

# Finance and Economic Output nexus in GCC Countries: Testing and Estimating Structural Breaks

**Housseem RACHDI**

*IPAG Business School, France & IHEC Carthage Business School, Tunisia  
rachdih@uvic.ca*

**Hichem SAIDI**

*ESC Tunis Business School, Tunisia  
hichem.saidi@gmail.com*

**Abdelaziz HAKIMI**

*Faculty of Law, Economics and Management of Jendouba, Tunisia  
abdelazizhakimi@yahoo.fr*

## Abstract

This paper revisits the effects of financial liberalization and stock market returns on economic growth in the Gulf Cooperation Council countries over the period 1989-2018. We performed the panel stationarity test advanced by Carrión-i-Silvestre et al. (2005) that accommodates the presence of multiple structural breaks and exploits the cross-section variations. Empirical results from several panel tests provide strong support for the long-run positive effect of financial liberalization on economic growth and a long-run negative association between stock market returns and growth.

**Keywords:** Financial liberalization; stock market returns; economic growth; structural breaks; GCC countries

**JEL Codes :** E44, G21, G28, F36

## 1. Introduction

Since the pioneering work of McKinnon (1973) and Shaw (1973), the economic literature points to different channels through which might affect economic growth. The positive effects of financial liberalization could be transmitted to economic growth through the two main channels of saving and investment (Lee and Chou, 2018; Hou and Chang, 2017; Tonna et al., 2017; Galindo et al. 2007; Kroszner et al. 2007; Abiad et al. 2008). In fact, that financial liberalization has a "quantitative" effect, which manifests itself in an increase in savings and investment.

Moreover, financial liberalization is strongly associated with an efficient allocation of savings while financial repression leads to the opposite effect. Financial liberalization is also considered at the origin of the emergence of many financial and banking crises by opening financial sectors to external shocks and increasing uncertainty and competition between banks and other financial institutions (Rahman and Alam 2021; Zaman et al., 2021; Batuo et al., 2018; Yu et al., 2018; Ahmed, 2016; Ariss 2008; Bussiere and Fratzscher 2008; Demirgüç-Kunt and Detragiache 1998; Kaminsky and Reinhart 1999; Ranciere et al. 2006).

Given the conflicting results on the real impact of financial liberalization on growth, many empirical studies tried to explain how stock market can leads to more economic growth. Stock returns have been observed to be associated with economic fundamentals and macroeconomic variables. In fact, better developed stock markets support faster growth of innovative-intensive, high-tech industries and consequently lead to more growth because credit market development fosters growth in industries that rely on external finance for physical capital accumulation but is unimportant for growth in innovation-intensive industries (Brown et al. 2016).

While most of studies on the linkage between financial development and economic output have focused on the developed and developing countries (Erlando et al. 2020; Lee and Chou , 2018; Hou and Chang, 2017; Tonna et al., 2017; Ben Rejeb and Boughrara, 2013; Hamdi et al. 2017; Foroni et al., 2017), the Asian context (Yu et al., 2018; Wu et al., 2017; Chiang and Chen, 2016), ) or the African context and the MENA region (Batuo et al., 2018; Ahmed, 2016; Misati and Nyamongo, 2012; Ben Naceur et al., 2008), less abundant studies have been carry out on the GCC context (Gazdar et al, 2018; Muhammad et al, 2016; Hamdi et al, 2014; Grassa and Gazdar, 2014).

During the last two decades, GCC countries have made considerable effort to develop their financial systems. The financial market has undergone several reforms in order to strength stock market supervision and to improve governance practice (IMF, 2018). In this region, stock markets play a crucial role especially in Kuwait and Saudi Arabia (World Bank 2015). Hence, it is very interesting to study the consequence of these reforms on the economic output of the GCC countries.

The aim of this paper is to investigate the relationship between financial liberalization, Stock market return and economic growth. To this end, we used a balanced panel of 6 Gulf Cooperation Council countries over the period 1987-2016. As empirical approach, we performed a multivariate analysis based on cointegration test and Panel Vector Error Correction Model (PVECM).

This paper contributes to the existing empirical literature by many folds. This paper revisits the finance-economic growth relationship for GCC countries applying the panel stationarity test advanced by Carrión-i-Silvestre et al. (2005) that accommodates the presence of multiple structural breaks and exploits the cross-section variations and recent second-generation cointegration tests. In addition, we apply different traditional panel cointegration tests. The motivations for our choice of this methodology are clear. We notice that cross-section dependence structural breaks have not received much attention in the previous studies on the

stock market returns -growth nexus. The financial markets as well as the economic conjuncture of GCC countries have undergone a lot of structural changes during the last 20 years. Furthermore, the majority of empirical studies that explored this relationship without taking into the effect of these breaks. This study comes to fill this gap and to deal with this problem that occurred when modeling such linear relationship.

