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THE RELATIONSHIP BETWEEN FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH:

EVIDENCE FROM BRICS COUNTRIES AND TURKEY

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ABSTRACT

The aim of this paper is to analyze the link and the direction of the relationship between financial development and economic growth in Turkey and BRICS countries for the period of 1994-2011. Moreover, the paper divides the financial market into two sub-markets as banking sector and stock market to examine their individual impact on economic growth. Fixed effect panel regression method and a relatively new panel causality technique, namely Dimutrescu-Hurlin test is applied to estimate the existence of the causal link between financial development and economic growth. The results of the analysis show that there is neither linear nor causal link for stock market development and economic growth, while statistically significant relationship exists between banking sector development and economic growth in the direction of economic growth to banking sector. In a nutshell, the results suggest an evidence for demand-following pattern in Turkey and BRICS Countries.

Keywords: Financial Market Development, Economic Growth, Panel Regression, Dumitrescu Hurlin Causality Test, Unit Root Test

JEL Codes: D53, E44, G2, O40.

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FİNANSAL KALKINMA VE EKONOMİK BÜYÜME İLİŞKİSİ: BRICS ÜLKELERİ VE TÜRKİYE ÖRNEĞİ

ÖZET

Bu çalışmanın amacı finansal kalkınma ile ekonomik büyüme arasındaki nedensellik ilişkilerini ve bu ilişkinin yönünü BRICS Ülkeleri ve Türkiye'den deneye dayalı bulgular sunarak incelemektir. Ampirik testler 1994 ile 2011 yıllarını içeren panel veri seti kullanılarak gerçekleştirilmiştir. Finansal piyasalar sektörlere özgü etkilerin incelenebilmesi açısından bankacılık sektörü ve menkul değerler piyasası olarak iki alt sektöre ayrılmıştır, finansal gelişmişlik ile ekonomik büyüme arasındaki ilişkinin varlığı ve yönünün belirlenebilmesi amacıyla sabit etkili panel panel regresyon metodu ile göreli olarak yeni bir yöntem olan Dumitrescu Hurlin nedensellik testleri tahmin edilmiştir. Gerçekleştirilen analiz sonuçlarına göre, menkul değerler piyasası gelişmişliği ile ekonomik büyüme arasında ne doğrusal ne de nedensel ilişkinin varlığına rastlanamamış; ancak bankacılık sektörü gelişmişliği ile ekonomik büyüme arasında nedenselliğin yönünün ekonomik büyümeden bankacılık sektörüne doğru olduğunu gösteren anlamlı istatistiksel ilişki bulunmuştur. Özet olarak, bulgular Türkiye ve BRICS Ülkelerinin talep takipli kalıbı izlediği yönünde kanıt sunmaktadır.

Anahtar Kelimeler: Finansal Kalkınma, Ekonomik Büyüme, Panel Regresyon, Dumitrescu Hurlin Nedensellik Testi, Birim Kök Testi
Jel Kodu: D53, E44, G2, O40.

1. Introduction

This paper introduces supporting evidence related to discussion over whether financial development has the precedence or antecedence of economic growth. The relationship between financial development and economic growth has been discussed by economists for decades. Up until today consensus on finance-growth subject is not build despite the existence of broad literature of both empirical and theoretical studies. Many economists claim development of the financial system is able to effect economic growth positively, while others regard financial markets as inessential. For instance, Schumpeter (1911) claimed that well-functioning financial markets enhance technological innovations by funding entrepreneurs and lead to increase in

productivity and growth through more efficient production processes. On the contrary, Robinson (1952) asserted that outlook and development of financial system is a consequence of economic growth. In other words, financial markets are created in accordance with the demands in developing markets. Financial system simply follows it. Moreover, Lucas (1988) asserted that contribution of financial institutions to economic growth is over-emphasized.

Effects of financial market development have also been discussed by economic growth doctrinaires. On one hand, financial system is able to increase savings rate which stimulates economic growth only in the short-run from the viewpoint of Neoclassical Growth framework. On the other hand, endogenous growth theories which were developed afterwards, support the hypothesis that sustainable economic growth can be achieved through developed financial markets. Similarly, perspective of economists on finance-growth nexus has changed over time. Currently economists accept that development of financial system is a vital for economic growth.

