EMPIRICAL ANALYSYS OF FINANCIAL INTERMEDIATION AND ECONOMIC GROWTH: THE CASE OF MACEDONIAN ECONOMY

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The main goal of the paper is to examine the relationship between the financial sector and economic growth in the Republic of North Macedonia. The Macedonian economy has been facing slow development dynamics and low rates of economic growth for a long period of time. The reasons are certainly multidimensional and identifying them is quite complex. Hence, our task in the paper is to examine the impact of the financial sector on economic growth as one of the factors. First we provide a theoretical model for the analysis of the relationship between the financial sector and economic growth, while in the second part of the paper we use a methodology based on the single-country regression analysis to investigate the relationship between the financial sector measured through the lending activity of banks to private sector and economic growth measured as real GDP growth. Furthermore, we present a comparative analysis of the trend in the level of banking intermediation. The results of the analysis indicate that financial intermediation is a significant factor for the growth of the Macedonian economy through gross investments, which depicts that improving financial intermediation and reducing the interest rate will increase investments and encourage the growth of the Macedonian economy.

Keywords
Financial intermediation, economic growth, single-country regression, North Macedonia

1. Introduction

Economic growth is based on several factors that can be on the supply side or on the demand side. Poor domestic finances refer to insufficient capacity for efficient mobilization of free cash resources and their efficient placement in the form of loans to the private sector. Hence, when we talk about domestic finances as a factor or limitation of economic growth, we mean access to affordable (low-cost) credit for the private sector in order to encourage

investments. On the other hand, when we analyze international finance as a potential limiting factor, we consider of the country's limited access to international capital markets, the country's bad credit rating and the unattractiveness of the economy as a whole to attract foreign investments.

The main focus of this paper is the analysis of the impact of the quality of domestic financial intermediation seen through bank loans to the private sector. For this purpose, we use two empirical methods. The first technique is growth econometrics through which we analyze the importance of the financial sector for the growth of the Macedonian economy and try to answer the question of whether there is a correlation between the credit activity of the banking sector and economic growth in the Republic of North Macedonia and what is the magnitude of the correlation. At the same time, we examine the relationship between the interest rate and the gross investment rate as a growth factor. The second technique used in the paper is comparative analysis. This approach gives us the opportunity to identify the situation with the financial sector through the analysis of a set of indicators for the domestic financial sector in a comparative basis with other countries in the region.

The paper is structured in an introduction, three parts and concluding observations. The first part elaborates the theoretical framework for the analysis of the financial sector and economic growth. The second part provides a detailed review of the relevant literature related to the financial sector and economic growth. The third part refers to the empirical analysis of the financial sector in the Republic of North Macedonia. In the other segment of this section, the specification of the model is presented, the variables of the model are explained, the data sources used and the results obtained and the diagnostic tests performed are presented. Finally, the concluding observations of the paper are presented in detail based on the obtained results of the research and the empirical analysis. Based on the obtained results and conclusions, certain recommendations are given to the economic policy makers in the direction of accelerating the economic growth of the country.
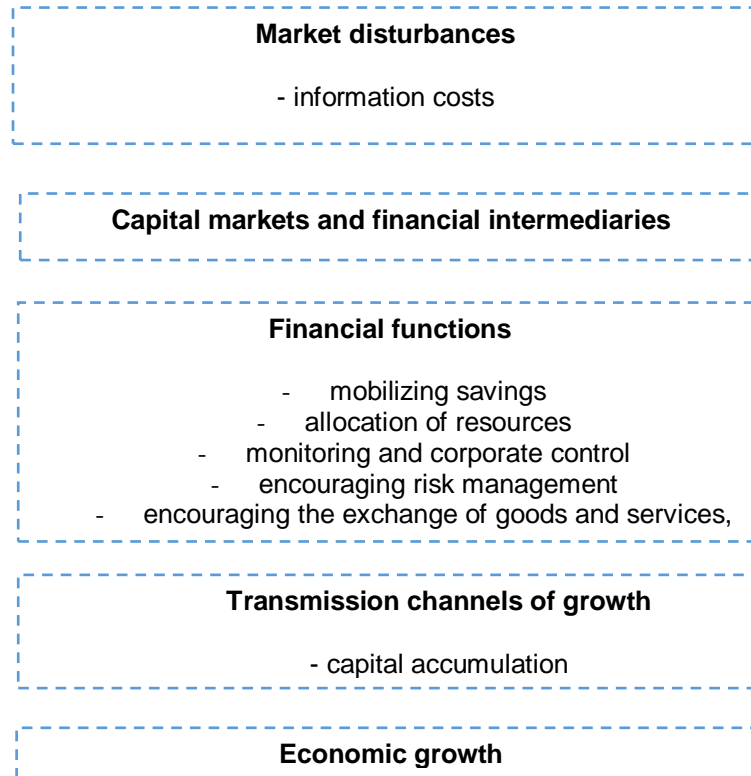
2. Theoretical framework of financial sector and economic growth

