Preliminary communication
UDC: 336.761: 338.1
https://doi.org/10.18045/zbefri.2020.2.619

The interdependence between stock market development and economic growth: a multi-country examination*

Hana Bawazir[1], *Mukesh Kumar*[2], *Saban Celik*[3], *Khadija Abdulredha Abdulla*[4], *Bora Aktan*[5]

Abstract

This paper attempts to test the relationship between economic growth and equity market development in GCC region which is the Cooperation Council for the Arab States of the Gulf, namely, Saudi Arabia, Bahrain, the United Arab Emirates, Oman, Kuwait and Qatar over the period of 2000 and 2017. The Generalized Linear Mixed Model (GLMM) is adopted to find the nexus and the nature of the relationship. Compared to the conventional regression models, GLMM provides a more reliable conclusion accounting for the missing data and eliminate the country specific differences. The study finds a significant positive association between stock market liquidity (SML) and per capita real gross domestic product (GDP) but insignificant negative association between stock market capitalization (SMC) and GDP in the long run. The results also indicate that SML and SMC are significantly and positively correlated. Considering well-performing stock markets

* Received: 14-10-2020; accepted: 21-12-2020

[1] *Assistant Professor, University of Bahrain, College of Business Administration, Sakheer, 32038, Kingdom of Bahrain. Scientific affiliation: financial markets and institutions, risk management and insurance. Phone: 17 438 592. E-mail: hbawazir@uob.edu.bh.*

[2] *Professor, University of Bahrain, College of Business Administration, Sakheer, 32038, Kingdom of Bahrain. Scientific affiliation: econometrics, microeconomics, macroeconomics. Phone: 17 438 592. E-mail: mkumar@uob.edu.bh.*

[3] *Associate Professor, İzmir Katip Çelebi University, Faculty of Economics and Administrative Sciences, Çiğli Balatcik 33/2, İzmir, Turkey. Scientific affiliation: corporate finance, international finance, investment analysis. Phone: +90 537 610 34 54. E-mail: saban.celik@ikcu.edu.tr.*

[4] *Expert, Tamkeen, 70 Street Manama, Kingdom of Bahrain. Scientific affiliation: financial advisor, project financing. Phone: 17 383 333. E-mail: kabdullah@tamkeen.bh.*

[5] *Associate Professor, University of Bahrain, College of Business Administration, Sakheer, 32038, Kingdom of Bahrain. Scientific affiliation: financial management, financial markets and institutions. Phone: 17 438 592. E-mail: gbora@uob.edu.bh. (Corresponding Author).*

can enhance the nation's wealth, reduce the over-dependence on oil as a major contributor to the economic growth, the results suggest that policy makers in the region ought to play more active role to stimulate their equity markets together with global integration.

***Key words**: stock market development, economic growth, financial market, causality*

***JEL classification**: G10, G20, O40*

1. Introduction

The long-run economic growth has been a subject of interest to researchers and economists since late 1880s. Different views have been developed overtime to arrive at explanations of what spurs economic activities. Economically, growth is caused by increase in the aggregate demand and supply. Factors such as lower interest rate, increased consumer spending, increased government spending and increased financial stability and confidence are vital to create healthier economy and achieve better standards of living. Research studies find many factors that may contribute to or stimulate economic growth. For example, financial development, banking sector development, financial inclusion, stock market development, innovation and entrepreneurship may stimulate economic growth in the long or short term. The level and direction of this impact may be affected by the type of economy in which the study is conducted.

Economic growth is the increase in market value of the products produced and services provided by an economy over time adjusted for real inflation. Traditionally, it has been defined as the increase in productivity from traditional factors of production such as, land, labor and capital (Epley, 2003). Within the theoretical context, the mercantilism perspective regarding economic growth defends the idea that accumulation of silver and trade surplus explain economic growth (Gaido, 2016). However, under the neo-classical theory, factor inputs, workforce and productivity are the main determinants of growth. The "neoclassical production theory" focuses on the production as a building block, where firms optimize their production function with some degree of factor substitution (Fanti and Manfredi, 2009). On the other hand, Nelson and Winter (1974: 901) find that 'the sharp "growth accounting" split made within the neoclassical paradigm is bothersome empirically and conceptually'. Additionally, the neoclassical models find a level of convergence between countries as the poorer economies faster to grow than richer ones (Pietak, 2014). Whereas, the endogenous growth theory assumes that the economic growth is resulted by internal (endogenous) factors. "The main determinants of growth are: the innovation, imperfect competition, increasing returns to scale, externalities" (Popa, 2016: 241). According to Popa (2016) the endogenous growth theory holds that the technical progress includes: investments in physical capital (Romer model); investments in human capital (Lucas model);

investments in public capital (Barro model); investments in research and development (Romer model). Increase in physical capital, human capital, public capital and investment in R&D play an important role to spur economic growth. According to Pietak (2014), countries with high stock of human capital grow faster in the long run.

On the other hand, Keynes believes that an economy cannot keep full employment automatically. Keynesians advocate that government intervention is needed to maintain a full or reasonable level of employment and enhance economic growth. "Keynes and the quantity theorists neglected the relevance of free banking and, indeed, the availability of credit in its widest sense" (Steele, 1998: 496). Economic growth can be spurred by several factors. Within the academic research context, a financial system that successfully performs its financial functions would also contribute to the economic growth in the long run (Mercan and Gocer, 2013). The financial development- economic growth relationship has been controversial since the early work of Bagehot (1873) who discussed the importance of financial system to economic growth by facilitating the mobilization of capital and enhancing industrialization. This idea was extensively studied in literature in 1960s and 1970s (Patrick, 1966; Porter, 1966). On the other hand, as it was argued by Robinson (1962) that "where enterprise leads, finance follows". Economic growth creates the need for financial innovations and the financial system responds to those needs by creating innovative financial arrangements and services. This argument was also supported by some early studies such as the study by Levine (1997).

Stock markets, as a major part of financial systems, are mechanisms to transform savings into financing for the real sector. From a theoretical perspective, it can accelerate economic growth by improving the quantity and quality of investments and by boosting and mobilizing domestic savings. If the cost of saving mobilization reduced, stock market would extensively facilitate investments in expensive technologies and eventually leads to economic growth (Greenwood and Smith, 1997).

Generally, stock market ensures the proper environment for obtaining more financial resources for developing investment projects and sharing risks (Carp, 2012). This paper contributes the literature in two folds. First, a specific sample of countries, GCC region, is investigated which are highly dependent on oil production. Second, data are examined by GLMM type regression that produce relatively more reliable results. Moreover, the GCC countries have a very small part in the literature studying this relationship as most studies are about the financial sector in general. In addition, the stock market–economic growth relationship remains a subject of debate and disagreement among researchers. As a result, with their special economic conditions and characteristics, stock market–economic growth relationship in the GCC countries will add an important interpretation to the literature on this subject. It is the common fact that financial sector development which has been used in most researches –

especially those that were conducted in the GCC countries- is too general and may not help us to specify the direct originator of economic growth. The distinctiveness of the present study is to analyze the stock market as a major part in the financial systems of developed and oil production based economies and examine the differentials due to the time period, origin of countries and variables used.

2. Literature review

Apart from economic theories, there are those who brought the idea that economic growth is a product of financial development. Many significant studies on the same topic worked hard to prove this relationship and the nature and the direction of causality between financial development and economic growth (King and Levine, 1993). Bagehot (1873) has paid a great attention to the relationship between financial development and economic growth followed by many other researchers (i.e. Schumpeter and Opie, 1983; Robinson, 1962; Hicks, 1969).

Adjasi and Biekpe (2009) find that the stock market returns are major influencer on investment growth. This is because lower cost of capital and availability of investment funds are associated with increases in stock prices. They concluded that the well performance of stock markets has a positive effect on the formation of capital for investment in some selected African countries that are emerging economies. In Egypt, "widening financial development to include the stock market has paid off" (Bolbol et al., 2005: 193). Furthermore, well developed stock markets will shift the world portfolio from low risk and low return of investments to high risk and high return investments creating welfare gains and economic growth due to higher consumption (Obstfeld, 1994).

According to Jensen and Murphy (1990), stock markets enhance corporate governance and eliminate the problem of principle-agent, which is also beneficial to healthier economic growth. Jensen and Murphy (1990) support Wu et al. (2010) in that the contribution of stock market capitalization to economic growth is substantially larger than that of banking in the long-term.

The stock markets are also important in that they "enable firms acquire capital quickly and more efficiently by creating an open market platform for transparent and efficient business transactions to take place" (Adjasi and Biekpe, 2009: 109). The capital acquired through stock markets can be invested in profitable projects which promotes the sustainable investment growth. A study by Tobin (1969) and later by Furstenberg et al. (1977) concluded that stock market activities and investments are positively correlated.

It is also worth to mention that stock markets, through the liquidity they create, reduce the risk of investments by allowing investors the flexibility to buy or sell

equity stocks without locking their savings for a long period, while allowing firms to obtain long term capital (Levine, 1991).

According to Cheng et al. (2011), well developed stock markets directly promotes economic performance, aids in the development of credit markets and eventually brings an economic boom. To ensure the smooth and well-functioning of the whole financial system, a credible and reliable stock market is indispensable and important to increase economic productivity (Pradhan et al., 2014). The adequate functioning of stock markets is significant to the evolution of financial sector and the later has an essential contribution to sustainable economic development. Stock markets that are functioning adequately transform the national economy to an attractive market for foreign investors (Carp, 2012).

In a study by Pradhan et al. (2014) on the causal nexus between economic growth, banking sector development, stock market development and other economic variables, ASEAN countries show that all variables are co-integrated. This means that components of the financial system including the banking sector development, stock market development and other macroeconomic variables collectively play an important role in the determination of the long-run economic growth. It is also argued that markets can promote growth, and the process works in two ways so that growth in turn can encourages the formation of markets (Greenwood and Smith, 1997).

