IJBESAR

International Journal of Business and Economic Sciences Applied Research

Trade Openness and Economic Growth in the GCC Countries: A Panel Data Analysis Approach

Hatem Hatef Abdulkadhim Altaee, Mohamed Khaled Al-Jafari

pp. 57-64

Volume 11, Issue 3

Eastern Macedonia & Thrace Institute Of Technology Press

International Journal of Business and Economic Sciences Applied Research

IJBESAR
ijbesar.teiemt.gr

Trade Openness and Economic Growth in the GCC Countries: A Panel Data Analysis Approach

Hatem Hatef AbdulkadimAltaee[1], Mohamed Khaled Al-Jafari[2]
[1]Cihan University, Department of Accounting, Region Iraq
[2] Prince Mohammad Bin Fahd University, Department of Accounting & Finance, Al-Khobar Kingdom of Saudi Arabia

ARTICLE INFO
Article History
Received 26 August 2018
Accepted 2 October 2018

JEL Classifications
C23, O40, O57, P52

Keywords:
Trade openness, Export, Import, Economic Growth, GCC, Panel Data

ABSTRACT

Purpose
The purpose of this study is to re-examine the relationship between trade openness and economic growth in the Gulf Cooperation Council countries (GCC), with emphasis on both the role of exports and imports in economic growth in a multivariate framework including gross fixed capital formation, energy consumption, import, and export as the regressors.

Design/methodology/approach
The study covers the period from 1992 to 2014 and utilizes five models of the panel data regression: pooled ordinary least squares, one-way and two-way of fixed effects models as well as one-way and two-way of random effects models. In addition, the study employs the root mean square error statistics in selecting the most representative model.

Findings:
The study found that partially, export had a significant positive effect on economic growth, while import had a significant but negative impact on economic growth. These results provide evidence that GCC countries during the period of study were largely dependent on exports, in which carbohydrate exports account for the bulk of their business trading activities. Moreover, the findings reveal that investment and energy, as conventional input factors had a significant and positive impact on the GCC's economies.

Research limitations/implications:
According to our finding, export is the most important contributor to economic growth. In addition, in order to ensure the stability of economic growth of these countries, more effective and efficient import policies must be pursued.

Originality/value
The novelty of this study is the uses of panel data covering more than two decades, and employs different models that allow testing of many hypotheses.

Eastern Macedonia and Thrace Institute of Technology

1. Introduction

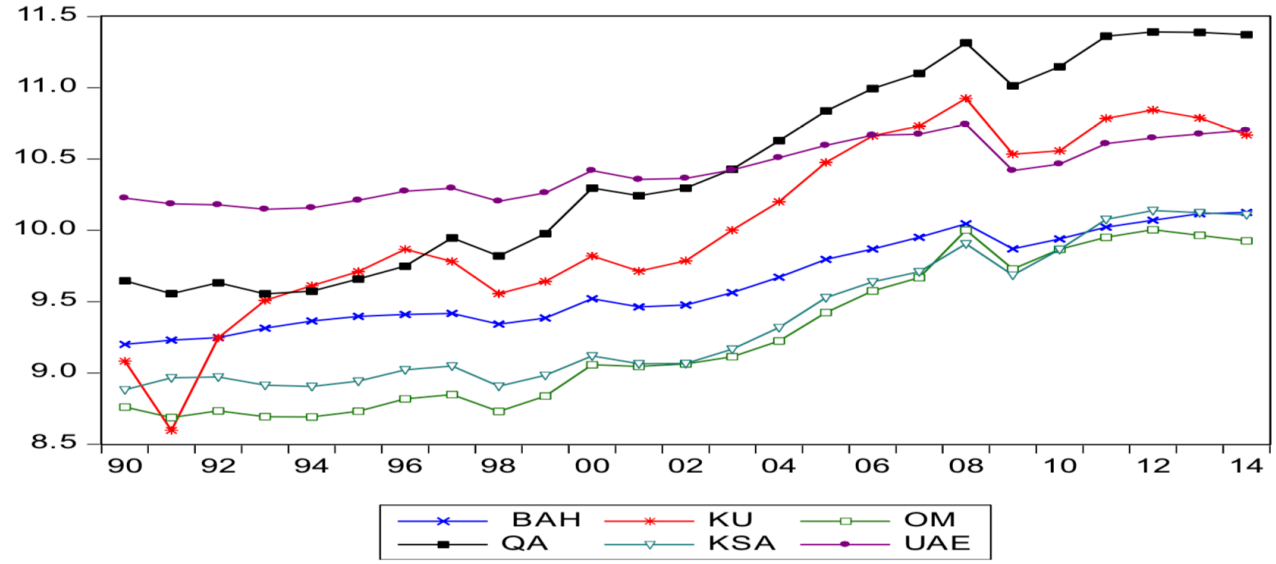
Economic theories that are related to economic growth are abundant. It can be dated back to Adam Smith in his notable book "The Wealth of Nations", then followed by the evolvement of the classical economic theory that was pioneered by economists such as Ricardo, Malthus and Mill. Later on, Carl Marx explained the historical development of growth while the Austrian economist Joseph Schumpeter introduced the theory of technological innovation. On the other hand, Harrod and Domar developed the classical Keynesian model of economic growth, implying that capital formation is an important factor of economic growth because it generates income and increases production capacity. Similarly, the neo-classic theory was expanded by economists such as Tobin, Swan, Solow, Meade, etc. According to this theory, economic growth can be achieved with the help of variables such as stock of capital, supply of labor and technological development. On the other hand, the endogenous economic growth theory was advanced by American economists Paul Romer and Robert Lucas. They stressed on the endogenous nature of technological innovations that are based on investment in human capital and technological development.

