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THE RELATIONSHIP BETWEEN FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH FOR TURKEY

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ABSTRACT

The aim of this study is to clarify the controversial relationship between financial development and economic growth for Turkey. After surveying the related theoretical and empirical literature, the structure and development of the Turkish financial system and economic growth in process of financial integration is examined. To test the relationship between financial development and economic growth, by using quarterly time series data for Turkey between 1988-2012 period, Vector Auto regression Analysis and Granger causality test are applied. The result of the econometric analysis showed that while there is a short run relationship between financial development and economic growth, there is no long run relationship between these variables. Moreover, according to Granger causality test, the direction of causality runs from economic growth to financial development for Turkey.

Key words: *Financial Development, Economic Growth, Financial Liberalization, Vector Autoregression analysis, Granger causality test*
JEL: *G10, G20, O43*

ÖZ

Bu çalışmanın amacı, finansal gelişme ve ekonomik büyüme arasındaki tartışmalı ilişkiyi Türkiye için açıklığa kavuşturmaktır. İlgili teorik ve uygulamalı literatür incelendikten sonra, Türk finansal sisteminin yapısı ve gelişmesi ile ekonomik büyüme ilişkisi finansal entegrasyon sürecinde incelenmiştir. Finansal gelişme ve ekonomik büyüme arasındaki ilişki, Türkiye için 1988-2012 yılları arasındaki çeyrek dönemlik zaman serisi verileri kullanılarak, VAR analizi ve Granger nedensellik testi ile test edilmiştir. Yapılan ekonometrik analizin sonuçları, finansal gelişme ve ekonomik büyüme arasında kısa dönemli bir ilişki gösterirken, değişkenler arasında uzun dönemli bir ilişki yoktur. Ayrıca, Granger nedensellik testi sonuçlarına göre, nedensellik ilişkisinin yönü Türkiye için ekonomik büyümeden finansal gelişmeye doğrudur.

Anahtar Kelimeler: *Finansal Gelişme, Ekonomik Büyüme, Finansal Serbestleşme, Vektör Otoregresyon Analizi, Granger nedensellik testi*

JEL: *G10, G20, O43*

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INTRODUCTION

The questions of what are the motives behind the long run sustainable economic growth and what are the reasons of cross-country growth differences between countries have always attracted a considerable attention in the literature. Since the economic growth is closely related to the welfare of a country, it is necessary to determine the sources of economic growth and implement appropriate policies accordingly.

A numerous explanations of the sources of economic growth are devoted in the economic growth literature. As a result of global crises caused by real sector in 1970s, neoclassical approach in economic policies dominated to Keynesian view and many developing countries transformed their economic policies towards economic liberalization as suggested by neoclassical vision after 1980s. Therefore, there is an increasing interaction between financial and real sector in recent years and the finance and growth nexus gained importance in economic literature.

Although the interaction between finance and real sector accelerate in the last thirty years, the finance and growth literature is not a new one and it dates back to works of Adam Smith (1776) and Schumpeter (1912) who emphasize on the crucial role of financial development on economic growth. Substantial theoretical and empirical studies are devoted to clarify the relationship between financial development and economic growth since that time. While some of the studies suggest that there is a positive relationship between financial development and economic growth, other studies found that financial system has destructive role on economic growth. Moreover, some economists state that the role of financial system on economic growth is overstated and its effect can be negligible.

The leading neoclassical growth theory in 1950s states that long run sustainable economic growth only depends on continuous technological improvements and other factors that affect economic growth is included in Solow residual or total factor productivity, unexplained part of the sources of economic growth. However, the endogenous growth theory which emerged in 1980s allowed endogeneity of other possible variables affecting economic growth in

economic model. In this way, the effect of financial system could be better explained. Moreover, improvements in theoretical and empirical analysis methods and tools and availability of statistical data allowed examining and testing the relations between economic variables in many different ways. These developments helped to determine and test the relationship between financial development and economic growth in the last few decades. According to the results of these studies, while economists have generally reached a consensus on the crucial role of financial development on economic growth, the direction of the causal relationship remains unclear. In the light of last theoretical and empirical works, the importance of examining the relationship on country basis has revealed and the empirical results of the direction of causation differs among different countries as every economy differ in economic structure, development process, factor accumulation, innovations, macroeconomic policies, financial institutions, etc...

The aim of this study is to reveal the controversial relationship between financial development and economic growth for the case of Turkey after financial liberalization period 1988-2012. The reason behind selecting an individual country is a necessity of evaluating this relationship according to each country's own economic structure and dynamics. In the first part of the study, the theoretical and empirical literature on the relationship between financial development and economic growth is briefly viewed. In the second part, the relationship between financial development and economic growth for Turkey in the process of financial integration is examined. In the last part, financial development and economic growth in Turkey is tested by using VAR analysis and then study reached a conclusion by evaluating the results.

1. FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH: THEORETICAL AND EMPIRICAL LITERATURE

The finance and growth relationship was first explicitly demonstrated by Bagehot (1873) who presented apparent examples on how financial market development in England stimulates capital flow to find its highest rate of return and how financial intermediaries transform savings into long term investments which promotes economic growth. According to Schumpeter (1912), sound banking sector is the most important motive behind the economic

growth as they finance and support technological innovations for efficient production of goods. The notable works of Gurley and Shaw (1955), Goldsmith (1969) and Hicks (1969) along the Schumpeterian line state that while developed financial system and sophisticated financial markets stimulate economic growth; financial under-development may retard economic growth. Hicks (1969) also contends that because many innovative projects require large injections and long term commitments of capital, *"The industrial revolution therefore had to wait for the financial revolution…"* (Bencivenga et.al. 1995: 243). Building upon the works of Gurley and Shaw (1955), Goldsmith (1969) and Hicks (1969), McKinnon (1973) and Shaw (1973) provide a new paradigm in favor of financial liberalization in promoting economic growth by stressing on the distorting role of financial repression policies in the working of financial system. On the contrary, Stiglitz (2000) and Mankiw (1986) points out that financial liberalization policies may be harmful for the stability of the economy and cause financial crises.

Economists hold different views on the direction of causality between financial development and economic growth. Patrick (1966) proposes a distinction between "supply leading" and "demand following" phenomenon while former indicates the leading role of financial development in promoting economic growth, latter states that economic growth creates wider array of financial institutions. By advocating demand following approach, Robinson (1952) noted that *"By and large, it seems to be the case that where enterprise leads, finance follows"* (Robinson 1952: 86).