The remainder of this paper is structured as follows. Section 2 discusses the relationship between financial liberalization, stock market return and economic growth. The methodology is presented in section 3. In section 4, we discuss our empirical findings. Section 5 presents the robustness checks of our results. In section 6, we present the panel error correction models and causality analysis of Engle and Granger (1987). Section 7 concludes the paper and addresses some policy implications.

## **2. Literature Review**

Since the 80s and following the recommendations of McKinnon and Shaw (1973) toward positive effects of the financial liberalization, many economies have deregulated their financial markets. However, real impacts are so far away. Under an unstable macroeconomic conditions, a weak institutional context and wrong sequence of financial liberalization process it results a breakdown of growth rates, an increase of inflation and unemployment rates followed by banking instability and banking fragility that finished in almost cases by banking crises (Demirgüç-Kunt and Detragiache, 1998a). Faced to these adverse consequences, several criticisms were addressed to the financial liberalization advised by McKinnon and Shaw (1973). In reality, financial liberalization does not allowed to more growth and more economic dynamism. But it was responsible for banking fragility and banking crisis (Arestis and Demetriades, 1999; Wolfson, 1993)

While studies on the finance-growth relationship were strongly documented (King and Levine, 1993b; Levine et al., 2000; and Rousseau and Sylla, 2003), less abundant studies that investigated the interaction between financial liberalization, stock market and economic output (Yu et al., 2018; Chiang and Chen, 2016; He et al., 2014). Furthermore, like the inconclusive results of the finance-growth relationship, empirical studies on the impact of financial liberalization, stock market and economic growth also present mixed result. A significant part of literature supports the positive effect (Hou and Chang, 2017; Tonna et al., 2017; Hamdi et al., 2017). However, some other studies support the opposite view (Yu et al., 2018; Batuo et al., 2018; Ahmed, 2016).

Concerning the positive association between financial liberalization, stock market and economic growth, Hou and Chang (2017) using a sample of 31 countries observed during the period 1981-2008; tried to more understand the dynamic relationship between financial development and growth. Empirical results of GMM and the PMG methods indicate that the effects of financial activities on growth vary with the time period, income level, and financial development. Countries at different levels of development should engage in different financial activities to ensure sustainable growth. More recently, Lee and Chou (2018) have used a sample of 11 countries over the period to explore the linkage between financial openness and the financial market liquidity. Findings present strong evidence that higher degree of the financial market openness enhances the domestic financial market liquidity. Additionally, the effect of the financial market openness on the emerging markets is more significance than the developed markets.

The positive relationship between financial liberalization and bank efficiency was confirmed by the study of Tonna et al. (2017). The authors used a sample of 88 countries over the period 1999-2011. Findings of the DEA technique indicate that there is a positive effect of financial liberalization on the bank TFP growth. Similarly, Ben Rejeb and Boughrara (2013) concluded that financial liberalization not only improves the degree of efficiency but also reduces the probability of financial crises. Their study is made based on sample of 13 emerging economies observed during the period of January 1986 - December 2008.

The finance-growth relationship was explored by several empirical studies through the institutional quality. In countries with strong institutional quality, finance generally leads to grow output. However, negative association was found under a weak institution quality. In this line of idea, Hamdi et al. (2017) investigated the impact of institutional quality on the financial sector development and economic relationship. The sample is made by 143 countries over the period 2006-2013. Empirical findings of GMM indicate that that financial sector is considered as a key factor of economic development and growth for the whole sample as well as for developed and developing countries. Furthermore, the results show that this relation is more pronounced for developed countries that profit from strong institutional quality.

Besides the linear relationship between financial liberalization, stock market and growth, some empirical studies reported that this relationship could be non-linear. As for example, Ng et al. (2015) have used a sample of cross-section of 85 jurisdictions to investigate the possible non-linear relationship between stock market and economic growth during a post-crisis period. They found that only within a certain threshold level of property rights protection, stock market liquidity could have a significant and positive influence on GDP growth.

Several empirical studies related to this topic have been interested in the Asian context. More precisely, using data related to Botswana over the period 1974-2009, Ahmed and Mmolainyane (2014) have reported that financial integration is positively and significantly correlated with financial development. More recently, Wu et al. (2017) used monthly data from Taiwan from January 2003 to December 2009. Empirical findings of the vector autoregressive (VAR) model show that capital flows from foreign investment institutions allows the appreciation of the domestic currency, promotes the stock markets, developed the real estate markets, and increases the bond index.

The African context was explored by Misati and Nyamongo (2012). Based on a sample of 34 countries in Sub-Saharan Africa observed during the period 1983-2008, they investigated the traditional relationship between financial liberalization and economic growth. Result of panel cointegration and granger causality indicate that the growth retarding effects of financial liberalization are dominant over growth enhancing effects, which show mixed results. The authors also found that Institutional variables, human capital formation and foreign aid are key factors in explaining growth in Sub-Saharan Africa.

