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Üst Orta Gelirli Ülkelerde Ekonomik Büyüme ile Finansal Gelişme Arasındaki Nedensellik Yönü

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The Direction of Causality between Economic Growth and Financial Development in Upper Middle-Income Countries[1]

Abstract

The aim of this study is to investigate the relationship between economic growth and financial development for the period 1980 - 2017 in Upper-Middle-Income countries by employing panel (FMOLS, DOLS and GMM) and panel Granger-causality tests by Toda–Yamamoto. The results confirmed that domestic credit to private sector (percentage of GDP) and broad money (percentage of GDP) have a positive effect on economic growth. As a result, it can be said that financial development accelerates economic growth. In addition, the results showed that unidirectional causality running from economic growth to financial development in the countries of Jordan, Morocco, Belize, Botswana, China, Guatemala, Paraguay, Peru, and Thailand. While, the unidirectional causal relationship is running from financial development to growth in the countries of Algeria, Egypt, Saudi Arabia, Dominican Republic, Malaysia, South Africa and Turkey. In contrast, there is no causal relationship in Oman, Tunisia, Brazil, Mauritius and Mexico.

Keywords: Economic growth, FMOLS, Causality, Upper Middle-Income, Granger

Üst Orta Gelirli Ülkelerde Ekonomik Büyüme ile Finansal Gelişme Arasındaki Nedensellik Yönü

Öz

Bu çalışmanın amacı, 1980-2017 dönemi için Üst Orta Gelirli ülkelerde ekonomik büyüme ve finansal gelişme arasındaki ilişkiyi Toda-Yamamoto'nun panel (FMOLS, DOLS ve GMM) ve panel Granger-nedensellik testleri kullanarak araştırmaktır. Sonuçlar, özel sektöre verilen yurtiçi kredinin (GSYİH yüzdesi) ve geniş paranın (GSYİH yüzdesi) ekonomik büyüme üzerinde olumlu bir etkisi olduğunu doğruladı. Sonuç olarak finansal gelişmenin ekonomik büyümeyi hızlandırdığı söylenebilir. Ayrıca Ürdün, Fas, Belize, Botsvana, Çin, Guatemala, Paraguay, Peru ve Tayland'da ekonomik büyümeden finansal gelişmeye doğru tek yönlü bir nedensellik ilişkisi bulunmuştur. Cezayir, Mısır, Suudi Arabistan, Dominik Cumhuriyeti, Malezya, Güney Afrika ve Türkiye'de finansal gelişmeden büyümeye doğru tek yönlü nedensellik ilişkisi bulunmaktadır. Buna karşılık Umman, Tunus, Brezilya, Mauritius ve Meksika'da nedensellik ilişkisi bulunmamaktadır.

Anahtar Kelimeler: Ekonomik büyüme, FMOLS, Nedensellik, Üst Orta Gelir, Granger

Introduction

One of the most important goals that all countries want to do is to achieve economic growth by increasing the level of national income. To achieve sustainable economic growth, it is needed to increase investments. It is clear that investments can be increased through well-developed financial systems. In this context, whether financial development is decisive in achieving economic growth has become an important research topic in the literature. With the acceleration of globalization trend in the post-1980 period, the importance of financial markets increased and the belief that financial markets were one of the major drivers of economic growth became widespread.

Several researches have been done by concentrating on the relationship between economic growth and development of financial sector, it seems explicit or implicit that

[1] This is revised version of research presented in 2nd Econder International Congress.

an efficient financial system activates economic development or that financial sector development is an effective tool for promoting sustainable growth (Patrick 1966; Aimer 2016 and Taghizadeh-Hesary et al. 2019). It is thought that financial markets direct funds to investments so that economic growth can be provided (Durusu et.al. 2017). Addition to this, well-developed financial system supports entrepreneurs and entrepreneurial projects, increase the profits of firms, decrease the negative effects of economic crisis and reduce information asymmetry. Mckinnon and Shaw hypothesis claims that institutionalization of the liberal financial market causes an increase in savings, a decrease in interest rates and finally an increase in economic growth. However, neoclassical growth theories do not give any role to financial development. According to neoclassical models the impact of financial markets on growth is temporary (Çeştepe & Yıldırım, 2016)

Similarly, the academic controversy over the link between economic growth and financial development has been present since the beginning of the financial system. This relationship has been widely searched by many scholars. Generally empirical models searched whether well-developed financial markets promote the efficiency of scarce resource usage and allocation (Durusu et.al. 2017). Among the various conceptualized trends are the works whose stance affirms that the financial sector is a fundamental element for the growth of a country, among which (Schumpeter 1911, McKinnon 1973, Jung 1986, King & Levine, 1993b; 1993a, Odedokun 1996, Mc Kinnon 1973, Arestis & Demetriades 1997, Levine 1999, Shaw 1973, Yang 2019).

