

Financial Development and Economic Growth Nexus in Emerging European Economies: New Evidence from Asymmetric Causality

Selim Yıldırım

Anadolu University, Department of Economics, Eskişehir, Turkey.
Email: selimy@anadolu.edu.tr

Bilge Kağan Özdemir

Anadolu University, Department of Economics, Eskişehir, Turkey.
Email: bilgeko@anadolu.edu.tr

Burhan Doğan

Anadolu University, Department of Economics, Eskişehir, Turkey.
Email: burhand@anadolu.edu.tr

ABSTRACT: The interplay between the development of financial markets and economic growth is either undermined or considered to be debilitating for the economic performance after the recent global credit crisis. Such economic situations may arise due to the asymmetry of the relation between financial markets and the economic activity as a whole. This study investigates the relation between financial development and economic growth from the asymmetry perspective within the emerging European economies. Financial development is measured with two different indicators to capture the different dimensions of the financial system. The results show the direction of causality depends on the indicators that are opted to represent the financial development. Furthermore, the relation between financial development and economic growth exhibits differences among emerging European economies despite these economies has similar structural features. Finally, causal relation is more prominent from the direction of negative economic growth shocks to negative financial development.

Keywords: Financial development; economic growth; asymmetric causality; emerging Europe.

JEL Classifications: G18; G21; O52

1. Introduction

The causality between the finance and growth is one of the intensely discussed issues in economics literature. One of the main reasons behind discussions is its relation to financial regulation-deregulation debate. Therefore policy implications of the topic made it a popular item in many research agendas. Beside the discussions on the interactions between economic growth and financial development, the financial crises, for which 2008 is a recent example, hints at the possible existence of asymmetric impacts in this relation. This study attempts to identify the asymmetric impact of economic growth and financial development on each other.

This study focuses on the economic growth and financial development nexus in emerging European economies with regard to the possibility of asymmetry in the causal relation. The analysis covers the new member states of the EU (Bulgaria, Hungary, Latvia, Lithuania, Poland and Romania), candidate and potential candidates of the EU (Croatia, and Turkey, Russia and Ukraine). The asymmetry is investigated through, the asymmetric causality test, developed by Hatemi-J (2012a, b).

The contributions of this study to the empirical literature are as follows: The asymmetric causality test, used in this study, is a new research method in the economic growth and financial development relation literature. This methodology distinguishes the impact of positive and negative shocks of one series to the other. Best of knowledge, there is not such study available about the Emerging Europe countries. In addition, two different financial development indicators have been used in this study in order to determine the impact of financial development on the economic growth depending on the multi-dimensional nature of financial development. Finally, the period of 1990-2012, that our analysis covers, is another important point which this study contributes to. Since this

period cover the transition from centrally planned economies to market economies, that is still in progress for some of the emerging Europe countries.

The remaining parts of our study are structured as follows: In section two, the development of financial sector is outlined in the Emerging European economies. In section three, a brief review of literature on financial development and economic growth nexus is presented. In the fourth section, the data and empiric methodology is introduced. The empiric results are presented in the section five and finally the study is concluded with policy implications and related further study topics.

2. Overview of Financial Development in Emerging Europe

The emerging European economies have distinctive features among the developing economies. They are geographically close to each other; is building an institutional structure similar that of the developed Western European countries; and many of those countries are the European Union members. These countries had a period of the transition from centrally planned economic system to the market based economic system through 1990's, with the exception of Turkey. Another important feature of the emerging Europe countries is the gradual but encompassing integration with the rest of the world. Gill et al. (2012) argued that the economic and commercial relationship of Emerging Europe region have been integrated not only to the Western European economies but to the remaining economies of the world. The transition period left those economies with a human capital stock in need of the new knowledge and skills. Thus, revealed the necessity to restructure the industrial sector and to rebuild many institutions that did not exist in the centrally planned economies or were non-functional.

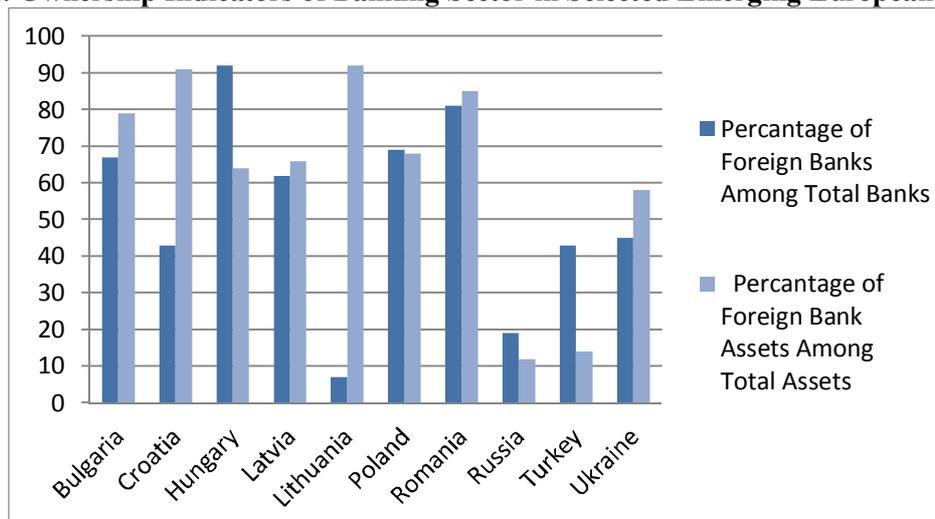
Kolev and Zwart (2013) indicate that with regard to restructuring the industrial sector and regaining the inactive capital stock, the need for finance and banking sector have increased in these economies. As a result the financial system and legal structure related to finance are some of institutions exhibiting the most significant changes during the transition period. At the beginning of the transition period, the banking sector had been managed with a relatively low expertise level and had only played a small role within the economic activity.

As a result of the privatization process from the beginning of 1990's, the share of private sector has increased consistently in GDP during the past two decades. Similar development has also occurred in the finance sector. Those countries that had a restricted financial system only by the beginning of 1990s have covered an important distance regarding the financial development during the past two decades. However, as shown in Zoli (2007) the financial development level exhibits strong differences across the emerging European economies and the process for creating a diversified and matured system is not completed yet.

Due to this non-completion of the financial development, the bank credits maintain their feature of being the cornerstone of financial intermediation in the emerging European economies, where non-bank financial sector, has begun to develop recently. The problems related to the expertise, modern banking applications and accessing to the new capital sources that were missing until the beginning of 2000s have been coped with the entrance of Western banks to the region. Meanwhile, the foreign banks in the region have also made contributions such as easy accessing to the credit, customer centered service culture, introducing risk management techniques and many new banking products in the emerging Europe countries (Kolev and Zwart, 2013). Two main indicators related to the activity levels of foreign banks in the Emerging European countries are shown in the Figure 1. When we disregard Russia, as the percentage of foreign banks within the total banking system in the remaining Emerging Europe countries is between 43% and 92%, the percentage of properties of the foreign banks within the properties of total banking sector in the countries, except Russia and Turkey, is between 58% and 91%.