The primary functions of the financial sector that are aimed at promoting economic growth are: 1) Mobilization of savings that are the basis for new investments; 2) Generating information for financing the potentially best quality investment projects; 3) Monitoring of managers and implementation of corporate control; 4) Encouraging capital market trading, hedging and diversifying risk and 5) Encouraging and facilitating the exchange of goods and services, [2].

In fact, the relationship between the financial system and economic growth is direct and immediate and it takes place through multiple channels and mechanisms. Namely, the financial system affects growth through the capital market and through the banking system, which enables the mobilization of free cash resources and their redirection to investments in productive purposes that encourage growth and enable the technological development of the economy.

On the Picture 1 the basic framework for analyzing the relationship between the financial sector and economic growth is presented through the elaboration of the specific channels and mechanisms of the relationship.

Picture 1 Link between financial system and economic growth

Market disturbances

- information costs

Capital markets and financial intermediaries

Financial functions

- mobilizing savings
- allocation of resources
- monitoring and corporate control
- encouraging risk management
- encouraging the exchange of goods and services,

Transmission channels of growth

- capital accumulation

Economic growth

In addition, there are several theoretical models that identify the relationship between the financial sector and economic growth. Namely, endogenous growth models implement the financial sector as a factor that determines long-term economic growth through the accumulation of capital and the stimulation of technological innovation.

As a theoretical framework for the analysis of the financial sector and economic growth, a simple endogenous growth model, the AK model will be used, which is based on the assumption that the marginal return on capital is constant, rather than decreasing. This model assumes that the national income records a continuous increase by some factor A, as a result of the increase in the capital stock. The assumption of constant returns to scale is inherent in the AK model, due to the fact that this model treats the total capital in an economy (physical and human), whereby human capital is much less likely to exhibit diminishing returns to scale than other forms of capital, [16].

The linear endogenous growth model, the AK model, can be represented by the following equation:

$$Y_t = AK_t \text{ [14]} \tag{1}$$

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[14] Where: the parameter A is a positive constant indicating the level of technology, while the parameter K represents the stock of total capital in the economy, physical and human.

The equation below shows that the change in capital stock, i.e. net investment, is the difference between gross investment and depreciation (depreciation) of capital stock:

$$\Delta K = K_{t+1} - K_t = I_t - \delta K_t \Rightarrow$$
$$I_t = K_{t+1} - (1-\delta)K_t \tag{2}$$

In conditions of a closed economy, when the only source of investment financing is national savings[15]:

$$I_t = S_t = sY_t \tag{3}$$

Investments represent that part of the national income that the economy saves. However, this assumption is wrong due to the fact that a part of the national savings, the size of $(1-\phi)$, "disappears - is lost" in the process of financial intermediation in the form of "savings leakage".

Namely, the financial intermediaries leave a part of the mobilized savings deposits to cover the costs incurred during the implementation of the financial intermediation process, so consequently, a part of the total amount of savings is not converted into investments.

$$I_t = \phi S_t = \phi s Y_t = \phi s (AK_t) \tag{4}_{16}$$

where ϕ the part (fraction), of the national savings can be used to finance the investments. In fact, this fraction represents the difference between the interest rate on deposits and loans, thus interpreting the (in)efficiency of financial intermediation.