Accordingly, extensive empirical studies related to previous different economic grow theories were accomplished such as in Solow (1956), Feder (1983), Lucas (1988), Barro (1991, 2003), Mankiw, et al., (1992), Kim and Lau (1994), De Mello (1997, 1999), Al-Yousef (2000), Obwona (2001), Tuwaijri (2001), Bengoa and Sanchez-Robles (2003), Choe (2003), Al-Jarrah (2005), Bahraumahah and Thannon (2006), Al-Iriani and Al-Shamsi (2007) Bloom and Finlay (2009), Aghion and Howitt (2009), Cavalcanti, et al., (2011), Mahran (2012), Alkhathlan (2013), Alhowaish (2014), Kim (2014),

[1]Corresponding Hatem Hatef AbdulkadimAltaee
Email: Hatm.hatf@sulicihan.edu.krd
DOI: 10.25103/ijbesar.113.05

Alodadi and Benhin (2015), Altaee and Al-Jafari (2015), Altaee et al., (2016), Howarth et al., (2017), Bekhet et al., (2017), Echchabi et al., (2018) and others. However, this study selected GCC countries for several positive key characteristics. This is to include: i- a high per capita income as in Figure 1; ii-abundance wealth of energy resources reserves of mainly oil and gas; iii- young population that can enrich the labor market; and iv- excellent places for investment opportunities in different industrial sectors, especially in the financial, real estate, and technology sectors. Therefore, the purpose of this study is to examine the relationship between trade openness and economic growth in the GCC countries utilizing a panel data analysis approach. This paper is unrivaled to previous empirical studies in several ways. Studies on the determinants of economic growth in the GCC countries are scarce.

Figure 1. Trend of real per capita income of GCC.



Therefore, this study will add to the previous literature and enrich the knowledge and benefits of policymakers of those countries. In addition, the study employed five models that have not been utilized in previous studies to test the significance of the relationship between the dependent variable and the independent variables, and then used the root mean square error statistics to choose the most suitable model. Moreover, the tested data were more recent and updated.

This study is organized into five sections: Section 2 sheds some lights on the previous literature related to this subject. On the other hand, data and econometric models are presented in section 3. Section 4 discusses and analyzes the findings and the results of the study, while the concluding remarks and recommendations are presented in section 5.

2. Literature Review

There is a wealth of research on the relationship between trade openness and economic growth in most countries worldwide. However, there is a lack of research related to economic growth in the GCC countries. GCC countries are emerging market economies with affluent economic wealth that comes from gas and oil production that can exert a significant influence on the global economy. Therefore, in this section we introduce previous studies that discussed economic growth determinants in the GCC countries.

Starting with a more recent study by Echchabi et al, (2018), where they examined the impact of Sukuk financing on economic growth in the GCC countries. Their results show that Sukuk financing had no impact on economic growth of the GCC countries. On the other hand, Howarth et al, (2017), investigated the relationship between energy consumption at a sectoral level and the gross domestic product in the GCC countries. Their findings show that energy consumption and economic growth were significantly related at all sectors. They stressed the need for improvement in energy efficiency in GCC countries. Similarly, Bekhet et al., (2017) used the ARDL model to test the relationship between carbon emission, financial development, economic growth and energy consumption for the GCC countries. Their results confirm a long-run causal relationship among carbon emissions, financial development, GDP and energy use in all GCC countries except for the UAE. The study emphasized the need for curbing carbon emissions and preserving economic growth in GCC countries. In addition, Osman et al, (2016), used a panel data analysis approach to explore the relationship between electricity consumption and economic growth in the GCC countries. The findings reveal an existing long-run equilibrium relationship between electricity consumption and economic growth. The study concluded that adopting electricity conservation policies could result in a negative impact on economic growth. Furthermore, Edrees (2016) utilized the ARDL approach to explore the impact of foreign workers and outflow remittances on economic growth in selected GCC countries. He concluded that foreign workers contribute positively to economic growth. On the other hand, outflow remittances found to have a significant and negative impact on economic growth.