With the emergence of endogenous growth theory in the 1980s, to show the effect of financial system on growth, more complex types of models which incorporate financial institutions into endogenous growth models in the early 1990s. (see Greenwood and Jovanovic 1990, Bencivenga and Smith 1991, 1993, Saint-Paul 1992, King and Levine 1993, Pagano 1993, Bencivenga, Smith and Starr 1995, Greenwood and Smith 1997, Blackburn and Hung 1998). These models support the supply leading phenomenon of the Patrick (1966) by stating that financial system reduces information and transaction costs and improve more efficient resource allocation. Diamond and Dybvig (1983) and Greenwood and Jovanovic (1990) developed their own models to show the advantages of having a developed financial system in investing a high return, risky projects which promotes economic growth. For Levine (1997),

through the functions of financial system such as producing information and allocating capital, monitoring firms, facilitating the trading, hedging, diversifying, and pooling of risk, mobilizing savings and easing exchange, financial system affects steady state economic growth through capital accumulation or technological innovation.

Although theoretical literature stress on the positive role of financial system on development process, there are some opposing views related with destabilizing effect of stock markets on economy as the financial sector has an ability to spread risks. While Minsky (1975) claims that the instable nature of the financial system leads to financial crises, Keynes (1936) asserts that stock markets are open to speculative activities which distort the stability of the economy. Some economists didn't convince about the relevance of the financial sector and real economic activities. For example, Lucas (1988) thinks that economists *"badly over-stress"* on the role of financial development in influencing economic growth.

As an important extension to the growing literature, some studies stress on the relative advantages of bank-based or market-based financial system. Gerschenkron (1962) indicates that banks are more effective in funding process and more efficient in resource allocation than stock market. By contrast, advocates of market-based financial system states that broad, liquid and sound financial markets encourages long run economic growth by financing industries that face continuous technological improvements (Allen and Gale 1999).

Many empirical studies have tested the relationship between financial development and economic growth by using different econometric techniques which can be classified under three categories; cross country growth regressions, individual country case studies and panel studies. While empirical studies were initiated much earlier, most of the empirical studies have developed after 1990s following King and Levine (1993), with the sophistication in econometric analysis techniques. King and Levine (1993) search the relationship between liquid liabilities and economic growth measures and found that *"the link between growth and financial development is not just a contemporaneous association… Finance does not only follow growth; finance seems importantly to lead economic growth"* (King and Levine 1993:730).

Similar to King and Levine (1993), Levine et. al. (2000), Beck and Levine (2004), and Christopoulos and Tsionas (2004) indicated that there is a significant link between stock market and banking sector development and found strong evidence in favor of finance-led growth hypothesis. By using time series analysis, Arestis, Demetriades and Luintel (2001) found that while stock market and banking sector development is crucial in economic growth process, the effect of banking sector development on economic growth is more pertinent than stock market development.

Unlike the studies found finance-led growth hypothesis, Xu (2000) states that economic growth leads to financial sector development. Demetriades and Hussein (1996) also proved growth-led finance hypothesis in some cases, but bi-directional causality relationship is found in majority of concerned countries. Luintel and Khan (1999) support bi-directional relationship in their studies, as well. Rousseau and Wachtel (2005) suggest that while the finance-growth nexus only holds for middle income countries and it is not significant for low and high income countries. The relationship between financial development and economic growth is positive for middle income countries.

As can be seen from the literature, although the results of the studies are controversial and ambiguous, majority of the studies point out reliably positive relationship and financial development is a crucial factor in promoting economic growth not only in developed countries, but also in developing countries. Thus, a sound and better functioning financial system encourages investments, leads to better resource allocation and improves economic growth. Moreover, the results of the studies prove that examining finance-growth literature by panel data analysis or time series analysis rather than cross section data produces more realistic results because every country differ in structure.

2. FINANCIAL SECTOR DEVELOPMENT AND ECONOMIC GROWTH IN PROCESS OF FINANCIAL INTEGRATION IN TURKEY

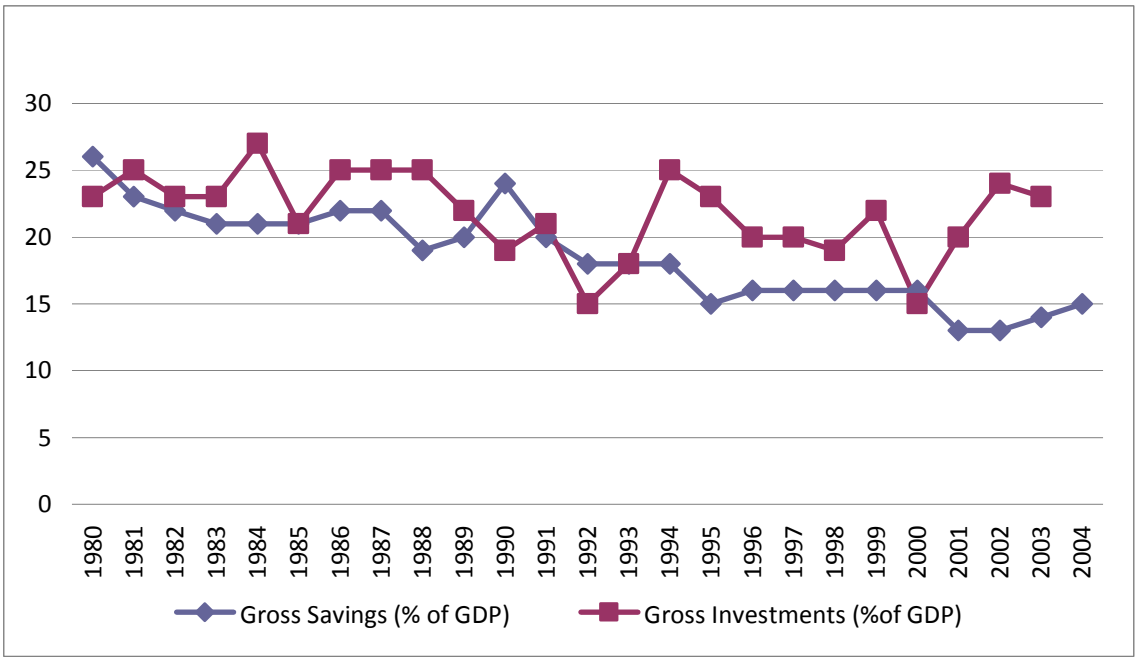
With the dominance of liberalization policies among developing countries after 1980s and experiencing that financial repression policies deteriorate operation of the working of financial system, many developing countries changed their policies towards liberalization to

better integrate global economy. In this context, it is useful to evaluate the effect of financial development on economic growth in process of financial integration.

