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Assessing Accrual Accounting Implementation in Cianjur Regency: An Empirical Investigation

Aditya Wira Dianto[1], Khoirul Aswar[2]

Universitas Pembangunan Nasional Veteran Jakarta, Jl. RS Fatmawati No.1 – Pondok Labu, Jakarta Selatan 12450

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ABSTRACT

Purpose:
This research aimed to analyse the effect of top management support, training and communication on the implementation of accrual accounting.

Design/methodology/approach:
The hypotheses of the study were tested using the survey data from 63 working unit in Cianjur Regency. The instrument for content and construct validity and reliability was tested. Then, the hypotheses were tested using Structure Equation Modelling (SEM) by SmartPLS 3.0.

Finding:
This study found that top management support and training have significant relationship with implementation of accrual accounting. Meanwhile, communication has no significant relationship with implementation of accrual accounting.

Research limitations/implications:
This study contributes to provide input into the adoption of Government Regulation No. 71 of 2010 in order to apply the rule of accrual accounting to the fullest, and to minimize errors in financial reporting with the identification of possible obstacles faced in implementing accrual accounting. This study recommended that, more factors such as consultant support, education level and project management support are needed to complement and improve financial reporting with implementation of accrual accounting.

Originality/value:
To the best of the researcher's knowledge, no study of Cianjur Regency has tested the impact of factor such as top management support, training and communication on implementation of accrual accounting.

1. Introduction

Reformation of public sector was started in 1980s. It occurred in developed countries as the answer of criticism because the public sector was considered inefficient, always loss, unproductive, poor innovation and creativity, and low quality. The reforms were as a result of changes by introducing the approach of reinventing government and the New Public Management (NPM) adopted by several countries, especially the Anglo-Saxon countries. The purpose of this NPM global phenomenon is to improve efficiency and effectiveness, increase responsibility and improve managerial accountability of public organizations (Aswar & Saidin, 2018).

In Indonesia, the application of NPM began with reforms in the financial sector with the inception of three sets of laws, which were Law (UU) No. 17 of 2003 concerning State Finance and No. 1 of 2004 concerning the State Treasury, and Law No. 15 of 2004 concerning the Examination of Management and Responsibility of State Finances. The existence of the three sets of laws had marked the start of a new era in the management of state finances. Furthermore, from this phenomenon, PP No. 24 of 2005 concerning Government Accounting Standards (SAP) based on cash towards accruals accounting. In 2010, Indonesian government has issued Government Regulation (PP) No. 71 of 2010 concerning Accrual Based Accounting concerning Government Accounting Standard.

The supreme audit agency (BPK) of 542 LKPD in 2018 stated Unqualified opinion over 443 (83%), qualified opinion of 86 (16%), and disclaimer opinions of 13 (2%). While compared to the achievements in 2017, the quality of LKPD in 2018 had increased as indicated by an increase in unqualified opinion by 6% points, from 76% in 2017 to

†Corresponding Author: ADITYA WIRA DIANTO
Email:adit16wira@gmail.com

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82%, in 2018. In 2017, 411 of 542 LKPD received unqualified opinion (76%), while in 2018 443 of 542 LKPD obtained unqualified opinion (82%) (IHPS I in 2019).

Besides, as revealed in the Notes to the Financial Statements, the Government of Cianjur District/Regency presented Building Expenditures and Buildings of IDR 267.22 billion. From this value, there was a realization of IDR 4.95 billion accounted for as the procurement of facilities and infrastructure of the State Junior High School. However, it was used not in accordance with its accountability.

As the disclosure in Notes to the Financial Statements, The Cianjur District Government presented a Grant Expense of IDR 241.36 billion. Of this value, there was a realization of IDR 2.77 billion. It was accounted for as the procurement of facilities and infrastructure for Private Junior High Schools. However, it was used not in accordance with its accountability (BPK 2018). Based on the identification of the problems which have been found above, this research aims to examine and analyse whether the top management support, training, communication affect accrual-based accounting

Some previous studies on the implementation of accrual accounting. For example, Agyemang (2017), Cohen *et al*, (2007), Christiaens (2001) found that the obstacle of public sector in the application of accrual accounting in the transition period is related to the organizational and procedural factors. In line with research in Indonesia found that some obstacles on the accrual accounting implementation which is lack of human resources, motivation and incentive, information technology, effective communication and support from top management (Aswar & Saidin, 2018; Harun & Kamase, 2012; McLoad & Harun, 2014; Harun et al, 2012).

In particular, this paper focuses on the factor influencing on the implementation of accrual accounting in Cianjur Regency. Furthermore, the aim of this study is to examines the relationship between top management support, training and communication on the implementation of accrual accounting in Cianjur Regency.

2. Theoretical Perspective

Based on Scott (2008), Institutional Theory is new institutional approach in studying organizational sociology. The theoretical source comes from cognitive theory, cultural theory, as well as phenomenology and ethnomethodology. There are 3 elements of analysis which build institutions even though some elements are dominant. However, these elements combine with each other. They come from different perspectives on the nature of social reality and social order in earlier sociological traditions. Furthermore, Scott (2008) explains the existence of 3 pillars in a new institutional perspective. First is regulative pillars. It works in the context of rules, monitoring and sanctions. This relates to the capacity to enforce rules, and provide rewards and penalties. This approach draws closer to enforcement through informal and formal mechanisms. Development will provide opportunities as well as limits to individuals who work through the pillars of repression and restrictions. Thus, individuals in this organization will be seen as a context which will maximize profits. Therefore, these institutions are often also referred to as regulatory institutions and rational choice institutions.

Second is normative pillars. In this view, norms produce evaluative perceptions and affirm responsibility in social life. This pillar includes values and norms. Norms are useful for guiding individuals what goals are to be achieved, and how to achieve them. Therefore, this section is often referred to as normative institutions and historical institutions. This is often referred to as the "original institutional" theory. Third is cultural-cognitive pillar. The core of this pillar is that humans behave is highly determined by how he interprets the meaning of the world and its environment.

3. Hypothesis Development and Conceptual Scheme

3.1 The Effect of Top Management Support toward Accrual based Implementation

The change of management in applying accrual accounting is highly needed because Top management support becomes an important factor in the implementation of accrual accounting in accordance with institutional theory which states that top management support has a very important role in achieving these goals. Aswar and Saidin (2018) found that there was a positive effect between top management support toward the implementation of accrual-based accounting. In line with previous research, it states that that there is a relation between top management support for the implementation of accrual-based accounting Rosyadi and Mulyani (2017). Besides, top management support has a positive effect on accrual-based implementation (Safitri, 2017; Nasution 2016; Kristiawati 2015; Putra & Ariyanto, 2015). Based on the explanation above, this argument leads to the following hypothesis:

H1: Top management support has a positive effect on the implementation of accrual-based accounting

3.2 The Effect of Training toward Accrual Based Implementation

Training is an important part in implementing accrual accounting. This is in line with institutional theory which states that part of the training is professionalism to exert pressure on accrual accounting reform. Previous studies have found that training has a positive effect toward the implementation of accrual accounting (Aswar & Saidin, 2018; Cavaluzzo & Ittner, 2004, Jantong *et al*, 2018, Ridder & Bruns, 2006). Based on the discussion above, this hypothesis is formulated as follow:

H2: Training has a positive effect toward the implementation of accrual accounting.

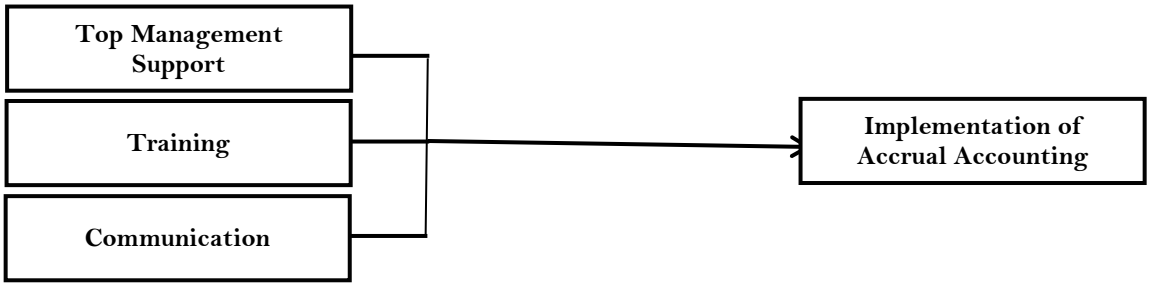
3.3 The Effect of Communication toward Accrual Based Implementation

Good communication is a very important aspect for group effectiveness or any organization. Good communication in an organization will be able to work systematically to improve productivity, especially in applying the implementation of accrual accounting. Good communication will affect the implementation of accrual accounting. This is in accordance with institutional theory which states that the encouragement of communication will increase human communication between the organizational environment. Thus, the application of accrual accounting is getting better.

Several researches found a positive relationship between communication and the implementation of accrual accounting. This shows that the better communication carried out by the SKPD in socializing and applying government accounting standards, the higher level of application of accrual government accounting standards in the area (Safitri, 2017; Putra & Ariyanto, 2015; Pratiwi *et al*, 2017). Based on the explanation above, this argument leads to the following hypothesis:

H3: Communication affects the implementation of accrual accounting.

Figure 1: Research framework



4. Methodology

Population refers to all element which is wanted to be investigated to draw the conclusion (Sekaran, 2006). The population in this research was Cianjur District SKPD. there were 65 SKPD such as Regional Secretariat, Regional Inspectorate, DPRD Secretariat, Regional Service, Regional Agency, District and Hospital. The samples were part of the population, consisting of a number of members with characteristics possessed by the population (Sekaran, 2006). (Cooper and Emory, 1996) stated that the population is not limited. Thus, the sample of this research were65 SKPD with a total sample of 65 x 2 = 130 total samples.

The sampling technique was the census sampling method. This method is a technique for determining the overall sample taken from all elements in the population. Thus, it could be used as a sample (Sekaran, 2006). The unit of analysis in this research was the individual who were in charge of preparing financial statement in the Cianjur District SKPD. They were the secretary and accounting department staffs. The determination of the unit of analysis was based on individuals who knew the government regulations on accrual-based accounting.

In the context of this study, the implementation of accrual accounting has been operationalized the application of governmental accounting standard which measured by revenue, expense, asset, liabilities, and equity in the accrual based financial statement, and measure revenue, expenditure, financing in the budgeting based on the financial statement on the accrual accounting (Nasution, 2016). This variable was adopted by Nasution (2016) using 5 dimensions which is revenue recognition, expenses, asset, liabilities, and equaity.

Top management support is the involvement of top managers to make the strategy, providing resources and setting goals. This variable was measured using questions adopted from Aswar and Saidin (2018) modified according to the environment in the Cianjur Regency SKPD. Training is individuals who are in an organization, of course they must have the potential needed by the organization to achieve their goals. According to Noe (2010: 5), Training is a planned effort made by the company to facilitate employee learning based on work competencies carried out. Job competencies which must be possessed include knowledge, skills, or behaviours which are very important for the success of employee performance (Rosyadi & Mulyani, 2017). This variable was measured using questions adopted from Aswar and Saidin (2018) modified according to the environment in the SKPD Cianjur District.

Communication is disclosure process and understanding the meaning. How great the idea is, it will not be useful if it is not passed on and understood by others. Good communication is very important for the effectiveness of any group or organization. This variable was measured using questions adopted from research (Aswar & Saidin, 2018).

5. Result

Besides, mean and standard deviation were always used to explain research characteristic which used ratio and interval scales. In this research, the interval scale used a five-point Likert scale. Furthermore, suggestions made by

Muhammad, *et al.* (2010) regarding the interpretation of average scores were also supported. They recommend that an average score of less than 2.33 was low, scores between 2.33 to 3.67 were considered moderate and values above 3.67 was considered high. The level of statistical significance in this study is 5%. The following results of descriptive statistical analysis of the results of this study are as follows:

Table 1. Result of Descriptive Statistic of Mean and Standard Deviation

Variable	Total of Question	Mean	Std. Deviation
Implementation of Accrual Accounting	5	20,18	3,009
Top Management Support	7	29,76	4,542
Training	8	31,76	4,819
Communication	6	25,04	4,287

Based on descriptive statistic result in table 1, it shows that the biggest mean is in the training which is equal to 31.76 with the number of question items of 7 out of 76 respondents and the standard deviation value of 4,819. Furthermore, it was followed by the mean value of top management support of 29.76 with a standard deviation of 4.542. Furthermore, the mean value contained in the communication variable is 25.04 with a standard deviation of 4.287. Finally, the mean value for the training variable is 20.18 with a standard deviation of 3.009.

Thus, it can be seen that there is not a large enough gap from the respondent because all the mean and standard deviations of each variable indicate that the standard deviation is smaller than the mean. This shows that the smaller value of the standard deviation, it will describe the level of homogeneity of the data is quite high and shows an average that describes the actual data. In addition, the mean value is also above 20. In this case, the item has a high value which indicates that respondents believed in implementing high accrual accounting to be applied in Cianjur District.

In the result of data processing structural models for path coefficients analysis (Path Coefficients) are obtained as follows:

Table 2. Value of Path Coefficient Analysis

Variable	*Original Sample* (O)	*Sample Mean* (M)	STDEV	*T Statistics*	*P Values*
DTM -> IAA	0,435	0,459	0,204	2,134	0,033
K-> IAA	0,145	0,133	0,203	0,714	0,476
P -> IAA	0,297	0,292	0,145	2,049	0,041

Based on table 2, it can be seen in part of Original Sample (O), it shows the results of the path analysis coefficient values for testing between variables of top management support for the accrual accounting implementation of 0.033, training for the accrual accounting implementation of 0.476, communication of the accrual accounting implementation of 0.041.

Top management support is factor which can improve the implementation of accrual accounting which are the involvement of top managers to start a strategy, provide resources and set goals (Aswar & Saidin, 2019). Top management support is needed. Thus, the executors of financial statement recording implement the accrual accounting properly.

The result of the research was in line with a research conducted by Aswar and Saidin (2018). It found that there was a positive effect between top management's support for the implementation of accrual-based accounting in Java and Sumatra. In line with research which stated that there was a relation between top management support to the implementation of accrual-based accounting Rosyadi and Mulyani (2017) and also top management support had a positive effect on accrual-based implementation (Safitri, 2017). The results were also in line with the research of Putra and Ariyanto (2015) who conducted research in Badung District. They found that management support had a positive effect on the implementation of accrual accounting.

The results of this research were also in accordance with institutional theory in which the support of top management as a normative pillar. Top management gives responsibility by the imposition of sanctions and rewards so that normative expectations to implementers and motivation to meet these expectations. Thus, it can be considered that if the implementer is supported by the encouragement of top management so the implementer can implement accrual accounting. Thus, the greater the encouragement of top management will increase the implementation of accrual accounting implementation.

This implicated the result because SKPD in Cianjur District, top management support as Policy makers have a very important and vital role because the implementation of accrual accounting is a large project. It requires large resources and also complex changes. The top management support was part of the commitment by the SKPD in Cianjur Regency to adopt and implement accrual accounting. Therefore, it could facilitate the accrual accounting system until the implementation goals are reached.

Based on the results of data processing, the relation of training to the implementation of accrual accounting showed the value of t> table of 2.049> 1.66123 and a significant value of 0.041 <0.05 indicated that training had a significant effect on the implementation of accrual accounting.

This finding was consistent with previous research about accounting reformation research. This was because of the findings of Windel and Christiaens (2006) in Flemish, public centres also reported a significant and positive relationship between training and accrual accounting reform. Likewise, the research of Christiaens and Peteghem (2007) empirically proved that the training program had a significant influence on the level of compliance with accounting reform. Consistent with this research, the research of Eriotis et al. (2011) also established a significant and positive relation between training and the rate of adoption of accounting reforms in Greek public hospitals. In Ghana, research conducted by Agyemang (2017) showed that there was a significant positive relationship between training and implementation of AIPSAS.

This research was also in line with what has been conducted in Indonesia. Aswar & Saidin (2018) found that adequate training had an effect on the implementation of accrual accounting in local governments throughout Java. Kamemy (2017) explained training influences the implementation of accrual accounting in SKPD. In line with research conducted by Kusuma and Fuad (2013), it found that specifically the level of application of accrual accounting was significantly influenced by training of financial staff. Training was a key factor in the successful implementation of accrual accounting because changes which could not be implemented directly without adequate training by each government agency.

This phenomenon could happen because training program had been defined well and effectively. Thus, it increases the intention to use the new system. Defining the right training approach is seen as an important factor which could affect successful implementation because ineffective training methods actually reduce motivation to use the new accounting system.

The results occurred in the Cianjur District SKPD were that the level of accrual accounting adoption could be maximally achieved not only because of qualified employees. There were several factors which supported cities in their regional development and one of them was a training program. Therefore, it could be considered that training was an important factor in increasing the application of accrual accounting. Based on the discussion above, the results showed that an acceptable level of training had been provided to staff appointed by the government. However, controversial training programs was needed because the adoption and implementation of the accrual basis of accounting was a long process project which took years to achieve.

Communication toward implementation of accrual accounting showed value of t-value > t-table of 0.714 <1.66123 and a significant value of 0.476> 0.05 showed that communication significantly influences the implementation of accrual accounting. So it can be concluded, communication does not significantly influence the implementation of accrual accounting.

The results of this study are not in line with research conducted by Putra and Ariyanto (2015) showing that communication, organizational commitment has a positive effect on the readiness of applying accrual-based government accounting standards in Badung Regency. Pratiwi *et al*, (2017) concluded that communication has a positive effect on accrual accounting in the city government of Bandung.

In the context of Cianjur Regency SKPD broad communication has no effect on the accrual accounting implementation. This was because of the possibility occurred that ineffective communication was built up within the organization. Another possibility, the Cianjur district SKPD organization considered that minimal communication could implement accrual accounting.

6. Conclusion

This research aims to examine and find out the effect of top management support, training and communication toward implementation of accrual accounting in Cianjur Regency. Based on the results and discussion after data analysis and testing of the effect of top management, training and communication support on the accrual accounting implementation of 71 respondents in Cianjur Regency. Based on the research findings and discussion, it can be concluded in accordance with the research problem, as follows:

Top management support has a positive and significant effect on the implementation of accrual accounting. This shows that if the implementation is supported by top management, the implementation of accrual accounting will be better. Training affects positively and effectively toward implementation of accrual accounting. This shows that good training will facilitate the implementation of accrual accounting. This result is also due to the implementation of accrual accounting by the government providing facilities and conducting structured training for the implementation phase. Communication has no positive and significant effect on the implementation of accrual accounting. This is because of the possibility that occurs that ineffective communication is built up within the organization.

This research has several limitations in conducting this research. The results of the research only use the research object of Cianjur District in one part of the local government in West Java. Thus, it has not been able to give a more or generalized depiction for the whole related to the implementation of accrual accounting. The research was conducted at the end of the year. Therefore, it coincides with the book closing activities for each regional work unit so that many questionnaires were not returned.

This study contributes to local government especially for SKPD in Cianjur Regency to concern more communication between top and bottom in this organization which means that two ways communication verse versa. Based on the conclusion above, it can be summarized some suggestions for further researchers to add the variables of

consultant support, education level, and project management support as suggestions for developing research results. Furthermore, the process of compiling and filling out the questionnaire should be simplified, so there is no incomplete in answering questionnaire. Research data collection must be complemented using interview methods to dig deeper into the implementation of accrual accounting. In addition, further research is expected to expand research to not only focus on SKPD in Cianjur District.

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Competitiveness and FDI Inflows in ASEAN Member Countries

Dewa Gede Sidan Raeskyesa†

School of Business and Economics, Universitas Prasetiya Mulya, Indonesia

Reinardus Adhiputra Suryandaru

School of Business and Economics, Universitas Prasetiya Mulya, Indonesia

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ABSTRACT

Purpose: The goal of this study is to investigate the empirical effect between competitiveness and FDI inflow in ASEAN member countries over the period 2007-2017.

Design/methodology/approach: The effect of competitiveness and foreign direct investment (FDI) was investigated by using Pearson correlation and panel data analysis. The fixed effect and random effect models were applied, followed by the Hausman test, which led us to use the fixed effect model.

Finding: The study revealed that the majority of ASEAN countries have a strong and positive association between competitiveness and the FDI inflow. Specifically, variable institutions, market size, health, and primary education had a significant effect on attracting inward foreign direct investment in the region.

Research limitations/implications: In order to attract more foreign direct investment, it is highly suggested the ASEAN countries enhance their institution quality and improve the human capital through health and basic education.

Originality/value: Our study enriches the literature on globalization and competitiveness by focusing on the regional empirical effect between each variable from the Global Competitiveness Index and the FDI inflow exclusively in countries within the ASEAN region.

Keywords:
FDI, International Competitiveness, Foreign Investment

1. Introduction

During the current globalization era, Foreign Direct Investment (FDI) plays a pivotal role in supporting the development of countries' economic development process. As countries develop their economies, they use FDI as an external source to finance their development projects and to increase their economic productivity. For decades, FDI has been an extensive source for developing economies and the most resilient to economic and financial shocks (UNCTAD, 2018:12-13). As reported, the global inflows of FDI declined by 23 percent to $1.43 trillion in 2017. One of the reasons for this is because the value of net cross-border mergers and acquisitions (M&As) decreased from $887 billion to $694 billion in 2016. In 2017, developed economies experienced a decline to $172 billion, whereas developing economies have remained stable at $671 billion. A minor improvement is observed in the Latin American region, with an 8 per cent increase to $151 billion, while the African region has faced a decline to $42 billion (-21 per cent). Furthermore, developing countries from the Asian region have become recognized as the largest FDI recipient by attracting $476 billion. In contrast to the global trend, developing Asia has increased its share in the global FDI from 25 per cent in 2016 to 33 per cent in 2017 (UNCTAD, 2018).

The FDI flow to ASEAN region has risen from $123 billion in 2016 to $137 billion in 2017. This situation had led the ASEAN region to increase its share in the global FDI to developing countries from 18 per cent in 2016 to 20 per cent in 2017. Indonesia has performed extensively well by attracting the inflows up to $23.1 billion, Thailand tripled its inflows to $9.1 billion, the Philippines experienced a 21 per cent increase up to $10 billion, and Vietnam became the third largest recipient, with more than $14 billion. The first place is taken by Singapore, which accounted for 45 per cent of the total FDI among the ASEAN countries with $62 billion. Thus, it comes no surprise that FDI influences Singapore's GDP significantly (Feridun & Sissoko, 2011). Moreover, Singapore also performed extensively well, with

†Corresponding Author: Dewa Gede Sidan Raeskyesa
Email: dewa.sidan@pmbs.ac.id/raeskyesa@gmail.com

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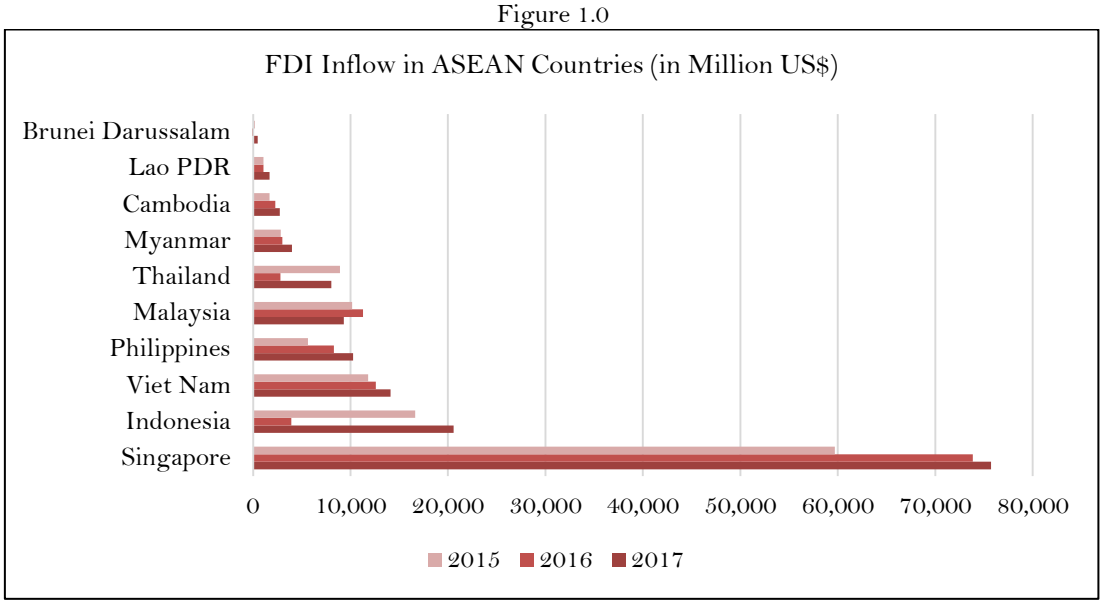
investments within ASEAN members up to 69 per cent of the total intra-regional investment. On the other hand, Indonesia has become the largest recipient for intra-regional investment by attracting 45 per cent of the total FDI within ASEAN, with Singapore as the largest investor for Indonesia with $10.7 billion (ASEAN & UNCTAD, 2018). In this context, the benefit from FDI inflows to the ASEAN economy has been confirmed by Uttama and Peridy (2010), who conclude that the FDI in the form of multinational corporations' existence in host countries' economy will increase productivity through backward and forward linkages (Uttama & Peridy, 2010).

Figure 1.0



Source: ASEAN Secretariat Statistics Office (Author's calculation)

In light of this phenomenon and the work from Dunning and Zhang (2008), who argue that the locations' competitiveness level influences FDI (Dunning & Zhang, 2008), we pose a central question in this study: how do competitiveness aspects affect the FDI inflow? Therefore, the objective of the study is to examine the empirical effect between competitiveness factors and the inflow of the FDI. We are using the Global Competitiveness Index to represent the competitiveness variable, which consist of 12 pillars: institutions, infrastructure, the macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labour market efficiency, financial market development, technological readiness, market size, business sophistication, and innovation.

The Pearson correlation shows a strong and positive relationship between competitiveness and FDI inflow. Moreover, the fixed effect model shows that institutions, market size, health and primary education have a positive and significant influence on FDI inflow to ASEAN countries; in fact, a higher degree on institutional quality, health and primary education are attracting FDI inflow more than an improvement in market size. Those variables are important for providing a productive, competitive and stable environment for the economy. Moreover, our result supports the view that the location decisions of FDI are influenced by the country's characteristics, especially in quality of institution and human capital. Furthermore, our study complements the literature on FDI and national competitiveness by utilizing the Global Competitiveness Index from the World Economic Forum and concentrating on ASEAN member countries. The rest of the paper is structured as follows: the following section presents the literature on the nexus between FDI and national competitiveness, then continued with panel data analysis in section 3. Moreover, in section 4 and 5 consists of the empirical result and conclusion.

2. Literature Review

Based on the work of Asghari (2012), foreign direct investment is composed of international credit, transfer of capital, and reinvestment profit between the principal company abroad and its domestic branch (Asghari, 2012). However, Kindleberger argues that "FDI is essentially about transfer of control rather than movement of capital per se." (Krugman, 2000). In support of this definition, Duce (2003) expresses that FDI reflects the purpose from the entities in one economy to engage in a long-term economic relationship and sufficient degree of influence on the management activities toward other entities from other economies (Duce, 2003).

Furthermore, Dunning (2000) created the eclectic paradigm, which is well known as "The OLI Framework," to understand the determinants of FDI and the behaviour of multinational companies. This simple framework is constructed of three sub-paradigms. The first paradigm refers to the ownership (O) of the enterprise, which acts as an investor for a particular advantage. It is formed based on the assumption that the FDI will likely arise if the benefit for making foreign value-adding operations outweighs its own cost. The second paradigm is related to the location of the region (L) where the enterprise would like to operate its foreign production. The third paradigm, called internalization (I), refers to the preference of the investing enterprise to do its own foreign production rather than granting a license to other foreign firms to conduct their business (Dunning, 2000).

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Initially, the paradigm recognizes the importance of location factors for attracting FDI, which is amplified by the exposure of the knowledge-based world economy and asset exploration through FDI (Dunning, 2000). Location factors such as countries with natural resource advantage will attract FDI, as determined by Hayat (2014). However, Mina (2007), who studied the location determinants of FDI flows in Gulf Cooperation Council (GCC) countries found that a country's institutional quality and infrastructure development can encourage more FDI than oil production and oil reserves (Mina, 2007). Meanwhile, other studies empirically identified that FDI is attracted to countries with great demand or market size, and the study supports other variables such as the quality of formal institutions and the provision of special economic zones within the region to be an advantage for a country to attract more FDI (Nielsen, Asmussen, & Weatherall, 2017). A study by Belascu and Shivarov (2016) identified that, in emerging countries, the country's economic development and access to natural resources become positive attributes that attract FDI (Belascu & Shivarov, 2016).