From another perspective, Jouini (2015) examined the relationship between economic growth and international trade openness for the GCC countries. The results reveal

evidence of cointegration and that economic growth were positively linked to trade openness in both the short-run and the long-run.

On the other hand, Abdalla & Abdelbaki (2014) utilized the vector error correction model (VECM) to investigate the determinants of economic growth in the GCC countries. The findings show that foreign direct investment and gross capital formation are important determinants of economic growth in Bahrain. Further, exports and gross capital formation were found to be important determinants of economic growth for Kuwait, Qatar and Saudi Arabia. As for the UAE, both exports and foreign direct investment were found to be significant determinants of economic growth. In contrast, the study found no evidence of short-run or long-run unidirectional or bidirectional causality relationship for Oman. Additionally, Grassa & Gazdar (2014) investigated the effects of Islamic financial development and conventional financial development on economic growth in five GCC countries (Bahrain, Kuwait, Qatar, Saudi Arabia & UAE). They utilized the OLS model and panel data analysis technique. The results indicate a strong and significant relationship between Islamic finance and economic growth in all five GCC countries. On the other hand, conventional financial development was found to have no significant impact on economic growth.

Furthermore, Al Awad (2010) tested the role of manufacturing on economic growth in GCC countries. He found that in the long-run, manufacturing is strongly related to non-oil economic growth. In contrast, short-run link between manufacturing and non-oil economic growth were found to be insignificant. On the other hand, Hussein (2009) studied the impact of foreign direct investment (FDI) on economic growth in the GCC countries. His results revealed a weak relationship between FDI and gross domestic product.

3. Data and Econometric Methods

3.1 Data

The data sample consists of the six GCC member states: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. The data sample covers the period from 1992 to 2014. Table 1 summarizes all variables used in this study as well as their sources.

Table 1: Variables definitions and sources

Variable	Indicator Name	Source
GDPPC	Gross Domestic Product per capita (constant 2010 US $)	National Accounts Main Aggregate Database, https://unstats.un.org/unsd/nationalaccount/ama.asp ma.asp
LEN	Energy use (kg of oil equivalent per capita)	World Bank indicators http://www.worldbank.org/
GFCF	Gross fixed capital formation constant 2010 US $)	National Accounts Main Aggregate Database, https://unstats.un.org/unsd/nationalaccount/ama.asp
EXP	Export volume (constant 2010 US $)	National Accounts Main Aggregate Database https://unstats.un.org/unsd/nationalaccount/ama.asp
IMP	Import volume (constant 2010 US $)	National Accounts Main Aggregate Database https://unstats.un.org/unsd/nationalaccount/ama.asp

3.2 Methodology

A longitudinal, or panel data set can capture variations along cross section units (country, region, state, individual, etc.) and time. This is important to the study for the following reasons: (1) unobservable and time-invariant effects may exist for each country. (e.g., political and economic policies, trade policies, values, spending pattern on higher education, and economic freedom); and (2) time may have potential effect in some variables (Hsiao, 2007). In addition, including the variation in both time series and cross section data into fixed or random effects models would provide a rich and powerful study of a group of countries, if one is willing to consider both the region and the time dimension of the data.

Therefore, this study uses the gross domestic product per capita (GDPPC) as a measure of economic growth to be the dependent variable, and four explanatory independent variables. Furthermore, there are panel data sets for the dependent and the independent variables.

Given the panel data nature, the most general specification of the model that we consider is the following:

$$y_{it} = a_{it} + x'_{it}\beta_{it} + u_{it} \qquad (1)$$
$$i = 1,\ldots\ldots\ldots,N \quad t = 1,\ldots\ldots\ldots,T$$

The index i refers to individuals (countries), the unit of observation, t refers to the time period. Where y is the gross domestic product per capita representing economic growth, x is representing the explanatory variables. Is the constant is the error term for country i in the period t, satisfies all the standard assumptions. are the estimated coefficients of all independent variables.