In this aspect, it becomes evident that there are four basic views in explaining the relationship between economic growth and financial development. According to the first view, growth leads to development. At first economic growth occurs and then the financial system grows due to most of researches studied relationship between these two variables. According to the second view, in the beginning financial development is achieved and then the economy grows (Kandır et.al. 2007; İnançlı et.al. 2016). Thus, economic growth is realized with the support of the financial system. According to the third view, there is a mutual interaction between financial development and growth (Çeştepe & Yıldırım, 2016). According to the fourth opinion, there is no significant relationship between them (Robinson 1952, Lucas 1998, Stern 1989, Kar et.al. 2011, Karamelikli & Kesgingöz, 2017). In shortly, there is no consensus on the relationship between them.

In this paper, we discuss the issue of causality between economic growth and financial development using panel data of upper-middle-income countries for the period 1980-2017. Our goal is to; first, decide to clarify whether or not there is a long run relationship for the economies of upper-middle-income countries. The remainder of this paper is organized as follows: In the second part, a brief review of a relevant sample of empirical works on the subject is offered; then, subsequently, the data and the econometric methodology that support the empirical analysis are described, the results of which are shown below; Finally, the conclusions are presented.

1. Economic Growth and Financial Development

Acquiring information, enforcing contracts and transactions have costs that lead to develop financial markets. By the development of financial markets, new types of financial contracts appear, their volumes increase, numbers and size of financial intermediaries increase (Levine, 2004). The reason of financial development can be accepted as the difficulties in obtaining information about financial investment decisions and the information asymmetries between parties (Çeştepe & Yıldırım, 2016). It is absolute that as financial sector develop, firms have opportunity to find funds for their investments and this causes economic growth and development for states. Capital requirements are one of the barriers to entry for markets and firms need to find funds to solve this problem (Dilek & Top, 2012, p.776). In developed countries, firms have several opportunities to find funds for their investments. For example, in developed countries stock markets are working efficiently.

Schumpeter (1911) and Andriesz et al. (2005) attests that credit serves industrial development and is an important condition for the creation and development of innovation and therefore economic growth. According to Schumpeter (1911) technological innovations are ultimately important motor for economic growth, however technological innovations can not be done automatically. Innovations can be reached through technologically based researches. Factors such as financial intermediary services which support innovations benefit economic growth. Patrick (1966) declares that there can be two way relationships between them. This relationship from economic growth to financial development can be occurred because by the economic growth, financial needs of firms and entrepreneurs will increase. By the other way, establishment of new financial institutions, finance sector can be motor of economic growth. Modern financial systems make it easy entrepreneurs to find funds needed for new establishments and solve information asymmetries in financial markets.

Additionally, the World Bank's World Development Report (Jones and Rodgers 2011) provides a qualified research of the link between finance and growth, emphasizing the development of the financial institutions and intermediaries to enhance growth. For Gurley & Shaw (1967), financial innovation that accompanies financial development reduces investment risk and the costs of financial intermediation and stimulates savings. Levine (1997 and 1999) argues that financial intermediaries, through the services they provide, stimulate economic growth through factor productivity and capital accumulation.

The traditional theory of finance and development postulates a direct relationship between the financial sector and development. This theory has recently been extended to suggest a direct relationship between the performance of financial markets and economic growth. Empirical evidence has produced results that demonstrate the presence of a two-way impact

between both sectors (Odedokun 1996). On the other way Lucas (1998) have alternative view to relationship between financial development and economic growth. According to Lucas (1998), financial development can't be a fundamental reason of long run economic growth. Development of financial institutions can lead to waste of scarce resources by withdrawing from effective economic areas.

The great volatility in the behaviour of international financial markets during the last decades has been mainly a reflection of the global economic crisis (Singh 1997). Turning into the variable mostly considered by investors to make their decisions and causing a change in the composition of income on a global scale: investments in capital markets have been favoured over direct investment.

2. Upper-Middle Income countries

The process of decline in economic cycles not only occurred in emerging economies, but the dynamism in the economic activity of developed countries also showed the same trend. Yang (2019) claims that financial development has positive impact on growth through total factor productivity and physical capital stock. Ercan et.al (2013) mentions that developments in financial markets can increase the performances of state and private sector. International financial markets, both emerging and developed, exhibit greater fragility in relation to the performance shown by the world's most powerful economy, that of the United States, which has historically held the role of the world's largest investor. In view of this, much has been said in studies conducted by various international financial institutions on the role that the economic performance of USA plays in international financial markets. If the US economy expands, it encourages export and economic activity, but as soon as the activity is depressed the Federal Reserve of the United States contracts capital inflows, therefore, it is affected more degree to those countries whose commercial relations are closer as is the case of Mexico and Canada.

There are empirical researches which claim that well-developed financial system helps to allocate funds for innovations and to support GDP growth (Yang, 2019). Table 1 shows GDP per capita (US$), General Government Final consumption (GGF), Domestic Credit to private sector (DCPS), and Broad Money (BROM) of upper middle income countries.

