VERIFICATION OF THE HYPOTHESIS „TOO MUCH FINANCE” IN THE POLISH ECONOMY

Abstract

The last global financial crisis has affected the changes in the architecture of the global financial system. This aspect is particularly important and valid starting point for a deeper and broader analysis of the impact of the boom of the financial sector to economic growth. The aim of the study is to identify the optimal level of bank credits to the private sector to GDP in the Polish economy, over which the economic growth rate begins to decline.

In this paper we estimate parameters of the dynamic growth model in order to find an optimal level of the financial depth. Restrictions are imposed and verified on parameters concerning the level and square of financial depth. Results of estimation show that the optimal level of financial depth equals 0.44 for Poland.

JEL Classification Code: A100, C400, E220.

Keywords: Lucas paradox, international capital flows, neoclassical theory.

Introduction

Researches on the relationship occurring between financial development and economic growth gained rapid acceleration, especially in the second half of the 90s. The issue of researches focused in the area that has always accompanied the economy, namely the impact of the development of the financial system on the economic development of countries. The financial system in any modern economy plays an important role. The type of the financial system and its de-
development determines the long term economic growth of countries. The effects of progressive financial integration, broader financial globalization are different across economies.

The evolution of financial systems and economic and social causes that the discussion on the optimal model of the financial system continues. The last global financial crisis has affected the changes in the architecture of the global financial system. This aspect is particularly important and valid starting point for a deeper and broader analysis of the impact of the development of financial sector on the economic growth. Particular attention is focused on an empirical analysis of the degree of development of financial intermediation, mainly bank credits. The aim of the study is to identify the optimal level of bank credits to the private sector to GDP in the polish economy, over which the economic growth rate begins to decline. The analysis was made based on the analysis of literature and define the role of financial development in the development of modern economies and to compare the degree of financial depth of selected economies.

In order to find an optimal level of the financial depth, parameters of the econometric model of the growth rate in Poland (assuming quadratic function) are estimated. In this growth model standard variables – which are commonly used in growth regressions – are included. In order to test the hypothesis about the existence of the optimal point, on parameters concerning the level and square of financial depth restrictions are imposed.

1. The finance – growth nexus – theoretical aspects and empirical studies

W. Bagehot (1873) and J. Schumpeter (1911) are considered the pioneers of research on the impact of development banking system in the long-term rate of economic growth and the search for relationships between them. The authors of this study hypothesize that provides that service the financial sector is one of the most important catalysts of economic growth. Owing to these services in the economy there is a reallocation of savings from investments having relatively lower income sectors with a higher rate of return, at the lowest possible transaction costs and an acceptable level of risk. J. Schumpeter (1911) analyzed the economic opportunities that arise as a result of the activities undertaken by financial intermediaries in the area of investments in new technologies. Financial intermediaries using their advantage had better and cheaper access to information, including tools for assessing technological innovation and its implementation in the individual corporations. At the time, particularly the influence of banks on economic development was significant.

At the turn to of the 19th to 20th century as a result of the evolution of the world financial system, two models have been developed. There are two classically separate financial systems: the Anglo-Saxon system (market-based financial system)
with the dominant stock exchanges and the continental system (bank-based financial system) with the majority of financial intermediaries – mainly universal banks. The primary function of any financial intermediary is to transform some financial assets in given conditions in other financial assets. An example of referring to this statement is mainly the activities of banks, which convert savings into loans. In practice, conversion function of homogeneous assets in other assets is filled by various financial intermediaries in the economy. Since then, in the literature, there are two separate models of classic financial system, whose meaning, essence and characteristics created by years of political and economic systems. The final form of these systems affected by a number of factors, which result in continuing their evolution, but the search for effective solutions to the institutional world is still ongoing.