The capital structures of foreign owned banks in the emerging European economies were stronger and the banking services based on the bank deposits have showed the significant developments upon such banks took gradually more place in the markets as shown in Naaborg and Scholtens (2006). Except Czech Republic, Hungary, Romania and Bulgaria, the credit from foreign bank had been higher compared to domestic banks in the region. Despite their positive impact on the economies of emerging Europe, Sirtaine and Skamnelos (2007) have argued that the increasing amounts of credit from the foreign banks had increased the financial fragility and left the region more vulnerable to crisis.

Figure 1. Ownership Indicators of Banking Sector in Selected Emerging European Countries



Source: Claessens and van Horen (2012)

The amount of bank system-sourced credits in this region as well as in the Baltic countries had gradually increased during the period of 2002-2007. Deleveraging have observed at the significant level during the post-2007 period (Brown and Lane, 2011). The fundamental financial development indicators of Emerging European economies are given in the Table 1. In order to make comparison in this table, the financial development indicators from the different zone of the world such as European Union, Euro Zone, and Developing Latin American and East Asian and Pacific economies are also provided. The values of the domestic credit provided by banking sector and Bank credit to private sector variables, which we use in order to point out the role that banking sector plays in the economy, show a significant increasing in the Emerging Europe zone recently. Evaluation of this results suggest that even though the value of such variables is significantly lower than in the developed countries, it is higher than in the Latin American Emerging economies.

Table 1. Financial Depth and Efficiency in Selected Emerging European Countries (2012)

	Domestic Credit Provided by Banking Sector (%of GDP)	Domestic credit to private sector (% of GDP)	Broad Money (M2) (as % of GDP)	Market capitalization of listed companies (% of GDP)	Stocks traded, turnover ratio (%)
<i>Bulgaria</i>	71,4	72,1	75,6	15,4	4,1
<i>Croatia</i>	90,3	73,8	72,9	34,9	4,1
<i>Hungary</i>	75,8	65	63,7	13,4	83,9
<i>Latvia</i>	79,3	82,7	47	3,8	4,4
<i>Lithuania</i>	57,5	53,7	47,6	9,5	5
<i>Poland</i>	66,2	55	58	26,9	58,4
<i>Romania</i>	52	42,8	37,3	11,2	11,9
<i>Russia</i>	39,5	46,8	52,7	42,9	127,3
<i>Turkey</i>	69,2	50	54,7	26	162,7
<i>Ukraine</i>	73,4	55,9	52,1	15,5	14
<i>East Asia & Pacific (developing only)</i>	132,4	115,3	159,3	50,6	154,37
<i>Latin America & Carib. (developing only)</i>	68,45	44,7	54,5	41,2	46,4
<i>Euro Area</i>	153,5	131,8	173,5	42,5	109,5
<i>European Union</i>	156,6	135,9	159,9	53,1	103,2
<i>OECD Members</i>	202,1	154,8	137,4	75,6	139,8

Source: The World Bank-World Development Indicators; IMF-International Finance Statistics.

The non-bank financial sector in emerging Europe is quite far from being diversified and deep throughout the entire region (Zoli, 2007; Syriopoulos, 2007; Sirtaine and Skamnelos, 2007). In return, the development of stock market shows differences within the region. As there are countries that have relatively developed stock markets such as Czech, Hungary, Turkey and Poland on the other side,

there are other countries whose markets have not developed adequately such as Latvia, Lithuania and Croatia on the other side (IMF, Regional Outlook, 2011). When we look at the region in general, we may see that the bond markets are effective only in Czech Republic, Hungary, Poland, Turkey and Russia, not in other economies (Szilagyi et al., 2003). These differences in stock market development throughout the region can be observed by the stock market traded turnover ratio and market capitalization ratio given in Table 1. As shown with the values in the Table 1, we see that there are countries that Stock traded turnover ratio is as low as about 4 percent in the Emerging Europe countries.

Other finance institutions such as pension funds, mutual funds and insurance companies have begun to emerge recently. We see that the pension funds' assets are higher in the countries where they implement the pension funds and regulatory applications previously than in the entire region. For example, the percentage of pension funds' properties in Croatia, Hungary and Poland in the GNP is even higher than in the countries such as Germany and Italy. The percentage of mutual funds in GDP is generally lower than 5 percent in the scope of Emerging Europe. Similarly, the percentage of insurance premiums in GDP is lower than 2 percent except Croatia, Czech, Hungary, Poland and Slovenia (Zoli, 2007).

To sum up, the main source of the finance in this region is still the banking sector. Additionally the growth observed in the stock market, is also important in this region. Even though the stock markets continue to grow fast throughout the region, those markets are not adequately stable yet (Niemczak, 2010). Finally, it should be mentioned is that despite of positive reforms in the finance markets, the capital outflows, which have started, especially since August 2007 and have accelerated in September 2008, increase the fragility in the financial systems of emerging Europe economies. The acceleration observed in the capital outflow during that period, has increased the fragility especially in Belarus, Georgia, Hungary, Latvia, the Kyrgyz Republic, Romania and Ukraine and has forced those countries to apply for IMF assistance (Connolly, 2009).

3. The Relationship between Finance and Economic Growth and a Brief Review of Literature

The direction of causality between the financial development and economic growth has always been an important discussion subject. Patrick (1966) pointed out that the direction of causality between these two variables might be from economic growth toward the financial development (demand following hypothesis) or from financial development toward the economic growth (supply leading hypothesis) depending on the growth level. According to Patrick (1966) the supply-leading hypothesis may be dominant at the initial stage of economic growth, while at the later stages the demand following hypothesis may become more prominent. On the other hand, there are views which suggest that there is no relationship between the economic growth and financial development (Lucas, 1998; Stern, 1989; Chandavarkar, 1992; Qayyum, et al., 2012)

According to those who advocate the finance-led growth view, the financial development has generally an affect to revive the economic growth (Schumpeter, 1911; McKinnon, 1973; Shaw 1973; King and Levine 1993a, b; Levine 1997). The deep, liquid, diversified and stable financial markets enable the efficient distribution of funds and diversifying the risks, thus create a positive impact on the long-term economic growth. In addition the strength of domestic financial markets creates the sources, which will minimize the effect of fluctuations in the international capital flows on the public and private sectors.

