The Scientific Journal of Cihan University – Sulaimanyia **PP: 151-173**
Volume (3), Issue (1), Jun 2019
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

Financial Sector Development and Economic Growth in Developed and Developing Countries from 1970 to 2017 Using Panel Estimation

Saud Ghali Sabr[1], Younis A. Ahmed[2], Twana N. Mohamad Khan[3]

[1,2]Department of Economics, College of Administration and Economics, University of Sulaimani, Sulaimanyia, Iraq
[3]Department of Banking and Financial Science, College of Administration and Financial Science, Cihan University of Sulaimani, Sulaimanyia, Iraq
saud.sabr@univsul.edu.iq[1]
uns.ahmad@univsul.edu.iq[2]
twana.najaf@sulicihan.edu.krd[3]

Abstract

There is a very important association between the financial sector and economic growth, in order to attaining particular economic goals. More specifically, there are two channels that link the financial sector to economic growth: the Gross Domestic Product (GDP) and the efficiency of resources used by financial intermediaries, who perform the intermediation between the financial sector and those they allocate credit to. Thus, this article explores the long-term nexus between financial development and economic growth in certain developed and developing countries from (1970 – 2017) by using the Johansen panel co-integration test, the panel Dynamic Ordinary Least Squares (DOLS), the panel Fully Modified Ordinary Least Squares (FMOLS) test and the fixed and random effects' approaches. The empirical results show a significant and positive long-term influence from liquid liabilities and private credit on GDP per capita in developed and developing countries. By contrast, there is a negative correlation coefficient from the deposit money banks' assets and bank deposits on GDP per capita.

Key Words: Financial development, economic growth, panel data regression, developed and developing countries.

الملخص

هناك ارتباط مهم بين القطاع المالي والنمو الاقتصادي ، من أجل تحقيق أهداف اقتصادية معينة. وبشكل أكثر تحديداً ، هناك قناتان رئيسيان تربطان القطاع المالي بالنمو الاقتصادي: الناتج المحلي الإجمالي (GDP) وكفاءة الموارد التي يستخدمها الوسطاء الماليون ، الذين يقومون بالوساطة بين القطاع المالي وتلك التي يخصصون الائتمان لها. لذا يهدف هذا البحث اكتشاف العلاقة طويلة الأمد بين التنمية المالية والنمو الاقتصادي في بعض البلدان المتقدمة والنامية خلال المدة (1970 - 2017) . ولتحقيق هذا الهدف اعتمد البحث على [اختبار التكامل المشترك لـ (Johansen) ، طريقة المربعات الصغرى الاعتيادية الديناميكية (DOLS) ، طريقة اختبار المربعات الصغرى الاعتيادية المعدلة بالكامل (FMOLS) وطرق التأثيرات العشوائية والثابتة]. و اخيرا ، توصل البحث الى مجموعة من الاستنتاجات منها ان هناك تأثيراً كبيراً وإيجابيًا على المدى الطويل من المطلوبات السائلة والائتمان الخاص على نصيب الفرد من إجمالي الناتج المحلي في البلدان المتقدمة والنامية. على العكس من ذلك ، هناك معامل ارتباط سلبي من الأصول التي تحتفظ بها بنوك والودائع المصرفية على نصيب الفرد من إجمالي الناتج المحلي .

الكلمات المفتاحية: التنمية المالية ، النمو الاقتصادي، تحليل (Panel regression) ، البلدان المتقدمة والنامية .

The Scientific Journal of Cihan University – Sulaimanyia **PP: 151-173**
Volume (3), Issue (1), Jun 2019
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

پوختە

پەیوەندیەکی بەهێز هەیە لە نێوان کەرتی دارایی و گەشەکردنی ئابوری بۆ بەدەست هێنانی ئامانجە ئابوریەکان. ووردتر بڵێین دوو ڕێگای سەرەکی هەیە بۆ بەستنەوەی کەرتی دارایی و گەشەی ئابوری پێکەوە : بەرهەمی گشتی ناوخۆیی (GDP) و کاریگەری ئەو سەرچاوانەی کە لە ناوەندە دارایی یەکاندا بەکاردەهێنرێن وەک ناوەندێك لە نێوان کەرتی دارایی و مامەڵەکاران لەگەڵ کەرتی دارایی. هەربۆیە ئەم توێژینەوەیە هەوڵ دەدات بۆ دۆزینەوەی پەیوەندی درێژخایەن لە نێوان پەرەسەندنی دارایی و گەشەکردنی ئابوری لە هەندێك وواڵتی پێشکەوتوو و تازە پێگەشتوو بۆماوەی نێوان (1970 -2017) . بۆ بەدیهێنانی ئەو ئامانجەش ئەم توێژینەوەیە کۆمەڵەمیتۆدێکی بەکارهێناوە لەوانە [The Johansen panel co-integration test, panel dynamic ordinary least squares, panel fully modified ordinary least squares , fixed and random effects' approaches]

ئەم توێژینەوەیە گەیشتۆتە کۆمەڵە دەرئەنجامێك لەوانە پەیوەندیەکی ئەرێنی و کایگەر و درێژخایەن هەیە لە نێوان قەرزی نەختینەیی و قەرزدان بە کەرتی تایبەت لە لایەن بانکەوە لەسەر پشکی تاك لە کۆی بەرهەمی ناوخۆیی لە وواڵتانی پێشکەوتوو و تازە پێگەشتوو. بە پێچەوانەوە پەیوەندیەکی نەرێنی هەیە لە نێوان سەرمایەی نەختینەیی دانراو لە بانك و نەختینەیی بانکی لەسەر لەسەر پشکی تاك لە کۆی بەرهەمی ناوخۆیی.

وشە سەرەکییەکان: پەرەپێدانی دارایی ، گەشەی ئابوری، میتۆدی (Panel regression)، وڵاتانی پێشکەوتوو و وڵاتانی تازەگەشەکردوو.

1. Introduction

A financial system consists of institutions and markets that interact, typically in a compound manner, for the purpose of mobilising funds for investment and providing facilities, including payment systems, to finance commercial activities Mishkin (2007). In other words, as the World Bank (1989) has described, the purpose of a financial system is to simplify the transference of savings from surplus sectors to deficit sectors. The surplus sectors include savings while the deficit sectors refer to the entrepreneurs and government directed out of their own savings.

Likewise, economic process is measured by the gross domestic product within the short, medium and long run. This growth is that the outcome of an increase within the value-added product and services made by all national corporations. A rise in these added product throughout a given amount implies that the nation's wealth is rising. This manifests within the growth of per capita financial gain and during a higher level of well-being Ngongang (2015).

Bagehot (1873) is the first famous author to possess developed a link between the financial sector and economic growth. He emphatic that, within the United Kingdom (the UK), the financial sector

DOI: http://dx.doi.org/10.25098/3.1.10

had an important role in facilitating the transfer of money associated to form an industrializing policy. Moreover, Schumpeter (1912) investigated the services provided by these financial sector intermediaries as being vital for innovation and development. He more delineate the importance of the banking system in economic growth by the source of innovation and power, which might enhance future growth by characteristic productive investment.

Additionally, after the 1950s, the impact of the financial and banking sectors on economic growth was evaluated by Gurley and Shaw (1956) and Cameron (1967). They demonstrated that banks had an important role to play in economic growth by providing the manufacturing industries. Furthermore, Shaw (1973), McKinnon (1974), Galbis (1977) and Fry (1980) argued that government interventions to the industry, like a credit ceiling, high reserve requirements, and direct credit programmers, will hinder financial development, which they have a negative impact on financial sector development, as a result, they scale back economic growth.

Greenwood and Boyan (1990) claimed that financial intermediation encourages growth as a result of it permits for a higher rate of return of capital (ROC), and this growth, in turn, provides the means that to implement costly financial structures. Likewise, Bencivenga & Smith (1991) contributed to the event of the banks and therefor the potency of financial intermediation resulting in economic growth by channelling savings into high rates of production and to the reduction of liquidity risks. several studies have shown that the impact of financial development on economic growth in bound developing countries demonstrates that financial development contains a positive influence on economic growth (Neusser & Kugler, 1998; Benhabib & Spiegel, 2000; Xu, 2000; Rioja & Valev, 2004; Arshad Khan et al., 2006).