According to Fisher (1939) an economy tracks a way with three stages which are firstly traditional sector, secondly manufacturing sector and lastly "services" sector. Financial service institutions which are a section of tertiary sector, conduct fund transmission mechanism for previous two sectors especially for industrial and entrepreneurial activities. Transfer of funds to promising investment projects through financial transmission mechanism that serve as a bridge between savers and real sector is of crucial importance. Briefly financial assets are a veil. In other words, financial assets somewhat secretly connect investments that are made on real assets by another person (Parasız, 2009). Referring to Hicks (1969) technological innovations that initiated industrial revolution was realized no later than beginning of industrial revolution in England, however it had to wait up until the arise of financial revolution.

Financial system has an essential role on the process of economic growth such as taking entrepreneurial activities under review and mobilizing savings to most promising ones, diversify risks of these innovational initiatives and encourage innovation rather than traditional production methods. With the favor of well-functioning and developed financial systems, promising innovative projects may be enhanced and pace of economic growth is stimulated. Similarly, deteriorations in financial services may slow down rate of growth by reducing level of innovation (King and Levine, 1993a). Additionally, transaction costs and bureaucracy which constitute obstacles

for entrepreneurial activities can be eliminated under the favor of financial system. It is surely beyond doubt that it is relatively effortless to set up a business, in a well-functioning financial system and economy, without costs and time-consuming bureaucratic procedures. For this reason, existence of well-functioning financial markets is essential (Baumol, Litan and Schramm, 2007).

Apart from these, information asymmetries may lead to adverse selection problems and further various breakups in an economy (Akerlof, 1970). Adverse selection may lead to financial crises which are hazardous for economic growth and these asymmetries can be eliminated by well-functioning financial systems. Systematic crises and structural irregularities in developing countries reveal the importance of financial markets (Altunç, 2008). If finance-growth relationship can be conceived, better policy implementations can be arranged and this leads to increase in living standards in terms of economic growth.

In the presence of finance-growth relationship another question arises; what is the direction of the causal relationship? Whether economic growth or financial development has the precedence in the policy making process. For this reason, critical question was put forward by Patrick (1966) that whether financial sector or real sector leads to the long run process of economic development or in the words of Patrick's nomenclature; whether financial markets follow "supply-leading" or "demand-following" pattern? Or do both of these characteristics take place synchronically? The direction of causal relationship is of vital importance since effectiveness of various economic development policies can be understood through the achievement of interactive relation between financial markets and economic growth.

The following sections of the paper gives brief literature review, analyzes selected data related to economic growth and development of financial services with different aspects such as size, depth, efficiency and activity, to capture existence and direction of relationship between finance and growth; and, ultimately, presents conclusions.

2. Literature Review

Discussion on the relationship between economic development and financial growth has been studied both theoretically and empirically. On the theoretical aspect economists such as Schumpeter (1911) emphasize the crucial role of financial systems on the process of economic development.

He suggests that an individual has to be a debtor before becoming entrepreneur. Necessary financial resources for entrepreneur's innovational investment projects can be provided through financial system. .Hereby, entrepreneurs can contribute to productivity growth that is essential for economic growth and economic development. Gurley and Shaw (1955) criticize general opinion that economic development depends majorly on real factors. They suggest that financial factors play essential role on economic development by providing useful tools such as portfolio diversification and saving mobilization. Pagano (1993) examines finance-growth nexus based on the endogenous growth theory framework of "The AK Model". He claims that growth can be affected by financial system development via three channels such as conducting transmission mechanism between savings of households and investment projects, increasing the marginal productivity of both physical and human capital and lastly by affecting aggregate saving rate.

