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Research on the relationship between the structure of financial system and economic development

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Abstract

This empirical study analyzes the implications of financial structure (bank-based versus market-based systems) for country's economic development. In recent years a considerable attention is paid to this issue in the scientific literature, however, there is a lack of empirical studies on this issue, especially investigating the relationship between the structure of financial system and economic development. The aim of this paper – to investigate empirical link between the structure of financial system and economic development.

The research results show that the development level of both banking sector and financial markets is higher in countries where higher GDP per capita level is observed, however financial markets become more relevant in the process of capital accumulation. Based on the research results there can be stated that the relationship between the structure of financial system and economic development exists, i.e. the level of country's economic development is higher in countries with market-based financial system. There also can be stated that countries those can be characterized by mixed and market-based financial systems are better economic developed.

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1. Introduction

According to Allen & Carletti (2012), the efficiency of the process through which savings are channeled into productive activities is crucial for growth and general welfare and banks are an important part of this process. Allen et al. (2004), Cecchetti et al. (2011), Allen & Carletti (2012), Hubbard & O'Brien (2012), Deltuvaite (2013) argue

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that lenders of funds (households and firms) can supply funds to the ultimate borrowers (firms, governments and households) in two ways: the first is through financial markets and the second is through banks and other financial intermediaries. According to Hubbard & O'Brien (2012), funds flow from lenders to borrowers indirectly through financial intermediaries, such as banks, or directly through financial markets. Financial systems, where banks play the main role as financial intermediaries, are called the bank-based financial systems, while the financial systems with more developed financial market are called the market-based financial systems.

Bollard (2011) and other scientists raise the question what structure of financial system is optimal for country's economic development, however, the answer is not straightforward. According to Bollard (2011), Allen & Carletti (2012), banks play an important role in bank-based financial systems, however, the failure of any one of larger banks could have serious repercussions for the rest of the economy. Bollard (2011) also notes that larger capital markets might stimulate greater competition in the financial system by providing a substitute for banks funding of both small and large businesses, however, due the high fluctuations in financial markets the access to funds is not always available. Lin et al. (2011) state that economic development and the structure of factor endowments in a country is the most fundamental force determining its optimal financial structure and there is a specific financial structure that is optimal for a country at a specific stage of economic development. Arestis et al. (2004) argue that the relationship between financial structure and economic development can be examined on the basis of competing theories of financial structure. According to Arestis et al. (2004) research results, market-based financial systems reduce inefficiencies associated with banks and enhance economic development better than bank-based financial systems. Arestis et al. (2004), Beck (2011) also note that the structure of financial system changes in different stages of economic development and countries become more market-based alongside with higher economic development. Luintel et al. (2008) found that financial structure matters for output levels and economic growth. According to Cull et al. (2013), this phenomena can be explained by the fact that economic development increases the demand for the services provided by securities markets relative to services provided by banks. Sahoo (2013) cointegration analysis results show that both the bank-based and market-based indicators have positive impact on economic development. However, Maksimovic et al. (2000) state that neither market-based nor bank-based financial systems matter for economic development.

While there is a disagreement on which type of financial system can better promote economic development in the scientific literature, the further research on this topic is required. The investigation of relation between the structure of financial system and economic development is also important from public policy makers' perspective. The empirical results could suggest what type of financial system structure (bank-based or market-based) should be stimulated by policy makers because it is important for a long-term economic growth and development. The aim of the paper – to investigate the empirical link between the structure of financial system and economic development. The research object – the structure of financial system. The research methods: the systemic, logical and comparative analysis of the scientific literature, the analysis of the statistical data, descriptive statistics, hierarchical cluster analysis, correlation analysis (Spearman's rho correlation coefficient).

2. Methodology

Identification of the structure of financial system. Demirgüç-Kunt & Levine (1999) use a conglomerate index of financial structure based on measures of size, activity and efficiency. Specifically, they study ratios of banking sector development (measured in terms of size, activity, and efficiency) relative to stock market development (also measured in terms of size, activity, and efficiency). According to Demirgüç-Kunt & Levine (1999) methodology, countries with larger ratios are classified as bank-based, while countries where the conglomerate ratio of banking sector development to stock market development is below the mean are classified as market-based. Thus, this grouping system produces two categories of financial system: bank-based and market-based. This classification of financial systems is also used by Wang & Ma (2009), Lin et al. (2011) and others. However, Demirgüç-Kunt & Levine (1999) argue that this bivariate classification system presents a number of complications. For this reason we will classify the financial systems into three categories: bank-based, market-based and mixed (both market-based and bank-based) as recommended by Allen & Carletti (2012) and use the following mathematical equation (Eq. 1). The authors of this article also suggest to use larger intervals on classification of financial system structure, i.e. less

strictly condition as proposed by Demirgüç-Kunt & Levine (1999).

$$FSST_c^t = \begin{cases} 2, & \text{when } \frac{PCRDBOFGDP_c^t}{STMKTCAP_c^t + PRBOND_c^t + PUBOND_c^t} > 1.1 \text{ (bank-based financial system)} \\ 1, & \text{when } \frac{PCRDBOFGDP_c^t}{STMKTCAP_c^t + PRBOND_c^t + PUBOND_c^t} = [0.9; 1.1] \text{ (mixed financial system)} \\ 0, & \text{when } \frac{PCRDBOFGDP_c^t}{STMKTCAP_c^t + PRBOND_c^t + PUBOND_c^t} < 0.9 \text{ (market-based financial system)} \end{cases} ; (1)$$

here: $FSST_c^t$ – type of financial system’s structure of country c at time period t ;

$PCRDBOFGDP_c^t$ – private credit by deposit money banks and other financial institutions to GDP in country c at time period t , %;

$STMKTCAP_c^t$ – stock market capitalization to GDP in country c at time period t , %;

$PRBOND_c^t$ – private bond market capitalization to GDP in country c at time period t , %;

$PUBOND_c^t$ – public bond market capitalization to GDP in country c at time period t , %.