According to Levine (2005), financial intermediary development stimulates economic growth by making economic conditions that improve potency in resource allocation. The association between financial intermediaries and economic growth has been widely examined (Chang & Caudill, 2005; Seetanah, 2008; Anwar & Nguyen, 2010; Uddin & Shahbaz, 2013; Nwani & Bassey, 2016). Most of these studies concluded that financial intermediary development becomes a source of economic growth.

There is additionally a deviation within the impact of financial development on economic growth. The dimensions and even the signs of growth vary between and among empirical studies. A comparison of studies suggests that the estimated impact depends on the estimation strategies, the proxy measures for monetary development, the time distance of the data, the countries enclosed within the estimation and therefore the management variables used. The key objective of this study is to empirically examine the connection between financial development

and economic growth in five developed and five developing countries throughout the period from 1970 to 2017. This study aims to investigate the impact of financial sector development on economic in these groups of states. The second a part of this article presents the theoretical and empirical research on the link between financial development and economic growth. The third half describes the study's econometrics model and therefore the results. The ultimate section interprets these results.

2. Link between Financial Development and Economic Growth

It is necessary to define the theoretical framework of this study in order to draw accurate results and conclusions. The main issue of the theoretical framework is to understand the basic fundamentals of the study.

2.1 Theoretical framework

Theories about financial development and economic growth can be divided into four different points of view.

The first is called the supply-leading theory, which argues for a positive influence of financial development on economic growth. According to this viewpoint, financial intermediation strongly influences economic growth, and it is implemented by raising the savings rate and thus the investment rates Shaw (1973), by increasing the efficiency of capital accumulation Goldsmith (1969) by facilitating capital mobilisation (Bagehot, 1873; Hicks, 1969) and by creating capital, trade and the formation of capital Ahmed (2006). This theory is supported principally by Schumpeter (1912) and Gurley and Shaw (1956) for further empirical studies, please see: Roubini & Martin, 1992; King & Levine, 1993; Darrat, 1999; Rousseau & Wachtel, 2000; Calderón & Liu, 2003; Christopoulos & Tsionas, 2004; Demirguc-Kunt & Levine, 2008; Kwarteng & Collins, 2015; Idenyi et al., 2016; Puatwoe & Piabuo, 2017).

The second is the demand-following theory. This theory supports the notion that when there is growth or development in an economy, there will be an increase in the financial sector. This means that financial development follows economic growth, and thus more attention should be given to the development of the economy, including the employment of a large amount of people Robinson (1952). This institute of believed posits that the financial system develops in reaction to better economic growth. Several authors provide empirical support to this view and recommend a unidirectional causality running from growth to finance (Gurley & Shaw, 1955; Friedman &

DOI: http://dx.doi.org/10.25098/3.1.10

The Scientific Journal of Cihan University – Sulaimanyia **PP: 151-173**
Volume (3), Issue (1), Jun 2019
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

Schwartz, 1963; Goldsmith, 1969; Jung, 1986; Ireland, 1994; Kar & Pentecost, 2000; Boulila & Trabelsi, 2002; Islam et al., 2004; Guryay et al., 2007; Rachdi, 2011).

The third view states that there is a mutual impact on finance and growth. This attitude is based on many studies that have claimed that there is bidirectional relation between financial development and economic growth (Wood, 1993; Demetriades & Hussein, 1996; Demetriades & Arestis, 1996; Greenwood & Smith, 1997; Luintel & Khan, 1999; Rousseau & Vuthipadadorn, 2005; Apergis et al., 2007; Adam & Siaw, 2010; Ayub, 2012).

The forth theory claims that there is a negative, weak or zero relationship between financial development and economic growth. Lucas (1988) and Stern (1989) state that there is no relationship between financial development and economic growth. They argue that any strategy that reinforces financial development would be a waste of resources; it more removes what they deliberate to be a necessary concentrate on more appropriate policies on problems, like labour and productivity enlargement programmer, implementing pro-investment tax reforms and inspiring exports that are sources of economic growth. There are also several studies that have found a weak relationship between financial development and economic growth (Singh, 1997; Narayan & Narayan, 2013; Grassa & Gazdar, 2014; Mhadhbi, 2014; Ayadi et al., 2015; Ductor & Grechyna, 2015).

Each theory presents different assumptions and relies on different variables to obtain their conclusions, and each one also applies to a different group of countries. Thus, the current study depends on supply-leading and demand-following theories for explaining the behaviour of financial development and economic growth in developed and developing countries.

2.2 Empirical literature review

The literature review on the association between financial development and economic growth provides a theoretical basis for the empirical estimation. In a panel data framework, an empirical study of the connection between financial development and economic growth is rich universally. Empirical research can be classified by the methods used, the countries investigated, whether it employs a time series analysis or panel studies and the case studies used. It can also be categorised according to the theories used, that is a supply-led, demand-following or whether there is no relationship or a bidirectional one. This section reviews the existing literature according to these categories, which are country or group of countries, the time series, the cross sectional and panel models that have been used (ARDL, VECM, VAR and GMM) and the variables employed as a substitution for financial development.

Savvides (1995) uses the ratio of quasi-liquid liabilities of the financial system to GDP as a financial development indicator in a panel study for 28 African states. He found a positive impact from the financial sector on economic growth. Different variables were used as a proxy for financial sector. For instance, Odedokun (1996) uses the ratio of liquid assets to GDP as a financial sector indicator in a panel of 71 countries. The estimation method used was the generalized least squares (GLS) technique.

Compared to studies in other fields, there are few researching a cross-sectional framework, and the number of cross-sectional analyses is even less. King and Levine (1993) used cross-country data on 80 countries for the period between 1960 and 1989, and financial depth, BANK*, credit to the private sector and the overall size of the public sector as a financial sector development indicator. They found that there is a significant impact from financial sector development on economic growth. Further to this, Levine and Zervos (1996) empirically tested the question as to whether the financial system is important for economic growth. They used the stock market as a proxy for financial sector development in a cross-country regression analysis. They concluded that stock market development is positively associated with long-term economic growth.

A study by Luintel and khan (1999) used data from ninety countries to look at the long relationship between financial development and economic growth. The methodology used was a multivariate vector auto-regressive (VAR) analysis. They adopted a ratio of the total deposit liabilities of deposit banks to at least one amount lagged nominal (GDP) as a proxy of financial development. As a result, they found bidirectional relation between financial development and economic growth in all the sample countries.

Huran and Chun (2013) studied 89 countries using the Bayesian dynamic factor model. In contrast to the above study, to determine the financial development indicator, they employed the domestic credit of the private sector as a percentage of GDP. This means that they used the ratio of the domestic assets of deposit money banks to the domestic assets of deposit money banks and the central bank, and the ratio of liquid liabilities of the financial system to GDP.

There are more studies that analyse the link between financial development and economic growth in an exceedingly country that uses time series analyses. Gautam (2014) study in Nepal between 1975 and 2012 used the quantitative relation of domestic credit to gross domestic product, broad money to gross domestic product and private sector credit to GDP as proxies of financial development. He has used the VECM methodology, and he found that financial development influences economic growth within the short-run though economic growth is

* *The ratio of the domestic assets of deposit money banks to the domestic assets of deposit money banks and the central bank is called the variable BANK (King & Levine, 1993) .

DOI: http://dx.doi.org/10.25098/3.1.10

the source of financial development in the long run. Conversely, Iheanacho (2016) studied the link between financial development and economic growth in Nigeria. Iheanacho (2016) used five variables to measure financial sector development: the ratio of credit provided by the domestic banks to the non-public sector divided by gross domestic product, liquid liabilities to gross domestic product, assets held by deposit money banks to gross domestic product and bank deposits to GDP from 1981 to 2011, mistreatment the autoregressive distributed lag (ARDL) methodology. He found a negative correlation between financial sector development and economic growth.