On the empirical side, first study was practiced by Goldsmith (1969), by using annual data for the period of 1860-1963, which indicates that financial development and economic growth are positively correlated. Roubini and Sala-i Martin (1991) investigate impact of financial development on economic development through financial repression policies which aim to expand seigniorage return by increasing required reserve ratio. They found that financial repression which cause to increase required reserve ratios has contractionary effect on financial services and also economic growth. King and Levine analyze relationship between economic growth and financial development in their two studies that are practiced in the same year. King and Levine (1993a) examine finance-growth nexus through innovation and entrepreneurial activities. They conclude that development of financial system eases entrepreneurship and productivity which in turn enhance growth. King and Levine (1993b) claim that financial system development and economic growth are positively correlated. Their study is exercised based on "Creative Destruction" phenomenon and they suggest that financial system also stimulates innovation. Demetriades and Hussein (1996) investigate finance-growth link in a causal way and they find little indication of supply-leading pattern and also strong evidence related to existence of two-way causality. Levine (1997) concentrates on banking sector to measure financial development. His findings indicate that financial system development has strong positive relationship with economic growth and also financial development measures prosperous predictors of long run growth rates. Levine and Zervos (1998) claim that financial market development is positively corre-

lated with growth, capital accumulation and productivity growth. Demirgüç-Kunt and Maksimovic (1998) analyzes finance-growth link in micro level by examining constitutional-financial distinctness and their effects on outsourcing skills that sustain growth. They conclude that functioning of stock-exchange market and constitutional regulations are crucial for firm growth which establish micro components of economic growth. Filer, Hanousek and Campos (1999) suggest that there is strong and positive correlation between stock-exchange market and economic growth and supply- leading pattern exists especially in industrial countries. Beck et al. (2000) emphasize the importance of legislative system on financial market development and claim that well-regulated legal systems may enhance economic growth through developed financial markets. Positive impacts of legal systems on financial development are also emphasized by Levine, Loayza and Beck (2000). Their findings suggest that advancements in financial markets have strong positive impact on economic growth and differences in financial system development levels among countries can be explained by differences in legal arrangements and accountancy mechanisms. Calderón and Liu (2003) find supply-leading pattern in their study with their broad sample. Besides that, they conclude that there is bi-directional causality between financial development and economic growth when sample is divided into two parts as advanced and emerging countries. According to Christopoulos and Tsionas (2004), financial markets lead to growth and supply-leading pattern dominates economic structure of countries. Hassan, Sanchez and Yu (2011) suggest existence of bi-directional causal relationship between finance and growth in the short run except Sub-Saharan and East Asia Pacific. They also conclude that poorest countries follow demand-following pattern.

3. Data and Methodology

To investigate impact of financial market development on economic growth and to understand existence and direction of causal relationship Dimutrescu-Hurlin Panel Causality test is employed for Turkey and BRICS countries, namely Brazil, Russia, India, China and South Africa, for the period of 1994-2011. The availability of the data is limited, which also constitute the constraints of the paper.

Annual GDP growth rate is employed as an indicator for economic growth. Due to non-existence of a direct measure for financial development financial system is evaluated in terms of size, depth, efficiency and activity, and these data are selected through a large scale literature research. Financial

development is analyzed in two parts such as banking sector development and stock market development to investigate individual effects of two major components of financial markets. On one hand, three indicators are selected for banking development, namely; ratio of private credit by deposit banks and other financial institutions to GDP, ratio of deposit bank's assets to GDP, ratio of liquid liabilities to GDP and on the another hand two indicators, ratio of stock market capitalization to GDP and ratio of stock market value traded to GDP are selected as proxies for stock market development. Additionally, some crucial determinants of economic growth such as average years of schooling, foreign trade openness and inflation are also investigated. List of employed indicators are reported in Table 1.

Table 1: Selected Economic Growth and Financial Development Measures

Variable		**Indicator**	**Abbreviation**
Economic Growth		GDP Growth Rate	G
Financial Development	Banking Sector Development	Liquid liabilities/GDP	LLG
		Private Credit/GDP	PCG
		Deposit Banks Assets/GDP	DMCG
	Stock Market Development	Stock Market Capitalization/GDP	SMCG
		Stock Market Value Traded/GDP	SVTG
Economic Growth Determinants		Trade Openness	TRADE
		Inflation	INF
		Average Years of Schooling	SCH