However, this study employed five different versions of panel data static regressions as described below:

a. Pooled OLS

This model does differentiate between period and cross section and it is mostly not applicable for analysis. However, it is often suitable to apply redundant fixed

effect tests and based on the results, decide whether we have to use fixed-effect or pooled model.
The pooled model can be written as:

$$y_i = \beta_0 + \beta_1 x'_i + \varepsilon_{it} \quad i = 1,\ldots\ldots,6 \quad t = 1,\ldots\ldots,25 \qquad (2)$$

Model (2) does not make optimal use of the assumed structure in the error term. Thus, it is not considered to be a practical model. (Wooldridge, 2006).

b. One-way fixed effects model

Although we expect that GCC countries have too many similarities among themselves, but still there are some differences, at least in their country sizes, geographical locations, political and economic policies, etc. Individuality among the studied countries could result in bias of the estimated parameters. Accordingly, it seems reasonable to account for the individuality among the GCC countries. One set of panel data models account for the individuality across countries, but confines that individuality to the intercept term of the relationship.
The one-way fixed effects model is the

$$y_{it} = \left(a + \mu_{it}\right) + x'_{it}\beta + \nu_{it} \qquad (3)$$

The individual effects μ_i assumed as unobserved constants (parameters), is the written as: fixed-effects (FE) regression model, encapsulating all variables that affect the dependent variable cross-sectionally but do not vary over time. (ν_{it}) fulfills the usual conditions on errors: independent, E (v) = 0, var (v) = σ_v^2

c. One-way random effects model

An alternative to the fixed effects model is the random effects model. Unlike with the one- way fixed effects specification, the one-way random effects propose different terms for each country and again these intercepts are invariant over time, with the relationships between the regressor and the predicted variables assumed to be the same, both cross-sectionally and over time. Moreover, this approach assumes that the individuality comes in the form of an error component model (as part of individual disturbance terms).

The basic one-way random effects model is written as:

$$y_i = \alpha + x'_{it}\beta + \left(\mu_i + \nu_{it}\right) \qquad \nu_{it} \sim IID\left(0, \sigma_v^2\right) \qquad (4)$$

μ_i measures the random deviation of each country's intercept from the —common intercept term.

d. Two-way fixed effects model

Another possible panel data model is the two-way fixed effects approach. By using this approach, we extend the analysis to account for the average value of the dependent variable changes over time as well as cross-countries. The final specification of this approach would be:

$$y_{it} = \left(\alpha + \mu_i + \tau_t\right) + x'_{it}\beta + \nu_{it} \qquad (5)$$

where:
ui is time invariant individual fixed-effects. Control for permanent differences between countries.
τ_t is time fixed effects. Impacts common to all groups but vary by year.
vit is I.I.D. component.

e. Two-way random effects model

One variant of model (5) examines how individuals and time effect error variances. This model functional form is:

$$y_{it} = a + x'_{it}\beta + \left(\mu_i + \tau_t + \nu_{it}\right) \qquad (6)$$

As in the two-way fixed effects model, μ_i represents the time invariant individual effects, τ_t stands for the time effects, and vit is idiosyncratic error.

4. Results and Analysis

Before going further and starting our estimation of the proposed models we believe it is necessary to check the properties of our data. For this purpose, we will test the stationarity of our panel and then the cointegration among the variables.

4.1 Panel Unit Root Tests Results

Although there are several kinds of unit root test methods including Breitung, Choi, Hadri, Levin, Lin and Chu (LLC test), Im, Pesaran and Shin (IPS test), and Carrion-i-Silvestre, etc., only two test have been used in this study, to examine for the existence of a unit root in our panel. The Levin, Lin and Chu (2002) (LLC) specification as well as the Im, Pesaran and Shin (IPS) (2003).
These tests are performed on the variables in the levels, and first difference. The null hypothesis of the presence of a unit root is rejected if the two tests confirm that hypothesis simultaneously. Since LLC does not consider a possible heterogeneity bias present in the data, IPS generally would be the favored test.
We can conclude that the results of panel unit root tests stated in Table 2 backing the hypothesis of a unit root in all variables across the six GCC countries, as well as the hypothesis of zero-order integration in first rejection of the null hypothesis of no cointegration at 1% level of significance.

4.2. Panel Cointegration

Given that each variable contains a panel unit root, the set of Pedroni's panel differences. Indeed, six of the tests reveal the cointegration tests were carried out to examine whether there was a long-term relationship among the dependent variable and the independent variables. Pedroni has proposed seven different statistics. Out of these seven statistics, four are based on pooling, what is referred to as the "Within"dimension. The other three tests based on the —Between dimension. Both ype of tests were focused on the absence of integration. In

our case, the majority of tests (Table 3) clearly suggest rejecting the null hypothesis and presence of cointegration.

