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# THE IMPACT OF BANKING SECTOR DEVELOPMENT ON ECONOMIC GROWTH: THE CASE OF EU COUNTRIES

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**Abstract**
*Using a multiple linear regression model, this paper examines the role of banking sector development on economic growth in the European Union member countries. The analysis covers a period of 21 years (2000-2020) and is based on data obtained, mainly, from the World Bank's World Development Indicators database. Our empirical results would indicate a strong and statistically significant link between the development of the banking sector and economic growth, both at the level of the EU countries and at the level of the other two groups of countries (euro area countries and non-euro EU countries). However, we obtain some different results in the case of EU countries, which are not members of the euro area. In general, our findings are in line with economic theory, but also with the results of empirical studies relevant to our topic.*
**Keywords:** *banking sector, credit, economic growth, EU countries.*
**JEL Classification:** G21, O40, C33.

## 1. INTRODUCTION

The banking sector is the main pillar of the financial system, providing most of the liquidity in the market and supporting economic activity by financing economic agents in the process of financial expansion. Through its functions, it ensures the speed and consistency of transactions, facilitates the flow of information between different sectors, redistributes resources and creates added value, which is then passed on to gross domestic product. Through its institutions (banks), the banking sector provides various banking products and services through which it facilitates trade, improves living standards and contributes to economic development and growth.

Knowing the role of the banking sector in the economy is part of the national identity and is important from the perspective of establishing the real state of the financial system. The analysis of the functions of the sector determines its efficiency within the society and provides an opportunity to estimate long-term results, highlighting the possibility of comparing the de facto state with the expected one. Thus, through its specific intermediary function, it connects participants in transactions, both nationally and internationally, ensures the necessary resources for the conduct of economic activities, facilitates the exchange of information and maintains market liquidity. At the same time, it is the banking sector, by being able to adapt quickly to unexpected situations under conditions of uncertainty, which can provide confidence to certain activities through lending, leading to asset price re-pricing, which is essential during an economic downturn. By acting in the same way as reallocating resources, it lays the foundations for economic growth.

The main objective of this paper is to empirically investigate the impact of banking sector development in the European Union countries on economic growth. In order to achieve this objective, our study is structured as follows: section 2 provides a review of the literature, focused on examining the link between banking sector development and economic growth; section 3 describes the data, the variables included in the analysis and the research methodology used; section 4 focuses on discussing the empirical results obtained, and the last section formulates some conclusions resulting from the investigation undertaken.

## 2. LITERATURE REVIEW

The banking sector can be considered as a cornerstone of the financial system, which means that its influence on the economy is colossal. Thus, the development of this sector is closely linked to economic growth, stability and efficiency.

Reviewing the literature, we find a significant number of studies (e.g., Petkovski and Kjosevski, 2014; Ductor and Grechyna, 2015; Ghosh, 2017; Gruptha and Prabhakar, 2018; Škare, Sinković and Porada-Rochoń, 2019; Matei, 2020; Abeka *et al.*, 2021; Rinosha and Mustafa, 2021; Iqbal *et al.*, 2021; Machado, Saraiva and Vieira, 2021; Silva, Tabak and Laiz, 2021) that estimate the link between banking sector development and economic growth. Petkovski and Kjosevski (2014) focused on the influence of the banking sector on economic growth in 16 transition economy countries in Central and South-Eastern Europe, whose financial systems are relatively new and diverse. The results of the empirical study show that the interest margin and credit to the private sector do not lead to economic growth, while the quasi-money ratio turns out to be directly proportional to the dependent variable, the GDP growth rate. Thus, although banks could take these empirical results into account in their decisions, a drawback would be the small sample of developing countries.

Another research (Ductor and Grechyna, 2015) examines the relationship between financial development and economic growth (as expressed by the real growth rate of per capita gross domestic product), analyzing indicators from 101 developed and developing countries over the period 1970-2010. The results found that financial development is directly influenced by private credit growth relative to real output growth, but if very rapid credit growth occurs, economic growth may be negatively affected. At the same time, the idea of balanced development of both the real and financial sectors is emphasized, as they are reflected in the GDP growth rate. Thus, the study stands out for the large sample of countries used and the important findings, which could serve as additional guidelines in future regulations concerning macroprudential policy, but it is based only on developed and developing countries, undermining the importance of less developed countries in the global economy.