Prior to 1980, financial system was constrained by repression policies, heavy tax burdens on financial profits, negative real interest rates and high liquidity and reserve requirement ratios in Turkey (Cizre-Sakallıoğlu and Yeldan 2000: 484). After 1980, Turkey started to put into practice domestic and international liberalization policies. With the decisions made on January 24, 1980, the first step of liberalization was taken by allowing flexible foreign exchange rates to avoid over-appreciation of TL and removing interest rate caps to prevent negative real interest rates and hereby directing savings to the financial system. To settle required conditions for financial liberalization and to increase competition among financial institutions, legal and institutional regulations were made by the Central Bank such as the establishment of Istanbul Stock Exchange (ISE) and Interbank Money Market in 1986. Monetization of the economy and development of the financial system were also aimed by the government. (Eser 1996: 29; Günçavdı; Küçükçiftçi 2002: 90). In 1982, for regulation and supervision of the market operation, Capital Market Board had been established.

With the completion of free capital movements and convertibility of TL against other currencies in 1989, Turkish financial system completely opened to global markets. The real reason behind allowing free capital movements were the need for financing huge public debt by foreign capital and pressure of the 1989 election on government. The expectation was the transformation of domestic and international savings into investments with lower cost of capital as flow of savings to Turkey decrease interest rates. But on the contrary, real interest rate reached very high levels and the cost of investment didn't fall. Thus, firms' financing behaviors hadn't much changed. The dominance of the government on both real and financial sector continued to exist (Akkay 2010:179). Another expected result with financial liberalization in Turkey was to meet saving-investment deficit. The ratio of aggregate domestic savings to GNP was closely moved with the ratio of aggregate investments to GNP ratio until external financial liberalization in 1989. After 1989, although aggregate savings rose, the gap between aggregate domestic saving and investment ratio increased which mainly resulted from foreign savings.

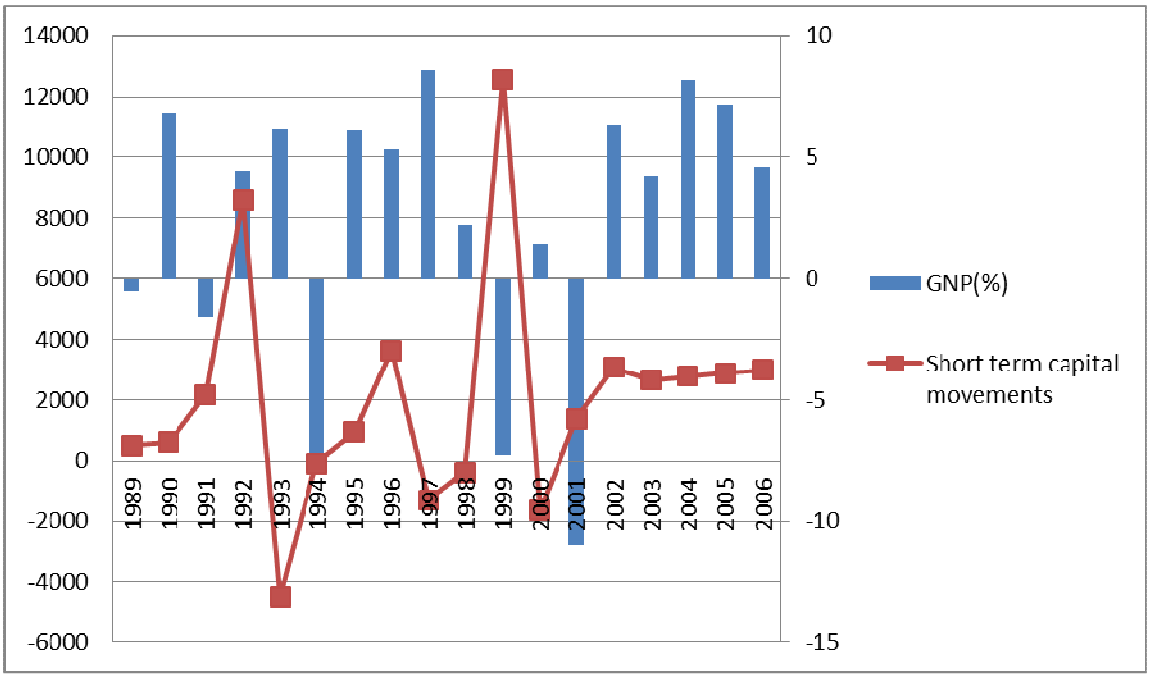
Graph 1: Gross Saving and Investment ratio to GDP



After 1989, being open against external shocks, Turkey was unable to determine required independent money, interest and exchange rate policies in inflationary pressures. The economy became dependent on hot money inflows in determining interest rate and exchange rates. This deteriorated the effectiveness of monetary and fiscal policies. As international capital owners seek short term speculative financial earnings in Turkey, economic growth fluctuated according to short term capital movements after 1989 which can be seen from Graph 2.

In the wake of short term foreign capital inflow and outflows, increasing speculative transactions, high interest rates and uncontrolled international capital movements created instability and uncertainty in finance and real sector. This became an obstacle for economic growth. While GNP growth rate was 6,8% in 1990, economy contracted at a rate of 0.55% in 1991 and continued to fluctuate after this period, as seen in Graph 3. Consumption expenditures and volume of investments were also fluctuated and public investments decreased after liberalization (Yıldırım 2004: 3).

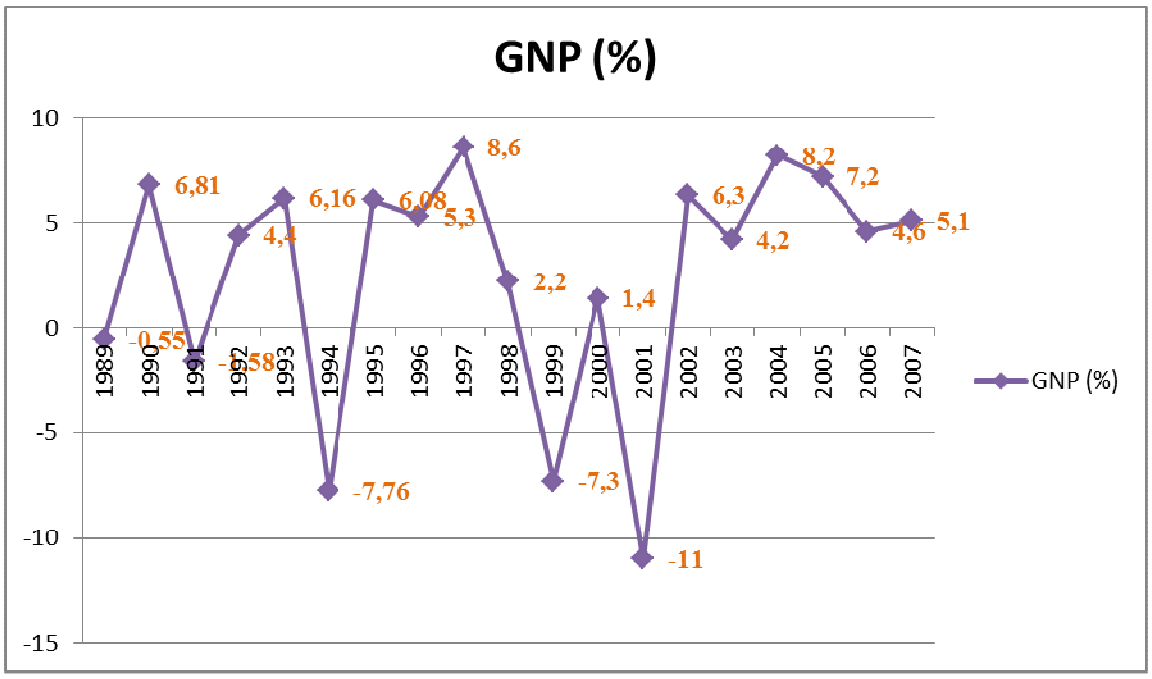
GRAPH 2: Short-term Capital Movements and GNP Growth between years 1989 and 2006