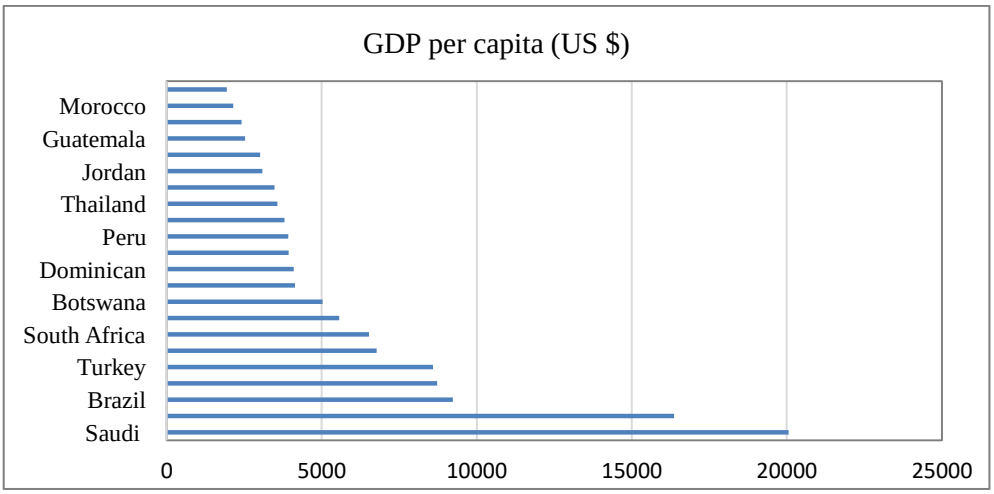
The level of the upper-middle-income countries, Saudi Arabia recorded the first rank among the highest middle-income countries in the average per capita real GDP by about $ 20059.82 during the period 1980-2017, Oman follows with $ 16,358.33. Finally, Egypt ranked last among the countries in the average per capita GDP Total, with an average per capita share of about $ 1935,653 during the period (1980 - 2017). While South Africa ranked first among the highest middle-income countries in the average domestic credit for the private sector (percentage of GDP) with an estimated rate of 112.23%, Malaysia followed by 106.60% during the period 1980-2017. Botswana ranked last among Countries in the average domestic credit to the private sector (% of GDP), where the ratio of average domestic credit to the private sector (% of GDP)

about 17.90% during that period. In the context, of final consumption expenditure, Saudi Arabia ranked first among the countries with the highest average middle income in general government final consumption expenditure (% GDP) at a rate of 25.72% during the period 1980-2017, 23.96% in Oman, the Dominican Republic ranked last among the Countries in the average public final consumption expenditure of the general government (% of GDP), where the percentage of the average final public consumption spending of the general government (% of GDP) reached 7.78% during that period. With regard to broad money (% of GDP), China ranked first among the countries that achieved the highest average broad money (% of GDP) with a rate of 120.59% during the period 1980-2017, Malaysia by 119.47%, and finally, Ecuador ranked last among the countries in the average broad money (% of GDP), where the proportion of Broad money (% of GDP) 23.82% during that period (see Table 1 & Figure 1).

Table 1: Averages of Variables from 1980 to 2017 by Countries

	Economic growth	**Financial Development**		
	GDP per capita (US $)	***DCPS (%)***	***GGF (%)***	***BROM (%)***
Algeria	3928.947	27.38372	16.64681	61.87153
Egypt	1935.653	34.5365	12.34938	83.69637
Jordan	3087.218	68.35402	22.49132	113.0581
Morocco	2143.278	43.66583	17.70041	73.4223
Oman	16358.33	33.73933	23.96421	33.57103
Saudi	20059.82	27.55917	25.72329	47.70292
Tunisia	3013.127	63.68994	17.00278	53.57835
Belize	3472.85	43.20144	15.23574	54.00033
Botswana	5021.663	17.90311	23.12397	33.87327
Brazil	9228.819	52.06449	16.8502	53.24812
China	2416.416	101.1002	13.98081	120.591
Dominican Republic	4093.396	25.56742	7.783077	29.78034
Ecuador	4141.097	20.0349	12.87542	23.82095
Guatemala	2524.343	22.0306	8.07158	32.51671
Malaysia	6773.543	106.6011	13.19876	119.4705
Mauritius	5567.069	57.24645	13.68613	77.94637
Mexico	8726.261	20.13636	9.982079	27.42855
Paraguay	3793.115	22.13179	8.547442	26.1789
Peru	3922.19	22.84247	11.03477	30.41618
South Africa	6524.38	112.2362	18.51774	60.09709
Thailand	3566.892	102.2405	13.24103	93.14096
Turkey	8590.893	28.07518	11.92541	36.4984

Figure 1: Averages of GDP Per Capita from 1980 to 2017 by Countries



Despite the great interest raised around the relationships between the financial development systems and the growth, some issues are not entirely clear in the theoretical and empirical analysis of this important link; For example, the fact that it is not known precisely whether liberalized stock markets have been really important for economic growth stands out.

