

## Dependence of the Financial Structure and Efficiency of the Bank Sector on Economic Growth

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*Rapid growth and development of economy is taking place in Lithuania. Under such conditions the issue of choice between the forms of concentration of financial resources becomes relevant in both the theoretical and the practical respect. Research emphasizes the influence of the forms of concentration of financial resources and the financial structure formed in the country on the economic processes that are taking place. Analyzing financial systems, indicators of the size, activity and efficiency of the bank-based and market-based structures are discussed, which in their turn define the domination of these structures. For research of the Lithuanian financial structure the authors used indicators characterizing the nature of the financial structure, such as: Assets of banks/GDP; Bank credit to private sector / GDP; Capitalization of the stock market / GDP; Stock turnover / GDP; Stock turnover/Capitalization of stock; (Assets of banks + Capitalization of the stock market) / GDP; (Assets of banks + Capitalization of the stock market) / GDP; Capitalization of stock / Assets of banks; Stock turnover / Bank credit; (Stock turnover / GDP) \* (Fixed bank costs / Assets of banks). Influence of the development of the finance sector on the growth of economy and vice versa is the object of the theoretical research of the recent years. This aspect of research is especially relevant to the countries of rapidly emerging economies, as one can presume that the growth of the financial system has a positive impact on the rate of economic growth. Upon characterizing the tendencies of economic growth the most often used indicator is GDP per capita. Developing research in a similar direction and characterizing the tendencies of formation of the structure of the Lithuanian financial system a research of the bank structure and economic growth was carried out. This research does not provide an unambiguous answer as to which of the financial structures – bank-oriented or market-oriented – has a bigger influence on the economies of rapidly emerging countries. However, the dynamics of change of the size and activity of the Lithuanian bank sector corresponds to the tendencies established in research: with the growth of the economy of the country, the size and activity of the bank sector also increases. Growth of the Lithuanian bank sector and the strengthening of its influence on the economy of the country show that possibilities of concentration of financial resources through the bank sector are forming in the country, and this allows us to say that the Lithuanian financial system is oriented towards the bank structure.*

**Keywords:** *financial structure, efficiency of banks, financial system, economic growth, bank-based structure, market-based structure.*

### Introduction

Rapid growth and development of economy is taking place in Lithuania. Under such conditions the issue of choice between the forms of concentration of financial resources becomes relevant in both the theoretical and the practical respect. Research emphasizes the influence of the forms of concentration of financial resources and the financial structure formed in the country on the economic processes that are taking place. Discussions on the advantages and disadvantages of one or another structure of the financial market are mostly based on the growth and development of the country and an individual company: in the majority of articles comparison of the two mentioned financial structures are based on the examples of Germany, as a financial system based purely on banks, and the USA, as a system based on the market, and only recently several economists (Asl Demirgüç-Kunt (1999), Harry Huizinga (2000), Vojislav Maksimovic (1999; 2001), Ross Levine (1997, 1999) and Thorsten Beck (1999)) cover a much larger number of analyzed countries in their researches (150 countries during 1990-1995 and 175 countries during 1960-1997), including emerging countries, as only in the last decade quite a number of debates arouse as to which of these two models is more suitable for economies of such countries as Eastern – Central Europe, the Baltic States and Russia. R. Levine (1997) also carried out an extensive research in order to establish the importance of the financial structure for economic growth more exactly. The researcher emphasizes the positive role of banks in concentrating capital, establishing good projects, supervising heads of companies and managing risk. The market-based approach not only emphasizes the positive role of markets in increasing risk management, spreading of information, management of companies and redistribution of capital (R. Levine, Zervos, 1998), but also stresses issues related to banks. Powerful banks may block innovations thus protecting companies related to them from competition (Hellwig, 1991; R. Rajan, 1992). Moreover, powerful banks may secretly cooperate with the heads of the companies against other creditors and encumber efficient management of companies. Concluding it can be stated that the advocates of the market-based approach emphasize that markets reduce inefficiencies related to banks and promote economic growth.

The results of empirical research, covering the influence of different financial structures on economic growth (T. Beck, R. Levine 2002), (C. Girardone, P. Molyneux, E. P. M. Gardener, 2004), show that there is no empirical foundation to state that one system is better than the

other. None of the analyzed systems is distinguished in promoting economic growth. More interesting results (S.Tadesse, 2000; 2001) show that countries with well developed banks, but with little developed markets, do not differ from countries with well developed markets and vice versa. This also allows us to think that the financial structure changes with the development of the country and the legal system. This is also confirmed by the results of the research of A.Demirgüç-Kunt, R.Levine (1999); O.E.Ergungor (2002) and R.Levine (2001): a well-developed financial system is most important to economic growth, while the foundation of its development (banks or market) is not so important.

After performing the analysis of works providing exhaustive analysis of different countries, industry sectors and companies, establishing the impact of the financial structure on the concentration of financial resources and on the general economic growth, it may be stated that the level of financial development allows to predict the rate of economic growth, concentration of resources and technological change, as the functioning of the financial system is closely related to different economic sectors and companies and at the same time with the economic growth of the country. Two main approaches may be distinguished in research: the first one emphasizes the influence of the financial structure on the micro and macro economy of the country; the second one negates the importance of the financial structure. The latter approach stresses the development of the components of the financial structure (bank and capital markets) and not their relation in outlining the benefit for the economy of the country.

Therefore the **objective of this article** is to carry out a research of possibilities of concentration of financial resources through the bank sector and the stock market in Lithuania, establishing and evaluating the influence of the financial structure on the efficiency of the bank sector and development of the stock market and the economic growth of the country.

The following **tasks** were set to achieve this objective:

1. To carry out a scientific analysis of literature providing exhaustive analysis of different countries, industry sectors and companies, establishing the impact of the financial structure on the concentration of financial resources and on the general economic growth.
2. To prepare suitable methods for research of the structure of rapidly emerging economies.

**Research methods** used to reach the aim of the article and to solve the scientific problem are – scientific literature review, analysis of analytical and empirical studies and synthesis of fragmentary knowledge on the subject, as well as mathematical statistical method – correlation and regressive analysis, and P – value negating the Null hypothesis. The research was based on the secondary statistical data of The Statistical Department of the Republic of Lithuania, the data of the Lithuanian Central Bank.