Based on the previous elaboration, net investment ΔK, represents the difference between gross investment $\phi s (AK_t)$, and the depreciation of the existing capital stock δK,

$$\Delta K = I_t - \delta K_t = \phi s (AK_t) - \delta K \tag{5}$$

The fact that the AK model abandons the assumption of diminishing returns to scale confirms that an economy can achieve continuous economic growth as long as net investment is positive.

$$g = A\phi s - \delta \tag{6}_{17}$$

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[15] In today's world of globalization in which countries trade more and more with the world, this assumption is unrealistic, but nevertheless useful, because the abstraction from international trade and finance creates an opportunity to analyze financial intermediation in detail.·

[16] Note: $S_t = sY_t$ and $Y_t = AK_t$.

[17] Mathematical note: The equation $g_Y = Ag_K$ shows that output growth (economic growth) is determined by the growth of total capital in the economy. The equation, $g_K = \Delta K / K = K_{t+1} - K_t / K_t$

Steady-state rate of economic growth interpreted through equation (6), alternatively through a graphic display can be represented as the difference between the angles β and α.

In the model that was developed, the (exogenous) process of financial intermediation can potentially determine long-term economic growth through three different transmission mechanisms. First, by increasing the fraction of savings that is actually used to finance investments ϕ, that is, by reducing distortion $(1 - \phi)$, which is the result of low-quality financial intermediation. Second, by increasing the marginal productivity of capital, A. Financial intermediaries are able to improve the allocation of capital by financing investment projects characterized by a relatively higher marginal productivity of capital. Third, financial intermediation can increase the propensity to save. However, the question arises, does the development of the financial sector always mean a higher rate of savings? To get the answer to this question, several examples will be presented. Namely, the development of the financial sector may lead to an increase in the supply of different types of insurance products in the financial market, which will cause a reduction in savings by the household sector as a reaction to greater caution. There is a possibility that the financial sector will ensure a quality transformation of savings into investments, but, nevertheless, economic growth will stagnate due to the insufficient level of national savings that will finance the necessary capital accumulation.

3. Literature review

Debates about the role and importance of the financial sector in promoting economic growth have existed for a long time. The financial system played the key role in the process of industrialization in many countries through the success in mobilizing the capital necessary to finance large infrastructural and capital investments. Many studies confirmed that a well-developed banking system encourages technological innovation by identifying and finding those entrepreneurs with the best chance of successfully implementing their business ideas, [4, 18]. More recent theoretical and empirical literature has reached a consensus on the question of the positive influence of finance (banking sector and financial markets) in promoting economic growth, [1, 7, 11].

There are several theoretical models in which efficient financial markets direct financial resources to investment projects with the highest rates of return, improve the financial performance of firms, increases access to finance, thus promoting economic growth, [8].

In general, there are multiple channels through which the financial sector influences economic growth, [5]. Financial intermediaries (commercial and investment banks, insurance companies and pension funds) and financial markets (capital markets and stock exchanges) can increase the saving rate, reduce information and transaction costs, can improve resource allocation

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interprets the increase in the stock of capital (physical and human) in the economy. Considering that the parameter A is a constant, then, the economic growth can be calculated in the following way:

$$g = \frac{K_{t+1} - K_t}{K_t} = \frac{K_{t+1}}{K_t} - 1 = \frac{I_t - \delta K_t}{K_t} = \frac{K_{t+1} - (1 - \delta)K_t}{K_t} = \frac{I_t}{K_t} - \frac{\delta K_t}{K_t} = \frac{I_t}{K_t} - \delta$$

$$\Leftrightarrow g = \frac{\phi s Y_t}{K_t} - \delta \Leftrightarrow g = \frac{\phi s (A K_t)}{K_t} - \delta = A \phi s - \delta$$

and investment efficiency by improving risk and liquidity management, scanning and monitoring and hedging, [12, 13].

A number of empirical studies analyze the relationship between the financial sector and economic growth, [10]. For example, one stream of literature identified positive effects of financial sector development (measured by banking sector development) on economic growth by applying cross-country regression analysis [6, 12], while another group of litreature identified a significant positive effect of capital market development on economic growth, [11].