When we look at the recent empiric studies that advocate the necessity of development of the financial structure in order to achieve the economic growth, Levine et al. (2000), used a sample of 74 developed and less developed countries for the period 1960 to 1995. They included the instrumental variables like legal rights of creditors, the soundness of contract enforcement and the level of corporate accounting standards in their analysis. Their findings supported the positive correlation between financial system and economic growth. Hussain and Chakraborty (2012) employed the method of Principal Component to construct a financial depth indicator (IFD) that serves as a proxy of financial development and found that the causality works from financial structure toward the economic growth and therefore, the financial reform policies had the feature which increases the economic growth and became the leader in their study related to Assam, a state of India. Abu-Bader and Abu-Qarn (2006) examined this relationship for six Middle Eastern and North African countries (Algeria, Egypt, Israel, Morocco, Syria, and Tunisia), within a quadivariate vector autoregressive

framework. Their empirical results strongly support the hypothesis that finance leads to growth in five out of the six countries. Christopoulos and Tsionas (2004) used threshold cointegration tests, and dynamic panel data estimation for a panel-based vector error correction model for 10 developing countries. Their empirical results provided support for the unidirectional causality from financial depth to growth. Jaffe and Levonian (2001) examine the relationship in 23 transition economies using cross sectional data. They find a positive and statistically significant relationship between bank sector development and economic growth. Besides, they find a positive and statistically significant relationship between bank sector reforms and economic growth. Ibrahim and Shuaibu (2013) investigate finance-growth nexus for Nigeria using the bounds testing approach to cointegration and Toda-Yamamoto approach to Granger causality test. Their empirical results show that financial development has a significant impact on economic growth in the short and long run and financial development granger causes growth. Ozturk (2008) found two way causality (bidirectional) between financial development and economic growth for Turkey.

Those, who advocate the growth-driven finance view, provide the development of real economy would lead the development of the modern finance institutions and financial services (Robinson, 1952; Gurley and Shaw, 1967; Goldsmith, 1969; Jung, 1986). From this perspective, the expansion in the real sector of the economy creates demand for new financial instruments and thereby the financial sector effectively responds to this demand. When we look at the recent empirical studies advocating that as long as the economic growth occurs, the financial development will increase; Zang and Kim (2007) used panel analysis to examine 74 countries over the period 1961- 1995. Using Sims–Geweke causality tests the study found a substantial indication that economic growth precedes subsequent financial development. Al-Malkawi et al. (2012) using ARDL in the outward-oriented economies of United Arab Emirates covering the period of 1974-2008, show the negative and significant relationship between the economic growth and financial development level. Zhang (2001) has used the time series and panel data for 8 eastern and Far East countries (China, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore and Thailand) in his study which he searched the answer to if financial development provides the economic growth after the financial crises in Eastern and Southeastern Asia. The estimating results of this study do not support the view that financial development promotes economic growth for East Asian economies. Finally, Ndlovu (2013) finds existence of demand following financial development in Zimbabwe.

Some studies have obtained the evidences that there might be an interaction in both direction, hence, financial development helps economic growth and economic growth helps to develop financial systems. Berthelemy and Varoudakis, 1995; Demetrades and Luintel 1996). The two directional causality has been found for many regions in the studies by Al-Yousif (2002) using both time-series and panel data from 30 developing countries for the period 1970–1999 strongly support the view that financial development and economic growth are mutually causal. Hassan et al. (2011) estimated both panel regressions and variance decompositions of annual GDP per capita growth rates to examine what proxy measures of financial development are most important in accounting for economic growth. They found a two-way causality relationship between finance and growth for most regions and one-way causality from growth to finance for the poorest regions, i.e.; Sub-Saharan Africa and East Asia & Pacific.

4. Methodological Issues

4.1. Data Description and Transformation

One of the problems that is encountered in the studies, which review the causality between financial development and economic growth, is to find a suitable variable which will represent the financial development. There is no single empiric indicator which defines the financial development. In literature, various indicators, which represent the different aspects of financial development, are used. Since the stock and bond markets in the Emerging European economies haven't developed adequately, the effect of those markets on the economic growth is not discussed in this study, but only two different indicators, representing the activities and mediating dimension of banking sector, are used. Those indicators are M2 to GDP (denoted by FD1) and Liquid liabilities to GDP (denoted by FD2), respectively. The economic growth is achieved based on the real GDP changes that each economy, which is included in the sampling, shows.

Data were collected from the International Financial Statistics of the International Money Fund (IMF). Quarterly data is used for 10 countries that are selected among the Emerging European countries depending on the data restrictions. 10 countries are as follows: Bulgaria, Croatia, Hungary, Latvia, Lithuania, Poland, Romania, Russia, Turkey, and Ukraine. The analysis period at the initial stage of study is targeted the period between the beginning of 1990 and end of 2012. However, the data from each country covers the different time intervals depending on the data restrictions. It is shown which data, used for each country, covers which period in the Chapter 5 that the estimated results obtained from our study are indicated. All variables are transformed by natural logarithm.

4.2. Asymmetric Causality

Granger causality investigates whether one series has explanatory power on the future values of another series. Although it provides useful information on the relation among various time series the impact of negative and positive values on the future values of the other series may differ in absolute terms. In consideration of this, Hatemi-J (2012a) introduces an asymmetric causality test which is based on Granger and Yoon's (2002) study on asymmetric cointegration test and Hacker and Hatemi-J's (2012) study on bootstrap distribution in lag augmented causality with endogenous lag selection, which in turn is based on Toda and Yamamoto(1995).

Toda and Yamamoto (1995) propose augmenting the lag of the vector autoregressive (VAR) model utilized in the granger causality with the maximum order of integration among the series for which the causality is tested. In other words rather than using VAR (p), where p is the optimal lag of the model, they suggest using VAR($p+d$), where d is the maximum of the integration order of pertinent series. Hacker and Hatemi-J (2006) first elaborate the Toda-Yamamoto approach by addition of bootstrap then further elaborate it (Hacker and Hatemi-J 2012) by endogenizing the lag length selection.