Unlike studies that support the positive association between financial liberalization, stock market and economic growth, some other studies adopt the opposite view. They reported that financial integration and stock market liberalization leads to more instability and more shocks. Since financial liberalization process in these countries is implemented in unstable macroeconomic conditions and weak institutional context, also financial system are less developed, most empirical results support the negative association. For example, Ahmed (2016) investigated the linkage between financial integration and economic output for a sample of 30

Sub-Saharan African (SSA) over the period 1976-2010. Empirical results support the negative association between the two indicators.

For the same context, Batuo et al. (2018) has used a sample of 14 African countries observed during the period 1985-2010. The same results were found. The authors reported that financial development and financial liberalization have positive effects on financial instability. The MENA region was explored by Ben Naceur et al. (2008) during the period 1979-2005. The main empirical findings suggest that the impact of stock market development on economic growth is negative in the short run but turns positive in the long run. For the case of China, Yu et al. (2018) have found that the Global economic policy uncertainty (GEPU) has influenced the volatility of the Chinese stock market which has been gradually integrated into the global economy.

### 3. Methodology

#### 3.1. Data

The dataset constitutes a balanced panel of 6 Gulf Cooperation Council countries over the period 1989-2018. Data relative to the economic output and financial liberalization are extracted from the World development indicators database (WDI) and the new database of Chinn and Ito index of financial liberalization. Stock market returns are extracted from the global financial development database (World Bank).

FL (KAOPEN) is the Chinn-Ito index of financial liberalization. The KAOPEN index is an indicator of financial openness. It indicates on the classification of restrictions documented by Mody and Murshid (2005). The Higher value of this index, the lower the restrictions. This index was used in prior studies such as Bhatia and Sharma (2019), Misati and Nymongo (2012), Gubillas and González (2012), Mody and Murshid (2005). The positive effects of financial liberalization could be transmitted to economic growth through the two main channels of saving and investment (Lee and Chou, 2018; Hou and Chang, 2017; Tonna et al., 2017; Galindo et al. 2007; Kroszner et al. 2007; Abiad et al. 2008).

SMR is stock market return year % year. Theoretical considerations support that stock returns are positively associated with economic growth. The standard economic growth models of Solow, Ramsey and Diamond and the consumer based stock-return models of Lucas (1978) predict a positive association between asset returns and economic growth. However, the empirical literature does not give unanimous support to these theories. Stock market returns was considered as a driver for economic growth in several prior studies such as Dabwor et al. (2020), Madsen et al. (2013).

Table 1 presents definition of descriptive statistics for the variables that include financial liberalization, stock market return and economic growth. For each variable, Table 1 shows means, maximums, minimums and standard deviation for all the variables.

**Table 1:** Definition and Summary statistics

Variables	Definition	Mean	Std Dev	Min	Max
GDP	The natural logarithm of real GDP per capita	10.05	6.78	8.48	11.39
KAOPEN	Chinn-Ito index of financial liberalization	2.04	0.532	1.08	2.237
SMR	Stock market return year % year	12.23	27.08	-44.15	133.73

Statistics displayed in Table 1 indicate that on average the natural logarithm of the real GDP per capita is 10.05 with a maximum value of 11.39 and 8.48 as a minimum value. For the financial liberalization the KAOPEN index of Chinn-Ito, the mean value of this index is 2.04. Concerning the stock market return, the average value in the GCC countries over the period

1989-2018 is 12.23%. During the same period, the stock market return in this region records some fluctuated trends. For example, we note that the stock return has negative value with -44.15% as the minimum value and highly level with a maximum value of 133.73%.

### 3.2. Estimation strategy

To investigate the relationship between financial liberalization, stock market returns and economic growth using the following non-stationary panel data equation given by:

$$Y_{it} = f(FL_{it}; SMR_{it}) \quad (1)$$

Where;  $i = 1, \dots, N$  represents each countries and  $t = 1, \dots, T$  denotes each year.  $Y$  represents economic output which is measured by the natural logarithm of real GDP per capita (constant LCU), FL (KAOPEN) is the Chinn-Ito index of financial liberalization and SMR is stock market return year % year.

To estimate equation (1), the study uses five-steps. First, cross section dependence tests are applied to verify the consideration of cross-section dependence. Second, panel unit root tests with and without cross-section dependence and structural breaks are performed to determine the order of integration among the variables and acts as a prerequisite or estimating long-run relationship. Third, first and second generation of panel cointegration tests are conducted to determine the long-run relationship among the variables. Fourth, we determine the structural breaks country by country. Fifth, the dynamic and fully modified ordinary least square (DOLS and FMOLS) estimators are used to estimate heterogeneous long-run coefficients.

## 4. Empirical results

### 4.1. Cross-sectional dependence tests

Table 2 presents results of cross-sectional dependence. Results obtained from Pesaran's CD and Pesaran et al.'s  $LM_{adj}$  tests for cross sectional dependence indicate that the null hypothesis of no cross-section dependence in the errors is strongly rejected at a significance level of 1%.

**Table 2:** Tests of cross-sectional dependence

	Y	FL	SMR
<i>Pesaran (2004); CD test</i>	22.299***	38.831***	64.939***
<i>Pesaran et al. (2008); <math>LM_{adj}</math> test</i>	18.284***	33.237***	51.288***

\*\*\* denotes significance at 1%.