Liquid liabilities divided by GDP (LLG), which is a conventional indicator of financial depth (Demetriades and Hussein, 1996), also measures the intensity of banking sector (Hassan and Sanchez, 2012) and it can be called as the broadest measure of financial intermediation services (Beck, Demirgüç-Kunt and Levine, 2010). Banking sector development is also measured by using private credit by deposit banks and other financial institu-

tions to GDP (PCG) ratio. PCG measures financial market in terms of size. It is a useful indicator for financial services level which is positively correlated with financial development (Levine, Loayza and Beck, 2000). PCG covers only the credits issued to private sector or credits issued by the private sector which means that it excludes credits related to government sector. This exclusion gives a better proxy for financial development since private sector is a better representative of growth (Calderón and Liu, 2003). Positive relationship is found between private credit and GDP growth rate (Yu, Hassan and Sanchez, 2012; Dudian and Popa, 2013; Ghali, 1999) and also negative relationship is observed between private credit and poverty (King and Levine 1993b). Third and last indicator of banking sector development is the ratio of deposit banks assets to GDP (DMCG). Households typically tend to deposit their savings in deposit banks in advanced countries. For this reason, higher ratio of DMCG refers to well-functioning of financial systems (Demetriades and Hussein, 1996). This action allows for more resources for investment which interact GDP growth. Conversely savings leak from economic system and do not turn into investment in countries with less-developed financial systems (Kar and Pentecost, 2000). Stock market development, is measured by stock market capitalization divided to GDP (SMC) ratio and stock market total value traded to GDP ratio (SVTG). SMC measures stock market size relative to total output and is positively correlated with saving mobilization and diversifying risk capacity of financial system (Demirgüç-Kunt and Levine, 1996a). SVTG measures trading volume or in other words market liquidity. In spite of higher capitalization level, trading volume may be inconclusive. For this reason, SVTG is crucial variable, because it completes the SMC (Demirgüç-Kunt and Levine, 1996a).

Annual GDP growth rate, trade and inflation data are obtained from the WDI (World Bank, World Development Indicators), financial development indicators are taken from IMF-IFS (International Money Fund-International Financial Statistics) and GFDD (Global Financial Development Database) and data resource of mean years of schooling values are from HDI (Human Development Index).

Panel unit root test is performed to check for stationarity (Pesaran and Shin, 2003) and Table 2 present the results.

Table 2: Panel Unit Root Test Results

	Level		**First Difference**	
Variables	**Sta-**	**Prob.***	**Statistic**	**Prob.***
G	-2.4481	0.0072***		
DMCG	0.4357	0.6685	-1.8208	0.0343**
LLG	2.1770	0.9853	-2.4321	0.0075***
PCG	0.0386	0.5154	-1.8119	0.0350**
SMCG	-0.4316	0.3330	-2.6393	0.0042***
SVTG	1.4225	0.9226	-4.9821	0.0000***
TRADE	0.0610	0.5243	-6.4999	0.0000***
INF	-337.463	0.0000***		
SCH	2.2713	0.9884	-7.0946	0.0000***

Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. ***, ** and * indicates statistical significance at the 1 , 5 and 10% level respectively.

Test results imply that all of the variables are stationary in Level 1, except for G and INF. In order to select an appropriate fitted panel regression model to our dataset among Pooled Regression Model, Fixed Effect Model and Random Effect Model, Redundant Fixed Effect Test and Hausman Test is conducted. Test results can be seen in Table 3 as follows.

Table 3: Redundant Fixed Effects Tests Results

	Statistic	**Probability**
Cross-section F	14.7641	0.0000***

It is founded that Fixed Effect Model is most appropriate method for our data. The estimation model, namely panel least square, is written as below:

$$G_{it} = \beta_0 + \beta_1 \Delta DMCG_{i,t} + \beta_2 \Delta LLG_{i,t} + \beta_3 \Delta PCG_{i,t} + \beta_4 \Delta SMCG_{i,t} + \beta_5 \Delta SVTG_{i,t} + \beta_6 \Delta TRADE + \beta_7 \Delta SCH + \beta_8 INF + FE_t + \varepsilon_{it}$$

Where t is the time indices from 1994 to 2011and i is the country indices for six cross-sections and FEt unobserved fixed effect indicator. Panel

corrected standard errors (PCSE) are taken into consideration to obtain robust standard errors. Hereby valid β coefficient standard errors can be obtained in the event of difference in error variances across cross-sections. Fixed Effect Panel Regression results where annual GDP growth is the dependent variable are reported in Table 4.