While private capital accumulation was 35% in 1993, it decreased to -9,1% and couldn't contribute to economic growth. With the over appreciation of TL, current account deficit hit the record levels in 1993 and fragility of the economy reached the top.

Above-mentioned results of financial liberalization and policies implemented during this period increased economic fluctuations and lay ground for the 1994 economic crisis in Turkey. With the sudden short term capital outflow in 1994, production capacity and industrial production decreased substantially and GNP growth declined to -7.7%. There is a consensus among economists on inability of the Turkey to protect economy against probable negative effects of financial integration and not implementing necessary regulations and taking measures. Moreover, public sector couldn't ensure a healthy environment and conditions for economic growth (Cizre-Sakallıoğlu and Yeldan 2000: 489-491).

GRAPH 3: GNP Growth rate between years 1989-2007



After the 1994 crisis Turkey signed IMF stand-by arrangement in 1999 and accepted disinflation program. Although disinflation program helped to decrease inflation and interest rates, balance of payments deteriorated as a result of decrease in capital flows to Turkey. An increasing liquidity and exchange rate complicated banking activities and 11 banks were transferred to Saving Deposit Insurance Fund of Turkey (SDIF). Financial distress and banking failure on November 2000 transformed into a crisis in 2001. The economy contracted 9,4%, inflation rate rose from 39% to 69%, exchange rates and interest rates started to rise. The loss of banks reached to 77% of their equity (Akkay 2010: 140). Thus, transition program for strengthening the economy started to be implemented on April 2001 to restructure economy and for lasting stability. The program considered to be successful with the positive environment of the global economy. Between years 2002-2007, Turkish economy recorded high growth rates with sound banking sector and macroeconomic stability.

In spite of the growth episode between 2002 and 2007, Turkish economy was vulnerable to rising current account deficit which associated with appreciating currency making economic growth unsustainable after mid-2006. After growing average at 7.3% between 2002 and 2005, GDP growth gradually decelerated to 4.7% in 2007. In 2008, global crisis hit the Turkey hard via financial markets and foreign trade. Even though it was expected that emerging

economies, including Turkey would not be affected by US subprime mortgage crisis, growth trend of Turkey slow down starting from 2007. Macroeconomic supporting policies starting from the last quarter of 2008 relieve the effect of crisis, but recession didn't entirely end. Negative effect of global recession to Turkish exports, inefficiency in credit channels, large amount of given credits and their default risk prevailed in the economy. In the first quarter of the 2009, economy contracted 13,8%. Following the recession period, in the second quarter of 2009, GDP growth started to grow rapidly. This was driven by the recovery in private consumption, investment activities and slowdown of destocking. Unemployment remained at low levels as a result of nominal wage cuts.

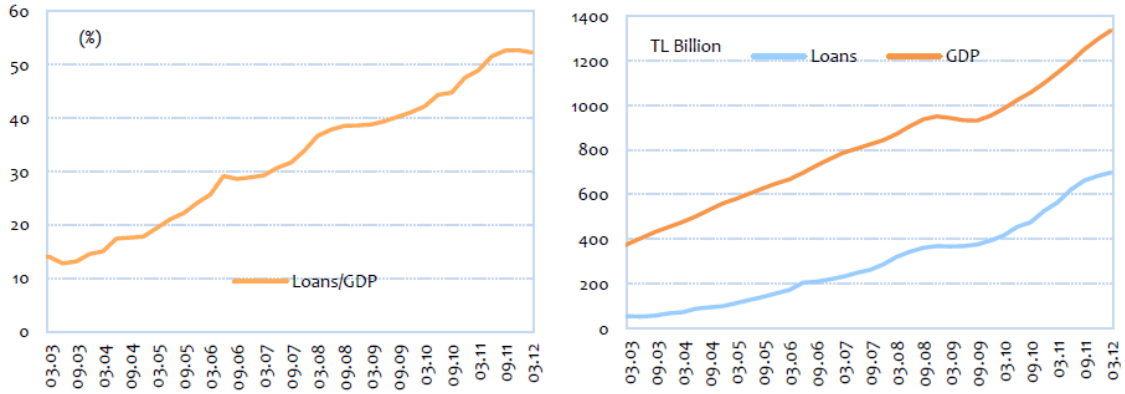
After the 2008 crisis, global economy enter relatively positive phase with decreasing short term risks in spite of the low economic growth, unemployment and financial fragilities. As global markets recover, Turkish financial sector continued to attract the interest of foreign capital. According to BRSA report published on December 2012, the implemented macro prudential policies enabled macro variables to maintain a sustainable balance in 2012 which attributed to the fiscal discipline and national income, the policies towards stimulating domestic savings, flexible monetary policy and implementations limiting the strong loan demand (Financial Markets Report of BRSA, Dec. 2012: 1).

When evaluating the relationship between financial integration and economic growth, it can be reached that in recent years, financial market integration process of domestic and international markets bring the financial crisis fact. Stiglitz states that short-term capital movements played an important role in recently experienced economic crises (Stiglitz, 2000). On the one hand, liberalization of the financial system remarkably increases capital movements and promotes real economic activities; on the other hand it results in contagious and drastic financial crises. Developing countries that experienced both financial liberalization and financial crisis created skepticism about benefits of financial liberalization. In Turkey, because of the structural problems of the economy, prior to all crises, TL was over appreciated and this decreased exports and increased imports, resulting in foreign trade and current account deficit. Policies implemented during these crises were also ineffective. On the other hand, 2008 crisis was external shock to Turkish economy which shows the effect of financial integration of our economy to global economy and vulnerability of the financial

system from outside shocks. Furthermore, it is argued among authors that low economic growth and macroeconomic instability comes from uncontrolled and badly managed financial liberalization policies of government in literature and timing for liberalization was also wrong. As stated above, to attract foreign capital or to sustain capital inflows, interest rates increased and considerable part of GDP went to interest payments. Crises which arose as a result of financial liberalization created uncertainty, loss of confidence in firms and consumers, and decreased investment and production which leads to low economic growth. But, foreign direct investments contributed to economic growth and employment. Nevertheless, variety and number of financial intermediaries and instruments has increased, financial markets widen and the financial system has developed after 1980.