### 4.2. Panel unit root tests

On the one hand, most first-generation unit root tests applied to the three variables of the model reject the hypothesis of absence of a unit root and also accept the integration of order one ( $I_1$ ). On the other hand, given a study period of 30 years, the consideration of transversal dependence and structural breaks should provide more reliable results.

Table 3 summarizes the results of panel unit root tests. The inclusion of the cross-section dependence via the Pesaran test (2007) shows that KAOPEN and GDP per capita are integrated of order one. When applying two Carrion-i-Silvestre (2005)<sup>1</sup> tests (with and without structural breaks) it is observed that the three series are non-stationary.

<sup>1</sup> This test considers the existence of unit root with or without structural breaks only in level.

**Table 3:** Panel unit root tests with and without cross-section dependence and structural breaks

			Y	dY	FL	dFL	SMR	dSMR
Traditional Panel unit root tests	Harris &Tzavalis (1999) Rho-stat	without time trend	0.9356	0.049***	0.8880	-0.138***	0.304***	-0.3461
		time trend included	0.7604	0.059***	0.7847	- 0.1206***	0.251***	-0.3454
	Levin, Lin & Chu (2002) t-stat		- 0.6744	-4.78***	-1.6413	-1.2451	-1.3802	- 7.9000***
	Im, Pesaran and Shin (2003) W-stat		1.1604	-5.32***	-1.4404	- 3.1642***	-3.5749	- 11.171***
Panel unit root test with cross section dependence	Pesaran (2007) CIPS-stat		-0.167	-5.48***	-1.152	-2.095**	-3.36***	- 10.121***
Panel stationary test with and without structural breaks	Carrion-i- Silvestre and al.(2005) LM( $\lambda$ )-test	No breaks	1.321	-	1.023	-	-2.007	-
		Breaks	1.228	-	1.009	-	-2.126	-

**Notes:** \*\*\* represents statistical significance at the 1% level. LLC and IPS tests assume asymptotic normality. The choice of lag levels for the IPS test is determined by empirical realizations of the Schwarz Information Criterion. The LLC test was computed using the Bartlett kernel with automatic bandwidth selection. For the test of Pesaran (2007), the number of common factors is set at 1. For the test of Carrion-I-Silvestre and al. (2005), the number of breaks points has been estimated using LWZ information criteria allowing for a maximum  $m = 5$  structural breaks. The long-run variance is estimated using the Bartlett kernel with automatic spectral window bandwidth selection as in Andrews (1991)

Once integration and non-stationarity is established, the next step is to determine whether a long-run relationship between GDP per capita, KAOPEN index and Stock market returns exists through cointegration tests.

#### 4.3. Panel cointegration tests

To examine the existence of a long-run relationship between the three series, we use two types of cointegration tests first- and second-generation. Results of both tests of cointegration are given in Table 4 and Table 5.

**Table 4:** First generation Panel cointegration tests

<b><i>Pedroni's test</i></b>					
<i>(Within-dimension)</i>	Statistic	Prob.	<i>(Between-dimension)</i>	Statistic	Prob.
<i>Panel v-Statistic</i>	-0.9887	0,8386	<i>Group rho-Statistic</i>	2,2707*	0,0884
<i>Panel rho-Statistic</i>	1,1877	0,8825	<i>Group PP-Statistic</i>	2.2530*	0,0679
<i>Panel PP-Statistic</i>	1.2211	0.8890	<i>Group ADF-Statistic</i>	1.2974	0,392
<i>Panel ADF-Statistic</i>	1.1090	0.8663			
<b><i>Kao's test</i></b>					
ADF-stat	0.5542	0.2899			

*Pedroni's statistics are asymptotically distributed as standard normal. The variance ratio test is right-sided, while the other Pedroni tests are left-sided. The null hypothesis is that the variables are not cointegrated. Under the null hypothesis, all the statistics are distributed as standard normal distributions. \* represent statistical significance at the 10% levels.*

Pedroni's (2004) test results indicate that all tests, except for *Group- $\rho$ -stat* and *Group-PP-stat*, accept the null hypothesis of no co-integration. Similarly, the Kao test (1999) yields the same result. We did not manage to find a long-run balance between GDP, KAOPEN and SMR through these two types of test since they did not take into account the prospective economic dependences or the structural breaks. Since 1987, GCC countries have followed policies of economic, financial and stock market openness. Indeed, the countries of this region have undergone structural changes, mainly due to the implementation of reforms aimed at developing their financial markets. We propose also second generation cointegration test of Westerlund and Edgerton (2008).