Among theorists dealing with issues of financial systems, there are both supporters and opponents of the current solutions used in different countries. So far, empirical research did not clearly help prove which system is more conducive to the economic development of countries. In practice, this may mean opinion, according to which the optimal model for the financial system is considered to be the one that resulted from the evolution of the existing classic models. According to F. Allen (1993) the banking system ensures a lower rate of return, however, reaching it is accompanied by relatively lower risk. In countries dominated by the pro-market system it is preferred higher profitability, but at the cost of higher risk. The differences relate to individual characteristics lenders, namely an appeal to their preferences. That position is supported by R. Rajan and L. Zingales (2002), according to which market-oriented systems to access information about business entities is wider and therefore it is easier to assess the risk associated with the project. The pro-banking system, in turn, access to information is limited, higher risk and potential lenders require a higher rate of return, and this can cause the profitability resulting from the implementation of new projects is unsatisfactory. Therefore, it can bet the general thesis that in the banking oriented system there is a domination of traditional industries but in market system the predominance of new technologies is dominating.

R. W. Goldsmith (1969) made the description of the evolution of national financial systems in the process of economic development. He provided information about legal systems of individual economies and included an attempt to identify macroeconomic determinants which determine the financial structure. After analysis he drew conclusions. He believed that the development of the financial system affects the level of economic growth. He proved that there is a positive correlation between financial and economic development. He concluded that financial systems are more developed in richer countries and financial exchanges to banks are more active and effective. In addition, there is little impact of the financial structure on economic growth. The author added that
the financial structure does not play such a role to be attributed to it in literature. Economic policy should focus less on solving the dilemma of whether the country is dominated by a system of “market-oriented” and more on the legal system and appropriate legal regulations and defining the orientation of reforms resulting in initiation of growth stimulation and effective functioning both markets and banks and the effective functioning of both markets and banks.

On the other hand, J. Kulawik (1997) defines financial development as improving financial systems components, i.e. the markets, institutions and financial instruments. According to the author as defined financial development aimed to increase in the volume of financial transactions and their effectiveness. Used measure of financial development included indicator showing the ratio of total financial system assets to GDP. According to another approach, financial development is understood as a process resulting in the reduction of transaction costs associated with financial services by financial institutions involving the conversion of liquid assets on illiquid assets. In the literature, besides the above-mentioned indicator there is also the ratio of bank loans granted by the private banking sector to GDP.

Financial development does not occur in a steady and continuous way. This is demonstrated by studies A. Demirgüç-Kunt and V. Maksimovic (1998), R. King and R. Levine (1993b), J. Jayaratne and P. E. Strahan (1996) and R. Rajan and Zingales L. (1998). Among the above economists on this issue, there is a common – as is clear from the study – the belief that the development of domestic financial sectors contributes to the economic development of a given economy. They undertake a broader aspect of the presentation a key for many researchers phenomenon of financial development and its relationship with economic growth. The starting point for these considerations is the thesis that the level of financial development is a good predictor of the level of future economic growth, capital accumulation and technological change in the country. Basing conclusions on an analysis of data in many countries, under which the financial development as well as its lack can make a certain pattern (possibly optimal), toward which many developing countries but also the most developed countries tend to. The experience of many countries may constitute a reference point for economic policy in the area of the financial system and the rate at which these changes should occur.

R. Levine, N. Loayza and T. Beck (2000) as well as T. Beck, R. Levine, N. Loayza (2000) in their studies have used linear models, and recent studies relate to the effect of financial development on the accumulation of capital, increase of productivity or real GDP per capita growth. The authors believe that the size of these variables may significantly depend also on other factors. F. Valev and N. Rioja (2004b) using the same methodology and data found that financial development stimulated economic growth in rich countries in the first place by increasing efficiency, while in developing countries, financial develop-
ment at first raised the level of capital accumulation. In further analysis F. Rioja and N. Valev (2004a) found that this effect is non-linear. Economy with a very low level of financial development experience very low levels of capital accumulation, while in rich countries, the impact is much greater. Attempt to explain the reasons for non-linearity of the relationship between financial development and economic growth have taken N. Loayza and R. Rancière (2006) subjected to empirical analysis of the relationship between financial development and economic growth. In their study they divided the effect of financial development and economic growth into short-term and long-term effect. They noted that the rapid rise in short-term of bank lending may be a signal of the coming financial crisis and economic stagnation. They use variable Private Credit/GDP as a measure of the development of financial intermediation and came to the conclusion that there is a positive long-term relationship between financial development and growth, while in the short-term, the relationship is generally negative. However, empirical studies suggest that very high credit relative small GDP may lower economic growth.