A Schumpeterian model analyzed the relationship between innovations, economic growth, and entrepreneurship. The analysis concludes that both innovations and entrepreneurship have a positive effect on economic growth. In this circular effect, all the three variables would have noticeable positive effects on each other. Greater entrepreneurship activity and innovation would spur economic activity, in turn the later would have positive effects on entrepreneurship and innovation. In contrast to the Keynesian theory, research shows that a tighter money supply would significantly and positively encourages innovation and entrepreneurship activities (Galindo and Mendez, 2014). The reason behind this may be that less fund availability can enhance motivation to save. As a result, innovations will be encouraged to arrive at financial and non-financial products and solutions that would reduce cost.

More recent studies on the same topic explain the nature of the relationship between financial development and economic growth as being affected by the type of economy or market. In developed countries, it may be easier and more reasonable to expect a positive relationship as economic growth in those countries has a big portion attributed to entrepreneurs expecting good investments and regulatory freedom, while this is not the case in developing countries (Valliere and Peterson, 2009). In contrast, Pradhan et al. (2014) found that the stock market development does not play a statistically significant role in spurring further economic growth

in relatively developed countries (i.e. OECD). This is because markets in such countries are mature enough not showing dramatic increase or decrease.

Using the dynamic panel threshold model Ruiz (2018) found two independent variables in finance (bank credit and domestic credit). He also finds that there is no consensus about how economic growth is affected by finance. The data analysis results show a positive relationship in industrialized economies because policy makers in such economies provide good regulations and incentives to institutional investors to encourage better investments. While in developing economies, the threshold of finance is lower. As a result, industrialized economies *grow* faster than developing economies.

Pan and Mishra (2018) concluded that in very large economies such as China where stock market plays a very small role in the economy, there is no significant effect of the stock market on the economic growth. Sometimes, in such countries stock market development is negatively related to economic growth and this could be explained by Chinese government using stock market as a tool to achieve specific goals. It is also worth mentioning that the nature of this relationship may vary in the short run versus the long-run and in one type of stocks versus another.

Batuo et al. (2018) used a dynamic panel method for the period 1985-2010 to investigate the relationship between financial instability, financial liberalization, financial development and economic growth in African countries. They first find that financial development and financial liberalization positively affect financial instability. Second, they also find that economic growth helps to reduce financial instability and the reduction is higher in the pre-liberalization period compared to post- liberalization period.

Since the above researches are based in different regions, there is a possibility that regional differences influence the nexus and nature of the financial (stock market) development- economic growth relationship. In the GCC countries, there is a long-run relationship between economic growth and its determinants and the financial development (Hamdi et al., 2014). Hamdi et al. (2014) detects the existence of this relationship in the GCC region by using panel unit root tests, panel error correction models and cointegration techniques. He finds that there is a strong evidence of long term but not short-term relationship.

Within the same context, Muhammad et al. (2016) use four estimation techniques to conduct a recent study on the finance-growth nexus based in the GCC countries. The study employs four estimation techniques which are Pooled OLS, System GMM, Random Effect Estimation and Fixed Effect Estimation using static and dynamic panel data. It also added more control variables to enhance the results of the research. The study resulted in a consistent positive relationship between financial sector development and economic growth when there is substantial improvement in the financial sector.

3. Methodology

As mentioned in the introduction and literature, the GCC countries have been chosen for their distinct economic characteristics as compared to other countries studied before. The study required three sets of data for each country: per capita real GDP (GDP), stock market capitalization (SMC) and stock market liquidity (SML), for the six countries in the period from 2000 to 2017, all of which have been collected from a single source which is World Development Indicators (WDI) which is the World Bank's premier compilation of cross-country comparable data on development. The dataset generated and formed a panel data that has more than one predictor varies over a period of time. The data for the six countries under study are pooled to form a panel of 108 (18 years* 6 countries) observations. Pooling the data of group of countries that share similar characteristics is common and used by many researchers in other studies such as Pradhan et al. (2014), Muhammad et al. (2016), Smaoui and Nechi, (2017) and others.

This empirical research aims at testing the stock market- economic growth nexus in the GCC countries during the period from 2000-2017. Mainly, papers on the same topic, use panel data techniques that observe different variables over a specific time period and cross-country regression analysis which is the best fit methodology for such studies. The panel data is tested to determine whether they are stationary, co-integrated, normal and non-collinear followed by relationship testing using Generalized Linear Mixed Model (GLMM).

The measurement of relevant variables is guided by past studies. Economic growth will be measured by per capita real GDP (GDP) that is widely used by researchers in the same field such as Livine and Zervos (1998). Stock market development will be measured by stock market capitalization and stock market liquidity which has been previously used by Livine and Zervos (1998) and Cooray (2010).

Per capita real (GDP) provides a better estimate to track economic output than nominal GDP. In contrast to nominal GDP, real GDP accounts for inflation by adjusting annual figures for price changes over time. GDP is defined as the total US dollar amount resulted from adding the gross value of an economy's resident producers in addition to product taxes and after subtracting subsidies that could not be included in the product value. It is calculated without considering depreciation of tangible assets, depletion of intangible assets or degradation of natural resources. Real GDP has no meaning by itself, for this, it must be compared with GDP figures of other years and is calculated using a "base year" prices. It is of great importance to note that because of the economic differences among the GCC countries, there is a need to unify the GDP measure and address differences in countries' population, income and natural resource availability. For example, the total GDP of Bahrain in a given year cannot be compared with the total GDP of Saudi Arabia in the same year. In this case the GDP figures will show a huge difference on behalf of Saudi Arabia.

In order to unify the measurement, the *Per Capita Real GDP* is used and it simply referred to as GDP in this research, which is total real GDP figure divided by mid-year population in USD:

$$Per\ Capita\ Real\ GDP\ (GDP) = \frac{Total\ GDP}{Mid\ year\ population} \quad (1)$$

Using per capita real GDP eliminates a country differences and allow for more accurate comparisons and research modeling.

Stock market capitalization is the share price multiplied by the number of outstanding shares of all listed domestic companies and excluding unit trusts, investment funds and companies whose purpose is only to hold shares of other listed companies using end of year values.

Stock Market Capitalization (SMC) is the ratio of the value of listed shares to real GDP and can be calculated using the following formula:

$$StocMarket\ Capitalization\ Ratio\ (SMC) = \frac{The\ value\ of\ listed\ shares}{Total\ Real\ GDP} \quad (2)$$

GCC data on stock market capitalization ratio are readily calculated and made available on WDI website except for the missing years data which have been accounted for by Log transformation and the addition of 5 to all values in the SMC data sheet.

Stock Market Liquidity (SML) is the end of year total number of domestic and foreign shares traded in an economy multiplied by their prices. While calculating the amount, only one side of the transaction is taken into consideration.

Stock Market Liquidity (Total value of stocks traded as a % of total real GDP), is the ratio of value of shares traded on a stock exchange divided by total real GDP and calculated as follows:

$$Stock\ Market\ Liquidity\ (SML) = \frac{The\ value\ of\ shares\ traded}{Total\ real\ GDP} \quad (3)$$

The GCC countries' data on stock market liquidity ratio are readily calculated and made available on WDI website except for the missing years data which have been accounted for by Log transformation and the addition of 5 to all values in the SML data sheet.

Country grouping is essential in all aspects specially for researches that are related to economics and finance. Previously, grouping was based on political boundaries, but this has been changed with time due to the industrial and economic development. Classification of countries into groups helps researchers to perform

comparative analysis on economies and regions as groups, especially that the main purpose of creating those groups is to form sets of homogeneous countries with common features. The total list of groups (economic, political and economic-political) represents the population for this research from which the GCC countries are selected as the study's sample.

The study uses a panel data consisting of annual observations of per capita real GDP, stock market capitalization and liquidity ratios of the 6 GCC countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates). Similar characteristics of countries under study make pooling of data easier and more realistic. The sample period spans from 2000 to 2017. The main reason behind the choice of this period is to consider the effect of different economic conditions such as, the global financial crisis 2007-2008. This period is also the most recent period with the maximum number of data available for the three predictors of the study.

The main models used to test the nexus of stock market development- growth relationship are: Levin, Lin and Chu (LLC) panel unit root test, Kolmogorov-Smirnov normality test, and Generalized Linear Mixed Model (GLMM) Repeated Measures analysis.

4. Empirical data and analysis

Table 1 shows descriptive statistic (means, standard deviations (SD), range, minimum, maximum and percentiles) across the selected time span of the studied variables for the six GCC countries (1= Bahrain, 2= Kingdom of Saudi Arabia (KSA), 3= Kuwait, 4= Qatar, 5= UAE, and 6= Oman).

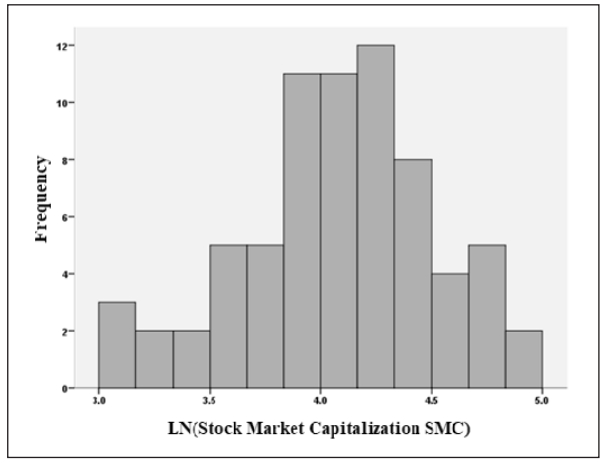
Table 1: Descriptive statistics for the measured financial indicators

		Stock Market Capitalization (SMC)	Stock Market Liquidity (SML)	Per Capita Real GDP (GDP)
Mean		41.63	24.93	31,141.39
Median		45.77	7.36	24,656.29
Std. Deviation		37.69	55.25	19,187.04
Range		128.37	372.26	80,088.21
Minimum		0.00	0.00	8,476.61
Maximum		128.37	372.26	88,564.82
Percentiles	25th	0.00	1.06	17,035.61
	50th	45.77	7.36	24,656.29
	75th	66.32	21.62	41,538.48

Source: Authors' calculations

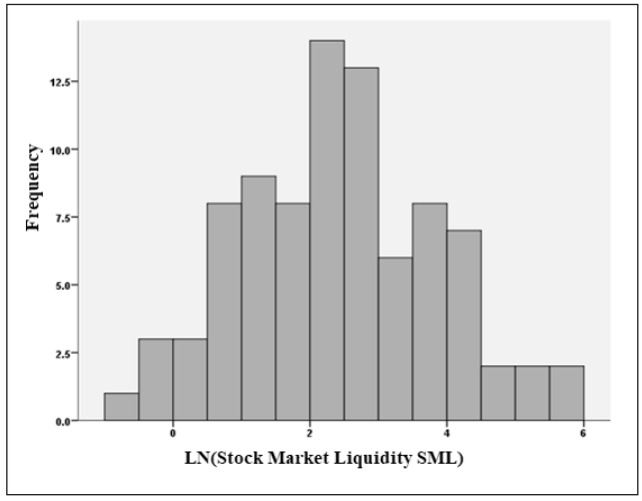
The mean and SD of SMC for the six countries equals to 41.63 points and 37.69 points, with a range of 128.40 points, but most of the countries (50%) have an SMC of 45.8 percent points or less (Figure 1).