**Table 5:** Second generation Panel cointegration test: with structural breaks and cross section dependence for Westerlund and Edgerton (2008)

Model	$Z_{\tau}(N)$	$Z_{\phi}(N)$
No breaks	3.332*** (0.0023)	1.5225 (0.4011)
Mean shift	2.987* (0.0871)	1.8829* (0.0777)
Regime shift	2.776* (0.0877)	2.0011* (0.0787)

*This test uses the Campbell and Perron (1991) automatic procedure to select the lag length. We use three breaks, which are determined by grid search at the minimum of the sum of squared residuals. The P-values are for a one-sided test based on the normal distribution. The LM-based test statistics  $Z_{\phi}(N)$  and  $Z_{\tau}(N)$  are normal distributed. The number of common factors is determined by means of the information criterion proposed by Bai and Ng (2004) and the maximum number is set to 5. \*\*\*, and \* indicate significance at the 1% and 10% levels, respectively.*

We apply the LM-based tests proposed by Westerlund and Edgerton (2008) that simultaneously consider cross-section dependence and structural breaks. Both test statistics  $Z_{\phi}(N)$  and  $Z_{\tau}(N)$  reveal evidence in favor of cointegration relationship with dependencies and structural breaks between stock market return index, financial liberalization index and real GDP per capita for the three regressions: no breaks, mean shift and regime shift. In addition, we apply the Bai and Perron approach (1998) to determine the location of structural breaks. Table 6 reports the contemporaneously estimated breaks for each country.

**Table 6:** Estimates of Breaks

Countries	Break number	Break date(s)
Bahrain	2	1995-2008
Kuwait	1	2009
Oman	3	1994-2002-2009
Qatar	3	1996-2004-2009
Saudi Arabia	1	1996
United Arab Emirates	1	2007

Table 6 presents the detected break dates. Statistics displayed in this table indicate that the relationship between the three variables is non-linear. Hence, it confirms that there are breaks for all countries used in this study. Most of empirical studies that explored this relationship have not taken account for the effect of these breaks. This study comes to fill this gap and to deal with this problem that occurred when modeling such linear relationship.

Another important feature can be observed from table 6 is that there are almost similar break dates for all countries. This similarity is explained by the economic and financial interdependence of the GCC countries. In fact, one break date in one country can simultaneously affect all the other countries. Most of the structural breaks can be linked either to some dates relating to the financial liberalization policies initiated by the countries of this region from 1995 or to the global financial crisis during the period 2007-2009. This crisis which strongly affected the yields of GCC stocks and intensified the transmission of shocks from the global financial markets to the stock markets of the GCC countries. Some other break dates might correspond to domestic economic events.

#### 4.4. Results of panel long-run relationship: FMOLS and DOLS

Having established co-integration among the variables, the next step consists to estimate the long-term relationship between financial liberalization, stock market return and economic growth using the Fully-Modified Least Squares (FMOLS) and Dynamic Ordinary Least Squares (DOLS). The results are shown in Table 7.



**Table 7:** Panel long run estimations (Dependent variable; Y)

	FMOLS	DOLS
FL	0.0578* (1.918)	0.0404*** (3.543)
SMR	-0.1410** (-2.0757)	-0.1341* (-1.651)

\*\*\*, \*\* and \* denotes statistical significance at the 1%, 5% and 10% levels, respectively. The values in parentheses are t-student

The results of this set of estimations show that the financial variables included in the model have a long-term impact on GDP per capita. Results of FMOLS and DOLS show a positive long run effect of financial liberalization on growth. This result is explained by the fact that GCC countries have joining the global trend by opening their domestic capital markets to foreign investors and institutions. This policy offers many opportunities for GCC countries by mobilizing financial resources, facilitating risk management, allocating resources to the most efficient projects, monitoring the use of financial resources. In addition, GCC countries have received many capital inflows from advanced economies that imply to better insurance against aggregate shocks and reduced consumption volatility which, in turn, affects economic growth. In GCC countries, financial liberalization allows capital to move to its most attractive destination, increasing productivity, fostering a better functioning of financial markets and economic growth. This result is in line with Lee and Chou, 2018; Hou and Chang, 2017; Tonna et al., 2017; Galindo et al. 2007; Kroszner et al. 2007; Abiad et al. 2008. For the stock market, we find a negative long run relationship with growth because when GCC countries become more integrated with the global economy, potential risks arise and make economies more vulnerable to external financial crises. Also, the international integration of GCC countries leads to higher volatility interrupts the efficient allocations of saving and investments may lead firms to post pone investments and leads to the decrease of the economic welfare. This finding can be explained by the negative impact of market efficiency of the recent financial shocks as Subprime and Arab spring crises. This result is in line with the work of Pan and Mishra (2018) but divergent to Brown et al. (2016) who support the positive relationship between stock market return and economic growth.

## 5. Robustness

For robustness tests, we estimate the same model for each country. Table 8 reports the empirical results.

