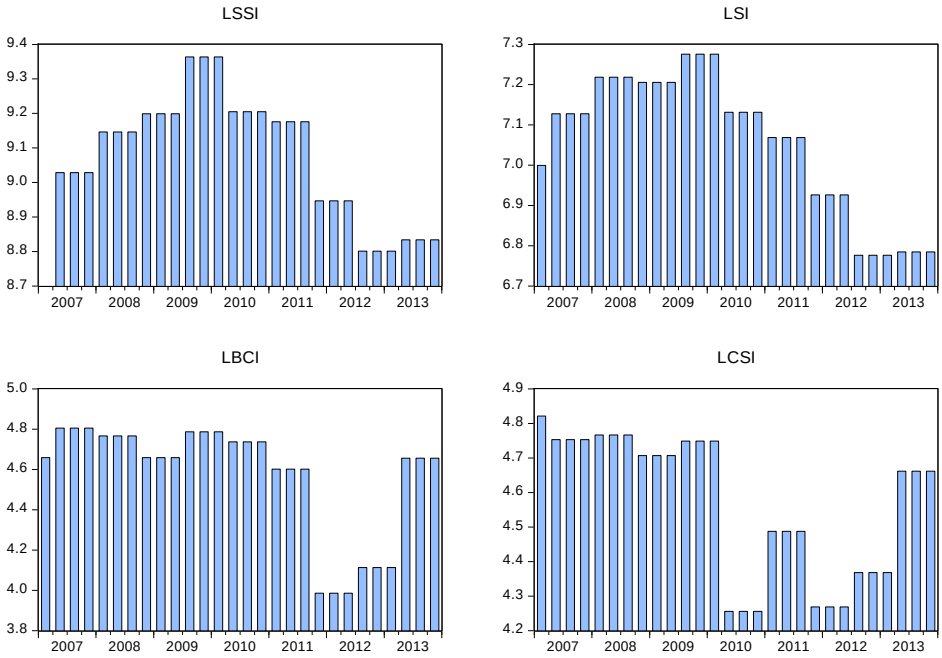
Table 2: Consumer Sentiment Index and Business Condition Index

Consumer Sentiment Index	
SL	Questions/Issues
1	Household income
2	Expected financial condition
3	Expected employment condition
4	Inflation expectation
5	Expected investment in real estate or automobiles
Business Condition Index	
SL	Questions/Issues
1	Current and expected level of production
2	Level of sales
3	New job offerings
4	Level of inventory
5	Level of new orders placed

Source: MIER (2010)
Notes: The surveys are conducted by Malaysian Institute of Economic Research (MIER) on the inhabitants of the Klang Valley in Malaysia. The surveys are conducted quarterly basis and are published alongside other economic indicators on the MIER's website.

BCI and CSI started long back in the 1987. The *Shari'ah* stock market index is available from only 2007. If the data is considered is considered quarterly, we have a dataset from Q1 2007 until Q4 2013 at time of writing this report. Table 2 shows the items considered in the CSI and BCI questionnaires by MIER. Figure 1 illustrates the movement in four important variables considered for this study. The figure shows strong relationship between the sentiment proxies and the stock market indices. Time series variables are influenced by a number of statistical violations. For instance, tests for unit root and heteroskedasticity, auto-correlation and normality tests were conducted.

Figure 1: Movement in important variables



Notes: LSSI – Natural log of Shariah stock index, LSI – natural log of (conventional) stock index, LBCI – natural log of business condition index, and LCSI – natural log of consumer sentiment index. The charts present the movement in key variable with respect to financial crisis and market turmoil.

Table 3 starts with very basic descriptive statistics. The descriptive statistics show that the consumer price index (CPI) is having a high correlation with money supply. We dropped CPI for further analysis. CPI was also highly correlated with some other key variables.

We tested for unit roots and presented the findings in Table 4. Augmented Dickey-Fuller (ADF) test, Phillips-Perron (PP) test, and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests were applied. After the right level of differencing and log transformation, we have conducted OLS. All the variables were first-differenced. The two models tested are given below in equation 1 and 2. Following Liu and Shrestha (2008), we included a number of lag terms, especially with the dependent variable