Figure 1: Histogram of natural logarithm of stock market capitalization



Source: Authors' calculations

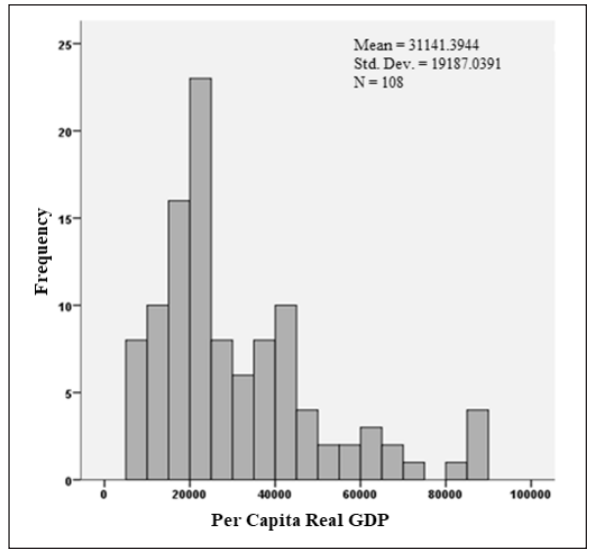
Figure 2: Histogram of natural logarithm of stock market liquidity



Source: Authors' calculations

This suggests an approximately normal distribution of the natural logarithm transformation of SMC which is used to get rid of the skewness in the original metric scale. On the other hand, the mean and SD of SML are 24.93 and 55.3 points respectively, with a range equals to 372.3 points between lowest and highest values. It is also important to notice that 50% of the countries' SML measures 7.36 points or less across the analyzed time span (Figure 2). Additionally, GDP shows an overall mean and SD equal to 31,141.39 and 19,187.04 points and a range of 80,088.21 points (Figure 3).

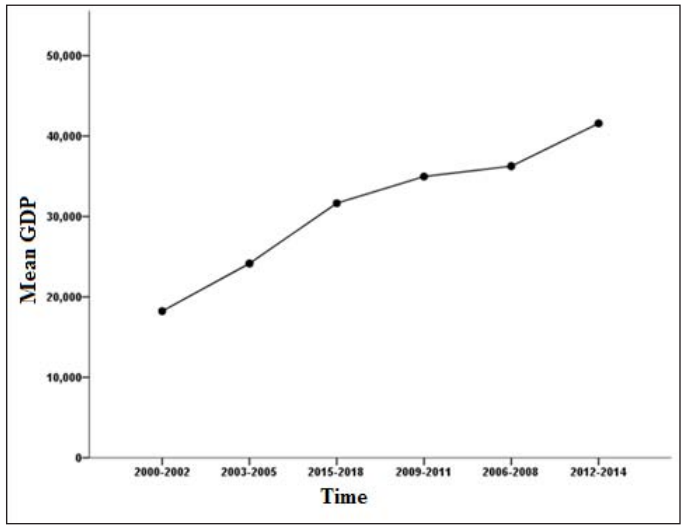
Figure 3: Histogram of per capita real GDP



Source: Authors' calculations

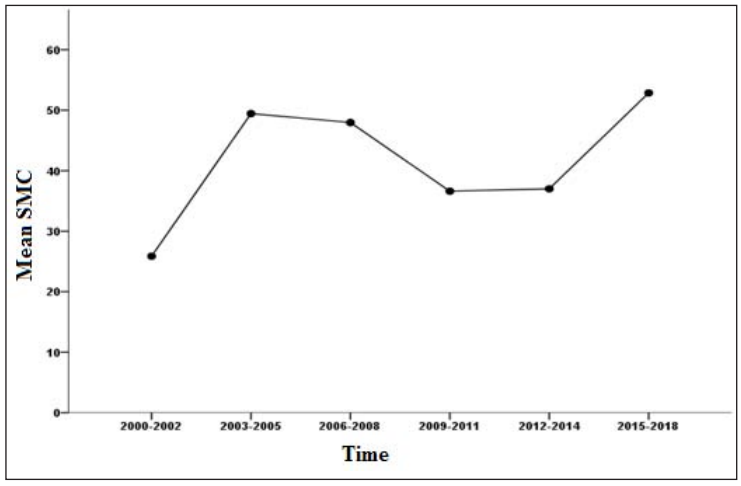
Overall, Figure 5 shows that SMC is the lowest between 2000-2002 with a mean of 25.87 points and SD of 33.71 points for all countries combined. SMC also shows a significant rise in the period between 2003-2005, where SMC in those countries combined had almost doubled with means equals to 49.5 and SD equals to 50.9. In successive periods SMC had declined between 2006-2011, followed by another period of rise between 2012 till 2018 as can be seen in the Figure 5.

Figure 4: Association between time (3-year groups) and average (mean) GDP



Source: Authors' calculations

Figure 5: Association between time (3-year groups) and average (mean) SMC



Source: Authors' calculations

Considering the country related differences, Bahrain's SMC has the highest mean and SD (71.98, 32.7), followed by Kuwait (37.93, 52.4) and then UAE (37.17, 21.6). The difference is considered high because both Kuwait and UAE have an average (mean) SMC that is nearly half of Bahrain's average (mean) SMC. Oman,

Qatar and KSA come after with KSA having the lowest SMC mean and SD among the six countries (31.61, 32.97).

In contrast to the above, the descriptive statistics of SML shows that KSA has the highest SML mean and SD (97.74, 104.6) followed by Kuwait (17.92, 32.69) then Qatar (14.1, 13.8), UAE (10.9, 10.1), Oman and finally Bahrain. In summary, SML statistics shows a significant association between SML values and SML variations. In other words, countries with high SML values tend to have higher variations in those values.

GDP, which is the dependent variable in this study, shows that Qatar has the highest GDP values with mean equals to 60,930.7 and SD equals to 21,145.3. UAE (mean= 38,388.83, SD=4,719.4), Kuwait (mean=35,210.49, SD=12,308.5) come directly after Qatar while Bahrain (mean=19,770.62, SD= 4,191.8) and KSA, then Oman which has the lowest GDP figures across years (Table 4). The overall average countries' GDP show incremental rise in their mean and variability. Higher GDP values are associated with higher GDP variability due to unrevealed reasons inherited in their systems (Figure 4).

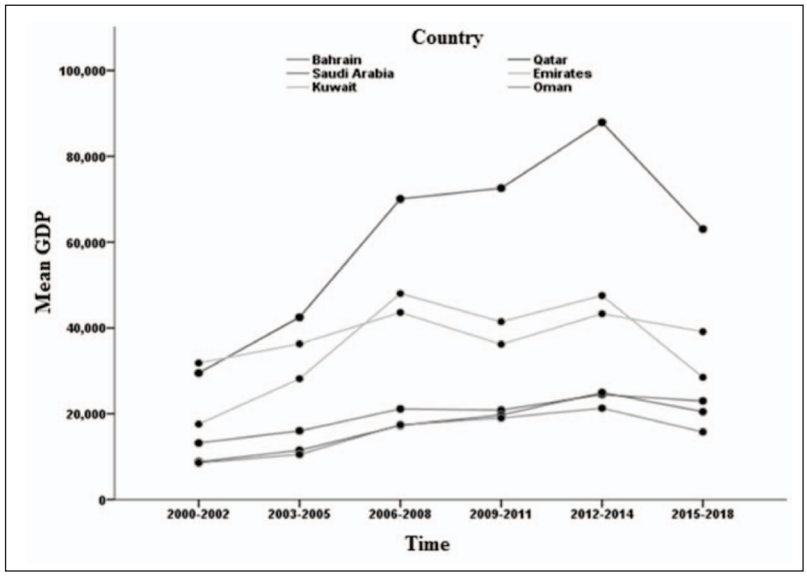
Table 2: Country specific means and standard deviations

Countries	N (years)	Mean (SD)		
		Market Capitalization SMC	Market Liquidity SML	Per Capita Real GDP
Bahrain	18	71.98 (32.67)	2.59 (2.25)	19,770.62 (4191.8)
Saudi Arabia	18	31.61 (32.97)	97.74 (104.6)	17,116.49 (5898.3)
Kuwait	18	37.93 (52.37)	17.92 (32.69)	35,210.49 (12308.5)
Qatar	18	34.4 (45.61)	14.06 (13.82)	60,930.7 (21145.3)
Emirates	18	37.17 (21.56)	10.9 (10.1)	38,388.83 (4719.4)
Oman	18	36.69 (17.3)	6.36 (4.74)	15,431.25 (4958.7)

Source: Authors' calculations

To understand the basic behavior of GDP for each country, the grouped time periods were plotted (x-axis), against the average (mean) GDP on the (y-axis) (Figure 6). It is evident that, for most countries, GDP rises then falls during the research period. On the contrary, some countries show constant rising trend like KSA and Qatar and some countries start with high/low GDP values and continue in the same level of GDP as compared to other countries. Remarkably, all six countries show decline in their GDP values after 2014. As such we analyze those countries for statistically significant differences on their overall average (mean) SML, SMC and GDP across the analyzed period using the conventional One-way ANOVA test in subsequent analysis (Table 4 and 5).