However, the application of the cross-country regression approach as the most useful in the analysis of finance and economic growth has been significantly criticized due to large differences between countriesand other problems and weaknesses of this econometric technique. In order to address and overcome some of the econometric problems and weaknesses associated with cross-country regression analysis, such as the problem of endogeneity or double causality and omitted variable bias, [12]. However, the results obtained from these studies do not differ much from previous research, indicating that the conclusions of the original studies are completely valid and reliable.

All these papers, regardless of which method they use, in their essence, analyze the financial sector as a factor that determines economic growth. The approach used in this paper is quite different and it tries to answer the question of whether the financial sector is a limiting factor of growth by analyzing the cost of financing. In addition, the methodological framework in the conducted empirical research is adapted for the analysis of a single country, rather than as in most cases for a group of countries. All this gives a new, applicable and applied dimension to the research itself, from where it draws the contribution to the existing literature, especially for the case of the Republic of Macedonia.

4. Empirical analysis of financial sector and economic growth relation

The fact that investments need to be financed indicates that the credit activity of banks towards the private sector as the most important financial intermediaries (in the conditions of the bank-centric financial system dominant in all of Europe) has a significant role in dynamizing economic growth. In that direction, the figure below provides information on the credit activity in the Republic of Macedonia compared to the countries of the Western Balkans, the new EU member states, and the countries of the Eurozone, in the period from 2002 to 2022.

Chart 1 Bank loans to the private sector (% of GDP)
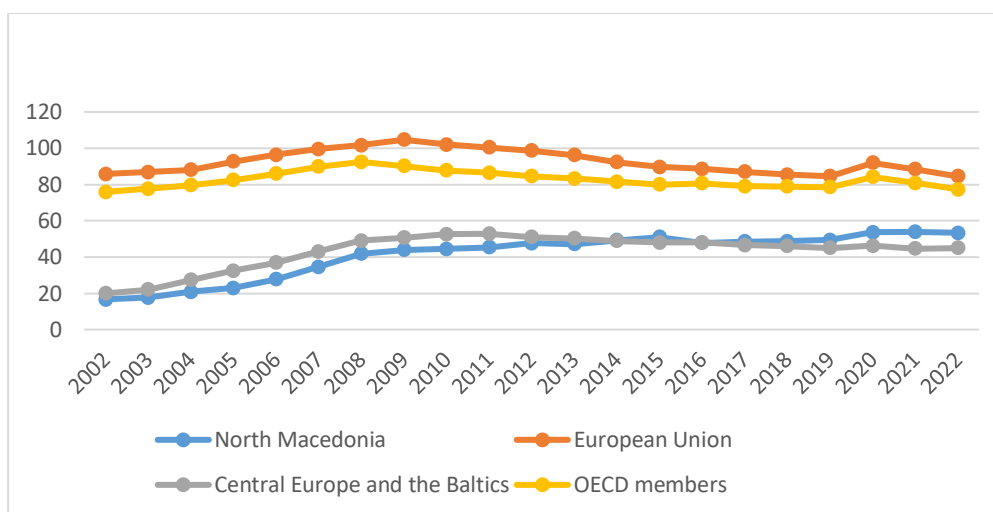
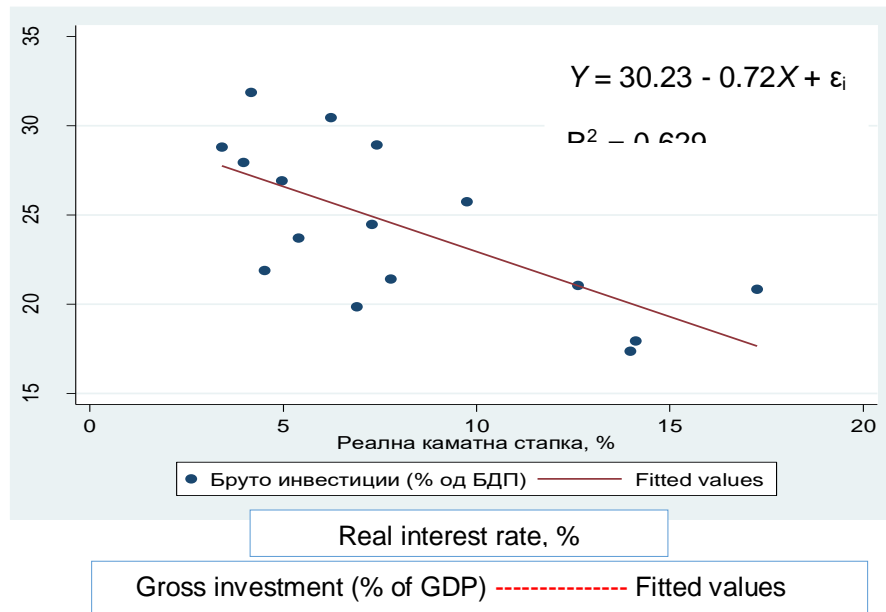Source: Authors' calculation based on the Global Financial Development Database

