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An Empirical Analysis of Relationship between Economic Growth and Financial Development: The Case of Turkey

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Abstract

The direction of the causality in the relationship between financial development and economic growth is debated in Turkish Economy as well as in economic literature. This paper analysis the causation relationship between economic growth and financial development in Turkey during the period 1998Q1–2014Q4 within VAR framework. Granger Causality test states that there is one way causality from economic growth to financial development.

Keywords: Economic growth, Financial Development, VAR Model, Granger Causality

1. Introduction

Financial development, the increase in kind of financial instruments used in a country and make it available more extensive is that these tools. That is to say, financial development is the development of financial markets. (Erim-Türk 2005). Economic growth, as defined in standard economic textbooks, is an increase in the capacity of an economy to produce goods and services.

There are four different perspectives on the direction of this causality. First one is “supply-leading” view, according to this view financial development has a positive effect on economic growth. The second view is devised by Robinson (1952), it expresses that economic growth leads financial development, in other words this view is called “demand-leading”. It can be found in our literature survey on table 1. (etc. Ang and McKibbin (2005), Öztürk, Darıcı and Kesikoğlu (2011)). Third view of this relationship suggests that the two variables have bidirectional causality (etc. Jung (1986), Luitel and Khan (1999)). The last view asserts that there is no causality between economic growth and financial development. This view was suggested by Lucas (1988).

We can say that easily from this brief, financial development and economic growth issue has mixed literature.

The target of this paper is to analyze the causation relationship between economic growth and financial development in using Granger Causality test within VAR framework for the period 1998-2014 using quarterly data. Our result shows that causation goes from economic growth to financial development in Turkey.

2. Literature Review

Ever since the pioneering study of Shaw (1973), McKinnon (1973) Goldsmith(1969) this relationship has been received more and more attention in theoretical and empirical literature. In particular the direction of causality has attracted a great deal of attention.

Table 1 presents some selected studies regarding economic growth and financial development debate.

Authors	Sample	Period	Method	Direction of Causation
Jung (1986)	Industrialised country	different time intervals	Granger Casualty	FD ↔ EC
Rousseau and Watchel (1988)	Industrial countries-	1870-1929	Granger Casualty	FD → EC
Luitel and Khan (1999)	10 country-	different time intervals	VAR	FD ↔ EC
Al-Yousif (2002)	30 developing countries	1970-1999	Panel Data Analysisn and Granger Casualty	FD ↔ EC
Ünalmiş (2002)	Turkey	1970-2001	VECM and Granger Casualty	FD → EC
Cristopoulos and Tsionas (2004)	10 developed countries	1970-2000	Cointegration Test and Dynamic Panel Data	FD → EC
Ang and McKibbin (2005)	Malezya-	1960-2001	Granger Casualty	EC → FD
Shan and Jianhong (2006)	China	1977-2001	VAR	FD ↔ EC
Öztürk, Darıcı and Kesikoğlu (2011)	9 emerging markets countries	1992-2009	Panel casualty test	EC → FD
Özcan and Arı (2011)	Turkey	1998-2009	VAR	EC → FD
Mercan and Peker (2013)	Turkey	1992-2010	ARDL	FD → EC
Mutlugün (2014)	Tukey	1988-2012	Granger casualty	EC → FD