Despite the progress shown by theoretical developments in this area, they also do not establish the direction of causality between growth and development. Such is the case of McKinnon (1988), who questions: "What is the cause and what is the effect? Is the financial sector a promoter of economic development, or does it simply follow the growth of the real product that is generated by other factors? "To date there is no consensus that financial development determines growth of economies, or if the opposite occurs, or if both processes are determined reciprocally. Recently, a series of empirical works have attempted to establish the direction of causality between growth and financial development. Some tend to confirm a positive association between them while others tend to reject.

3. Literature review

To understand the true interaction between growth and financial development, several empirical studies have been carried out. Most empirical work shows that countries with high-interest rates and high investment rates have a more developed financial sector. Thus, in countries where the growth rate is low, the level of intermediation is also low. Otherwise, in countries where the level of the financial sector is developed, there is an effective allocation of real resources to productive sectors of growth.

In this respect, Svaleryd and Vlachos (2005) show an analysis of the effects of financial development on industrial specialization in *OECD* countries, among other things, that financial development is a major cause of industrial specialization. Savvides (1995) shows that the M_2/GDP financial development indicator has a positive effect on growth when in the analysis of the link

between financial development and economic development the political freedom variable is not taken into account.

Goldsmith (1969) uses the value of the assets of financial intermediaries - divided by the GNP - to measure economic development by assuming positive correlation between the supply-quality of financial services and the size of the financial system. Using data from 35 countries during the years between 1860-1963, the author notes that nexus between financial development and growth is evident in prolonged periods although there are situations, for some countries, in which periods of faster growth have been accompanied by a financial development rate higher than the group average taken. Despite these results, and in terms of the relationship between economic growth and the structure of the financial system, the author cannot find some type of causality at the level of the selected countries.

King & Levine (1993a, 1993b) tried to explain the failure of the Goldsmith research. In their research they studied on 80 countries covering years between 1960 and 1989 and also they benefited from financial development indicators differs from the research of Goldsmith. In these researches it is found that higher level of financial development supports economic development and they observed a significant positive effect of the ratio of liquid assets in the financial sector to national income.

Additionally, a robust correlation of the degree of financial development with growth, investment and capital is concluded (Menyari 2019: 191). The authors show that at the 1% level each financial development indicator is positively correlated with each indicator of economic development. To address the inverse causality between growth and financial development, the authors have regressed the growth rate of GDP per capita on the share of assets in GDP. As a result, development has a positive and significant impact on growth over the period 1960 to 1989. Consequently, they concluded from their study that financial development can predict growth, that the high level of financial development is linked to future improvement in the effective allocation of capital and the rate of accumulation. However, their study, although significant, does not give a clear idea of the relationship between these two economic entities because the fact that initial financial development predicts long-term growth is not enough to decide on causality. De Gregorio and Guidotti (1995) arrive at the same result by considering as an indicator of financial development the ratio of credit to the private sector over GDP.

Rajan and Zingales (1996) used industrial data to assess the impact of financial development on growth. They argue that financial development alleviates market imperfections that impede business access to credit. Using panel data from several industrial sectors in a sample of 41 countries from 1980 to 1990, the results show that financial development has a stronger effect on the average growth rate of value added.

However, for some authors, financial development is the pure consequence of economic growth. One of the great of this current is Robinson (1952) who

thinks that financial markets and adequate institutions emerge when the process of economic growth causes a demand for financial services that induce the expansion of the financial system. For Patrick (1966), financial development causes growth in the early stages of development, but this effect gradually diminishes during development and reverses. Indeed, if entrepreneurs anticipate future economic growth, which will lead to increased demand for financial services, they could invest in the creation of financial intermediation activities in anticipation of future profits. The financial sector is, therefore, developing in response to growth prospects in the real sector (Antzoulatos et al. 2008). The financial system is developed by growth but it precedes it. Demetriades and Hussein (1996) estimate in their study that in several of the 16 countries in their sample, causality seems to go from growth to financial development and not vice versa.

Other economists have examined the mutual impact of finance and growth and suggest that the two variables are mutually causal and the work of Greenwood and Smith (1997) focused on this study. Greenwood and Smith (1997), Demetriades and Hussein (1996), observed a two-way relationship between growth and financial development. Goldsmith (1969) in his study showed that growth and financial development are linked by indigenousness.

Spears (1992) studied the link between economic growth and financial development for sub-Saharan countries including WAEMU countries. He showed that the financial intermediation (measured by M2 / GDP) because of Granger, GDP per capita growth in Kenya and Malawi, Cameroon, Côte d'Ivoire. Burkina Faso has the distinction of having a bidirectional causality.