As the studies reveal, a country's economic competitiveness can potentially be included as location determinants for FDI inflow. Dunning and Zhang (2008) identified resources (machines, land, and natural resources), capabilities (intangible assets, education, and organizational capacity), the market (information on both domestic and foreign market, capability on market exploitation), and institutions (regulations, law, and customs) as factors that enhance a country's competitiveness (Dunning and Zhang, 2008).

This understanding is in line with The Global Competitiveness Report (GCR),[1] which describes "competitiveness as the set of institutions, policies, and the factors that determine the level of productivity of a country." (World Economic Forum, 2008). The capability to enhance the country's productivity will create the possibility not only to increase the country's income level but also becomes the factor of its return on investment, which is one of the important factors to explain economic growth prospects (Ali, 2017). Moreover, the report has considered a set of pillars such as institutions, infrastructure, macroeconomic stability, education, market conditions, policies, and technological readiness. These interrelated variables together are well known as the Global Competitiveness Index (GCI). Therefore, the definition becomes the reason for this study to use the index as representative for a country's competitiveness.

Several studies have used the index; for example, Popovici and Calin (2012) identified a country's competitiveness as a determinant to attract FDI inflow. Using the competitiveness index from European Commission, they found positive connections between competitiveness and FDI in seven countries from Central and Eastern Europe (CEE) (Popovici & Călin, 2012). In addition, the enhancement of a country's competitiveness also has a positive impact for countries to attract more FDI. As shown by Popovici and Calin (2015), who employ GCI for the calculation, enhancement in institution quality, labor market efficiency, and innovation increases the level of FDI per capita for half countries in the CEE region (Popovici & Călin, 2015).

With a similar index, the empirical study by Ali (2017) found that a country's competitiveness level in the ASEAN region has incredible function to attract FDI inflow. Furthermore, the study unveils that countries in the ASEAN region demonstrate weakness regarding institution quality, therefore suggesting that variables beyond economic indicators such as political stability, property rights, and government efficiency should be taken into account as FDI inflow determinants (Ali, 2017). The importance of variables beyond economic indicators as FDI determinants has been confirmed by the study from Harms and Ursprung (2002), who conclude that countries that respect civil and political freedom attract more FDI compared to repressive ones (Harms & Ursprung, 2002).

Amongst the literature provided, our study enriches the literature by focusing on the regional empirical effect between each variable from the Global Competitiveness Index and FDI inflow exclusively in countries within the ASEAN region.

3. Data, Methodology and Empirical Results

3.1 Data

We set the amount of FDI inflow for ASEAN countries taken from the World Bank Dataset as the dependent variable. For the independent variables, this study uses the Global Competitiveness Index from the Global Competitiveness Report, 2018, to measure the level of competitiveness in the region, which consists of 12 pillars: (1) institutions, (2) infrastructure, (3) macroeconomic environment, (4) health and primary education, (5) higher education and training, (6) goods market efficiency, (7) labour market efficiency, (8) financial market development, (9) technological readiness, (10) market size, (11) business sophistication, and (12) innovation. The period of observation is from 2007 to 2017. Since both dependent and independent variables have a different level of measurement, we transform the entire dataset into logarithmic form to stabilize the variance (Suryandaru, 2020). Based on the theories and previous literature review, especially with reference to locational theory from Dunning (2000), we hypothesize that the signs of all independent variables are positive to attract FDI inflow.

3.2 Methodology

This study analyses the regional empirical effect between the amount of FDI inflow for ASEAN countries and the level of competitiveness in the region using the unbalanced panel data analysis. Through panel data analysis, we are

[1] GCR is an annual report published by World Economic Forum

able to control individual heterogeneity and obtain more reliable estimates from the dataset compared with time series and cross-section observations (Gujarati and Porter, 2009). Our logarithmic functional model for this study is as follows:

LN_FDI Inflow= f(LN_INST,LN_INFRA,LN_ME,LN_HPE,LN_HET,LN_GME,LN_LME,LN_FMD,LN_TR,LN_MS,LN_BS,LN_INOV)

Where INST = Institution, INFRA = Infrastructure, ME = Macroeconomic Environment, HPE = Health and Primary Education, HET = Higher Education and Training, GME = Goods Market Efficiency, LME = Labour Market Efficiency, FMD = Financial Market Development, TR = Technological Readiness, MS = Market Size, BS = Business Sophistication, and INOV = Innovation.

In general, the panel data model can be classified into three categories: pooled OLS model, fixed effect model, and random effect model. Pooled data has constant coefficients for both intercepts and slopes. It usually pools all of the data and runs an ordinary least squares model (OLS). The model of a pooled OLS can be specified as follows:

$$LN\_FDI\ Inflow_{it} = \beta_0 + \beta_1 LN\_INST_{it} + \beta_2 LN\_INFRA_{it} + \beta_3 LN\_ME_{it} + \beta_4 LN\_HPE_{it} + \beta_5 LN\_HET_{it} + \beta_6 LN\_GME_{it} + \beta_7 LN\_LME_{it} + \beta_8 LN\_FMD_{it} + \beta_9 LN\_TR_{it} + \beta_{10} LN\_MS_{it} + \beta_{11} LN\_BS_{it} + \beta_{12} LN\_INOV_{it} + u_{it}$$

The pooled OLS model cannot control the unobserved individual effects since the heterogeneity of the countries under consideration may affect the measurement of estimated parameters. To control the individual heterogeneity, we use the random effect model in which the variations across countries can be captured within the model. By incorporating countries' individual effects, the random effect model can be constructed from equation (2) as follows:

$$LN\_FDI\ Inflow_{it} = \beta_0 + \beta_1 LN\_INST_{it} + \beta_2 LN\_INFRA_{it} + \beta_3 LN\_ME_{it} + \beta_4 LN\_HPE_{it} + \beta_5 LN\_HET_{it} + \beta_6 LN\_GME_{it} + \beta_7 LN\_LME_{it} + \beta_8 LN\_FMD_{it} + \beta_9 LN\_TR_{it} + \beta_{10} LN\_MS_{it} + \beta_{11} LN\_BS_{it} + \beta_{12} LN\_INOV_{it} + v_{it}$$

Where v_{it} is a component of the random error term, which consists of between-country error (ω_{it}) and within-country error (ε_{it}) over time. The explanation in the random effect model is that a country's error is not correlated with the explanatory variables. In contrast, if a country's error is correlated with the explanatory variables, then we should use the fixed effect model to allow each country to have its own intercept. The fixed effect model can be specified as follows:

$$LN\_FDI\ Inflow_{it} = \beta_{0i} + \beta_1 LN\_INST_{it} + \beta_2 LN\_INFRA_{it} + \beta_3 LN\_ME_{it} + \beta_4 LN\_HPE_{it} + \beta_5 LN\_HET_{it} + \beta_6 LN\_GME_{it} + \beta_7 LN\_LME_{it} + \beta_8 LN\_FMD_{it} + \beta_9 LN\_TR_{it} + \beta_{10} LN\_MS_{it} + \beta_{11} LN\_BS_{it} + \beta_{12} LN\_INOV_{it} + u_{it}$$

To test for the possible existence of such a correlation between a country's error and its explanatory variables, we use the Hausman Test. The null hypothesis for this test is that there is no correlation between individual countries' error with its explanatory variable (i.e., random effect). If we reject the null hypothesis, then we prefer the fixed effect model. In contrast, if we do not reject the null hypothesis, we prefer the random effect model. By doing so, this study uses only a one-way error component model; i.e., either fixed effect or random effect.

3.3. Empirical Result

As an initial statistical check, we conduct Pearson Correlation test to discover the strength of relationship between competitiveness and FDI inflow for each member of ASEAN countries during the period of observation. The result in Table 1 indicates that the majority of ASEAN countries have a strong positive association between competitiveness and the FDI inflow. Only Laos and Thailand have a negative association. This result suggests that the correlation between competitiveness and FDI inflow is somewhat heterogeneous, depending on the degree of economic development and social-cultural aspects for each member.

Table 1. The Pearson Coefficient of Correlation

Country	Pearson Coefficient
Indonesia	0.63
Singapore	0.60
Thailand	-0.36
Vietnam	0.74
Malaysia	0.50

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Brunei Darussalam	0.92
Laos	-0.54
Myanmar	0.99
Philippine	0.78
Cambodia	0.88

Source: Author's calculation by using the original unit of account

We now turn to the estimated result of the panel regression, as the result from Table 2 shows that both the F-Test and Wald Test are significant at the 1 percent level. These evidence underpin that all of the independent variables in both models are able to explain the behaviour of the dependent variable (i.e do not reject the null hypothesis). In addition, the Hausman Test indicates that the fixed effect model is statistically preferred over the random effect model.

The fixed effect model shows that the variable of institutions (LN_INST) has a positive coefficient and is statistically significant toward FDI inflow. It implies that the institution plays an important role in attracting investment from abroad. When ASEAN members can increase their score in institutional capacity by 1 percent, it leads to an increase of up to 2.354 percent of FDI inflow, *ceteris paribus*. In general, this finding is in line with another study by Ali et al. (2010), which stated that an institution becomes a robust determinant for FDI. Another study from Ullah and Khan (2017) suggested that the improvement of the institutional quality of ASEAN countries is significant to attract more FDI.

Moreover, health and primary education (LN_HPE) achieves the highest significance level at 1 percent, with a positive coefficient up to 1.668 percent. This means that, when the ASEAN countries manage to increase their score in citizens' health and primary education variable by 1 percent, the FDI inflow will increase up to 1.66 percent. This result is similar to another study conducted by Majeed and Ahmad (2008), who found that health care expenditures in developing countries are a significant factor to attract FDI. Furthermore, as health and education are human capital determinants, this finding resonates with other studies that stated that investment in human capital has a positive and significant effect on FDI inflow (Tsen, 2005: Kumari and Sharma, 2017). Lastly, variable market size (MS) is significant at the 10 percent level, with positive magnitude towards FDI inflow up to 1.067 points. In other words, a 1 percent increase in the market size variable leads to an increase in the inflow of FDI up to 1.067 percent.

Table 2. Fixed Effect and Random Effect

Panel data Models: Dependent variable (LN_FDI Inflow)		
Independent Variables	Fixed Effect	Random Effect
LN_INST	2.354** *(2.44)*	-0.552 *(-0.88)*
LN_INFRA	-0.502 *(-1.45)*	-0.353 *(-1.66)*
LN_ME	0.164 *(0.92)*	0.188 *(1.19)*
LN_HPE	1.668*** *(3.90)*	0.246 *(0.86)*
LN_HET	0.243 *(0.40)*	0.580 *(1.48)*
LN_GME	-0.068 *(-0.10)*	1.188** *(2.32)*
LN_LME	-0.437 *(-0.92)*	0.695* *(1.90)*
LN_FMD	-0.178 *(-0.49)*	0.334 *(0.98)*
LN_TR	-0.554 *(-1.54)*	-0.552* *(-.175)*
LN_MS	1.067* (1.74)	1.057*** *(5.00)*
LN_BS	-0.379 *(-0.39)*	-2.50*** *(-4.84)*
LN_INOV	-0.065 *(-0.07)*	1.917** *(3.10)*
Constant	5.678 *(1.39)*	12.489*** *(6.15)*
Model Summary		

R^2	0.5016	0.8195
F-Test	5.13***	
Prob > F	0.00	
Wald Test		358.73***
Prob > chi2		0.00
Hausman Test		86.46***
Countries Included	11	11
Total Panel Observations	92	92

Note: Significance level ***1%; **5%; and *10%. The null hypothesis of the Hausman Test is that there is no correlation between individual countries' error with its explanatory variable. Values in parentheses are the *t*-value.

4. Conclusion

The objective of this study is to find the regional empirical effect between a country's competitiveness and the inflow of foreign direct investment by employing Pearson correlation and annual panel data from ASEAN country members from year 2007 to 2017. In order to choose the right model, we did the Hausman test which led us to use fixed effects as the best model in this study.

The result from Pearson correlation shows that the majority of ASEAN countries have a strong positive association between competitiveness and the FDI inflow. From the panel data estimation, variables of institutions (LN_INST) and health and primary education (LN_HPE) are quite elastic to the FDI inflow in ASEAN countries. Besides, the respected parameters are also statistically significant at 5 and 1 percent, respectively. In addition, the variable of market size (LN_MS) is also elastic to the FDI inflow in ASEAN countries despite the significance level is only at the 10 percent.

Based on the estimated results, the following suggestions are found to be important: first, according to our findings, institutions show the highest coefficient value to attract foreign direct investment. Based on the global competitiveness index, this variable matters to create an environment in which individuals, firms, and governments are managed to generate income and wealth within the economy. This means that strengthening both public and private institutions would help create a supportive environment for growth. As economic activities work well in the presence of trust and reliability, thus enhancement on transparency, corporate governance, and government efficiency is beneficial to attract investment into the region.

Second, health and basic education provision are important for the country's productivity and competitiveness. Healthy workers have a better function to fulfil their potential and generate more value in economic activities than ill ones. The latter population hinders the process of knowledge and technology transfers, which discourage the probability of foreign investment for the country (Mirvis, Chang, & Cosby, 2008). Furthermore, decent provision on basic education will help both economic and business activities to enhance its value. This could be an education and training that equip the workers with ICT (Information, Communication and Technology) skills which can increase the efficiency in business activities. Third, it would be beneficial for ASEAN countries to increase their growth both on domestic and foreign markets through international trade. This could be done by exercising more economic interactions between ASEAN members and other countries outside the ASEAN region.

In summary, based on the values of contribution and the level of significance, the main agenda item to be pursued for the ASEAN members should be to improve human capital and the quality of institutions in order to attract FDI inflow into the region.

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New Insights on Audit Quality

Ya-Fang Wang†

Providence University, 200, Sec. 7, Taiwan Boulevard, Shalu Dist., Taichung City 43301, Taiwan

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ABSTRACT

Purpose:
The mechanism of dual attestation system is to enhance audit quality through bonding legal liability of two signing partners. However, an intense debate regarding the retention or abolition of dual attestation system was discussed in recent years, because the amended Accountant Act have disputes over auditor's legal liabilities attributed to the Bardon and Rebar frauds. This study thus examines the audit quality of dual attestation system by exploring whether auditor locality and auditor tenure can affect audit quality simultaneously.

Design/methodology/approach:
This study investigates whether auditor locality and auditor tenure can affect audit quality simultaneously, using a regression model to examine my research issues. The sample is restricted to Taiwan's public listed companies of Big Four audit from 2002-2013 because data collection involves significant manual effort in reading individual auditor information of Big Four and searching lead/concurring auditor-client distance of Big Four. Financial data is obtained from Taiwan Economic Journal database (TEJ).

Finding:
I present evidence that audit quality is affected by auditor locality and auditor tenure, and differential portfolio of auditor locality and auditor tenure have different effects on audit quality under the dual attestation system.

Research limitations/implications:
This study has three limitations. First, the sample is limited to the clients of PwC, Deloitte, EY and KPMG because the required information for practice offices of lead and concurring auditors is only available for Big 4. Second, although discretionary accruals is a noisy proxy for audit quality and it does not necessarily reflect actual audit quality, it is widely used in the literature to provide rich insights into audit quality. Three, sample size is limited because of insufficient data to compute discretionary accruals.

Originality/value:
This investigation extends previous research on audit quality by examining the geographic proximity and auditor-client relationship. Furthermore, this study contributes to the debate regarding the retention or abolition of dual attestation system.

1. Introduction

A series of high-profile accounting scandals in Taiwan (e.g., Procomp, Rebar, Infodisc, and Summit Computer) has caused substantial economic losses and eroded investor confidence in financial reporting reliability. These accounting scandals also have attracted the attention of regulators and market participants to the role of auditors in financial reporting and its audit quality. Understanding the determinants of audit quality with a focus on the role of auditors is especially important because auditors play an important role in safeguarding investor interests by providing effective audits and reasonable assurance on financial reporting. In particular, Taiwan has implemented dual attestation system to enhance audit quality by two auditors (lead and concurring auditors) review audit works to reduce audit risks and share the responsibility of financial assurance. This gives this study an opportunity to study whether and how audit quality is affected by individual auditor effects.

The discussion regarding audit quality and its determinants has received more research attention in recent years. Regarding audit quality research, prior studies focus on three key aspects, namely: auditor/audit firm (skepticism and independence); client (internal controls); and auditor-client relationship (auditor tenure). In this study, I extend prior

†Corresponding Author: Ya-Fang Wang
Email: yfwang2@pu.edu.tw

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literature and focus on the aspect of auditor-client relationship by highlighting that audit quality not only is affected by auditor-client relationship (duration), but by auditor locality (distance) and auditing environment (dual attestation system) to investigate my research issues. Most of prior research (Choi et al., 2014; DeFond and Zhang, 2014; Eshleman and Peng, 2014; DeFond et al., 2018) has focused on examining the effect of audit office specialisation and/or audit office size on audit quality, and found that larger audit firms and industry specialist provide higher audit quality because they have rich resources to plan audit engagements more completely and sophisticated audit experiences to perform audit engagements more prudently. Prior studies further have found that geographic advantages between the auditor's practicing office and the client's headquarter are more likely to bring a more efficient audit to their clients (Francis et al., 1999; Wallman, 1996), and then receive audit fee premiums (Ferguson et al., 2003; Francis, 2004). Moreover, geographic advantages of auditor locality help auditors understanding their clients and obtain more industry knowledge in performing audit programs (Francis and Yu, 2009; Choi et al., 2010; Reichelt and Wang, 2010; Choi et al., 2012; Francis et al., 2013; Francis and Michas, 2013; Chi et al., 2011). Therefore, geographic advantages of auditor locality seem to play an important role in audit programs and bring auditing information advantages to improve audit quality.

Mentioning the cooperation relationship between auditors and clients, prior auditing literature has documented that the long-term auditor-client relationship may impair auditor skepticism and independence because auditors are more familiar with their clients leading to the auditor building an excessive economic bond with the client (Dopuch et al., 2001; Deis and Giroux, 1992; Berton, 1991; U.S. Senate, 1977; Mautz and Sharaf, 1961). In contrast, some auditing literature has documented that long-term auditor-client relationship may improve audit quality because auditors are more likely to obtain better understanding of client conditions (Carcello and Nagy, 2004; Myers et al., 2003; Johnson et al., 2002; Geiger and Raghunandan, 2002; Chen et al., 2008; Chi et al., 2009). Therefore, there is still confusion and debate on whether long-term auditor-client relationship improves or impairs audit quality. However, prior studies might ignore that inconclusive results might affect by the combined effects of cooperation relationship (duration) and auditor locality (distance), not only single factor.

In Taiwan, performing a dual attestation system in the auditing environment is special. A dual attestation system indicates that lead and concurring auditors sign their names in the audit report published and share the responsibility of financial assurance. In fact, a dual attestation system is focused on the individual auditor (lead and concurring auditors), not on audit firms. This study thus conjectures that the individual auditor (lead and concurring auditors) is close related to audit quality. As discussed above, the auditor-client relationship not only is affected by cooperation relationship (duration) and auditor locality (distance), but by the individual auditor (lead and concurring auditors). Taiwan's auditing environment gives this study an opportunity to explore on whether audit quality is affected by cooperation relationship (duration), auditor locality (distance), and the individual auditor (lead and concurring auditors).

Prior studies (Manry et al., 2008; Myers et al., 2003) indicate that the level of discretionary accruals is related to audit quality and thus using discretionary accruals as the proxy for audit quality is reasonably well specified. Several studies also indicate that discretionary accruals is highly associated with audit quality proxies. For example, auditor litigation (Heninger, 2001), qualified audit opinions (Bartov et al., 2000), auditor's reporting failures (Geiger and Raghunandan, 2002), aggressive audit style (Becker et al., 1998; Francis and Krishana, 1999), and auditor changes (DeFond and Subramanyam, 1998) are positively associated with discretionary accruals. Therefore, this study adopts discretionary accruals as a proxy for audit quality and includes various control variables in the research model that could affect audit quality. The research model (1) is presented as follows:

$$\begin{aligned} DA_{i,t} = {} & \alpha_0 + \alpha_1 LCOF_{i,t} + \alpha_2 LOCAL1_{i,t}\ (or\ LOCAL2_{i,t}) + \alpha_3 LCOF_{i,t} \times LOCAL1_{i,t}\ (or\ LOCAL2_{i,t}) \\ & + \alpha_4 GROWTH_{i,t} + \alpha_5 ROA_{i,t} + \alpha_6 LEV_{i,t} + \alpha_7 CR_{i,t} + \alpha_8 MB_{i,t} + \alpha_9 MVE_{i,t} \\ & + \alpha_{10} OPINION_{i,t} + \alpha_{11} TENURE_{i,t} + \delta YEAR_{i,t} + \varphi IND_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

where:

DA	=	discretionary accruals from the modified Jones model (1991);
$LCOF$	=	1 if the lead and concurring auditor come from different practice offices, and 0 otherwise;
$LOCAL1$	=	1 if the city of practice office of lead auditor and client are different, and 0 otherwise;
$LOCAL2$	=	1 if the city of practice office of concurring auditor and client are different, and 0 otherwise;
$GROWTH$	=	percentage growth in sales;
ROA	=	net income divided by total assets;
LEV	=	long-term debt divided by total assets;
CR	=	current assets divided by total assets;
MB	=	market value divided by book value of equity;
MVE	=	the natural log of market value of equity;
$OPINION$	=	1 if the company receives a modified unqualified audit opinion, and 0 otherwise;

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TENURE = the natural log of the auditor's tenure;

YEAR = fiscal year dummies;

IND = dummy variables controlling for industries.

In Eq. (1), this study includes the test variable (*LCOF*) and a series of control variables, and the dependent variables (*DA*) as described above. Dependent variable, *DA*, is discretionary accruals from the modified Jones model (1991). Test variable, *LCOF*, is a dummy variable that takes the value of 1 when the lead and concurring auditor come from different practice offices. This study further includes two test variables: *LOCAL1* and *LOCAL2* are dummy variables that takes the value of 1 when the city of practice office of lead/concurring auditor and client are different. Additionally, this study includes various control variables in the research model that could affect audit quality (Morsfield and Tan, 2006; Hribar and Nichols, 2007; Chi et al., 2011; Butler et al., 2004; Myers et al., 2003). For example, including *GROWTH*, *MB*, *ROA*, *LEV*, *CR*, and *MVE* control for firm's financial conditions. This study also follows prior research (Stice, 1991; Heninger, 2001; Butler et al., 2004) to include audit opinion (*OPINION*) and auditor tenure (*TENURE*). Finally, including year and industry dummy variables (*YEAR* and *IND*) control for possible variation across years and industries.

2. Empirical Result and Analysis

2.1 Sample Description

Using publicly traded firms listed on the Taiwan Stock Exchange (*TWSE*) from 2002 to 2013, this study examines the audit quality of dual attestation system by exploring whether auditor locality (distance) and auditor tenure (duration) can affect audit quality simultaneously. Following prior studies (Kothari et al., 2005; Teoh et al., 1998), this study created a matched sample by matching each firm-year *LCOF* observation in the sample with another *Non-LCOF* from the same industry classification and year with the closest firm size in the current year to control for systematic temporal and cross-sectional differences. The final sample comprised 463 firms that the lead and concurring auditor come from same practice offices and 463 firms that the lead and concurring auditor come from different practice offices.

Table 1 is the sample description. Panel A reports descriptive statistics and shows that the mean value of *DA* for the *LCOF* (*Non-LCOF*) Group is -0.003 (-0.035), showing that *LCOF* Group has higher audit quality than *Non-LCOF* Group. The mean value of *OPINION* for the *LCOF* (*Non-LCOF*) Group is 0.644 (0.575), showing that *LCOF* Group seems more likely to receive an unfavorable opinion than *Non-LCOF* Group. The mean value of *TENURE* for the *LCOF* (*Non-LCOF*) Group is 2.401 (2.304), showing that *LCOF* Group has a long-tenured auditor-client relationship than *Non-LCOF* Group. Additionally, the matched sample appears effective in forming a balanced sample of *LCOF* and *Non-LCOF* companies, as most control variables are insignificantly different between the two company types, except *OPINION* and *TENURE*. Panel B presents Pearson correlation coefficients for all control variables considered. The correlations between control variables are mostly very low, except for those between *GROWTH* and *MB* (0.353). This study also computes variance inflation factors (VIFs) for all models and find that none of the VIFs exceeds 10, suggesting that multicollinearity is not problematic in this study.

Table 1 Sample Description

Panel A: Descriptive Statistics

	LCOF Group [a] (Obs=463)		*Non-LCOF* Group (Obs=463)		**Test of Differences**	
Variable [b]	Mean	Median	Mean	Median	t-test [c]	Wilcoxon
DA	-0.003	0.001	-0.035	-0.034	2.852***	2.953***
GROWTH	0.082	0.041	0.087	0.044	-0.244	-0.134
ROA	0.107	0.095	0.107	0.096	0.049	-0.094
LEV	0.088	0.046	0.079	0.044	1.394	1.063
CR	2.426	1.832	2.435	1.878	-0.055	-0.457
MB	1.619	1.229	1.630	1.273	-0.070	-0.575
MVE	15.434	15.289	15.321	15.101	1.212	1.577
OPINION	0.644	1.000	0.575	1.000	2.158**	2.154**
TENURE	2.401	2.485	2.304	2.398	2.112**	2.296**

Panel B: Pearson Correlation Matrix

Variable	*GROWTH*	*ROA*	*LEV*	*CR*	*MB*	*MVE*	*OPINION*
ROA	0.162						
LEV	0.073	-0.117					
CR	-0.057	0.122	-0.210				

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MB	0.353	0.297	0.011	0.033			
MVE	0.055	-0.026	0.285	-0.158	-0.117		
OPINION	-0.001	0.011	0.062	-0.056	0.007	0.190	
TENURE	-0.118	-0.054	0.071	-0.071	-0.133	0.269	0.025

[a] *LCOF* (Non-*LCOF*) Group denotes the lead and concurring auditor come from different (same) practice offices.
[b] The definition of the variables reported in this table are: *DA* = discretionary accruals from the modified Jones model (1991); *GROWTH* = percentage growth in sales; *ROA* = net income divided by total assets; *LEV* = long-term debt divided by total assets; *CR* = current assets divided by total assets; *MB* = market value divided by book value of equity; *MVE* = the natural log of market value of equity; *OPINION* = 1 if the company receives a modified unqualified audit opinion, and 0 otherwise; *TENURE* = the natural log of the auditor's tenure. All continues variables are winsorized at the first and 99th percentiles.
[c] Asterisks*, **, ***indicate significance at the 0.10, 0.05, and 0.01 levels, respectively.

2.2 Empirical Result

Auditor Locality

Table 2 reports sample distributions by lead and concurring auditor locality. Panel A shows that firms with lead auditor locality have the highest percentages (66.41%) while firms without lead auditor locality have the lowest percentages (33.59%). Panel B also shows that firms with concurring auditor locality have the highest percentages (60.15%) while firms without concurring auditor locality have the lowest percentages (39.85%). These results imply that auditor locality may play a moderating factor in the degree of audit quality when there is a geographic relationship between auditees and their auditors. Panel C presents the results of OLS regression analyses of auditor locality and their audit quality. As shown in Column (1) of Panel C, the coefficient of *LCOF* is positively significant (t=3.18, p<0.01), indicating that the degree of audit quality is low when there is no geographic relationships between lead and concurring auditors. This finding implies that geographic relationships can improve audit quality because it is a very crucial and significant element in auditing communication. Results show that *LOCAL1* in Column (1) is significantly positive (t=2.23, p<0.05), indicating that firms have a lower audit quality when there is no geographic relationships with their lead auditors. The coefficient of *LOCAL2* in Column (2) is insignificant (t=1.58). Altogether, these results reveal that geographic relationships among lead auditors, concurring auditors, and clients help to communicate and bridge differences of auditing processes. This study further includes *LCOF* and its interaction with *LOCAL1* in Column (1) and *LCOF* and its interaction with *LOCAL2* in Column (2). Results show that *LCOF*×*LOCAL1* in Column (1) is significantly negative (t=-1.82), whereas *LCOF*×*LOCAL2* in Column (2) is insignificant (t=-1.18).