Table 3: Descriptive Statistics

	LSI	**LSSI**	**LIPI**	**LCPI**	**LMNS**	**LINT**	**LBCI**	**LCSI**
Mean	7.0552	9.0777	12.0915	4.6956	13.6858	1.4752	4.5709	4.5667
Median	7.1279	9.1461	12.1129	4.7029	13.7092	1.6094	4.6587	4.6616
Maximum	7.2759	9.3639	12.2327	4.7431	13.7651	1.9021	4.8048	4.8211
Minimum	6.7762	8.8009	11.9197	4.6548	13.578	0.5306	3.9853	4.2556
Std. Dev.	0.1757	0.1807	0.0836	0.0304	0.0699	0.3685	0.2865	0.208
Correlation Coefficient								
LSI	1	0.929567	0.262387	-0.64395	-0.73461	0.624443	0.671867	0.473675
LSSI		1	0.525314	-0.36586	-0.4431	0.651531	0.616631	0.301608
LIPI			1	0.534987	0.306647	0.503142	-0.02298	-0.45046
LCPI				1	0.884022	-0.10263	-0.59942	-0.7145
LMNS					1	-0.36042	-0.60651	-0.65577
LINT						1	0.490383	0.297251
LBCI							1	0.680376
LCSI								1

Notes: LIPI – industrial production, LMNS – money supply, LINT – interest rate.
LCPI has high correlation with LMNS, hence was dropped from final analysis.

Table 4: Unit Root Test

Items	**Level**			**1st Differencing**			**Remarks**		
	ADF	PP	KPSS	ADF	PP	KPSS	ADF	PP	KPSS
LBCI	-1.711	-1.8377	0.1174	-4.742**	-4.8675	0.0807	I(1)	I(1)	I(0)
LCSI	-1.633	-1.7649	0.1446	-5.538**	-4.8235	0.142	I(1)	I(1)	I(0)
LSSI	-1.818	-1.7765	0.3173	-4.801**	-4.7423	0.1837	I(1)	I(1)	I(1)
LSI	-2.997	-3.2369	0.4818	-5.025**	-5.5577	0.169	I(1)	I(1)	I(1)
LMNS	-1.127	-1.8093	0.5	-1.98	-6.6351	0.1486	I(1)	I(1)	I(1)
LINT	-2.429	-2.5526	0.0499	-5.076**	-4.8009	0.1188	I(1)	I(1)	I(1)
LGDP	-1.655	-1.6047	0.4313	-4.823**	-5.0247	0.1646	I(1)	I(1)	I(0)
LCUR	-1.261	-1.2613	0.1683	-4.867**	-5.0767	0.1156	I(1)	I(1)	I(1)

Notes: Three tests (ADF, PP and KPSS) were being used in testing the presence of unit root in the data. The null hypothesis for Augmented Dickey Fuller (ADF) test and Phillip Perron Test are same. The null hypothesis (H_0) would be there is a unit root and the H_1 stated that there is no unit root. The results above indicated that the null hypothesis

cannot be rejected. The confidence level applied here is 95% confidence level. ADF Critical value at level = -3.4671, at 1st differencing= -2.899**, ** means the test-statistic is significant at 5% level. The null hypothesis for KPSS test would be there is a unit root and the H_1 stated that there is no unit root. KPSS (Kwiatkowski-Phillips-Schmidt-Shin) at level =0.146, at 1st differencing= 0.463, test-statistic is significant at 5% level.

$$\Delta LSSI = \Delta LSI + \Delta LINT + \Delta LIPI + \Delta LMNS + \Delta LCUR + \Delta LBCI \quad \ldots(1)$$

$$\Delta LSSI = \Delta LSI + \Delta LINT + \Delta LIPI + \Delta LMNS + \Delta LCUR + \Delta LCSI \quad \ldots(2)$$

3. Discussion and Implication

Influence of investor sentiment in Islamic capital market is one of the focus of this study. Table 5 and 6 shows the results. In Table 5 we found equation 1 and 2 using two sentiment proxies. In Table 6 we extended the findings to reduce statistical bias by including some lag terms. We conducted trial-and-error method to find the best model with highest adjusted R-squared at the cost of minimum statistical biasness. Hence, Table 6 carries more significance while explaining the ultimate role played by various indicators.

Table 5: Regression outputs Panel I (without lag terms)

	Model 1		**Model 2**	
Variable	Coef.	Prob	Coef.	Prob
ΔLSI	1.292	0.000	1.321	0.000
ΔLMNS	1.118	0.000	1.090	0.000
ΔLIPI	0.161	0.333	-0.048	0.582
ΔLINT	-0.022	0.188	-0.023	0.019
ΔLCUR	0.661	0.260	1.189	0.002
ΔLCSI	0.082	0.010		
ΔLBCI			0.079	0.000
C	-2.750	0.000	-2.502	0.000
R Squared		0.997		0.993
F Statistics		132.2		86.95

Note: Dependent variable ΔLSSI

Table 6: Regression outputs Panel II
(reduced version after statistical cleansing)