Banking system is the most important source of the financial activities in Turkey and channels major part of the funds to support investment activities which leads to higher economic growth. For the sustainable financial stability and economic growth, development of the loan amount granted by Turkish banking sector is important. From 2003 to 2012, the ratio of the loan amount to GDP increased significantly. GDP growth and development in loans lines move in the same direction. When the 2008 crisis period contracted the amount of loans, GDP has also decreased.

GRAPH 4: Development of Loans and Economic Growth

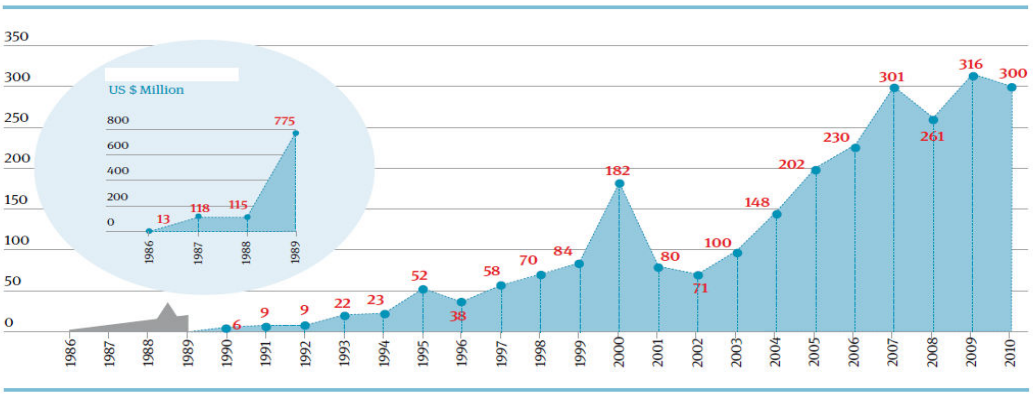


Source: BRSA, Financial Markets Report 2012, No.26, p. 16.

The most important component of the financial sector following banks is the stock market in Turkey. Being established in 1986, Borsa Istanbul showed a considerable development. While

yearly total traded value was 11 million US dollar in 1986, it reached to 300 billion US dollar in 2010. Rising number of quoted firms to stock market or listed firms on ISE shows that aggregate savings of the country channels through capital market in the economy. The number of quoted firms to ISE steadily increased from 80 in 1986 to 404 in 2012.

GRAPH 5: Yearly Total Traded Value of Borsa Istanbul (USD, Billion)



Source: ISE, "Verilerle IMKB", p.11.

However, high turnover ratio which reveals the speculative motives behind the Borsa Istanbul proves that financial deepening hasn't been achieved for stock market in Turkey yet. Thus, investors choose to get short term speculative earnings rather than long term return (Doğu 1996: 8). The turnover ratio in 1986 rapidly rose from 1,23% to 27,72% in 1990. This ratio continued to grow and climbed 187% in 1995, 188% in 2000, 211% in 2004 and maintained its high value after 2004. Thus, relatively low levels of market capitalization, high trading volume and turnover ratio indicate speculative earnings in Borsa Istanbul and it doesn't have an important role in funding real sector and economic growth (TSPAKB 2004: 11-44)

3. Empirical Study on the Financial Development and Economic Growth for Turkey

In this section, the relationship between financial development and economic growth for Turkey will be empirically examined by econometric analysis.

3.1. Data and Methodology

The study covers quarterly time series data of the 1988Q1-2012Q4 period for Turkey which obtained from Electronic Data Distribution System (EDDS) of the Central Bank of the Republic of Turkey (CBRT) and uses Eviews 5.1 econometrics program. Following the literature, financial development proxies are PRIVATE CREDIT which denoted as PRY (equals to the value of credits by financial intermediaries to the private sector divided by GDP) and private credit as a share of domestic credit denoted as PCDC. As an economic growth proxy, real GDP series at constant prices measured by TL (GDP is based on 1987 prices) is used. Natural logarithms of the selected variables are taken which indicated as LNGDP, LNPRY and LNPCDC.

The first impression we get from the properties of data set is that all of the time series seem to be trending upward, albeit with fluctuations. Line graphs of the LNGDP and LNPRY exhibit seasonality features while LNPCDC does not. This means that the data we collected quarterly should be seasonally adjusted to remove seasonal patterns. Thus LNGDP and LNPRY series are seasonally adjusted with Census X-12 program.

FIGURE 1: Line Graphs of the Selected Variables

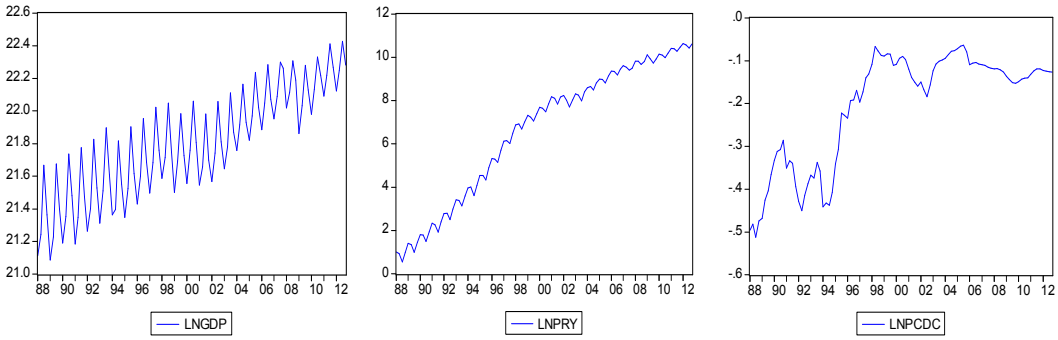
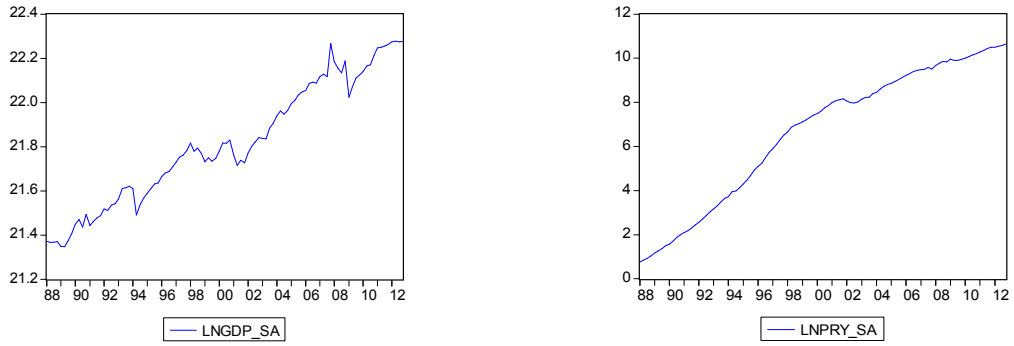