Comparatively, Ghosh (2017) is concerned with economic growth from the perspective of the impact of globalization of the banking sector, following the same line of research as other authors in the field of economics. The paper examines the impact of global systematization on a group of 138 countries over a period of eighteen years (1995-2013), reflected in the increase or decrease in the quantity of goods and services produced in these economies (GDP growth) over the years under consideration. Thus, the research results show that foreign banks are reducing the volume of private lending in the countries where they have their head offices, which emphasizes that they are finding it difficult to extend loans to more potential customers in the financial markets of the host countries due to information bottlenecks. In another perspective, the analysis suggests that further opening up of the banking sector may lead to a slowdown in the pace of economic growth or even stagnate it to some extent. While the findings point to the reality in emerging markets, low-income countries or countries where more than 10% of banks are foreign-owned, they do not capture the effects of banking globalization in developed economies and are limited to low and medium-developed countries. Finally, some monetary and economic policy interventions are needed to limit or even eliminate information barriers between the two countries involved in economic processes.

Another study of interest is the one by Gruptha and Prabhakar (2018), which analyzes the world's most powerful developing economies, the so-called BRICS countries (Brazil, Russia, India, China and South Africa), explaining the practical impact of the development of the financial system in the countries concerned on the growth of the global economy. Thus, the results show that economic growth in one of the five countries does not necessarily lead to economic growth in the others, highlighting the unevenness in the relationship and causality of fluctuations among the largest emerging economies on earth.

Škare, Sinković and Porada-Rochoń (2019) complements the literature with an analysis on the case of Poland (period 1990-2018) following the relationship between economic and financial growth, taking into account the credit side of the financial sector, as most other studies do not involve this variable. As a result of the research, it has been observed that the share of households over the share of firms in total credit is statistically significant, positively influencing economic growth. At the same time, empirical evidence shows that using the total share of private credit in GDP or the total amount of private credit underestimates the effects of the financial system on economic growth, implying the need to introduce the breakdown of bank credit by section in decision making and future studies.

Similar to the other studies, Matei (2020) investigates the impact of financial development on economic growth. However, the author introduces a novel element by looking at finance as an engine of economic growth due to its implications on investments of an innovative nature. At the same time, the analysis on 11 European countries with emerging economies over the period 1995-2016 results in the identification of the linear relationship between the sample units, according to which financial development has beneficial effects on the economy and implicitly on its growth rate over a short period of time.

Other more recent studies (such as, Abeka *et al.*, 2021) measure economic growth expressed by the real growth rate of GDP per capita and analyze its relationship with financial development in sub-Saharan economies. After analyzing the results, it is observed that infrastructure in the nature of telecommunication is an important pawn in alleviating bottlenecks and positively helps economic growth.

In the view of other authors (Iqbal *et al.*, 2021), the link between the financial system and national governance with economic growth needs to be approached from a causality perspective, which is why a sample of 115 economies over the period 1996-2018 is used. Thus, the final results lead to a two-branch dispersion across economies, considering that financial development and the shakeup in national governance have stronger influences on economic growth in undeveloped countries compared to developed and developing economies.

Silva, Tabak and Laiz (2021) emphasize the relationship between financing and economic growth by showing the importance of bank ownership, loan origination, bank type and lending method on economic expansion.

Looking in perspective, although the relationship between financial sector development and economic growth is analyzed at a global level by different authors, each of them brings an element of novelty in terms of the variables taken into account, the differentiated approaches and the factors taken into account in the research (e.g. pandemic). In this way, the 'outdated' literature is combined with current literature to provide valuable lessons for financial and banking market players so as to avoid the mistakes of the past and to enable the economies of the world's countries to evolve harmoniously in order to streamline the financial process.