Figure 6: Association between time and country specific average (mean) GDP



Source: Authors' calculations

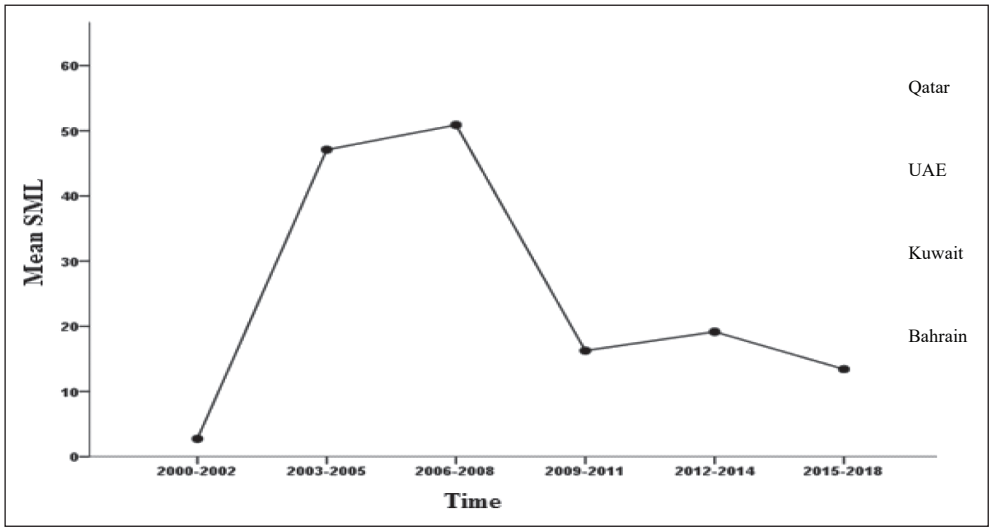
Table 3: Descriptive statistics across the study's period

Years	N	Mean (SD)		
		Market Capitalization SMC	Market Liquidity SML	GDP Mean (Standard Deviation)
2000-2002 Years	18	25.87 (33.71)	2.75 (5.04)	18,239.5 (9,586.4)
2003-2005 Years	18	49.45 (50.88)	47.09 (88.16)	24,158.23 (13,328.3)
2006-2008 Years	18	47.97 (45.15)	50.88 (90.13)	36,255.69 (20,667.8)
2009-2011 Years	18	36.62 (29.35)	16.26 (20.18)	34,967.6 (20,121.5)
2012-2014 Years	18	37.01 (30.27)	19.15 (23.35)	41,574.46 (23,692.8)
2015-2018 Years	18	52.86 (29.09)	13.42 (18.23)	31,652.89 (16,358.5)

Source: Authors' calculations

The average (mean) SML begins low (mean= 2.75, SD=5.04) for all countries between 2000-2002 however, it shows a significant rise in the successive years between 2003-2008 then a decline afterwards, see (Figure 7).

Figure 7: Association between time (3-year groups) and average (mean) SML



Source: Authors' calculations

Nonetheless, GDP shows a substantive linear rise across the time period between 2000-2018 on average. A Joncheere-Terpestra non-parametric independence alternatives test is used to assess whether or not the rise in the countries' GDP is significant in the analyzed time period. The analysis shows that there has been a significant rising trend between 2000-2018 in the countries average (mean) GDP with $\chi 2(108) = 3156$ and $p<0.001$, denoting that those countries had measured a significant rise in their mean GDP across time (Figure 6).

Next, to understand whether those countries differed in their average (mean) measured financial parameters, a one-way ANOVA test is performed to assess the difference between those countries in their mean measured GDP, SML and SMC scores. However, an adjusted Welch's One-Way ANOVA is quoted for those tests due to the violation of the statistical assumption of equal variance found across the analyzed countries, Leven test is statistically significant to assess the equal variance assumption in each of GDP, SML and SMC. In addition, the study compares the logged (LN transformed values) of both SML and SMC.

To simply integrate the findings of the analysis, the study begins with the stock market capitalization. The Welch's one-way ANOVA test suggests that there are statistically significant differences on the average (mean) SMC among the GCC countries with $f (5,47.1) =3.84$ and $p=0.005$, and a post-hoc follow up Games-Howell pairwise comparison on the Average (mean) SMC (i.e., series of pairwise t-tests) suggests that Bahrain has significantly higher average (mean) SMC compared to Saudi Arabia with $p=0.042$. Bahrain also has a significantly higher average (mean) SMC than Qatar but

lower SMC than Kuwait and no significant difference in its average (mean) SMC compared to Emirates and Oman, p>0.050 respectively (Table 4).

Table 4: One-way ANOVA – country comparison

Countries	N (year)	Mean (SD)		
		LN (Stock Market Capitalization SMC)	LN (Stock Market Liquidity SML)	Per Capita Real GDP
Bahrain	18	4.12 (0.94)	1.99 (0.30)	19,770.62 (4,191.8)
Saudi Arabia	18	2.91 (1.34)	4.19 (1.04)	17,116.49 (5,898.3)
Kuwait	18	2.77 (1.5)	2.46 (1.1)	35,210.49 (12,308.5)
Qatar	18	2.74 (1.5)	2.65 (0.83)	60,930.7 (21,145.3)
Emirates	18	3.49 (0.91)	2.57 (0.7)	38,388.83 (4,719.4)
Oman	18	3.56 (0.75)	2.35 (0.66)	15,431.25 (4,958.7)
test statistic		f(5,47.1)=3.84	f(5,45.30)=17.03	f(5,46.8)=63.14
p-value		*0.005*	*<0.001*	*<0.001*

LN = Natural Logarithm transformation; A constant = (5) was added to all values of SMC and SML; N = 108

Source: Authors' calculations

Saudi Arabia has no statistically significant difference in its average (mean) SMC as compared to the remaining GCC countries (p>0.050) when pairwise compared to Bahrain, Qatar, Kuwait, Oman and United Arab Emirates respectively. However, the pairwise analysis shows that Oman, Kuwait, United Arab Emirates and Saudi Arabia do not differ significantly in their respective average (mean) SMC. It is also evident that Bahrain has the highest average (mean) SML among the six GCC countries in the analyzed period.

The One-way ANOVA is used to compare the grouped year periods in their average (mean) GDP, SML and SMC (Table 5). When comparing the logged values of both stock market liquidity and stock market capitalization, the one-way ANOVA test shows that there is no statistically significant difference in the average (mean) SMC across year groups with F(5,47.51)=1.46 and p=0.219. However, the study uses another Welch's adjusted one-way ANOVA test to compare year groups for their respective mean SML and find that there is a significant mean differences between those spans in their respective average (mean) SML indexes having f(5,46.40)=7.50 and p<0.001. Games-Howell post-hoc pairwise comparison between those groups of years shows that the average (mean) SML in the time period of 2000-2002 is not significantly different from those in the period of 2006-2008 with p=0.088 and in the period of 2015-2018, but the remainder years has significantly greater SML indexes with p<0.050.

Table 5: One-way ANOVA analysis across the study's period

Years	N	Mean (SD)		
		LN(Stock Market Capitalization +5) (SMC + 5)	LN(Stock Market Liquidity + 5) (SML + 5)	Per Capita Real GDP (GDP)
2000-2002 Years	18	2.70 (1.3)	1.96 (0.50)	18,239.5 (9,586.4)
2003-2005 Years	18	3.27 (1.43)	2.91 (1.4)	24,158.23 (13,328.3)
2006-2008 Years	18	3.36 (1.33)	3.3 (1.15)	36,255.69 (20,667.8)
2009-2011 Years	18	3.24 (1.21)	2.71 (0.84)	34,967.6 (20,121.5)
2012-2014 Years	18	3.25 (1.2)	2.81 (0.86)	41,574.46 (23,692.8)
2015-2018 Years	18	3.76 (1)	2.56 (0.82)	31,652.89 (16,358.5)
test statistic		f(5,47.51)=1.46	f(5,46.40)=7.50	f(5,46.7)=5.69
p-value		*0.219*	*<0.001*	*<0.001*

LN = Natural Logarithm transformation; A constant = (5) was added to all values of SMC and SML; N=108.

Source: Authors' calculations

In general, pairwise comparison between the remainder of the year groups suggests no statistically significant differences on the average (mean) SML indexes when each of those periods are pairwise compared. In short, the period of 2000-2003 may have the lowest SML compared to the rest of the years, but the periods of 2000-2002 and 2003-2005 does not differ in their respective average (mean) SML indexes, indicating they are close in their average (mean) SML indexes on average. The period between 2015-2018 show a decline in SML compared to the previous time periods between 2003-2014 (Figure 5).

In the same way, the study compared the GDP across year groups using the Welch's adjusted one-way ANOVA. The yielded results are shown in Table 5. To explain the yielded analysis findings, the one-way ANOVA test indicated that there is a statistically significant differences in the average (mean) GDP indexes between the analyzed time periods with $F(5,46.7)=5.69$, $p<0.001$, and a post-hoc Games-Howell pairwise comparison between those time periods indicates that the GDP index is not different in the adjacent time periods 2000-2002 and 2003-2005 ($p=0.649$), but the time period of 2000-2002 has significantly lower GDP average (mean) index compared to time periods after 2005 ($p<0.050$).