Figure 1 shows the statistical data for selected regions in order to make a preliminary assessment of the importance of credit intermediation measured by the share of credits to private sector to GDP for 2005-2014.

![Figure 1](image-url)
The data in Figure 1 can be deduced that in the period from 2005 to 2014 the volume indicator measuring the relative share of loans in financing the private sector by banks is relatively high and represents on average in the period approx. 110% of GDP in European Union countries, including countries in the euro zone (approx. 100%). In the USA share of bank credits in GDP is only approx. 50%, while the highest level is the height indicator represents the share of credits from the wider financial sector in GDP (nearly 230% of GDP) and it's important that the share of this sector in the provision of financial capital to the market is growing. The same indicator for the countries of the EU and euro zone average fluctuates within 152% of GDP in the period considered. It is interesting that the highest level of this indicator was recorded in 2011, it means in the period between the liquidity crisis in the banking sector and the sovereign debt crisis (approx. 170% of GDP). We can generally state the conclusion, that in European Union dominates a model of the bank-based financial system. Significant share of GDP is a bank credit, while the role of other financial intermediaries began to wane after 2011. In contrast, in the United States participation of the wider financial intermediation throughout the period increasing and is reducing the share of bank loans in GDP (50% of GDP in 2014.). On the other hand, the average for the indicator showing the ratio of credits extended by the banking sector for the world is approx. 82.8% of GDP, while the share of credits from the financial sector represents 164.4% of world GDP.

Over the past three decades, the size of the financial sector in the US to nominal GDP has increased six times faster. That was the basis to put forward a proposal which states that "instead of being a servant, finance had become the economy’s master" (Wolf 2009). In the literature, studies were undertaken and a wide discussion on financial sector development boundary, beyond which the interaction and the development of the financial sector to GDP is negative and declining influence. The last global financial crisis revealed some irregularities in the functioning and development of the financial sector and its "overestimated" impact on economic growth.

Among some economists there is also a trend opposed to the existence of a causal link between the development of financial markets and economic growth. This trend has been pioneered by J. Robinson (Robinson, 1952, p. 86), who noted that banks passively react to economic growth determining this phenomenon by saying, "where enterprise leads, finance follows". According to R. Solow (1956) there is no casual relationship between financial development and economic growth. He said that the long-term rate of economic growth is the result of technological advances, from which this growth is dependent. Contemporary representative of this trend is the R. E. Lucas (1998), who claims that economists overestimate the role of the financial system, calling the phenomenon straightforward "badly overstress".
In the 70s of the last century perceived, the results also confirmed, expectations concerning the impact of the financial system on economic growth (Minsky, 1974; Kindleberger, 1978). It was thought that they might be exaggerated. Excessive lending was the cause of many financial crises (sudden stop) in emerging economies. The name "sudden stop" comes from the phenomenon, which is characterized by dynamic growth of foreign capital inflow and its outflow, which causes financial crisis (Calvo, 1998). The subject of research Mendoza and Terrones (2008) were both developed countries and developing countries. They noted that in the years 1960-2006 credit booms were related to periods of economic expansion, an increase in shareholders’ equity and real estate prices and appreciation of the exchange rate. According to the authors, the cause of many crises in developing economies were credit booms. According to other authors (Dell’Ariccia et al., 2012) about one-third of credit booms ended with the financial crisis but many credit booms contributed to sustained long-term economic growth in many countries.

The recent crisis has shown that both the stability of the financial system and the economic balance affects the rate of growth in lending. If in the long run growth rate of lending is significantly higher than GDP growth, this may lead to disequilibrium in the economy. This is particularly important when there is feedback between credit growth and property prices.

