THE CAUSALITY BETWEEN FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH IN TURKEY*

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Özet

Finansal sistemin gelişimi ile ekonomik büyüme ilişkisi uzun yıllardır tartışılmaktadır. Genel ekonomik başarı, finans sisteminin etkinliğine büyük ölçüde bağlı görünmektedir. Diğer yandan, ekonomik büyüme ortalama gelir düzeyinde artışa, yasal düzenlemelerde ve uluslararası bütünleşme düzeyinde gelişmeye neden olmakta, finansal sistemin gelişimi için uygun ortam yaratmaktadır. Bu çalışma Türkiye'de finansal gelişme ile ekonomik büyüme arasındaki nedensellik ilişkisini analiz etmektedir. Bu amaçla büyüme ve finansal gelişme arasındaki nedenselliğin varlığı ve yönü ile ilgili hipotezleri test etmek için Granger nedensellik testi kullanılmıştır. Çalışmamızda finansal gelişme ve ekonomik büyüme arasındaki nedensellik analizi sonuçları çelişkili olmakla birlikte, Türkiye ekonomisi açısından ekonomik büyümenin finansal gelişmeye neden olduğu düşüncesi ağır basmaktadır.

Anahtar Sözcükler: Finansal sistem, finansal gelişme, ekonomik büyüme, Granger nedensellik analizi

Abstract

The relation between the development of financial system and economic growth has been discussed for a long time. Mostly general economic success depends on the efficiency of the financial system. On the other hand, economic growth brings about increasing national income and causes a development in the international integration and legal arrangements thus it leads to an appropriate environment to development financial system. This paper examines the causal relationship between financial development and economic growth in Turkey. Therefore; in this study Granger causality test used in order to test the hypotheses regarding the presence and the direction of causality between financial development and economic growth.

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Although the results of the causality analysis between financial development and economic growth are contradictory in this study, most people seem to support the idea that economic growth causes financial development in terms of Turkish economy.

Key Words: Financial system, financial development, economic growth, Granger Causality Analysis

Introduction

Financial development, which can be defined as the development of financial institutions, markets and instruments, contributes to financial intermediation process positively and plays an important role in increasing the savings. The development of financial system facilitates the portfolio variety which reduces the risk of saver and provides a lot of options increasing the earnings of the investors. Another important function of financial system is to provide information regarding the most cost-effective investment projects in order to reduce the investment cost for the investors.

Financial development also accounts for the change in a financial system in terms of both volume and the structure. In this case, the development in the financial system is explained by the concept "financial depth", which provides information about the extent to which financial system expands and the level of the variation in financial instruments. Financial depth is defined as the increase in the proportion of the sum of financial assets in an economy to national income. In other words, it is considered as the increase in monetization and the expansion of the services provided by financial intermediation. The increase in financial deepness results in the increase in savings in the country and financial activation of low-income savings as well as the changing direction of funds from disorganized high-risk markets into well-organized ones. On the other hand, financial development generally starts with banking sector in shallow economies since banking is more dominant in such economies. However, as the development continues banking sector loses its importance.

1. The Relationships Between Financial Development And Economic Growth

There is a considerable amount of research investigating the relationship between financial development and economic growth in the literature. Although most of them conclude that financial development affects economic

growth positively, some find a negative relationship between financial growth and economic growth, and still others show that there is no relationship between these two variables.

The early studies on the relationship between financial development and economic growth were conducted in undeveloped and developing countries. The effects of financial development will differ according to the level of the country's economic development. In addition, the importance of each financial system might differ in different phases of the development (Loayza and Ranciere, 2005;12-15).

While the composition and the productivity of financial intermediation is much more related to economic growth in developed countries, the level of financial intermediation might be more important for the economic growth in the early phase of the development (Rioja and Valev, 2004;127-140). Financial structure is different in different parts of the world and it is impossible to claim that there is one single relationship between financial structure and economic growth

Recent studies on this issue focus mostly on the causality of two variables. The following section lists the results of the studies conducted accordingly.

Kindleberger analyzed England, French, Germany and Italy and concluded that the there is a two-way relationship between financial development and economic growth (Kindleberger,1987; 339-353).

Shan and others studied the relationship between financial development and economic growth in 9 OECD countries and China by using causality test. According to the authors, there is evidence supporting two-way relationship in half of those countries while three countries provided data for negative causality relationship. In addition, they suggest that evidence supporting the hypothesis that finance leads to economic growth is not sufficient (Shan, Morris and Sun,2001;443-454).