Nonetheless, the time period between 2003-2005 is characterized by a non-statistically significant difference on the average (mean) GDP compared to the

rest of time periods ($p>0.05$). The remainder of the time periods do not differ significantly in their respective average (mean) GDP when each pair of them are pairwise compared ($p>0.050$). This indicates that there is a rise in the per capita real GDP between 2006-2018 which stays constant across those years, at the same time the time period of 2000-2005 has the lowest average (mean) GDP scores for all the GCC countries combined (Figure 4).

Furthermore, Welch's adjusted one-way ANOVA test is used to assess differences between the analyzed GCC countries on their average (mean) SML. The analysis results suggest that there are statistically significant differences on the overall average (mean) SML between countries during 2000-2018, ($F(5,45.30)=17.03$, $p<0.001$). According to Games-Howell post-hoc pairwise comparison between each pair of those countries, Bahrain has a statistically significant lower average (mean) SML as compared to KSA ($p<0.001$). Bahrain also has a statistically significant lower SML compared to Qatar ($p=0.042$), Emirates ($p=0.025$) and Oman ($p=0.051$). The pairwise comparison on SML between Kuwait and Bahrain suggested that they do not significantly differ in their average (mean) SML when pairwise compared ($p=0.498$). Additionally, the test finds that KSA has a significantly greater average (mean) SML compared to other GCC countries ($p<0.001$) when pairwise compared with each of them. The pairwise comparison between Kuwait, Qatar, Emirates and Oman suggests that they do not statistically significantly differ in their respective average (mean) SML across the analysis period ($p>0.050$).

To sum up, Saudi Arabia differs substantively in its average (mean) SML compared to the other countries (has the highest SML rates) across the analysis period. Other countries have similar average (mean) SML except Bahrain and Kuwait which have the lowest average (mean) SML. Figure 5 shows a clear rise then fall pattern in their measured market liquidity.

Likewise, study compares the overall average (mean) (18-years mean) using Welch's adjusted one-way ANOVA test and finds that a statistically significant 18-year mean difference in GDP between those countries may exist ($F(5,46.8)=63.14$, $p<0.001$). In addition, Games-Howell pairwise comparison indicates that Bahrain, Oman and Saudi Arabia do not significantly differ in their overall eighteen years' average (mean) GDP index ($p=0.632$). Bahrain has a significantly lower average (mean) GDP compared to Kuwait ($p=0.001$), Qatar and UAE ($p<0.001$) each respectively. Moreover, the pairwise comparison between KSA and the other countries suggests that KSA has a significantly lower average (mean) GDP as compared to Qatar, Kuwait and UAE ($p<0.001$) each respectively. When Kuwait compared to Qatar, it shows significantly lower mean overall GDP index across the span of the eighteen years ($p=0.002$). Kuwait also has a significantly higher GDP compared to Oman ($p<0.001$). In addition, in pairwise comparisons, Qatar has significantly the highest average (mean) GDP across years as compared to the remaining five GCC countries, ($p<0.001$) each respectively. Oman, on the other hand, has the lowest average (mean) GDP compared to others.

In sum, Qatar has the highest 18- year average (mean) GDP compared to the other countries but, KSA, Oman and Bahrain do not differ significantly with Oman having the lowest average (mean) GDP (Figure 4).

The One-way ANOVA analysis compares the behavior of the studied indicators across the six countries and despite economic size differences it shows how similar are those countries which is rationale of choosing them as a group and pooling their data.

Unit root and stationarity is one of the most important tests in any study. Stationary data is predictable and better to analyze and assess. For the purpose of testing our data stationarity, two main tests are used that are Im, Pesaran and Shin (IPS) and Levin, Lin and Chu (LLC).

After rejecting the null hypothesis of unit root at 1 % significance test was repeated by using first differencing LLC and ISP. It was found that GDP, SML and SMC are stationary in their respective log-difference at the 0.05 significance level. As such, it can be concluded that the variables are integrated of order one I(1) (Table 6).

Table 6: Results of (Im, Pesaran and Shin) and (Levin, Lin and Chu)

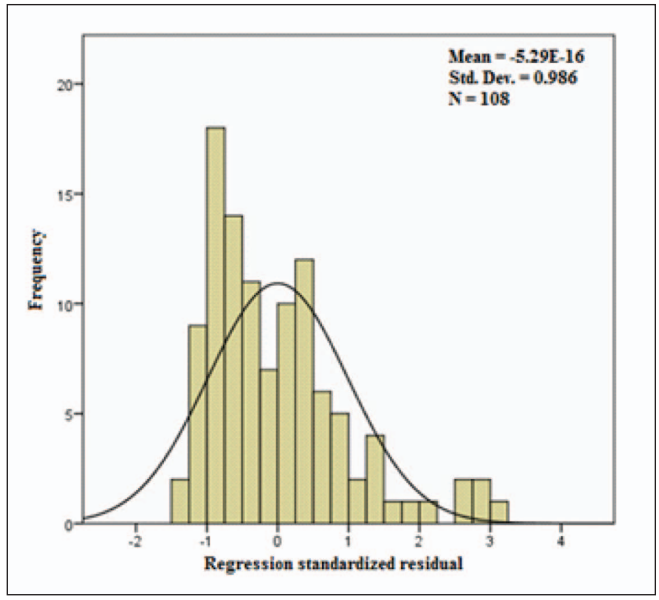
Levin, Lin & Chu		Im, Pesaran & Shin		
1st difference	Level	1st difference	Level	
-7.07 (< 0.001) **	-2.17 (0.015) *	-5.05 (< 0.001) **	-0.54 (0.295) //	Log of GDP_CAP
-8.37 (< 0.001) **	-3.27 (< 0.001) **	-4.82 (< 0.001) **	-3.00 (0.001) **	Log of SMC
-4.16 (< 0.001) **	1.41 (0.080) /	-2.69 (0.004) **	-0.70 (0.241) //	Log of SML

Testing Unit-Roots in log of (GDP_CAP, SMC and SML)

Source: Authors' calculation

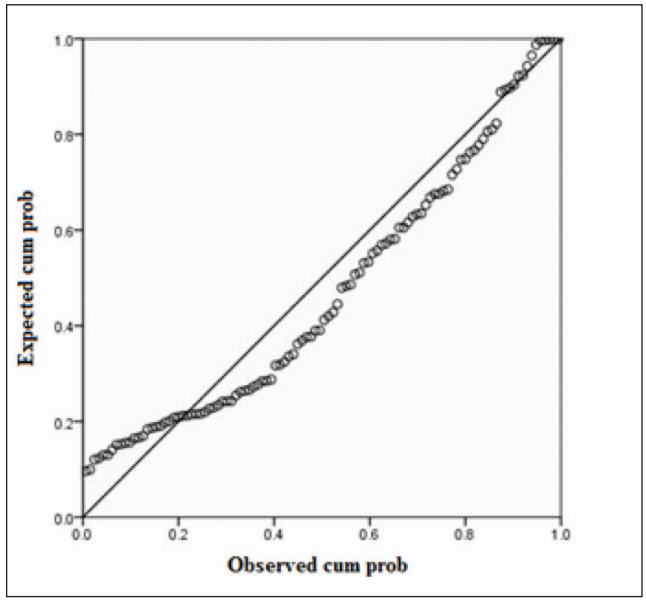
The linear regression multivariate analysis was conducted to assess the collinearity levels between stock market liquidity and capitalization when regressed against GDP as the dependent variable (DV). The tolerance level is substantively above 0.350, and the VIF is low in general and does not exceed the critical value of 10, denoting the absence of unwanted collinearity between the independent variables (IV). However, the residuals of the prediction model were positively skewed (Figure 8), as can be seen in the p-p plot (Figure 9). This indicates that this study's dependent variable (GDP) could not be analyzed by the conventional linear regression analysis due to the presence of inconstant error in the prediction. Moreover, data has a repeated measured structure in which data is nested within countries across years. Therefore, data was analyzed using the Generalized Linear Mixed Model (Table 7).

Figure 8: Histogram of GDP (Dependent Variable)



Source: Authors' calculation

Figure 9: Normal P-P plot of regression standardized residual of GDP



Source: Authors' calculation

Table 7: Multivariate Gamma Generalized Linear Model (GLM)

Beta 95% Confidence interval						
Model term	Beta coefficient (β)	Std. Err	Lower	Upper	t-value	p-value
Intercept	9.484	0.249	8.885	10.083	38.1	<0.001
LN(SML) Percent	0.125	0.032	0.062	0.188	3.953	<0.001
LN(SMC) Percent	-0.011	0.017	-0.046	0.023	-0.66	0.512
Time-Years	0.117	0.01	0.098	0.137	12.12	<0.001

Dependent Variable = GDP. Link function = Gamma log function. Model AIC = 4.078, BIC = 18.40, β = regression coefficient.

Explains the combined and individual association between Economic Growth (GDP), Stock Market Capitalization (SMC), Stock Market Liquidity (SML) and Time (3-years groups). N=108 repeated records.

Source: Authors' calculation

As a result of the pitfalls of the standard linear regression multivariate analysis in processing our data, the Generalized Linear Mixed Model is used and better fits our dataset. It shows that per capita real GDP correlates significantly with their measured SML with r=0.17 and p<0.010, denoting that as countries measured SML tends to rise by a factor equal to one logarithmic unit, the average (mean) GDP tends (on average) to rise incrementally too (r-square (r^2) x 100= 0.16^2 x 100 =2.6%) across the analyzed period. SMC, on the other hand, do not correlate significantly with GDP with r=-0.056 and p=0.282.

Nonetheless, SMC correlates significantly, and positively, with the Liquidity of market index (r=0.30, p<0.010) denoting that as the countries SML tends to rise, their average (mean) SMC tends to rise incrementally by a factor equal to r-square= r^2= 0.3^2 X 100= 9% of the shared covariance units across the analysis period (Table 8).

Table 8: Pearson's correlations between GDP, SML and SMC

	Per Capita Real GDP	Ln (LC)
GDP	1	
Ln (SML+ 5)	0.156*	
Ln (SMC+ 5)	-0.056	0.300*

*Correlation is significant at the 0.01 level, i.e. p-value <0.010, note: this correlation was weighted by country level.