Table 2 Auditor Locality and Audit Quality

Panel A : Distribution by *LCOF* Group and *LOCAL1* Group

	Non-LOCAL1 Group [b]	*LOCAL1* Group	Total
LCOF Group [a]	260	203	463
Non-LCOF Group	355	108	463
Total	615 (66.41%)	311 (33.59%)	

Panel B : Distribution by *LCOF* Group and *LOCAL2* Group

	Non-LOCAL2 Group [c]	*LOCAL2* Group	Total
LCOF Group	187	276	463
Non-LCOF Group	370	93	463
Total	557 (60.15%)	369 (39.85%)	

Panel C : Regression Analysis

		(1)		(2)	
Variable [d]	Pred. Sign	Coef.	t-value [e]	Coef.	t-value
CONSTANT		-0.8276	-14.00***	-0.8221	-13.80***
LCOF	+ / -	0.0356	3.18***	0.0313	2.50**
LOCAL1	+ / -	0.0343	2.23**		
LCOF×*LOCAL1*	+ / -	-0.0366	-1.82*		
LOCAL2	+ / -			0.0259	1.58
LCOF×*LOCAL2*	+ / -			-0.0250	-1.18
GROWTH	-	-0.0396	-2.49***	-0.0393	-2.47***
ROA	-	-0.4280	-6.30***	-0.4257	-6.24***
LEV	+	0.0063	0.12	0.0094	0.18

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CR	+	0.0160	7.87***	0.0160	7.82***
MB	-	-0.0057	-2.45***	-0.0057	-2.45***
MVE	+	0.0563	15.12***	0.0562	14.97***
OPINION	+	0.0067	0.67	0.0070	0.70
TENURE	+ / -	-0.0130	-1.82*	-0.0134	-1.87*
YEAR & *IND*		Included		Included	
Adj. R^2		38.51%		38.34%	
Obs		926		926	

[a] *LCOF* (Non-*LCOF*) Group denotes the lead and concurring auditor come from different (same) practice offices.
[b] *LOCAL1* (Non-*LOCAL1*) Group denotes the city of practice office of lead auditor and client are different (same).
[c] *LOCAL2* (Non-*LOCAL2*) Group denotes the city of practice office of concurring auditor and client are different (same).
[d] The definition of the variables reported in this table are: *LCOF* = 1 if the lead and concurring auditor come from different practice offices, and 0 otherwise; *LOCAL1* = 1 if the city of practice office of lead auditor and client are different, and 0 otherwise; *LOCAL2* = 1 if the city of practice office of concurring auditor and client are different, and 0 otherwise; *DA* = discretionary accruals from the modified Jones model (1991); *GROWTH* = percentage growth in sales; *ROA* = net income divided by total assets; *LEV* = long-term debt divided by total assets; *CR* = current assets divided by total assets; *MB* = market value divided by book value of equity; *MVE* = the natural log of market value of equity; *OPINION* = 1 if the company receives a modified unqualified audit opinion, and 0 otherwise; *TENURE* = the natural log of the auditor's tenure. All continues variables are winsorized at the first and 99th percentiles.
[e] Asterisks*, **, ***indicate significance at the 0.10, 0.05, and 0.01 levels, respectively.

Auditor-Client Relationship

As discussed above, empirical results show that audit quality is affected by geographic relationships particularly when there is no geographic relationships with lead auditors. Additionally, audit quality not only is affected by geographic relationships, but also effects of the auditor-client relationship (e.g., auditor tenure). Prior research has explored two competing views concerning the influence of auditor tenure on audit quality. For example, several studies (Farmer et al., 1987; Brody and Moscove, 1998; Davis et al., 2002) have shown that long audit tenure might reduce auditor independence and professional skepticism, thereby reducing audit quality. On the other hand, some studies (St. Pierre and Anderson, 1984; Geiger and Raghunandan, 2002; Myers et al., 2003; Carey and Simnett, 2006; Chen et al., 2008; Gul et al., 2009; Chi et al., 2009) have shown that long auditor tenure might increase auditor independence and competence because the auditor's client-specific knowledge increases over the years, thereby increasing audit quality. Therefore, there is no systematic evidence on whether auditor-client relationship affects audit quality. This study further includes the factor of lead auditor-client relationship in following empirical analyses. Table 3 presents empirical results. First, I partition the sample into two subsamples based on lead auditor tenure, namely the long term ($\geqq$ 5 consecutive financial years) and short term (< 5 consecutive financial years) auditor-client relationship subsamples. Panel A of Table 3 shows that the coefficients of *LCOF*, *LOCAL1* and *LCOF*×*LOCAL1* in Column (2) are significantly positive and negative (t=3.24, t=1.91 and t=-1.97, respectively), whereas all of the coefficients of *LCOF*, *LOCAL1* and *LCOF*×*LOCAL1* in Column (1) are insignificant. Second, I partition the sample into two subsamples based on lead and concurring auditor tenure, namely the close-knit (lead auditor tenure > concurring auditor tenure) and alienated (lead auditor tenure < concurring auditor tenure) auditor-client relationship subsamples. Panel B of Table 3 shows that the coefficients of *LCOF*, *LOCAL1* and *LCOF*×*LOCAL1* in Column (2) are significantly positive and negative (t=5.18, t=2.36 and t=-3.16, respectively), whereas all of the coefficients of *LCOF*, *LOCAL1* and *LCOF*×*LOCAL1* in Column (1) are insignificant.

Table 3 Considering the Auditor-Client Relationship

Panel A : Considering Auditor Rotation

		(1)		(2)	
Variable [a]	Pred. Sign	Coef.	*t*-value [b]	Coef.	*t*-value
CONSTANT		-0.9433	-9.98***	-0.7638	-9.43***
LCOF	+ / -	0.0122	0.81	0.0542	3.24***
LOCAL1	+ / -	0.0265	1.24	0.0429	1.91*
LCOF × *LOCAL1*	+ / -	-0.0196	-0.71	-0.0573	-1.97**
GROWTH	-	-0.0298	-1.22	-0.0525	-2.44**
ROA	-	-0.3480	-3.61***	-0.5113	-5.09***
LEV	+	0.0133	0.19	0.0256	0.35
CR	+	0.0250	6.07***	0.0142	5.66***
MB	-	-0.0003	-0.05	-0.0057	-1.99**
MVE	+	0.0610	11.29***	0.0545	10.57***
OPINION	+	-0.0097	-0.73	0.0188	1.28

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TENURE	+ / -	-0.0134	-0.78	-0.0158	-1.76*
YEAR & *IND*		Included		Included	
Adj. R^2		38.69%		38.83%	
Obs		389		537	

Panel B : Considering Auditor Tenure

		(1)		(2)	
Variable	Pred. Sign	Coef.	*t*-value	Coef.	*t*-value
CONSTANT		-0.8940	-11.60***	-0.7690	-8.24***
LCOF	+ / -	-0.0095	-0.66	0.0924	5.18***
LOCAL1	+ / -	0.0264	1.34	0.0566	2.36**
LCOF × *LOCAL1*	+ / -	-0.0022	-0.09	-0.0991	-3.16***
GROWTH	-	-0.0755	-3.64***	-0.0313	-1.15
ROA	-	-0.3466	-3.83***	-0.4432	-3.65***
LEV	+	-0.0333	-0.51	0.1455	1.77**
CR	+	0.0171	5.06***	0.0148	5.56***
MB	-	0.0136	2.10**	-0.0147	-3.19***
MVE	+	0.0586	12.40***	0.0534	9.05***
OPINION	+	-0.0056	-0.45	0.0185	1.14
TENURE	+ / -	-0.0166	-1.39*	-0.0076	-0.80
YEAR & *IND*		Included		Included	
Adj. R^2		39.51%		43.04%	
Obs		501		425	

[a] The definition of the variables reported in this table are: *LCOF* = 1 if the lead and concurring auditor come from different practice offices, and 0 otherwise; *LOCAL1* = 1 if the city of practice office of lead auditor and client are different, and 0 otherwise; *DA* = discretionary accruals from the modified Jones model (1991); *GROWTH* = percentage growth in sales; *ROA* = net income divided by total assets; *LEV* = long-term debt divided by total assets; *CR* = current assets divided by total assets; *MB* = market value divided by book value of equity; *MVE* = the natural log of market value of equity; *OPINION* = 1 if the company receives a modified unqualified audit opinion, and 0 otherwise; *TENURE* = the natural log of the auditor's tenure. All continues variables are winsorized at the first and 99th percentiles.

[b] Asterisks*, **, ***indicate significance at the 0.10, 0.05, and 0.01 levels, respectively.

2.3 Additional Test (results are not tabled)

To provide evidence on whether there is any potential association among auditor-client relationship (duration), auditor locality (distance) and measures of discretionary accruals conditional on whether discretionary accruals are income-increasing or income-decreasing, this study partitioned the sample into companies engaging in income-increasing vs. income-decreasing earnings management (Francis and Yu, 2009; Lamoreaux, 2016). After re-running the Table 2, empirical results show that *LCOF*×*LOCAL1* is significantly negative, whereas *LCOF*×*LOCAL2* is insignificant, no matter whether these companies engaging in income-increasing or income-decreasing earnings management. This study obtained substantially similar results to those documented in Table 2. I further re-run the Table 3, empirical results show that *LCOF*×*LOCAL1* is significantly negative in Columns (2) of Panels A and B. The empirical results are similar to those reported in previous sections. Additionally, the events of restatements and auditor changes may bias the measure of discretionary accruals, this study further excluded observations with restatements or auditor changes to re-run empirical analyses and obtained substantially similar results. Overall, the inference of empirical results did not change.

3. Conclusion

Empirical results imply that auditor locality may play a moderating factor in the degree of audit quality when there is a geographic relationship between auditees and their auditors, and the degree of audit quality is low when there is no geographic relationships between lead and concurring auditors. This finding implies that geographic relationships can improve audit quality because it is a very crucial and significant element in auditing communication. Altogether, these results reveal that geographic relationships among lead auditors, concurring auditors, and clients help to communicate and bridge differences of auditing processes. Additionally, empirical results reveal that lead auditors are more likely to engage in improvement of auditing processes and present a higher audit quality under short auditor-client relationship or lacking audit experience.

This study has three limitations. First, the sample is limited to the clients of PwC, Deloitte, EY and KPMG because the required information for practice offices of lead and concurring auditors is only available for Big 4. Second, although discretionary accruals is a noisy proxy for audit quality and it does not necessarily reflect actual audit quality, it is widely used in the literature to provide rich insights into audit quality (Bartov et al., 2000; Becker et

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al., 1998; DeFond and Subramanyam, 1998; Francis and Krishana, 1999; Heninger, 2001; Geiger and Raghunandan, 2002; Manry et al., 2008; Myers et al., 2003). Three, sample size is limited because of insufficient data to compute discretionary accruals.

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The Dynamic Effects of Oil Price Shocks on the Economies of the Twelve Major Oil Exporting Countries from 1970-2013: The Role of Political Economy Factors

Sinem Sonmez†

New School University, Department of Economics, New York, NY

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ABSTRACT

Purpose:
This paper examines whether the economies of oil-exporting countries respond to oil shocks differently, depending on the country's political economy factors, such as regional economic alliance, stage of economic development, and the exchange rate regime, using a structural Vector Error Correction Model (VECM). The sample countries covered in this study include all the major twelve oil exporters: the GCC countries (Bahrain, Kuwait, Oman, Saudi Arabia, UAE, and Qatar)1 and the non-GCC oil exporters (Iran, Nigeria, Norway, Canada, Russia and Venezuela) for the 1970-2013 period.

Design/methodology/approach:
To achieve the above, this paper employs a four-variable restricted structural Vector Error Correction Model (VECM) with oil prices (exogenous) and a set of endogenous variables, including GDP, M2, and Inflation for the 1970-2013 period, with a co-integrating relationship that varies from 1 to 2. Both Johansen Cointegration Test and Granger Causality Tests have been applied. To eliminate the effects of a contemporaneous correlation of the residuals with the regressors, the errors are orthogonalized by a Choleski decomposition.

Finding:
The political economy characteristics of countries explain why the economies of oil exporters either with fixed or managed floating exchange rates behave differently than those economies with floating exchange rates. Money is endogenous in oil-exporting countries with fixed or managed floating exchange rates, but not in oil-exporting countries with floating exchange rates. The evidence found in this paper suggests that the fixed exchange rate regime of the GCC countries is not effective in tamping down inflationary pressures, as planned. There is a strong positive effect of oil price shocks on the foreign exchange reserves of the GCC countries, whereas the effect of oil price shocks on foreign exchange reserves has been rather non-existent for the non-GCC oil exporters with floating exchange rates.

Research limitations/implications:
The data span is restricted by data availability, the study could ensure for more robustness and better confidence with quarterly data, but most of the variables for countries are reported annually, except for Canada, Russia, and Norway.

Originality/value:
This paper separates oil exporters into two distinct categories, the GCC countries and the non-GCC oil exporters. To my knowledge, this has not been done before in the academic literature. Unlike the GCC countries, the non-GCC oil exporters do not participate in a common political alliance or an economic union. Their economies are diversified and less dependent on oil exports. This study shows that the political economy characteristics play a large role in explaining why the economies of oil exporters with either fixed or managed floating exchange rates behave differently than the oil exporters with floating exchange rates.

[1] The currencies of the GCC countries, other than that of Kuwait, are formally pegged to the US dollar.

†Corresponding Author: SINEM SONMEZ
Email: sonms376@newschool.edu

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1. Introduction

The economies of the oil-exporting countries respond differently to oil shocks depending on the political economic factors, such as regional economic alliance, stage of economic development, and the exchange rate regime. The purpose of this paper is to explore whether political economy factors is a reason why the macroeconomic variables of oil exporters behave differently in response to oil shocks. I am particularly interested in understanding the behaviour of economic variables, such as real government spending, real output, real exchange rates, foreign exchange reserves, reserve money, and the money supply, in response to oil price shocks.

Recent papers focused on advanced economies, which are importers of oil rather than on countries that export oil. Unlike the papers that focus primarily on industrialized economies, here the focus is entirely on a group of oil exporters. This paper focuses on the macroeconomic responses of all twelve major oil exporters to oil price shocks, rather than focusing on the macroeconomic response of a select few oil exporters or advanced economies that import oil, and separates the major oil exporters into two distinct categories, the GCC countries and the non-GCC oil exporters. To my knowledge this has not been done before in the academic literature. This categorization of oil exporters is important, since the GCC countries share a political and economic alliance and their economies are largely oil dependent, with currencies (other than that of Kuwait) formally pegged to the US dollar. Unlike the GCC countries, the non-GCC oil exporters do not participate in a common political alliance or an economic union. Their economies are diversified and less dependent on oil exports. The GCC countries and non-GCC oil exporters combined are known to account for more than 50 percent of the global oil reserves and exports, according to the US Energy Information Administration (EIA).

This paper aims to address the following set of policy questions for all the twelve major oil exporters, in response to oil price shocks, explaining in the context of political economy factors, as mentioned above:

Are fiscal policies of oil exporters pro-cyclical or countercyclical? Is money endogenous for oil exporters? Do real oil price shocks have an impact on the real exchange rates of oil-exporting countries, and if so, does a real exchange rate appreciation come in the form of an increase in the price level or an appreciation of the nominal exchange rate? Do foreign exchange reserve shocks (through the transmission of oil prices) have a positive effect on reserve money and subsequently the money supply?

These are questions of key importance and have important policy relevance for the twelve major oil-exporting countries.

Oil-exporting countries do not form a homogenous group. There is a significant variation in the extent of a country's oil dependence. In some countries, oil accounts for majority of exports, while in other countries oil plays a less significant role.

The economic intuition suggests that oil is an international commodity, whose price is determined by the global supply and demand conditions. Thus, small economies such as the ones I study in this paper are unlikely to affect the price of oil on their own, possibly except for Saudi Arabia, which is a leading member of OPEC that influences the price of oil.

The identification of oil as an exogenous variable would be incorrect if economic developments in the country under consideration would affect the world price of oil contemporaneously, but the countries examined in this paper are all oil exporters and not the advanced economies that would normally affect the price of oil. (Blanchard and Gali, 2007).

The importance of oil in each economy varies widely across the sample of oil exporters. In relation to an overall GDP, the share of oil exports ranges from about 4 percent in Canada, 11 percent in Norway and Russia, and nearly to 50 percent in the case of Bahrain, Kuwait, and Oman.

I make several other contributions to this paper. I treat real oil shocks as exogenous, as substantiated by Granger causality test results and the interpretation of variance decomposition results from the Vector Error Correction Models, such a treatment not previously reported in the academic literature results in a significantly high R2 for all the structural VECM equations. I would like to add that the literature of this paper, which explores similar macroeconomic questions, treats oil as endogenous. (See, Bernanke, Gertler and Watson (1997), Blanchard and Gali (2007), Kilian (2009), and Kilian (2010)). Second, this paper complements the existing large literature on fiscal shocks being exogenous with respect to output, (see, Monacelli and Perotti (2006), Ravn. et al. (2012), Enders et. al (2011)), with results that are virtually the same when there is a change in the order of variables and that lags of real output do not Granger-cause real government spending. Similarly, lags of M2 do not Granger-cause GDP for any of the oil exporters and the results are insensitive to a change in the order of variables, which suggest that the existing order of variables from GDP to M2 to Inflation remains correct for the twelve major oil exporters of this paper. This is not something which has been done before in academic literature.

Some of the main highlights of this paper are discussed below and the rest of the findings are discussed in Section 2. The findings of this paper are reasonably close to the findings of empirical literature, also discussed in Section 2.

The literature survey suggests that the effects of fiscal policy shocks on output or the effects of output shocks (through the transmission of oil prices) on fiscal policy have not been studied together for the major oil-exporting countries. I aim to contribute to this part of the literature.

First, this paper explores whether the fiscal spending shocks affect output, since the structural VECMs show that there is not a positive estimated response of real economic activity to real government spending shocks in eight out of the ten oil exporters (out of the ten countries with available government spending data), except for Iran and

Canada, which means that there is not a countercyclical fiscal policy response in most the twelve-major oil-exporting countries. The non-existence of a response of real economic activity to real fiscal spending shock is not surprising, but rather consistent with findings from academic literature that the fiscal policies of developing countries tend not to be countercyclical, but rather they are pro-cyclical, as is shown to be the case here for Saudi Arabia, Oman, Bahrain, and Venezuela.

Second, the literature survey also suggests that the effects of real oil prices on real exchange rates have been studied relatively little. I aim to contribute to this part of the literature.

Since oil constitutes a large portion of the revenues of oil exporters, especially of the GCC countries examined here, real oil prices affect their real exchange rates. There is no real exchange rate appreciation from real oil shocks in any of the non-GCC oil exporters, except for Venezuela, which may be because oil accounts for a small share of output, or simply that these countries may have more monetary policy options available under a floating/managed floating exchange rate regime than those available under a fixed exchange rate regime.

Later, I investigate the effect of real oil shocks on the real exchange rates of oil exporters, where I determine whether the real exchange rate appreciation takes the form of inflation or a nominal exchange rate appreciation, which sharply differentiates this paper from earlier studies. The theory predicts that a real exchange rate appreciation under fixed exchange rate regimes comes primarily in the form of inflation instead of a nominal exchange rate appreciation. This paper concludes that a real exchange rate appreciation from real oil price shocks in the GCC countries and Venezuela, with fixed/managed floating exchange rates, comes in the form of a rise in the price level, with virtually no change in their nominal exchange rates consistent with economic theory.

The real exchange rate appreciation from real oil price shocks could have broad policy implications for oil exporters, since a real exchange rate appreciation can deteriorate the countries' trade and current account balances, which may adversely affect their non-oil sector and make the non-oil sector become less competitive in global markets.

Third, this paper discusses the presence of endogenous money, which goes from economic activity to money supply. This paper shows that money is endogenous in oil-exporting countries with fixed or managed floating exchange rates, including the GCC countries, Venezuela, and Iran, but money is not endogenous in countries with floating exchange rates, such as Canada, Norway, and Nigeria1, since it is the exchange rate that responds to an external shock, such as GDP, rather than the money supply.

Fourth, this paper shows that foreign exchange reserve shocks (through the transmission of oil prices) have a strong positive effect on the reserve money of the GCC countries and in Venezuela, Nigeria, and Iran, countries with either fixed or managed floating exchange rates. In Canada, Norway, and Nigeria, with a purely floating exchange rate regime, the response of reserve money to foreign exchange shocks has been mostly non-existent, either with weak or no impact of foreign exchange reserves on reserve money, consistent with economic reasoning.

Sixth, this paper suggests that there is a positive effect of the changes in oil prices on the money supply (M2) of Oman, Nigeria2, Venezuela, and Russia, either with fixed or a managed floating exchange rate, but there is no change in the money supply (M2) to changes in the oil prices for oil-exporting countries with floating exchange rates, such as Canada and Norway.

This paper proceeds as follows: Section 2 provides a literature survey. Section 3 presents the basic facts. Section 4 presents the methodology. Section 5 discusses the response of real output from real government shocks, the response of real exchange rates to real oil shocks, the response of reserve money to foreign exchange reserve shocks, and finally, the response of money supply to changes in oil prices. Section 6 concludes.

2. Literature Review

This paper relates to several strands of literature.

This paper contributes to the dearth of academic literature on the effect of fiscal shocks on output in the developing countries, from the perspective of oil exporting countries.

In contrast to the logic and approach used by Bernanke and Mihov (1998) on monetary policy using the structural VAR model, where identification is achieved by assuming that variables like GDP and interest rates do not react to policy variables such as fiscal policy contemporaneously, this paper follows the same logic proposed by Blanchard and Perotti (2002), which uses a structural VECM method with exogenous fiscal shocks and traces their dynamic effects on real GDP, a method better suited to the study of fiscal policy than perhaps for monetary policy.

Both the Keynesian and standard neoclassical models predict that an increase in government spending has a positive effect on output. Several authors have assessed the effects of fiscal shocks on economic activity, including Rotemberg and Woodford (1992), Fatas and Mihov (2001), Eichenbaum et. al (2003), Blanchard and Perotti (2002), Burnside et al. (2004), Perotti (2005), and Mountford and Uhlig (2008), who discuss the countercyclical nature of fiscal policy of advanced economies, where fiscal policy is exogenous with respect to output and has a positive effect on output.

[1] Nigeria adopted a floating exchange rate in 1986.

2 Nigeria had a fixed exchange rate regime from 1970-1985, with naira pegged to the dollar, and in 1986, the country adopted a flexible exchange rate.

As in Anshasy (2014), the structural VECM models show that the effects of fiscal policy on the economic activity of oil exporters are from an increase in oil revenues, and for a group of highly oil-dependent countries, fiscal spending is tied to oil revenues, which has a significant positive effect on economic growth, but there is no fiscal spending from oil revenues in less oil-dependent economies.

More generally, this paper builds on the vast literature related to the effects of fiscal spending shocks on output, similar to that of Rotemberg and Woodford (1992), Fatas and Mihov (2001), Eichenbaum et. al (2003), Blanchard and Perotti (2002), Burnside et al. (2004), Perotti (2005), and Mountford and Uhlig (2008), who treat government spending exogenous with respect to output. This paper differentiates itself from other papers, since the four-variable structural VECM results are largely insensitive to the ordering and Granger causality test results suggest that real economic activity changes do not predict real government spending and GDP does not predict M2.

Close to the analysis of this paper on real exchange rates, there are several other papers looking at the effects of real oil price shocks on the real exchange rates, with an investigation into the behavior of real exchange rates under a fixed exchange rate regime and a floating exchange rate.

Methodologically, the empirical strategy of this paper is similar to that of Mussa (1976) and Frankel (2010), with an investigation into the behavior of real exchange rates under two different exchange rate regimes: fixed exchange rate regime, where the nominal exchange rate between the two countries is kept fixed or within narrow bands, and a floating exchange rate regime where market forces are allowed significant latitude to move the nominal exchange rate on a continual basis. Mussa (1976) and Frankel (2010) show that there are substantial and systematic differences in the behavior of real exchange rates under two different exchange rate regimes, and the increased variability of real exchange rates under floating exchange rate regimes is largely accounted for by an increased variability of nominal exchange rates, with little or no contribution from changes in the variability of ratios of national price levels. On the other hand, the variability of real exchange rates under fixed exchange rate regimes has to do with strictly the variability of ratios of price levels.

Many papers discuss the presence of endogenous money, where economic activity affects the money supply. One of the contributions of this paper is to show how output shocks affect the money supply through the Vector Error Correction Models. Marx (1907), Nell (1967), and Minsky (1990) study the effects of output on the money supply, including how money supply depends on profit seeking activity, i.e., money is endogenous, how nominal aggregate demand determines money, and how money correlates with the preferred measure of aggregate demand.

This paper complements the existing literature on the effects of a commodity boom on foreign exchange reserves and base money, with an emphasis given to the role of an exchange rate, fixed vs. floating. Here, I am interested in oil-exporting countries and the paper focuses on the impact of oil price shocks on foreign exchange reserves and reserve money using structural Vector Error Correction Models.

The results of this paper are much like that of Cuddington (1989) and Krugman and Obstfeld (2006), who assert that the central bank's foreign reserves surge at the outset of a commodity boom. Unless the monetary authority uses effective mechanisms for sterilizing the monetary impact, the inflow in foreign exchange reserves will cause the domestic monetary base and the broader monetary aggregates to expand.

In countries with fixed or managed floating exchange rates, an increase in foreign exchange reserves leads to an equal amount of an increase in the money supply, whereas a decrease in foreign exchange reserves leads to a decline in the money supply. In countries with floating exchange rates, foreign exchange reserves do not affect reserve money, consistent with the economic intuition.

More generally, there is vast literature out there on the possible effects of external shocks, such as GDP on the money supply; however, here the focus is entirely on the effect of oil shocks on the money supply, which vary depending on the exchange rate, fixed vs. flexible.

The results of this paper are similar to that of Mundell (1963) and Cuddington (1989), who discuss the economic effects of a fixed exchange regime, where an exogenous increase in GDP or any other external shock forces the monetary authority to supply the market with local currency to keep the exchange rate unchanged. Under a floating exchange rate, however, any exogenous changes in GDP or any oil price changes are offset by changes to the exchange rate. The results of this paper are also similar to that of Mussa (1976), who argues that when the demand for money rises relative to the supply of money, either the domestic credit component of the money supply expands, the exchange rate appreciates, or else, there is a combination of these effects, depending on the exchange rate regime, fixed vs. flexible.

3. Data and Methodology

3.1. Data

This paper studies the world's top twelve oil exporters. The oil exporters studied in this paper account for more than 50 percent of the global oil reserves and exports, according to the US Energy Information Administration (EIA). Unlike the GCC countries that are part of a political and economic alliance, the rest of the six oil exporters do not have any common regional and economic ties.

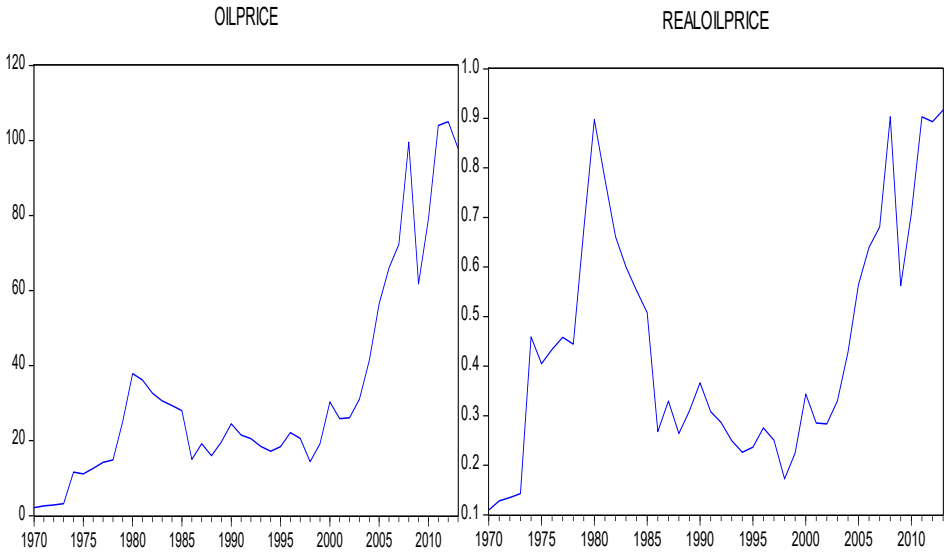
Figure 1 below illustrates the trend in oil prices from 1970 to 2013 on an annual basis. More specifically, it shows the annual price of a barrel of oil, measured in US dollars. Figure 1 shows a trend for real oil prices for the same period. As Figure 1 shows, changes in real oil prices in log levels have been very large and concentrated over the 1978-1980 and 2000-2008 periods, the latter period known as the most recent run-up in oil prices, with oil prices

that reach their peak in 2008. Oil prices dropped from $37 to $19 from 1980 to 1999 then continued their rise from $30 to $99 for the 2000-2008 period, following a decline in oil prices to $61 in 2009, due to the financial crisis, and a sudden increase in oil prices to $105 in 2012, levelling off at $97 in 2013. The real US dollar price of oil has been calculated using crude oil prices in US dollars deflated by the US consumer price index, in log levels and first differences.