Table 2: Panel unit root tests

Variable	Level				First difference			
	LLC		***IPS***		***LLC***		***IPS***	
	Intercept	***Intercept and trend***	***Intercept***	***Intercept and trend***	***Intercept***	***Intercept and trend***	***Intercept***	***Intercept and trend***
LGDPPC	-0.47260 0.31830	-1.4625* 0.07180	1.96370 0.97520	-1.09100 0.13760	-11.24*** 0.00000	-10.408*** 0.00000	-10.07*** 0.00000	-8.838*** 0.00000
LGFCF	0.81680 0.79300	-2.10720 0.0176**	1.17640 0.88030	-1.69200 0.04530	-8.459*** 0.00000	-8.304*** 0.00000	-8.70*** 0.00000	-8.820*** 0.00000
LEN	-6.417*** 0.00000	-0.71500 0.23730	-2.606*** 0.00460	-1.3067* 0.09570	-12.36*** 0.00000	-12.485*** 0.00000	-12.57*** 0.00000	-12.627*** 0.00000
LEXP	-1.880** 0.03000	-10.946** 0.01570	-0.39620 0.34600	-7.811*** 0.00030	-10.88*** 0.00000	-10.272*** 0.00000	-10.86*** 0.00000	-10.210*** 0.00000
LIMP	2.38340 0.99140	-2.561*** 0.00510	4.68790 1.00000	-1.3680* 0.08560	-10.53*** 0.00000	-10.091*** 0.00000	-9.571*** 0.00000	-9.1208*** 0.00000

Note: *, **, *** indicates rejection of the null hypothesis of no unit root at 10%, 5%, and 1% levels of significance

Table 3: Panel co-integration test results of the GCC countries

(Dependent variable: Real GDPPC)

Alternative hypothesis: Common AR coefs. (within-dimension)

			Weighted	
	Statistic	*Prob.*	*Statistic*	*Prob.*
Panel v-Statistic	-1.524505	0.9363	-2.572446	0.9950
Panel rho-Statistic	0.995144	0.8402	0.867118	0.8071
Panel PP-Statistic	-3.756719	0.0001***	-2.376793	0.0087***
Panel ADF-Statistic	-3.761791	0.0001***	-2.790198	0.0026***

Alternative hypothesis: Individual AR coefs. (between-dimension)

	Statistic	*Prob.*
Group rho-Statistic	2.246893	0.9877
Group PP-Statistic	-3.843779	0.0001***
Group ADF-Statistic	-4.628695	0.0000***

*Denotes 10% level of significance; ** denotes 5% level of significance; and *denotes 10% significant level.

4.3. Estimation, Model Selection, and Discussion

We now turn to the estimated results of the panel regression models. The starting point is selecting the most fitting model for our panel. However, when a distinction is made between several models, one of the two measures is to be adopted, namely, the mean absolute error (MAE) and the root mean squares error (RMSE). However, recent literature has debated which of these should be preferred. In this research, we use RMSEs based on the results of Brassington (2017), Pesaran & Zhou (2016) and Fernandez-Van &Weidner (2017).

Table 4 shows the RMSEs for the five estimated models. It is clear that two-way fixed model has the lowest

RMSE. Therefore, the two-way fixed effect model has been selected.

Table 4: RMSE Statistics

Model	RMSE
POLS	0.24190
FEM *(one-way)*	0.13692
FEM *(two-way)*	0.10000
REM *(one-way)*	0.24190
REM *(two-way)*	0.13642

In the selected model, we see that 87.7 percent of the variation in real gross domestic product per capita of GCC countries was explained by export, import, gross fixed capital formation. As expected, we find that export has positive and significant impacts on economic growth in the GCC countries. This finding is justified by the fact that hydrocarbon export still plays a significant role in the Gulf economies (Hvidt , 2013). Saudi Arabia, for example, depends on the oil sector for 80 percent of its export revenues and around 85 percent of its budget revenues. The results are in line with the results of Hamdan (2016) for 17 Arab countries and Altaee et al., (2016) for KSA.

Moreover, figures in Table 5 reveal that energy input has the second highest positive effect on economic growth. This finding is similar to those of Odhiambo (2009); Apergis & Payne (2010); Iyke (2015); and Esen & Bayrak, (2017). This implies that energy is an important factor of production; therefore, it stimulates economic growth. An important implication for that is since energy and other inputs are found to be complements (Gibbons, 1984; Apostolakis, 1990; Ebohon, 1996), and since the GCC countries have abundant energy resources, it is considered an advantage in their development.

Table 5: Panel data regression estimates for GCC countries

Variables	*POLS*	*(One-way) FEM*	*(Two-way) FEM*	*(One-way) REM*	*(Two-way) REM*
GFCF	0.1965** 0.0104	0.1781** 0.0308	0.1300** 0.0138	0.1964** 0.0314	0.1464*** 0.0098
LIMP	0.09483 0.1965	0.11748 0.1184	-0.137*** 0.0000	0.09483 0.2353	-0.119*** 0.006
LEN	0.16387* 0.0697	0.12793 0.2161	0.1636*** 0.0000	0.16387 0.1071	0.1743*** 0.0011
LEXP	0.541*** 0.0000	0.5545*** 0.0000	0.344*** 0.0000	0.541*** 0.0000	0.363*** 0.0000
C	0.00406 0.7086	0.00283 0.5379	0.0347*** 0.0000	0.00406 0.7524	0.0316 0.1348
R2	*0.3945*	*0.41045*	*0.8768*	*0.3945*	*0.5398*
Adjusted R^2	*0.3763*	*0.369*	*0.8408*	*0.3763*	*0.526*
S.E.R	*0.1024*	*0.103*	*0.0517*	*0.1023*	*0.0517*
F-stat.	*21.665*	*9.9016*	*24.339*	*21.665*	*39.003*
Prob(F-sta.)	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*
S.D.	*0.1296*	*0.1296*	*0.1296*	*0.1296*	*0.075*