Ghirmay studied 13 African countries by using causality analysis test. According to Ghirmay, "there is a long-term relationship between financial development and economic growth (in 12 out of 13 countries). Financial development plays causative role in 8 countries and there is evidence showing two-way relationship in 6 countries (Ghirmay, 2004; 415-432).

Thangavelu and Jiunn applied causality analysis on the data from Australia. According to the authors, financial mediator and markets have diffe-

rent effects on economic growth. There is evidence for causality from economic growth to the development financial intermediation Economic growth creates a demand for financial services, therefore leading to financial development (Thangavelu and Jiunn,2004;247-260).

Although a few in number, there are also studies showing that there is no causality relationship between financial development and economic growth. Among the economists who support this idea are Lucas (1988), Stern (1989), Merr and Seers (1984) and Chandavarkar (1992). According to Chandavarkar, "financial development cannot be a leading factor for economic growth".

There are also a number of studies conducted on this issue in Turkey. Kar investigated the relationship between financial development and economic growth in Turkey by applying Granger causality test on the data covering 1963-1995 fiscal years. Despite the conflicting results regarding the direction of causality, he concluded that it can be said that economic growth might cause financial development in Turkish economy (Kar, 2000;2-13).

Similarly, Yılmaz and Kaya used Granger causality test on 1986-2004 fiscal years' data. According to the authors, "there is causality relationship from economic growth to financial development in Turkey (Yılmaz and Kaya, 2006; 120-130).

Aslan and Küçükaksoy examined the data covering 1970-2004 fiscal years by using Granger causality test for Turkey. According to the authors "financial development is the cause of economic growth in Turkey or it fosters economic growth". In other words, the direction of the relationship is from financial development to economic growth as supported by supply leading hypothesis (Aslan and Küçükaksoy, 2006; 23-36).

2. Method And Material

The aim of this study is to investigate the causality relationship between financial development and economic growth observed in Turkey especially after 1980s. It is necessary to measure the volume and the efficiency of finance sector and economic growth in order to determine the effect of financial development on economic growth. In this study, the indicator for economic growth is increasing rate of GDP. The development of finance sector is generally measured in reference to the volume of this sector. The most prevailing indicator of the volume of finance sector is M2Y/GDP rate. The

downside of this indicator is that it is impossible to know how loans are used or who provides these loans. It might not be sufficient for measuring the volume of the services provided by financial mediators. Therefore; the proportion of domestic bank loans to GDP was used as the indicator of the developments of the banks. Another indicator has been used for the size of capital market, which is the proportion of market capitalization to GDP. The study includes the quarterly data covering the fiscal years 1990-2006. Te data used in this study was obtained from the Electronic Data Delivery System of Central Bank of Turkish Republic

In this study Granger causality test will be used in order to test the hypotheses regarding the presence and the direction of causality between FDI and economic growth. The direction of causality determines the direction of the relationship among variables and Granger causality test has three different directions for these purposes (Yılmaz,2005):

a) One way causality: In this single equation model, Y is the dependent variable and X independent. Here, there is a causality relationship from X towards Y (X⇒Y)

b) Two-way causality: There can be a reciprocal effect between variables. (X ⇔Y).

c) Lack of Causality: There is no relationship among variables, therefore no causality.

In order to apply Granger causality test, the series that belong to variables should be stationary. Therefore; it is necessary to make unit root tests to examine whether the series for these two variables are stationary or not.

There are many tests used to determine stationary. In this study, the stationary of the variables will be tested by using Augmented Dickey-Fuller unit root test. Here, Akaike and Schwarz criteria are used while determining the appropriate lag length for delayed variable. The models suggested for this test are as follows:

$$\Delta Y_t = \gamma Y_{t-1} + \sum_{i=2}^{m} \beta_i \Delta Y_{t-i+1} + \varepsilon_t \quad (1)$$

$$\Delta Y_t = \alpha_0 + \gamma Y_{t-1} + \sum_{i=2}^{m} \beta_i \Delta Y_{t-i+1} + \varepsilon_t \quad (2)$$

$$\Delta Y_t = \alpha_0 + \gamma Y_{t-1} + \beta_t + \sum_{i=2}^{m} \beta_i \Delta Y_{t-i+1} + \varepsilon_t \quad (3)$$

After the test, H_0 hypothesis are tested by comparing the τ value obtained in this test to the values calculated by Dickey-Fuller (Enders, 1995;225). If the absolute value of calculated τ statistics is higher than the absolute value of critical values, we cannot reject the hypothesis which shows that series is stationary. However, if this value is lower than critical value, time series is not stationary (Gujarati, 1995).