	Model 1		Model 2	
Variable	**Coef.**	**Prob**	**Coef.**	**Prob**
ΔLSI	0.692	0.000	0.732	0.000
ΔLMNS	1.118	0.000	1.0003	0.000
ΔLSI (-1)	1.161	0.003	0.982	0.068
ΔLINT	-0.022	0.088	-0.083	0.691
ΔLSSI (-1)	0.661	0.060	0.788	0.002
ΔLCSI	0.791	0.000		
ΔLBCI			0.381	0.000
C	-0.620	0.000	-0.043	0.000
R-squared		0.956		0.986
Adj R-squared		0.952		0.983
F-statistic		132.1		86.92
Prob (F-statistic)		0.000		0.000
Wald F-statistic		274.8		690.4
Prob (Wald F-stat)		0.000		0.000
Durbin-Watson stat		1.87		2.089

Note: Dependent variable ΔLSSI

Table 6 shows that the *Shariah* index is positively influenced by both the sentiment proxies. Both consumer sentiment and entrepreneurial sentiment are strongly positively connected to stock market in Islamic market in Malaysia. Both the models fulfilled almost all the statistical requirements. The adjusted R-squared of the models are impressive, which is again very common in time series model. This part of the study is incomparable to existing studies as none of the past studies investigated the influence of investor sentiment on Islamic stock index in Malaysia in the presence of macroeconomic variable. Going forward from here comes the other macroeconomic factors. For instance, higher conventional stock index is strongly positively influence the Islamic stock market index. Even the past lag (lag 1) of the conventional stock index shows similar positive strength. Money supply is another important and positively significant factor that influences Islamic stock market index in Malaysia. Interest rate, however, is strong negative in

the first model with CSI and negatively insignificant in the second model with BCI. This somehow comes similar to earlier findings that interest rate may be taken as a negative factor in the Islamic stock market as Islamic principles prohibits interest rate (*Riba*). However, more studies are needed to test this relationship.

Past lag of the dependent variable LSSI also positively influences the Islamic stock market index, which is quite common in time series modelling. Autoregressive lag models can be suggested for future studies with more samples. Among the macroeconomic variables, only money supply and interest rates were significant in the reduced model (Table 6). It indicates that the lagged values capture the importance of the other macroeconomic variables, which also indicates that the economic variables require different regression tests to capture their importance.

These findings have far-reaching consequences for Islamic capital market all over the world. If the policymakers really like to see *Shariah*-based Islamic capital markets, and they also like to segregate the influence of non-Islamic factors influencing the Islamic stock index, a number of crucial decisions need to be made. If Islamic finance industry is influenced by CSI and BCI, it indicates that attitude towards Islamic financial industry has similarity with that of the conventional finance industry. This further indicates that investors are not taking Islamic finance differently than the conventional financial instruments. These findings raise important questions on the Islamic trading behaviour of the investors.

The results indicate that there could be three reasons behind a strong influence on such influence. Firstly, it may so happen that existing form of capital market is not fit for Islamic investors. Secondly, there is mixture of Islamic and conventional investors in the same market trading on Islamic assets. Thirdly, investors, either Islamic or conventional, share similar psychological limitations with respect to financial investment. As they are human being, they share similar behavioural limitations when they are choosing assets. Another issue is that there is no limitations, except for the religious bindings, that investors cannot add an Islamic asset into a conventional portfolio. This mixture might be of serious violation of Islamic principles. All the three arguments presented above are true in practical sense. However,

discussion on a unique Islamic capital market would be more appealing than the other points. The concepts of unique Islamic capital markets are still developing; and Islamic capital market where there will no such mixture that violates Islamic principles. All the Islamic financial assets are being traded alongside conventional financial assets in global market. Hence, it will take some time to devise out a unique Islamic capital market framework for Muslim world. This is the capital market where Islamic corporate finances would be available for long-term basis, which also triggers greater understanding and practice of corporate finance based on *Sunnah*. Unless we have a strong framework on corporate finance in Islam, it will be difficult to understand the unique requirement of an Islamic capital markets to Muslims.

Besides, behavioural characteristics of the investors are human attributes irrespective of their religion. For instance, overconfidence is found among Muslims and non-Muslims across the globe. Hence, it is common to see sentiment influencing Islamic stocks. However, it raises debate on to what is extent of the capital market trading that can be Islamic when we have strong role of sentiment in Islamic capital markets. Thus, significant influence of investor sentiment demands *Shari'ah* compliant capital market for Islamic investors. Islamic capital market will be an overhaul from the existing system of trading in stock market. Such a system will educate investors on ideal Islamic trading behaviour that will help reducing rumour-based transaction in financial markets.

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