The countries represented in this paper are from a list of top oil exporters for 2013 by US EIA, which consists of Saudi Arabia, Russia, UAE, Kuwait, Iraq, Nigeria, Venezuela, Qatar, Angola, and Canada, and to this list of oil exporters, Oman, Bahrain, Norway, Iran have been added, while Angola and Iraq have been removed, without the complete economic data.

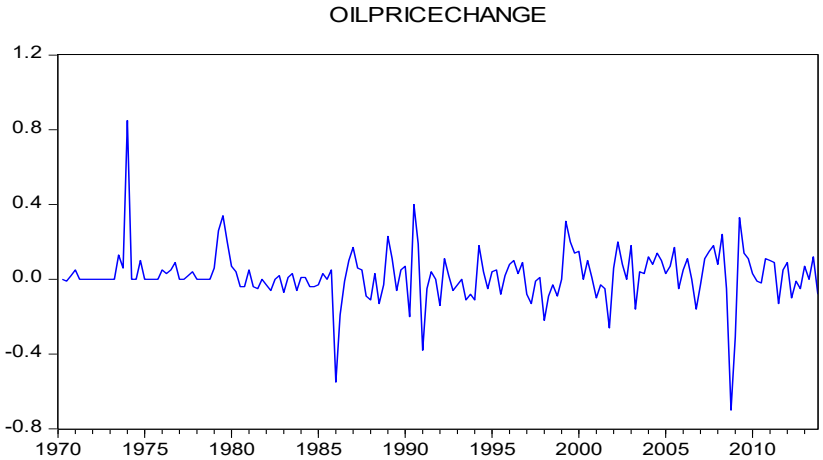
Based on US EIA's report on top world oil net exporters for 2013, (in thousands of barrels per day), Saudi Arabia exported the largest volume of oil around 11,000 barrels, Russia is the world's second-largest exporter of oil (after Saudi Arabia) with an export of around 10,000 barrels of oil, Canada ranks third with an export of 4,000 barrels of oil, UAE is the world's fourth largest exporter of oil, with an export of oil of about 3,400 barrels of oil, Iran is the world's fifth largest exporter of oil, with 3,000 barrels of oil, Kuwait is the world's sixth largest exporter of oil, with an export of 2,800 barrels of oil, Venezuela is considered the world's seventh-largest oil exporter, with an export of 2,700 barrels of oil, Qatar ranks eighth with an export of 2,000 barrels of oil, Nigeria ranks ninth with an export of oil of around 2,300 barrels of oil, and Norway, Europe's largest oil producer, and the world's tenth exporter of oil, export 1,845 barrels of oil, and lastly, Oman and Bahrain take the eleventh and twelfth spots in a list of major oil exporters, with an export of oil of 945 and 61 barrels of oil per day, respectively.

Figure 1: Oil Prices in US $ (1970-2013)



Source: IMF (IFS) database, 2014, Crude Oil (Petroleum), US Dollars per Barrel; US Consumer Prices, Index 2005=100.

Figure 2: Nominal Oil Prices % Change (1970-2103)



In Figure 2 above, changes in the nominal price of oil are based on the quarterly data and in log difference.

The exchange rate regimes of the GCC countries and non-GCC oil exporters of this paper are as follows:

The currencies of the GCC countries have been formally pegged to the US dollar. The fixed exchange rates (USD to Local Currency) for Saudi Arabia, Bahrain, and Oman have been fixed at 3.75, 0.38, and 0.38 for one US $, respectively, from 1986-2013. For Qatar and UAE, their currencies have been fixed at 3.64 and 3.67, respectively, from 1980-2013. Kuwait's currency has been pegged to a weighted currency basket from 1975-2003, and from 2003-2007, their peg has been switched to 0.29 for one US $, and since 2007, the country's currency has been pegged to a basket of currencies.

Both Canada and Norway have purely floating exchange rates. Since 1999, Russia has implemented a policy of a managed floating exchange rate. The Venezuelan Bolivar is pegged to the U.S. dollar and has been supported by foreign exchange restrictions. Nigeria had a fixed exchange rate regime from 1970-1985, as Nigeria's naira has been pegged to the dollar, and in 1986, the country adopted a flexible exchange rate. Iran's official exchange rate is fixed and officially determined by the government authorities.

Unlike the non-GCC oil exporters, the GCC economies are highly dependent on oil. In the GCC countries, the value of oil exports account on average for 40 percent of the GCC countries' GDP and oil exports range from approximately 36 to 45 percent of GDP for the 1980-20113 period. For the non-GCC oil exporters, oil exports account for approximately 16 percent of GDP for the same period, although their oil exports range from as low as 4 to 11 percent of GDP for Canada, Norway, and Russia, and as high as 39 percent of GDP for Nigeria.

3.2 Methodology

This paper presents a four-variable restricted structural Vector Error Correction Model (VECM) with real oil prices (exogenous) and a set of endogenous variables, including real GDP, real government expenditures, and real exchange rates:

For each of the six countries of the GCC and non-GCC oil exporters, a restricted structural VECM is estimated using four macroeconomic variables: the real US dollar price of oil (in log-differences), real GDP (in log differences), real government expenditures (in log differences), and real exchange rates (in log differences). Each equation in the structural VECM of countries has one lag of the three (endogenous) variables as listed above, contemporaneous real oil prices, affecting each equation, and a constant, using annual data or quarterly data, depending on the availability of data. (See, Enders (2008) for a discussion on VECM method).

In order to eliminate the effects of contemporaneous correlation of the residuals with the regressors, the errors are orthogonalized by Choleski decomposition. (See, Hamilton (1994) and Lutkepohl, H. (2005)). In a Choleski decomposition, all endogenous variables affect each other with lags, with a contemporaneous effect of other endogenous variables, depending on the ordering of variables. Sims (1980), Bernanke (1986), Bernanke and Blinder (1992), Blanchard and Quah (1989) proposed this particular ordering of the innovations in their own structural VAR analysis.

The structural VAR models or VECMs are constructed using quarterly or even monthly data in advanced economies. However, macroeconomic data for the GCC and non-GCC oil exporters exist mostly on an annual frequency, except for Canada, Russia, and Norway, with the available quarterly data. The period covered in this paper is from 1970-2013.

However, this study has some limitations, including the frequency of the data for the oil exporters which is limited to an annual basis for most countries, except for Canada, Russia, and Norway.

The annual data on nominal GDP and Government Expenditures come from the World Development Indicators database (2014) and the data on nominal exchange rates and a country-specific CPI come from IMF's IFS database (2014). For UAE, Oman, and Venezuela, there is no complete CPI data, so GDP deflator (base year varies by country) has been used instead. For Oman, UAE, and Russia, there is no complete data on government spending, which means there is no analysis for these countries.

Real US dollar price of oil is calculated using crude oil prices in US dollars deflated by the US consumer price index. This simple measure reflects yearly changes in crude oil prices. The real government expenditures are calculated from a country's government expenditures deflated by a country's CPI. The Real GDP is calculated from a country's nominal GDP deflated by a country's CPI in log differences. The Real Exchange Rate for each country is calculated using the formula, as discussed below.

The estimated one standard deviation of real oil price innovation is equivalent to 28 percent, using yearly data, and the estimated one standard deviation of real oil price innovation is equivalent approximately to 14 percent, using quarterly data.

The nominal exchange rate, E, reported by IMF IFS data (2014) is (local currency per US dollar), then the definition of a real exchange rate can be expressed as:

$$RER = (P/E)/P^*)) \qquad (1.2)$$

That is, E, Nominal Exchange Rate (the price of a unit of foreign currency in terms of local currency) P (the domestic price level)/ P* (the foreign price level), in log differences.

[3]The data for the value of oil exports are not available prior to 1980 for the GCC countries.

Consumer Price Indices (CPIs) are used to measure national price levels, because reliable data for such price indices are generally available on a yearly and sometimes on a quarterly basis for all the oil exporters covered in this paper for the period studied.

Under this definition, an appreciation of the real exchange rate (an increase in RER) has the same meaning as an increase in the real value of domestic goods in terms of foreign goods.

The structural VECMs, using annual data, is estimated with one lag, given the limited size of the panel data, which is approximately 44 observations for all countries from 1970-2013.

For Russia, Canada, and Norway, countries with quarterly data, Akaike Information Criterion (AIC) and Schwartz Information Criterion (SIC) have been used to determine the number of lags in their structural VECMs. The lag length of the VECM in log levels that minimizes the information criteria are chosen to be three for these three advanced economies.

This paper tests for co-integration of variables using the Johansen co-integration test (1992). Johansen (1988) developed maximum likelihood estimators co-integrating vectors, which provides a rank test to determine the number of co-integrating vectors, r.

For all the oil exporters, there is exogenous oil and a set of endogenous variables, including real government expenditures, real GDP, and real exchange rates, with a co-integrated I (1) process, there is a reduced rank, and a co-integrating relationship that varies from 1 to 2 for each of the vector error correction models of these countries. (See, Engle and Granger (1987)).

Sims (1980), Sims (1986), and Sims, Stock, and Watson (1990) recommend against differencing, since differencing leads to throwing away of information concerning the co-movements in data, when there are co-integrating relationships.

This paper also tests whether lags of real GDP Granger-causes real government spending, based on VEC Granger Causality/Block-Exogeneity Wald Tests and Pairwise Granger Causality Tests. (see, Granger and Newbold (1977)).

Second, this paper presents a four-variable restricted structural Vector Error Correction Model (VECM) with oil prices (exogenous) and a set of endogenous variables, including GDP, M2, and Inflation:

For each of the GCC and non-GCC oil exporters, a restricted structural VECM is estimated using four macroeconomic variables: the nominal US dollar price of oil (in log-differences), nominal GDP (in log differences), M2 (in log differences), and consumer prices (in log differences). Each equation in the structural VECM of countries has one lag of the three (endogenous) variables as listed above, contemporaneous oil prices, affecting each equation, and a constant, using annual or quarterly data, depending on the availability of data. (See, Enders (2008)).

To eliminate the effects of a contemporaneous correlation of the residuals with the regressors, the errors are orthogonalized by a Choleski decomposition. (See, Hamilton (1994) and Lutkepohl, H. (2005)).

The annual data on GDP, M2, and Consumer Price Index are from IMF's IFS database (2014) and World Bank's World Development Indicators database (2014). The quarterly data on GDP, M2, and CPI are from International Monetary Fund's International Financial Statistics (IFS), 2014. For UAE, Oman, and Venezuela, the GDP deflator has been used instead since there is no data available on consumer prices.

The structural VECMs of oil exporters, using annual data, is estimated with one lag given the limited size of panel data, which is of approximately 44 observations from 1970-2013 for these countries.

For Russia, Canada, and Norway, using quarterly data, Akaike Information Criterion (AIC) and Schwartz Information Criterion (SIC) have been used to determine the number of lags in a structural VECM. The lag length of the VECMs in log levels that minimizes the information criteria varies from 1 to 3 for these countries.

For each of the twelve oil exporters, there is exogenous oil prices, and a group of endogenous variables including GDP, M2, and CPI, with a co-integrated I(1) process, where there is a reduced rank, and the co-integrating relationships vary from 1 to 2, and therefore there exists a vector error correction model. (See, Engle and Granger (1987)).

This paper also tests whether lags of M2 Granger-causes GDP, using the VEC Granger Causality/Block-Exogeneity Wald Tests and Pairwise Granger Causality Tests. (See, Granger and Newbold (1977)).

Third, this paper presents a two-variable restricted structural Vector Error Correction Models (VECM) for each of the following set of equations: a). oil prices and real exchange rates. b). oil prices and foreign exchange reserves, c). foreign exchange reserves and reserve money, d). oil prices and inflation.

For each of the twelve oil exporters, the restricted structural VECMs are estimated using oil prices (in log-differences), real exchange rates (in log differences), foreign exchange reserves (in log differences), reserve money (in log differences), and inflation (in log-differences).

This paper uses data on a quarterly basis and when quarterly data are not available, the annual data are used. The period covered in this paper is from 1970-2013. The quarterly and annual data on oil prices, foreign exchange reserves, and reserve money come from IMF's IFS database (2014).

The estimated one standard deviation of oil price innovation is equivalent to 14 percent, using quarterly data, and the estimated one standard deviation of real oil price innovation is equivalent to 28 percent, using yearly data. The estimated one standard deviation of foreign exchange reserve innovation and one standard deviation of reserve money innovation both vary from country-to-country.

Akaike Information Criterion (AIC) and Schwartz Information Criterion (SIC) have been used to determine the number of lags for structural VECMs, which vary from one to three lags, for the equation on oil prices and inflation.

For each of the twelve oil exporters, the oil prices and the endogenous variables including foreign exchange reserves, reserve money, inflation, and real exchange rates, are a co-integrated I(1) process, where there is a reduced rank, and the co-integrating relationships vary from 1 to 2, so there exists a vector error correction model for each equation. (See, Engle and Granger (1987)).

4. The Structural Vector Error Correction Models

4.1 The Impulse Response and Variance Decompositions

Once a restricted structural VECM has been estimated, it can be used as a forecasting tool. In order to investigate the relationships among macroeconomic variables, the impulse response functions (IRFs) are estimated.

The impulse response functions of the restricted structural VECMs illustrate the effect of a temporary shock (a 1-standard deviation) in an endogenous variable, including real government spending, real GDP, and real exchange rates through the dynamic structure of a (VECM) model, while holding all other shocks constant and errors as uncorrelated across variables (Blanchard and Gali, 2007). To understand the importance of a shock in one variable contributing to the variation of another macroeconomic variable, the variance decompositions of each macroeconomic variable are examined.

The variance decompositions are estimated using the Monte Carlo integration methods of 100 replications.

The variance decompositions address the following questions for each oil-exporting country in this paper: How important are real government spending (through the transmission of real oil prices) shocks in accounting for the fluctuations in real output? How important are the real output (through the transmission of real oil prices) shocks in accounting for the fluctuations in real government spending? How important are the real oil price shocks in accounting for the fluctuations in real exchange rates? How important are the output shocks in accounting for the fluctuations of M2? How important are oil shocks in accounting for the fluctuations in foreign exchange reserves, and subsequently, what is the role of foreign exchange reserve shocks in accounting for the fluctuations in reserve money?

The estimated variance decompositions are reported for the sample period of 1970-2013, either over a horizon of ten years or ten quarters, depending on the availability of data.

4.1.1. The Response of Real GDP to Real Government Spending Shocks

This section investigates the effects of a Real Government Spending Shock on Real GDP, where the results vary depending on whether the country is considered a developing or an advanced economy. The fiscal spending shocks are unrelated to unanticipated output shocks, which means that the real government spending shocks are uncorrelated to real output shocks in the structural VECMs. Therefore, the impulse response functions of this paper here capture the direct impact of fiscal spending shocks on real output.

The standard neoclassical, Keynesian, and real business cycle models all predict that an increase in government spending generally has an expansionary effect on economic activity that raises output. The structural VECM results of this paper show that there is no effect of real government spending shocks on real economic activity in eight out of the ten oil exporters, countries with the available data, which means that countercyclical fiscal policy is not employed in any of these countries, except for Iran and Canada.

The non-existence of a response of real economic activity to a fiscal spending shock for majority of the oil exporters is not surprising and consistent with findings from the academic literature that fiscal policies of developing countries tend to be pro-cyclical rather than countercyclical, with ten out of the twelve major oil exporters considered as developing countries.

The structural VECM results here suggest that fiscal spending is countercyclical in both Canada and Iran, since real government spending shocks have a positive effect on real output. The positive response of real output to a real government spending shock in Canada is in line with economic intuition that the fiscal policy response of advanced economies tend to be countercyclical rather than pro-cyclical, in common with Kaminsky, Reinhart, and Vegh (2004) and Lane (2003), who argue that causality runs from fiscal policy to output.

In Iran, there is a strong positive and persistent effect of a real government spending shock on real economic activity. In Canada, there is a relatively small positive effect of a real government spending shock on real economic activity, which are in common with Rotemberg and Woodford (1992), Fatas and Mihov (2001), Blanchard and Perotti (2002), Burnside et al. (2004), and Mountford and Uhlig (2008), who argue that government spending shocks have a positive effect on the economic activity of advanced economies.

In Iran, a real government spending shock leads to a substantial and a persistent rise in real GDP, which accounts for a sizeable 90 percent of the fluctuations in real GDP, whose fiscal policy response is countercyclical. (See, Table 1). The trends in data suggest that there is an inverse relationship between the oil prices and government spending, which highlights the use of a countercyclical fiscal policy employed by the government authorities in Iran.

In Canada, the response of real GDP to a real government spending shock is positive but relatively smaller, with a real government spending shock that accounts for a relatively small 10 percent of the fluctuations in real GDP. (See, Table 1). The positive response of real economic activity to a real government spending shock in Canada is consistent with the conventional wisdom that advanced economies tend to have countercyclical fiscal policies, rather than a pro-cyclical fiscal policy response.

It is important to mention that Canada's economy is similar to that of the US, where there is not a large social safety net and the government has to rely on automatic stabilizers to offset the decline in aggregate demand during times of economic recession.

The fiscal policy response of Saudi Arabia, Oman, Bahrain, Venezuela, whose economies are largely dependent on oil, including Norway, are pro-cyclical, since real government spending responds positively to a real output shock in these countries, where oil prices drive output, and later the econometric causality goes from output to fiscal spending.

Table 1: Variance Decompositions[4] (Real Government Spending, Real GDP, and Real Exchange Rates Shocks and Responses)

Saudi Arabia				**Kuwait**			
10th Quarter Variation	**Real Govt**	**Real GDP**	**Real Exch**	*10th Quarter Variation*	**Real Govt**	**Real GDP**	**Real Exch**
Real Govt	39%	52%	9%	**Real Govt**	93%	6%	1%
Real GDP	2%	98%	0%	**Real GDP**	8%	65%	27%
Real Exch	9%	61%	30%	**Real Exch**	16%	13%	71%
No. Obs:		42		**No Obs:**		40	
Period:		1972-2013		**Period:**		1974-2013	
Oman				**Bahrain**			
10th Quarter Variation	**Real Govt**	**Real GDP**	**Real Exch**	*10th Quarter Variation*	**Real Govt**	**Real GDP**	**Real Exch**
Real Govt	21%	28%	51%	**Real Govt**	26%	60%	4%
Real GDP	14%	24%	62%	**Real GDP**	5%	90%	5%
Real Exch	16%	41%	42%	**Real Exch**	26%	2%	72%
No. Obs:		41		**No. Obs:**		31	
Period:		1972-2013		**Period:**		1982-2012	
Qatar				**UAE**			
10th Quarter Variation	**Real Govt**	**Real GDP**	**Real Exch**	*10th Quarter Variation*	**Real Govt**	**Real GDP**	**Real Exch**
Real Govt	NA	NA	NA	**Real Govt**	NA	NA	NA
Real GDP	NA	84%	16%	**Real GDP**	NA	96%	4%
Real Exch	NA	26%	74%	**Real Exch**	NA	7%	93%
No. Obs:		33		**No Obs:**		37	
Period:		1981-2013		**Period:**		1977-2013	
Canada				**Norway**			
10th Quarter Variation	**Real Govt**	**Real GDP**	**Real Exch**	*10th Quarter Variation*	**Real Govt**	**Real GDP**	**Real Exch**
Real Govt	59%	8%	33%	**Real Govt**	37%	50%	13%
Real GDP	11%	34%	55%	**Real GDP**	5%	76%	19%
Real Exch	7%	3%	90%	**Real Exch**	5%	7%	88%
No Obs:		42		**No Obs:**		42	
Period:		1972-2013		**Period:**		1972-2013	
Venezuela				**Iran**			
10th Quarter Variation	**Real Govt**	**Real GDP**	**Real Exch**	*10th Quarter Variation*	**Real Govt**	**Real GDP**	**Real Exch**
Real Govt	17%	13%	70%	**Real Govt**	95%	5%	NA
Real GDP	4%	65%	31%	**Real GDP**	92%	8%	NA
Real Exch	7%	20%	73%	**Real Exch**	NA	NA	NA
No Obs:		42		**No Obs:**		35	
Period:		1972-2013		**Period:**		1973-2007	
Nigeria				**Russia**			
10th Quarter Variation	**Real Govt**	**Real GDP**	**Real Exch**	*10th Quarter Variation*	**Real Govt**	**Real GDP**	**Real Exch**
Real Govt	82%	3%	15%	**Real Govt**	NA	NA	NA
Real GDP	0%	96%	4%	**Real GDP**	NA	93%	7%
Real Exch	58%	14%	28%	**Real Exch**	NA	0%	100%
No Obs:		31		**No Obs:**		76	
Period:		1983-2013		**Period:**		1995Q1-2013Q4	

4.1.2. The Response of Real Exchange Rates to Real Oil Shocks

This section of the paper first investigates whether there is a real exchange rate appreciation from real oil shocks in all the oil exporters, then later explores whether real exchange rate appreciation in the GCC countries takes

[4]The reported variations are for the 10th period. The shocks are horizontal and the variables that are affected from these shocks are listed vertically.

the form of inflation, since a real exchange rate appreciation under fixed exchange rates is expected to be primarily based on the behavior of domestic price levels, with no contribution of nominal exchange rate to a real exchange rate appreciation, except maybe for sharp changes associated with the official parities, which may affect the real exchange rates, see, Mussa (1976) and Frankel (2010).

The real exchange rate analyses for all the oil exporters are done using quarterly data, except for Oman, Qatar, UAE, and Venezuela, using annual data. For Iran, the real exchange rates are calculated to be zero, so there is no analysis done for the calculation of real exchange rates.

The real oil prices and real exchange rates of the GCC countries and the non-GCC oil exporters are a co-integrated I (1) process, where there is a reduced rank, with one co-integrating relation between real oil prices and the real exchange rates, and therefore there exists a vector error correction model (VECM) for each of the twelve major oil exporters for the 1970-2013 period. (See, Engle and Granger (1987)).

Since oil constitutes a large portion of the GCC countries' revenues, oil prices affect the real exchange rates, particularly in the GCC countries. The real price of oil has been quite volatile in recent decades, so large macroeconomic effects from oil price changes are to occur in the economies of the GCC countries.

There is a real exchange rate appreciation from real oil shocks in the GCC countries, where oil accounts for approximately 40 percent of their economies. (See, Table 2). The real exchange rate appreciation from real oil price shocks in the GCC countries and Venezuela come in the form of a rise in the price level with virtually no change in their exchange rates. The real exchange rate appreciation in these countries from oil price shocks can have broad implications on their trade and current account balances since the non-oil sectors of these countries can become less competitive in the global markets.

The GCC countries instituted a fixed exchange rate regime in 1986, which anchors monetary policy and helps central bank to achieve low-inflation credibility. (See, Frankel (2010)). However, the structural VECM results show that the GCC countries were not able to accomplish their intended objective of lower inflation, which defeats the purpose of having a fixed exchange rate regime.

The positive effect of oil shocks on the inflation of the GCC countries (see, Table 3), as shown in the structural VECMs, lend empirical support to the view that a real exchange rate appreciation of the GCC countries, under fixed exchange rate regimes, comes primarily in the form of inflation and not as a nominal exchange rate appreciation, in common with Mussa (1976) and Frankel (2010). Moreover, there is a full breakdown of the components of a real exchange appreciation for the GCC countries, see Appendix.

The positive effect of the oil shocks on the real exchange rates of the GCC countries are supported by the OLS estimates, which suggest that nominal exchange rates of the GCC countries do not respond to changes in the oil prices, when oil prices are regressed against nominal exchange rates (in log, first differences), and therefore a real exchange rate appreciation in the GCC countries does not take the form of a nominal exchange rate appreciation, other than for sharp devaluations related to the official parities of Saudi Arabia and Oman, which is in common with Mussa (1976) and Frankel (2010). (See, Appendix). The nominal exchange rate graphs for the GCC countries support the OLS estimates, where there have been no significant changes to the nominal exchange rates of the GCC countries, with currencies pegged to the US $ since 1986, except for Kuwait.

There is no real exchange rate appreciation in response to real oil shocks for any of the non-GCC oil exporters, except for Venezuela. (See, Table 2). For the non-GCC oil exporters, the non-existence in the response of real exchange rates to real oil shocks can be explained by a relatively small share of oil in output, an average of 18 percent from 1970-2011. The nominal exchange rate graphs of the non-GCC oil exporters suggest that the VECM results in countries with managed floating exchange rates, such as Venezuela, Iran, Nigeria, and Russia experience far less volatility in their currencies than that of Norway and Canada, but more volatility than that of the GCC countries, with fixed exchange rates. The volatility of the exchange rates of the GCC countries seems to coincide with either financial or political crises, or else with sudden changes in their nominal exchange rates.

Table 2: Variance Decompositions[5] (Real Oil and Real Exchange Rates Shocks and their Responses)

Saudi Arabia			**Kuwait**		
10th Quarter Variation	**Real Oil**	**Real Exch**	*10th Quarter Variation*	**Real Oil**	**Real Exch**
Real Oil	99%	1%	**Real Oil**	94%	6%
Real Exch	16%	84%	**RealExch**	4%	96%
No Obs:	164		**No Obs:**	159	
Period:	1972Q4-2013Q3		**Period:**	1974Q1-2013Q3	
Oman			**Bahrain**		
10th Quarter Variation	**Real Oil**	**Rea lExch**	*10th Quarter Variation*	**Real Oil**	**Real Exch**
Real Oil	93%	51%	**Real Oil**	95%	5%
Real Exch	87%	13%	**RealExch**	18%	82%
No Obs:	41		**No Obs:**	31	
Period:	1972-2012		**Period:**	1982-2012	
Qatar			**UAE**		
10th Quarter Variation	**Real Oil**	**Real Exch**	*10th Quarter Variation*	**Real Oil**	**Real Exch**
Real Oil	85%	15%	**Real Oil**	84%	16%
RealExch	77%	23%	**RealExch**	71%	29%
No Obs:	33		**No Obs:**	37	
Period:	1981-2013		**Period:**	1977-2013	
Canada			**Norway**		
10th Quarter Variation	**Real Oil**	**Real Exch**	*10th Quarter Variation*	**Real Oil**	**Real Exch**
Real Oil	91%	9%	**Real Oil**	100%	0%
Real Exch	4%	96%	**RealExch**	6%	94%
No Obs:	172		**No Obs:**	174	
Period:	1971Q1-2013Q4		**Period:**	1970Q1-2013Q4	

Venezuela			**Russia**		
10th Quarter Variation	**Real Oil**	**Real Exch**	*10th Quarter Variation*	**Real Oil**	**Real Exch**
Real Oil	60%	40%	**Real Govt**	99%	1.00%
Real Exch	28%	72%	**Real Exch**	6%	94%
No Obs:	42		**No Obs:**	84	
Period:	1972-2013		**Period:**	1992Q4-2013Q3	
Nigeria			**Iran**		
10th Quarter Variation	**Real Oil**	**Real Exch**	*10th Quarter Variation*	**Real Oil**	**Real Exch**
Real Oil	93%	7%	**Real Oil**	NA	NA
Real Exch	4%	96%	**Real Exch**	NA	NA
No Obs:	31		**No Obs:**		
Period:	1970Q1-2013Q4		**Period:**	1970Q12013Q4	

The reported variations are for the 10th period. The shocks are horizontal and the variables that are affected from these shocks are listed vertically.