Table 4: Fixed Effect Panel Regression Results

	Coefficient	**Std error**	**t-statistics**	**Probability**
C	6.1249	0.5379	11.385	0.0000***
DMCG	-0.3183	0.1803	-1.7653	0.0810*
LLG	-0.3898	0.1820	-2.1416	0.0350**
PCG	0.3511	0.1011	3.4730	0.0008***
SMCG	0.0257	0.0193	1.3319	0.1863
SVTG	0.0087	0.0178	0.4896	0.6256
TRADE	0.0315	0.0674	0.4674	0.6413
INF	-0.0110	0.0204	-0.5415	0.5895
SCH	0.8440	0.7309	1.1548	0.2513
$R^2 = 0.565$ $\bar{R}^2 = 0.500$ AIC= 5.0443 SIC = 5.1596				

*** , ** and * indicates statistical significance at the 1 , 5 and 10% level respectively

It is notable that slope coefficients are cross-section invariant however intercept values may differ among countries in case of employing Fixed Effect Model. Individual intercept values can be seen in Table 5.

Table 5: Cross Section Fixed Effects

Country	**Fixed Effects**
Brazil	-1.8200
China	5.6236
India	1.5652
Russian Federation	-1.5530
South Africa	-3.4601
Turkey	-0.4469

According to panel estimation results we find that GDP growth rate has strong positive relationship with ratio of Private Credit to GDP which is statistically significant at 1% level. Slope coefficient implies that one-unit increase in of private credit-GDP ratio leads to approximately 0.35 unit increase in GDP growth rate which gives evidence that private domestic credit stimulates growth via providing funds for real sector. Ratio of liquid liabilities to GDP is significant at 5% significance level, however relationship is negative. Liquid liabilities divided by GDP slope parameter signalizes that one unit increase in liquid liabilities-GDP ratio causes 0.38 unit decrease in GDP growth rate which is consistent with the results of Saci, Giorgioni and Holden (2009). One of the important sources of inverse relationship between growth and liquid liabilities may be insufficient transmission mechanism between real sector and financial intermediaries. In other words, even though households give preference to hold their savings in bank deposits, mentioned funds have not been canalized to the real sector. Deposit bank assets divided by GDP is statistically significant at 10% level and a negative relationship is found between ratio of deposit bank assets to GDP and GDP growth. Both of the stock market development indicators stock market capitalization divided by GDP and stock market value traded divided by GDP have positive relationship with growth however they are found statistically insignificant. Potential reason of this result may arise from the notion that stock markets represent long-term features of an economy (Morck et al, 1990). Long-term investments require higher rates of savings which is scarce in emerging countries.

While trade openness and average years of schooling have positive relationship with GDP growth rate, inflation is negatively correlated with GDP

growth. However all of these controlling variables are found statistically insignificant.

Causal relationship between financial development and economic growth is also inter-relatedly and separately examined with regard to both major components of financial development by employing Dumitrescu-Hurlin Panel Causality Test. Dumitrescu-Hurlin Panel Causality Test findings for banking sector development are summarized in Table 6.

Table 6: Panel Causality Test Results Of Banking Sector Development Indicators

Null Hypothesis	**W-Stat**	$\bar{Z}$	**P-Value**
PCG Does not Homogeneously Cause G	3.0684	0.4987	0.6179
G Does not Homogeneously Cause PCG	5.3147	2.2944	0.0218**
DMCG Does not Homogeneously Cause G	2.6277	0.1465	0.8835
G Does not Homogeneously Cause DMCG	4.5517	1.6844	0.0921*
LLG Does not Homogeneously Cause G	1.9597	-0.3874	0.6984
G Does not Homogeneously Cause LLG	7.3240	3.9006	0.0001***

*** , ** and * indicates statistical significance at the 1 , 5 and 10% level respectively

Analysis results indicate that there exists unidirectional homogenous causal relationship running from growth to ratio of private credit to GDP, in another saying growth causes private credit-GDP ratio at 5% significance level. Moreover, it is possible to assert that unidirectional homogenous causal relationship is found in the direction of growth to ratio of deposit bank assets to GDP, in a nutshell economic growth homogeneously causes deposit bank assets divided by GDP at 10% significance level. Tantamount to other two banking sector development indicators ratio of liquid liabilities to GDP has unidirectional causal relationship with growth. Causal relationship between liquid liabilities divided by GDP and growth has highly significance at 1% level. Test results imply that economic growth homogeneously causes banking sector development. These results also bring evidence that Turkey and BRICS countries follow a demand-following pattern.