Notes: Values beneath the parameters values are the estimated p-values. ***Coefficient significant at the 1% level, ** Coefficient significant at the 5% level, and * Coefficient significant at the 10% level.

The results of the study confirmed a negative relationship between economic growth and imports during the investigated period. The negative coefficient proposes that GCC countries could be adversely affected due to the inflow of imports. Theoretically, imports are an important factor in economic growth. The impact of imports on economic growth is largely related to the composition of imports. When imports of productive goods and advanced technology constitute a large part of imports of a country, a positive and effective contribution to imports can be expected on the economic growth process.

In any event, the rise in per capita income and the high level of consumption lead to allocate a large part of imports to the import of luxury goods, which does not make a positive contribution to the process of economic growth. This result is supported by previous research such as Altaee, et al., (2016) for KSA, and Mushtaq, et al., (2014) for China, Indonesia, Japan, Malaysia, Pakistan, Philippines, Sri Lanka and Thailand.

5. Conclusion and Policy Recommendations

In this study, we have scrutinized the impact of export, import, energy consumption, and capital on economic growth in the GCC countries, by employing annual panel data from 1992 to 2014. To appropriately deal with static panel models, we employed ordinary least squares (POLS), one and two-way fixed effects (FE) and

one and two-way random effects (RE) models. Findings show that export is the main contributor to economic growth of GCC countries, followed by energy usage, then gross fixed capital formation. In contrast, import contribution ended to be negative. Based on estimation results of the study, the following recommendations are found to be important:

First, according to our finding, export is the most important contributor to economic growth. This provides a support for the export-led growth hypothesis in the GCC countries. Thus, significant attention must be directed towards diversifying the GCC economies.

Second, as long as energy usage and gross capital formation input play significant role in economic growth in the GCC countries, Gulf States must encourage an increase in gross capital formation, to increase its contribution to economic growth. At the same time great attention should be given to energy usage especially there is an abundant energy reserve available at cheap prices.

Third, since import plays a negative role in the economic growth process of the GCC countries, thus, they should decrease their imports or at least change their import policies to achieve higher economic growth.

References

Abdalla, M. A. & Abdelbaki, H. H. 2014. Determinants of Economic Growth in GCC Countries. *Asian Journal of Research in Business Economics and Management*, *4*(11), 46-62.

Aghion, P. & Howitt, P. 2009. *The Economics of Growth.* Cambridge, MA: The. MIT Press.

Alhowaish, A. K. 2015. Causality between Construction Sector and Economic Growth:The Case of Saudi Arabia. *International Real Estate Review*, *18*(1), 131-147.

Alkhathlan, K. 2013. The Nexus between Remittance Outflows and Growth: A Study of Saudi Arabia. *Economic Modelling*, 33, 695-700.

Alodadi, A., & Benhin, J. 2015. Religious Tourism and Economic Growth in Oil-Rich Countries: Evidence from Saudi Arabia. *Tourism Analysis*, *20*(6), 645-651.

Altaee, H. H., Al-Jafari, M., K & Masoud, K. 2016. Determinants of Economic Growth in the Kingdom of Saudi Arabia: AnApplication of Autoregressive Distributed Lag Model. Applied Economic and Finance, 3 (1), 83 93. https://doi.org/10.11114/aef.v3i1.1200.

Altaee, H. H. A., & Al-Jafari, M. K. 2015. Financial Development, Trade Openness and Economic Growth: A trilateral Analysis of Bahrain. *International Journal of Economics and Finance*, 7(1), 241–254.

Al Awad, M. 2010. The Role of Manufacturing in Promoting Sustainable Economic Growth in the GCC. Working Paper ZU-WP 2010-003, Institute for Social & Economic Research, Zayed University.

Al-Jarrah, M. A. 2005. Defense Spending and Economic Growth in an Oil-Rich Country: The Case of Saudi Arabia. *Pakistan Economic and Social Review*, *43*(2), 151-166.

Al-Iriani, M. & Al-Shamsi, F. M. 2009. Foreign Direct Investment and Economic Growth in the GCC Countries. A Causality Investigation Using Heterogeneous Panel Analysis. Topics in Middle Eastern and North African Economies, electronic Journal, Volume 9, Middle East Economic Association and Loyola University Chicago.