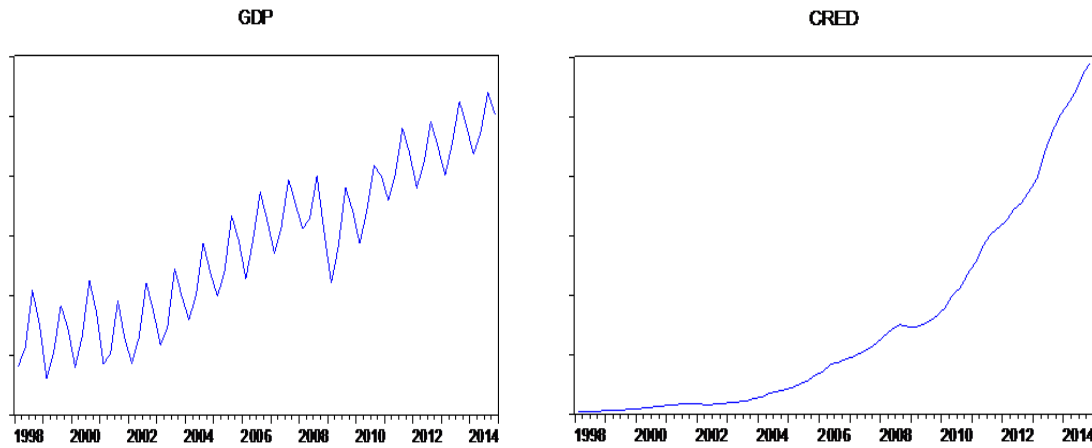
It is clear from Table 1 that five studies have found that the direction of causation starts from financial development to economic growth while four studies show bi-directional relation and four studies found that causation starts from economic growth to financial development.

3. Data and Methodology

To analysis the casuality relationship between financial development and economic growth using Granger Causatlity within a VAR framework. In this study, reel gross domestic prodcut (GDP) is used the indicator of economic growth. Following the literature financial development is stated by the ratio of private sector credit (CRED) to nominal gross domestic product. The quarterly data set is used for the Turkish Economy for the period 1998-2014. GDP was obtained from *The Central Bank of The Republic of Turkey*. CRED was obtained from *Turkish Statistical Institute*.

Line graph of the GDP exhibit seasonality features while PCREDIT does not. Therefore GDP series are seasonally adjusted with Census X-12 program. Then natural logarithhm is applied to the selected variables which indicated as LNGDP and LNPCREDI

GRAPH 1 : Line Graph Regarding to Raw Data of The Selected Varibales



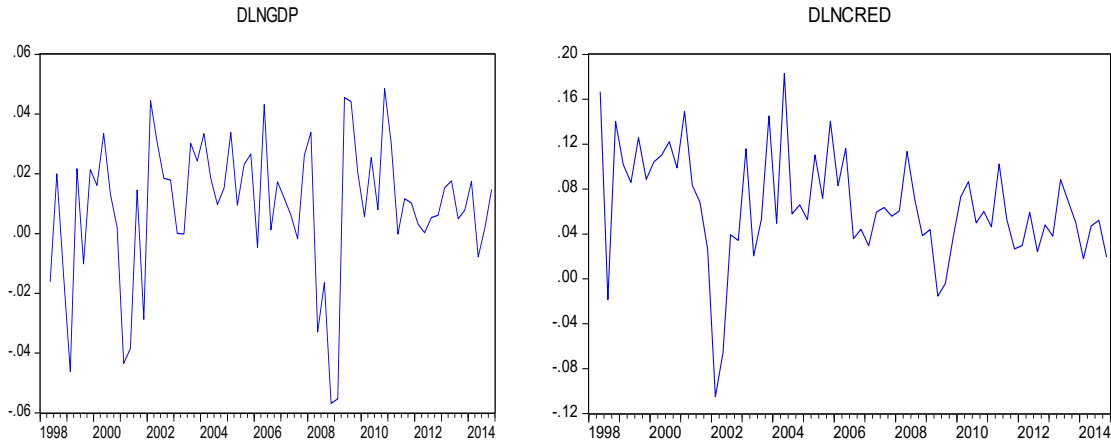
4. Unit Root Test

We tested the stationary of variables by using ADF test. The test results presented in Table 1. Our selected variables become staionary after first differencing.