Dumitrescu-Hurlin Panel Causality Test results for stock market development are summarized in Table 7.

Table 7: Panel Causality Test Results of Stock Market Development Indicators

Null Hypothesis	W-Stat	$\overline{Z}$	P-Value
SMCG Does not Homogeneously Cause G	7.37643	3.94249	8.E-05
G Does not Homogeneously Cause SMCG	3.18055	0.58842	0.5563
SVTG Does not Homogeneously Cause G	3.24829	0.62946	0.5290
G Does not Homogeneously Cause SVTG	3.24864	0.62973	0.5289

*** , ** and * indicates statistical significance at the 1 , 5 and 10% level respectively

According to test results, neither ratio of stock market capitalization to GDP homogenously causes growth nor does growth homogenously cause ratio of stock market capitalization to GDP which means that there is no causal relationship between growth and stock market capitalization in granger sense. Both of the null hypotheses are accepted. Along similar lines causal relationship is not found between growth and stock market value traded divided by GDP in the short run. On the basis of Dumitrescu-Hurlin Panel Causality Test results of both indicators which measure stock market development, we can argue non-existence of causal relationship between stock market development and economic growth in the short run.

Our findings are non-contradictory with study of Beck and Levine (2004) and Levine (2002) which state that banking sector plays crucial role in the in the earlier phases of economic development in emerging countries. They also state that stock market has more accelerative role in advanced countries. Gurley and Shaw (1955) is another example of study which mention about leading role of banking system in the process of economic development.

4. Conclusion

Factors such as increasing aggregate saving and channeling them to most prospering investment projects are crucial for economic growth. Importance of understanding the link between financial development and economic growth lies beneath the fact that both of these two factors are performed substantially by financial system. Therefore finance-growth relationship is investigated on both existence and direction manners in this paper. For this purpose theoretical background and literature are examined in detail to investigate mechanisms that act as a bridge between financial system and economic growth. In addition to this, finance-growth linkage is analyzed empirically to find out existence and strength of relationship by using panel regression estimation. Economic growth is measured by using annual growth rate and financial development indicators which represent both banking sector development and stock market development are employed to discover individual effects of two major component of financial system.

Fixed Effect Panel Regression Estimation ascertains that significant positive relationship exists between banking sector development and economic growth while relationship between stock market development and economic growth are insignificant which is consistent with the widespread opinion for stock markets of emerging countries. It can be suggested that security markets of Turkey and BRICS countries will develop and flourish as economies develop. Economic disincentives which restrain developing of stock markets should be eliminated. Moreover stock market development should be supported by arranging tax and legal regulations. In this way it is able to stimulate economic growth at that advanced countries. On the other hand, panel estimation results show that banking sector development indicators, namely, assets of deposit banks, liquid liabilities and credits issued to private sector are found significant. Deposit bank assets and liquid liabilities are negatively correlated with economic growth rate while private credit is positively. It implies that credits issued to private sector is stimulating economic growth, however financial intermediary institutions are inadequate to turning deposits into investment. In these circumstances financial transmission should be improved by policy implementations. Herewith negative impact of deposit bank assets and liquid liabilities may be reoriented and support growth through several ways as credit market that already positively linked to economic growth.

Determining existence and direction of causal relationship is another key factor to regulate constructive policy implications. For this reason Dumitrescu-Hurlin Causality Test is performed. Test findings indicate existence of unidirectional banking sector development-economic growth relationship running from economic growth to banking sector development and non-existence of causal relationship between stock market development and economic growth which are consistent with panel estimation results. According to causality test, advancement in financial markets in Turkey and BRICS countries is outcome of increasing demand for financial services in real sector. In another saying Turkey and BRICS economies follow demand-following pattern. For this reason, economic growth stimulating policy implications should be discussed with priority. By this way, economic development may proceed faster thanks to interaction between financial market and growth.

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