3. Findings

In this study, Granger causality test was applied in order to determine the presence and the direction of the relationship between M2Y, the volume of domestic credits of the banks and capitalization value, which are mostly accepted as the indicators of economic growth and financial development When the results of the test displayed in the table below are examined, it can be seen that the series belonging to GDP is not stationary in level value and it becomes stationary only when first differences are.

Null Hypothesis: GROWTH has a unit root			
Exogenous: Constant			
Lag Length: 4 (Automatic based on SIC, MAXLAG=10)			
		t-Satistic	**Probability***
Augmented Dickey-Fuller test statistic		**-2.691623**	**0.0811**
Test critical values:	**1% level**	-3.538362	
	5% level	-2.908420	
	10% l evel	2.591799	

**MacKinnon (1996) one-sided p-values*

The results of unit root test (stationary test) for the variable "money supply" can be seen in the following table. According to this table, M2Y money supply variable becomes stationary when the first difference is taken

Null Hypothesis: D(DM2Y) has a unit root			
Exogenous: Constant			
Lag Length: 2 (Automatic based on SIC, MAXLAG=10)			
		t-Statistic	**Probability***
Augmented Dickey-Fuller test statistic		**-29.09980**	**0.0001**
Test critical values:	**1% level**	-3.538362	
	5% level	-2.908420	
	10% l evel	-2.591799	

**MacKinnon (1996) one-sided p-values*

When the same test is applied for the variable providing information about the sum of domestic loans (credit), it was found that this series was stationary when the first differences were taken (See the table below).

Null Hypothesis: D(CREDIT) has a unit root			
Exogenous: Constant,			
Lag Length: 5 (Automatic based on SIC, MAXLAG=10)			
		t-Statistic	**Probability***
Augmented Dickey-Fuller test statistic		**-2.858449**	**0.0563**
Test critical values:	**1% level**	-3.542097	
	5% level	-2.910019	
	10% l evel	-2.592645	

**MacKinnon (1996) one-sided p-values*

The table below displays the stationary analysis for the last variable "capitalization value" (cap). According to the results, Cap variable becomes stationary when first differences are taken

Null Hypothesis: D(CAP) has a unit root			
Exogenous: Constant			
Lag Length: 1 (Automatic based on SIC, MAXLAG=10)			
		t-Statistic	**Probability***
Augmented Dickey-Fuller test statistic		**-9.227765**	**0.0000**
Test critical values:	**1% level**	-3.534868	
	5% level	-2.906923	
	10% l evel	-2.591006	

**MacKinnon (1996) one-sided p-values*

Following this procedure, Granger causality test was applied in order to determine the presence of the relationship among variables and its direction (Granger,1969;424-438). Granger's causality test is carried out by using the following equations:

$$Y_t = \sum_{i=1}^{m} \alpha_i Y_{t-i} + \sum_{j=1}^{m} \beta_j X_{t-j} + u_{1t} \qquad (4)$$

$$X_t = \sum_{i=1}^{m} \lambda_i X_{t-i} + \sum_{j=1}^{m} \delta_j Y_{t-j} + u_{2t} \qquad (5)$$

According to these equations, if the addition of the information about the variable X to the model contributes to the estimate of the variable Y, the variable X is the cause of the variable Y. For the model presented above, Granger causality test is carried out as H_0:β = 0 and H_1:β ≠ 0. When H_0 hypothesis is accepted, X is not the cause of Y. If H_1 hypothesis is accepted X is the cause of Y. If both hypotheses are rejected, this means there is a two-way causality relationship between X and Y. If "F" value calculated during the testing of the hypothesis is lower than "F" table value, H_0 hypothesis is accepted as "there is no causality from X to Y. If "F" value is higher than the table value, H_0 hypothesis is rejected and it is said that there is causality from X to Y (X ⇒Y). All these calculations are applied in the same way in order to test whether there is causality from Y to X.

There are three variables in this study as the indicators of financial development. Therefore; it is necessary to apply causality test for each indicator one by one. The table below displays the results of Granger causality test done in order to determine the presence and the direction of the causality relationship between M2Y money supply and economic growth.