Luintel and Khan (1999) find a negative correlation between growth and financial development in seven countries. They show that the correlation decreases and becomes insignificant for OECD countries. Guidotti and De Gregorio (1992) extend King and Levine (1993b) sample by dividing the sample into 3 groups of countries according to the income level per capita. They show that the correlation between development and growth increases and becomes significant as the initial income per capita decreases. By reducing the sample to only Latin American countries, they surprisingly obeserved a negative impact of financial development on growth. Loayza and Ranciere (2004) suggest a positive relationship between finance and growth versus a negative relationship in the short run. They believe that this change in the impact of financial development on growth in the short and long run is strongly linked to the financial fragility they measure through the recurrence of economic crises and the volatility of the financial development indicator.

Kandır et.al. (2007), used 1988-2004 Turkish data in their research by employing Johansen cointegration, error correction and causality methods. According to their results, development of financial sector did not support economic growth in Turkey.

Durusu et.al. (2017), estimated a long run relationship in the period 1989-2011 of 40 countries. This research found that financial development positive long run effects on GDP per capita.

Although the majority of the literature reports a positive relationship between growths and finance in long-term, some articles challenge this semi-consensus. Demetriades and Hussein (1996) studied a sample of 16 countries using time-series techniques and found no evidence of a causal link between growth and finance. However, in about half of the countries studied, they found bidirectional causation.

In summary, the link between growth and financial development has been analyzed from different perspectives and through different econometric techniques such as regression analysis, time-series techniques and data panel methods, mainly. The choice of technique to be used has generally been subject to the objective pursued by the author (the authors) and the scope proposed for the study, a particular country or for a party of countries. One of the advantages of using time series techniques such as unit root and cointegration tests and causality by methodology of TY-DL such as the one used in this paper, and whose results are reported in later pages, is that they allow answering questions such as the direction of causality between the indicator of growth and finance, whose determination in the upper-middle-income countries case is our main objective.

4. Data and the Sample used

In this research, the relationship between economic growth financial development was analyzed for 22 upper-middle-income countries (Algeria, Egypt, Jordan, Morocco, Oman, Saudi, Tunisia, Belize, Botswana, Brazil, China, Thailand, South Africa, Dominican Republic, Paraguay, Ecuador, Guatemala, Malaysia, Mauritius, Mexico, Peru and Turkey) between 1980-2017. In this study, GDP per capita representing economic growth as the dependent variable, the ratio of credit provided to private sector to GDP as a proxy of financial development, broad money (% of GDP) as a percentage of GDP, and general government final consumption expenditure as a percentage of GDP as independent variables. All variables used in the *logarithmic* formula.

Domestic credit to the private sector, which is defined as the value of credit provided by financial intermediaries, to the private sector divided by GDP, financial intermediaries include all financial institutions (banks etc.). Private Credit is a commonly used measure in the literature (Levine *et al*. 2000)

General government final consumption expenditure (% of GDP), which represents the size of the government or the public sector, and this study was taken with the final public government consumption spending as a percentage of GDP.

The panel data analysis method was applied in the study, the empirical model used in the study is shown in Eq. (1):

$$lnGDPPC_{it} = f(lnDCPS_{it};\ lnBROM_{it};\ lnGGF_{it}) \qquad (1)$$

Where *i=1,...,22* denotes the country and *t=1980,....,2017* denotes the time period. This paper considers Causality between financial development and economic growth

for a panel of 22 Upper Middle-Income Countries (Algeria, Egypt, Jordan, Morocco, Oman, Saudi, Tunisia, Belize, Botswana, Brazil, China, Dominican Republic, Turkey, Thailand, Ecuador, Guatemala, Malaysia, Mauritius, Peru, Mexico, Paraguay and South Africa). We analyzed the model between 1980 and 2017, the longest time period for which data are available for the variables.

5. Research Methodology

5.1. FMOLS, DOLS, GMM Panel.

In this step, we estimate the long run relationship between the variables of interest, when the variables are cointegrated. The classical method for estimating a cointegration vector is that of ordinary least squares (OLS). However, using OLS to estimate the long-term equation on panel data leads to biased estimates (Pedroni 2001a and 2001b). To solve this problem, Pedroni (2001b) proposes the fully modified ordinary least squares estimator (FMOLS) while Kao & Liu (2000), Mark and Sul (2003) recommend the dynamic ordinary least squares estimator (DOLS). Because these estimators are complementary, we use them both to determine the long-term relationship. The FMOLS estimator is based on a non-parametric approach, which takes into account the possible existence of a serial correlation while solving the problem of endogeneity of the regressors. In contrast, the DOLS estimator uses a parametric adjustment for errors by increasing the statistical regression with lags and leads and contemporary values of the regressors in prime differences. These estimators provide consistent estimates of the standard error. It was obtained by (Pedroni 2001a) from the following Eq. 2:

$$ln\,(GDPPC_{it}) = \beta_{0i} + \beta_1 ln\,(DCPS_{it}) + \beta_2 ln\,(BROM_{it}) + \beta_3 ln\,(GGF_{it}) + \sum_{j=-k}^{k} \gamma_{ij} \Delta\, ln(DCPS_{i,t-j}) + \sum_{j=-k}^{k} \delta_{ij} \Delta\, ln(BROM_t) + \sum_{j=-k}^{k} \eta_{ij} \Delta\, ln(GGF_t) + e_{it}, \quad i = 1, \dots 22; t = 1980, \dots, 2017 \tag{2}$$