The comparative analysis indicates that the Republic of North Macedonia has made significant progress (from 20% in 2002 to approximately 53% at the end of 2022) in the banking sector in the past period, with a slight stagnation during the period of the world economic crisis. Such a tendency allowed the country to reach the level of the countries of Central Europe and the Baltic countries. However, the level of financial intermediation is far behind the EU and OECD countries, which, despite the stagnation in the past period, are at a level above 80%.

What is extremely important in the analysis of the thesis that the financial sector is a limiting factor for the growth of the Macedonian economy is the research of the relationship between the interest rate as the cost of capital and investments as a significant factor of economic growth.

For this purpose, we use a linear regression model where the dependent variable is gross investment (as a percentage of GDP), while the independent variable is the real interest rate for the period 2002-2022.

The obtained results show that there is a negative and statistically significant (at 1% significance) dependence between investments and the real interest rate, confirming the hypothesis that the real interest rate is one of the most important determinants of investments and economic growth, i.e. that investments are significantly sensitive to change of the real interest rate.

Chart 2 Gross investments and real interest rate in North Macedonia

$Y = 30.23 - 0.72X + \varepsilon_i$

$R^2 = 0.629$

Реална каматна стапка, %

● Бруто инвестиции (% од БДП) ——— Fitted values

Real interest rate, %

Gross investment (% of GDP) --------------- Fitted values

Considering the fact that the cost of capital in the Republic of North Macedonia is at a fairly high level and the fact that the real interest rate as a cost of capital has a significant impact on investment and growth in the Republic of North Macedonia, our next task is to identify and address the reasons for the high cost of capital as a potential limiting factor for growth.

From the international finance point of view, we should emphasize that the increasing trend of public debt and the political crisis can have a negative impact on the cost of capital by reducing the country's credit rating, despite the fact that there is still no restriction to the international capital markets. On the other hand, the favorable monetary conditions in the EU and the low interest rate up to a certain level compensates such disadvantage. What is also important in the analysis of international finance as a limitation of growth, and especially considering the existing growth model of the Macedonian economy, is the country's attractiveness for attracting FDI.
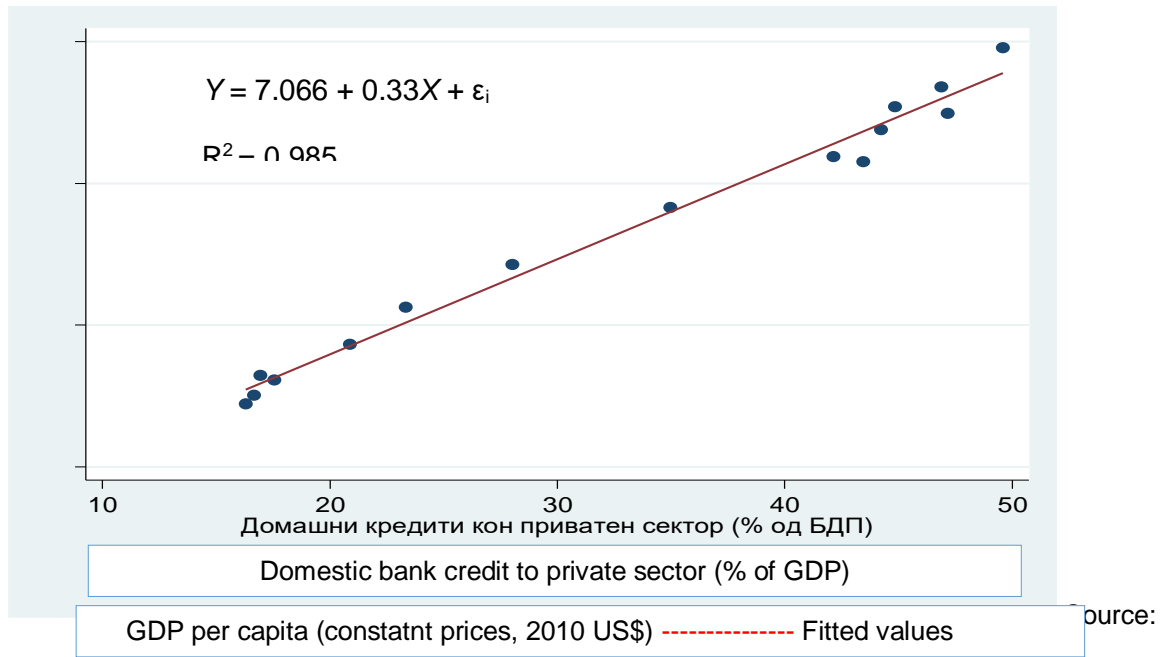
However, due to the limited room in the paper, our focus is on the analysis of domestic finances. There are at least three potential explanations for the rather high costs of financing in the Republic of Macedonia analyzed through the prism of financial intermediation: 1) the low level of liquidity of the financial sector, 2) the small banking market, the low level of competition and insufficient efficiency, and 3) the high credit risk.