FIGURE 2: Line Graphs of the Seasonally Adjusted Series of LNGDP and LNPRY



The methodology of this study based upon the VAR model as it is suitable to analyze and predict economic relations, causality between variables and enable to put forward the effect of financial development on economic growth with the aid of impulse-response functions. To determine the direction of the causation, Granger causality test is used.

3.2. Empirical Results

3.2.1. Unit Root and Cointegration Test Results

In studying time series analysis, it is important to work with stationary time series in econometric analysis. As Gujarati states, *"to avoid the spurious regression problem that may arise from regressing a nonstationary time series on one or more nonstationary time series, we have to transform nonstationary time series to make them stationary"* (Gujarati, 2004).
To observe the stationarity properties of the data set and test whether there is a unit root or not, this study uses Augmented Dickey Fuller (ADF) and Phillips Perron (PP) Unit Root tests. PP test is more effective in grasping the potential confusion of the structural breaks in the series than the ADF and other tests. Thus, PP test has complementary features to that of ADF test.

TABLE 1: ADF Test Results

ADF test at levels and first difference		**LNGDP***(constant)*	**LNPRY***(Constant, Linear)*	**LPCDC***(constant, trend)*
ADF at levels	ADF test statistic	-0.571013	-0.564311	-1.601820
	P Value	0.8709	0.9787	0.7848
ADF at first difference	ADF test statistic	-17.74413	-12.68918	-7.948575
	P value	0.0000*	0.0000*	0.0000*
* denotes rejection of the null hypothesis that there is unit root at 1%, 5% and 10% significance levels.				

According to the ADF test results, each series have unit root at their levels and they are stationary when first differences are taken. PP test also confirms this result. Therefore, it can be said that all variables are integrated of order one, I (1).

TABLE 2: Phillips-Perron Test Results

PP test at levels and first difference		**LNGDP***(none)*	**LNPRY***(intercept)*	**LNPCDC***(intercept and trend)*
PP at levels	PP test statistic	0.349838	0.476789	-1.719102
	P Value	0.7841	0.9991	0.7355
	Bandwidth	14	16	4
PP at first difference	PP test statistic	-17.74413	-12.68918	-7.948575
	P value	0.0000*	0.0000*	0.0000*
	Bandwidth	13	15	3
* denotes rejection of the null hypothesis that there is unit root at 1%, 5% and 10% significance levels.				

Once we have seen that variables in the analysis are non-stationary, we can take their differences for d times to make them stationary, integrated of order d, I (d). But, if two variables are integrated of the same order and they are non-stationary, the linear combination

of these two series cancels out the stochastic trends in the two series, and linear combination of these two variables may be stationary which is called cointegration (Gujarati 2004: 822). If the series are integrated of the same order, Johansen cointegration test to detect long run relationship between the series can be applied. Prior to Johansen analysis, optimum lag length is chosen as 2 according to Sequential Modified Likelihood Ratio (LR), the Final Prediction Error (FPE), Akaike Information Criterion (AIC), the Schwarz Information Criterion (SC) and the Hannan-Quinn Information Criterion (HQ).

TABLE 3: VAR Lag Order Selection Criteria for Cointegration Test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	7.342773	NA	0.000183	-0.094408	-0.012176	-0.06121
1	549.6375	1037.433	1.69e-09	-11.68777	-11.35884	-11.55501
2	589.0304	**72.79113***	**8.71e10***	**-12.34849***	**-11.77286***	**-12.11616***
3	593.0609	7.184900	9.72e-10	-12.24045	-11.41813	-11.90856
4	598.8162	9.883982	1.05e-09	-12.16992	-11.10090	-11.73845
5	602.5217	6.122126	1.18e-09	-12.05482	-10.73910	-11.52378
6	607.3961	7.735477	1.30e-09	-11.96513	-10.40272	-11.33453
7	613.8044	9.751804	1.39e-09	-11.90879	-10.09968	-11.17862
8	615.9843	3.175095	1.63e-09	-11.76053	-9.704722	-10.93079

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

In the context of optimal lag order selection criteria, Johansen Cointegration test results according to Trace and Maximum Eigen statistics are below in Table 4.

TABLE 4: Cointegration Test Results
Selected number of cointegrating Relations by model (0,05 level*)

Data Trend:	None	None	Linear	Linear	Quadratic
Test Type	No Intercept No Trend	Intercept No Trend	Intercept No Trend	Intercept Trend	Intercept Trend
Trace	1	0	0	0	0
Max-Eig	0	0	0	0	0

*Critical values based on MacKinnon-Haug-Michelis (1999)

According to these results, there is no cointegration relationship between variables. Thus, there is no long run relationship between variables of GDP, PRY and PCDC.

3.2.2. Vector Autoregression Model and Granger Causality Test Results

If variables of X and Y are nonstationary, but there is no cointegration between variables, then, VAR analysis should be applied in order to reveal the short term relationship between variables. VAR analysis includes impulse-response analysis, variance decomposition and Granger causality test. While there is a prediction for future is valid for impulse-response analysis and variance decomposition, Granger causality analysis interprets the causality for the term period under consideration in analysis. In this study, after predicting VAR model, Granger causality test, variance decomposition and impulse-response analysis will be made.