Where, e_t is the white noise term and Δ is the first difference. While for DOLS specification γ_{ij} , $\delta_{ij}$and η_{ij} are coefficients of current, $\beta_1, \beta_2\ and\ \beta_3$.

The system GMM (Generalized Moments Method) estimator method, which is one of the dynamic panel data methods and developed by Arellano and Bover (1995), was used to analyze the relationship in question. An important advantage of the GMM method, which is widely used in the prediction of dynamic models, is that it takes into account the country-specific effects that cannot be observed and the problems that arise due to the internality of the independent variables in the lagged dependent variable models. In GMM estimators, the lagged values of the dependent variable are added to the model as an independent variable, thus providing the opportunity to solve such econometric problems. Accordingly, the system GMM approach, which is widely used in the estimation of dynamic panel data models, was preferred in the

study. Within the framework of the dynamic panel approach, according to the system GMM approach, the variables used in the study are modeled as follows:

$$ln\,(GDPPC_{it}) = \beta_i + \beta_1 ln\,(DCPS_{it-1}) + \beta_2 ln\,(BROM_{it}) + \beta_3 ln\,(GGF_{it}) + \delta_i + \gamma_i + \epsilon_{it} \quad (3)$$

5.2. Toda-Yamamoto (TY) (1995) Causality

The most frequently used definition of causality in econometrics is Granger's definition (Granger 1969). In the presence of non-stationary series, the F causality test in a VAR is not valid. Toda and Yamamoto (1995), Dolado and Lütkepohl (1996) have proposed an alternative method for testing causality which, unlike the standard Granger test, involves the estimation of an augmented VAR model with additional delays determined by the maximum order of integration of the series.

In order to test for the causality the procedures recommended by Toda & Yamamoto (1995), Dolado and Lütkepohl (1996), require estimating the following *VAR (k+d_{max})* model:

Real GDP, equations (4 and 5):

$$lnGDPPC_t = a_0 + \sum_{i=1}^{k+d_{max}} a_{1i} lnGDPPC_{t-i} + \sum_{i=1}^{k+d_{max}} b_{1i} lnDCPS_{t-j} + \varepsilon_{1t} \quad (4)$$

$$lnDCPS_t = c_0 + \sum_{i=1}^{k+d_{max}} c_{1i} lnDCPS_{t-i} + \sum_{i=1}^{k+d_{max}} d_{1i} lnGDPPC_{t-j} + \varepsilon_{2t} \quad (5)$$

where $lnGDPPC$ is *natural logarithm of real GDP*; $lnDCPS$ represents *natural logarithm* of domestic credit to private sector (% of GDP). a_0 and c_0 are constants; a_{1i}, b_{1i}, c_{1i} and d_{1i} are the parameters of the model; k is indicating the optimum lag length. This is determined according to information criteria such as AIC and SIC; d_{max} is the maximum order of integration. ε_{1t} and ε_{2t} are the error terms. For the bivariate VAR Eq. (4 and 5) above, the null hypotheses (H_0) and alternative hypotheses (H_1) are defined respectively and as follows:

H_0: $lnGDPPC_t$ does not Granger cause $lnDCPS_t$, if $\sum_{j=1}^{l} b_{1j} = 0$

H_1: $lnGDPPC_t$ does Granger cause $lnDCPS_t$, if $\sum_{j=1}^{l} b_{1j} \neq 0$

H_0: $lnDCPS_t$ does not Granger cause $lnGDPPC_t$, if $\sum_{j=1}^{l} b_{2j} = 0$

H_1: $lnDCPS_t$ does Granger cause $lnGDPPC_t$, if $\sum_{j=1}^{l} b_{2j} \neq 0$

6. Results and Discussion

6.1. Panel Unit Root Test

In this context, the variables in the model and the horizontal cross-sectional dependence properties of the model were investigated by Levin & Lin (1993), Maddala & Wu (1999), Im *et al*. (1997), Choi (2001). Table 1 shows unit root results, the statistics solidly confirm that the three series ($lnGDPPC$, $lnDCPS$, $lnBROM$, $lnGGF$) are the first difference process.