Table 3: Variance Decompositions (Oil and Inflation Shocks and their Impulse Responses)

Saudi Arabia					
10th Quarter Variation	**Oil**	**Inflation**	*10th Quarter Variation*	**Oil**	**Inflation**
Oil	98%	2%	**Oil**	99%	1%
Inflation	28%	72%	**Inflation**	27%	73%
No Obs:	172		**No Obs:**	142	
Period:	1971Q1-2013Q4		**Period:**	1978Q3-2013Q4	
Bahrain					
10th Quarter Variation	**Oil**	**Inflation**	*10th Quarter Variation*	**Oil**	**Inflation**
Oil	98%	2%	**Oil**	99%	1%
Inflation	7%	93%	**Inflation**	37%	63%
No Obs:	170		**No Obs:**	157	
Period:	1970Q1-2013Q4		**Period:**	1979Q1-2013Q4	
Kuwait					
10th Quarter Variation	**Oil**	**Inflation**	*10th Quarter Variation*	**Oil**	**Inflation**
Oil	94%	6%	**Oil**	98%	2%
Inflation	30%	70%	**Inflation**	20%	80%
No Obs:	161		**No Obs:**	119	
Period:	1970Q1-2013Q4		**Period:**	1983Q2-2009Q3	
Oman			**Qatar**		
10th Quarter Variation	**Oil**	**Inflation**	*10th Quarter Variation*	**Oil**	**Inflation**
Oil	94%	6%	**Oil**	91%	9%
Inflation	96%	4%	**Inflation**	45%	55%
No Obs:	36		**No Obs:**	33	
Period:	1977-2013		**Period:**	1981-2013	
UAE			**Russia**		
10th Quarter Variation	**Oil**	**Inflation**	*10th Quarter Variation*	**Oil**	**Inflation**
Oil	100%	0%	**Oil**	76%	24%
Inflation	85%	15%	**Inflation**	9%	91%
No Obs:	36		**No Obs:**	85	
Period:	1977-2013		**Period:**	1992Q2-2013Q4	

Canada					
10th Quarter Variation	**Oil**	**Inflation**	*10th Quarter Variation*	**Oil**	**Inflation**
Oil	70%	30%	**Oil**	88%	12%
Inflation	15%	85%	**Inflation**	30%	70%
No Obs:	82		**No Obs:**	87	
Period:	1970Q1-1991Q1		**Period:**	1991Q2-2013Q4	
Norway					
10th Quarter Variation	**Oil**	**Inflation**	*10th Quarter Variation*	**Oil**	**Inflation**
Oil	90%	0%	**Oil**	87%	13%
Inflation	9%	91%	**Inflation**	9%	91%
No Obs:	71		**No Obs:**	91	
Period:	1970Q1-1988Q2		**Period:**	1988Q3-2013Q4	
Iran			**Nigeria**		
10th Quarter Variation	**Oil**	**Inflation**	*10th Quarter Variation*	**Oil**	**Inflation**
Oil	99%	1%	**Oil**	99%	1%
Inflation	1%	99%	**Inflation**	1%	99%
No Obs:	173		**No Obs:**	138	
Period:	1970Q1-2013Q4		**Period:**	1970Q1-2013Q4	
Venezuela					
10th Quarter Variation	**Oil**	**Inflation**			
Oil	96%	4%			
Inflation	1%	99%			
No Obs:	42				
Period:	1972-2013				

4.1.3. The Response of Real GDP to Real Government Spending Shocks

This section investigates the effects of a Real Government Spending Shock on Real GDP, where the results vary depending on whether the country is considered a developing or an advanced economy.

The fiscal spending shocks are unrelated to unanticipated output shocks, which means that the real government spending shocks are uncorrelated to real output shocks in the structural VECMs. Therefore, the impulse response functions of this paper here capture the direct impact of fiscal spending shocks on real output.

The standard neoclassical, Keynesian, and real business cycle models all predict that an increase in government spending generally has an expansionary effect on economic activity that raises output. The structural VECM results of this paper show that there is no effect of real government spending shocks on real economic activity in eight out of the ten oil exporters, countries with the available data, which means that countercyclical fiscal policy is not employed in any of these countries, except for Iran and Canada.

The non-existence of a response of real economic activity to a fiscal spending shock for majority of the oil exporters is not surprising and consistent with findings from the academic literature that fiscal policies of developing countries tend to be pro-cyclical rather than countercyclical, with ten out of the twelve major oil exporters considered as developing countries.

The structural VECM results here suggest that fiscal spending is countercyclical in both Canada and Iran, since real government spending shocks have a positive effect on real output. The positive response of real output to a real government spending shock in Canada is in line with economic intuition that the fiscal policy response of advanced economies tend to be countercyclical rather than pro-cyclical, in common with Kaminsky, Reinhart, and Vegh (2004) and Lane (2003), who argue that causality runs from fiscal policy to output.

In Iran, there is a strong positive and persistent effect of a real government spending shock on real economic activity. In Canada, there is a relatively small positive effect of a real government spending shock on real economic activity, which are in common with Rotemberg and Woodford (1992), Fatas and Mihov (2001), Blanchard and Perotti (2002), Burnside et al. (2004), and Mountford and Uhlig (2008), who argue that government spending shocks have a positive effect on the economic activity of advanced economies.

In Iran, a real government spending shock leads to a substantial and a persistent rise in real GDP, which accounts for a sizeable 90 percent of the fluctuations in real GDP, whose fiscal policy response is countercyclical. (See, Table 1). The trends in data suggest that there is an inverse relationship between the oil prices and government spending, which highlights the use of a countercyclical fiscal policy employed by the government authorities in Iran.

In Canada, the response of real GDP to a real government spending shock is positive but relatively smaller, with a real government spending shock that accounts for a relatively small 10 percent of the fluctuations in real GDP. (See, Table 4). The positive response of real economic activity to a real government spending shock in Canada is consistent with the conventional wisdom that advanced economies tend to have countercyclical fiscal policies, rather than a pro-cyclical fiscal policy response.

It is important to mention that Canada's economy is similar to that of the US, where there is not a large social safety net and the government has to rely on automatic stabilizers to offset the decline in aggregate demand during times of economic recession.

The fiscal policy response of Saudi Arabia, Oman, Bahrain, Venezuela, whose economies are largely dependent on oil, including Norway, are pro-cyclical, since real government spending responds positively to a real output shock in these countries, where oil prices drive output, and later the econometric causality goes from output to fiscal spending. (See, Table 4).

Table 4: Variance Decompositions6 (Real Government Spending, Real GDP, and Real Exchange Rates Shocks and their Responses)

Saudi Arabia				**Kuwait**			
10th Quarter Variation	**Real Govt**	**Real GDP**	**Real Exch**	*10th Quarter Variation*	**Real Govt**	**Real GDP**	**Real Exch**
Real Govt	39%	52%	9%	**Real Govt**	93%	6%	1%
Real GDP	2%	98%	0%	**Real GDP**	8%	65%	27%
Real Exch	9%	61%	30%	**Real Exch**	16%	13%	71%
No Obs:		42		**No Obs:**		40	
Period:		1972-2013		**Period:**		1974-2013	
Oman				**Bahrain**			
10th Quarter Variation	**Real Govt**	**Real GDP**	**Real Exch**	*10th Quarter Variation*	**Real Govt**	**Real GDP**	**Real Exch**
Real Govt	21%	28%	51%	**Real Govt**	26%	60%	4%
Rea lGDP	14%	24%	62%	**Real GDP**	5%	90%	5%
Real Exch	16%	41%	42%	**Real Exch**	26%	2%	72%
No Obs:		41		**No Obs:**		31	
Period:		1972-2013		**Period:**		1982-2012	
Qatar				**UAE**			
10th Quarter Variation	**Real Govt**	**Real GDP**	**Real Exch**	*10th Quarter Variation*	**Real Govt**	**Real GDP**	**Real Exch**
Real Govt	NA	NA	NA	**Real Govt**	NA	NA	NA
Real GDP	NA	84%	16%	**Real GDP**	NA	96%	4%
Real Exch	NA	26%	74%	**Real Exch**	NA	7%	93%
No Obs:		33		**No Obs:**		37	
Period:		1981-2013		**Period:**		1977-2013	
Canada				**Norway**			
10th Quarter Variation	**Real Govt**	**Real GDP**	**Real Exch**	*10th Quarter Variation*	**Real Govt**	**Real GDP**	**Real Exch**
Real Govt	59%	8%	33%	**Real Govt**	37%	50%	13%
Real GDP	11%	34%	55%	**Real GDP**	5%	76%	19%
Real Exch	7%	3%	90%	**Real Exch**	5%	7%	88%
No Obs:		42		**No Obs:**		42	
Period:		1972-2013		**Period:**		1972-2013	
Venezuela				**Iran**			
10th Quarter Variation	**Real Govt**	**Real GDP**	**Real Exch**	*10th Quarter Variation*	**Real Govt**	**Real GDP**	**Real Exch**
Real Govt	17%	13%	70%	**Real Govt**	95%	5%	NA
Real GDP	4%	65%	31%	**Real GDP**	92%	8%	NA
Real Exch	7%	20%	73%	**Real Exch**	NA	NA	NA
No Obs:		42		**No Obs:**		35	
Period:	1972-2013			**Period:**		1973-2007	
Nigeria				**Russia**			
10th Quarter Variation	**Real Govt**	**Real GDP**	**Real Exch**	*10th Quarter Variation*	**Real Govt**	**Real GDP**	**Real Exch**
Real Govt	82%	3%	15%	**Real Govt**	NA	NA	NA
Real GDP	0%	96%	4%	**Real GDP**	NA	93%	7%
Real Exch	58%	14%	28%	**Real Exch**	NA	0%	100%
No Obs:		31		**No Obs:**		76	
Period:	1983-2013			**Period:**		1995Q1-2013Q4	

[6]The reported variations are for the 10th period. The shocks are horizontal and the variables that are affected from these shocks are listed vertically.

4.1.4. The Responses of M2 to a GDP Shock

This section investigates the effects of a GDP shock on M2, where the results vary depending on the exchange rate regime. The money is endogenous for oil exporters, either with fixed or managed floating exchange rates, as shown in the structural VECMs of oil-exporting countries.

For the GCC countries, the GDP shock leads to an immediate increase in M2. In the GCC countries, M2 gradually increases from a GDP shock, whose effect becomes relatively large in the second year. The GDP shocks explain on average from 59-85 percent of the fluctuations in M2 for over a period of ten year.

Table 5: Variance Decompositions[7] (GDP, M2, and CPI Shocks and their Impulse Responses)

Saudi Arabia				Kuwait			
10th Quarter Variation	GDP	M2	CPI	10th Quarter Variation	GDP	M2	CPI
GDP	81%	2%	17%	GDP	99%	1%	0%
M2	60%	10%	30%	M2	85%	14%	1%
CPI	36%	1%	63%	CPI	10%	6%	84%
No. Obs:		42		No. Obs:		40	
Period:	1972-2013			Period:		1974-2013	
Bahrain				**Oman**			
10th Quarter Variation	GDP	M2	CPI	10th Quarter Variation	GDP	M2	CPI
GDP	99%	0%	0%	GDP	87%	12%	1%
M2	76%	20%	4%	M2	85%	14%	1%
CPI	80%	8%	12%	CPI	29%	8%	64%
No. Obs:		37		No. Obs:		39	
Period:	1977-2013			Period:		1974-2012	
Qatar				**UAE**			
10th Quarter Variation	GDP	M2	CPI	10th Quarter Variation	GDP	M2	CPI
GDP	92%	5%	3%	GDP	92%	6.%	2%
M2	53%	33%	14%	M2	75%	18%	6%
CPI	11%	55%	34%	CPI	49%	12%	39%
No Obs:		30		No. Obs:		37	
Period:	1984-2013			Period:		1977-2013	
Canada				**Norway**			
10th Quarter Variation	GDP	M2	CPI	10th Quarter Variation	GDP	M2	CPI
GDP	97%	3%	0%	GDP	96%	0%	4.%
M2	3%	96%	1%	M2	23%	74%	3%
CPI	26%	2%	72%	CPI	14%	3%	83%
No. Obs:		170		No. Obs:		149	
Period:	1971Q3-2013Q3			Period:		1971Q3-2008Q3	
Venezuela				**Iran**			
10th Quarter Variation	GDP	M2	CPI	10th Quarter Variation	GDP	M2	CPI
GDP	96%	1%	3%	GDP	78%	22%	0%
M2	59%	40%	1%	M2	41%	46%	13%
CPI	97%	0%	3%	CPI	15%	7%	78%
No. Obs:		40		No. Obs:		42	
Period:	1970-2013			Period:		1972-2013	
Nigeria				**Russia**			
10th Quarter Variation	GDP	M2	CPI	10th Quarter Variation	GDP	M2	CPI
GDP	38%	58%	4%	GDP	16%	2%	82%
M2	5%	93%	2%	M2	5%	36%	60%
CPI	23%	37%	40%	CPI	0%	1%	98%
No. Obs:		42		No. Obs:		138	
Period:	1972-2013			Period:		1996-2013	

For Iran and Venezuela, M2 also shifts up immediately from a GDP shock. For Iran and Venezuela, the GDP shocks explain a large amount of the fluctuations in M2. Under a fixed or managed floating exchange rate, M2 responds to a

[7]The reported variations are for the 10th period. The shocks are horizontal and the variables affected from those shocks are listed vertically.

GDP shock, whereas there is either a no response or a muted response of M2 to a GDP shock under a floating exchange rate for Canada and Nigeria[8], consistent with Mundell (1963) and Mussa (1976), who argue that it is the exchange rate that reacts to an external shock, such as a GDP shock, under a floating exchange rate. In countries with fixed/managed floating exchange rates, the monetary authorities are expected to expand the money supply, which in turn can lead to an increase in output.

The positive responses of M2 to a GDP shock for the GCC countries, Iran, and Venezuela are consistent with Marx (1907), Nell (1967), Nell (2004), who argue that the transaction demand for money from an increase in GDP is met through an increased circulation of money, and similar to that of Minsky (1990), who argues that money supply depends on a profit seeking activity, i.e., money is endogenous.

4.1.5. The Response of Foreign Exchange Reserves to Oil Price Shocks

This section focuses on the effect of oil shocks on foreign exchange reserves.

The restricted structural VECMs have been used for all the twelve oil exporters, with one co-integrating relation between the oil prices and foreign exchange reserves for the 1970-2013 period, and additional VECMs for Qatar and Venezuela have been used, given the structural breaks in the foreign exchange reserves data.

A one standard deviation shock in the oil price (approximately of 14 percent) leads to an immediate shift in foreign exchange reserves for the GCC countries, except for Oman and UAE. For the GCC countries, foreign exchange reserves exhibit a substantial increase from oil price shocks, including for Bahrain, Kuwait, Qatar, and Saudi Arabia, based on the restrictions of a fixed exchange rate regime and given the conditions of a Mundell-Fleming model, which requires central banks to trade domestic currency for foreign currency at a predetermined price, to keep the exchange rate at its preannounced rate.

An oil shock accounts for a large amount of the fluctuations in the foreign exchange reserves of the GCC countries, except for Oman and UAE. The oil shocks account for half of the fluctuations in the foreign exchange reserves of Bahrain and Kuwait, which explain 75 percent of the fluctuations in foreign exchange reserves of Saudi Arabia and Qatar. (See, Table 6).

In Oman and UAE, there is a muted response of foreign exchange reserves to oil shocks, which can be explained by their foreign exchange policies, based on how some of the foreign exchange reserves have been used to purchase foreign securities, where local banks deposit some of their foreign exchange reserves with foreign banks or institutions, or foreign currency reserves are invested in other assets, as shown in their central bank statements.

In contrast to that of the GCC countries, the response of foreign exchange reserves to oil shocks is muted for many of the non-GCC oil exporters, since they have greater leeway for investing their foreign exchange reserves, in the absence of restrictions typically found under a fixed exchange rate regime, except for Nigeria (1970-1983). (See, Table 6).

For the non-GCC oil exporters, including Norway, Nigeria (1984-2009), Russia, Iran, and Venezuela, there is a muted response of foreign exchange reserves to oil shocks. In the absence of any restrictions under a fixed exchange rate regime, these countries are able to use their foreign exchange reserves to purchase foreign securities, deposit some of their foreign exchange reserves with foreign banks or institutions, or else invest their foreign exchange reserves in other assets, including in a money market portfolio, as is the case here for Norway.

In Nigeria (1970-1983), the foreign exchange reserves shift up immediately and stay positive for 10 quarters. An unanticipated shock in oil reserves for Nigeria accounts for more than half of the fluctuations in foreign exchange reserves. In contrast to the 1970-1983 period, the impact of oil prices on foreign exchange reserves is virtually non-existent for the 1984-2009 period. The IRF-based findings on the muted response of foreign exchange reserves to oil shocks are consistent with Kuijs (1998), who argues that the oil production in Nigeria has increased from the 1970s until the early 1980s, thereafter oil prices and oil production both declined.

[8]Nigeria adopted a floating exchange rate in 1986.

Table 6: Variance Decomposition Table 9(Oil, Foreign Exchange Reserves Shocks, and their Impulse Responses)

Qatar					
10th Quarter Variation	**Oil**	**Foreign Exch. Reserves**	*10th Quarter Variation*	**Oil**	**Foreign Exch. Reserves**
Oil	95%	5%	**Oil**	99%	1%
Foreign Exch. Reserves	6.00%	94%	**Foreign Exch. Reserves**	76%	24%
No. Obs:	97		**No. Obs:**	44	
Period:	1974Q1-1998Q3		**Break: 1998Q4**	1998Q4-2009Q3	
Bahrain			**Kuwait**		
10th Quarter Variation	**Oil**	**Foreign Exch. Reserves**	*10th Quarter Variation*	**Oil**	**Foreign Exch. Reserves**
Oil	98%	2%	**Oil**	99%	1%
Foreign Exch. Reserves	34%	66%	**Foreign Exch. Reserves**	42%	58%
No. Obs:	173		**No. Obs:**	156	
Period:	1970Q1-2013Q4		**Period:**	1970Q1-2009Q3	
S. Arabia			**Oman**		
10th Quarter Variation	**Oil**	**Foreign Exch. Reserves**	*10th Quarter Variation*	**Oil**	**Foreign Exch. Reserves**
Oil	100%	0%	**Oil**	99%	1%
Foreign Exch. Reserves	78%	22%	**Foreign Exch. Reserves**	5%	95%
No Obs:	148		**No. Obs:**	136	
Period:	1971Q1-2013Q4		**Period:**	1972Q1-2009Q2	
UAE			**Norway**		
10th Quarter Variation	**Oil**	**Foreign Exch. Reserves**	*10th Quarter Variation*	**Oil**	**Foreign Exch. Reserves**
Oil	98%	2%	**Oil**	99%	1%
Foreign Exch. Reserves	3%	97%	**Foreign Exch. Reserves**	1%	99%
No. Obs:	152		**No. Obs:**	114	
Period:	1974Q1-2009Q3		**Period:**	1970Q1-2001Q3	
Russia			**Canada**		
10th Quarter Variation	**Oil**	**Foreign Exch. Reserves**	*10th Quarter Variation*	**Oil**	**Foreign Exch. Reserves**
Oil	57%	43%	**Oil**	N/A	N/A
Foreign Exch. Reserves	6%	94%	**Foreign Exch. Reserves**	N/A	N/A
No Obs:	50		**No Obs:**		
Period:	1993Q1-2008Q4		**Period:**	1970Q1-2006Q4	
Nigeria					
10th Quarter Variation	**Oil**	**Foreign Exch. Reserves**	*10th Quarter Variation*	**Oil**	**Foreign Exch. Reserves**
Oil	99%	1%	**Oil**	96%	4%
Foreign Exch. Reserves	53%	47%	**Foreign Exch. Reserves**	4%	96%
No Obs:	52		**No Obs:**	133	
Period:	1970Q1-1983Q3		**Break: 1983Q4**	1983Q4-2009Q2	
Iran			**Venezuela**		
10th Quarter Variation	**Oil**	**Foreign Exch. Reserves**	*10th Quarter Variation*	**Oil**	**Foreign Exch. Reserves**
Oil	97%	3%	**Oil**	99%	1%
Foreign Exch. Reserves	2%	98%	**Foreign Exch. Reserves**	7%	93%
No Obs:	141		**No Obs:**	95	
Period:	1970Q1-2011Q1		**Period:**	1970Q1-2013Q4	

[9]The reported variations are for the 10th period. The shocks are horizontal and the variables that are affected from those shocks are listed vertically.

4.1.6. The Response of Reserve Money to Foreign Exchange Reserve Shocks

This section analyses the effect of foreign exchange reserve shocks on reserve money, where results vary depending on the exchange rate regime. At first, this paper identifies the structural breakpoints in the foreign exchange reserves data, using the OLS method.

In the GCC countries, the reserve money exhibits a strong increase from foreign exchange reserve shocks, most notably for Saudi Arabia and Kuwait, consistent with the economic intuition. (See, Table 7).

The trends in data for foreign exchange reserves and reserve money show that reserve money has been consistently below foreign exchange reserves for the 1970-2013 period, which means that only a part of the foreign exchange reserves of the GCC countries has eventually made its way into the reserve money. A part of the foreign exchange reserves in the GCC countries has not been used for internal macroeconomic purposes, i.e., currency or bank deposits, since the government authorities used some of its foreign exchange reserves to either purchase gold, retained some of the foreign exchange reserves as government deposits at the central bank, purchased foreign securities, or local banks deposited some of the foreign exchange reserves with foreign banks or institutions.

The foreign exchange shocks account for about a quarter of the fluctuations in reserve money for Bahrain, Oman, Qatar, and UAE, for the entire 1970-2013 period, and about half of the fluctuations in reserve money for Kuwait and Saudi Arabia from 1999-2013. (See, Table 7).

In support of the VECM results from above, Saudi Arabia's central bank balance statement for 2013 shows that an increase in foreign exchange reserves partially transmits to an increase in broad money, M3, and the rest of the foreign exchange reserves stay as government deposits at the central bank.

In support of the VECM results from above, Kuwait's central bank balance statement for 2013 shows that an increase in foreign exchange reserves partially transmits to an increase in currency and bank deposits, with the rest of the increase in foreign exchange reserves that stays as government deposits. The central bank of Kuwait issues bonds for the remainder of the foreign exchange reserves, which effectively enables the central bank to withdraw liquidity from the financial markets.

There is a positive response of reserve money to foreign exchange reserve shocks for Iran, Venezuela, Russia, and Nigeria, with a managed floating exchange rate, like that of the GCC countries, with fixed exchange rates. (See, Table 6).

The reserve money of Iran, Venezuela, Russia, and Nigeria (1970-1982) shifts immediately from a shock in foreign exchange reserves, where the reserve money remains positive for a protracted period, with half of the foreign exchange reserves of Iran and more than three quarters of the foreign exchange inflows of Venezuela, Russia, and Nigeria (1970-1982) transfer into reserve money. (See, Table 7).

It is important to note that Nigeria had a managed floating exchange rate from 1970-1985, thereafter its exchange rate has been freely floating. With the adoption of a floating exchange rate in 1986, Nigeria's naira has been allowed to devaluate strongly. In 1995, the devaluation was sufficiently large, which subsequently led to a liberalization of the foreign exchange market. For Canada, there has been a loss of foreign exchange reserves from 1979-1999, which explains why there has not been a structural VECM, given the negative values.

The central bank statement for Iran for 2013 support the VECM results from above, which shows that an increase in foreign exchange reserves partially transmits to an increase in currency and bank deposits, where part of the increase in foreign exchange reserves stays as government deposits at the central bank. Iran issues government bonds for the remainder of the currency reserves, which effectively enables the central bank to withdraw liquidity from the financial markets.

The central bank statement for Russia for 2013 support the VECM results from above, which shows that an increase in foreign exchange reserves partially transmits to an increase in currency and bank deposits, and the rest of the increase in foreign exchange reserves transfer into government deposits.

In Norway and Nigeria (from 1983-2009), with floating exchange rates, reserve money hardly changes in response to shocks from foreign exchange reserves, consistent with the economic intuition. In Norway and Nigeria (from 1983-2009), the foreign exchange reserves do not transfer into reserve money, in accord with Mussa (1976) and Mundell (1963), who argue that it is the exchange rate which fluctuates from an external shock, such as oil, and not the base money or the money supply.

Norway invests some of its foreign exchange reserves in an investment fund, which explains why there has not been a positive response of reserve money to foreign exchange reserve shocks. Norway used some of its foreign exchange reserves for internal macroeconomic purposes, i.e., currency or bank deposits, and the rest of its currency reserves has been invested in a global government pension fund, which is a sovereign wealth fund, instead of allowing the foreign exchange reserves to be transmitted to local currency or bank deposits.

In Nigeria, the estimated negative response of foreign exchange reserves to reserve money for the 1983-2009 period may be related to a devaluation at first, and later to a depreciation of the currency, which is associated with a loss of foreign exchange reserves.

Table 7: Variance Decomposition Table10 (Foreign Exchange Reserves, Reserve Money Shocks, and their Responses).

Saudi Arabia					
10th Quarter Variation	Reserve Money	Foreign Exch. Reserves	10th Quarter Variation	Reserve Money	Foreign Exch. Reserves
Reserve Money	74%	26%	Reserve Money	43%	56%
Foreign Exch. Reserves	1%	99%	Foreign Exch. Reserves	1%	99%
No Obs:	172		No Obs:	58	
Period (full):	1971Q1-2013Q3		Break: 1999Q3	1999Q3-2013Q4	
Bahrain			Kuwait		
10th Quarter Variation	Reserve Money	Foreign Exch. Reserves	10th Quarter Variation	Reserve Money	Foreign Exch. Reserves
Reserve Money	89%	23%	Reserve Money	1%	57%
Foreign Exch. Reserves	1%	99%	Foreign Exch. Reserves	43%	99%
No Obs:	174		No Obs:	157	
Period:	1970Q1-2013Q4		Period:	1970Q1-2009Q3	
Qatar			Oman		
10th Quarter Variation	Reserve Money	Foreign Exch. Reserves	10th Quarter Variation	Reserve Money	Foreign Exch. Reserves
Reserve Money	84%	16%	Reserve Money	76%	24%
Foreign Exch. Reserves	3%	97%	Foreign Exch. Reserves	12%	92%
No Obs:	141		No Obs:	127	
Period:	1971Q1-2013Q4		Period:	1972Q1-2009Q2	
UAE			Canada		
10th Quarter Variation	Reserve Money	Foreign Exch. Reserves	10th Quarter Variation	Reserve Money	Foreign Exch. Reserves
Reserve Money	90%	10%	Reserve Money	N/A	N/A
Foreign Exch. Reserves	3%	97%	Foreign Exch. Reserves	N/A	N/A
No Obs:	152		No Obs:		
Period:	1974Q1-2009Q3		Period:	1970Q3-2008Q4	

[10]The reported variations are for the 10th period. The shocks are horizontal and the variables, which are affected from these shocks, are listed vertically.

Table 7: Variance Decomposition Table11 (Foreign Exchange Reserves, Reserve Money Shocks, and their Responses) cont'd…

Venezuela					
10th Quarter Variation	**Reserve Money**	**Foreign Exch. Reserves**	*10th Quarter Variation*	**Reserve Money**	**Foreign Exch. Reserves**
Reserve Money	57%	43%	**Reserve Money**	70%	30%
Foreign Exch. Reserves	6%	94%	**Foreign Exch. Reserves**	4%	96%
No Obs:	67		**No Obs:**	95	
Period:	1970Q1-1987Q4			1988Q1-2013Q4	
Nigeria					
10th Quarter Variation	**Reserve Money**	**Foreign Exch. Reserves**	*10th Quarter Variation*	**Reserve Money**	**Foreign Exch. Reserves**
Reserve Money	15%	85%	**Reserve Money**	86%	14%
Foreign Exch. Reserves	7%	93%	**Foreign Exchange Reserves**	17%	83%
No Obs:	47		**No Obs:**	103	
Period:	1970Q1-1982Q1		**Break: 1982Q2**	1982Q2-2009Q2	
Norway			**Iran**		
10th Quarter Variation	**Reserve Money**	**Foreign Exch. Reserves**	*10th Quarter Variation*	**Reserve Money**	**Foreign Exch. Reserves**
Reserve Money	87%	13%	**Reserve Money**	54%	46%
Foreign Exch. Reserves	1%	99%	**Foreign Exch. Reserves**	2%	98%
No Obs:	112		**No Obs:**	138	
Period:	1970Q1-2006Q4		**Period:**	1970Q1-2010Q4	
Russia					
10th Quarter Variation	**Reserve Money**	**Foreign Exch. Reserves**			
Reserve Money	99%	1%			
Foreign Exch. Reserves	90%	10%			
No Obs:	50				
Period:	1994Q1-2008Q4				

[11]The reported variations are for the 10th period. The shocks are horizontal and the variables, which are affected from these shocks, are listed vertically.

4.2. The Oil Prices and M2 (reduced form OLS estimates)

This last section explores the effects of a change in oil prices on the money supply, where the results vary depending on the exchange rate regime.

The (reduced-form) OLS estimates of the restricted structural VECM suggest that there is a strong positive and statistically significant relationship between the oil prices and money supply for Oman, Nigeria, Venezuela, and Russia, with fixed/managed floating exchange rates. The positive response of reserve money from foreign exchange reserve shocks eventually make their way into the money supply for Oman, Russia, Nigeria, and Venezuela, which the reduced-form OLS estimates suggest.