Puatwoe and Piabuo (2017) found different results even though they used the same methods (the ARDL) in their study in Cameroon between 1980 and 2014. They selected broad money, deposit/GDP and domestic credit to private sector as substitutes of financial sector development. This study showed that there is negative association between bank deposits, private investment and economic growth in the short term.

There are numerous studies within the literature on the link between financial sector development and economic growth that used panel data co-integration techniques, however few focused on both developed and developing countries. However, Beck et al., (2000) used the generalized method of moments (GMM) to analyse 74 developed and developing countries; he adopted the ratio of credit provided by domestic banks to the domestic private sector divided by GDP, liquid liabilities to GDP, the assets of deposit money banks to GDP and bank deposits to GDP as measures of financial development.

Hence, further research seems necessary to examine the link between the variables of financial development and economic growth in a panel data framework in both developed and developing countries. Moreover, an additional aim is to provide an improved empirical analysis by using panel co-integration and estimation models that supply more information about the data while correcting many of the inadequacies mentioned above.

3. Data Collection and Discussion of the Results

3.1 Data description and data sources

This study uses a secondary annual panel data from the five developed and five developing countries covering the period from 1970 to 2017 from Data Market, World Development Indicator and World Bank databases (WDI, 2019). The econometric method was conducted on two sample country groups. The first sample includes the five developed countries: the United States (the US), the UK, Italy, Germany and France. The second sample focuses on the five developing countries: Iraq, Iran, Kuwait, Turkey and Saudi Arabia. The GDP per capita is used as a proxy variable for

The Scientific Journal of Cihan University – Sulaimanyia **PP: 151-173**
Volume (3), Issue (1), Jun 2019
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

economic growth. The four variables used as a measure of financial sector development are: the assets held by deposit money banks to GDP (%); bank deposits to GDP (%), liquid liabilities to GDP (%) and private credit given by deposit money banks to GDP (%). These variables are also used in the literature, such as liquid liabilities by Beck et al., (2000), and Iheanacho (2016) used these variables as a measure of financial intermediary development in a time series analysing model.

Table 1: Variables definition

Variables	Definition
LGPC	Logarithm Gross Domestic product (GDP) per capita (constant 2010 US$)*
LDMB	Logarithm Deposit money banks assets to GDP (%)
LBDG	Logarithm Bank deposits to GDP (%)
LLG	Logarithm Liquid liabilities to GDP (%)
LPCD	Logarithm Private credit by deposit money banks to GDP (%)

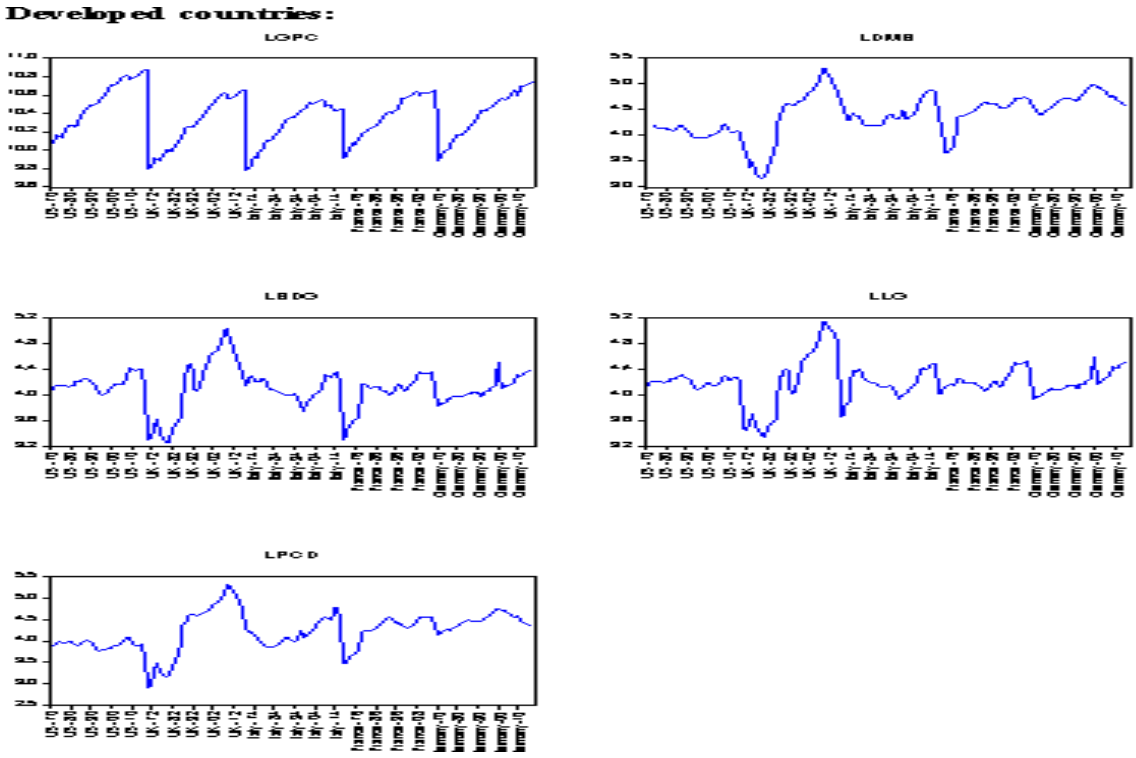


Figure 1: The frequency distribution of data in developed and developing countries

DOI: http://dx.doi.org/10.25098/3.1.10

The Scientific Journal of Cihan University – Sulaimanyia **PP: 151-173**
Volume (3), Issue (1), Jun 2019
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

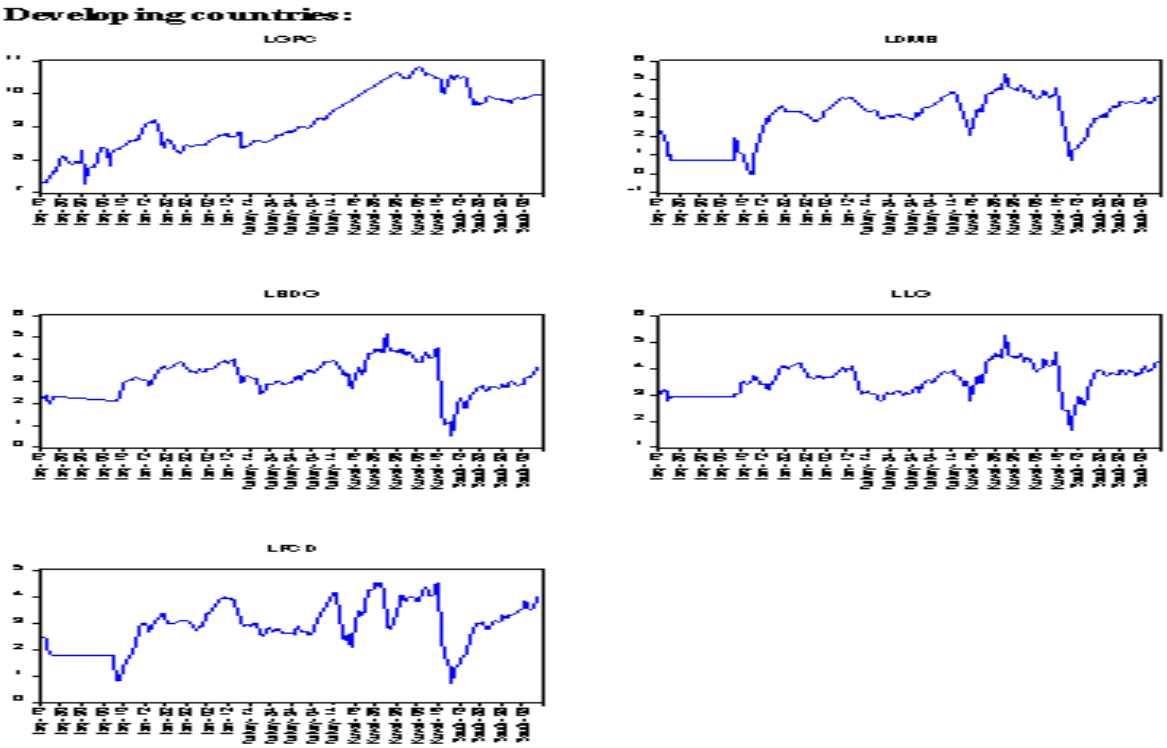


Figure 2: The frequency distribution of data in developed and developing countries