Investigation the relationship between the structure of financial system and economic development. In order to assess the relationship between the structure of financial system and economic development the following statistical methods are used: hierarchical cluster analysis, descriptive statistics, correlation analysis (Spearman’s rho correlation coefficient).

Data. Empirical analysis focuses on the annual data covering the European Union countries (except Bulgaria, Czech Republic, Denmark, Hungary, Latvia, Lithuania, Luxembourg, Poland, Sweden) and China, Iceland, Japan and the United States. In the empirical research the following indicators were used: GDP based on purchasing-power-parity (PPP) per capita, private credit by deposit money banks and other financial institutions to GDP, stock market capitalization to GDP, private bond market capitalization to GDP, and public bond market capitalization to GDP. Data sources are IMF (2013) and WB (2013).

3. Results

Analyzing the World Bank (WB (2013)) data on the different countries around the world, it can be stated that stock market development level is higher than banking sector or bond market, and stock market has had the remarkable development over the last few decades. Based on the research methodology proposed by authors’ the structure of financial system in the sample of countries was identified (Table 1).

Table 1. Classification of countries by the structure of financial system

The structure of financial system	Bank-based financial system	Market-based financial system	Mixed financial system
Countries	Austria, China, Cyprus, Estonia, Finland, Greece, Ireland, Malta, Portugal, Romania, Slovak Republic, Slovenia, Spain	Belgium, Croatia, France, Iceland, Italy, Japan, United States	Germany, Netherlands, United Kingdom
Number of countries	13	7	3

Variables	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
PCRDBOFGDP	42.2	284.6	134.5	69.1	187.7	123.2	103.8	198.2	164.5
STMKTCAP	4.8	76.5	30.2	14.7	110.2	52.2	37.5	126.5	80.7
PRBOND	5.0	113.5	36.5	19.8	91.9	52.0	12.3	71.8	36.0
PUBOND	10.5	62.7	33.3	19.8	218.9	83.8	47.9	58.6	52.2
GDP per capita	8,304.5	41,050.1	26,279.1	17,664.8	49,796.9	34,670.3	36,171.0	41,480.7	38,459.9
FSST ratio	1.1	9.6	2.4	0.5	0.9	0.7	0.9	1.0	1.0

The research results show that bank-based financial system dominates in the sample countries. The lowest GDP per capita ratio was observed in countries with bank-based financial system, while the highest – in countries with market-based and mixed financial system. In order to assess the relationship between the structure of financial system and economic development Spearman's rho correlation coefficient was calculated (Table 2). The negative statistically significant relationship between the type of financial system structure (FSST ratio) and economic development (GDP per capita) was identified. These results suggest that the level of economic development is higher in countries with market-based financial system.

Table 2. Spearman's rho correlations between GDP per capita and FSST value

	All countries	Countries with bank-based financial system	Countries with market-based financial system	Countries with mixed financial system
Correlation coefficient	-.554**	-.445	-.357	.500
Sig. (2-tailed)	.006	.128	.432	.667
N	23	13	7	3

** . Correlation is significant at the 0.01 level (2-tailed).

In order to assess the relationship between the type of financial system structure and economic development cluster analysis was also performed, using GDP per capita as grouping variable. Based on the cluster analysis results four clusters were identified. In the first cluster that can be characterized by lowest GDP per capita (on average 10,347.4 dollars per person) bank-based financial system was identified. Bank-based financial system also dominates (bank-based financial system in 8 countries and market-based financial system in 2 countries) in the second cluster where GDP per capita was 25,199.3 dollars on average. In the third cluster where GDP per capita is 37,721.6 dollars on average three countries with bank-based financial system, four countries with market-based financial system and three countries with mixed financial system were identified. The United States was excluded into the fourth cluster where the highest GDP per capita was observed (49,796.9 dollars per person). The results of cluster analysis show that lower GDP per capita ratio is typical for bank-based financial system.

4. Conclusions

The research results show that bank-based financial system dominates in the sample countries. The lowest GDP per capita ratio is typical for bank-based financial systems, whereas, market-based and mixed financial system was identified in countries with higher development level.

The research results show that both banking sector and financial markets are better developed in countries where level of economic development is higher, however, financial markets become more relevant in the process of capital accumulation. Based on the correlation analysis results it can be stated that the relationship between the structure of financial system and economic development exists, i.e. the country's economic development is higher in the countries with market-based financial system.

Summarizing the research results it can be stated that mixed and market-based financial system is related with higher economic development of country, whereas bank-based financial system is characteristic by lower GDP per capita ratio.

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