Basically, oil exports affect the money supply of Oman, Nigeria, Venezuela, and Russia through bank reserves (see, Section 5.1.5), in common with Mundell (1963), Mussa (1976), Cuddington (1989), and Edwards (1986), who argue that foreign exchange reserve inflows from commodity booms will cause an expansion of the domestic monetary base and broader monetary aggregates (M2) in countries where there is either a fixed or a managed floating exchange rate. In Saudi Arabia, Kuwait, Qatar, Bahrain, and Iran, there is not a positive and a statistically significant relationship between the oil prices and M2, despite an increase in reserve money from foreign exchange reserves, which could be explained by some form of sterilization, in accord with Cuddington (1986), who argues that sterilization can reduce the money multiplier, and its larger effect on broader monetary aggregates.

In Canada and Norway, there is not a positive response of money supply to changes in oil prices, in common with Mundell (1963) and Mussa (1976), who argue that the money supply does not respond to an external shock, such as the oil prices, rather only does the exchange rate.

4.3. Order Dependence of Variables in the Structural VECMs

Are the VECM results order-dependent and robust?

A Structural VECM with Real Government Spending, Real GDP, Real Exchange Rates, and Real Oil (exogenous):

When the order of variable is changed from Real Government Spending, Real GDP, and Real Exchange Rates to Real GDP, Real Government Spending, and Real Exchange Rates, the results are insensitive to ordering for most of the oil exporters, except for Oman and Iran[12], for the reasons discussed below.

The new ordering of variables for Oman is counterintuitive to economic intuition, which shows that the government spending shock has a strong positive effect on output, in contrast to the more commonly observed and anticipated pro-cyclical fiscal policy response for the developing countries. (See, Kaminsky, Reinhart, and Vegh (2004)).

For Iran, the new ordering makes a clear difference to the policy outcome, with a positive effect of a real output shock on real government spending, which is more consistent with a pro-cyclical fiscal policy stance of developing countries, whereas before there was not a positive response of real government spending to a real output shock, with the initial order of variables.

The existing order of variables remains reasonable for a group of oil exporters. Under the Choleski decomposition, the order of variables goes from Real Government Spending to Real Output in the structural VECM equations of each country, where fiscal shocks are exogenous with respect to output, in common with Rotemberg and Woodford (1992), Fatas and Mihov (2001), Blanchard and Perotti (2002), Burnside et al. (2004) and Mountford and Uhlig (2008), who use the same order of variables in their VAR models.

A Structural VECM with GDP, M2, Inflation, and Oil (exogenous):

With a change in variables from GDP-M2-INF to M2-GDP-INF, the results are virtually the same, which allows me to conclude that the existing order of variables remains the most reasonable for all twelve oil exporters examined in this paper, in common with Bernanke and Blinder (1992), Bernanke and Mihov (1995), Christiano, Eichenbaum, and Evans (1994b), who assume the results are relatively insensitive to the ordering.

Next, I seek to find out whether a variable such as an economic activity is exogenous with respect to M2. For a variable to be exogenous, the variable cannot be affected either by contemporaneous or past values of any other endogenous variable, shown in the variance decomposition results. If one or more variables explain a significant portion of the forecast error variance decompositions of a variable at all forecast horizons, then the order of variables may not be correct, which may mean that GDP is not entirely exogenous with respect to M2. For UAE, Oman, Iran, and Nigeria, M2 shocks explain only a small amount of the fluctuations in GDP, which makes GDP exogenous.

Lastly, this paper tests for three key assumptions in the ordering of the endogenous variables, which has not been done before in the academic literature: a). policymakers have contemporaneous information about non-policy variables, such as GDP and CPI, whereas a policy variable, such as M2, is ordered last, with the equation ordered from GDP-CPI-M2, b). policymakers know only the lagged values of non-policy variables, with the order of variables that goes from M2-GDP-CPI, and c). policymakers have contemporaneous information about a non-policy variable

[12]The restricted VECM results with a new order of variables from real GDP to real government spending and real exchange rates are available upon request.

such as GDP, but a monetary aggregate, such as M2, predicts another non-policy variable CPI (implying that CPI is ordered last), with the order of variables that goes from GDP-M2-CPI, which is known as the existing order of variables.

Bernanke and Blinder (1992), Bernanke and Mihov (1995), Christiano, Eichenbaum, and Evans (1994b) use "assumption a" from above, where the non-policy macroeconomic variables, such as GDP and CPI, are ordered first before any other policy variable, such as a monetary aggregate, M2. The non-policy variables, GDP and CPI, affect M2 contemporaneously and through their lagged values, whereas only the lagged values of a policy variable, such as M2, affect the non-policy variables, such as GDP and CPI. The assumption here is that the policy shocks, such as the federal funds rate, total bank reserves, or the money supply do not affect any of the macroeconomic variables contemporaneously, but only with a lag. This identification scheme has been widely used in the developing countries.

I obtained relatively similar results under all three assumptions. However, the original ordering of variables (GDP-M2-INF) makes the most sense for a group of twelve major oil exporters.

5. Conclusion

The economies of oil-exporting countries may respond to oil shocks differently, depending on their political economic systems, including their regional economic alliance, stage of economic development, and the exchange rate regime. This paper tracks a vector of macroeconomic variables (real government spending, real output, real exchange rates, inflation, foreign exchange reserves, reserve money, and money supply), in response to oil price shocks, and analyzes whether any of these macroeconomic variables behave differently given the political economy factors. This paper concludes that the political economy factors explain why the economic indicators of the twelve major oil exporters to behave differently.

Most importantly, the focus of this paper is entirely on a group of oil exporters, unlike many other papers that focus on industrialized economies, which import oil. This paper separates oil exporters into two distinct categories, the GCC countries and the non-GCC oil exporters. This categorization of oil exporters is important, since the GCC countries share a political and economic alliance and their economies are largely oil dependent, with currencies (other than that of Kuwait) formally pegged to the US dollar. Unlike the GCC countries, the non-GCC oil exporters do not participate in any common political alliance or an economic union. Their economies are diversified and less dependent on oil exports. To my knowledge this type of categorization for oil exporters has not been done before in the academic literature.

I treat real oil as exogenous in the four-variable restricted structural VECMs of this paper, since no country influences the price of oil, maybe other than for Saudi Arabia. Such a treatment not reported in the academic literature results in a significantly high R2. I would like to add that other academic literature treats oil as endogenous[13].

This paper has reached several conclusions supported by economic reasoning and empirical evidence.

First, there is not a positive estimated response of real economic activity to real government spending shocks for eight out of the ten oil exporters (out of the ten countries with available government spending data), which suggests that countercyclical fiscal policy does not play a role in determining output for most the oil-exporting countries, except for Iran and Canada. These results are consistent with the economic reasoning that fiscal policies of developing countries tend to be pro-cyclical rather than countercyclical.

Some recommendation for future research would include whether there was any countercyclical fiscal policy implemented by developing oil-exporting countries for the 1970-2013 period, other than for Norway and Canada.

Second, real oil prices affect the real exchange rates of the GCC countries, but a real exchange rate appreciation for these countries with fixed exchange rate regime comes primarily in the form of inflation, rather than a nominal exchange rate appreciation. Contrary to the purpose of achieving low inflation under a fixed exchange rate regime, the GCC countries experienced significant inflation for the 1970-2013 period.

Third, money is endogenous in oil-exporting countries with fixed or managed floating exchange rates, including the GCC countries, Iran, and Venezuela; however, money is not endogenous in oil-exporting countries with floating exchange rates, such as Canada, Norway, and Nigeria.

Further research might extend the VAR analysis and empirical research to other countries with fixed or managed floating exchange rate regimes to find out whether money is endogenous for these countries and not for countries with floating exchange rates.

Fourth, there is a strong positive effect of oil price shocks on the foreign exchange reserves of the GCC countries, consistent with the restrictions of a fixed exchange rate regime under the conditions of a Mundell-Fleming model, whereas the effect of oil price shocks on foreign exchange reserves has been almost non-existent for the non-GCC oil exporters (except for Nigeria). This maybe because the non-GCC oil exporters (with flexible exchange rates) have significant leeway in investing their foreign exchange reserves.

Lastly, the foreign exchange reserves have a strong positive effect on the reserve money of the GCC countries, Venezuela, and Iran, which are countries with either fixed or managed floating exchange rates, whereas in countries with a purely floating exchange rate regime, such as that of Canada, Norway, and Nigeria[14], the response of reserve

[13]See, Bernanke B., Gertler M., and Watson M. (1997), Blanchard and Gali (2007), Kilian (2009), and Kilian (2010) for use of endogenous oil prices.

[14]Nigeria adopted a floating exchange rate in 1986.

money to a foreign exchange shock has been almost non-existent, either due to weak or no impact of foreign exchange reserves on reserve money.

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Knowledge as an Object of Transfer Cooperation between Enterprises Foreign and Domestic

Magdalena Byczkowska†[1], Anna Majzel[1],

[1] Department of of Economics, The Jacob of Paradyz University, Poland

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ABSTRACT

Purpose:
The aim of the considerations undertaken in this article was to identify the issues concerning the scope and effects of cooperation between companies with foreign capital and domestic entities of foreign direct investment and to identify the scale of impact of foreign companies operating in Poland on domestic entities in the sphere of knowledge.

Design/methodology/approach:
The main survey was conducted in 2017 and covered a group of 120 foreign enterprises from the list of the largest foreign investors in Poland, drawn up by Polish Information and Foreign Investment Agency (PAIiIZ). As part of the conducted survey, a targeted selection was applied, which guaranteed a selection corresponding to specific survey criteria. The measurement tool was a survey questionnaire, which contained both open and closed questions. In the case of the majority of closed questions, it was possible to add own answers to the proposed variants, not provided by the Author.

Findings:
By penetrating domestic economies, they bring not only such an important capital, but a whole package of added values, which are worth mentioning, among others: knowledge, managerial skills or an increase in the level of innovativeness of enterprises.
The importance of foreign direct investment, as one of the most important factors in the modernisation of the domestic economy, is all the greater the scarcity of domestic financial resources prevents actions to improve the country's competitiveness, but also when it is not possible to create innovations on one's own. An opportunity to bridge the gap in economic development (including the technology gap) of less developed or developing countries is precisely the activity of international companies, which are a form of foreign direct investment. This is because they bring with them the transfer of technology and knowledge, which are stimuli for innovation and development of the modern economy.

Research limitations/implications:
One of the most basic and uncontrolled constraints is the limited access to data related to the survey - (data protection by enterprises), - original sample selection - The group of investors was selected by comparing the list of the Polish Information and Foreign Investment Agency (PAIiIZ) - the 500 largest foreign investors in Poland, and the list of "Fortune" magazine - the 500 largest corporations in the world classified by value of income. Apart from direct impact on the economy of a given country, foreign investment may also have an indirect impact (portfolio investment) - the method of quantification of data collected by financial institutions has often made it impossible to distinguish between these two streams of foreign capital.

Originality/value:
The study carried out by the author of the dissertation is in itself a significant contribution to the development of FDI methodology in Central and Eastern Europe. The most significant results representing the scientific novelty of the dissertation include the following elements: determining the impact of FDI on the formation of business systems related to the broadly understood knowledge and skills of the company - including the management and organization system, quality management, and employment.

†Corresponding Author: Magdalena Byczkowska
Email: magdabyczkowska@wp.pl

1. Introduction

Modern technology, knowledge and investment in people are nowadays important, if not the most important factors for the long-term development of enterprises. Investments in these aspects of increasing corporate value significantly determine their national competitive advantage. Not without significance in this case are the links and cooperation of domestic companies with companies with foreign capital. It is their expansion that is attributed, among others, to filling the gap of capital shortage, transfer of modern technologies, knowledge and skills or diffusion of modern organizational solutions. Therefore, the aim of this study was to identify the scale of cooperation between domestic and foreign companies, as well as the degree of impact of this cooperation in terms of knowledge and skills transfer.

The article uses indirect measurement methods (research questionnaire), comparison and literature review. The choice of these methods was determined primarily by the type of research materials available. The method of indirect measurement was used to diagnose the transfer of knowledge to domestic enterprises, while the comparative method was used primarily to confront different points of view related to the topic of the role of foreign capital. Whereas the literature review was carried out in order to characterize the latest achievements related to the undertaken issues, which were presented in the scientific publications in question.

2. Implementation of the study

The main survey was conducted in 2017 and covered a group of 120 foreign enterprises from the list of the largest foreign investors in Poland, drawn up by Polish Information and Foreign Investment Agency (PAIiIZ). As part of the conducted survey, a targeted selection was applied, which guaranteed a selection corresponding to specific survey criteria.

The measurement tool was a survey questionnaire, which contained both open and closed questions. In the case of the majority of closed questions, it was possible to add own answers to the proposed variants, not provided by the Author. Entrepreneurs marked their chosen answer variants with an appropriate sign or assigned them a specific scale of importance by assigning the given values. The data obtained in this way were developed on the basis of the number of answers given to a given question.

The questionnaire consisted of three main parts and the so-called tag, where respondents were asked to provide basic information about the company.

The main parts of the questionnaire are:

- Part I - Cooperation of undertakings.
- Part II - Innovative activities and technology transfer.
- Part III - Transfer of knowledge.

The research process included the following methodological approach:

A. desk research - it included the collection and analysis of available information and a review of previous research on the state of innovative potential of entrepreneurship in Poland, as well as the activities of companies with foreign capital in this respect; the research also provided information used in building research questions;

B. questionnaire survey - in order to maximise the effectiveness of the survey, the designed survey tool was previously checked in a pilot study, which allowed to verify the accuracy and comprehensibility of the questions included in the questionnaire, as well as to verify the correctness of its general structure.

As a result of the actions taken, 45 correctly completed research questionnaires (out of 120) were returned, which means a return of 37.5% and allows the results to be generalised to the whole community. Among the 45 companies that took an active part in the survey were large companies with an average employment of 565 people. In the surveyed sample, the majority of companies with foreign capital and those with a majority share of foreign capital (over 80%) prevailed. Information on the share of foreign capital in the surveyed group of companies is presented in Table 1.

Table 1: Share of foreign capital in the surveyed group of enterprises

Share of foreign capital	Number of enterprises	
	Absolute	In %
Up to 50%	1	2,2%
51%-75%	2	4,4%
76%-90%	4	8,9%
91%-99%	16	35,6%
100%	21	46,7%
No answer	1	2,2%
Total	45	100%

Source: (Researcher, 2017)

The vast majority of investors who engaged capital in the surveyed companies came from the European Union (81%). The majority of them were investors from the European Union (81%): Germany, France, Sweden, Holland. From outside the EU structures, capital came from Switzerland and the USA (Table 2).

Table 2: Country of origin of foreign investor of enterprises constituting the research sample

Number	Country	**Number of enterprises**	
		Absolute	in %
1.	Germany	17	37,8
2.	France	8	17,8
3.	Holland	6	13,3
4.	Italy	4	8,9
5.	Switzerland	3	6,7
6.	USA	3	6,7
7.	Denmark	1	2,2
8.	Spain	1	2,2
9.	UK	1	2,2
10.	Austria	1	2,2
Total	Total	45	100

Source: (Researcher, 2017)

Due to large diversification of location of enterprises with foreign capital participation in Poland, the number of questionnaire questionnaires per each voivodship was drawn with a probability proportional to the number of active enterprises in a given layer. The number of conducted interviews in particular voivodships is presented in Table 3.

Table 3: Percentage distribution of the surveyed enterprises in particular voivodships

Voivodships	%	Voivodships	%	Voivodships	%
dolnośląskie	8%	mazowieckie	17%	świętokrzyskie	2%
kujawsko-pomorskie	3%	opolskie	2%	warmińsko-mazurskie	5%
lubelskie	4%	podkarpackie	4%	wielkopolskie	11%
lubuskie	5%	podlaskie	2%	zachodniopomorskie	4%
łódzkie	7%	pomorskie	5%	świętokrzyskie	2%
małopolskie	8%	śląskie	13%		
TOTAL	100%				

Source: (Researcher, 2017)

Additionally, when interpreting the results, the classification of provinces into regions with different levels of investment attractiveness was used. Each voivodship belongs to one of four classes of voivodship determined by the degree of investment risk. Below is the Investment Risk Map, on the basis of which the classification was made. Class A - provinces of highest investment attractiveness Class B - provinces of medium investment attractiveness Class C - provinces of low investment attractiveness Class D - provinces of lowest investment attractiveness (Table 4, Map 1).

Table 4: Investment attractiveness of Poland

Voivodships	mazowieckie	śląskie	wielkopolskie	dolnośląskie	zachodnipomorskie	małopolskie	lubuskie	łódzkie	pomorskie	kujawsko-pomorskie	opolskie	podkarpackie	warmińsko-mazurskie	świętokrzyskie	podlaskie	lubelskie
Class	A	A	B	B	B	C	C	C	C	C	C	D	D	D	D	D

Source: (1)

Map 1: Investment attractiveness of Poland

Source: (1)

Foreign enterprises surveyed represented mainly the industrial sector - industrial processing (51%), financial intermediation (20%) and trade and repairs (13.3%). The activities of the remaining 15.7% of respondents focused mainly on transport, warehouse management and communications, construction and hotel and catering activities (Figure 1).

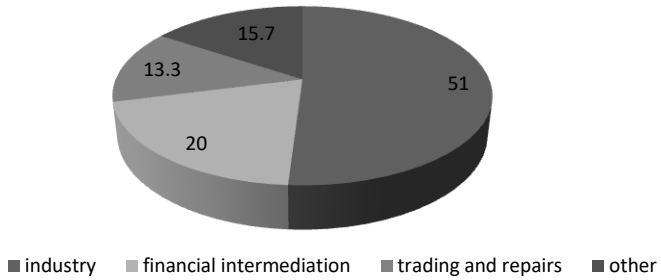

Figure 1: Structure of the surveyed enterprises by sections of the Polish Classification of Activities (in %)

Source: Research Data (2017)

Taking into account the above, foreign companies representing the following sections of the Polish Classification of Activities took part in the survey - Table 5.

Table 5: Structure of the surveyed enterprises

SECTION D	MANUFACTURING
SECTION F	CONSTRUCTION
SECTION G	TRADING AND REPAIRS
SECTION H	HOTELS AND RESTAURANTS
SECTION I	TRANSPORT, STORAGE AND COMMUNICATION
SECTION J	FINANCIAL INTERMEDIATION
SECTION K	REAL ESTATE, RENTING AND SERVICES RELATED TO DOING BUSINESS

Source: (Researcher, 2017)

Among the surveyed foreign entities, the vast majority were new enterprises, created from scratch. They prevailed both in the industrial and service sectors, dominating the sections of the economy represented in the study. Much less often foreign investors built new enterprises together with Polish capital, creating the so-called joint venture. The form of entry into the Polish market is presented in Table 6.

Table 6: Form of entry into the Polish market

Description	Number of enterprises	
	Absolute	In %
Greenfield investments	31	68,9
Joint- venture	7	15,5
Acquisition	2	4,4

No data	5	11,1
Total	45	100

Source: (Researcher, 2017)

The obtained results allow for the implementation of the set objectives, and in particular the cooperation of foreign enterprises with the entities of the country of deposit, the innovative activity of enterprises with foreign capital and the transfer of knowledge and skills by them.

3. Knowledge as a subject of business cooperation transfer

Knowledge transfer is the process of finding, assessing, validating, applying, improving knowledge and creating routines. According to W. Grudzewski and I. Hejduk (Grudzewski, Hajduk, 2004), the use of knowledge is not possible without its transfer, and in turn, knowledge transfer is not possible without its prior location. Location of knowledge is based on reaching people who have the necessary knowledge and are able to transfer it to others without delay. The literature highlights the fact that cooperation between companies strengthens the sharing of knowledge. The tools used in this process include: training of employees in different organizations, exchange of experienced staff, exchange of documents, diagrams or computer programs, as well as information about the organizational structure. Knowledge transfer between organisations can therefore take place by moving people, technology or structures between cooperating entities (Argote, 1999).

Surveys conducted among a group of foreign companies showed that they were active in activities aimed at knowledge transfer between their closest partners. Companies in the vast majority (nearly 80%) declared that they had established and respected the rules of cooperation with their closest partners, which facilitated knowledge transfer, especially during the initial operation on the market Companies were also willing to share knowledge with their direct partners (73%), which means that despite the high degree of formalisation, these companies were ready to exchange knowledge as part of cooperation- Figure 2.

Figure 2: Active in knowledge transfer activities (in %)

Source: Research Data (2017)

Among the directions of cooperation, within the framework of knowledge transfer, of foreign enterprises with the enterprises of the country, there are: organization of occasional events for employees and direct cooperators (44.4%), inviting direct cooperators to participate in the research (37.8%), conducting consultations, transferring technical information, sharing know-how (31.1%), participation in projects organized by direct cooperators (31.1%), exchange of information between employees and further cooperators. (26.2%), contacts with competitors in order to access their knowledge (22.2%), sharing know-how and technologies with direct partners (22.2%), visits of partners in order to present the principles of the company's operation (20%), organization of courses, trainings attended by employees of partner companies (20%) and sharing of commercial information (11.1%).-Figure 3.

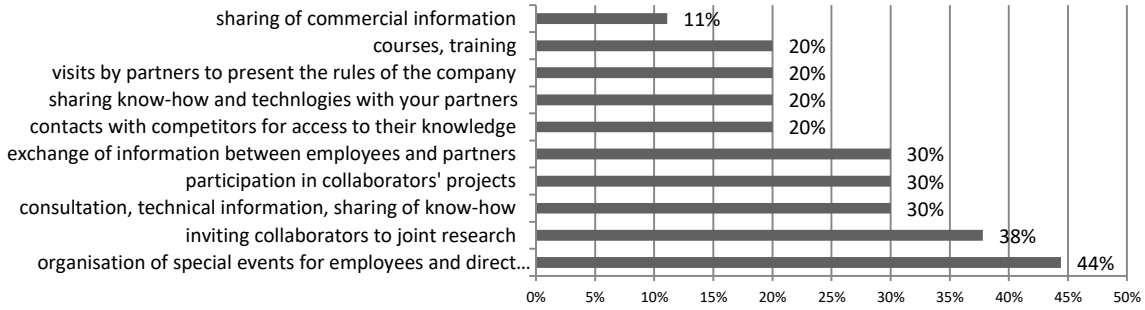

Figure 3: Areas of cooperation between partner enterprises in the framework of knowledge transfer (in %)

Source: Research Data (2017)

Within the framework of knowledge transfer between foreign and domestic enterprises, the methods and techniques used in this respect were also identified. They were evaluated in terms of: comprehensibility, effectiveness, and usefulness of the knowledge transferred through them. The average assessment of the importance attributed by the respondents to the methods and techniques in question is presented in Table 7. The higher the average value and

closer to a 5.0 rating, the companies surveyed attributed more importance to the method. On this basis, the methods and techniques considered to be key in terms of knowledge transfer were identified (mean score of at least 4) and those of lesser importance (mean score below 4).

Table 7: Importance attributed to knowledge transfer methods and techniques

KNOWLEDGE TRANSFER METHODS AND TECHNIQUES	FOREIGN COMPANIES N=45
FACE-TO-FACE CONSULTATIONS	4,31
CALL CENTRES	4,28
TRAININGS	4,28
CONTACT BY ELCTRONIC MAIL	4,24
CCESS TO TECHNICAL DOCUMENTATION	3,95
E-LEARNING	3,93
JOINT RESEARCH	3,75
ACCESS TO EXPERTISE ON THE WEBSITE	3,62
MEETINGS IN EMPLOYEE (TASK FORCE) TEAMS	3,55

The scale of answers: 1 - I do not agree, 2 - I partially disagree, 3 - I do not have an opinion, 4 - I partially agree, 5 - I agree

Source: Research Data (2017)

The qualitative research carried out has shown that the knowledge transfer methods and techniques used demonstrate the complexity and diversity of their application. The most important knowledge transfer methods and techniques were identified as those that take the form of direct or indirect contact with the "source of knowledge": direct consultations, telephone consultations, participation in training courses and e-mail contact. Less crucial were identified as: access to technical documentation, e-learning, joint research, access to expertise on the website or meetings in teams..

The research carried out also showed that the imported knowledge had an impact on the company's functioning and management process.

The impact on the company's management and organisation system was confirmed by as much as 80% of the companies surveyed. According to them, the most changes took place in the sphere of quality management (36%). Slightly fewer changes were observed in the sphere of research management and the development of the company (25%), as well as in the sphere of information management (25%). Changes in personnel management were indicated by 20% of the surveyed entities. According to the respondents, the least changes occurred in the area of occupational health and safety management (11%) (Figure 4).

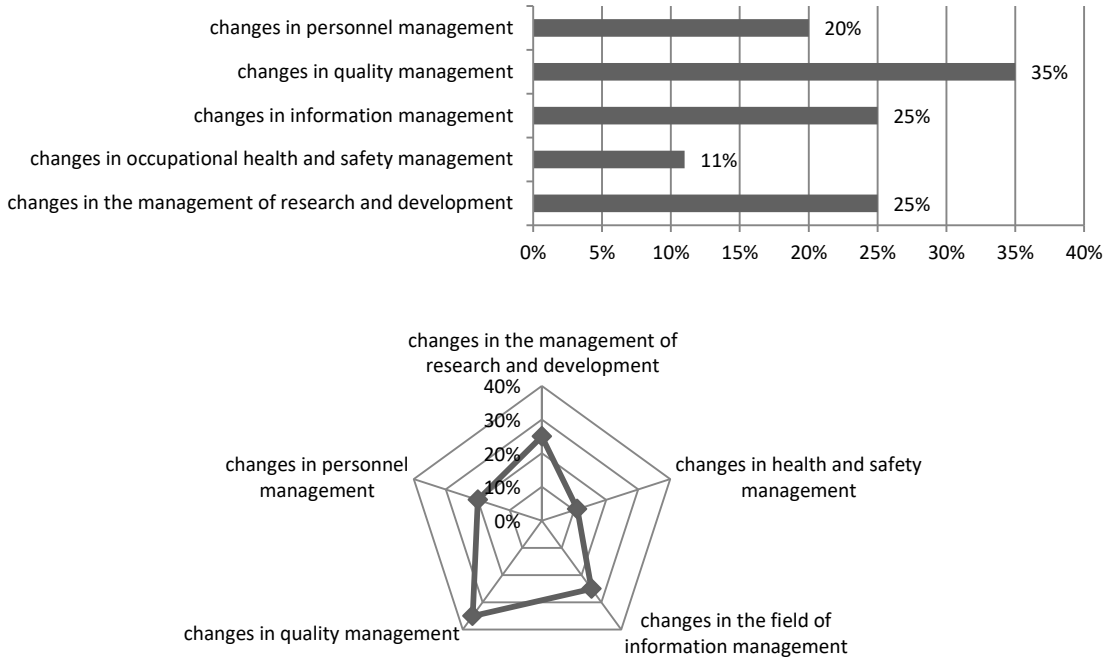

Figure 4: Company management and organisation system and foreign capital inflow (in %)

Source: Research Data (2017)

In the sphere of quality management, the impact of imported knowledge was visible in processes related to: process and service quality improvement (40%), quality certification (25%) and in improving the qualifications of personnel responsible for improvement and quality control (23%)-Figure 5.