### **Importance of the financial structure**

For a long time economists have been trying to establish the advantage of the bank-based and market-based financial systems (structures) over one another. The eco-

nomical change of the last decade, a wave of financial liberalism, movement of free capital served only to accelerate and escalate such debates: P.G.Szilagyi (2003) maintains that the most suitable way for the countries of Central and Eastern Europe is to ensure the needs of future financing by developing the markets of capital, especially those of bonds. However, such research of the financial structure was mostly limited to comparison of financial structures between countries, which have similar economic indicators or a common geographical position: R.Rajan and L.Zingales (1994) analyzed and compared the capital structure and borrowing possibilities of the companies in G7 states, J.Koke and M.Schroder (2002) – the capital markets of countries of Eastern and Central Europe, S.Schmukler (1999) – the solutions of attraction and concentration of funds in South America and East Asia when integrating into international financial markets. Using data on companies in different economies, A.Demirgüç – Kunt and V.Maksimovic (1998) calculated maximum levels of growth of a company, which can be achieved by companies, when opportunities to use external financing for investment are absent. A.Demirgüç – Kunt and V.Maksimovic (1998) conclude that the majority of companies exceeded their forced growth levels in those economies that were more financially developed. Economies with effective legal systems, active stock markets, and a large bank sector provided more opportunities for companies to use external financing. But the first to carry out an analysis of the type of the financial structure among a large number of countries were A.Demirgüç-Kunt and R.Levine (1999). In this work A.Demirgüç-Kunt and R.Levine (1999) drew attention to the change of the structure of the financial market influencing economic growth of the country. The scientists analyzed and compared the financial structures of over 150 countries. Research of the financial system was based on the following directions:

- economic development of the country and bank, non-bank financial institutions and stock markets;
- comparison of economic development with the bank-based and market-based financial structure;
- legal, administrative, tax and macroeconomic factors determining the financial structure of the country.

In the theoretical respect this work is important because the authors have created *methods*, which will make it possible to evaluate the development of the financial system of the country and, on the basis of respective criteria, establish its structure: bank-oriented or market-oriented. *Method of calculating the index of the financial structure*, which defines the financial structure of every country more exactly, was created for this purpose.

Though many authors tend to consider the financial system of European countries as oriented towards the bank sector when analyzing financial structures, A.Demirgüç-Kunt and R.Levine (1999), A.Demirgüç-Kunt and H.Huizinga (2000) in their later works distinguished the financial structure of every European country using the method of calculating the index of the financial structure. According to the research of these scientists, the financial systems of such countries as the United Kingdom, Sweden and Holland are

considered bank-oriented, while the ones in Germany, Belgium and France are considered market-oriented. Thus, it may be stated that elements of market-based system exist in EU, but they are differently distributed in different European countries. However, there are no researches defining the financial structure in the Baltic States, including Lithuania.

Based on the methods of research of A.Demirgüç-Kunt and R Levine (1999), the type of the financial structure is established evaluating the level of development of the financial system. The financial system of the country is considered developed with respect to the group of analyzed countries, provided its *Bank credit to private sector / GDP* and *Market capitalization / GDP* indicators are bigger than the average of the indicators of the group of these countries. In other words, the financial system of the country is defined as developed if it has a relatively developed bank-based and market-based financial structures.

Evaluation of the **bank-based** financial structure is based on the evaluation of its **size**, **activity** and **efficiency**. According to A.Demirgüç-Kunt and R.Levine (1999), indicators defining the general **size** of the bank-based financial structure show the general size of the bank sector with respect to the economy of the country. For establishment of the **activity** of the bank system in the private sector authors use indicators, outlining the correlation of bank credit (and other claims) to the private sector with GDP. It should be noted that this indicator does not include credits to the public sector (government and state institutions). (R.G.Rajan and L.Zingales (1998) used an analogous indicator to evaluate the size of the bank system, the only difference being that in the latter model only local country banks were evaluated.) and the claims on private sector of non-bank financial institutions (insurance companies, pensions funds, investment funds, development banks, etc.). The **efficiency** of the bank-based system, in the opinion of the authors, is best defined by indicators of net interest margin, (lower interest margin in a sign of bigger efficiency), ratio of fixed expenditure to the profit of the main activity (excessive fixed expenditure may mean irrational use of resources and low competition) and return of assets.

After calculating the indicators of the size, activity and efficiency of the *bank-based financial system* for each country, the target group of countries was divided into four subgroups according to their income (low, low-average, average-high, high), which are expressed as GDP per capita. Upon calculating the average of respective indicators in every group, the authors came to a conclusion that *when the income of the country increases, banks and other financial institutions become larger, more active and more efficient* (A.Demirgüç-Kunt, R.Levine, 1999). The coefficients of correlation with GDP per capita of all the discussed indicators were also calculated. Indicators of the size of the *bank-based financial system* show *positive correlation*, and the indicators of efficiency show *negative correlation* with GDP.

The evaluation of the **market-based** financial structure is also based on the evaluation of its **size**, **activity** and **efficiency**. The **size** of the stock market is defined by the correlation of market capitalization, trading in the national stock market, with GDP. Indicators defining the

**activity** of the stock market evaluate the value of stock transactions with respect to the economy of the country and the liquidity of the market. The calculated indicator of turnover shows **efficiency** with respect to the stock market.

The same method as in evaluating the bank-based financial structure was used to establish that *the size of the stock market and its activity increase when the income of the country grows, and all indicators show positive correlation with GDP per capita* (A.Demirgüç-Kunt, R.Levine, 1999).

Upon evaluating the *bank-based* and *market-based* financial structures, which together compose one single financial system of the country, it can be established which of these systems is the best developed, i.e. dominating. Based on their level of development, the general financial system of the country is attributed to the type of the system of *bank-based* or *market-based* structure. According to R.Levine and A. Demirgüç-Kunt the type of the financial structure of the country may be determined in the target group of countries employing three dimensions:

1. *Size of the financial system*; the indicator, which evaluates the size of the bank system with respect to the financial system of the market.
2. *Activity of the financial system*; the indicator, which evaluates the activity of the bank system with respect to the financial system of the market.
3. *Efficiency of the financial system*, the indicator, which evaluates the efficiency of one financial system with respect to the other.