VAR analysis equations which shows the short term relationship between gross domestic product and private credits and share of private credits to domestic credits is as follows:

$$LNGDP_t = \alpha_1 + \sum_{i=1}^{p} \beta_{1i} LNGDP_{t-i} + \sum_{i=1}^{p} \gamma_{1i} LNPRY_{t-i} + \sum_{i=1}^{p} \lambda_{1i} LNPCDC_{t-i} + u_{1t} \quad (3.15)$$

$$LNPRY_t = \alpha_2 + \sum_{i=1}^{p} \beta_{2i} LNGDP_{t-i} + \sum_{i=1}^{p} \gamma_{2i} LNPRY_{t-i} + \sum_{i=1}^{p} \lambda_{2i} LNPCDC_{t-i} + u_{2t} \quad (3.16)$$

$$LNPCDC_t = \alpha_3 + \sum_{i=1}^{p} \beta_{3i} LNGDP_{t-i} + \sum_{i=1}^{p} \gamma_{3i} LNPRY_{t-i} + \sum_{i=1}^{p} \lambda_{3i} LNPCDC_{t-i} + u_{3t} \quad (3.17)$$

while p is lag length and u_{1t}, u_{2t} and u_{3t} are random error term and shocks. Before forming the VAR model, lag lengths of each model must be determined (Davidson and MacKinnon 1993: 685). According to LR, FPE, AIC, SC and HQ criteria, lag length is determined as 1.
Our predicted VAR(1) model for the equations above by using GDP, PRY and PCDC time series for Turkey between 1988Q1-2012Q4, VAR(1) is as seen in Table 5.

TABLE 5: VAR (1) Model Results

	DLNGDP	**DLNPCDC**	**DLNPRY**
DLNGDP(-1)	-0.224513 (0.11137) [-2.01594]	0.064741 (0.07402) [0.87463]	1.136762 (0.14277) [7.96230]
DLNPCDC(-1)	0.262072 (0.16518) [1.58660]	0.168600 (0.10979) [1.53573]	-0.212891 (0.21175) [-1.00539]
DLNPRY(-1)	0.013447 (0.06089) [0.22084]	0.043009 (0.04047) [1.06279]	0.773406 (0.07805) [9.90864]
C	0.009020 (0.00731) [1.23409]	-0.001922 (0.00486) [-0.39571]	0.012726 (0.00937) [1.35820]
Adj. R-squared	0.045863	0.032635	0.565625
F-statistic	2.554174	2.090785	43.10313

The causality issue between variables by using the Granger causality analysis is shown in below table 6.

TABLE 6: VAR Granger Causality/Block Exogeneity Wald Tests

Dependent variable: D(LNPRY)		
Excluded	*Chi-Square*	*Probability*
D(LNPCDC)	1.010818	0.3147
D(LNGDP)	63.39825	**0.0000***
All	65.55588	0.0000
Dependent variable: D(LNPCDC)		
D(LNPRY)	1.129518	0.2879
D(LNGDP)	0.764973	0.3818
All	1.341242	0.5114
Dependent variable: D(LNGDP)		
D(LNPRY)	0.048772	0.8252
D(LNPCDC)	2.517299	0.1126
All	3.348460	0.1875

According to VAR Granger Causality Test, credits to private sector and the ratio of private credits to domestic credits does not have an effect on GDP in the short run. But, GDP has an effect on private sector credits.

The result of the VAR analysis and Granger causality test supports the view of **demand-following hypothesis** which states that a rise in economic growth creates demand for more financial services by the economic agents.

3.2.3. Diagnostic Test Results

To reach long run and stationary equilibrium point of the variables in the model, the estimated model must also be stationary. The stationarity or stability properties of the model depend on the Eigen value of coefficient matrix. If all Eigen value of coefficient matrix, or all characteristic roots lay inside the unit circle, then all of the variables are stationary (Hendry and Juselius 2000: 10). In figure 3, inverse roots of the AR characteristic polynomial are in the unit circle. So, necessary and sufficient condition for stability is verified for our VAR model.

FIGURE 3: Inverse Roots of Characteristic Polynomial

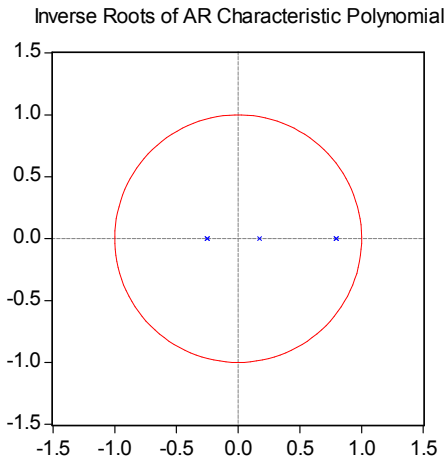


TABLE 7: Autocorrelation LM Test

VAR Residual Serial Correlation LM Tests
H0: no serial correlation at lag order h
Sample: 1988Q1 2012Q4
Included observations: 98

Lags	LM-Stat	Prob
1	5.547108	0.7842
2	3.026422	0.9632
3	7.486566	0.5866
4	9.349246	0.4057
5	11.77283	0.2264
6	12.05374	0.2103
7	3.636294	0.9337
8	7.563926	0.5786
9	8.894311	0.4471
10	12.93692	0.1655
11	7.724414	0.5621
12	4.490140	0.8763

Probs from chi-square with 9 df.

Autocorrelation LM and white heteroskedasticity tests are used to assess the validity of the modeling assumptions in applying VAR model. According to the results of autocorrelation LM test in Table 7, there is no serial correlation in error terms. The test results of the white heteroskedasticity test in table 8 also shows that variance is constant over time and

p=0,1036>0,05. Thus, the estimated VAR model has been successful in diagnostic tests, and satisfies the stationarity condition.

TABLE 8: White Heteroskedasticity Test

VAR Residual Heteroskedasticity Tests:
No Cross Terms (only levels and squares)

Sample: 1988Q1 2012Q4

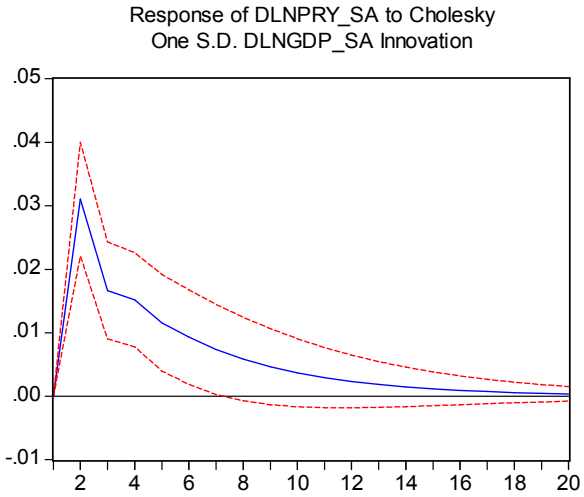
Joint test:

Chi-sq	df	Prob.
47.00635	36	0.1036

3.2.4. Impulse Response Analysis and Variance Decompositions

Impulse response function and variance decomposition analysis allows analyzing obtained residuals from the estimated VAR model instead of interpreting every single parameter (Özcan and Arı 2011: 136). An impulse response function traces the effect of a one standard deviation shock to one of the innovations on current and future values of the endogenous variables. Figure 4 shows the response of LNPRY to LNGDP. Against one standard deviation shock from LNGDP, LNPRY responses to this shock positively in the first two periods. After second period, the reaction is positive but decreasing until 18th period. In future periods, response fades and converges to its long run equilibrium. LNPRY always responses positively to shocks coming from LNGDP.