3.2 The panel unit root

This section discusses whether the variables are stationary or not, and whether they have a unit root. There are six popular panel unit root tests with varying assumptions about the autoregressive (AR) process. The five tests assume that the series has a common root, which includes the Levin, Lin and Chu (LLC) (1992) test (also seen in Breitung (2000) and Im, Pesaran and Shin (2003)) and the Fisher type test using the ADF and PP tests (Maddala & Wu, 1999; Choi, 2001). The results from these tests do not differ that much, and the null hypotheses are that the panel data have a unit root and the data are non-stationary, with the exception of Hadri (2000) who takes the notion of non-stationary (the presence of a unit root) as the null hypothesis. Hence, the study conducts five tests to confirm their reliability and then compares the results to check their robustness. The stationary tests are implemented first at level, and then in the first difference to establish the presence of unit roots and the order of integration in all the series. The results of the panel unit root tests are as follows:

The Scientific Journal of Cihan University – Sulaimanyia **PP: 151-173**
Volume (3), Issue (1), Jun 2019
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

Table 2: panel unit root tests for the dependent and independent variables for the developed and developing countries

Panel unit root tests								
Group One (Developed Countries)								
Variables	LLC		IPS		ADF		PP-Fisher	
	Level	1st difference	Level	1st difference	Level	1st difference	Level	1st difference
LGPC	-0.76	-11.08***	1.3	-9.19***	4.22	91.82***	2.25	84.96***
LDMB	-0.25	-5.52***	1.05	-5.41***	6.78	47.79***	2.61	48.72***
LBDG	-0.49	-7.49***	0.28	-7.82***	7.68	76.52***	7.57	80.15***
LLG	0.02	-9.28***	-0.1	-8.97***	13.49	88.80***	8.12	96.47***
LPCD	-0.34	-5.56***	0.94	-4.92***	8.32	47.00***	4.43	56.15***
Group Two (Developing Countries)								
Variables	LLC		IPS		ADF		PP-Fisher	
	Level	1st difference	Level	1st difference	Level	1st difference	Level	1st difference
LGPC	0.53	-10.45***	0.05	-10.04***	10.5	103.4***	6.23	107.1***
LDMB	-1.09	-9.36***	-0.52	-10.97***	12.86	108.6***	9.07	107.3***
LBDG	-0.5	-8.81***	0.69	-8.64***	6.50	86.20***	5.9	97.63***
LLG	0.02	-11.7***	0.68	-11.89***	7.92	122.7***	8.07	125.1***
LPCD	1.35	-9.35***	1.59	-9.42***	5.41	93.1***	5.97	93.88***
*Note: L is logharitm:GPC is Gross Domestic product (GDP) per capita; DMB is for Deposit money banks assets (%GDP); BDG is for Bank deposits (%GDP); DLLG is for Liquid liabilities (%GDP) and LPCD is for Private credit by deposit money banks (%GDP).								
* Significance at 10%, ** Significance at 5%, *** Significance at 1%. The asterisks indicate the rejection of the null hypothesis of unit root. All the variables are in the natural log form.								

Table (2) shows that none of the variables are stationary at level, while all the variables are in the first difference and integrated in order I(1) in both developed and developing countries.

3.3 Panel co-integration

After the order of the stationary variables has been determined, the next step is to apply the panel co-integration test. There are three common panel co-integration tests, which have been used in the literature. They are based on Engle and Grangeri's (1987) two-step approach, the single-equation framework by Pedroni (1999) and Kao (1999) and Johansen's (1988) multivariate test. This study adopted the approach called the Johansen-Fisher panel co-integration tests. Maddala and Wu (1999) and Fisher (1932) adjusted the Johansen (1988) to test for panel data.

$$\Delta y_{it} = \Pi_i y_{it-1} + \sum_{j=1}^{k} \Gamma_{ij} \Delta_{it-1} \varphi_i z_{it} + \varepsilon_{it} \qquad (1)$$

y_{it} is a $p \times 1$ vector of the endogamous variables (in this case, $y_{it} = [\log GPC, \log DMB, \log BDG, \log LLG, \log LPCD]$; p is the number of variables and Π_i represents the long-term $p \times p$ matrix. Johansen (1988) suggests two different approaches: the likely ratio of

DOI: http://dx.doi.org/10.25098/3.1.10

The Scientific Journal of Cihan University – Sulaimanyia **PP: 151-173**
Volume (3), Issue (1), Jun 2019
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

trace statistics and the maximum eigenvalue statistics to decide on the presence of co-integration vectors in a non-stationary time series analysis. The trace statistics and maximum eigenvalue statistics are shown in equations (3) and (4), respectively.

$$\lambda_{trace}(r) = -T\sum_{i=r+1}^{n} \ln(1-\lambda_i^*) \qquad (2)$$

And

$$\lambda_{\max}(r, r+1) = -T\ln(1-\lambda_{r+1}^*) \qquad (3)$$

T is the sample size, n=5 variables and λ_i^* is the largest canonical association between residuals from the three-dimensional processes and the three-dimensional differentiated processes.

For the trace tests, the null hypothesis is at the most the r co-integration vector against the alternative hypothesis of the full rank r=n co-integration vectors; the null and alternative hypotheses of the maximum eigenvalue statistics is to test the r co-integrating vectors against the alternative hypothesis of the r+n co-integrating vectors. The panel co-integration test outcomes are as follows:

Table 3: Johansen-Fisher panel co-integration test results

Johansen-Fisher Panel Co-integration Test			
Group one (Developed Countries)			
	r =0	r ≤ 1	r ≥ 1
Trace statistic	92.77***	45.19***	23.97***
Max-Eigen statistic	57.35***	27.24***	14.4*
Kao Residual Co-integration			
	t-statistics		
ADF	-1.62*		
Residual variance	0.000665		
HAC variance	0.001409		
Johansen-Fisher Panel Co-integration Test			
Group two (Developing Countries)			
	r =0	r ≤ 1	r ≥ 1
Trace statistic	98.42***	63.2***	44.07***
Max-Eigen statistic	76.79***	43.66***	35.61***
Kao Residual Co-integration			
	T-statistics		
ADF	2.063**		
Residual variance	0.003325		
HAC variance	0.004090		

Notes: The Johansen-Fisher test is has x^2distribution with 2N degrees of freedom and then it is asymptotically normally distributed.
***(**)(*) Indicates rejection of the null hypothesis at 1%(5%) and (10%).

The results of the panel co-integration tests are given in Table (3). Clearly, they reject the null hypotheses of less than two co-integration vectors amongst the series at any level in both developed and developing countries, which means that there is co-integration association between the variables.