A.Demirgüç-Kunt and R.Levine (1999) state that "in order to define a financial system of the country as a *market-based* financial structure, one hopes to see a big and active stock market in comparison to its bank system" (A. Demirgüç-Kunt, R. Levine, 1999).

In the theoretical respect these indicators, calculated in the context of one country, are of little use. For example, the indicators of size and efficiency of the financial system would show the extent to which the financial system of the market of the country is larger (smaller) and more active (more passive) than the bank system of the country, but isolated indicators of efficiency say little. These indicators must be compared with the indicators of other countries of the type of *bank-based* and *market-based financial structures*.

It is also not purposeful to interpret the financial system of the country on the basis of only one of these indicators. For example, it is possible to describe the financial system of the country as *bank-based* on the basis of the indicator of the *size of the financial structure*, not because it has a well-developed bank system, but because its stock market is very small. Therefore the authors created a *joint index of the size, activity and efficiency of the financial system* for establishment of the type of the financial system and called it the *structure index*. A.Demirgüç-Kunt and R.Levine (1999) state that "as single indicators evaluate the country differently in the scale of the financial-bank-based system and we do not have any reasons to vest these indicators with different priorities, it is correct to evaluate the financial system joining all indicators into one general index" (A. Demirgüç-Kunt, R. Levine, 1999). *From the indicators of the size, activ-*

ity, and efficiency of the financial system of every country, the average (country average) of its series is eliminated and then the average of these three indicators is calculated (A. Demirgüç-Kunt, R. Levine, 1999).

As a conclusion, it may be said that the financial system of the country may be defined as market-based or bank-based depending on its size, activity and the level of efficiency. All these components are equally important in ensuring more effective allocation of funds. The development of the market-based financial system is reflected by big

capitalization of the stock market and a high level of its high liquidity as compared with the GDP of the country. The development of the bank-based system is reflected by the size of the bank assets, large scope of financing of a big private sector and competitive rate of interest and low costs. Besides, all these features of the bank-based system are characterized by efficient competition in the bank sector.

Structured indicators analyzed in the works of A. Demirgüç-Kunt and R. Levine (1999), T. Beck et al. (1999) are provided in Table 1.

Table 1

Indicators of the financial structure

Size of the bank sector	Assets of banks/GDP
Activity of the bank sector	Bank credit to private sector / GDP
Size of the stock market	Capitalization of the stock market / GDP (stock of the companies of the country traded in the local stock exchange)
Activity of the stock market	Stock turnover / GDP
Liquidity of the stock market	Stock turnover / Capitalization of stock
Size of the financial sector	(Assets of banks + capitalization of the stock market)/GDP.
Size of the financial structure	Capitalization of stock / assets of banks
Activity of the financial structure	Stock turnover / bank credit
Efficiency of the financial structure	(Stock turnover / GDP)* (fixed bank costs/assets of banks)
Index of the financial structure	Average of the size, activity and efficiency of the financial structure upon eliminating averages of series of different indicators.

Sources: A. Demirgüç-Kunt, R. Levine (1999), T. Beck, R. Levine (1999), T. Beck, A. Demirgüç-Kunt, R. Levine (1999); A. Demirgüç-Kunt, H. Huizinga (2000).

**Economic factors determining the bank-based and market-based financial structures.** After an analysis of scientific literature we can state that up till now there has been no research clearly determining the factors leading to the domination of one or another financial structure. But in the theoretical and empirical works of the last decade general factors determining the financial structure may be distinguished. Dependence of financial systems on GDP did not receive much attention from researchers.

V. Maksimovic and A. Demirgüç-Kunt (1998) analyzed the financial structure of 19 developed and 11 emerging countries and the financing structure of companies. Among many other facts it was established that the size of the market-based and bank-based systems is directly dependent on GDP per capita. Twin correlation coefficients of the size of market (*Capitalization of market/GDP*) and the size of the bank-based system (*Bank assets/GDP*) with GDP per capita were respectively at 0.179 and 0.697 (A. Demirgüç-Kunt, V. Maksimovic, 1998). In research carried out with a bigger number of countries (over 150) A. Demirgüç-Kunt and R. Levine (1999) established a positive correlation between GDP per capita and the bank-based and market-based financial structures. According to the authors, as GDP increases, the bank-based and market-based financial systems become bigger, more active and more efficient. The following facts were distinguished during the research:

- In the countries with high income local stock markets become *more active*, as compared with the bank-based system.
- In the countries with high income local stock markets become *more efficient*, as compared with the bank-based system.
- In countries with high income the size of the bank system *does not change* in relation to the stock market.

Positive correlation between GDP and capital markets was also confirmed by R. La Porta, F. Lopez-de-Silanes, A. Shleifer, R. Vishy (1997). In the regress model the author evaluated the influence of the growth of GDP on the size of the capital market. The results showed that countries of rapidly emerging economies have larger stock capitalization markets – with GDP increasing by 1% between 1970 – 1993, the size of the stock market (*External stock capitalization/GDP*) (The corrected indicator is intended for evaluation of only that part of capitalization of stock in the market, which is related to external financing) increased about 4-6 %, while the size of the country was not significant. Another important fact is that the growth of GDP is not associated with a bigger number of listed companies. This means that bigger market capitalization is related to the evaluation of the stock of existing issuers (R. La Porta, F. Lopez-de-Silanes, A. Shleifer, R. Vishy (1997)).

Concluding it may be stated that economic factors influence the general financial system of the country more or less than separately any one of them – bank-based or market-based. On the other hand, the growth of GDP, as an indicator of the financial needs of companies, is more related to the increase in the activity of the market-based financial system. This means that as GDP grows, financial intermediates no longer manage to satisfy the financial needs of organizations, thus companies use the advantages of the stock market more. This results in more active trade in stock, and this increases their liquidity, efficiency indicators. But such financing is more associated with the financing of already existing and not new companies in the stock market.

### **Analysis of evaluation of correlation between the Lithuanian financial structure and economic growth**

The objective of the first phase was to evaluate the financial structure of Lithuania, tendencies of its change and possibilities of concentration of financial resources of individual components of the financial structure – the stock market and the bank sector in 1999-2004 (indicators of the financial structure and their economic values are provided in Table 1); to calculate correlation and regression coefficients, defining the strength of relation between the financial structure and GDP per capita; to make suppositions on the basis of the received data, defining the influence of the formation of the financial structure on the possibilities of attraction of financial resources and dependence of economic growth on the financial structure. For evaluation of the Lithuanian financial structure the structure index provided in Table 1 was used. The bigger the value of this index, the more the financial system of the country is oriented towards the market than the bank sector. The calculated index of the financial structure will allow to evaluate the change and

tendencies of the financial structure of our country, and at the same time the influence of the financial structure on bank efficiency and economic growth.