**Table 8:** Long-run output coefficients for individual countries

	FMOLS		DOLS	
	FL	SMR	FL	SMR
<b>Bahrain</b>	0.0630 (0.432)	0.3540*** (1.745)	0.1127 (0.621)	0.5273** (2.559)
<b>Kuwait</b>	-0.3714 (-4.129)	-0.4191 (-0.758)	-0.1270* (-7.009)	-0.2649** (-2.750)
<b>Oman</b>	0.8319 (1.548)	0.1073 (0.068)	0.9829 (1.506)	0.4507 (0.160)
<b>Qatar</b>	0.5556** (2.223)	0.4242*** (1.986)	0.6211** (3.315)	0.7787** (2.413)
<b>Saudi Arabia</b>	-0.8062* (-3.565)	-0.7395*** (-1.743)	-0.4711* (-4.998)	-0.4441** (-2.611)
<b>UAE</b>	0.0911** (2.133)	-0.2233*** (1.888)	0.1369** (2.856)	-0.2997 (-3.331)

\*\*\*, \*\* and \* denotes statistical significance at the 1%, 5% and 10% levels, respectively. The values in parentheses are t-student

Empirical results displayed in Table 8 and relative to individual countries indicate that financial liberalization and stock market return exert a positive and significant effect on economic growth in Bahrain, Qatar and UAE. The positive association can be explained by the stable institutional and macroeconomic context that which make successful the financial liberalization process. Also, financial markets in these countries are more stable, modernize and well developed and necessary positively contributes to grow output. Unlike Bahrain, Qatar and UAE, we find that both financial liberalization and stock market decrease economic growth in Saudi Arabia. For Kuwait and Oman, we found that financial liberalization and stock market return do not exert any significant effect on economic growth.

## 6. Panel error correction models and causality analysis

Using the two- steps procedure of Engle and Granger (1987), we consider the following panel vector error correction model:

$$\Delta Y_{it} = \alpha_{1i} + \sum_{j=1}^{m-1} \beta_{1ij} \Delta Y_{i,t-j} + \sum_{l=0}^{m-1} \varphi_{1il} \Delta FL_{i,t-l} + \sum_{r=0}^{m-1} \gamma_{1ir} \Delta SMR_{i,t-r} + \delta_1 ECM_{i,t-1} + \mu_{i,t} \quad (2)$$

$$\Delta FL_{it} = \alpha_{2i} + \sum_{j=1}^{m-1} \beta_{2ij} \Delta FL_{i,t-j} + \sum_{l=0}^{m-1} \varphi_{2il} \Delta Y_{i,t-l} + \sum_{r=0}^{m-1} \gamma_{2ir} \Delta SMR_{i,t-r} + \delta_2 ECM_{i,t-1} + v_{i,t} \quad (3)$$

$$\Delta SMR_{it} = \alpha_{3i} + \sum_{j=1}^{m-1} \beta_{3ij} \Delta SMR_{i,t-j} + \sum_{l=0}^{m-1} \varphi_{3il} \Delta Y_{i,t-l} + \sum_{r=0}^{m-1} \gamma_{3ir} \Delta FL_{i,t-r} + \delta_3 ECM_{i,t-1} + \omega_{i,t} \quad (4)$$

Where; ECM denotes the error correction term (ECT) and the optimal number of lagged terms included by the ECM models in equations (2), (3) and (4) is then determined by the Schwarz information criterion (SIC). The above models highlight the long-run relationship and short-run adjustment mechanisms towards equilibrium. Moreover, with such models, one can carry out causality tests. We will indeed consider two types of causality: long-run causality and short-run causality.

**Table 9: Long run causality**

	t-stat	F-stat
Y	-2.7132*** (0.0067)	7.3618*** (0.0067)
FL	-1.6108 (0.1074)	2.5947 (0.1074)
SMR	-1.0064 (0.2069)	3.1126 (0.5986)

**Table 10: Short Run Causality, GDP equation**

	F-stat	Wald-stat
FL→Y	1.8889 (0.5695)	4.9100 (0.1225)
SMR→Y	-2.6697** (0.035)	6.4568** (0.0267)
SMR → FL→Y	1.9975 (0.2352)	8.2314 (0.3312)

**Table 11: Short Run Causality, FL equation**

	F-stat	Wald-stat
Y→FL	1.3356 (0.4458)	3.4423 (0.2630)
SMR→FL	-3.4421** (0.0125)	5.3337** (0.0454)
SMR → Y→FL	0.3479 (0.8897)	5.2534 (0.8219)

**Table 12: Short Run Causality, SMR equation**

	F-stat	Wald-stat
Y→SMR	1.0369 (0.2443)	3.7521 (0.5221)
FL→SMR	0.4123 (0.5433)	1.6874 (0.1123)
FL → Y→SMR	0.5289 (0.6713)	7.9742 (0.9623)

\*\*\*, and \*\* indicate significance at the 1% and 5% levels, respectively.

Table 9 shows that there is a long-term causality running from FL and SMR to Y. Likewise, this long-term causality is not supported by reversing the path, i.e. from Y and SMR to FL and from Y and FL to SMR. Subsequently, Tables 10 and 11 reveal a short-run causality running from stock market returns to either financial liberalization or growth. However, in Table 12, we notice that Y does not cause SMR and FL in the short term.