The Scientific Journal of Cihan University – Sulaimanyia **PP: 151-173**
Volume (3), Issue (1), Jun 2019
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

3.4 Long-term relationship estimation

The results of Johansen's (1988) and Kao's (1999) tests are that there is a co-integration in the series. Next, this study estimates the long-term relationship using the dynamic ordinary least squares (DOLS) and pooled least square (POLS) tests, as suggested by Kao and Chiang (2000). These tests can be applied to find out whether there is a long-term equilibrium in the relationships in the series. The model can be modify to the following equation:

$$LGPC_{it} = \beta_0 + \beta_1 LDMB_{it} + \beta_2 LBDG_{it} + \beta_3 LLG_{it} + B_4 LPCD_{it}$$
$$+ \sum_{j-p}^{q} \varphi_{itj} \Delta LDMB_{it+j} + \sum_{j-p}^{q} \varphi_{itj} \Delta LBDG_{it+j} + \sum_{j-p}^{q} \varphi_{itj} \Delta LLG_{it+j} + \sum_{j-p}^{q} \varphi_{itj} \Delta LPCD_{it+j} + \varepsilon_{it} \text{.....(4)}$$

In the equation, φ_{itj} represents the coefficients of the lead (q) and lag (p) differences, which help generate unbiased estimates of $\beta 1$ …..β_n by eliminating the asymptotic endogeneity and serial correlations. The following table summarises the results of these estimations:

Table 4: Result of FMOLS and DOLS estimations

Developed countries									
Panel Fully Modified Least Squares (FMOLS)					**Panel Dynamic Least Squares (DOLS)**				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
LDMB	-0.637222	0.204731	-3.112488	0.0022	LDMB	-0.631002	0.296335	-2.129355	0.0356
LBDG	-1.520719	0.249359	-6.098502	0.0000	LBDG	-0.817098	0.356484	-2.292106	0.0240
LLG	1.829016	0.271659	6.732765	0.0000	LLG	1.217436	0.366149	3.324978	0.0012
LPCD	0.665431	0.189313	3.514970	0.0006	LPCD	0.595245	0.291227	2.043921	0.0435
Developing countries									
Panel Fully Modified Least Squares (FMOLS)					**Panel Dynamic Least Squares (DOLS)**				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
LDMB	-2.706033	0.676354	-4.000913	0.0001	LDMB	-1.015052	0.285557	-3.554643	0.0009
LBDG	-5.738985	4.113060	-1.395308	0.1650	LBDG	-1.362544	0.275960	-4.937472	0.0000
LLG	8.142876	4.227741	1.926058	0.0560	LLG	1.480301	0.278052	5.323827	0.0000
LPCD	2.423268	0.610470	3.969510	0.0001	LPCD	1.238500	0.342565	3.615374	0.0007

Source: Authors computation.

From Table (4) based on the two applied estimation approaches and the GDP per capita as the dependent variable, the coefficients of all the independent variables (LDMB, LBDG, LLG and LPCD) are statistically significant in both models (the FMOLS and DOLS) in developed countries. However, the LDMB and LBDG have negative coefficients for both developed and developing countries (-0.63;-1.52) and (-0.63 ; -0.81), respectively.

DOI: http://dx.doi.org/10.25098/3.1.10

The Scientific Journal of Cihan University – Sulaimanyia **PP: 151-173**
Volume (3), Issue (1), Jun 2019
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

Conversely, the results in Table (4) show a positive relationship between LLG and LPCD and the dependent variable LGPC. In other words, when there is a 1% increase in the liquid liabilities in the developed countries, GDP increases per capita by 1.82% or 1.21%. Likewise, a 1% increase in private credit by deposit money banks increases the GDP per capita by 0.66% or 0.59% in the long term. In general, the coefficients of all the independent variables (LDMB, LLG and LPCD) without LBDG are statistically significant in both models (FMOLS and DOLS). Nevertheless, the LDMB and LBDG have a negative impact of about (-2.70;-5.73) and (-1.01;-1.36), respectively. The last two variables (LLG and LPCD) had a strong positive affect on GDP per capita in developing countries. As a consequence, a 1% increase in the developing countries' liquid liabilities increases GDP per capita by 8.14% or 1.48%. Similarly, a 1% increase in private credit by deposit money banks increases GDP per capita by 2.42% or 1.23% in the long term.

In sum, the long-term estimations show positive effects from the liquid liabilities and private credit by deposit money banks on GDP per capita in both groups; the developed and developing countries. These results are in line with previous studies (Apergis et al., 2007; Lakštutienė, 2008; King & Levine, 1992).

3.5 Fixed effects and random effects models

One of the problems of panel data regression is the endogeneity problem, which can occur as a result of the model due to a lack of an independent variables, wrong identification and a dependent variable that has a correlation with a residual term. To test this problem, this study used a fixed effects and a random effects model for both sample country groups. The fixed effects model has a slope coefficient which is equal for time and section units while the constant coefficient differs based on the horizontal cross-sectional units because it has a unit effect Greene (1993). Every horizontal section unit takes a different value of constant, which means that the differences between the units are expressed by the differences in the constant term. Moreover, this model assumes that there is no correlation between the independent variable and the error term, which allows the correlation between the unit effect and the independent variable.

On the other hand, if these individual effects are treated as random variables similar to error terms, they are placed within the random effects model. The assumption of this model is that the error term and the differences in the horizontal section units are random Greene (1993). The error term in this model is different to the fixed effects model because any changes in the horizontal section units occurring in the model include a component of an error term. The aim is to prevent the loss of the

The Scientific Journal of Cihan University – Sulaimanyia **PP: 151-173**
Volume (3), Issue (1), Jun 2019
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

degrees of freedom experienced in the fixed effects model. The results of fixed and random effect models are as follows:

Table 5: Results of the fixed and random effects models

Developed countries					Developing countries				
Fixed effects result					Random effects result				
variables	coefficient	std.error	t.statistic	prob.	variables	coefficient	std.error	t.statistic	prob.
LDMB	-0.177800	0.044224	-4.020436	0.0001	LDMB	-0.181423	0.079198	-2.290743	0.0239
LBDG	0.140015	0.032396	4.321952	0.0000	LBDG	-0.212223	0.208074	-1.019937	0.3101
LLG	0.067727	0.027839	2.432764	0.0161	LLG	0.527638	0.244678	2.156458	0.0333
LPCD	0.034204	0.039220	0.872089	0.3845	LPCD	-0.368441	0.084943	-4.337510	0.0000
C	10.16029	0.045146	225.0535	0.0000	C	9.726215	0.280426	34.68375	0.0000
R-squared	0.9870	S.E. of regression	0.0312		squared	0.9539	S.E. of regression	0.2289	
Adjusted R-squared	0.9828				R-squared	0.9310			
F-statistic	235.4357	Prob. (F.statistic)	0.0000		F-statistic	41.7769	Prob. (F.statistic)	0.0000	
Developed countries					Developing countries				
Fixed effects result					Random effects result				
variables	coefficient	std.error	t.statistic	prob.	variables	coefficient	std.error	t.statistic	prob.
LDMB	-0.032166	0.118472	-0.271511	0.7863	LDMB	0.448732	0.050486	8.88818	0.0000
LBDG	0.502518	0.113049	4.445149	0.0000	LBDG	-0.782107	0.603360	-12.96260	0.0000
LLG	-0.021437	0.129216	-0.165902	0.8684	LLG	0.8300069	0.082167	10.10218	0.0000
LPCD	0.040765	0.120806	0.337187	0.7363	LPCD	-0.0174620	0.077786	-0.224489	0.8227
C	8.377103	0.201742	41.52377	0.0000	C	7.3984650	0.168093	44.01424	0.0000
R-squared	0.3309	S.E. of regression	0.1965		squared	0.2568	S.E. of regression	0.7613	
Adjusted R-squared	0.3176				R-squared	0.2377			
F-statistic	24.8612	Prob. (F.statistic)	0.0000		F-statistic	13.4795	Prob. (F.statistic)	0.0000	

Source: Authors commutation.

From Table (5), the results of the fixed effects model shows that most of the variables are statistically significant at 1% and 5%. By contrast, the results of the random effects model shows that even though most variables for the developing countries and some variables for the developed countries are statistically significant at 1% and 5%, based on the value of R-squared and adjusted R-squared, the goodness of fit for this model is not that good in comparison with the fixed effects model.

The results of the fixed effects model in Table (5) show that the impact of all independent variables (LBDG, LLG and LPCD) are positive, except LDMB is negative in the developed countries. Moreover, without LPCD, all the series are significant. On the other hand, the results in the developing countries are rather different because there is a negative sign recorded in the three variables, LDMB, LBDG and LPCD, but that LLG is positive. Moreover, LBDG is non-significant, but the rest of the variables are significant.