Al-Yousif, Y. 2000. Do Government Expenditures Inhibit or Promote Economic Growth: Some Empirical Evidence from Saudi Arabia. *The Indian Economic Journal*, *48*(2), 92- 96.

Apergis, N. & Payne, J.E. 2010. Energy Consumption and Growth in South America: Evidence from a Panel Error Correction Model. *Energy Economics*, *32* (6), 1421-1426. http://dx.doi.org/10.1016/j.eneco.2010.04.006.

Apostolakis, B. E. 1990. Energy-Capital Substitutability/Complementarity: The Dichotomy. *Energy Economics*, *12*(1), 48-58. http://dx.doi.org/10.1016/0140-9883(90)90007-3.

Bahraumahah, A. Z., & Thanoon, M. A. 2006. Foreign Capital Flow and economic Growth in East Asian Countries. *China Economic Review* 17, 70-83.

Barro R. J. 2003. Determinants of economic growth in a panel of countries. *Annals of Economics and Finance*, *4*(2), 231-274.

Barro R. J. 1991. Economic growth in a cross section of countries. *The Quarterly Journal of Economics*, *106*(2), 407-443.

Bekhet, H. A., Matar, A., & Yasmin, T. 2017. CO2 Emissions, Energy Consumption, Economic Growth, and Financial Development in GCC countries: Dynamic Simultaneous Equation Models. *Renewable and Sustainable Energy Review*, 70, 117–132.

Bengoa, M. & Sanchez-Robles, B. 2003. Foreign Direct Investment, Economic Freedom and Growth: New Evidence from Latin America. *European Journal of Political Economy*, *19* (3), 529-545.

Bloom, D. E. & Finlay, J. 2009. Demographic Change and Economic Growth in Asia. *Asian Economic Policy Review*, *4*(1), 45-64.

Brassington, G. 2017. Mean Absolute Error and Root Mean Square Error: Which is the Better Metric for Assessing Model Performance? *EGU General Assembly Conference Abstracts*, *19*, 3574.

Cavalcanti, T. V., Mohaddes, K. & Raissi, M. 2011. Growth, Development and Natural Resources: New Evidence Using a Heterogeneous Panel Analysis. *The Quarterly Review of Economics and Finance*, *51*(4), 305-318. https://doi.org/10.1016/j.qref.2011.07.007.

Choe, J. 2003. Do Foreign Direct Investment and Gross Domestic Investment Promote Economic Growth. *Review of Development Economics*, *7(1)*, *44-57. https://doi.org/10.1111/1467-9361.00174.*

De Mello, Jr. L. R. 1997. Foreign Direct Investment in Developing Countries and Growth: A selective Survey. *The Journal of Development Studies*, *34*(1), 1-34. https://doi.org/10.1080/00220389708422501

De Mello, Jr. L.R. 1999. Foreign Direct Investment-Led Growth: Evidence from Time

Series and Panel Data. Oxford Economic Papers, 51(1), 133–151, https://doi.org/10.1093/oep/51.1.133.

Ebohon, O.J. 1996. Energy, Economic Growth and Causality in Developing Countries: A Case Study of Tanzania and Nigeria. *Energy policy*, *24*(5), 447-453, http://dx.doi.org/10.1016/0301-4215(96)00027-4.

Echchabi, A., Abd Aziz, H., & Idriss, U. 2018. The Impact of Sukuk Financing on Economic Growth: The Case of GCC Countries. *International Journal of Financial Services Management*, *9*(1), 60 – 69.

Edrees, A. 2016. The Impact of Foreign Workers, Outflow Remittances on Economic Growth in Selected GCC Countries: ARDL Approach. *Arabian Journal of Business and Management Review*, 6, 250. DOI: 10.4172/2223-5833.1000250.

Esen, Ö. & Bayrak, M. 2017. Does More Energy Consumption Support Economic Growth in Net Energy-Importing Countries?*Journal of Economics, Finance and Administrative Science*, *22* (42), 75-98.

Feder, G. 1983. On Exports and Economic Growth. *Journal of Development Economics*, *12*(1-2), 59-73. https://doi.org/10.1016/0304-3878(83)90031-7.

Fernandez-Van, I. & Weidner, M. 2017. Fixed Effect Estimation of Large T Panel Data Models. CEMMAP Working Paper P. /142CW, Gibbons, J. (1984), Capital-Energy Substitution in the Long Run. *The Energy Journal*, *5* (2), 109-118.

Grassa, R., & Gazdar, K. 2014. The Financial Development and Economic Growth in GCC Countries: A Comparative Study between Islamic and Conventional Finance, *International Journal of Social Economics*, *Vol.* 41, *No. 6, 2014, 493-514.* DOI 10.1108/IJSE-12-2012-0232.