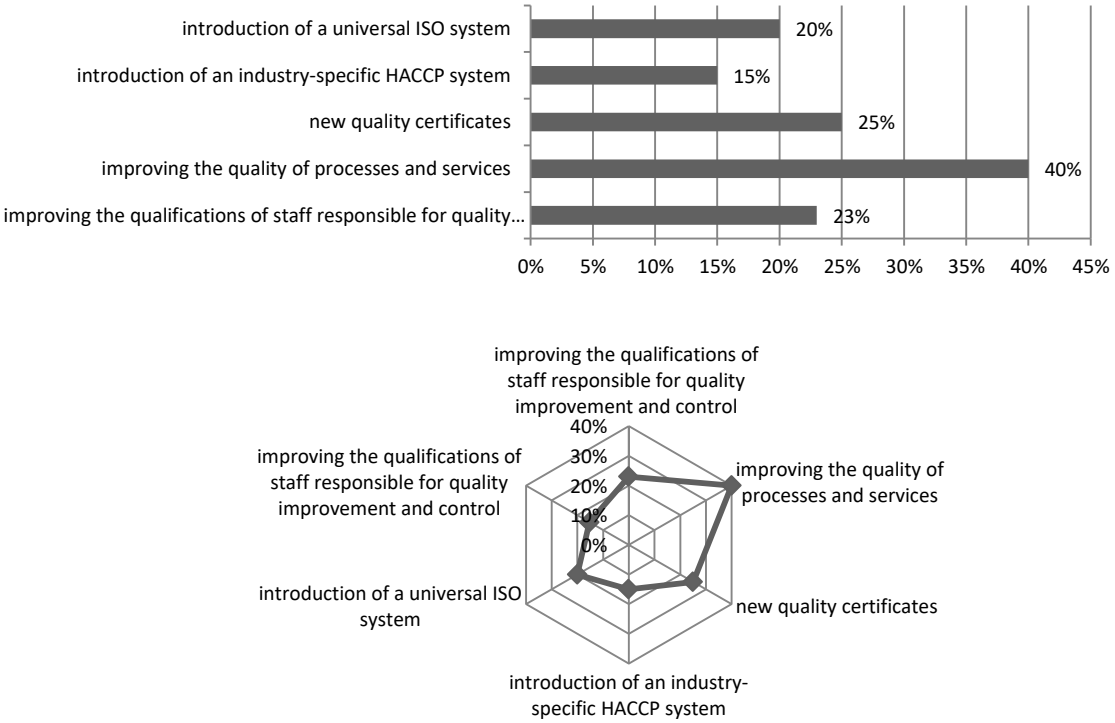

Figure 5: Changes in quality management in the surveyed group of enterprises caused by the inflow of foreign capital (in %)

Source: Research Data (2017)

On the other hand, in the sphere of information management, which allows for better organization and quicker reaction to all types of problems of the company, the impact of the transferred knowledge concerned mainly: introduction of a more efficient organization of the information management system (25%), as well as a system responsible for the security of processed data (23%) and more efficient satisfaction of the management's information needs (23%) Figure 6.

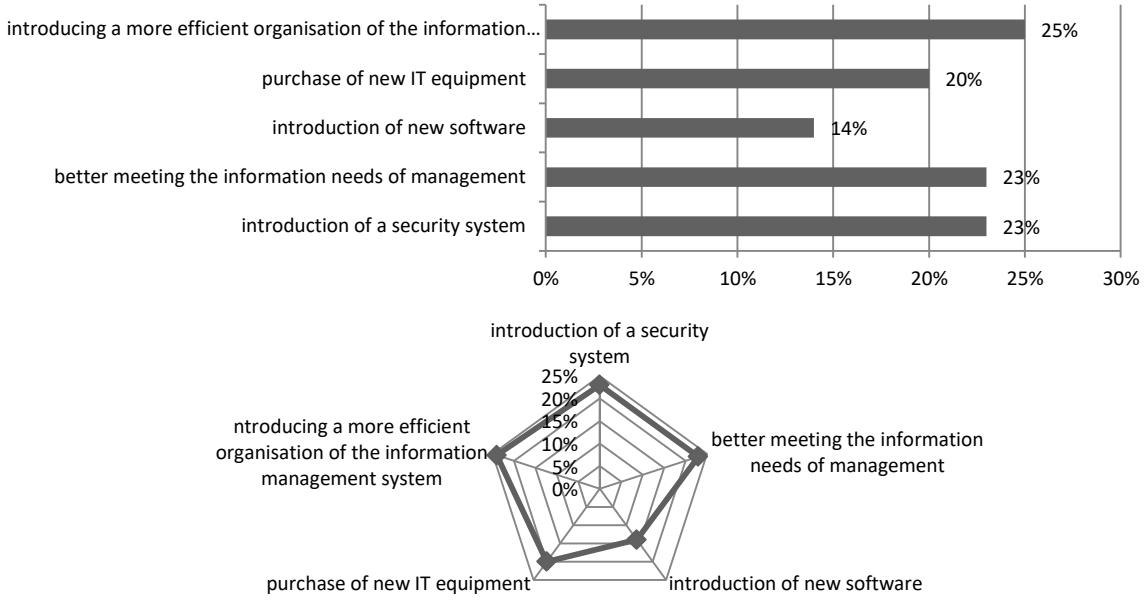

Figure 6: Influence of foreign capital in the form of FDI on changes in the sphere of information management in the enterprise (in %)

Source: Research Data (2017)

In terms of employment, on the other hand, imported knowledge has influenced primarily: employment policy, labour productivity and the level of qualifications of employees (Figure 7).

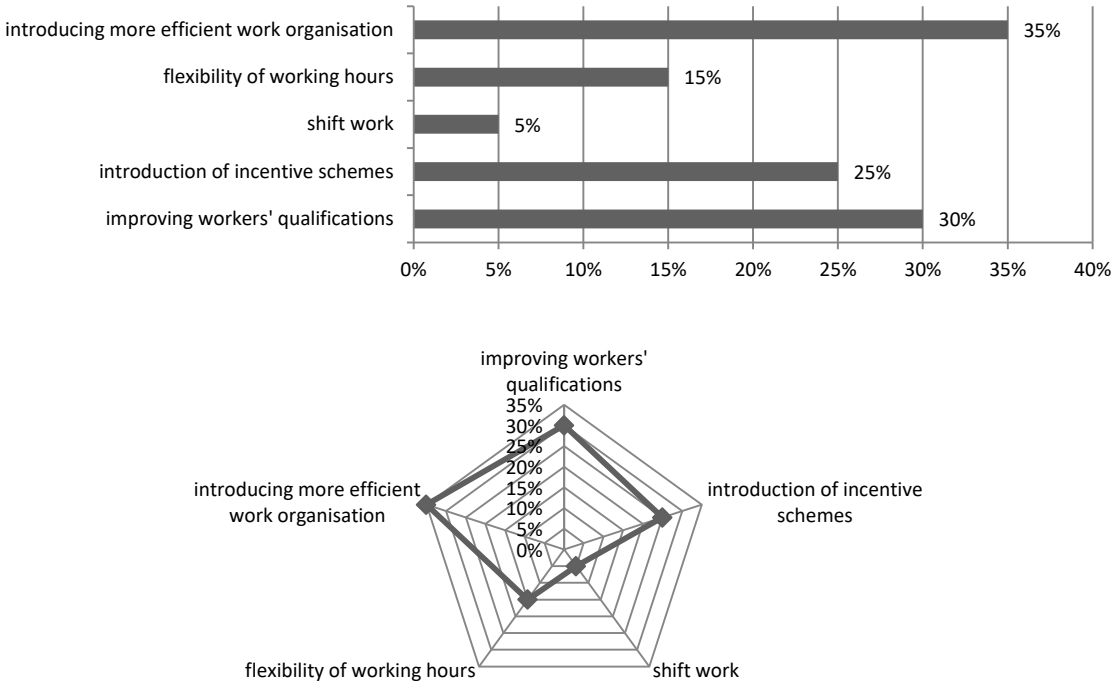

Figure 7: Impact of FDI on the employment policies of the enterprises participating in the survey (in %)
Source: Research Data (2017)

The qualitative research was aimed at illustrating and deepening the analysis of the internationalisation process in the context of activities supporting knowledge transfer. The following conclusions can be drawn from the analysis:

- Foreign companies established contacts with other entities, thanks to which they had access to specific knowledge, which made it easier for them to start up on the market;
- Internationalisation companies have established contacts with suppliers and buyers in order to access their technology and share their knowledge with their closest partners.;
- The most frequently used tools supporting knowledge transfer include: direct consultations or participation in vocational training.;
- Imported knowledge had an impact on particular spheres of business activity: quality management, information management, employment policy;
- Knowledge transfer has had a positive impact on employment policy, in particular on labour productivity and employee qualifications.

4. Conclusion and Recommendations

Foreign direct investment plays an important role in the global economy. By penetrating domestic economies, they bring not only such an important capital, but a whole package of added values, which are worth mentioning, among others: knowledge, managerial skills or an increase in the level of innovativeness of enterprises.

The importance of foreign direct investment, as one of the most important factors in the modernisation of the domestic economy, is all the greater the scarcity of domestic financial resources prevents actions to improve the country's competitiveness, but also when it is not possible to create innovations on one's own. An opportunity to bridge the gap in economic development (including the technology gap) of less developed or developing countries is precisely the activity of international companies, which are a form of foreign direct investment. This is because they bring with them the transfer of technology and knowledge, which are stimuli for innovation and development of the modern economy.

It is clear from the research carried out that undertaking and development of cooperation between companies was important for them. This cooperation was desirable because it brought a number of benefits, including: increasing employment, presentation of management organization techniques, forcing qualitative changes through necessary adjustments, co-implementation of new projects, joint training of employees or exchange of commercial information. National business partners were also an important source of information about the local market, competitors and potential customers. This created an opportunity for companies to gain a competitive advantage on the market, as well as to gain knowledge about new solutions that enabled them to increase innovation in future activities.

The results of the research conducted among foreign companies also showed that they established contacts with other entities, thanks to which they had access to specific, unique knowledge, facilitating their initial activity on the market. Companies that were internationalising established contacts with suppliers and buyers in order to have access

to their technologies, but also shared their knowledge with their closest partners. The most frequently used tools supporting knowledge transfer were: direct consultations or participation in professional trainings, and the imported knowledge had an impact on such spheres of business activity as: quality management, information management, employment policy.

To sum up, it should be stated that the lack of domestic capital significantly limits the possibilities of dynamising the Polish economy. Therefore, it should be postulated that a more favourable investment climate be created, encouraging foreign investors to invest free capital here. It is also advisable to build a system of incentives stimulating, first of all, the inflow of foreign capital to areas having a decisive impact on the development of the economy - creating new jobs, extending the scope of new technologies and modern solutions in the area of management and organisation of economic activity, dynamising exports and, consequently, leading to an improvement in the competitiveness of the global economy.

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The Impact of the Entrepreneur and Firm Related Factors on Small and Medium Enterprise Sales Growth

Ajtene Avdullahi[1], Vjosa Fejza Ademi[2*]

[1] Doctor of Entrepreneurship and SMEs Management, University of Mitrovica "Isa Boletini" Kosovo

[2*] Doctor of Marketing Sciences – University of Prishtina "Hasan Prishtina" Kosovo

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ABSTRACT

Purpose:
In nowadays economy, the role of Small and Medium Enterprises (SMEs) is continually increasing as they represent the primary source of employment, economic development, poverty alleviation, new product development, and innovations. The SMEs' growth depends mostly upon its internal factors like the entrepreneur related factors and firm related factors. The main objective of this research is to explore how these internal factors influence SMEs' sales growth.

Design/methodology/approach:
For our research purpose, we have used a sample of 600 business owners of SMEs across Kosovo, and the multivariate regression analysis is developed to test the four hypotheses that we have set.

Findings:
In our research, we did not find any significant statistical relation for the positive effect of the entrepreneur's education on SMEs' sales growth. We found negative support to our hypothesis: Female Entrepreneurs will be positively related to SMEs' sales growth. Our research results indicate that variable Business age have an impact on the firm's sales, whereas, regarding the firm size, our results indicate that the bigger is the number of employees within a firm, the firm will experience the higher sales growth.

Research implications:
Based on our research results, we suggest that entrepreneurs should attend long-term and high quality training considering their positive effects on the firms' growth, whereas female entrepreneurs and managers should improve their management and business skills, cash flow and, technical skills and create sustainable networks.

Originality/value:
This paper will contribute to existing theory by filling the gap in the literature on the impact of the entrepreneur and firm related factors on small and medium enterprise growth with empirical evidence from a unique transitional country.

1. Introduction

SMEs are considered as a significant factor for economic growth in any economy. Their importance is well known worldwide as the generator of employment and innovations. In Kosovo the unemployment rate is the highest when compared to the other countries of the region. For the period from 2001 until 2019, the average unemployment rate in Kosovo was 34.69 percent, in the fourth quarter of 2001 reached an all-time high of 57 percent and in the third quarter of 2019, a record low of 24.50 percent was recorded (Trading Economics, 2020).

The unfavorable economic conditions in Kosovo disables the government to generate new working places and decrease unemployment. Therefore, the development of entrepreneurship and SMEs remains as the main provisions for economic growth, employment, and social welfare in Kosovo. The main purpose of this research is to identify how internal factors such as the entrepreneur related factors and firm related factors have an impact on SMEs' growth. This paper intends to identify which is the contribution of the entrepreneur's age and gender to SMEs growth and to explore the impact that the firm's age and size have on the SMEs' growth. Given the gap in the literature on the impact of the entrepreneur and firm related factors on small and medium enterprise growth from transition

* Corresponding Author: Vjosa Fejza Ademi
Email: vjosa.fejza@uni-pr.edu

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developing countries, the overall purpose of this research is to contribute to existing theory with empirical evidence from a unique transitional country – Kosovo.

2. Theoretical background

Firm's growth presents one of the main concerns of entrepreneurs and researchers for many decades: since it has been discussed and measured in many different ways (Davidsson and Wiklund, 2000). According to Penrose (1959), the term "growth" sometimes presents only an increase in an amount, e.g., growth in profit, sales, production, export, whereas sometimes, it is used indicating an enhancement in quality after a process improvement. Whetten (1987) has operationalized the distinction between growth and size, who indicated that size, is an absolute measure, while growth is a relative measure of size throughout time. Based on numerous theories, growth appear in many different forms of a company's operations, such as sales, market share, clientele, employment, and cash flow (Murphy et al., 1996).

After reviewing the literature from 48 empirical studies Gilbert et al., (2006) concluded that there is no single overriding measure of new firm growth, and the most important measures are in terms of employment, sales, and its share of the market. According to Robinson (1999) sales growth provides information about revenue trends throughout time and presents information on the acceptance level of the firm's products or services. Thus, sales present the most frequently used indicator of new firm growth (Murphy et al., 1996). When firms experience sales growth, it is supplied with revenues that can be directed towards increasing the resources or developing capabilities (Gilbert et al., 2006). However, we are interested in exploring the factors that influence the performance of firms. Based on the literature review, the main determinants of small business performance are the entrepreneur demographics and firm characteristics factors (Cragg and King, 1993). Whereas, the demographic characteristics of an entrepreneur such as age, gender, education, and previous experience in the industry, are essentials for business success (Khan et al., 2011). Entrepreneurship is traditionally associated with masculine traits and image (Gupta et al., 2009). Particularly, the dominance of a masculine stereotype associated with entrepreneurship may lead women to evaluate business opportunities less favourably (Gupta et al., 2009), as compared to men. According to Dimitriadis et al. (2018), studies conducted in the majority of Western countries identify three main barrier-types to female entrepreneurship, which are related to the socio-cultural status of women (which identifies the primary role of women with family and domestic responsibilities and reduces the credibility of women intent on setting up businesses in a variety of ways), the access to networks of information and assistance, and finally, access to capital. Also, based on research conducted in Montenegro, The male-self-employed population is 21.3% almost double of the female population at 8.9%, which is indicative of much less opportunity for the female entrepreneurs (Karadzic, Drobnjak, & Reyhani, 2015). Whereas in Kosovo's economy only 10% of the total businesses in Kosovo are owned by female entrepreneurs, and the majority of these enterprises are the micro and small business (Mehmeti, Dobranja, Hashani, & Beqiri, 2017).

As stated by Bartlett and Bukvic (2001), large firms were typically expected to have advantages over small firms and grow more rapidly due to economies of scale and scope. However, the numerous literature on research studies coming from different countries proves the opposite of these expectations. Hart (2000), has reviewed empirical research on the growth of U.K. and U.S.A companies. He pointed out that "most studies relating to periods since 1885 shows that small firms grow more quickly than larger firms".

In Germany, Alnus and Nerlinger, (2000), revealed a negative relationship between growth and firm size. Scholars have widely accepted the relationship between entrepreneurial orientation and firm performance. Anderson and Eshima (2013) investigated in Japan the influence of firm age and intangible resources to its respective rivals on the entrepreneurial orientation firm growth relationship among SMEs. They pointed out that the firms' age and its intangible resource would represent theoretically meaningful limited provisions on the entrepreneurial orientation firm growth relationship among SMEs.

By bringing the research from Kosovo, this study provides a contextualized view of the impact of the entrepreneur's gender and education as well as the firm's age and size on SMEs' growth in terms of firm's sales.

3. Research objective, methodology and data

The main research questions of this research paper are:

- What is the contribution of the entrepreneurs' age and gender to SMEs' sales growth?
- Does the firms' age and size have an impact on SMEs' sales growth?

Therefore, the following four hypotheses are set and ranked into two main groups. It is hypothesized that entrepreneurs' attributes, e.g., education and gender, will be positively related to SMEs' sales growth; thus, the following hypotheses were set.

Hypothesis 1: Entrepreneurs' education is positively related to SMEs' sales growth.

According to Bardasi et al., (2011), the relationship between entrepreneurial performance and gender is intriguing. Substantial gender-specific constrained obstacles hinder the performance of female entrepreneurs. Therefore, aiming to test whether this statement stands in our research, we hypothesized the following:

Hypothesis 2: Female Entrepreneurs are positively related to SMEs' sales growth.

Regarding the firm-related characteristics, e.g., Firms age and size we hypothesized the following

Hypothesis 3: The firms' age does not have any impact on the SMEs' sales growth.

Hypothesis 4: The firms' size is positively related to SMEs' sales growth.

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The methodological position of the research in this paper rests on the use of the quantitative methodology. Creswell (1994) stated that a quantitative study is explained as an inquiry into social or human problems based on testing a theory consist of variables, measured with numbers and, analyzed with statistical procedures in order to determine whether the anticipated conclusions of the theory hold. Quantitative research experts accurately emphasize measurement variables and test hypotheses, which relate to general causal explanations (Newman, 2006). In this research study the cross-sectional research design is adopted, by using quantitative data at one point in time.

For our research purpose, we will use secondary data gathered from Riinvest (a non-profit research institute of Kosovo), who developed a survey that was conducted with a representative sample of 600 business owners of SMEs across Kosovo in 2011. The sample is drawn using a random selection from the business register that was kept at the Tax Administration of Kosovo. The procedure for selecting the sample size and companies to be interviewed was performed by the Riinvest team in Excel using the random command. The sample was stratified by the size of the company's category.

For the research purpose, we will use a survey that was prepared and conducted by Riinvest. The data obtained from the questionnaire were analyzed using the designed linear regression econometric model for investigating the firms' sales influencing factors.

3.1 Measurement of Study Variables

3.1.1 Dependent Variable

According to the Law of Proportionate Effect or the Gibrat's rule of proportionate growth, the growth of a firm does not depend on the size of the firm (Rosli and Sidek, 2013). The law of Gibrat anticipates the firms' growth as a random effect that is independent of firms' size (Gibrat, 1931). According to the reviewed literature, employment and sales are, the most widely used indicators for a firms' growth (Davidsson, 1991; Delmar, 1997; Ardishvili et al., 1998; Weinzimmer et al., 1998; Wiklund 1998). According to Zhou and De Wit (2009), the most commonly used indicators are employment and growth in sales, mainly as they immediate changes in a firm in both: short-term and long-term, and as they are easy to obtain. Employment and sales are more objective measures compared to other indicators, such as market shares (Delmar, 1997). Thus, for research purposes in this chapter, we will measure the firms' growth in terms of SME sales.

3.1.2 Independent Variables

An independent variable is that variable that is changed and whose effects are measurable and compared. As seen in table 1 in this research, independent variables are grouped into two categories: human capital related variables and firm related variables.

Human Capital related variables

For our research purpose, we have chosen some of the characteristics of human capital as the first group of variables. Similar to some previous authors we argue that generic human capital applies to the knowledge that the entrepreneurs or employees obtain in regular education, whereas specific human capital applies to tacit knowledge and skills and that are less transferable (Gimeno et al., 1997; Hoxha 2013). According to Akinboade (2015), the increased level of owner's education is associated with improved turnover growth. We have included variable education as a proxy for general human capital. Entrepreneurs specified their educational level, we have measured their education on a three-point scale (ranging from 1=Elementary School, 2=Secondary School, and 3=University Degree, Master's, and Doctoral Degree). Moreover, we control for the gender of the entrepreneur (1=Male, 2=Female).

Firm related variables

Regarding the firm related variables, as Kimberley (1976) stated, the most widely used measure of size is the number of employees. Thus, we included the variable business size that presents the firm's number of employees. Variable business age (with this variable, we have measured the number of years since the firm has been founded) is also included.

Table 1. List of explanatory (independent) variables

Category	Variables	Definition
Human Capital	Gender	1=Male, 2=Female
	Education	1=Elementary School, 2=Secondary School and 3=University Degree, Master's and Doctoral Degree
Firm	Firms Age	Number of years the firm has been founded
	Firms Size	The number of employees in the firm in 2011 (indicate number)

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4. Results and discussion

In this chapter, the obtained results of this research are presented. Initially, in the regression analysis are introduced the correlations of the variables. Afterward, the research model about SMEs' growth in terms of sales is discussed.

The multivariate regression analysis was used to analyze the effect of independent variables on the dependent variable. The independent variables of this research paper are marked with X, namely X1 – Entrepreneurs education, X2 – Gender of Entrepreneur, X3 – Business age, X4 – Business size. Whereas, the dependent variable is marked with Y, which in our case, presents – Firm's sales. The dependent variable is metric, where this fact has prompted us to apply in our paper this econometric model presented below.

Below is presented the formula for calculation of the multivariable regression analysis (Trek, 2017):

$$Y = \beta o + \beta 1X1 + \beta 2X2 + \beta nXn \qquad (1)$$

In table 2 are presented the multivariate regression analysis.

Table 2. Multivariate regression analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.342[a]	.117	.111	.391

a. Predictors: (Constant), Entrepreneurs Education, Number of Employees, Gender of Entrepreneur, Business Age

As shown in Table 2, based on the data, the R-value (multivariate correlation coefficient) is R= 0.342; thus, we can conclude that it represents a relative satisfaction prediction level for dependent variable Y (firm's sales). The value of R squared (determination coefficient) is R2 = 0.117, and the calculated standard deviation is 0.391. The result of R2 = 0.117, shows that the independent variables (X) included in this model can interpret 11.7% of the variability of dependent variable Y, the firms' sales. Table 3 depicts the variance analysis statistical test - ANOVA.

Table 3. Results of the variance analysis statistical test ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.102	4	2.775	18.144	.000[b]
	Residual	83.674	547	.153		
	Total	94.775	551			

a. Dependent Variable: Firm Sales

b. Predictors: (Constant), Entrepreneurs Education, Number of Employees, Gender of Entrepreneur, Business Age

According to the data presented above in Table 3, we can conclude that the dependent variable Y (firm's sales) has significant relations with all independent variables X, with the value reaching F (4,547) = 18.144, and significance value p = 0.000 (that presents significant value, considering that the p resulted in being under the value of 0.05).

In table 4 are shown the test results of the independent variable in order to be discovered if there is any statistical significance between them. Aiming to reach our objective to investigate the influencing factors of the growth of SMEs in terms of SMEs sales in Kosovo, the large dataset based on the Riinvest SMEs Survey was employed to estimate the influence of a variety of factors affecting SMEs growth and performance, e.g., entrepreneurs attributes (gender and education) will be positively related to SMEs growth.

In table 4 are presented the results of linear regression model estimating factors influencing the firms' sales. The t-test is implemented in table 4, in order to support or reject hypotheses from H1 to H4. Based on our results on the level of significance, it detects two from four independent variables are statistically significant with the significance levels under p <0.05. The variables Number of Employees (p = 0.000) and Gender of Entrepreneur (p = 0.031) are statistically significant, while the p values were under the significance level required p < 0.05.

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Table 4: Results from the linear regression model

Variables in the equation

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.199	.090		13.266	.000
	Business Age	.002	.002	.047	1.170	.242
	Number of Employees	.009	.001	.311	7.702	.000
	Gender of Entrepreneur	-.116	.054	-.087	-2.164	.031
	Entrepreneurs Education	.036	.028	.051	1.269	.205

a. Dependent Variable: Firms' Sales

(Dependent variable is categorical *1= firm's sales <50.000; 2=firm's sales ≤2.000.000; 3=firm's sales ≤10.000.000 and 4=firm's sales>10.000.000*)

4.1 Entrepreneur related factors (gender and education)

The hypothesis H1: "Entrepreneur's Education will be positively related to SMEs' sales growth" is rejected, considering that the significance value result for the "entrepreneur's education" (independent variable), exceeds 0.05 as p = 0.205. Many authors elaborated on the impact that the entrepreneur's education has on SMEs' performance and growth. Akinboade (2015) indicates that the owners' level of education affects SMEs' efficiency. Besides, Bhutta et al., (2008) found a positive impact that education has on the firm's performance. Our results weakly support previous findings in developed countries (Storey, 1994; Greve and Salaff, 2003; Sapienza and Grimm, 1997; Akinboade 2015; Bhutta et al., 2008) and differ to some extent from previous findings in Kosovo concerning the negative impact of formal education of entrepreneurs on start-up growth and size (Hoxha, 2013). Most of the young entrepreneurs were educated during the war and pre-war period, whereas it was the decade of enforced measures and later armed conflict that caused the human damage that affected mainly the younger generation since they did not have proper access to primary, secondary and higher education.

Regarding our hypothesis on the positive impact of female entrepreneurs on SMEs sales, we found a negative impact of female entrepreneurs on SMEs' sales growth.

Besides, hypothesis H2: "Female Entrepreneurs will be positively related to SMEs' sales growth" is supported, being that its significance value of p = 0.031 is lower than the standard required for this value (p < 0.05). Further, the Beta B value = -.087 is a negative value, which shows the indirect relationship between these two variables.

According to Akinboade (2015), there is no relationship between gender and firm growth in terms of sales. Furthermore, some research papers suggest a positive association between firm growth and gender (Farrell and Hersch 2005). Hassan et al., (2016), attempting to examine the gender diversity effect among corporate boards on the market value, found that participation of women does have an association with raising the value of the market. Whereas, an earlier study found a negative relationship between firm growth and female on board (Shrader et al., 1997).

4.2 Firm related-factors (SMEs size and age)

According to Expósito and Sanchis Llopis, (2019), characteristics of a firm, such as firm age and size, are not major antecedents of the performance of a business, whereas the firms that seem to enjoy a higher probability of better performance in operational measures are only those of medium-sized ones. In our research, Hypothesis H3: "Bussines age does not have any impact on the firm's sales" is rejected, being that its significance value of p = 0.242 exceeds the standard p < 0.05, proving that these two variables do not have a significant statistical relation.

Hypothesis H4: "Firms size will be positively related to SMEs sales growth," is highly supported, considering that the significance value of p = 0.000 in under the standard required value of p < 0.05, which means that there are significant relations between these two variables indicating that which means the more employees the firm has will experience higher sales growth

5. Conclusion and Recommendations

In this research, our primary purpose was to identify how the entrepreneur related factors and firm related factors as internal factors have an impact on SMEs' growth. For our research purpose, the Riinvest data are used with a sample of 600 business owners of SMEs across Kosovo. In general, the research questions were set to investigate the contribution of the entrepreneurs' and firm related factors to SMEs' sales growth. Based on our curiosity and research interest, we have set four hypotheses to be tested. Concerning our first research question: "What is the contribution of the entrepreneur's education and gender to SMEs sales growth?" based on the research results, is revealed the importance of the entrepreneur's attributes, e.g., education and gender on SMEs sales growth. In our research, it was not identified any significant statistical relation for the positive impact of an entrepreneur's education on SMEs' sales

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growth. Our results are in line with Hoxha (2013) indicating that it is mainly due to the extreme condition of SMEs growth, where education has no significant role in the firm's growth or the quality of entrepreneur's education, probably lack to offer the practical skills that would enhance the entrepreneurs' capacity to manage the firm's growth and performance. In this research is evident the performance gap among male and female entrepreneurs that presents the main starting point to explore and increase the literature on gender gaps and female entrepreneurship. It can be concluded that if inefficiencies exist it means that in certain economies human capital is not being fully utilized and SMEs growth remains an issue with a particular focus for many researchers (Bardasi et al., 2011).

Our research results are in line with numerous previous research findings, whereas we found negative support to our hypothesis, "Female Entrepreneurs will be positively related to SMEs sales growth," which confirms the inverse relationship among these variables. Numerous research papers have elaborated on the obstacles that female entrepreneurs face while launching and managing their businesses. According to the findings from a study that was done by Gobagoba and Littrell, (2003), female entrepreneurs faced a variety of obstacles such as lack of management, business and, financial skills; technical skills; the ability to recruit qualified staff; the limited access to appropriate technology and, have difficulties in sustainable networking. Based on the evidence from the United States, it can be concluded that businesses owned by males are twice as larger than businesses owned by females, in terms of both assets and sales (Coleman 2007).