5. Financial sector and economic growth

How significant the size and development of the banking sector is for economic growth in the Republic of Macedonia can be seen from the figure below, where the correlation between domestic bank loans to the private sector and the level of GDP per capita is presented.

Chart 3 Bank loans to the private sector and GDP per capita in Macedonia

$$Y = 7.066 + 0.33X + \varepsilon_i$$

$$R^2 = 0.985$$

Домашни кредити кон приватен сектор (% од БДП)

Domestic bank credit to private sector (% of GDP)

GDP per capita (constatnt prices, 2010 US$) ----------- Fitted values

Source: Authors' calculation.

The regression analysis performed for the period 2002-2022 using linear MNC shows a positive and statistically significant (at 1% significance level) relationship between domestic bank loans to the private sector (as a percentage of GDP) and the real level of GDP per capita (in US dollars) expressed in logarithmic form. This regression analysis was made in order to ensure a systematic confirmation of the hypothesis that banking activity has a positive impact on GDP growth, [3, 14, 15, 17].

Conclusion

The main goal of the paper is to analyze the relationship between financial intermediation and the growth of the Macedonian economy. In order to answer the given task, we use two methodological techniques for the diagnosis of growth in the direction of researching the question of whether the financial sector is a limiting factor for growth. First, we use a comparative analysis to investigate the country's financial integration over the past 20 years compared to countries in the region, the EU, and developed countries. Second, we use econometric analysis to investigate the relationship between the interest rate as the cost of capital and gross investment, as well as the relationship between financial intermediation and economic growth in the Republic of North Macedonia in the period 2002-2022.

Previously, through an endogenous growth model, we theoretically analyze the relationship between the financial sector and economic growth, indicating that the financial sector influences economic growth through various mechanisms. Namely, the financial sector enables the mobilization of free monetary capital and its allocation to the private sector in order to encourage investments and the technological development of economies.

The obtained results of the comparative analysis show that the financial sector in the Republic of North Macedonia recorded a significant improvement in the analyzed period. Namely, domestic bank loans to the private sector as a synthetic indicator that measures the level of development of the financial sector recorded a significant growth from 20% in 2002 to 43% in

2022. However, this level of financial development of the country is far compared to EU countries and developed countries where the level of bank loans to the private sector reaches over 80% of GDP. This shows that the country should work simultaneously to improve financial intermediation by encouraging the banking sector to increase the amount of loans to the private sector, but at the same time it is necessary for the business sector to create better business ideas that banks will support.

In addition, the results of the analysis indicate that financial intermediation is a significant factor for the growth of the Macedonian economy through gross investments, which indicates that improving financial intermediation and reducing the interest rate as a cost of capital will increase investments and stimulate the growth of the Macedonian economy.

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