The objective of the second phase was to evaluate the efficiency of Lithuanian banks calculating the following relative indicators after summarizing the researches carried out by foreign scientists: return of assets (ROA), net interest margin and ratio of fixed expenditure to the profit of the main activity. Agreeing with J. A. Bikker (1999) and A. Demirgüç-Kunt and R. Levine (1999) it is presumed that lower values of net interest margin show bigger efficiency of the bank sector.

The objective of the third phase was to evaluate the relation between the efficiency of the bank sector, the development of the components of the financial structure and economic growth using linear regression analysis. P – value negating the Null hypothesis is used to establish the significance of the coefficients of regression equation. P – value is one of the most often used values in scientific literature for statistical calculation and regression analysis. As the number of observations is small, it is presumed in the present research that the values of coefficients are significant if they are lower than 0.50.

The choice of the beginning of the analyzed period, i.e. 1999, was determined by shortage of data on the financial sector of 1998 and earlier years. The Lithuanian bank sector in 1999-2004 was also characterized by bigger stability than earlier. This notice is very important in carrying out regression analysis, as due to different impact of external factors on the analyzed variables the credibility of results usually suffers.

The size and activity of the Lithuanian bank sector and the stock market during the analyzed period is calculated according to the methods of calculation of relative indicators provided in Table 1. After performing regression analysis, the calculated correlation coefficients, defining the strength of relation between these values and GDP per capita as well as P-value, are provided in Table 2.

Table 2

**Dynamics of the size and activity of the Lithuanian bank sector and the stock market in 1999-2004 and correlation of indicators with GDP per capita and P-value**

	1999	2000	2001	2002	2003	2004	Correlation coefficient	P-value
Size of the bank sector, coef.	0.295	0.309	0.315	0.328	0.387	0.466	0.3079	0.002
Activity of the bank sector, coef.	0.128	0.114	0.114	0.140	0.204	0.259	0.2714	0.005
Size of the stock market, coef.	0.293	0.268	0.217	0.195	0.260	0.345	0.8905	0.513
Activity of the stock market, coef.	0.029	0.018	0.017	0.013	0.011	0.021	-0.1524	0.330
Liquidity of the stock market, coef.	0.098						-0.7440	0.060
Size of the financial sector, coef.	0.588	0.577	0.532	0.523	0.647	0.811	0.3969	0.075

As can be seen from the calculations provided in Table 2, the size of the bank sector grew gradually during the analyzed period and in 1999-2004 grew from 0.295 to 0.466, i.e. 56 per cent, and activity from 0.128 to 0.259, i.e. 102 per cent. Such significant change resulted from rapidly developing bank sector, the development which much exceeded the rate of the growth of GDP. However, the dynamics of change of the activity of the bank sector, contrary to that of size, was not growing gradually during

the analyzed period. As can be seen from Table 2, the correlation of the credit to the private sector in 2000 and GDP, as compared with 1999, decreased from 0.128 to 0.114, i.e. 11 per cent. These negative tendencies were determined by the consequences of the financial crisis in Russia: smaller number of companies, economic decline of the country, decreased the need for bank loans. Moderate increase of the activity of the bank sector is noticed since 2002. The activity of the stock market changed dif-

ferently from the bank sector. It should be noted that since 2000 both activity and size of the market had the same tendencies of decrease and during 1999-2002 the size of the stock market decreased by 33.4 per cent (from 0.293 to 0.195) and activity by 55.2 per cent (from 0.029 to 0.013). These negative changes were the result of decline of the price of stock not only in the Lithuanian stock market, but also in the stock markets of all emerging European countries.

Paying attention to the dynamics of the size of the Lithuanian financial sector provided in the table one cannot state unambiguously that the financial sector grew gradually during the period of analysis in the positive direction as GDP per capita ( P.G. Szilagy, J.A. Batten, T.A. Fetherson 2003), though the regression analysis records positive and significant correlation between these variables (0.3969), but it is important to remember that the decreasing size and activity of the stock market in 1999-2002 show that there are more important factors, determining the development of the stock market, than constant growth of economic welfare of the country.

The dynamics of the size and activity of the Lithuanian bank sector corresponds with the tendencies established in the research: as the economy of the country grows and the country becomes richer, the size and activity of the bank sector also increase. This is also confirmed by the correlation coefficients and P-values calculated and provided in the same table. As can be seen from Table 2, the correlation between GDP per capita and the size and activity of the bank sector is positive, and the obtained values of coefficients are very significant (P-values are respectively equal to 0.002 and 0.005). The growth of the Lithuanian bank sector and the strengthening of its influence on the economy of the country show that the

growth and rapid development of the bank sector is characteristic to the countries with rapidly emerging economies. Analyzing the size of the stock market and GDP per capita the regression results show a positive correlation (P-value is equal to 0.513), but the coefficient is not significant, while the correlation is sufficiently strong (0.8905). And the indicators of the stock market and liquidity during the analyzed period correlated negatively and are significant with respect to P – value according to the presumptions accepted in the present research. The reasons for such contradiction should be sought in the economic development of Lithuania. First of all, it should be associated with privatization, which was much more active at the beginning of the analyzed period. Secondly, the majority of stock companies were reorganized into closed stock companies, thus withdrawing from active participation in the capital market. The mentioned processes allow us to conclude that the Lithuanian stock market was not more developed in 1999 than in 2003, and the growing economy of the country by itself does not ensure big activity of the stock market. Agreeing with the conclusions of the researches carried out by foreign scientists we may state that the activities of the participants of the Lithuanian financial system largely depend on the legal and political environment of the country.

In order to evaluate the dynamics of the Lithuanian financial structure the structure index, covering the size, activity and efficiency of the whole financial structure, must be calculated. On the basis of the research of foreign scientists the higher values of this integrated index show bigger orientation of the financial system of the country towards market than the bank sector. The dynamics of the indicators of the Lithuanian financial structure in 1999-2004 are provided in Table 3.