Studies of other authors (Arcand, Berkes, Panizza, 2012) similarly point to the negative effect of the financial system impact on economic growth and more specifically refer this request to the impact of directed credit to the private sector (financial depth) on GDP. They noted that the economies in which the level of loans reaches 100% of GDP, then there is vanishing and the negative effect of the impact of additional units of credit to GDP of the economy (Arcand, Berkes, Panizza, 2012); Rousseau and Watchel (2011). The authors applied their research to different methodological approaches (simple cross-sectional and panel regressions as well as semi-parametric estimators), which were in line at the sought optimum of financial depth in the range between 80-100% of GDP, depending on the length of the dataset.

Cecchetti and Kharroubi (2012) stress that beyond a certain level, financial deepening is associated with slower rather than faster growth. They examined 50 advanced economies in the years 1980 to 2009 and noted that when private credit exceeds GDP, the productivity growth is decreasing.

2. Empirical growth model enabling testing „too much finance” hypothesis

In order to measure the impact of the ratio of banking credit to GDP on the rate of growth of the real GDP we should estimate the parameters of the growth regression including banking credit on the right-hand side of the equation. In
studies examining the relationship between financial depth and economic growth it is assumed that below certain level the size of the financial system has a positive impact on the economic growth, however at high levels of financial depth, an increase in the size of the financial system results in lower growth rate (see e.g. Arcand et al. 2012). Therefore in the specification of the econometric model growth rate depends on variables traditionally used in growth regressions, the level and square of the financial depth. Such specification enables the estimation of the optimal point of financial depth maximizing economic growth. In order to verify whether the relationship between financial depth and growth has an U-inverted shape, we consider the estimation of the parameters of the following model:

$$ \text{Growth}_t = \alpha_0 + \alpha_1 PC_t + \alpha_2 PC_t^2 + x_t \beta + \epsilon_t $$

(1)

where $PC_t$ denotes the ratio of banking credit to GDP and $x_t$ is the set of other explanatory variables. It should be stressed that we are not interested in measuring impact of remaining variables, however we should estimate parameters using possibly wide specification in order to avoid omitted variables bias. $x_t$ should consist of variables, which are included in specification (1) and turn out to have statistically significant impact on economic growth. We are aware that growth regressions very often include many sophisticated variables (see e.g. Moral-Benito, 2010; Cicone, Jarocinski, 2008), however we have limited sample of data and we are not interested in finding impact of them. Therefore we include in vector $x_t$ only the most important variables, which are especially important according to economic theories. Hypothesis about the U-inverted shape of the relationship between economic growth and financial depth is as follows:

$$ H_0 : \alpha_1 = \alpha_2 = 0 $$

$$ H_1 : \alpha_1 > 0 \land \alpha_2 < 0 $$

(2)

If the estimates of the parameters of model (1) are found and $H_0$ hypothesis is rejected, then the optimal level of financial depth is calculated as follows:

$$ \text{Opt}_PC = -\frac{\hat{\alpha}_1}{2\hat{\alpha}_2} $$

(3)