## 7. Conclusion and policy recommendations

Motivated by the consequence of structural change undergone by the financial markets as well as the economic conjuncture of GCC countries during the last 20 years, the aim of this paper was to investigate the relationship between financial liberalization, Stock market return and economic growth. To achieve this goal, we used a balanced panel of 6 Gulf Cooperation Council countries over the period 1987-2016. As empirical approach, we performed a multivariate analysis based on cointegration test and Panel Vector Error Correction Model (PVECM).

More specifically, the empirical strategy was based on five steps. First, cross section dependence tests are applied to verify the consideration of cross-section dependence. Second, panel unit root tests with and without cross section dependence and structural breaks are performed to determine the order of integration among the variables and acts as a prerequisite for estimating long-run relationship. Third, first and second generation of panel cointegration tests are conducted to determine the long-run relationship among the variables. Fourth, we determine the structural breaks country by country. Fifth, the dynamic and fully modified ordinary least square (DOLS and FMOLS) estimators are used to estimate heterogeneous long-run coefficients.

Overall, empirical results from several panel tests provide strong support for the long-run positive effect of financial liberalization on economic growth and a long-run negative association between stock market return and growth. The positive association between financial liberalization and economic growth was supported by the fact that GCC countries have joining the global trend by opening their domestic capital markets to foreign investors and institutions. This policy offers many opportunities for GCC countries by mobilizing financial resources, facilitating risk management, allocating resources to the most efficient projects, monitoring the use of financial resources.

However, the international integration of GCC countries that makes potential risks arise and make economies more vulnerable to external financial crises can explain the negative relationship between stock market and economic growth. Generally, more integration leads to higher volatility interrupts the efficient allocations of saving and investments, may lead firms to postpone investments and leads to the decrease of the economic welfare.

When we estimate regression relative to individual countries, we found that financial liberalization and stock market return exert a positive and significant effect on economic growth in Bahrain, Qatar and UAE. On contrary, a negative association was found in Saudi Arabia. For Kuwait and Oman, we found that both financial liberalization and stock market return do not exert any significant effect on economic growth.

Results of this paper can be considered of great importance for both academicians and policymakers. Furthermore, a number of methodological concerns and recommendations need to be noted. Several actions and steps should be taken by GCC countries that ensure to strong

regulation, effective supervision and efficient financial market. As for example, it is recommended to countries of Bahrain, Qatar and UAE to continue their liberalization process with more attention to the institutional and macroeconomic context stability. The sequence of financial liberalization process can significantly ensure the success or the failure of this program. For the other countries, strong work is needed in order to modernize financial market and to ensure it stability at the same time. Also, more action and financial economic reforms should be implemented in order to have stable institutional and macroeconomic context able to implement a program of financial liberalization.

## References

- Abiad, A., Oomes, N. & Ueda, K., "The quality effect: Does financial liberalization improve the allocation of capital"? *Journal of Development Economics*, (2008): 87, pp 270-282.
- Ahmed, A.D., "Effects of financial liberalization on financial market development and economic performance of the SSA region: An empirical assessment". *Economic Modelling*, (2013) : 30, 261-273.
- Ahmed, A.D., Mmolainyane, K.K. "Financial integration, capital market development and economic performance: Empirical evidence from Botswana". *Economic Modelling*, (2014): 42, 1–14.
- Ariss, R.T., "Financial liberalization and bank efficiency: evidence from post-war Lebanon", *Applied Financial Economics*, (2008): 18, pp 931-946
- Batuo, M., Mlambo, K., Asongu, S., "Linkages between financial development, financial instability, financial liberalisation and economic growth in Africa". *Research in International Business and Finance*.(2018): 45, 168-179.
- Ben Naceur, S., Ghazouani, S., Omran, M. "Does stock market liberalization spur financial and economic development in the MENA region?" *Journal of Comparative Economics*. (2008): 36 (4), 673-693.
- Ben Rejeb, A., Boughrara, A., "Financial liberalization and stock markets efficiency: New evidence from emerging economies", *Emerging Markets Review*, (2013): 17, 186–208.
- Bhatia, A., & Sharma, H. R. (2019). Financial liberalization and channels of growth: a comparative study of developed and emerging economies. *Indian Economic Review*. doi:10.1007/s41775-019-00038-5
- Bussiere, M. &Fratzscher, M., Financial openness and growth: Short-run gain, Long run pain? *Review of International Economics*, (2008): 16, pp 69-95
- Chiangn T.C., Chen, X., "Stock returns and economic fundamentals in an emerging market: An empirical investigation of domestic and global market forces". *International Review of Economics & Finance*. (2016): 43,107-120.
- Dabwor, D. T., Iorember, P. T., & Yusuf Danjuma, S. (2020). Stock market returns, globalization and economic growth in Nigeria: Evidence from volatility and cointegrating analyses. *Journal of Public Affairs*, e2393
- Demirguc-Kunt, A. & Detragiache, E., "Financial liberalization and financial fragility", IMF WP (1998):N°83, pp 1-36
- Erlando, A., Riyanto, F;D. & Masakazu, S., 2020. Financial inclusion, economic growth, and poverty alleviation: evidence from eastern Indonesia, *Heliyon*, 6, e05235
- Galindo, A.J., Schiantarelli, F. & Weiss, A., "Does financial liberalization improve the allocation of investment? Micro evidence from developing countries", *Journal of Development Economics*, (2007): 83 (2), pp 562-587
- Gazdar, K, Kabir Hassan, M., Faisal Safa., M and Grassa, R. "Oil price volatility, Islamic financial development and economic growth in Gulf Cooperation Council (GCC) countries", *Borsa Istanbul Review*, (2018): 1-10
- Grassa, R., and Gazdar, K. Financial development and economic growth in GCC countries: A comparative study between Islamic and conventional finance, *International Journal of Social Economics*, (2014): 41(6), 493-514
- Gubillas. E and González. F (2012). Financial liberalization and bank risk-taking: International evidence, *Journal of financial stability*, 11, pp 32-48
- Hamdi, H., Sbia. R and Kamil OnurTas., B. "Financial Deepening and Economic Growth in Gulf Cooperation Council Countries", *International Economic Journal*,(2014):28 (3), 459-473
- He, H., Chen, Sh., Yao, Sh., Ou, J., "Financial liberalisation and international market interdependence: Evidence from China's stock market in the post-WTO accession period". *Journal of International Financial Markets, Institutions & Money*, (2014): 33, 434–444.
- Hou, H., Cheng, S-Y., "The dynamic effects of banking, life insurance, and stock markets on economic growth". *Japan and the World Economy*. (2017): 41, 87-98.
- IMF,"How Developed and Inclusive are Financial Systems in the GCC"? , (2018), *Prepared by Staff of the International Monetary Fund*
- Kaminsky, G. & Reinhart, C., The twin: the causes of banking and balance of payments problems, *American Economic Review*, (1999): 89 (3), 473-500
- Kroszner, R.S., Laeven, L. &Klingeblid, D,"Banking crises, financial dependence, and growth", *Journal of Financial Economics*, (2007): 84, 187-228
- Lee, Ch-H., Chou, P-I., "Financial openness and market liquidity in emerging markets", *Finance Research Letters*, (2018) : 25, 124-130.