Table 2 : ADF Test Results

At Levels	Constant and Trend
LNREELGDP	-2,818577
LNPCRED	-1,669033
At First Difference	
DLNREELGDP	-6,367959
DLNPCRED	-6,453581

GRAPH 2 : At First Difference of The Selected Variables (Imported from Eviews)



5. Vector Autoregression Model (VAR)

Vector Autoregression model have been used intensely after Sim’s pioneer study,in particular macroeconomic and financial issue.

A simple VAR model with two variables as follows.(Tari,2006)

$$Y_t = \alpha_{10} + \sum_{i=1}^p \alpha_{11i} Y_{t-i} + \sum_{i=1}^p \alpha_{12i} X_{t-1} + u_{1t} \quad (5.1)$$

$$X_t = \alpha_{20} + \sum_{i=1}^p \alpha_{21i} Y_{t-i} + \sum_{i=1}^p \alpha_{22i} X_{t-1} + u_{2t} \quad (5.2)$$

In this equation α_{i0} is constant term while u_{it} is error term and p is lag length. Considering lag length, VAR model is named as VAR(p). In this study lag length is determined as 2 by means of LR,FPE,AIC,SC and HQ criteria.Our model as shown in table 2.

Table 3 : VAR(2) Results

	DLNGDP	DLNCRED
DLNGDP(-2)	0.084775 (0.13696) [0.61898]	0.468566 (0.23883) [1.96195]
DLNCRED (-2)	0.032606 (0.06420) [0.50786]	0.364882 (0.11196) [3.25913]
C	0.011060 (0.00611) (1.80891)	0.000763 (0.00665) (1.36195)
Adj. R-squared	0.092775	0.327113
F-Statistic	0.023077	0.040242

5.1 The Granger Causality Test

The series have to be stationary for Granger Casuality tes, so ADF test has been calculated for this. The P value in the table 3 shows that there is one way casuality from GDP to CRED. Our simple casual model is ;

$$\text{GDP} = \sum_{i=1}^n \alpha_i \text{CRED}_{t-i} + \sum_{j=1}^n \beta_j \text{GDP}_{t-j} + u_{1t} \quad (5.1.1)$$

$$\text{CRED} = \sum_{i=1}^m \lambda_i \text{CRED}_{t-i} + \sum_{j=1}^m \varphi_j \text{GDP}_{t-j} + u_{2t} \quad (5.1.2)$$

Table 4 : Granger Causality Test Results

Null Hypothesis	F -Statistic	Probability
DLNCRED does not Granger Cause DLNGDP	1.17150	0.3169
DLNGDP does not Granger Cause DLNCRED	6.03580	0.0041

5.2 Autocorrelation LM and White Heterokedasticity Test

Autocorrelation and White Heterokedasticity test is used to check availability of the assumptions in referring VAR model(Mutlugün,2014).Table 4 shows result of LM test.

Table 5 : LM Test (Imported from Eviews)

Lags	LM-Stat	Prob
1	7.726041	0.1021
2	1.553773	0.8171
3	0.871607	0.9286
4	5.158376	0.2714
5	0.956049	0.9164
6	1.250702	0.8697
7	3.185482	0.5273
8	5.394250	0.2492
9	5.582950	0.2325
10	5.865870	0.2094
11	1.423313	0.8401
12	3.942414	0.4139

As all LM probability values bigger than 0,05 there is no autocorrelation.

According to White Heterokedasticity test results shows that error term variance is constant for all observations, in other words not faced with heterokedasticity issue.(p>0,05).

Table : White Heterokedasticity Test (Imported from Eviews)

Joint test:

Chi-sq	df	Prob
32.10802	24	0.124

6. Conclusion

The role of financial development takes an important place in real economic activity in the world and also in our country.

This study analysis the relationship between economic growth and financial development in Turkey using Granger Casuality test within VAR framework for the period 1998-2014 using quarterly data. The emprical result shows that, economic growth whic represented by GDP causes financial devlepoment which stated by the ratio of private sector credit (PCREDIT) to nominal gross domestic product.In other words the case of Turkey provide the demand-leading phenomena in the short run.

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