3. Data and empirical results

Parameters of the model (1) are estimated for the Polish economy. We use quarterly data covering period from 2000Q1 to 2015Q2. Since the estimation is based on growth variables and we use growth between analogous quarters of neighbouring years, our sample covers the period 2001Q1 – 2015Q2. Table 1 presents the results of estimation of the parameters of the growth regression.
Table 1. Results of the estimation of the parameters of the growth equation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Estimate</th>
<th>Measuring goodness of fit and specification tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cons</td>
<td>-0.225*</td>
<td>Goodness of fit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R-squared = 0.89</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adjusted R-squared = 0.86</td>
</tr>
<tr>
<td>Growth$_{t-1}$</td>
<td>0.196*</td>
<td></td>
</tr>
<tr>
<td>Germany$_{Grt}$</td>
<td>0.001*</td>
<td>Testing hypothesis (2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>using Wald test</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Statistic = 3.93</td>
</tr>
<tr>
<td></td>
<td></td>
<td>p-value = 0.02</td>
</tr>
<tr>
<td>PC$_t$</td>
<td>1.132**</td>
<td>Breusch-Godfrey test for autocorrelation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Statistic = 0.61</td>
</tr>
<tr>
<td></td>
<td></td>
<td>p-value = 0.44</td>
</tr>
<tr>
<td>($PC^3$)$_t$</td>
<td>-1.294**</td>
<td>Cointegration Dickey-Fuller test for stationarity of residuals</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Statistic = -7.16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>p-value = 0.00</td>
</tr>
<tr>
<td>Cap$_{Grt}$</td>
<td>0.097***</td>
<td></td>
</tr>
<tr>
<td>Exp$_{Grt}$</td>
<td>0.063***</td>
<td></td>
</tr>
<tr>
<td>U2012Q4_2013Q1$_t$</td>
<td>-0.010*</td>
<td></td>
</tr>
</tbody>
</table>

*,**,*** denote significance at the 0.1, 0.05, 0.01 level of significance respectively.
Source: own calculations.

It can be noticed that estimates of parameters have appropriate signs, which are in line with economic theory. There is some memory in the process of the GDP growth and lagged growth rate has a significant impact on the actual one. Moreover the rate of growth in Germany, the rate of growth of capital and the export growth rate have positive and statistically significant impact on the rate of growth of the real GDP. Lower rate of growth of the real GDP is observed at the turn of years 2012 and 2013. We reject $H_0$ hypothesis that $\alpha_1 = \alpha_2 = 0$, we do not have the problem of autocorrelation and residuals are stationary. On the basis of the results presented in table 1, we calculate optimal value of the financial depth:

$$Opt\_PC = -\frac{\hat{\alpha}_1}{2\hat{\alpha}_2} = 0.44$$  \hspace{1cm} (4)

It means that 0.44 is the optimal level of financial depth in the case of Polish economy. If the financial depth is below this level then an increase in the ratio of the banking credit to GDP has a positive impact on the economic growth. Above this level, financial system in Poland seems to be “too large” compared to the size of the domestic economy. Above this line the financial development hits negative social returns.

Our results are consistent with the results of other authors [Arcand, Berkes, Panizza, 2012] that there is a limit beyond which, as a result of a further increase in the level of lending in the economy appears ”vanishing effect” of the impact on GDP growth, and then increase the share of bank credit / GDP may cause negative GDP growth, ceteris paribus.
4. Forecast of GDP growth

In the next part of this research, we conduct ex ante forecasts for the rate of growth of the real GDP in year 2016 assuming that explanatory variables take on the same values as in first two quarters of the year 2015 for different levels of the financial depth. Graph 1 presents these forecasts for optimal value of the financial depth (0.44), value observed in the last quarters of the sample (0.5), high value (0.6) and very low value (0.3). According to the presented forecasts, rate of growth of real GDP may be higher if credit action will be slightly limited, however significant limitation of the credit action seems to be very dangerous for the perspectives of growth of the polish economy. If the relation of banking credit is reduced to the level of 0.3, then a significant slowdown of the polish economy is expected.

![Graph 1](image)

**Figure 2.** An impact of the financial depth on the growth perspectives in Poland

*Source: Own calculations.*

Conclusions

This research is aimed at analysing the role of the credit intermediation in prompting economic growth. The role of this factor is especially important in the European countries, since banking sector in the European countries plays very important role in raising funds for investments. In contrary, a dominating factor in the United States is the capital market.

After estimation of the parameters of the dynamic growth model, it turns out that the optimal level of growth is reached if the ratio of banking credit to GDP equals
0.44. For such value of the financial depth, predicted rate of growth of GDP in year 2016 equals about 4 percent. In contrary, if this level equals 0.6 or 0.3 in 2016, then the predicted rate of growth will be 3 per cent and 1.5 per cent consecutively.

References