All studies mentioned earlier consider the causal impact of positive and negative shocks to be symmetric. In order to address this, Hatemi-J (2012a, b) and Hatemi-J and Uddin (2012) promote the idea of separating series into two, below and above a threshold value, propound by Granger and Yoon (2002). For any series x_j , where $j \in \{1, 2\}$, Granger and Yoon (2002) consider the series to be random walks:

$$x_{j,t} = x_{j,t-1} + \varepsilon_{j,t} = x_{j,0} + \sum_{i=1}^t \varepsilon_{j,i} , \quad (1)$$

then, for the threshold value, namely k defines the observations above this threshold as $\varepsilon_{j,i}^+ = \max\{\varepsilon_{j,i}, k\}$ and below this threshold as $\varepsilon_{j,i}^- = \min\{\varepsilon_{j,i}, k\}$. Similarly Hatemi-J (2012a) separate the series around the threshold of zero. Thus the series under investigation is considered as in eq.(1) and positive values becomes $\varepsilon_{j,i}^+ = \max\{\varepsilon_{j,i}, 0\}$ and negative shocks values $\varepsilon_{j,i}^- = \min\{\varepsilon_{j,i}, 0\}$. The positive shock is the accumulation of $\varepsilon_{j,i}^+$ values, such that $x_{j,i}^+ = \sum \varepsilon_{j,i}^+$. The negative shock, $x_{j,i}^-$, is also defined in cumulative form: $x_{j,i}^- = \sum \varepsilon_{j,i}^-$. Finally the binary combinations of the positive and negative shocks are employed instead of the original series in the aforementioned methodology developed Hacker and Hatemi-J (2012).

5. Empirical Results

In our study, we employed an asymmetric causality test based on stationary Toda-Yomamoto approach which doesn't require any pre-testing procedure. However, we apply the unit root test to observe the main dynamics of the series. Unit root tests examine the order of integration of data in the long run. If the series is non-stationary and its first difference is stationary, it is said to have a unit root in its characteristic equation. We use Augmented Dickey Fuller (ADF) and Kwiatkowski–Phillips–Schmidt–Shin (KPSS) tests since they are the commonly used method to test the presence of unit roots. While the null hypothesis of the ADF test is unit root, the null hypothesis of KPSS test is stationarity. The results of the unit root tests for all variables are presented in Table 2. The rejections of null hypothesis for each series are depicted by asterisks in the table. The results show that most of the series is non-stationary when the variables are defined in terms of levels. First differencing the series removed the non- stationarity in all series, concluding that all series are integrated of order one.

Table 2. ADF and KPSS Unit Root Test Results

	Var.	Period	ADF			KPSS	
			None	Drift	Trend	Drift	Trend
Bulgaria	fd1	1997Q1-2012Q3	-0.278372 (4)	-1.390975 (4)	-10.20510*** (4)	0.848313 (6)	0.136398 (5)*
	fd2	1996Q4-2009Q2	-1.206273 (8)	-1.118287 (8)	-4.540878*** (10)	0.358347 (6)**	0.228702 (6)**
	eg	2000Q2-2012Q3	1.188730 (4)	-1.489224 (4)	-1.218866 (4)	0.962363 (5)	0.146936 (9)**
Croatia	fd1	2003Q2-2012Q3	1.586846 (5)	-0.472719 (5)	-2.405470 (5)	0.793628 (5)	0.100807 (10)
	fd2	1998Q4-2009Q1	3.238336 (9)	1.357073 (9)	-5.185060*** (7)	0.827556 (5)	0.149557 (5)**
	eg	2000Q2-2012Q3	0.383777 (4)	-1.717799 (4)	-0.860762 (4)	0.818097 (5)	0.240786 (5)***
Hungary	fd1	1996Q2-2012Q3	1.042538 (4)	-0.747988 (4)	-2.221972 (4)	0.975143 (6)	0.208833 (5)**
	fd2	1996Q2-2009Q2	1.350593 (4)	0.473194 (4)	-3.499672** (4)	0.916115 (6)	0.210382 (3)**
	eg	1996Q3-2012Q3	1.819662 (5)	-2.177021 (5)	-0.116705 (5)	1.006132 (6)	0.267787 (5)***
Latvia	fd1	2005Q3-2012Q3	0.629749 (6)	-2.807806** (4)	-4.713705*** (5)	0.603990 (4)*	0.107632 (3)
	fd2	1995Q1-2009Q2	-0.049592 (5)	0.355669 (10)	-3.943296** (4)	0.920703 (6)	0.156564 (6)**
	eg	1991Q2-2012Q3	0.492108 (4)	-1.509159 (4)	-3.440813* (4)	0.806254 (7)	0.174082 (6)**
Lithuania	fd1	1998Q1-2012Q3	-0.395665 (4)	-2.010329 (4)	-0.528374 (4)	0.985266 (6)	0.257107 (5)***
	fd2	1994Q2-2009Q2	-0.999714 (4)	-0.495056 (4)	-2.219630 (4)	0.813830 (6)	0.247312 (6)***
	eg	2000Q2-2012Q3	0.998010 (4)	-1.719654 (4)	-2.389406 (4)	0.780428 (6)	0.208326 (5)**
Poland	fd1	1999Q2-2012Q3	1.824100 (9)	0.605714 (9)	-2.960822 (8)	0.939917 (6)	0.125577 (5)*
	fd2	1996Q2-2009Q2	0.207913 (4)	0.297819 (4)	-1.771709 (4)	0.877082 (6)	0.130534 (5)*
	eg	1996Q2-2011Q3	3.139344 (4)	-0.357746 (4)	-2.250803 (4)	1.059099 (6)	0.386491 (54)
Romania	fd1	2003Q1-2012Q3	-0.239648 (4)	-1.202482 (4)	-1.739687 (4)	0.770648 (5)	0.204073 (24)**
	fd2	1998Q2-2009Q2	-1.241296 (4)	0.614911 (10)	-6.411682*** (8)	0.816268 (5)	0.209971 (5)**
	eg	2000Q3-2012Q3	2.040119 (5)	-1.791433 (5)	-0.228808 (5)	1.092754 (4)	0.142213 (18)*
Russia	fd1	1996Q3-2012Q2	-0.730556 (4)	-0.025167 (5)	-3.662960** (4)	0.998876 (6)	0.171479 (6)**
	fd2	1995Q4-2008Q4	-1.758645* (6)	0.924143 (6)	-2.548126 (6)	0.930880 (6)	0.143279 (5)*
	eg	1996Q4-2010Q4	2.562280 (6)	-0.299440 (6)	-3.167708 (4)	0.974748 (6)	0.159769 (4)**
Turkey	fd1	1991Q2-2012Q3	-0.841265 (8)	-0.312674 (8)	-2.210541 (8)	1.003543 (7)	0.279366 (7)***
	fd2	1990Q2-2009Q2	-1.367355 (4)	-1.027762 (4)	-1.814338 (4)	0.593883 (6)**	0.194028 (6)**
	eg	1999Q3-2012Q3	2.035751 (5)	-0.298535 (5)	-2.969886 (4)	0.917717 (6)	0.077106 (5)
Ukraine	fd1	1998Q2-2012Q3	-0.325702 (4)	-1.370362 (4)	-0.780339 (4)	0.996839 (6)	0.195056 (5)**
	fd2	1998Q2-2009Q3	1.139090 (4)	1.499451 (6)	-3.243925** (4)	0.957949 (5)	0.094112 (4)
	eg	2000Q2-2012Q3	0.428746 (4)	-1.754263 (4)	-0.875906 (4)	0.834360 (5)	0.240415 (5)***

*, **, *** denote rejection of null hypothesis at the %1, %5, %10 level respectively.