FIGURE 4: Impulse-Response Analysis



Variance decomposition separates the variation in an endogenous variable into the component shocks to the VAR (Mucuk and Demirsel 2009: 371). Table 9 shows that 37% of variance of the forecasting error of the private sector credits DLNPRY, is determined by real GDP, 5% is determined by PCDC and 57% is determined by itself after 10^{th} period. This verifies our finding which states that economic growth has an effect on financial development. Variance decomposition result for DLNPCDC shows that 91% of variance of the forecasting error is determined by LNPCDC which states that there is no relation of PCDC with other variables. On the other hand, for DLNGDP variable, 31% variance of the forecasting error is explained by DLNPRY.

Our econometric study found that while there is no long run relationship between the ratio of private sector credits to GDP and economic growth, there exists a short run relationship between them between 1988 and 2012. The direction of the causation runs from economic growth to financial development for Turkey which is consistent with the demand-following approach of Patrick. But literature states that supply leading approach is more relevant for developing countries while demand following approach is more consistent with the developed countries.

TABLE 9: Variance Decomposition

Variance Decomposition of DLNPRY_SA:

Period	S.E.	DLNPRY_...	DLNPCDC	DLNGDP_...
1	0.045210	100.0000	0.000000	0.000000
2	0.056508	68.10608	1.738620	30.15530
3	0.061672	63.89963	3.489630	32.61074
4	0.064865	60.69556	4.346131	34.95831
5	0.066780	59.18065	4.839202	35.98015
6	0.067965	58.26883	5.120772	36.61040
7	0.068702	57.73329	5.289506	36.97721
8	0.069162	57.40557	5.392167	37.20226
9	0.069451	57.20363	5.455554	37.34082
10	0.069632	57.07792	5.494986	37.42709

Variance Decomposition of DLNPCDC:

Period	S.E.	DLNPRY_...	DLNPCDC	DLNGDP_...
1	0.023440	6.869706	93.13029	0.000000
2	0.023997	7.065013	92.39264	0.542347
3	0.024095	7.259450	91.93954	0.801011
4	0.024141	7.351029	91.65429	0.994676
5	0.024169	7.410149	91.47772	1.112132
6	0.024186	7.446378	91.36654	1.187078
7	0.024197	7.469274	91.29667	1.234058
8	0.024204	7.483662	91.25265	1.263685
9	0.024208	7.492732	91.22492	1.282346
10	0.024211	7.498447	91.20744	1.294109

Variance Decomposition of DLNGDP_SA:

Period	S.E.	DLNPRY_...	DLNPCDC	DLNGDP_...
1	0.035267	30.72702	9.362173	59.91081
2	0.036568	31.84294	9.626516	58.53055
3	0.036652	31.75575	9.601014	58.64324
4	0.036661	31.77983	9.605427	58.61474
5	0.036665	31.77582	9.605739	58.61844
6	0.036667	31.77684	9.606281	58.61688
7	0.036669	31.77676	9.606524	58.61671
8	0.036669	31.77686	9.606691	58.61645
9	0.036670	31.77689	9.606793	58.61632
10	0.036670	31.77692	9.606858	58.61623

Cholesky Ordering: DLNPRY_SA DLNPCDC DLNGDP_SA

CONCLUSIONS

Examining the link between financial system and real sector became crucial as developing countries started to adopt financial liberalization policies after 1980s and economies became interdependent. Sound, efficient and developed financial markets has critical importance for capital accumulation, supporting productive investment opportunities and technological innovations. Determination of the direction and degree of the relationship between financial system and real sector is necessary for the implementation of economic policies.

Empirical studies reached distinctive results as they test different countries and used several econometric methodologies, time periods, data sets and indicators. Every country differs in economic policies, macroeconomic situation, financial institutions; results of the empirical studies cannot be generalized to other countries. Thus, it is necessary to analyze the financial development and economic growth relationship by country-case studies or panel data and evaluate results according to those countries economic situation, financial institutions and implemented policies.

When considering the finance and growth nexus in Turkey, the transmission mechanism between financial and real sector mostly occurs through the banking sector which collects approximately 75% share of the total savings in the economy in 2012. On the other hand, stock market collects approximately 12-13% of the total savings in the economy in 2012. Moreover, Borsa Istanbul shows speculative behaviors because of the high turnover ratio and it hasn't deepened yet. Some of the studies debated relative merits of the bank-based or market-based systems in process of economic growth. But what matters for growth is to provide an economic environment that financial intermediaries and markets operate efficiently by sound financial services.

After the completion of liberalization policies in 1989, implementation of policies continued to ensure financial integration of Turkish financial sector to global world. But, required regulation, supervision, risk management and structural problems of the economy could not be achieved and solved. Government perceives financial development as a financing source of their rough and populist economic policies. High returns in financial sector are used for

financing high budget deficit. High public debt and liquidity need of the government lead banking sector to operate inefficiently in the financial system. To meet an increasing demand for liquidity of government, banks borrow from households and lend to government with high interest rates. Thus, banking sector could not do its duty as a financial intermediary and operate inefficiently and policies implemented for financial liberalization after 1980s had been a negative factor for economic growth. The growth progress of the Turkey followed different paths according to implemented economic policies. Economic growth rate couldn't sustain a significant stabilization and showed a fluctuating path because of the absence of long run economic growth policy.

According to empirical results of our study, there is a significant and positive relationship between private credits and real GDP between the periods of 1988-2012. But while there is a short run relationship between variables, there is no long run relationship between them. Moreover, the direction of causality runs from economic growth to financial development. Therefore, financial sector responds passively to growth in the real economy. As the real sector grows, increased demand for financial services induces expansion in the financial sector. The source of increasing banking sector credits is economic growth in Turkey. Additionally, extended banking credits are not the source of investments in Turkey. The source of investments can be attributed to **retained earnings, owners' equity** and **foreign capital** in Turkey and investment decisions of firms is an increasing function of these factors. Firms mostly use bank credits to meet their current expenses and maintain their business transactions. Besides, an increasing share of consumer credits in private sector credits indicate that most of the bank credits are used as personal loans by households that do not contribute to production.

The financial system is not an engine of economic growth as it is claimed by endogenous growth theory. But financial system contributes to sustainable growth by providing liquidity when needed. Thus, sound financial system in necessary for healthy economic growth. From a more comprehensive perspective, policy makers should attach more importance to economic development than economic growth as Turkey is a developing country. Unless the provision of sound economic, social and political structure completed, it is not possible to benefit from the developments of the financial system and economic growth.

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