- Madsen, J. B., Dzhumashev, R., & Yao, H. (2013). Stock returns and economic growth. *Applied Economics*, 45(10), 1257–1271.
- McKinnon, R.I., 1973, *Money and capital in economic development*, The Banking Institution
- Misati, R.N., Nyamongo, E.M., “Financial liberalization, financial fragility and economic growth in Sub-Saharan Africa” *Journal of Financial Stability*, (2012): 8 (3),150-160.
- Misati, R.N ; and Nymongo.E.M (2012). Financial liberalization, financial fragility and economic growth in Sub-Saharan Africa, *Journal of Financial Stability*, 8(3). pp, 150-160
- Muhammad, N., Mohammad Islam, A-R and Marashdeh, HA, “Financial development and economic growth: an empirical evidence from the GCC countries using static and dynamic panel data”, *Journal of Economics and Finance*, (2016): 40 (4) , pp 773–791
- Ng, A., Dewandaru, G., Ibrahim, M.H., “Property rights and the stock market-growth nexus”. *The North American Journal of Economics and Finance*, (2015): 32, 48-63.
- Pan, L and Mishra, V (2018). Stock market development and economic growth: Empirical evidence from China, *Economic Modelling*, 68, pp. 661-673
- Rahman, M.M, & Alam, K., 2021. Exploring the driving factors of economic growth in the world's largest economies, *Heliyon*, 7, e07109
- Ranciere, R., Tornell, A. & Westermann, F., “Decomposing the effects of financial liberalization: crises vs growth”, *Journal of Banking and Finance*, (2006): 3331-3348
- Shaw, E.S., 1973, *Financial deepening in economic development*, New York Oxford University Press
- Tanna, S., Luo, Y., De Vita, G., “What is the net effect of financial liberalization on bank productivity? A decomposition analysis of bank total factor productivity growth”, *Journal of Financial Stability*, (2017): 30, 67-78.
- World Bank, “GCC Engagement Note No. 2 Improving the quality of financial intermediation in the Gulf Cooperation Council (GCC) Countries, Finance & Markets Global Practice”, *World Bank report*, (2015): N97222
- Wu, M., Huang, P., Ni, Y., “Capital liberalization and various financial markets: Evidence from Taiwan”. *The Quarterly Review of Economics and Finance*, (2017): 66, 265-274.
- Yu, H., Fang, L., Sun, W., “Forecasting performance of global economic policy uncertainty for volatility of Chinese stock market”. *Physica A: Statistical Mechanics and its Applications*. (2018) : 505, 931-940.
- Zaman, M; Pinglu, C, Hussain, S.I, Ullah, A. & Qian, N., 2021. Does regional integration matter for sustainable economic growth? Fostering the role of FDI, trade openness, IT exports, and capital formation in BRI countries, *Heliyon*, 7, e08559