Table 3

**Dynamics of the indicators of the Lithuanian financial structure in 1999-2004**

Financial structures:	1999	2000	2001	2002	2003	2004
<b>Size</b> (Stock capitalization / Assets of banks)	0.995	0.868	0.689	0.593	0.671	0.742
<b>Activity</b> (Stock turnover / bank credit)	0.225	0.159	0.152	0.090	0.052	0.080
<b>Efficiency</b> (Stock turnover / GDP) * (Fixed bank costs/ Assets of banks)	0.0011	0.0007	0.0007	0.0005	0.0003	0.0005
<b>Structure index</b>	<b>0.624</b>	<b>0.168</b>	<b>0.069</b>	<b>-0.248</b>	<b>-0.396</b>	<b>-0.215</b>

On the basis of the values calculated in Table 3 it can be stated that during the period of 1999-2004 Lithuania had an inconsistent tendency in the development of the financial structure. The biggest value of the structure index obtained in 1999 is equal to 0.624 and, based on the scientific characteristics of this indicator, we can state that in 1999 the Lithuanian financial structure was more market-oriented. 2000 to 2003 inclusive, decreasing values of the indicator show the increasing role of the bank sector, as compared with the stock markets, and the structure index that began to increase only in 2004 specified the growth of the stock market in the financial structure. However, it is clearly seen that during the formation of the financial structure the primary phases of development of the financial system are domi-

nated by banks, but with economic growth the importance of the stock market should increase, and this is confirmed by the data of the carried out research provided in Table 3.

As can be clearly seen from the carried out research, the Lithuanian financial system is dominated by banks and influences economic growth. We will perform a regression analysis of the change of the indicators of the efficiency of the Lithuanian banks and their relation to GDP per capita.

Change of the indicators of efficiency of Lithuania – return of assets, net interest margin and the ratio of fixed expenditure to the profit of the main activity – in 1999-2004 and correlation between the indicators and GDP per capita as well as P-value are provided in Table 4.

Table 4

**Dynamics of indicators of efficiency of Lithuanian banks in 1999-2004 and correlation between indicators and GDP per capita and P-values**

	1999	2000	2001	2002	2003	2004	Correlation coefficient	P-value
Return of assets	0.001	0.004	-0.001	0.009	0.011	0.010	0.2086	0.036
Net interest rate margin	0.039	0.033	0.031	0.029	0.023	0.021	-0.3145	0.000
Fixed expenditure/profit of the main activity	0.644	0.688	0.752	0.754	0.720	0.601	-0.6772	0.668

As can be seen from the dynamics provided in Table 4, in 1999-2004 the net interest margin had the tendency to decrease, which shows increasing efficiency of banks. The value of this indicator in 2004 was 45.6 per cent lower than in 1999. Decreasing interest margin was mostly determined by growing bank competition, which in its turn reduced the interest income and encouraged banks to carry out their activities more efficiently. The consistent dynamics of return of assets defining efficiency of bank profit was interrupted by the general net loss of banks in 2001, which was equal to 22.5 million litas. However, already during the following year the return of assets of the Lithuanian bank sector grew to 0.9 per cent. During the last three years of the analyzed period evident increase in efficiency of the use of the assets of the bank sector is witnessed. The ratio of fixed expenditure to the profit of the main activity determines the efficiency of bank costs. It is presumed in the present research that lower fixed costs reflect bigger efficiency of banks due to competition and avoidance of unnecessary waste of funds. As can be seen from Table 4, in 1999-2002 the values of this indicator showed tendencies of increase. These changes should be associated with expansion of banks and employment of new staff. Since 2003 decreasing values of cost effi-

ciency allow to presume that banks, as well as the majority of Lithuanian companies, are prone to manage costs more effectively by reducing the number of employees.

The evaluation of the correlation between the economic growth of the country and efficiency indicators can be based on the regression analysis provided in the same table. Table 4 shows that significant coefficients are obtained with respect to return of assets and net interest margin (P-value is respectively equal to 0.036 and 0.000). In both cases the economic development of the country positively and significantly influences these profit efficiencies.

**Analysis of correlation of the financial structure and bank efficiency**

In this phase of the research the influence of the financial structure on the indicators of efficiency of banks was assessed taking into account the development of the bank sector and the capital market. Regression coefficients provided in Table 5 were calculated in order to establish the correlation. Upon calculating regression coefficients the indicators of the *size* and *activity* of the bank sector and stock market are controlled.

Table 5

**Correlations of bank efficiency and the financial structure**

Dependent variable/ independent variables	Return of assets		Fixed expenditure /profit of the main activity		Net interest rate margin	
	Coefficients	P-value	Coefficients	P-value	Coefficients	P-value
<i>Size indicators</i>						
Assets of banks/GDP	-0.074	0.642	-0.367	0.642	-0.051	0.359
Assets of Lithuanian banks/GDP	0.116	0.706	0.424	0.781	0.017	0.872
Capitalization of the stock market/GDP	0.107	0.485	-0.738	0.343	-0.001	0.987
Structure index	-0.016	0.512	-0.051	0.673	0.011	0.216
Corrected R <sup>2</sup>	0.08		0.84		0.93	
<i>Activity indicators</i>						
Bank credit to the private sector/GDP	0.058	0.434	-1.017	0.260	-0.055	0.448
Stock turnover/GDP	-0.314	0.679	-2.229	0.804	0.058	0.818
Structure index	-0.001	0.833	-0.111	0.722	0.010	0.390
Corrected R <sup>2</sup>	0.44		0.76		0.91	
Number of observations	6		6		6	

As can be seen the coefficients and P-values of the correlations provided in Table 5 are very unlike evaluating the relation of the financial structure with the indica-

tors of bank efficiency. Upon analyzing the influence of the indicators of the financial structure on the *return of assets* it is seen that only the indicators of the size of the

stock market and the activity of the bank sector have very insignificant positive influence, respectively 0.107 and 0.058, and the values of P-value are also not significant, as they balance of the limit of 0.05. The latter results only confirm that the financial system in Lithuania is still in its development phase – as the development of the bank sector increases the return of assets has a tendency to increase. This shows that the point of growth of the bank sector, where the profitability of the assets of banks starts to decrease, has not yet been achieved. The positive influence of the indicator of the size of the stock market on the profitability of the assets of banks could be explained by the fact that development of the capital market allows companies to easier attract capital and at the same time decrease the credit risk. With higher level of development of the capital market, banks can easier receive information on companies the stock of which is traded in the stock exchange and in this way to better evaluate the risk of credit.