Table 2. Unit Root Tests

Test	lnGDPPC	LnDCPS	lnBROM	lnGGF
Levin, et al.	--4.46***	-1.02	-0.90	-1.74**
Breitung t-stat	1.01	-1.83**	-1.13*	-1.96**
Im, Pesaran	-2.88***	-1.69**	-1.47*	-1.64**
ADF- F. χ^2	88.85***	62.77**	59.36**	60.06*
PP- Fisher χ^2	52.99	40.16	61.93**	51.60
	D(lnGDPPC)	D(LnDCPS)	D(lnBROM)	D(lnGGF)
Levin, et al.	--7.40***	-7.70***	-10.45***	-10.10***
Breitung t-stat	-8.85***	-11.39***	-9.78***	-8.61***
Im, Pesaran	-8.73***	-12.19***	-11.90***	-11.47***
ADF- F. χ^2	157.46***	225.85***	217.83***	207.35***
PP- Fisher χ^2	361.13***	412.01***	952.92***	649.25***

Note: significance at ***:1%, **:5% and *:10% levels.

For all the variables, we can not reject the null hypothesis of the absence of the panel unit root at the level. In $I(1)$, this hypothesis is rejected for ($lnGDPPC$, $lnDCPS$, $lnBROM$, $lnGGF$) of the analysis. The test used to confirm that the series is stationary from the first differences, which leads us to conclude that the panel series are all integrated of order one or $I(1)$. The verification of stationarity properties for all panel variables leads us to study the existence of a long-term relationship between them. The results suggest, by the majority, that the null hypothesis of non-cointegration at 10% significance is rejected, in favor of the existence of a co-integration relationship between the variables. Having obtained the results of applying the cointegration panel test according to Pedroni and seeking to corroborate these, the Kao test is performed, which indicates the existence of a cointegration vector to the extent that variables are included in the analysis. The results obtained when applying this test are the following:

Table 3. Kao Residual Cointegration Test

	t-Statistic	*Prob.*
ADF	-3.494	0.000
Residual variance	248176.0	
HAC variance	519758.5	

Table 4 shows the estimated coefficients of the long run relationship of equation (1) at the panel level.

Table 4. Long Run Equation

	FMOLS	DOLS	GMM
$LNDCPS$	0.078(7.295)***	0.084(1.789)***	0.084(2.982)***
$LNBROM$	0.618(70.950)***	0.562(7.888)***	0.591(15.258)***
$LNGGF$	-0.097(-7.320)***	-0.046(-0.550)***	-0.107(-2.158)**
C			6.097(43.254)***
	R^2= 0. 88	R^2= 0. 94	R^2= 0. 88

Notes: Dependent Variable: $LNGDPPC$. The number in parentheses denotes t-statistical. *, **, *** denotes significant level at 1%; 5% and 10%, respectively.

We employ both FMOLS, DOLS and GMM to obtain much more robust results as discussed in the methodological section.

Table 4 reports the estimated elasticities of long-term GDP. The results of the FMOLS, DOLS and GMM estimates are quite close to each other. Moreover, the results of upper-middle-income countries indicate that both domestic credit to private sector (% of GDP) and broad money (% of GDP) have a positive impact on per capita GDP in the long run. Where a 1% increase in GDP per capita increases both domestic credit to private sector (% of GDP) and broad money (% of GDP) by $ 0.07 and 0.61, respectively.

First, increased broad money (% of GDP) will increase economic growth in upper-middle-income countries. The general government final consumption expenditure (% of GDP) variable ($LNGGF$) was negative and significant throughout the study period. This shows that if government expenditure is effectively allocated to improve public affairs, then an increase in government expenditure will actually promote economic growth (Levine & Renelt 1992, Bekaert *et al*. 2001). There is a positive and important role for the broad money in the growth of the economy, as increasing broad money would lead to reducing the financing gap, and then increasing the volume of investment and effective total demand in both consumer and investment aspects. Therefore, positive repercussions on the growth of GDP, and the greater the broad money, it means that there is an increase in the national saving rate and is the most important indicator in financing investment and accelerating economic growth.

Also, general government final consumption expenditure (% of GDP) has a negative impact on per capita GDP, as a 1% increase in general government final consumption expenditure (% of GDP) leads to a decrease in per capita GDP in the long run by $ (-0.09). The results indicate that the influence of private credit on economic growth turns out to be positive and significant, evidencing mastery of the hypothesis of the leading offer in underdeveloped countries. As shown in Table 5, the results of the control variables are similar to those of previous researches. All control variables have the expected sign and are statistically highly significant; this is consistent with economic theory. The empirical results of Granger Causality test by

Toda & Yamamoto (1995) methodology is estimated through MWALD test for each country and for all countries (Table 5).