The directions of asymmetric causality between financial development indicators and economic growth are given in Table 3 and Table 4. We use broad *measure of money stock to GDP ratio* (M2 to GDP) as the first financial development indicator in Table 3 namely “*fd1*”. We use this indicator as a proxy of the size of indirect finance. This simple indicator helps us to measure the degree of monetization in an economy and it is expected that the increases in M2 would be higher than GDP growth if financial deepening is occurring. The second financial development indicator, *fd2*, in our study is *Credits to Private Sector to GDP ratio*. We use this indicator as a proxy of the activity of indirect finance. It is assumed that there will be increases in investment and productivity with the extended loans directed to the private sector.

At first glance, the impact of economic growth on financial development is more prominent. This pattern can be interpreted under the context of supply leading hypothesis. Further elaboration indicate it is commonly observed that causality runs from negative growth shock to negative shocks in financial development. However, this causal relation does not hold in Ukraine and Russia for either of the financial development indicator.

Table 3. Asymmetric Causality Test Results between the First Financial Development Indicator and Economic Growth

		$fdI^+ \neq eg^+$	$fdI^- \neq eg^-$	$fdI^+ \neq eg^+$	$fdI^- \neq eg^-$	$eg^+ \neq fdI^+$	$eg^- \neq fdI^-$	$eg^+ \neq fdI^+$	$eg^- \neq fdI^-$
Bulgaria 1999.01-2012.03	test value	1.072 (6)	2.023 (5)	1.368 (5)	35.132 (5)	4.187 (6)	22.716 (5)	6.420 (5)	8.704 (5)
	Bstr. CV at 1%	38.042	23.712	21.700	40.604	50.993	35.294	31.789	24.162
	Bstr. CV at 5%	20.003	13.649	13.346	24.870	25.352	22.017	19.792	13.720
	Bstr. CV at 10%	14.911	10.145	10.014	19.399	18.191	17.393	15.459	10.316
Croatia 2001.04-2012.03	test value	16.365 (3)	0.367 (6)	4.000 (5)	4.067 (5)	163.306 (3)	90.729 (6)	3.169 (5)	20.066 (5)
	Bstr. CV at 1%	13.079	479.799	50.496	48.453	14.290	478.543	50.678	40.817
	Bstr. CV at 5%	7.092	88.608	22.989	22.446	7.487	104.712	23.038	19.557
	Bstr. CV at 10%	4.997	41.866	15.900	15.425	5.308	53.759	15.682	13.383
Hungary 1995.01-2012.03	test value	3.896 (6)	33.120 (5)	4.963 (6)	17.856 (6)	9.722 (6)	5.273 (5)	14.236 (6)	15.777 (6)
	Bstr. CV at 1%	22.986	18.833	22.664	38.865	28.875	33.336	33.648	23.428
	Bstr. CV at 5%	14.158	11.584	14.813	26.185	19.409	22.469	21.792	14.875
	Bstr. CV at 10%	11.073	9.224	11.534	20.777	15.430	18.424	17.340	11.586
Latvia 2003.03-2012.03	test value	26.003 (6)	11.415 (6)	14.627 (6)	13.696 (6)	3.052 (6)	27.095 (6)	16.704 (6)	1.932 (6)
	Bstr. CV at 1%	37.980	33.507	25.864	33.538	24.337	26.515	39.654	25.203
	Bstr. CV at 5%	24.843	22.205	16.797	21.946	15.891	17.136	24.423	15.866
	Bstr. CV at 10%	19.865	17.922	13.155	17.447	12.530	13.826	19.325	12.219
Lithuania 1999.01-2012.03	test value	4.323 (5)	3.272 (5)	2.173 (6)	5.310 (6)	11.229 (5)	30.414 (5)	1.143 (5)	2.591 (5)
	Bstr. CV at 1%	25.208	22.670	40.646	38.613	28.361	26.382	25.932	28.385
	Bstr. CV at 5%	14.561	13.412	21.131	21.086	17.541	14.804	15.058	16.093
	Bstr. CV at 10%	10.966	10.203	15.259	15.359	13.218	11.350	11.393	12.082
Poland 1996.04-2012.03	test value	9.446 (5)	12.092 (6)	8.599 (6)	10.974 (6)	1.265 (5)	19.447 (6)	10.389 (5)	3.115 (5)
	Bstr. CV at 1%	20.645	27.001	27.983	35.434	25.759	42.730	24.686	20.928
	Bstr. CV at 5%	12.769	17.044	16.617	21.342	15.663	25.324	14.969	13.166
	Bstr. CV at 10%	9.724	12.589	12.709	16.199	12.081	19.884	11.651	10.117
Romania 2001.04-2012.03	test value	1.130 (5)	3.335 (5)	2.928 (5)	14.774 (5)	63.501 (5)	8.348 (5)	9.682 (5)	2.596 (5)
	Bstr. CV at 1%	39.359	50.547	44.146	55.664	60.647	57.518	59.497	43.760
	Bstr. CV at 5%	18.493	21.818	20.484	26.496	29.493	27.537	27.974	20.307
	Bstr. CV at 10%	13.116	14.924	14.015	18.220	20.359	19.165	19.434	13.891
Russia 1995.02-2010.04	test value	8.071 (6)	5.412 (5)	4.123 (6)	16.376 (6)	23.974 (6)	6.093 (5)	11.897 (6)	0.946 (6)
	Bstr. CV at 1%	31.554	19.554	28.635	27.988	39.913	20.728	30.035	29.490
	Bstr. CV at 5%	19.006	12.195	16.516	16.940	24.803	12.777	19.612	18.272
	Bstr. CV at 10%	14.371	9.194	12.398	12.830	18.918	9.910	15.088	14.363
Turkey 1998.01-2012.03	test value	11.554 (6)	6.211 (4)	9.987 (6)	22.106 (6)	16.802 (6)	26.150 (4)	13.606 (4)	4.357 (4)
	Bstr. CV at 1%	32.753	17.157	32.639	40.734	35.165	17.819	19.121	15.912
	Bstr. CV at 5%	18.770	9.906	18.698	22.641	20.299	11.039	11.587	9.739
	Bstr. CV at 10%	13.677	7.506	13.876	17.382	15.265	8.357	8.783	7.552
Ukraine 1999.01-2012.03	test value	1.799 (3)	15.144 (5)	24.196 (5)	6.133 (5)	25.328 (3)	8.636 (5)	0.041 (6)	0.679 (6)
	Bstr. CV at 1%	11.936	24.464	22.610	22.124	11.826	21.875	37.282	51.996
	Bstr. CV at 5%	6.885	13.787	13.338	13.097	6.981	12.207	19.718	26.976
	Bstr. CV at 10%	5.053	9.901	9.933	9.795	5.092	9.503	14.487	19.358