Pairwise Granger Causality Tests
Sample: 1990Q1 2006Q4

Lags: 3

Null Hypothesis:	**Obs**	**F-Statistic**	**Probability**
DM2Y does not Granger Cause GROWTH	**64**	1.13906	0.34109
GROWTH does not Granger Cause DM2Y		2.31251	0.08568

According to Granger causality test done by using quarterly data covering the study-specific period mentioned earlier, economic growth (GDP) is the cause of M2Y. In other words, there is causality from economic growth to money supply. However, In other words, there is a one-way relationship between money supply and GDP and the direction of this relationship is from GDP to (money supply) M2Y. Accordingly, if we accept money supply as the indicator of financial development, the economic growth in Turkey seems to be the cause of the financial development.

Pairwise Granger Causality Tests
Sample: 1990Q1 2006Q4

Lags: 4

Null Hypothesis:	**Obs**	**F-Statistic**	**Probability**
DCAP does not Granger Cause GROWTH	**63**	4.51607	0.00321
GROWTH does not Granger Cause DCAP		1.01249	0.40919

Secondly; the table below presents the results of Granger causality test done in order to determine the presence and the direction of the causality relationship between credits and economic growth.

Pairwise Granger Causality Tests
Sample: 1990Q1 2006Q4

Lags: 4

Null Hypothesis:	**Obs**	**F-Statistic**	**Probability**
DCREDIT does not Granger Cause GROWTH	**63**	0.84279	0.50422
GROWTH does not Granger Cause DCREDIT		9.50461	6.8E-06

According to Granger causality test done by using quarterly data between 1990 and 2006 in Turkey, economic growth (GDP) is the cause of domestic credits provided by the banks. In other words, there is causality

from economic growth to domestic bank credits. However, in this period, credits are not the cause of economic growth. In other words, there is a one-way relationship between credits and GDP and the direction of this relationship is from GDP to credit. Accordingly, if we accept the volume of domestic credits by the banks as the indicator of financial development, the economic growth in Turkey is the cause of the financial development.

Finally, the table below shows the results of Granger causality test done in order to determine the presence and the direction of the causality relationship between capitalization rate and economic growth.

Pairwise Granger Causality Tests
Sample: 1990Q1 2006Q4

Lags: 4

Null Hypothesis:	**Obs**	**F-Statistic**	**Probability**
DCAP does not Granger Cause GROWTH	**63**	4.51607	0.00321
GROWTH does not Granger Cause DCAP		1.01249	0.40919

According to the results, economic growth (GDP) is not the cause of capitalization (CAP) in Turkey between 1990 and 2006. In other words, there is not causality relationship from economic growth to capitalization. However, the research conducted with the quarterly data covering the same period of time shows that capitalization in Turkey is the cause of economic growth. There is a one-way relationship between CAP and GDP and the direction of this relationship is from CAP to GDP.

Conclusion

The relationship between finance and economic growth is a controversial topic studied for a long time. Although there is highly persuasive evidence supporting the idea that developed financial sector and strong economy are interrelated, the direction of the causality is still uncertain. While many people believe that finance is the determining factor for economic growth, still others claim that the development of financial system is simply responsible for economic development due to the changing demand. Although the theo-

ries state that the functions of financial systems might affect economic activities, still the question "what kind of financial development affects economic growth?" remains unanswered in most cases. Some outstanding studies found this relationship between industry and company levels and the evidence on all levels show a positive relationship between financial development and economic growth.

In this study, three variables were used as the indicators of financial development; namely M2Y, the volume of domestic credits provided by the banks and the capitalization of capital market. Therefore; Granger causality test was applied to investigate the relationship between economic growth and each variable one by one by using the quarterly data covering 1990-2006 fiscal years. If we accept the M2Y money supply as the indicator of financial development, in this case, it is found that the economic growth in Turkey is the cause of financial development. In the second case, if we accept the volume of domestic loans provided by the banks as the indicator of financial development, we again find that that the economic growth in Turkey is the cause of financial development. Finally if we accept the proportion of capitalization as the indicator of financial development, this time we find that the financial development in Turkey causes economic growth. Not all three indicators gave the same results for the relationship between financial development and economic growth, so we cannot make clear conclusions about this relationship. Although the results of the causality analysis between financial development and economic growth are contradictory in this study, most people seem to support the idea that economic growth causes financial development in terms of Turkish economy.

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