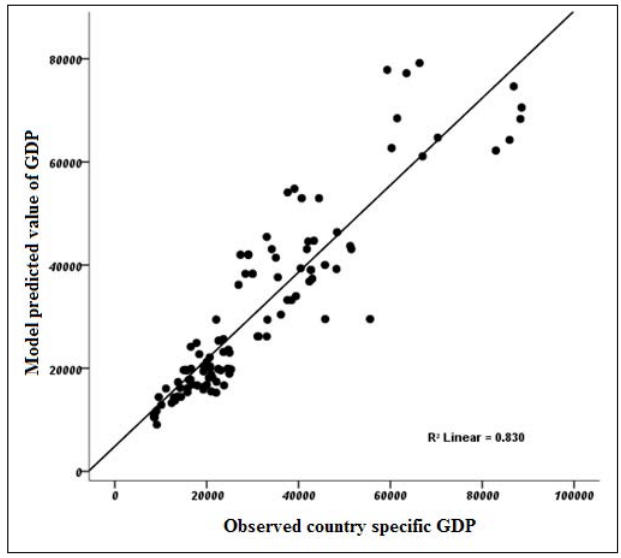
Source: Authors' calculation

Due to the presence of repeated measures in GDP and other parameters, the Generalized Linear Mixed Model Repeated Measures analysis was utilized. the time span was grouped into six intervals of three years each. This structure of data is fed into the generalized linear modelling suite in the analytical program, the countries are set as a random factor and the independent predictor variables (time, natural logarithm of liquidity and natural logarithm of the market capitalism) are set as fixed predictors regressed against GDP scores for those countries.

The analysis results are driven using the Gamma linked with pseudo-likelihood estimation method with Pseudo-likelihood=7.80. This model fits the data well compared to a model without any predictors as evidenced with a very low Baysian criteria (AIC =22.96, BIC=40.31). Those low values of the Baysian criteria denote better fit and enhanced accuracy of the model (Figure 10). The GDP data significantly match those predictions using the predictor independent variables.

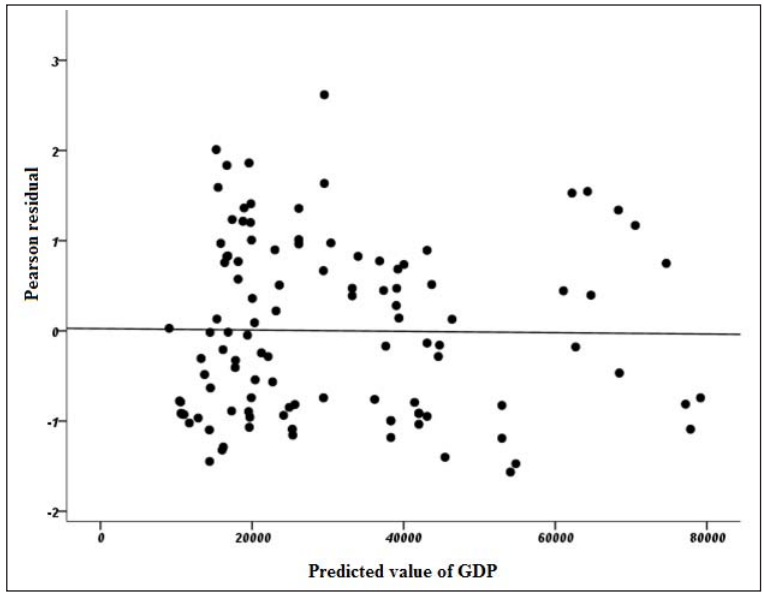
Figure 11 displays the predicted GDP values on the x-axis against the error (residuals) from the analysis model. This figure shows no distinct pattern or over-dispersion that may affect the accuracy of the model. Therefore, the results of the model can be accepted and its main findings can be relied on. The analysis shows that SML in logarithmic units converged significantly and positively on their respective GDP denoting that the SML correlates significantly and positively with higher GDP for those countries. For example, as the SML increase by a factor equal to one percent, GDP tends to rise across the analysis period by a factor equal to (Beta= 0.125). This expresses that the exponentiated value is equivalent to 1.13 times the rise in GDP, or a rise in SML is associated with a rise in GDP equivalent to (1.13-1) x 100= 13% on average ($p<0.001$), by accounting for the other predictor independent variables in the analysis.

Figure 10: Observed versus GLMM predicted values of GDP



Source: Authors' calculation

Figure 11: Scatterplot of model predicted values versus the residual (error)



Source: Authors' calculation

Unexpectedly, the analysis shows that SMC does not correlate significantly with GDP (p=0.512) but, the sign of Beta coefficient (Beta=-0.011) is negative, suggesting a negative but insignificant association between SMC and GDP in the GCC countries by accounting for the other predictor independent variables in the model.

Interestingly, the analyzed model suggests that there is a significant, and positive, association between time and the GDP index of those countries (Beta=0.117, p<0.00), denoting that as time lapses the rate of GDP tends to rise by factor equals to 0.117 on the logarithmic scale.

The analysis of the variance component of the six countries suggests that countries' GDP has varied significantly around the overall average (mean) GDP trajectory (p<0.050), denoting that some of those countries experience rise and fall in their GDP across time (Figure 4). For example, UAE's GDP has a rise and fall patterns in the period between 2001-2011. Despite these variations, GDP of those countries correlates positively and significantly with time (Beta=0.117) and this is clearly evidenced in the analysis model (Table 8).

The analysis is summed up to conclude that SML as well as time correlated positively and significantly with GDP, denoting that as time lapses the GDP tends to rise significantly. Higher SML predicts greater GDP, while SMC correlates insignificantly and negatively with GDP.

5. Results and discussion

Behavior of GDP, in response to increase in stock market, strongly depends on the indicator used to measure stock market (SMC/SML). The Generalized Linear Mixed Model analysis results show that in the long run SML positively correlates with per capita real GDP. In other words, there is an intense long run positive relationship between economic growth and stock market liquidity. Surprisingly, unlike SML, SMC correlates negatively but insignificantly with per capita real GDP (Table 9).

Table 9: Summary results

	SMC	SML
Generalized Linear Mixed Model GLMM	Correlated negatively but insignificantly with GDP in the long run	Correlates positively and significantly with GDP in the long run
	Correlates positively with SML	Correlates positively with SMC

Source: Authors' calculation

Since our data pass the normality, collinearity and stationarity tests, there should be no issues with the reliability of the tests applied and hence no issues with the results found. The panel data is well prepared and made suitable to fit in the Generalized Linear Mixed Model (GLMM) analysis to help in expressing the relationship between the chosen variables.

SML which is the value of shares traded divided by GDP, have a significant long run effect on the GCC economic growth. On the other hand, SMC which is the value of listed stocks divided by GDP is insignificant to the GCC economic growth in the long run. Overall, stock markets correlate positively with economic growth in the long run which is caused by increase in SML. This is in line with Pradhan et al. (2014) in that banking sector and stock market development in developing countries such as ASEAN countries along with other macroeconomic variables play an important role in the determination of long run economic growth.

The existence of a positive relationship between stock market development and growth is also supported by Coskun (2017) who gave an evidence that the aggregate effect of mutual fund, pension fund, stocks and corporate bonds is positively related to economic growth in Turkey. ASEAN and Turkey, as developing countries, have immature stock markets that can be compared to the stock markets in the GCC countries and this may explain the existence of stock market- growth relationship. According to Pradhan et al. (2014) stock market development does not play a statistically significant role in spurring further economic growth in relatively developed countries with mature stock markets such as the case of OECD. While Valliere and Peterson (2009) find that in developed countries it may be easier and more reasonable to expect a positive relationship as economic growth in those countries has a big portion attributed to entrepreneurs expecting good investments and regulatory freedom while this is not the case in developing countries

The difference in the results between the effect of SML and SMC on the economic growth is because that SML measures how active and responsive is the stock market whereas SMC measures the potential of the market from which real stock market activities can be stimulated. Stock market liquidity refers to the ability of investors to trade their shares quickly at low cost without affecting the share prices substantially (Chordia et al., 2005).

If SML has greater values than SMC, it can be concluded that the stock market is liquid and listed stocks are being traded without the need to reduce their prices. Whereas in illiquid markets, SML has lower values than SMC which indicates that in order to increase the tradability of the stocks, material changes to stock prices shall be forced.

Generally, SMC takes the first step in affecting GDP by making short run changes to stock prices to which investors respond immediately and start acting based on the available market information. Aali-Bujari et al. (2017) find that an increase in

the capitalization of listed companies supported by other financial factors have a positive relationship with per capita income. This study finds that this effect does not last for a long period as the price equilibrium is restored again but at a slightly higher price range. The accumulation of short run stock price changes will lead to an environment of better information acquisition and direct investment actions by investors that enhance SML and eventually increase GDP. Chu and Chu (2020) confirms that financial liquidity, in terms of financial intermediaries and stock markets, are not linearly correlated with economic growth and these results are supported by Lind and Mehlum (2010), Law and Singh (2014) and Samargandi et al. (2015), which contradict our finding of insignificant negative correlation between SMC and economic growth.

The indirect link between insignificant correlation of SMC with economic growth and the long run behavior of SML explains the correlation the study finds between SMC and SML using GLMM. This study shows the significant association between GCC's SML and SMC. As market liquidity rises market capitalization tended to rise insignificantly by 9%. The increase in liquidity indicates higher stock market activity levels which, to some extent, may encourage corporations to issue more shares or slightly increase stock prices.

Based on the conditional convergence model, convergence of stock market capitalization (SMC) and stocks traded (SML) is found for high and low-income panels, the OECD panel, and the Sub-Saharan African panel and the speed of convergence is in the range of 20–30% (approximately 10 and 15 years for convergence to take place) (Narayan et al., 2011). These fresh insights on financial market convergence is evidenced in this study by the results of the relationships found between SML and GDP, SMC and GDP and SML and SMC.