Table 4. Asymmetric Causality Tests between the Second Financial development Indicator and Economic Growth

		$fd2^+ \neq eg^+$	$fd2^- \neq eg^-$	$fd2^+ \neq eg^+$	$fd2^- \neq eg^-$	$eg^+ \neq fd2^+$	$eg^- \neq fd2^-$	$eg^+ \neq fd2^+$	$eg^- \neq fd2^-$
Bulgaria 1995 Q1-2009 Q2	test value	0.180 (6)	6150.003 (6)	6.148 (6)	76.311 (6)	77.125 (6)	0.412 (6)	1801.630 (6)	6.925 (6)
	Bstr. CV at 1%	20999.067	20092.024	16284.097	26205.101	27920.766	36309.168	33616.154	20299.299
	Bstr. CV at 5%	972.829	842.237	872.025	1146.306	902.721	1190.557	972.883	861.146
	Bstr. CV at 10%	229.173	220.598	245.041	241.944	218.573	277.344	241.502	221.654
Croatia 1999 Q1-2009 Q1	test value	11.191 (3)	18.557 (5)	144.159 (5)	7.008 (5)	3.653 (3)	46.851 (5)	4.414 (5)	0.707 (5)
	Bstr. CV at 1%	15.665	133.052	116.176	147.691	15.589	98.508	97.492	97.676
	Bstr. CV at 5%	8.619	39.261	36.558	49.647	8.591	30.633	33.554	30.863
	Bstr. CV at 10%	6.069	22.516	21.570	29.789	5.940	18.540	19.798	18.878
Hungary 1995 Q1-2009 Q2	test value	3.781 (6)	17.974 (6)	8.594 (6)	10.095 (6)	6.859 (6)	21.796 (6)	10.875 (5)	9.919 (5)
	Bstr. CV at 1%	32.710	31.634	30.285	34.726	53.528	42.833	32.423	21.813
	Bstr. CV at 5%	18.140	17.970	17.146	21.172	31.936	24.559	20.261	13.475
	Bstr. CV at 10%	13.368	13.662	13.079	15.743	24.556	18.477	16.308	9.875
Latvia 1995 Q3-2009 Q2	test value	15.942 (3)	4.282 (6)	3.560 (5)	8.943 (5)	0.648 (3)	4.226 (6)	22.017 (5)	3.227 (5)
	Bstr. CV at 1%	11.433	25.432	20.619	19.749	15.188	25.160	24.373	19.913
	Bstr. CV at 5%	6.841	15.346	12.114	12.384	9.001	15.210	16.133	12.540
	Bstr. CV at 10%	5.147	11.856	9.337	9.350	6.559	11.812	12.833	9.766
Lithuania 1999 Q1-2009 Q2	test value	1.924 (4)	1.566 (6)	32.423 (6)	39.189 (6)	17.980 (4)	3016.734 (6)	9.329 (6)	6.486 (6)
	Bstr. CV at 1%	23.677	28436.894	26471.025	23811.082	25.518	36767.111	19151.35	17569.67
	Bstr. CV at 5%	11.638	1228.385	1031.202	907.534	12.808	1239.775	1225.664	835.922
	Bstr. CV at 10%	8.327	317.854	287.015	244.002	8.962	299.117	282.013	207.083
Poland 1995 Q1-2009 Q2	test value	83.917 (6)	9.668 (6)	0.312 (5)	6.390 (5)	7.645 (6)	42.895 (6)	5.311 (6)	44.960 (6)
	Bstr. CV at 1%	28.891	30.819	19.208	22.267	28.066	37.285	32.981	29.887
	Bstr. CV at 5%	16.912	17.315	12.364	13.894	16.715	22.295	19.629	16.436
	Bstr. CV at 10%	12.873	13.043	9.224	10.724	12.706	16.732	14.788	12.112
Romania 1999 Q1-2009 Q2	test value	55.544 (6)	10.304 (6)	2.109 (5)	5.556 (5)	35.956 (6)	586.093 (6)	5.376 (5)	28.745 (5)
	Bstr. CV at 1%	20821.493	34556.206	62.457	62.509	28948.900	34003.548	71.917	65.531
	Bstr. CV at 5%	1073.959	973.721	25.099	25.954	1124.534	1257.731	28.558	25.394
	Bstr. CV at 10%	261.573	253.558	16.244	17.148	291.242	306.354	18.311	16.742
Russia 1995 Q1-2008 Q4	test value	11.516 (6)	1.163 (5)	0.355 (2)	0.528 (2)	7.002 (6)	2.626 (5)	3.240 (5)	3.380 (5)
	Bstr. CV at 1%	41.513	22.573	10.314	8.155	36.769	25.206	27.16	23.248
	Bstr. CV at 5%	22.635	13.37	4.986	4.462	20.897	14.752	16.301	13.267
	Bstr. CV at 10%	16.594	10.059	3.289	2.924	15.265	11.229	12.432	10.167
Turkey 1998 Q1-2009 Q2	test value	13.238 (6)	2.434 (4)	7.636 (6)	5.730 (6)	11.861 (6)	24.917 (4)	21.906 (5)	1.139 (5)
	Bstr. CV at 1%	128.255	23.484	166.645	151.737	135.329	26.523	42.34	31.788
	Bstr. CV at 5%	39.37	12.874	54.764	50.949	41.576	15.289	21.039	16.912
	Bstr. CV at 10%	22.794	9.183	32.448	30.206	24.221	11.364	14.94	11.885
Ukraine 1999 Q1-2009 Q3	test value	28.646 (6)	0.372 (6)	1.560 (5)	2.565 (5)	684.659 (6)	18.023 (6)	8.513 (6)	3.554 (6)
	Bstr. CV at 1%	41818.817	26476.407	59.433	61.590	28855.264	19607.597	23046.600	39269.062
	Bstr. CV at 5%	1772.219	1156.475	23.866	23.590	1275.938	1073.274	1069.058	1429.722
	Bstr. CV at 10%	440.222	277.905	15.434	15.569	298.838	266.440	284.448	350.183

The feedback hypothesis or bi-directional causality exist only in Croatia and Hungary. The bi-directional causality in Hungary is between the negative economic growth and negative $fd2$. In case of Croatia the causality is between positive $fd1$ and positive economic growth series. Additionally in

Croatia, both positive and negative financial development shocks have a significant causal impact on positive economic growth when *fd2* is considered. On the other hand, there is a causality from positive and negative growth shocks to negative shocks in *fd1* in Croatia. Similarly, Hungary, Poland and Romania depict causal relation from both types of growth shocks to negative financial development however not in *fd1* but in *fd2*. Furthermore, in Latvia both negative and positive shocks in *fd1* granger causes positive economic growth. To sum up, (eg^- and eg^+) \Rightarrow fd^- type of causal relation is observed in Croatia, Hungary, Poland and Romania and $eg^+ \Leftarrow (fd^- \text{ and } fd^+)$ is observed in Croatia and Latvia.