Hamdan, B. S. S. 2016. The Effect of Exports and Imports on Economic Growth in the Arab Countries: A Panel Data Approach. *Journal of Economics Bibliography*, *3*(1), 100-107, http://dx.doi.org/10.1453/jeb.v3i1.600

Hsiao, C., Panel Data Analysis — Advantages and Challenges, Sociedad de Estadística e Investigación Operativa, Test (2007) 16: 1–22. DOI 10.1007/s11749-007-0046-x.

Howarth, N., Galeotti, M., Lanza, A. & Dubey, K. 2017. Economic Development and Energy Consumption in the GCC: An International Sectoral Analysis. *Energy Transitions*, *1*(6). https://doi.org/10.1007/s41825-017-0006-3.

Hvidt, M. 2013. Economic Diversification in GCC Countries: Past Record and Future Trends. LSE, Monograph (Report),http://eprints.lse.ac.uk/id/eprint/55252.

Im, K.S., Pesaran, M. H. & Shin, Y. 2003. Testing for Unit Roots in Heterogeneous Panels. *Journal of Econometrics*, *115*, 53-74. Iyke, B.N. 2015. Electricity Consumption and Economic Growth in Nigeria: A Revisit of the Energy-Growth Debate. *Energy Economics*, *51*, 166-176. http://dx.doi.org/10.1016/j.eneco.2015.05.024

Jouini, J. 2015. Linkage between International Trade and Economic Growth in GCC Countries: Empirical Evidence from PMG Estimation Approach. *The Journal of International Trade and Economic Development*, (3), 341-372.

Kim, Jong-Il & Lau, L. 199). The Sources of Economic Growth in the East Asian Newly Industrialized Countries. *Journal of the Japanese and International Economies*, *8*(3), 235-271.

Kim, P. 2014. A New Economic Growth Theory: An Obstacle to Economic Growth. *Economics Papers and Presentations*, 4.

Levin, Lin & Chu 2002. Unit Root Tests in Panel Data: Asymptotic and Finite-Sample Properties. *Journal of Econometrics*, *108*(1), 1– 24.

Lucas, Jr., R. E. 1988. On the Mechanics of Economic Development. *Journal of Monetary Economics*, *22*(1), 3-42. https://doi.org/10.1016/0304-3932(88)90168-7.

Mahran, H. A.2012. Financial Intermediation and Economic Growth in Saudi Arabia: An Empirical Analysis, *Modern Economy*, 3, 1968-2010.

Mankiw, N. G., Romer, D. & Weil, D. N. 1992. A Contribution to the Empirics of Economic Growth. *The Quarterly Journal of Economics*, *107*(2), 407-437.

Mushtaq, M., Nazir, R., Bashir, I., Ahmed, S. Nadeem, M. 2014. Panel Cointegration Analysis of Government Spending, Exports, Imports and Economic Growth. *International Review of Research in Emerging Markets and the Global Economy*, *1*(2), 81-89.

Obwona, M. 2001. Determinants of FDI and their Impact on Economic Growth in Uganda. *African Development Review* 13, 46– 81.

Odhiambo, N.M. 2009. Energy Consumption and Economic Growth Nexus in Tanzania: An ARDL Bounds Testing Approach. *Energy Policy*, *37*(2), 617-622. http://dx.doi.org/10.1016/j.enpol.2008.09.077.

Osman, M., Gachino, G., & Hoque, A. 2016. Electricity Consumption and Economic Growth in the GCC Countries: Panel Data Analysis. *Energy Policy*, *98*, 318-327. https://doi.org/10.1016/j.enpol.2016.07.050.

Pedroni, P. 1999. Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors. *Oxford Bulletin of Economics and Statistics*, *61*, 653–670.

Pedroni, P. 2004. Panel Cointegration: Asymptotic and Finite Sample Properties of Pooled Time Series Tests with an Application to the PPP Hypothesis. *Econometric Theory*, *20* (3), 597–625.

Pesaran M. H. & Zhou, Q. 2016. Estimation of Time-Invariant Effects in Static Panel Data Models. *Econometric Reviews*, *37*(10), 1137-1171. http://dx.doi.org/10.1080/2016.1222225.

Solow, R. M. 1956. A Contribution to the Theory of Economic Growth. The Quarterly *Journal of Economics*, *70*(1), 65–94. https://doi.org/10.2307/1884513.

Tuwaijri, A. 2001. The Relationship between Exports and Economic Growth. *Journal of King Saud University*, *13*(1), 219-234.

Wooldridge, J. M. 2006. *Introductory Econometrics: A Modern Approach.* 3rd Edition, Thomson/South-Western, Mason.