This result can be further explained because real stock market activities (SML) is more powerful than potential stock market activities (SMC) to create real changes to the economy in line with Apergis et al. (2015) whose empirical results suggests that SML and economic growth are strongly associated in UK and Germany, even though the UK is a capital market-based economy and Germany a bank-based economy. For example, if there are X and Z values of listed shares, both will have no significant effect on the growth even if one is greater than the other, unless actively traded in the market. This means it does not matter how much shares of stocks are listed in a stock exchange, what truly matterisare the value of stocks that stimulate trade and exchanges. In other words, it is how tradable are the stocks not the availability of the stocks that causes growth. SML strongly contributes to boost economic growth by improving the process of information acquisition and corporate governance (Bencivenga et al., 1996).

The existence of a relationship between SML and economic growth supports the stock market – economic growth nexus and shows that regional and economic

differences have no influence in this field. Developed (high income) (Fufa and Kim, 2018), emerging (BRICS) (Carp, 2012), developing (ASEAN) (Pradhan et al., 2014) and oil rich (GCC) (Muhammad et al., 2016) all show positive and significant relationships either between financial markets and economic growth or between stock market in specific and economic growth.

In addition, this study demonstrates a significant relationship between time -as measured by groups of three years- and the growth- as measured by per capita real GDP- which means that overall economic prosperity increased over time. This could be due to the technological and financial innovations and advances that evolves overtime which stimulates efficiency and eventually growth (Pradhan et al., 2018). The increase in GDP overtime could be explained by and be supportive to the neo-classical and endogenous theories in that innovative advances that evolves overtime positively affect growth in a society's wealth and economic prosperity. Another explanation of GDP growth over time is the effect of inflation that may lead to hyperinflation in case consumer accepts to pay more even before prices really increase. The increased spending makes demand higher than supply which results in more people hired, better living and increased GDP.

6. Conclusion

Generally, stock market development affects economic growth in the long and in many ways having its direct and indirect effect. In addition, financial innovations and technological advance as well as inflation that evolves overtime increase the standard of living and have positive impact on economic growth. Stock market technological innovations enable better market research, easier execution of trade, higher frequency trading and more convenient and favorable trading programs. This allows for more rational investment decisions to be taken by investors and enhanced corporate governance using stock incentives and this would support income creation and GDP maximization.

On the managerial level, companies with listed stocks shall thrive to enhance the reputation of their stocks by proper market capitalization management that in turn will increase investors' confidence in the company' shares. This means that well managed listed companies can form the basis for high performance stock markets and eventually higher economy's wealth and greater per capita real GDP. Generally, properly managed corporations can boost its share price by growing its earnings and dividend payment. In the short run cutting R&D layoffs could dramatically increase profits but in the long run productivity enhancement like acquiring productive personnel, improving R&D and buying back corporation's shares to boost its market liquidity.

GCC oil returns, especially during economic boom periods, can be used to provide financial support and facilities to successful corporations and corporations that

have the potential to enhance the stock markets such as well performing banks and financial institutions and large listed companies. To account for the cultural and religion characteristics of the region, financial institutions located in the GCC region shall consider investing in Islamic financial instruments (that are halal/ Sharia'a compliant) such as sukuk and Murabaha and Mudarabah contracts. This could attract the GCC Muslim investors to pump their savings into the stock market and lift up GCC's SML.

Further researches on the same the topic may apply the same methodology on other markets with different economic and cultural characteristics (i.e. Egypt, Yemen and Sudan). Other recommended researches could be very specific to apply the same research methodology on each of the GCC countries separately. The reason is that during data analysis, noticeable differences were detected in the size as well as the value of stock markets among the six countries. In addition, the GCC countries still do not reach the desired level of collaboration and economic unification which generates differences in their political and economic policies. Researchers can also limit the study to the effect of Islamic instrument market on the growth of the GCC economies to discover whether or not to invest more in such instruments.

Future researches can also use different combination of data analysis tests, tools and models to validate the finding of this research. If further researches can reach the same conclusion, then our findings and results could be proven reliable. Last but not least, the use of GDP as an indicator of economic growth may be enhanced by using GDP proxies such as the index of industrial production (IP). IP gives more frequent growth indicator observations than annual per capita real GDP used in the current study. Using more frequent GDP observations will enhance the research conclusion especially that SMC and SML measures are much more frequent than annual.

References

Aali-Bujari, A., Venegas-Martinez, F., Pérez-Lechuga, G. (2017) "Impact of the stock market capitalization and the banking spread in growth and development in Latin American: A panel data estimation with System GMM", *Contaduria y Administracion*, Vol. 62, No.5, pp. 1427–1441, https://doi.org/10.1016/j.cya.2017.09.005.

Adjasi, C. K. D., Biekpe, N. (2009) "Do Stock Markets Matter in Investment Growth in Africa?", *Journal of Developing Areas*, Vol. 43, No. 1, pp. 109–120, DOI: 10.1353/jda.0.0032.

Apergis, N., Artikis, P. G., Kyriazis, D. (2015) "Does stock market liquidity explain real economic activity? New evidence from two large European stock markets", *Journal of International Financial Markets, Institutions & Money*, Vol. 38, pp. 42–64, https://doi.org/10.1016/j.intfin.2015.05.002.

Batuo, M., Mlambo, K., Asongu, S. (2018) "Linkages between financial development, financial instability, financial liberalisation and economic growth in Africa", *Research in International Business and Finance,* Vol. 45, pp. 168–179, https://doi.org/10.1016/j.ribaf.2017.07.148.

Bagehot, W. (1873) *Lombard Street: A Description of the Money Market,* 1st ed., New York: Scribner, Armstong & Co.

Bencivenga, V. R., Smith, B. D., Starr, R. M. (1996) "Equity Markets, Transactions Costs, and Capital Accumulation: An Illustration", *World Bank Economic Review*, Vol. 10, No. 2, pp. 241–265, https://doi.org/10.1093/wber/10.2.241.

Bolbol, A. A., Fatheldin, A., Omran, M. M. (2005) "Financial development, structure, and economic growth: The case of Egypt, 1974-2002", *Research in International Business and Finance*, Vol. 19, No. 1, pp. 171–194, https://doi.org/10.1016/j.ribaf.2004.10.008.

Carp, L. (2012) "Can Stock Market Development Boost Economic Growth? Empirical Evidence from Emerging Markets in Central and Eastern Europe", *Procedia Economics and Finance*, Vol. 3, pp. 438–444, https://doi.org/10.1016/s2212-5671(12)00177-3.

Cheng, S.-Y., et al. (2011) "Financial systems and mechanisms of growth in different conditions of country risk", *Applied Economics Letters*, Vol.18, No.11, pp. 1021–1028, https://doi-org.libweb.uob.edu.bh/10.1080/13504851.2010.522511.

Chu, L. K., Chu, H. V. (2020) "Is too much liquidity harmful to economic growth?", *Quarterly Review of Economics and Finance*, Vol. 76, pp. 230–242, https://doi.org/10.1016/j.qref.2019.07.002.

Chordia, T., A. Sarkar, A. Subrahmanyam. (2005) "An empirical analysis of stock and bond market liquidity", *The Review of Financial Studies,* Vol. 18, No. 1, pp. 85–129, doi: https://doi.org/10.1093/rfs/hhi010.

Cooray, A. (2010) "Do stock markets lead to economic growth?", *Journal of Policy Modeling*, Vol. 32, No. 4, pp. 448–460, doi: https://doi.org/10.1016/j.jpolmod.2010.05.001.

Coskun, Y. (2017) "Capital market and economic growth nexus: Evidence from Turkey", *Central Bank Review,* Vol. 17, No. 1, pp. 19–29, https://doi.org/10.1016/j.cbrev.2017.02.003.

Epley, D. R. (2003) "Measurement of Local Economic Growth as A Critical Part of Market Analysis", *Real Estate Issues*, Vol. 28, No. 2, pp. 8–13, https://www.cre.org/wp-content/uploads/2017/04/28_2_measurement.pdf.

Fanti, L., Manfredi, P. (2009) "Neoclassical production theory and growth with unemployment: The stability issue revisited", *Structural Change and Economic Dynamics*, Vol. 20, No. 2, pp. 126–135, https://doi.org/10.1016/j.strueco.2008.12.002.

Fufa, T., Kim, J. (2018) "Stock markets, banks, and economic growth: Evidence from more homogeneous panels", *Research in International Business and Finance*, Vol. 44, pp. 504–517, https://doi.org/10.1016/j.ribaf.2017.07.120.

Furstenberg, G.M., Lovell, M.C., Tobin, J. (1977) "Corporate Investment: Does Market Valuation Matter in the Aggregate?", *Brookings Papers on Economic Activity,* Vol. 1977, No. 2, pp. 347–408, https://doi.org/10.2307/2534406.

Gaido, D. (2016) "Rudolf Hilferding on English Mercantilism", *History of Political Economy*, Vol. 48, No. 3, pp. 449–470, https://doi-org.libweb.uob.edu.bh/10.1215/00182702-3638631.

Galindo, M., Méndez, M. T. (2014) "Entrepreneurship, economic growth, and innovation: Are feedback effects at work?", *Journal of Business Research*, Vol. 67, No. 5, pp. 825–829, https://doi.org/10.1016/j.jbusres.2013.11.052.

Greenwood, J., Smith, B. D. (1997) "Financial markets in development, and the development of financial markets", *Journal of Economic Dynamics & Control*, Vol. 21, No. 1, pp. 145–181, https://doi.org/10.1016/0165-1889(95)00928-0.

Hamdi, H., Sbia, R., Tas, B. K. O. (2014) "Financial Deepening and Economic Growth in Gulf Cooperation Council Countries", *International Economic Journal*, Vol. 28, No. 3, pp. 459–473, https://doi.org/10.1080/10168737.2014.913653.

Hicks, J. (1969) *A Theory of Economic History,* Oxford University Press.