On the other hand, the least number of causal relations are observed in Russia. The only causal relations observed are from positive *fd1* to negative growth, and from positive growth shock to positive *fd1* is found for Russia. The same structure of causal relations is observed only in Turkey in addition to unidirectional causalities from negative growth shock to both negative and positive financial development in Turkish economy.

The results also show that the direction of causality between financial development and economic growth is sensitive to the measurement of financial development in emerging Europe countries. The causal relations employing the two different financial development indices rarely overlap. The list of the countries and the direction of causalities where non causality hypothesis is rejected under the 10 percent significance level for which both indices are coincided are presented in Table 5.

Table 5. Coincided Causal Relations for Both Financial Development Indicators

Causal Relation	List of Countries
$fd^+ \Rightarrow eg^+$	Croatia, Latvia
$fd^- \Rightarrow eg^-$	Hungary
$fd^+ \Leftarrow eg^+$	Ukraine
$fd^- \Leftarrow eg^-$	Croatia, Lithuania, Turkey
$fd^+ \Leftarrow eg^-$	Turkey
$fd^- \Leftarrow eg^+$	Hungary

6. Conclusion

The empirical goal of this paper is to examine the asymmetric causal relations between financial development and economic growth in ten emerging Europe countries within the period of 1990-2012. The results indicate more prominent causal relation from economic growth to financial development in general. Specifically, the results provide evidence supporting supply leading hypothesis in Lithuania, Poland, Romania, and Turkey, whereas both demand following and supply leading hypotheses are observed for the cases of Bulgaria, Croatia, Hungary and Latvia. Consequently, economic policies regard to development of financial sector single handedly may not result in economic growth in emerging European economies with the exception of Bulgaria, Croatia, Hungary and Latvia. Among these four countries, in Latvia and Croatia both negative and positive shock in financial developments granger cause economic growth. Furthermore, in Hungary and Bulgaria negative shocks in financial development granger causes negative shocks in economic growth. This implies economic policies that focus on financial stability in Latvia and Croatia and policies that stabilize the negative shocks in financial markets in Hungary and Bulgaria should be given priority.

Causal relations from negative to positive and positive to negative shocks, regardless of the direction, does not have a strong presence. However the causal relation between same signed shocks are relatively noticeable. Although a negative shock in financial development does not cause negative economic growth (excluding Bulgaria and Hungary), the reverse is strongly supported. In fact it is the most commonly observed causal relation excluding Ukraine and Russia. This observation has two implications. First, exempting Hungary, aforesaid causal relation is uni-directional that means a negative shock in financial system does not directly affect economic performance. However, the financial sector provides support for the economic development. This becomes more apparent when credits to private sector to GDP ratio series (*fd2*) is employed as the financial development indicator. Second, Bulgaria, Croatia, Hungary and Latvia where negative shocks in financial sector have a causal impact on economic performance, the bi-directional relation may be employed to explain the business cycles. The interplay between economic performance and financial development is weakest in Russia,

followed by Ukraine. Especially in Russia interaction between financial markets and overall economic performance is minimal.

The empirical results suggest that the causal nexus is sensitive to the measurement of financial development in emerging Europe economies. However the impact of *fd2* on economic growth and vice versa is more predominant. Most plausible explanation is that emerging Europe countries are building up their physical capital stock since 1990's and private sector is takes a hand in the process.

Finally both in terms of financial and economic development emerging Europe countries are indisputably diverse. Although banking sector still provides most of the financing, some countries have a budding securities market. Furthermore the way the financial markets regulated differs among these countries. These countries developed different institutional structures since 1990's. While some are members to EU still others are not. The rule of law, regulatory and supervisory framework varies from country to country. Consequently the role of private sector in the economy is different in each country. Furthermore key macroeconomic indicators such as budget deficits and inflation are not similar to each other in these countries. Although there are clusters within emerging European economies where direction of causality between financial development and economic growth is similar, the reason why findings are generally country specific is diversity of these economies.

References

- Abu-Bader, S., Abu-Qarn, A. (2006), *Financial Development and Economic Growth Nexus: Time Series Evidence from Middle Eastern and North African Countries*. Munich Personal RePEc Archive (MPRA) Paper 972, University Library of Munich, Germany.
- Al-Malkawi, H., Abdullah, N. (2012), *Finance-Growth Nexus: Evidence from a Panel of MENA Countries*. *International Journal of Economics and Finance*, 4(5), 129-139.
- Al-Yousif, Y.K. (2002), *Financial Development and Economic Growth: Another Look at the Evidence from Developing Countries*. *Review of Financial Economics*, 11(2), 131–150.
- Berthelemy, J.C., Varoudakis, A. (1995), *Thresholds in Financial Development and Economic Growth*. *Manchester School of Economic and Social Studies*, 63, 70–84.
- Brown, M., Lane, P.R. (2011), *Debt Overhang in Emerging Europe?* The World Bank Policy Research Working Paper 5784.
- Chandavarkar, A. (1992), *Of Finance and Development: Neglected and Unsettled Questions*. *World Development*, 22, 133–142.
- Christopoulos, D.K., Tsionas, E.G. (2004), *Financial Development and Economic Growth: Evidence from Panel Unit Root and Cointegration Tests*. *Journal of Development Economics*, 73, 55-74.
- Claessens, S., Van Horen, N. (2012), *Foreign Banks: Trends, Impact and Financial Stability*. IMF Working Paper, WP/12/10.
- Connolly, R. (2009), *Financial Vulnerabilities in Emerging Europe: An Overview*. Bank of Finland, BOFIT Online 2009 No. 3.
- Demetriades, P. O., Luintel, K.B. (1996), *Financial Development, Economic Growth and Banker Sector Controls: Evidence from India*. *Economic Journal*, Royal Economic Society, 106(435), 359-74.
- Gill, I., M., Raiser, A., Dall'Olio, T. Packard, K. Richter, Sugawara N., Veugelers R., Zalduendo J. (2012), *Golden Growth: Restoring the Lustre of European Growth Model*. World Bank: Washington, DC.
- Goldsmith, R.W. (1969) *Financial Structure and Development*, New Haven: Yale University Press.
- Granger C. W., Yoon, G. (2002), *Hidden Cointegration*. Department of Economics Working Paper, University of California, San Diego.
- Gurley, J., Shaw, E. (1967), *Financial Structure and Economic Development*. *Economic Development and Cultural Change*, 15, 257–268.
- Hacker, S., Hatemi-J, A. (2006), *Test for Causality between Integrated Variables Using Asymptotic and Bootstrap Distributions: Theory and Application*. *Applied Economics*, 38:13, 1489-1500.
- Hacker, S., Hatemi-J, A. (2012), *A Bootstrap Test for causality with Endogenous Lag length Choice: Theory and Application in Finance*. *Journal of Economic Studies*, 39(2), 144-160.
- Hassan, M.K., Sanchez, B., Yu, J. (2011), *Financial Development and Economic Growth: New Evidence from Panel Data*. *The Quarterly Review of Economics and Finance*, 51, 88-104.