Indicators of the size of the stock market and the activity of the bank sector had a positive, though insignificant, influence on the efficiency of the costs of Lithuanian banks during the analyzed period, just as in case of return of assets. Expanding stock market increases the income of banks for owned stock, and at the same time the profit of the main activity. The latter presumption is confirmed by the correlation between the profit of the main activity and capitalization of the stock market (correlation of capitalization of the stock market with the profit of the main activity of banks, where the coefficient is equal to 1286.636 and P-value to 0.228). According to the presumptions with respect to P-value in this work the obtained regression coefficient is significant. And their positive values show that increasing capitalization of the stock market increases the profit of banks from the main activity.

The structure index has no clear influence on the discussed efficiencies of Lithuanian banks. In controlling both the indicators of size and activity of the financial structure, the P-values of the coefficient of the structure index exceed and in some cases even very much the 0.5 value. Analyzing the relation between net interest margin and the financial structure index a positive, though insignificant, relation in both categories of the indicators of the financial structure is recorded. This shows that with the financial system of the country becoming more capital market-oriented, the net interest margin of banks has a tendency to increase as well. Such a relation may be explained by better distribution of information between the bank sector and the capital markets, which allows to manage income from interest more efficiently, and this is especially useful in the development phase of the financial system. These tendencies show that in the case of Lithuania there was no direct competition between the stock market and the bank sector during the analyzed period. This notice allows us to better explain the already mentioned positive influence of the indicator of the size of the stock market on the efficiency of bank costs and to reject the possibility of direct competition.

The research recorded a negative correlation between development of the bank sector and net interest margin (Assets of banks/GDP P – value 0.359, Bank credit to private sector/GDP P – value 0.448). This correlation defines growing competition in the bank sector and increasing efficiency of bank profit.

As seen the obtained results of the research show that financial structures, both the development of the components of the financial structure and their interrelation influence the efficiency of banks. Such notices allow to agree with the already mentioned scientific approach that the financial structure is important to the economy of the country. Established positive correlation between efficiency of banks and the size of the stock market and the activity of the bank sector also allows to agree with the second approach emphasizing the benefit of the development of the components of the financial structure (bank and capital markets) to economy.

## Conclusions

1. Research of the influence of the financial structure on economic growth and attraction of funds does not provide an unambiguous answer as to which of the financial structures – bank-oriented or market-oriented – has a bigger influence on the economic growth of rapidly emerging economies.
2. The methods of analyzing the financial structure of Lithuania, its influence on the efficiency of the bank sector and economic growth shall cover: calculation of the values of the size, activity of the components of the structure, structure index and their correlation with GDP per capita, establishing the relation to economic growth; evaluation of the efficiency of Lithuanian banks calculating the return of assets of banks, the net interest rate margin and the ratio of fixed expenditure to the profit of the main activity and the strength of this relation with respect to economic growth; regression analysis allowing to evaluate the correlation between the changes of the financial structure, development of the components of the financial structure and the efficiency of the bank sector.
3. The dynamics of change of the size and activity of the Lithuanian bank sector correspond to the tendencies established in research: as the economy of the country grows and the country becomes richer, the size and activity of the bank sector also increase. The growth of the Lithuanian bank sector and the strengthening of its influence on the economy of the country show that the growth and rapid development of the bank sector is characteristic to countries of rapidly emerging economies. Upon carrying out an analysis of the development of the Lithuanian bank sector, it is evident that the correlation between GDP per capita and the size and activity of the bank sector is positive, and the obtained values of coefficients are very significant (P –value to 0.002 and 0.005).
4. Efficiency of Lithuanian banks is increasing and it is confirmed by decreasing net interest margin. Increasing return of assets shows that the economic development of the country positively influences efficiency of banks. The Growth of the Lithuanian bank sector and the strengthening of its influence on the economy of the country show that possibilities of the concentration of financial resources through the bank sector are forming in the country, and this allows us to state that the financial system of Lithuania



is bank-oriented.

5. Development of the bank sector and the stock market positively influences return of assets of banks and cost efficiency. The structure of the financial system has no influence on the mentioned efficiencies. Regression analysis exhibits positive, though not strong, correlation between return of assets of Lithuanian banks ( P-value to 0,485) and the size of the stock market ( P-value to 0,434) and activity of the bank sector (P- value to 0,343 and 0,260). An analogous relation with these indicators of the financial structure is also noticed with respect to efficiency of bank costs.

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## Finansų struktūros, bankinio sektoriaus efektyvumo bei ekonomikos augimo priklausomybių tyrimas

Santrauka

Lietuvoje vyksta spartus ekonomikos augimas bei plėtra. Tokiomis sąlygomis finansinių išteklių telkimo formos pasirinkimo problema tampa aktuali tiek teoriniu, tiek praktiniu požiūriu. Moksliniuose tyrimuose akcentuojamos finansinių išteklių telkimo formos ir šalies susiformavusios finansų struktūros įtaka vykstantiems ekonominiam procesams. Diskusijose apie kurias nors finansų rinkos struktūros pranašumus ir trūkumus daugiausia remiamasi šalies bei atskiros kompanijos augimu ir vystymusi: daugelyje straipsnių, lyginant dvi minimas finansų struktūras, remiamasi Vokietijos, kaip grynai banku paremtos finansų sistemos, ir JAV, kaip rinkos paremtos sistemos pavyzdžiais, ir tik pastaraisiais metais keletas ekonomistų (Asl Demirgüç-Kunt (1999), Harry Huizinga (2000), Vojislav Maksimovic (1999; 2001), Ross Levine (1997, 1999) bei Thorsten Beck (1999)) savo tyrimuose apima kur kas daugiau (150 šalių per 1990-1995m. ir 175 šalis per 1960-1997m.) tiriamų, tarp jų ir besivystančių