Besides, to analyse the fixed and random effects model results and to show which one is appropriate, this study uses the Hausman test Hausman (1978). To choose between these two regressions models, the Hausman test can determine whether the difference between the random

DOI: http://dx.doi.org/10.25098/3.1.10

The Scientific Journal of Cihan University – Sulaimanyia **PP: 151-173**
Volume (3), Issue (1), Jun 2019
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

and fixed effects regression models is zero. In other words, it is used to test the null hypothesis (H0: the random effect is preferred). The results of the Hausman test are shown in the table below:

Table 6: Results of the correlated random effects: the Hausman test

Developed countries group

Test Summary	Chi-Sq. Statistic	Chi-Sq.	Prob.
Cross-section random	69.038001	4	0.0000

Developing countries group

Test Summary	Chi-Sq. Statistic	Chi-Sq.	Prob.
Cross-section random	1078.935127	4	0.0000

Based on the present analysis in Table (6), the results of the Hausman test are that the probability is less than 5% (0.0000), which indicates that the fixed effects model is appropriate statistically and economically in both sample groups.

3.6 Diagnostic tests

Diagnostic testing is fundamental when testing the model to ensure that there are no regression problems. The results of the diagnostic tests and statistical indictors are presented in the table below:

Table 7: Diagnostic tests for the panel estimation for developed and developing countries

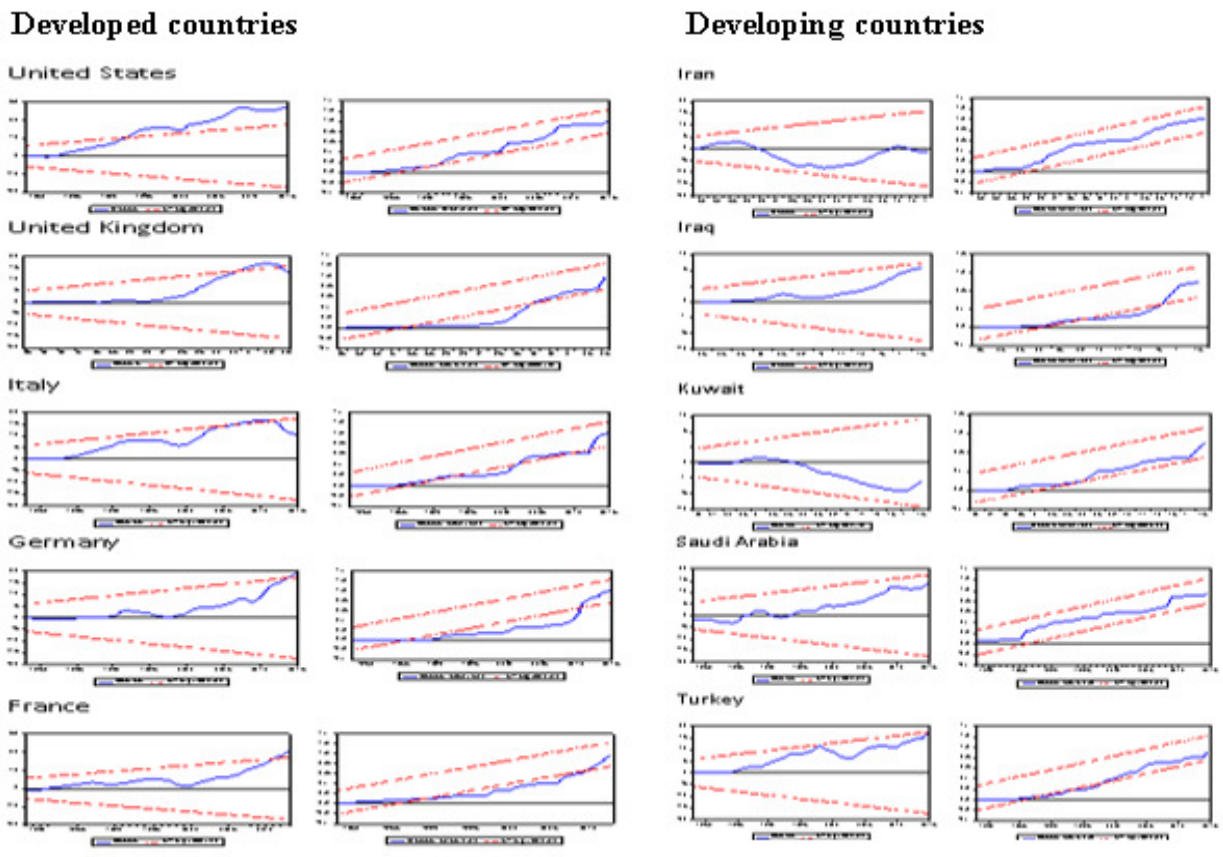
Test statistics:	LM test	(ARCH) test	Ramsey RESET test	Jarque-Bera	VIF
	F-statistic	F-statistic	F-statistic	F-statistic	Centered VIF
Developed Countries	**Diagnostic tests for Developed Countries**				
United States	43.341 [0.2102]	2.1507 [0.1109]	0.02197 [0.8830]	Not applicable [0.7818]	Less than 10
United Kingdom	35.999 [0.2081]	1.3885 [0.2624]	0.2740 [0.6045]	Not applicable [0.2173]	Less than 10
Italy	54.414 [0.1071]	1.6937 [0.1474]	7.57315 [0.0116]	Not applicable [0.2214]	Less than 10
Germany	25.906 [0.1547]	2.3074 [0.1152]	30.433 [0.0000]	Not applicable [0.4266]	Less than 10
France	3.4674 [0.1166]	1.7705 [0.1329]	8.0356 [0.0076]	Not applicable [0.4709]	Less than 10
Developing Countries	**Diagnostic tests for Developed Countries**				
Iraq	5.3947 [0.9632]	0.3061 [0.5894]	7.7489 [0.0178]	Not applicable [0.9401]	Less than 10
Iran	1.7493 [0.1315]	0.9445 [0.3384]	52.097 [0.0000]	Not applicable [0.2791]	Less than 10
Kuwait	44.701 [0.1169]	1.0560 [0.3177]	3.2619 [0.0910]	Not applicable [0.4822]	Less than 10
Turkey	1.8211 [0.1029]	0.1663 [0.1663]	2.1356 [0.1524]	Not applicable [0.5693]	Less than 10
Saudi Arabia	1.6259 [0.1429]	43.341 [0.1799]	72.109 [0.0000]	Not applicable [0.7421]	Less than 10

Source: Author computation.

The Scientific Journal of Cihan University – Sulaimanyia **PP: 151-173**
Volume (3), Issue (1), Jun 2019
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

Table (7) shows that for all the tests that used LM, ARCH, the Ramsey Reset, Jarque-Bera and the Variance Inflation Factor, the F-statistic is more than the critical value. The model passed these tests in all the countries, except for the Ramsey Reset test. The results of the Ramsey Reset test show that the null hypothesis can be rejected only in three countries: the US, the UK and Turkey, but in the other countries, it cannot be rejected. The null hypothesis (H0: the econometrics model does not exist) is accepted across all models for all countries. Therefore, the DOLS, PLS and the fixed effects model are correctly specified. Additionally the study used CUSUM and CUSUMQ for checking the problem of structural change. There is no evidence for this problem, and it involves the existence of a stable relationship between the variables. The relationship between the financial sector and economic growth is as follows:

Figure 3: CUSUM and CUSUMQ test result



4. Conclusion

The notion of the financial sector and economic growth is essential amongst researchers within the economic field. Hence, it absolutely was deemed necessary to look at the connection between the variables of financial development and economic growth during a panel data framework. Thus,

DOI: http://dx.doi.org/10.25098/3.1.10

this study empirically tests the dynamic long-term relationship between certain financial sector indicators and economic growth in five developed and developing countries. The GDP per capita was used as a proxy variable for economic growth and four financial sector development measures as well as the assets held by deposit money banks to GDP (%), bank deposits to GDP (%), liquid liability to GDP (%) and private credit given by deposit money banks to GDP (%). The five developed countries, the US, the UK, Italy, Germany and France, and the five developing countries, Iraq, Iran, Kuwait, Turkey, and Saudi Arabia, were chosen as the two groups by using the Johansen panel co-integration test, the panel dynamic ordinary least squares (DOLS), the panel fully modified ordinary least squares (FMOLS) approach and therefor the fixed and random effects model models of a set of data from 1970 to 2017. In doing so, the study applied various panel unit root tests to seek the order of integration of the variables. The long-term relationships among the variables were analyses using the Johansen panel co-integration test. The empirical results indicated that there is significant positive impact from liquid liabilities and private credit by deposit money banks on the GDP per capita in the long term in both group countries. In contrast, a negative coefficient correlation was seen in the assets held by deposit money banks and bank deposits on GDP per capita.