*Financial Development and Economic Growth Nexus in Emerging European Economies:
New Evidence from Asymmetric Causality*

- Hatemi-J, A. (2012a), *Asymmetric Causality Tests with an Application*. Empirical Economics, 43, 447-456.
- Hatemi-J, A. (2012b), *Is the UAE Stock Market Integrated with the USA Stock Market? New Evidence from Asymmetric Causality Testing*. Research in International Business and Finance, 26, 273-280.
- Hatemi-J, A., Uddin, G.S. (2012), *Is the Causal Nexus of Energy Utilization and Economic Growth Asymmetric in the US?* Economic Systems, 36, 461-469.
- Hussain, F., Chakraborty, D.K. (2012), *Causality between Financial Development and Economic Growth: Evidence from an Indian State*. Romanian Economic Journal, 15(35), 27-48.
- Ibrahim, T. M., Shuaibu, M.I. (2013), *Financial Development: A Fillip or Impediment to Nigeria's Economic Growth*. International Journal of Economics and Financial Issues, 3(2), 305-318.
- IMF, Regional Outlook, (2011) World Economic and Financial Surveys: Europe Strengthening the Recovery, May, 11.
- IMF, International Finance Statistics.
- Iwulski, A., Sugawara N., Zalduendo, J. (2012), *Financial Integration in Emerging Europe: An Enviably Development Opportunity with Tail Risks*. CASE Network Studies and Analysis, No:438/2012.
- Jaffe, D., Levonian, M. (2001), *The Structure of Banking Systems in Developed and Transition Economies*. European Financial Management, 7(2), 161-181.
- King, R., Levine, R. (1993a), *Finance and Growth: Schumpeter Might Be Right*. Quarterly Journal of Economics, 108(3), 717-737.
- King, R. G., Levine, R. (1993b), *Finance, Entrepreneurship, and Growth: Theory and Evidence*. Journal of Monetary Economics, 32, 513-542.
- Kolev, A., Zwart, S. (2013), *Banking in Central and Eastern Europe and Turkey Challenges and Opportunities*. European Investment Bank
- Levine, R. (1997), *Financial Development and Economic Growth: Views and Agenda*. Journal of Economic Literature, 35(2), 688-726.
- Levine, R.; Loayza, N., Beck, T. (2000), *Financial Intermediation and Growth: Causality and Causes*, Journal of Monetary Economics, 46, 31-77.
- Lucas, R. E., (1988), *On the Mechanics of Economic Development*. Journal of Monetary Economics, 22(1), 3-42.
- Jung, W.S. (1986) "*Financial Development and Economic Growth: International Evidence*. Economic Development and Cultural Change, 34, 333-346.
- McKinnon, R.I. (1973) *Money and Capital in Economic Development*. Washington: The Brookings Institution.
- Naaborg, I., Scholtens, B. (2006), *A Comparative Study of Banks' Balance Sheets in the European Union and European Transition Countries: 1995-2003*. International Finance Review, 6, 157-178
- Ndlovu, G. (2013), *Financial Sector Development and Economic Growth: Evidence from Zimbabwe*. International Journal of Economics and Financial Issues, 3(2) 435-446.
- Niemczak, K. (2010), *Eastern European Equity Markets and the Subprime Crisis Does Emerging Europe Still Offer Diversification Benefits?* Finansowy Kwartalnik Internetowy (e-Finanse), 6(3), 47-63.
- Patrick, H.T. (1966), *Financial Development and Economic Growth in Underdeveloped Countries*. Economic Development and Cultural Change, 14(1), 174-189.
- Qayyum, A., Siddiqui, R., Hanif, M.N. (2012), *Financial Development and Economic Growth: Evidence from Heterogeneous Panel Data of Low Income Countries*. Finance Research, 1(1), 15-26.
- Ozturk, I. (2008), *Financial Development and Economic Growth: Empirical Evidence from Turkey*. Applied Econometrics and International Development, 8(1), 85-98.
- Robinson, J. (1952), *The Generalization of the General Theory, the Rate of Interest and Other Essays*. Macmillan, London, 67-142.
- Schumpeter, J.A. (1911), *The Theory of Economic Development; an Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*. Translated by Opie, R. Harvard University Press, Cambridge.

- Shaw, E. (1973), *Financial Deepening in Economic Development*. Oxford University Press, Oxford.
- Sirtaine, S., Skamnelos, I. (2007), *Credit Growth in Emerging Europe A Cause for Stability Concerns?* The World Bank Policy Research Working Paper 4281.
- Stern, N. (1989), *The Economics of Development: A Survey*. The Economic Journal, 100, 597–685.
- Syriopoulos, T. (2007), *Dynamic Linkages Between Emerging European and Developed Stock Markets: Has the EMU any Impact?* International Review of Financial Analysis, 16, 41–60.
- Szilagyi, P.G., Fetherston, T.A., Batten, J.A. (2003), *Disintermediation and the Development of Bond Markets in Emerging Europe*, International Journal of the Economics of Business, 10(1), 69–84.
- Toda, H.Y., Yamamoto, T. (1995), *Statistical Inference in Vector Autoregressions with Possibly Integrated Processes*. Journal of Econometrics, 66, 225–250.
- The World Bank-World Development Indicators- <http://data.worldbank.org/data-catalog/world-development-indicators>.
- Zhang, Kevin H. (2001), *Does FDI Promote Economic Growth? Evidence from East Asia and Latin America*. Contemporary Economic Policy. 19(2), 175-185
- Zang, H., Kim, Y.C. (2007), *Does Financial Development Precede Growth? Robinson and Lucas might be Right*. Applied Economic Letters, 14, 15-19.
- Zoli, E. (2007), *Financial Development in Emerging Europe: The Unfinished Agenda*, IMF Working Paper, WP/07/245.