šalių, nes tik pastarąjį dešimtmetį kilo nemažai debatų, kuris šių dviejų modelių tinkamumas tokių šalių ekonomikoms kaip Rytų ir Centrinei Europai, Baltijos šalims bei Rusijai. R. Levine (1997), norėdamas tiksliau nusakyti finansų struktūros reikšmę ekonomikos augimui, taip pat atliko išsamų tyrimą, kuriame akcentuoja teigiamą bankų vaidmenį telkiant kapitalą, parenkant tinkamus projektus, prižiūrint kompanijų vadovus bei valdant riziką. Tačiau empirinių tyrimų, apimančių skirtingų finansų struktūrų poveikį ekonominiam augimui (Beck, Levine 2002), (Girardone, Molyneux, Gardener, 2004), rezultatai rodo, kad nėra jokio empirinio pagrindo teigti, jog viena sistema yra geresnė nei kita. Nė viena iš nagrinjamų sistemų nėra išsiskirianti skatinant ekonominį augimą. Dar įdomesni rezultatai (Tadesse, 2000; 2001) rodo, kad šalys su gerai išsivysčiusiais bankais, bet turinčios mažai išsivystytas rinkas nesiskiria nuo šalių su gerai išsivystytais rinkomis, ir atvirkščiai. Tai taip pat leidžia manyti, kad finansų struktūra keičiasi besivystant šaliai ir plėtojantis teisinei sistemai. Tą patvirtina ir A. Demirgüç-Kunt, R. Levine (1999); O.E. Ergungor (2002) bei R. Levine (2001) tyrimų rezultatai: svarbiausia ekonominiam augimui yra gerai išsivysčiusi finansų sistema, tuo tarpu jos išsivystymo pagrindas (bankai ar rinka) nėra taip svarbu.

Atlikus analizę darbų, kuriuose pateikti išsamūs atskirų šalių, pramonės sektorių ir bendrovių tyrimai, nustatant finansų struktūros poveikį finansinių išteklių kaupimui bei bendram ekonominiam augimui, galima daryti išvadą, kad finansinio išsivystymo lygis leidžia nuspėti ekonominio augimo, išteklių kaupimo ir technologijų pokyčių tempus, nes finansų sistemos funkcionavimas yra glaudžiai susijęs su įvairiais ekonominiais sektoriais ir bendrovėmis, taigi ir su šalies ekonominiu augimu. Tačiau moksliniuose tyrimuose galima išskirti du pagrindinius požiūrius: pirmasis – pabrėžia finansų struktūros įtaką šalies mikro- ir makro- ekonomikai, antrasis – neigia finansų struktūros svarbą. Pastarasis požiūris akcentuoja finansų struktūros sudedamųjų dalių (bankų ir kapitalo rinkų) išsivystymą, o ne jų santykį nusakant naudą šalies ekonomikai.

Ekonomistai jau senai stengiasi nustatyti bankinės ir rinkos finansinės sistemos (struktūros) pranašumą viena kitos atžvilgiu. Pastarojo dešimtmečio ekonominiai pokyčiai, nusiritusi finansinio liberalizavimo banga, laisvo kapitalo judėjimas tik paspartino ir paaštrino tokius debatus: P.G. Szilagyi (2003) teigia, kad tinkamiausias būdas Centrinės ir Rytų Europos šalims užtikrinti ateities finansavimo poreikius vystant kapitalo, konkrečiai – obligacijų, rinkas. Tačiau tokie finansinės struktūros tyrimai dažniausiai apsiribodavo finansinės struktūros palyginimu šalių, turinčių panašius ekonominius rodiklius arba bendrą geografinę padėtį: R. Rajan ir L. Zingales (1994) ištyrė ir palygino G-7 šalių įmonių kapitalo struktūrą bei skolinimosi galimybes, J. Koke ir M. Schroder (2002) – Rytų ir Centrinės Europos šalių kapitalo rinkas, S. Schmukler (1999) – Pietų Amerikos ir Rytų Azijos lėšų pritraukimo bei telkimo sprendimus integruojantis ir tarptautines finansines rinkas. Tačiau pirmieji finansinės struktūros tipo daugelio šalių analizę atliko A. Demirgüç-Kunt ir R. Levine (1999). Šiame darbe A. Demirgüç-Kunt ir R. Levine (1999) buvo atkreiptas dėmesys į finansų rinkos struktūros pokyčius, veikiančius šalies ekonomikos augimą. Mokslininkai ištyrė ir palygino daugiau kaip 150 šalių finansų struktūrų. Finansinės sistemos tyrimas rėmėsi tokiomis kryptimis: ekonominis šalies ir bankinių, nebankinių finansinių institucijų bei akcijų rinkų išsivystymas; ekonominio išsivystymo palyginimas su bankine ir rinkos finansine struktūra ir šalies finansinę struktūrą sąlygojantys teisiniai, administraciniai, mokestiniai ir makroekonominiai veiksniai. Teoriniu požiūriu šis darbas svarbus tuo, kad autoriai sudarė *metodiką*, kuria galima įvertinti šalies finansinės sistemos išsivystymą ir, remiantis atitinkamais kriterijais, nustatyti jos struktūrą: ar ji bankus orientuota, ar į rinką orientuota. Tam tikslui sukurta *finansų struktūros indekso apskaičiavimo metodika*, kuri tiksliau nusako kiekvienos šalies finansų struktūrą.

Nors daugelis autorių, analizuodami finansų struktūras, yra linkę Europos šalių finansų sistemą laikyti orientuotą į bankinį sektorių, A. Demirgüç-Kunt ir R. Levine (1999), A. Demirgüç-Kunt ir H. Huizinga (2000) tolesniuose savo darbuose, naudodami finansų struktūros indekso apskaičiavimo metodiką, išskyrė kiekvienos Europos šalies finansų struktūrą. Remiantis šių mokslininkų tyrimais, tokių šalių kaip Jungtinė Karalystė, Švedija ir Olandija finansų sistemos yra laikomos į bankus orientuotomis, tuo tarpu Vokietijos, Belgijos ir Prancūzijos – į rinką orientuotomis. Tad galima teigti, kad rinka paremtos sistemos elementai ES egzistuoja, tačiau jie yra skirtingai pasiskirstę atskirose Europos šalyse. Tačiau nėra atlikta tyrimų, nusakančių finansų struktūrą Baltijos šalyse, įskaitant ir Lie-

tuva. Taip pat, išanalizavus mokslinę literatūrą, galima teigti, kad iki šiol nėra tyrimų, aiškiai apibrėžiančių veiksnius, lemiančius kurios nors finansų struktūros dominavimą, tačiau, pastaruoju metu didelio tyrėjų dėmesio sulaukė finansinių sistemų priklausomybė nuo *BVP*, ir galima teigti, kad ekonominiai veiksniai daugiau ar mažiau veikia bendrą šalies finansinę sistemą nei atskirai kurią nors vieną – bankinę ar rinkos. Kita vertus, *BVP* augimas, kaip įmonių finansinio poreikio indikatorius, daugiau siejamas su rinkos finansinės sistemos aktyvumo padidėjimu. Tai reiškia, kad didėjant *BVP* finansiniai tarpininkai nespėja patenkinti organizacijų finansinio poreikio, dėl to kompanijos labiau išnaudoja akcijų rinkos privalumus.