Jensen, M. C., Murphy, K. J. (1990) "CEO Incentives – It's Not How Much You Pay, But How", *Harvard Business Review*, Vol. 68, No. 3, pp. 138–149, http://dx.doi.org/10.2139/ssrn.146148.

King, R. G., Levine, R. (1993) "Finance, entrepreneurship, and growth: Theory and evidence", *Journal of Monetary Economics,* Vol. 32, No. 3, pp. 513–542, https://doi.org/10.1016/0304-3932(93)90028-E.

Law, S. H., Singh, N. (2014) "Does too much finance harm economic growth? Publication Date License Does too much finance harm economic growth?", *Journal of Banking Finance*, Vol. 41, No. 1, pp. 36–44, https://doi.org/10.1016/j.jbankfin.2013.12.020.

Levine, R. (1997) "Financial Development and Economic Growth: Views and Agenda", *Journal of Economic Literature*, Vol. 35, No. 2, pp. 688–726, https://doi.org/10.1596/1813-9450-1678.

Levine, R., Zervos, S. (1998) "Stock Markets, Banks, and Economic Growth", *American Economic Review*, Vol. 88, No. 3, pp. 537–558, https://www.jstor.org/stable/116848.

Lind, J.T., Mehlum, H. (2010) "With or without U? The appropriate test for a U-Shaped relationship", *Oxford Bulletin of Economics and Statistics*, Vol. 72, No. 1, pp. 109–118, https://doi.org/10.1111/j.1468-0084.2009.00569.x.

Mercan, M., Göçer, I. (2013) "The Effect of Financial Development on Economic Growth in BRIC-T Countries: Panel Data Analysis", *Journal of Economic & Social Studies* (JECOSS), Vol. 3, No. 1, pp. 199–216, Doi:10.14706/JECOSS11318.

Muhammad, N., Islam, A. R. M., Marashdeh, H. A. (2016) "Financial development and economic growth: An empirical evidence from the GCC countries using static and dynamic panel data", *Journal of Economics and Finance*, Vol. 40, No. 4, pp. 773–791, doi: https://doi.org/10.1007/s12197-015-9331-9.

Narayan, P. K., Mishra, S., Narayan, S. (2011) "Do market capitalization and stocks traded converge? New global evidence", *Journal of Banking and Finance*, Vol. 35, No. 10, pp. 2771–2781, https://doi.org/10.1016/j.jbankfin.2011.03.010.

Nelson, R. R., Winter, S. G. (1974) "Neoclassical vs. Evolutionary Theories of Economic Growth: Critique and Prospectus", *Economic Journal,* Vol. 84, No. 336, pp. 886–905, https://doi.org/10.2307/2230572.

Obstfeld, M. (1994) "Risk-taking, global diversification, and growth", *American Economic Review*, Vol. 84, No. 5, pp. 1310–1329, Doi: https://www.jstor.org/stable/2117774.

Pan, L., Mishra, V. (2018) "Stock market development and economic growth: Empirical evidence from China", *Economic Modelling*, Vol. 68, pp. 661–673, https://doi.org/10.1016/j.econmod.2017.07.005.

Patrick, H. T. (1966) "Financial Development and Economic Growth in Underdeveloped Countries"*, Economic Development & Cultural Change*, Vol. 14, No. 2, pp. 174–189, https://doi.org/10.1086/450153.

Pietak, T. (2014) "Review of Theories and Models of Economic Growth", *Comparative Economic Research*, Vol. 17, No. 1, pp. 45–60, Doi: https://doi.org/10.2478/cer-2014-0003.

Popa, F. (2016) "Aspects Concerning Endogenous Growth in the Macroeconomic Theories", *Economics, Management & Financial Markets,* Vol. 11, No. 1, pp. 231–243, https://search.proquest.com/scholarly-journals/aspects-concerning-endogenous-growth/docview/1783000190/se-2?accountid=141837.

Porter, R. C. (1966) "The Promotion of the "Banking Habit" and Economic Development", *Journal of Development Studies*, Vol. 2, No. 4, pp. 55–69, https://doi.org/10.1016/B978-0-08-024041-1.50010-7.

Pradhan, R. P., et al. (2014) "Causal nexus between economic growth, banking sector development, stock market development, and other macroeconomic variables: The case of ASEAN countries"*, Review of Financial Economics*, Vol. 23, No. 4, pp. 155–173, https://doi.org/10.1016/j.rfe.2014.07.002.

Robinson J. V. (1962) *Essays in the Theory of Economic Growth*, Palgrave Macmillan UK, doi: https://doi.org/10.1007/978-1-349-00626-7.

Ruiz, J. L. (2018) "Financial development, institutional investors, and economic growth", *International Review of Economics & Finance,* Vol. 54, pp. 218–224, https://doi.org/10.1016/j.iref.2017.08.009.

Samargandi, N., Fidrmuc, J., Ghosh, S. (2013) "Is the Relationship between Financial Development and Economic Growth Monotonic for Middle Income

Countries?? Is the Relationship between Financial Development and Economic", *World Development*, Vol. 68, No. 13, pp. 66–81, https://doi.org/10.1016/j.worlddev.2014.11.010.

Schumpeter, J.A., Opie, R. (1983) *The theory of economic development: an inquiry into profits, capital, credit, interest, and the business cycle*, New Brunswick, New Jersey: Transaction Books, Translated from the 1911 original German, Theorie der wirtschaftlichen Entwicklung. Retreived from https://archive.org/details/in.ernet.dli.2015.187354/page/n1/mode/2up, doi:10.1080/00343404.2017.1278975.

Smaoui, H., Nechi, S. (2017) "Does sukuk market development spur economic growth?", *Research in International Business and Finance*, Vol. 41, pp. 136–147, https://doi.org/10.1016/j.ribaf.2017.04.018.

Steele, G. R. (1998) "The Money Economy: Mercantilism, Classical Economics and Keynes' General Theory", *American Journal of Economics & Sociology*, Vol. 57, No. 4, pp. 485–498, doi: https://www.jstor.org/stable/3487119.

Tobin, J., (1969) "A general equilibrium approach to monetary theory", *Journal of Money Credit and Banking*, Vol. 1, pp. 15–29, doi: https://doi.org/10.2307/1991374.

Valliere, D., Peterson, R. (2009) "Entrepreneurship and economic growth: Evidence from emerging and developed countries", *Entrepreneurship & Regional Development*, Vol. 21, No.5/6, pp. 459–480, https://doi.org/10.1080/08985620802332723.

Wu, J., Hou, H., Cheng, S. (2010) "The dynamic impacts of financial institutions on economic growth: Evidence from the European Union", *Journal of Macroeconomics*, Vol. 32, No. 3, pp. 879–891, https://doi.org/10.1016/j.jmacro.2009.09.003.

Međuovisnost razvoja burze i gospodarskog rasta: ispitivanje u više zemalja

Hana Bawazir[1], *Mukesh Kumar*[2], *Saban Celik*[3], *Khadija Abdulredha Abdulla*[4], *Bora Aktan*[5]

Sažetak

U ovom radu istražuje se veza između gospodarskog rasta i razvoja tržišta dionica u regiji GCC, a to je Vijeće za suradnju arapskih država Zaljeva, odnosno Saudijske Arabije, Bahreina, Ujedinjenih Arapskih Emirata, Omana, Kuvajta i Katara u razdoblju od 2000. do 2017. godine. Generalizirani linearni mješoviti model (GLMM) primjenjuje se kako bi se utvrdila povezanost i priroda odnosa. U usporedbi s konvencionalnim regresijskim modelima, GLMM pruža pouzdanije rezultate uzimajući u obzir podatke koji nedostaju i uklanja razlike specifične za pojedine zemlje. Ovim istraživanjem se potvrđuje značajna pozitivna povezanost između likvidnosti na burzi (SML) i realnog bruto domaćeg proizvoda (BDP) po stanovniku, kao i da je negativna povezanost između tržišne kapitalizacije (SMC) i BDP-a dugoročno beznačajna. Rezultati također ukazuju da su SML i SMC značajno i pozitivno povezani. Uzimajući u obzir da uspješne burze mogu povećati nacionalno bogatstvo, smanjiti preveliku ovisnost o nafti kao glavnom faktoru gospodarskog rasta, rezultati sugeriraju da bi kreatori politike u regiji trebali imati aktivniju ulogu u stimuliranju svojih tržišta dionica uključujući i globalnu integraciju..

Ključne riječi: *razvoj burze, gospodarski rast, financijsko tržište, kauzalnost*

JEL klasifikacija: *G10, G20, O40*

[1] *Docent, University of Bahrain, College of Business Administration, Sakheer, 32038, Kraljevina Bahrein. Znanstveni interes: Financijska tržišta i institucije, upravljanje rizicima i osiguranje. Tel.: 17 438 592. E-mail: hbawazir@uob.edu.bh.*

[2] *Redoviti profesor, University of Bahrain, College of Business Administration, Sakheer, 32038, Kraljevina Bahrein. Znanstveni interes: Ekonometrija, mikroekonomija, makroekonomija.Tel.: 17 438 592. E-mail: mkumar@uob.edu.bh.*

[3] *Izvanredni profesor, İzmir Katip Çelebi University, Faculty of Economics and Administrative Sciences, Çiğli Balatcik 33/2, İzmir, Turska. Znanstveni interes: Korporativne financije, međunarodne financije, analiza ulaganja. Tel.: +90 537 610 34 54. E-mail: saban.celik@ikcu.edu.tr.*

[4] *Ekspert, Tamkeen, 70 Street Manama, Kraljevina Bahrein. Znanstveni interes: financijski savjetnik, projektno financiranje. Tel.: 17 383 333. Email: kabdullah@tamkeen.bh.*

[5] *Izvanredni profesor, University of Bahrain, College of Business Administration, Sakheer, 32038, Kraljevina Bahrein. Znanstveni interes: financijski menadžment, financijska tržišta i institucije. Tel.: 17 438 592. E-mail: gbora@uob.edu.bh. (Osoba za kontakt).*