References

And, B., & Spiegel. (2000). The Role of Financial Development in Growth and Investment Stable URL : http://www.jstor.org/stable/40215899 The Role of Financial Development. Journal of Economic Growth, 5(4), pp.341–360.

Adam, A. M., & Siaw, F. (2010). Does financial sector development cause investment and growth? Empirical analysis of the case of Ghana.

Ahmed, A. D. (2006). The impact of financial liberalization policies: the case of Botswana. Journal of African Development, 8(1), pp.13-38.

Ang, J. B., & McKibbin, W. J. (2007). Financial liberalization, financial sector development and growth: Evidence from Malaysia. Journal of Development Economics, 84(1), pp.215–233. https://doi.org/10.1016/j.jdeveco.2006.11.006

Ayadi, R., Arbak, E., Naceur, S. B., & De Groen, W. P. (2015). Financial development, bank efficiency, and economic growth across the Mediterranean. In Economic and social development of the Southern and Eastern Mediterranean countries (pp. 219-233). Springer, Cham.

Ayub, V. S. (2012). The causal relationship between economic growth and financial development case study of South Africa.

Anwar, Sajid, and Lan Phi Nguyen. "Foreign direct investment and economic growth in Vietnam." Asia Pacific business review 16, no. 1-2 (2010): pp.183-202.

Apergis, N., Filippidis, I., & Economidou, C. (2007). Financial deepening and economic growth linkages: a panel data analysis. Review of World Economics, 143(1), pp.179-198.

Arestis, P., & Demetriades, P. (1997). Finance and growth: institutional considerations and causality. Available at SSRN 35996.

Beck, T., Levine, R., & Loayza, N. (2000). Finance-and-the-sources-of-growth_2000_Journal-of-Financial-Economics, *58*. https://doi.org/10.1016/S0304-405X(00)00072-6

Bencivenga, V. R., & Smith, B. D. (1991). Financial Intermediation and Endogenous Growth. *The Review of Economic Studies*, *58*(2), 195. https://doi.org/10.2307/2297964

Boulila, G., & Trabelsi, M. (2002). Financial development and long-run growth: Granger causality in a bivariate VAR structure, evidence from Tunisia: pp.1962-1997. Faculte des Sciences Economiques et de Gestion de Tunis (FSEGT).

Breitung. (2000). The local power of some unit root tests for panel data.

Calderón, C., & Liu, L. (2003). The direction of causality between financial development and economic growth. Journal of development economics, 72(1), pp.321-334.

Cameron, R. E. (1967). Banking in the early stages of industrialization: a study in comparative economic history. New York: Oxford University Press.

Chang, T., & Caudill, S. B. (2005). Financial development and economic growth: the case of Taiwan. Applied Economics, 37(12), pp.1329-1335.

Choi, I. (2001). Unit root tests for panel data. Journal of International Money and Finance, 20(2), pp.249–272. https://doi.org/10.1016/S0261-5606(00)00048-6

Christopoulos, D. K., & Tsionas, E. G. (2004). Financial development and economic growth: evidence from panel unit root and cointegration tests. Journal of development Economics, 73(1), pp. 55-74.

Darrat, A. F. (1999). Are financial deepening and economic growth causally related? Another look at the evidence. International Economic Journal, 13(3), pp.19-35.

Demetriades, P. O., & Hussein, K. A. (1996). Does financial development cause economic growth? Time-series evidence from 16 countries. Journal of development Economics, 51(2), pp. 387-411.

Demirguc-Kunt, A., & Levine, R. (2008). Finance, financial sector policies, and long-run growth. The World Bank.

DOI: http://dx.doi.org/10.25098/3.1.10

Ductor, L., & Grechyna, D. (2015). Financial development, real sector, and economic growth. International Review of Economics & Finance, 37, pp. 393-405.

Engle, R. F., Granger, C. W. J. (1987). Co-Integration and Error Correction : Representation , Estimation , and Testing Published by : The Econometric Society Stable URL : https://www.jstor.org/stable/1913236, 55(2), pp. 251–276.

Friedman, M., & Schwartz, A. J. (1963). A Monetary History of the United States (Princeton, 1963). FriedmanA Monetary History of the United States1963.

Fry, M. J. (1980). Money and Capital or Financial Deepening in Economic Developments?. In Money and Monetary Policy in Less Developed Countries(pp. 107-113). Pergamon.

Galbis, V. (1977). Financial intermediation and economic growth in less□developed countries: A theoretical approach. The Journal of Development Studies, 13(2), pp.58-72.

Gautam, B. P., & Ph, D. (2014). NRB Working Paper No . 25 Financial Development and Economic Growth in Nepal, (25), pp.1–17.

Goldsmith, R. W. (1969). Financial Structure and Development, Yale Uni. Press, New Haven.

Grassa, R., & Gazdar, K. (2014). Financial development and economic growth in GCC countries: A comparative study between Islamic and conventional finance. International Journal of Social Economics, 41(6), pp.493-514.

Greenwood and Boyan. (1990). Entrepreneurship : Productive , Unproductive , and Destructive Author (s): William J . Baumol Source : Journal of Political Economy , Vol . 98 , No . 5 , Part 1 (Oct ., 1990), pp . 893-921 Published by : The University of Chicago Press Stable URL : ht. Journal of Political Economy, 98(5),pp.893–921. https://doi.org/10.1007/sl0551-01

Greenwood, J., & Smith, B. D. (1997). Financial markets in development, and the development of financial markets. Journal of Economic dynamics and control, 21(1), pp.145-181.

Greene, N., Kass, M., & Miller, G. (September, 1993). Hierarchical Z-buffer visibility. In Proceedings of the 20th annual conference on Computer graphics and interactive techniques (pp. 231-238). ACM.

Gurley, J. G., & Shaw, E. S. (1955). Financial aspects of economic development. The American Economic Review, 45(4), pp.515-538.

Gurley, J. G., & Shaw, E. S. (1956). Financial intermediaries and the saving-investment process. The Journal of Finance, 11(2), pp.257-276.

Guryay, E., Safakli, O. V., & Tuzel, B. (2007). Financial development and economic growth: Evidence from Northern Cyprus. International Research Journal of Finance and Economics, 8(2), pp.57-62.

Hadri, K. (2000). Testing for stationarity in heterogeneous panel data Author (s): Kaddour Hadri

Published by: Wiley on behalf of the Royal Economic Society Stable URL: http://www.jstor.org/stable/23114886 Testing for stationarity in heterogeneous panel data, 3(2), 148–161.

Hausman, J. (1978). Specification tests in econometrics Econometrica 46: pp.1251–1271.

Hicks, J. R. (1969). A theory of economic history. OUP Catalogue.

Huran;, & Chun. (2013). Financial Development and Economic Growth : a New Investigation. Journal of Economic Developemnt, 38(1), 27–46. https://doi.org/DOI: ,

Idenyi, S., Bigben, O., Promise, C. O., & Charity, E. A. (2016). Investigating the Causal Relationship between Financial Development and Economic Growth in Nigeria and South Africa ., 7(2), 75–81. https://doi.org/10.9790/5933-0702027581

Iheanacho, E. (2016). The Impact of Financial Development on Economic Growth in Nigeria: An ARDL Analysis. Economies, 4(4), 26. https://doi.org/10.3390/economies4040026

Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. Journal of Econometrics, 115(1), 53–74. https://doi.org/10.1016/S0304-4076(03)00092-7

Islam, R., Habib, W., & Khan, H. (2006). Linked references are available on JSTOR for this article : A Time Series Analysis of Finance and Growth in Bangladesh, 30(1), pp.111–128.