Straipsnyje pateiktas Lietuvos finansų struktūros ir ekonomikos augimo ryšio įvertinimo tyrimas apima tris etapus. Pirmo etapo tikslas – įvertinti Lietuvos finansų struktūrą, jos kitimo tendencijas bei atskirų finansų struktūros sudedamųjų dalių akcijų rinkos ir bankinio sektoriaus finansinių išteklių telkimo galimybes 1999-2004 metais (finansų struktūros rodikliai ir jų ekonominė prasmė pateikti 1 lentelėje); apskaičiuoti koreliacijos ir regresijos koeficientus, nusakančius ryšio stiprumą tarp finansų struktūros ir *BVP*, tenkančio vienam gyventojui. Remiantis gautais duomenimis, galima daryti prielaidas, nusakančias finansų struktūros formavimo įtakos finansinių lėšų pritraukimo galimybėms bei ekonomikos augimo priklausomybės nuo finansų struktūros tendencijas. Lietuvos finansų struktūros tipui įvertinti naudojamas 1 lentelėje pateiktas struktūros indeksas. Kuo didesnė šio indekso reikšmė, tuo šalies finansų sistema labiau orientuota į rinką nei į bankinį lėšų rinką. Apskaičiuotas finansų struktūros indeksas leis įvertinti mūsų šalies finansų struktūros pokyčius ir tendencijas, o kartu ir finansų struktūros įtaką bankų efektyvumui bei ekonomikos augimui. Antro etapo tikslas, – apibendrinus užsienio mokslininkų atliktus tyrimus, įvertinti Lietuvos bankų efektyvumą apskaičiuojant santykinius rodiklius: turto grąžą (*ROA*), grynąją palūkanų maržą ir fiksuotų išlaidų santykį su pagrindinės veiklos pelnu. Sutinkant su J. A. Bikker (1999) bei A. Demirgüç-Kunt ir R. Levine (1999), daroma prielaida, kad mažesnės grynosios palūkanų maržos reikšmės parodo didesnį bankinio sektoriaus efektyvumą. Trečio etapo tikslas, – panaudojant tiesinę regresinę analizę, įvertinti ryšį tarp bankinio sektoriaus efektyvumo, finansų struktūros pokyčių, finansų struktūros sudedamųjų dalių išsivystymo bei ekonomikos augimo. Regresijos lygties koeficientų reikšmingumui nustatyti panaudojama *P* – vertė, kuri paneigia Nulio hipotezę. *P* – vertė viena dažniausiai naudojamų reikšmių mokslinėje literatūroje atliekant statistinius apskaičiavimus ir regresinę analizę. Kadangi stebėjimų skaičius mažas, šiame tyrime daroma prielaida, kad koeficientų reikšmės yra svarbios, jei jos žemesnės nei 0.50. Tiriama laikotarpio pradžios, t.y. 1999 m., pasirinkimą lėmė 1998 bei ankstesniais metais finansinio sektoriaus duomenų stoka. Lietuvos bankinis sektorius 1999-2004 metais taip pat pasižymėjo didesniu stabilumu nei anksčiau. Tai svarbu atliekant regresinę analizę, nes dėl išorinių veiksnių skirtingo poveikio nagrinėjamiems kintamiesiems paprastai nukenčia rezultatų patikimumas.

Atliktas tyrimas parodė, kad Lietuvos bankinio sektoriaus dydžio ir aktyvumo kitimo dinamika atitinka moksliniuose tyrimuose nustatytas tendencijas: augant šalies ekonomikai ir šaliai tampant turtingesne, bankinio sektoriaus dydis ir aktyvumas taip pat didėja. Lietuvos bankinio sektoriaus augimas ir jo įtakos šalies ekonomikai stiprėjimas rodo, kad bankinio sektoriaus augimas ir spartus vystymasis būdingas greitai augančios ekonomikos šalims. Atlikus Lietuvos bankinio sektoriaus vystymosi analizę, matyti, kad koreliacinis ryšys tarp *BVP*, tenkančio vienam gyventojui, ir bankinio sektoriaus dydžio bei aktyvumo, yra teigiamas, o gautos koeficientų reikšmės labai reikšmingos. Be to, Lietuvos bankų efektyvumas didėja, – tai patvirtina mažėjanti grynoji palūkanų marža. Didėjanti turto grąža parodo, kad ekonominis šalies vystymasis teigiamai veikia bankų efektyvumą. Lietuvos bankinio sektoriaus augimas ir jo įtakos šalies ekonomikai stiprėjimas rodo, kad šalyje formuojasi finansinių išteklių telkimo galimybes per bankinį sektorių, o tai leidžia teigti, kad Lietuvos finansų sistema orientuota į bankinę struktūrą. Tyrimo metu nustatyta ir tai, kad bankinio sektoriaus ir akcijų rinkos vystymasis teigiamai veikia bankų turto grąžą ir kaštų efektyvumą. Finansų sistemos struktūra neturi jokios įtakos minėtiems efektyvumams. Atlikus regresinę analizę, nustatytas teigiamas, nors ir nestiprus, ryšys tarp Lietuvos bankų turto grąžos ir akcijų rinkos dydžio bei bankinio sektoriaus aktyvumo. Analogiškas ryšys su šiais finansų struktūros rodikliais pastebėtas ir bankų kaštų efektyvumo atžvilgiu.

Raktažodžiai: *finansų struktūra, bankų efektyvumas, finansų sistema, ekonomikos augimas, bankų struktūra, rinkos struktūra.*

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