According to Robb and Wolken (2002), on average, female-owned businesses generate only 78% of the profits of comparable male-owned businesses. Besides, it is found that women lag behind the man to generate sales turnover, even in the same sector of industry (Loscocco and Robinson 1991; Chaganti and Parasuraman 1996).
However, many researchers found contrasting results, e.g. (Barbadasi et al., 2007) based on the World Bank Enterprise Surveys (2002-2006), found that when measured by total factor productivity and value-added per worker, businesses owned by females are at least as productive as those of male-owned businesses. Our results differ from Kepler and Shane (2007), indicating that there are no significant differences in gender in terms of the performance outcomes of startup entrepreneurs. Numerous literatures indicate that businesses owned by females do not lag in performance when comparing in terms of employment creation (Fischer et al., 1993; Chaganti and Parasuraman 1996) or survival rates in the market (Kalleberg and Kevin 2017; Bruderl and Preisendorfer 1998).

Concerning our second research question: Do the firms' age and size have an impact on the SMEs' sales growth? Our findings show that variable Business age have an impact on the firms' sales. Our research results are in line with Jovanovic's model (Jovanovic 1982) that introduces the growing dependency on age, considering that our findings do suggest that older firms have a higher level of sales growth compare to the younger firms and startups. Our last hypothesis in this research, "Firms size will be positively related to SMEs sales growth," is highly supported, strengthening the argument that our research does not hold the Gibrat Law.

Overall, the obtained results of this research paper have contributed to strengthening the existing theory with new evidence from human capital theory on the SMEs' performance, in a transition country. Based on our results regarding entrepreneurs' attributes, e.g., education on SMEs' sales growth, we did not find any significant statistical relation for the positive impact of an entrepreneur's education on SMEs' sales growth. Thus, we suggest that entrepreneurs and managers must attend long-term and high-quality trainings considering their positive effects on the firms' growth. Based on our results concerning female entrepreneurs and their negative impact on SMEs' sales growth, we suggest that female entrepreneurs and managers should improve their managerial and business skills, cash flow and, technical skills and create sustainable networks. Based on recent literature, the performance of female-owned businesses is increasing worldwide. Therefore, it is expected that this trend of the positive impact of female entrepreneurs on business performance will be evident very soon in Kosovo as well, given the Kosovo governments' institutional support to female entrepreneurs. The government should invest in developing an online information platform for female entrepreneurs to keep them informed with the sources of support such as financial support, training and, organizing trade fairs in order to promote local products and services of Kosovan female entrepreneurs. From all financial institutions in Kosovo, only three of them offer lending products and packages with preferential terms and conditions to support female entrepreneurs and boost female entrepreneurship (Avdullahi & Fejza Ademi, 2020). Considering this, we propose to increase the number of loans and credit packages that support women's entrepreneurship.

This research study has an exploratory and interpretive nature on the impact of internal factors on SMEs' sales growth. Although SMEs' growth depends mostly upon its internal factors such as entrepreneur's education and gender as well as SMEs age and size still many other internal and external factors affect the performance and growth of SMEs. The business environment can be supportive in many countries but in transition countries mainly bring barriers to doing business. The informal economy, taxes too high and corruption presents some of the main barriers of SMEs in Kosovo. SMEs sales growth depends also on the strategic decisions on new product development and new marketing practices. Therefore, despite the importance of the results of this paper, the exploration of the impact of some internal factors, without including other internal and external factors, can be considered as a limitation of this paper. This limitation leads to future research that will include both internal and external factors that have an impact on SMEs sales growth and thus have more holistic results.

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The Impact Factor of Education on the Public Sector – The Case of the U.S.

Constantinos Challoumis†

N.K.U.A. (National Kapodistrian University of Athens), Greece

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ABSTRACT

Purpose:
To this thesis is analyzed the impact factor of education to the public sector and tax system, through a procedure of theoretical and mathematical analysis, a quantification method, an econometric method and behavioral scrutiny by a real case scenario. This work compares the cycle of money, to the one case using the impact factor of education and to the other case without it. Then, this work aims to study if the taxes for the education don't belong to the general approach that taxes make weaker the cycle of money, but have a positive effect on the economy, are a different case as the theory of the cycle of money provides.

Design/methodology/approach:
The analysis stands on the cycle of money and the impact factor of education. Therefore, the appropriate education to the economy supports the market and in general the economy. The impact factor of education enforces the economic dynamic of any economy. The study of cases when there is the factor of education and when this factor is omitted allows the extraction of the appropriate conclusions. Moreover, this analysis is used for the Q.E. method through R.B.Q. model. The use of simulations before the real application guarantees the significance of the results. To be able to understand the way that taxes for the education system, estimated to the one case how the economy interacts with these taxes and after this examination without these taxes, following the mathematical logic of the "reductio ad absurdum".

Finding:
The education of the U.S. for the period of 2012-2017 shows that taxes for education return to the economy, enhancing it. The general approach of simulation complies with this real case scenario.

Research limitations/implications:
This paper shows that according to the theory of the cycle of money the education belongs to the case of factors that the taxes return to the economy, and robust the economic dynamic of a society.

Originality/value:
The findings of this study contribute to the existing knowledge regarding the concept of the cycle of money to the case of education. The taxes on education belong to the case that the money returns to the economy, on the contrary with most taxes that are not robust the economy and should be reduced.

1. Introduction

Definition of the cycle of money: The theory shows that to an economy the taxes return to the society, basically to the case of the education and the health system. But, the main rule is that the authorities should keep the taxes as low as it is this plausible. Moreover, if something is plausible to be offered by medium or small economic units, and enterprises, the government should protect them by very low taxes and the same time to put higher taxes on the bigger companies. But, for the case of the big companies that their purposes are not covered by small companies, should be put low taxes. Also,

†Corresponding Author: CONSTANTINOS CHALLOUMIS
Email: challoumis_constantinos@yahoo.com

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factories and high technology companies should have low taxes. Then, the main concept is to have an economy, with the best allocation of production. In that way, an economy achieves its higher level. Additionally, this theory shows that with the best allocation of production units and of taxes the money is cycled in the economy and is not lost from the economy, as it achieves the maximum use of the same amount of money in an economy. (Challoumis, The Theory of Cycle of Money 2018) (Challoumis, The Keynesian Theory and the Theory of Cycle of Money 2018) The cycle of money is based on the way that money reused in the economy and the way that is an economy is structured.
This paper has analyzed the case of the education, which belongs to the few cases that the taxes return directly back to the economy and serve the better allocation of its production units. The research problem is to clarify the effect of taxes on the education system to the economy, as according to the theory of the cycle of money the high rate taxes make weaker the economies. The taxes when applied to small and medium companies, to high technological units, and factories, should be low, but to companies that make controlled transactions, and large companies that substitute the activities of smaller companies the taxes should be higher than the other companies. Because the large companies and the companies that proceed to international controlled transactions, make international bank savings and the money lost from the local bank systems and the local markets, making the reuse of money weaker. According to the theory of the cycle of money some taxes robust the economies, and that taxes are considered as exceptions. The education system, as the education system, belongs to that exception. To that work is examined the role of taxes of the education system to the economy. Then, the hypothesis is that the taxes of the education system have a positive impact on the economy.
This work aims to study the impact factor of education on the cycle of money through the view of taxes. The paper scrutinizes the case of the cycle of money with and without all the determined impact factors of the education. Then, to the one application is used the impact factor of the education and in the other case is not used, to be able to conclusions about the behavior of the model. Thus, using the Q.E. method extracted conclusions, about the importance of this impact factor in the economy. The impact factor of education is used for the case of administration of the public sector to the private sector and the returns of taxes to the market. Moreover, it should be noted that any other rewarding taxes (taxes those enhance the economy) are excluded from this study to estimate the utility of this factor, achieving with that way to isolate the searching problem and hypothesis (the taxes for the education, of robust the economy). Therefore, this work has analyzed the comparison between the cycle of money including and then excluding the impact factor of education. (Challoumis 2019) The analysis which followed is based on the R.B.Q. (Rational Behavioral and Quantified model). This means that initially, the paper starts with the theoretical concepts and the mathematical structure. Also, this paper achieved a behavioral approach using here real data from the United States educational system for the period between 2009 and 2015. (Challoumis, The R.B.Q. (Rational, Behavioral and Quantified) Model 2019) Finally, we are compiled virtual quantity data to confirm the compliance between the theoretical approaches with a real case study.

2. Methodology

The Q.E. method is used to this work, to determine the mathematical equations and the conditions of the model. The dependent variable is used for the determination of the behavior of the model. It should be noted that it is given an upper limit and a lower limit to the values of the independent variables. Therefore are used two facets to the application of the Q.E. method, which are:

- Behavior analysis: The analysis of the behavior of the model stands on the structural characteristics of each model accordingly, using a determined mathematical equation. To the equation are used some variables of the model, and after compilations are determined the behavior of the model. Then, some variable is excluded to determine again the behavior of the model. This happens to conclude how the model acts with and without a certain variable.

- Frequency analysis: The frequency analysis behavior analyses the number of appearances of a variable subject to other variables, concluding the impact that one independent variable has on other independent variable or variables.

Hence, the Q.E. method uses as index four basic steps. The steps are these:

- First step: Initially, it is set the hypothesis. The hypothesis determines the aims and the scope of each study. Moreover, the hypothesis is the key element of the reliability of a model.

- Second step: Forward, it is set the generator. The generator belongs to the hardcore of the Q.E. method. This means that the generator is the source of the Q.E. method, as at this stage produced random numbers which used according to fuzzy logic to determine the form of the model. Based on the results of this second step follows the next step. (Challoumis, Fuzzy Logic Concepts in Economics 2018)

- Third step: It is about the conclusions. The conclusions are the final stage of the analysis, except the case that the scientist obtains that needed further modifications. To serve the readjustments to model is needed the next step, of the feedback.

- Fourth step: It is the case of the feedback and is about the repetitions and the adequate adjustments to the model. (Challoumis, Arm's Length Principle and Fix Length Principle Mathematical Approach 2018)

Through these four steps, the Q.E. method used for the examination study. Therefore, is used a theoretical background, a mathematical structure, econometric scrutiny, a quantity procedure, and a real case scenario for the importance of education on the GDP. Thus, there are three steps, the theoretical and mathematical background (rational step – step 1), the quantification analysis (quantity step – step 2), and the econometric scrutiny plus the real case scenario (behavioral step –step 3). Step 1 is revealed to the next section, where the theoretical and mathematical background is applied. To step 2 was run the compilation of the following variables: the α_p is about the enforcement savings, of citizens and small and medium-sized enterprises, the α_t is about the case that there are escaped savings and $\alpha_n * h_n$ symbolizes the impact of education on the economic system. The final and third step is about the repetitions made by programming to modify the model.
Then is followed the R.B.Q methodology, this means that as the first step defined the hypothesis, the theoretical, and the mathematical background. As the second step is to set a compilation of the equations (the tree steps that referred before) to clarify the behavior of the model. As the third step is to set the econometric procedure to conclude the appropriate conclusions for the hypothesis. Finally compared the result of programming compilation with the mathematical, theoretical, and econometric results to establish that comply between them.

3. Literature Review

The profits and losses are connected with the case of the taxes and therefore with the case of the taxes to the education system in the economy. Because of the controlled transactions, the tax avoidance of the large companies, and the international controlled transactions affect the taxing system, according to the existing theory (The theory of cycle of money). Then the case of taxes to the education system is an exception from the general taxes. Therefore, the behavior of the companies and the implied taxes from the authorities define the frame of this research. Some necessary theoretical background is presented. Then, the contracts of companies and the agreements of companies with the authorities are very important for their profits and losses. The changes in the contracts should be included in the agreements. This is crucial for the procedure as the changes that companies make plausibly could affect their relationship with the government authorities. The tax authorities should make periodic inspections. (Challoumis, The Keynesian Theory and the Theory of Cycle of Money 2018) Therefore the comparability analysis needs the periodic specification of contracts. This analysis is about the comparison of the indexed aims that the government puts with the real data which provides the enterprises. The arm's length principle procedure needs the periodic inspections of the companies which participate in controlled transactions[1]. The cost-sharing pends on the periodic check of companies which are tested parties.[2] The companies of controlled transactions face taxation issues that are connected with their activities. (Zax 1988) Hence, the enterprises of controlled transactions should comply with the arm's length principle of the authorities. The comparability analysis has as a target to clarify the tax obligations of the companies they comply with the tax requirements of the authorities. (Boland 1991) Since the adequate agreement of the enterprises of controlled transactions is that which maximizes the costs in economic environments with a high tax rate and the same time maximizes their profits in tax environments with a low tax rate. Thence, the allocation of profits and losses clarifies the maximization of the utility of companies with controlled transaction activities.
Additionally, it should be mentioned that the enterprises of controlled transactions and tax authorities are proceeding to comparability analyses virtue to proportional adjustments. The proportional adjustments are a term that shows that the companies should adjust their data under conditions of lack of information. (King 2009) The companies of controlled transactions, many times when they don't have the adequate data to make comparisons with existing uncontrolled transactions of similar cases to perceive their condition, proportionally adjust their data. (Wilson 1986) Thereupon, the tested parties when obtaining that the profits and losses of companies from uncontrolled transactions are higher or lower than their profits and losses, they proceed to proportional analogies to be able to compare their data with data of uncontrolled transactions.

The production of goods is the reason for the profits and losses of the enterprises. (Challoumis, Arm's Length Principle and Fix Length Principle Mathematical Approach 2018) The same thing happens and for the services, where the profits and losses come from the services which offer to the companies of controlled transactions. Standing on the prior analysis:

[1] The arm's length principle provides the way that taxed the companies that proceed to international control transactions.
[2] Tested parties are the enterprises which participate in control transactions.

$$u = s(zf + \tilde{z}d) \quad (1)$$

$$z = |\tilde{z} - 1| \quad (2)$$

Where u is about the impact factor of the comparability analysis. The symbol of s is the amount of money using and the allocation of profits and losses. The symbol of z is a variable that receives values between 0 and 1. The symbol of f is about the cost that comes up from the production of goods, and the symbol of d describes the cost of the distribution of the goods.

Using equations (1) to (2) determined the following equations:

$$u_c = zf + \tilde{z}d \quad (3)$$

And

$$b = (p - u_c) * j_1 \quad (4)$$

The symbol of b is the amount of taxes that should pay the companies of controlled transactions to the case of the arm's length principle. The symbol of p is the amount of money. The symbol of u_c is the amount of tax obligations that can be avoided by the companies through the allocation of profits and losses. The symbol of j_1 is a variable for the rate of taxes. Then, equation (4) represents the case of the arm's length principle. Also, the case of the fixed length principle is described by the next equation:

$$v = p * j_2 \quad (5)$$

The symbol of v shows the taxes that should pay the companies that participate in controlled transactions, for the estimations of the fixed length principle. Then, j_2 is a coefficient for the rate of taxes in the case of fixed length principle. Thereupon, it is concluded according to the prior theory that:

$$v \geq b \quad (6)$$

From equations (4), (5) and (6) is obvious that to the case of fixed length principle the companies should pay more taxes, than to the case of the arm's length principle, as the authorities receive as a fact the condition that the international companies proceed to controlled transactions, to avoid to pay taxes.

The applied methodology is based on the Q.E. method. The Q.E. method is affiliated with the theory of axiomatics. (Challoumis, The Role of Risk to the International Controlled Transactions Years XXIII) The hypothesis is axiomatics. Then, the axiomatics is used to confirm the theoretical background and to confirm that the hypothesis complies with the results of the model. Thence, there are two facets of the axiomatics:

- If the results comply with the hypothesis, then the model is satisfied. In that case, the study stops as the model doesn't need any further examination.

- In the second case, if axiomatics is not satisfied, it should be made further analysis, until to have the adequate model.

Thence, the main concept of axiomatics stands in compliance with the hypothesis with the final results of the study. Forasmuch as is plausible with that way to clarify and modify the theory of the chosen model.

4. The cycle of money and the ideal case of the cycle of money

The tax revenues are lost savings from the economy, diminishing with that way the cycle of money. The lower taxes robust the cycle of money, as the small and medium economic units and enterprises can distribute the money again and again inside a country's economy, growing with that way the cycle of money, and reducing the lost money from the economy (enforced savings). The large companies which proceed to international controlled transactions achieve to avoid tax-paying, making the cycle of money weaker (escaped savings). For this reason, the companies of controlled transactions must pay higher taxes because otherwise a huge amount of money would be lost from a country's economy. To this work are used the following equations:

$$\alpha = \alpha_s + \alpha_t, \text{ or, } \frac{1}{v} + \alpha_t \quad (7)$$

$$x_m = m - a \quad (8)$$

$$\mathrm{m} = \mu + \alpha_p \quad (9)$$

$$\mu = \sum_{\iota=0}^{n} \mu_\iota \quad (10)$$

$$\alpha_p = \sum_{j=0}^{m} \alpha_{pj} \quad (11)$$

$$c_m = \frac{dx_m}{da} \quad (12)$$

$$c_\alpha = \frac{dx_m}{dm} \quad (13)$$

$$c_y = c_m - c_\alpha \quad (14)$$

The symbol of α is the variable of the escaped savings, meaning the savings that lost from the consumption, as lost from a country's economy, as they are not saved to local banks, but they saved to international banks or are not taxed. The symbol of α_s is about the escaped savings of transfer pricing activities. The symbol of α_t is about the escaped savings by any other commercial activity. The symbol of m is the financial liquidity in an economy. (OECD, Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations July 2017) The symbol of μ is about the consumption in an economy. The symbol of α_p is the enforcement savings of small-sized, medium-sized enterprises and the citizens. The symbol of x_m is about the condition of financial liquidity in a country's economy. (Feinschreiber 2004) The symbol of c_m is about the velocity of financial liquidity variations. The symbol of c_α is about the velocity of escaped savings. Then the symbol of c_y is the cycle of money. Then, the cycle of money is a factor that determines the dynamic of an economy, meaning how well structured is an economy, noting how well distributed and reused many times the money inside the economy, without to be lost from it. Therefore, it is obtained that the cycle of money grows with the application of the fixed length principle and decreases to the case of the arm's length principle.

5. The mathematical approach of the cycle of money with and without the impact factor of the education

For the mathematical approach of the cycle of money used the prior equations:

$$\alpha_p = \alpha_r + \alpha_n * h_n + \alpha_m * h_m \quad (15)$$

And

$$\alpha_r \geq \alpha_n * h_n \geq \alpha_m * h_m \quad (16)$$

The symbol of $\alpha_r$is about the impact factor for the rest of rewarding taxes. The variable of α_n symbolizes the impact factor of education and any technical knowledge. The factor of α_m is the impact factor of the health system. The factor of h_n, and of h_m, are accordingly the variables of the education and the health system impact. Therefore, using the prior equations is determined in the following table:

Factors	Values	Values'
αs	0.6	0.6
αt	0.7	0.7
μ	0.9	0.9
αr	-	-
$\alpha_n * h_n$	0.3	-
$\alpha_m * h_m$	-	-

Table 1: Compiling coefficients (see Appendix II)

The prior factors have as an upper limit the value of 1, and as a lower limit the value of 0, but s and $\tilde{s}$ could receive higher values than 1. After 461 repetitions extracted the next graph:

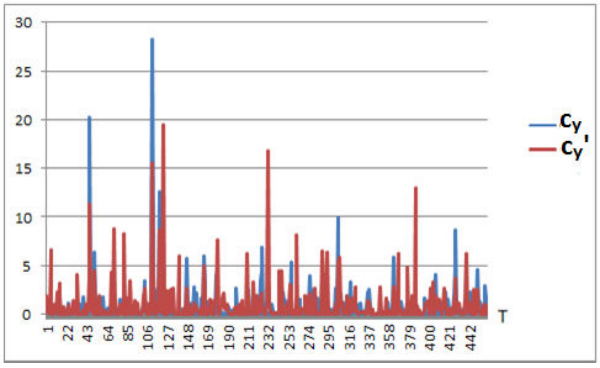

Figure 4: Comparison of the cycle of money with and without the impact factor of education

According to the prior scheme, it is obtained that the impact factor of education has an impact on the cycle of money (blue line). An economy with an appropriate education system has a declined cycle of money (red line) because the distribution of money is lower than the case that the cycle of money is higher (blue line). An economy with a low cycle of money would have lower savings and consumption as the high tax rates diminish the dynamic of the economy. To that case should apply higher taxes to larger companies because they save their money out of the country's economy.

6. The case of the U.S. for the period of 2012-2017

First, examine the relevant factors of education. This means that at this stage we determine the important factors of the model, standing on the theory. Therefore, is determined that:

Year	GDP	Exports	Imports	Education
2012	15,155,255	1,544,932	2,274,462	40,550
2013	16,691,517	1,577,587	2,265,911	39,852
2014	17,427,609	1,619,743	2,410,855	55,266
2015	18,120,714	1,501,846	2,313,425	88,014
2016	18,624,475	1,450,457	2,248,209	77,080
2017	19,390,604	2,407,390	1,545,609	115,367
p-value	0.0520*	0.0467**	0.4685	dependent variable
p-value'	-	-	0.0006***	dependent variable

Table 2: Estimated variables (the amounts are in million dollars) (Education 2020) (OECD, Trend 2020)

To the prior table the three asterisks imply significant at 0.01, the asterisks two asterisks imply significant at 0.5, and the one asterisk imply significant at 0.1. From the prior table, it is received that the GDP is rejected the null hypothesis, therefore it is statistically significant. It is concluded that and the other variables are significant. The model is the following one:

$$\text{Education} = f(\text{GDP}, \text{imports}, \text{exports}) \quad (17)$$

$$\text{Education} = \beta_0 + \beta_1 \text{GDP} + \beta_2 \text{ Imports} + \beta_3 \text{Exports} + \varepsilon \quad (18)$$

Thus, follows the clarification of the real case scenario according to the theory, with the most significant variable of the education, meaning the GDP as there is a direct connection between these two factors, according to the theory, the mathematical structure, the quantification approach, and the econometric data.

It follows an example of the case of the U.S. using data from the WITS and the U.S. Department of education. It is made a comparison between two different periods. Are used two elements because these are the explaining factors. The trend between them is proven through the work of OECD. Then, for the explaining variables of U.S.:

1. Education spending = 40,550 US million dollars, for 2012 (initially)
2. Education spending = 115,367 US million dollars for 2017 (finally)
3. GDP = 15,155,255 US million dollars for 2012 (initially)
4. GDP = 19,390,604 US million dollars for 2017(finally)

According to OECD even in the recent economic downturn, the tertiary graduates generated a positive impact on GDP of more than half a percentage point per year, from 2008 to 2010. The education and the GDP are directly connected. Therefore, from equations (7) to (16) received:

$c_m = \frac{dx_m}{da} \cong$ GDP (includes at least four factors, like exports, investments, imports, consumption etc.) (19)

da =a, for one period (20)

$dx_m = x_m$, for one period (21)

$c_\alpha = \frac{dx_m}{dm}$ (22)

$c_y = c_m$ (23)

Then, $c_y = \mathrm{f}(\alpha n * hn)$, or, $c_y = \mathrm{f}(\text{Education})$ (24)

From the prior data, and equations follows the next table:

Factors	Values(dollars/capita, 2012)	Values'(dollars/capita, for 2017)
c_m,c_y	46,318	59,262
αn*hn	123.93	422.28 (it is 0.3 in the Q.E. approach of table 1)

Table 3: Application of real explaining values to the extracted model

According to the prior table, received the next graphs:

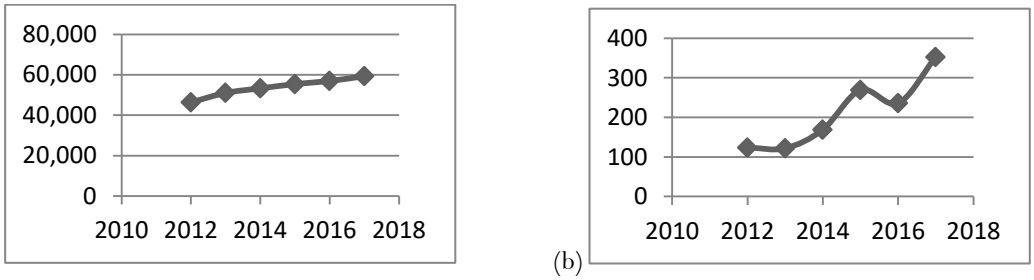

Figure 5: (a) GDP/capita diagram of U.S. (OECD, Gross domestic product (GDP) (indicator) 2019) (b) Education/capita spending diagram of the U.S. (Research 2019)

It is obtained that the quantification results comply with the real case of the U.S. paradigm. The graph of education expenditures follows the GDP, as expected from the results of the quantified model. It is clarified from figures 4 and 5 that education increases the cycle of money of the U.S., and contemporaneously the quantified model has the same result with the real case scenario of the U.S. paradigm.

7. Conclusions

The general estimations of the education system, with programming and compiling, are used to define the adequacy of the applied mathematical model. Then the hypothesis that the taxes for the education system robust the economy complies. The case of U.S. taxes for the education system is used as a real case scenario of the already confirmed model by programming. The case of the U.S. is reconfirmed by an econometrical application. Then, the hypothesis that taxes of the education system robust the economy is confirmed with be mathematical and theoretical clarification, by programming and completion procedure and finally by the econometric application. Then to this paper showed the relation of the dynamic of the economy using the cycle of money with the public sector and the international controlled transactions. It is obtained using R.B.Q. model, as expected, that an economy with the avoidance of education has a lower economic dynamic and on the other hand, an economy with the presence of the appropriate educations system has a higher economic dynamic. The taxes of the economy do not return to the market. Thence, the investments and the consumption of this economy would be lower. This means that as the most taxes harm the economy, on the other hand, the education taxes have a positive effect on the economy, as they return to the economy, to be used for consumption and investments. This is the main difference between general taxes and the three rewarding taxes (education taxes, health taxes, and rest-structural taxes. This analysis showed that the taxes for the education system help the economy. It is perceived that the economies which estimate education receive more utility than to the case that there does not be a proper education

system. The education system advances the dynamic of the economy complying with the theory of the cycle of money. Future research could be achieved for a different case scenario, with a three steps methodology of the R.B.Q. the method, meaning the theoretical/mathematical study, the programming/compilation application, and the econometric application of the model, showing that to all cases the result is the same and is plausible to exclude general results.

Appendix I

Following the R.B.Q. model, the applied steps are these:

Step I: Determination of the theoretical background and the mathematical structure.

Step II: Application of the Q.E. method, meaning the quantification procedure.

Step III: Econometric analysis and behavioral study of a real case scenario.

Appendix II

Code of the Q.E. method, about the quantification of the model:

```
as=0;
at=0;
xm=0;
m=0;
m1=0;
ap=0;
cm=0;
ca=0;
cy=0;
t=0;

while t<10
   t=t+1;

if rand()<9
   as=0.6*rand();
end

if rand()<9
   at=0.7*rand();
end

if rand()<9
   m1=0.9*rand();
end

if rand()<9
   ap1=0.4*rand();
end
if rand()<9
   ap2=0.3*rand();
end
if rand()<9
   ap3=0.2*rand();
end
a=as+at;
apk1=ap1+ap2+ap3;
apk2=ap2+ap3;
apk3=ap1+ap3;
apk4=ap1;
apk5=ap2;
apk6=ap3;
apk7=ap1+ap2;
```

```
mk1=m1+apk1;
xmk1=mk1-a;
cmk1=xmk1/a;
cak1=xmk1/mk1;
cyk1=cmk1-cak1;

mk2=m1+apk2;
xmk2=mk2-a;
cmk2=xmk2/a;
cak2=xmk2/mk2;
cyk2=cmk2-cak2;

mk3=m1+apk3;
xmk3=mk3-a;
cmk3=xmk3/a;
cak3=xmk3/mk3;
cyk3=cmk3-cak3;

mk4=m1+apk4;
xmk4=mk4-a;
cmk4=xmk4/a;
cak4=xmk4/mk4;
cyk4=cmk4-cak4;

mk5=m1+apk5;
xmk5=mk5-a;
cmk5=xmk5/a;
cak5=xmk5/mk5;
cyk5=cmk5-cak1;

mk6=m1+apk6;
xmk6=mk6-a;
cmk6=xmk6/a;
cak6=xmk6/mk6;
cyk6=cmk6-cak6;

mk7=m1+apk7;
xmk7=mk7-a;
cmk7=xmk7/a;
cak7=xmk7/mk7;
cyk7=cmk7-cak7;
%;tab for the first compile is not used
tab=[apk1,apk2,apk3,apk4,apk5,apk6,apk7,xmk1,xmk2,xmk3,xmk4,xmk5,xmk6,xmk7,cmk1,cmk2,cmk3,cmk4,cmk5,cmk6,
cmk7,cak1,cak2,cak3,cak4,cak5,cak6,cak7,cyk1,cyk2,cyk3,cyk4,cyk5,cyk6,cyk7;tab];
end
```

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