Ireland, P. (1994). Money and growth: an alternative approach" the American economic review.

Johansen, S. (1988). Statistical analysis of cointegration vectors. Journal of economic dynamics and control, 12(2-3), pp.231-254.

Jung, W. S. (1986). Financial development and economic growth: international evidence. Economic Development and cultural change, 34(2), pp.333-346.

Kao, C., & Chiang, M. (2000). On the estimation and inference of a cointegrated regression in panel data Chihwa Kao and Min-Hsien Chiang. Center for Policy Research. Paper 145., 15, 179–222.

Kar, M., & Pentecost, E. J. (2000). Financial development and economic growth in Turkey: further evidence on the causality issue. Universitäts-und Landesbibliothek Sachsen-Anhalt.

King, R. G., & Levine, R. (1993). Finance and Growth : Schumpeter Might be Right Author (s): Robert G . King and Ross Levine Published by: Oxford University Press Stable URL: http://www.jstor.org/stable/2118406 Accessed: 10-05-2016 18: 56 UTC Your use of the JSTOR archive indicates, *108*(3), pp.717–737.

Kugler, N. & (1998). Manufacturing Growth and Financial Development : Evidence from OECD Countries Author (s): Klaus Neusser and Maurice Kugler Source : The Review of Economics and Statistics , Vol . 80 , No . 4 (Nov ., 1998), pp . 638-646 Published by : The MIT Press

DOI: http://dx.doi.org/10.25098/3.1.10

Sta. *The Review of Economics and Statistics*, *80*(4), pp.638–646.

Kwarteng & Collins, A. (2015). Financial Development and Economic Growth: the Causal Relationship in Ghana, pp.1–123.

Lakštutienė, A. (2008). Correlation of the indicators of the financial system and gross domestic product in European Union countries. Engineering economics, 58(3).

Levine, R., & Zervos, S. (1996). Stock Market Development and Long-Run Growth Author (s): Ross Levine and Sara Zervos Source : The World Bank Economic Review , Vol . 10 , No . 2 , A Symposium Issue on Stock Markets and Economic Development (May , 1996), pp . 323-339 Published by : Ox, *10*(2), 323–339.

Levine, R. (2006). Finance and Growth: Theory and Evidence, Handbook of Economic Growth, P. Aghion and S. Durlauf.

Luintel, K. B., & Khan, M. (1999). A quantitative reassessment of the finance-growth nexus: Evidence from a multivariate VAR. *Journal of Development Economics*, *60*(2), pp.381–405. https://doi.org/10.1016/S0304-3878(99)00045-0

Maddala, G. S., & Wu, S. (1999). A Comparative Study of Unit Root Tests with Panel Data and a New Simple Test. *Oxford Bulletin of Economics and Statistics*, *61*(s1), pp.631–652. https://doi.org/10.1111/1468-0084.61.s1.13

McKinnon, R. I. (1974). The BB-SR Systen. *The American Political Science Review*, *68*(4), pp.1822–1824. https://doi.org/10.1007/978-3-540-92966-6_10

Mhadhbi, K. (2014). Financial development and economic growth: A dynamic panel data analysis. International Journal of Econometrics and Financial Management, 2(2), pp.48-58.

Mishkin, F. S. (2007). The economics of money, banking, and financial markets. Pearson education.

Muhammad Arshad Khan, A. Q. and E. G. (2006). Pakistan Institute of Development Economics , Islamabad Trade Liberalisation , Financial Sector Reforms , and Growth [with Comments] Author (s): Muhammad Arshad Khan , Abdul Qayyum and Ejaz Ghani Source : The Pakistan Development Review , N. *Pakistan Institute of Development Economics*, *45*(4).

Narayan, P. K., & Narayan, S. (2013). The short-run relationship between the financial system and economic growth: New evidence from regional panels. International Review of Financial Analysis, 29, pp.70-78.

Ngongang, E. (2015). Financial Development and Economic Growth in Sub-Saharan Africa: A Dynamic Panel Data Analysis. *European Journal of Sustainable Development*, *4*(2), pp.369–378. https://doi.org/10.14207/ejsd.2015.v4n2 p369

Nwani, C. and Bassey Orie, J., 2016. Economic growth in oil-exporting countries: Do stock market and banking sector development matter? Evidence from Nigeria. Cogent Economics &

Finance, 4(1), pp.115-132.

Odedokun, M. O. (1996). Alternative econometric approaches for analysing the role of the financial sector in economic growth: Time-series evidence from LDCs. *Journal of Development Economics*, *50*(1), 119–146. https://doi.org/10.1016/0304-3878(96)00006-5

Pedroni, P. (1999). Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors. *Oxford Bulletin of Economics and Statistics*, *61*(s1), pp.653–670. https://doi.org/10.1111/1468-0084.61.s1.14

Puatwoe, J. T., & Piabuo, S. M. (2017). Financial sector development and economic growth: evidence from Cameroon. *Financial Innovation*, *3*(1), 25. https://doi.org/10.1186/s40854-017-0073-x

Rachdi, H., & Mbarek, H. B. (2011). The causality between financial development and economic growth: Panel data cointegration and GMM system approaches. International Journal of Economics and Finance, 3(1), pp.143-151.

Robinson, J. (1952). The Generalization of the General Theory, in: The Rate of Interest and Other Essays (MacMillan, London).

Roubini, N., & Sala-i-Martin, X. (1992). Financial repression and economic growth. Journal of development economics, 39(1), pp.5-30.

Rousseau, P. L., & Vuthipadadorn, D. (2005). Finance, investment, and growth: Time series evidence from 10 Asian economies. Journal of Macroeconomics, 27(1), pp.87-106.

Rousseau, P. L., & Wachtel, P. (2000). Equity markets and growth: cross-country evidence on timing and outcomes, 1980–1995. Journal of Banking & Finance, 24(12), 1933-1957.

Savvides, A. (1995). Economic growth in Africa. World Development, 23(3), pp.449–458. https://doi.org/10.1016/0305-750X(94)00130-Q

Seetanah, Boopen, Rojid Sawkut, Vinesh Sannasee, and Binesh Seetanah. "Stock market development and economic growth in developing countries: Evidence from Panel VAR framework." online]. CSAE Working Paper 41 (2008).

Stern, N. (1989). The economics of development: a survey. The Economic Journal, 99(397), pp. 597-685.

Shaw, Edward S., Financial Deepening in Economic Development, New York, Oxford University Press, 1973, American Journal of Agricultural Economics, Volume 56, Issue 3, 1 August 1974, pp. 670.

Singh, A. (1997). Financial liberalisation, stockmarkets and economic development. The Economic Journal, 107(442), pp. 771-782.

Schumpeter, J. A. (1912). The Theory of Economic Development. Google Scholar.

DOI: http://dx.doi.org/10.25098/3.1.10

Tahir, M. (2008). An Investigation of the Effectiveness of Financial Development in Pakistan, 2(Winter), pp. 27–44.

Uddin, G. S., Sjö, B., & Shahbaz, M. (2013). The causal nexus between financial development and economic growth in Kenya. Economic Modelling, 35, pp. 701-707.

Valev, R. & (2004). Finance and the Sources of Growth at Various Stages of Economic Development. Journal of Emergency Medicine, 13(3), pp. 317–320. https://doi.org/10.1016/0736-4679(95)00002-R

Wood, A., 1993. Financial development and economic growth in Barbados: Causal evidence. Savings and Development, pp.379-390.

WDI. (2019, January 1). Data Bank World Development Indicators. Retrieved from corporation web site: https://databank.worldbank.org/data/reports.aspx?source=World-Development-Indicators

Xu, Z. (2000). Financial development, investment, and economic growth. Economic inquiry, 38(2), pp. 331-344.