Table 5. Results of Granger Causality by Toda–Yamamoto

Countries	H0: *lnGDPPC* dose not cause *lnDCPS*		H0: *lnDCPS* dose not cause *lnGDPPC*	
	Chi-sq	***P*-value**	**Chi-sq**	***P*-value**
Algeria	3.463	0.325	20.727***	0.000
Egypt	1.816	0.769	8.930*	0.062
Jordan	8.544*	0.073	5.143	0.272
Morocco	4.761*	0.092	0.365	0.833
Oman	0.000	0.981	1.182	0.276
Saudi	0.381	0.826	5.934*	0.051
Tunisia	0.069	0.792	0.415	0.519
Belize	9.952***	0.006	2.301	0.316
Botswana	7.810*	0.098	3.140	0.530
Brazil	5.664	0.129	1.365	0.713
China	14.506**	0.024	6.045	0.418
Dominican	4.316	0.229	9.092**	0.028
Ecuador	8.655**	0.034	7.985**	0.046
Guatemala	29.228***	0.000	0.495	0.992
Malaysia	10.583	0.157	20.546***	0.004
Mauritius	8.412	0.297	9.185	0.239
Mexico	6.218	0.717	7.623	0.572
Paraguay	5.717*	0.057	0.845	0.655
Peru 15.018*** 0.000 0.689 0.708				
South Africa	0.678	0.712	5.930*	0.051
Thailand	19.301***	0.003	8.872	0.180
Table5: Continue				
Turkey	0.847	0.357	3.575*	0.058
Panel	27.008***	0.000	1.829	0.767

Note: *, **, *** significant level at 1%; 5% and 10%, respectively.

The bidirectional causal relationship between the two variables in Ecuador. In Ecuador there have been strong changes in financial management, these changes are appreciated since the 70's, beginning of a liberalization of financial policies, going through the strongest crisis that occurred in the late nineties, and then arrive at an apparent financial stability until a possible development and deepening that began in the middle of the 2000s until today.

In contrast, the study showed that unidirectional causality running from growth to financial development in Jordan, Morocco, Belize, Botswana, China, Guatemala, Paraguay, Peru, and Thailand. This finding is consistent with (Demetriades and Hussein 1996; King and Levine 1993b,).

The unidirectional causal relationship is running from financial to growth in Algeria, Egypt, Saudi Arabia, Dominican Republic, Malaysia, South Africa and Turkey.

There is no causal relationship in Oman, Tunisia, Brazil, Mauritius and Mexico.

The results of the study showed a difference in the direction of the relationship according to the studied state, where the study found that the relationship is heading in some countries from economic growth to financial development while the relationship in others was bidirectional, whereas in some countries there is no causal relationship between these two variables. This explains the results differences result from the different levels of financial development and the characteristics of financial institutions in each country, in addition to the various economic policies applied.

7. Conclusions

Firms, which want to invest, should find funds with lowest costs. As financial markets emerge, firms have more opportunities to find funds for their investments. It is observed that developed countries have effective financial markets. So the relationship between growth and financial markets come to agenda. There exits many researches about this relationship in literature. We analysed the relationship between growth and financial development and for upper-middle-income countries for the period from 1980-2017. We used panel fully modified least squares (FMOLS), panel dynamic least squares (DOLS), panel generalized method of moments (GMM) to obtain long-run parameter estimates. We take GDP growth per capita representing economic growth as a dependent variable while taking domestic credit provided by the financial sector as a percentage of GDP domestic credit to the private sector as a percentage of GDP and general government final consumption expenditure as a percentage of GDP as independent variables.

When the results obtained for the upper-income countries are evaluated, it is seen that the domestic credit to private sector (% of GDP) and broad money (% of GDP) have a positive effect on growth. Thus, the general government final consumption expenditure (% of GDP) has a negative effect on economic growth. Finally, we concluded that financial development accelerates economic growth. Moreover, in order for the financial system to make a significant contribution to economic growth, the level of development of the countries must be at a certain level. Again, a well-functioning and developed financial system is needed to sustain economic growth in a stable manner.

In addition, our results indicated that unidirectional causality coming from economic growth to financial development in Jordan, Morocco, Belize, Botswana, China, Guatemala, Paraguay, Peru, and Thailand. However, the one-way causal relationship is coming from financial development to economic growth in Algeria, Egypt, Saudi Arabia, Dominican Republic, Malaysia, South Africa and Turkey. In contrast, there is no causal relationship in Oman, Tunisia, Brazil, Mauritius and Mexico. These results confirmed previous researches. In literature there exists four

types of researches. Some of them claim one way causal relationship while others claim two way causal relationship and no causal relationship between growth and development of financial sector.

Finally, it is prudent to note that the empirical contributions on the relationship between private credit and GDP are important, but a structural change analysis is necessary for causal relationships in upper-middle-income countries. Therefore, future research should focus on the different reforms that changed the banking system in upper-middle-income countries to determine the contribution they make to the causal relationship between private credit and GDP. In this way, the strong transformations of the formal and informal rules that determine financial and economic performance will be taken into account.

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