## 3. DATA, VARIABLES AND RESEARCH METHODOLOGY

The main objective of the study is to highlight the link between the development of the banking system and economic growth in the EU Member States using a multiple linear regression model. In investigating the link between banking sector development and economic growth, we use econometric analysis and estimate the regression equation using a panel composed of the 27 EU countries, divided according to the single currency adoption criterion. Thus, we have euro-area countries (Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia, Spain, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia and Spain) and non-euro area countries (Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Sweden and Denmark). The choice of the time period was conditional on the availability of time series data, so that they were the same for all influencing factors. The variables were selected on the basis of the literature in view of their potential impact on economic growth and were collected from various sources, using the years 2000-2020 as the reference period. As the dependent variable, economic growth measured by the annual growth rate of GDP per capita (GDPgrowth) is used. The independent variables included in the study are domestic credit granted to the private sector by banks (PRVC), gross fixed capital formation (GFC), government consumption (GVE), population growth (PG), openness of the economy (TRD), inflation rate (INF) and unemployment rate (UNEMP) are obtained from The World Bank Data Base (WBD). The independent variable asset rate (BAS) is obtained by hand-writing the data from the GlobalEconomy database, due to insufficient data in the other source and unavailability of the download option.

On the basis of the literature review, we performed the following regression equation:

$$(GDPgrowth)_{it} = \beta_0 + \beta_1 * PRVC_{it} + \beta_2 * GFC_{it} + \beta_3 * GVE_{it} + \beta_4 * PG_{it} +$$

$$\beta_5 * TRD_{it} + \beta_6 * INF_{it} + \beta_7 * UNEMP_{it} + \beta_8 * BAS_{it} + \mu_{it}$$

Where: i = 1, 2, ......, 27; t = 2000, 2001, ......, 2020; $(GDPgrowth)_{it}$ = the economic growth rate in country i and at time t, measured by the growth rate of GDP per capita; μ = the error term of the equation; $\beta_0$ = the constant; $\beta_1$ , $\beta_2$ ,....., $\beta_8$ - the coefficients of the independent variables.

Economic growth is a rather complex process that is difficult to define in a clear-cut manner, and studies have not yet reached a generally valid conclusion for the most appropriate indicator that captures its specificity. Most of the literature considers the GDP growth rate as the dependent variable rather than the actual value of GDP growth (Petkovski and Kjosevski, 2014), as it is assumed that changes in the independent variables have a long-lasting effect on the GDP growth rate. To highlight the influences on growth, we use alternative items from different domains. Thus, from the banking sector and its efficiency we consider private credit and asset ratio, and from the macroeconomic sphere we consider, inflation rate, government consumption, openness of the economy, gross fixed capital formation, unemployment rate and population growth (Table 1).

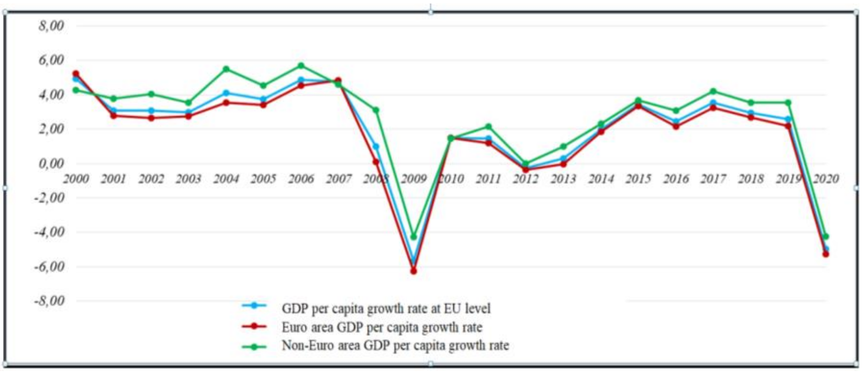
**Table 1. Econometric variables and expected effects**

| Variable | Symbol | Description | Unit of measurement | The expected effect | Data source |
|---|---|---|---|---|---|
| **Dependent variable** | | | | | |
| *Economic growth* | GDPgrowth | Annual growth rate of GDP per capita | % | | World Bank Data (World Bank Indicators) |
| **Independent variables** | | | | | |
| *Private credit* | PRVC | Domestic credit granted by banks to the private sector | % of GDP | + | World Bank Data (World Bank Indicators) |
| *Banking assets* | BAS | Share of banking assets in GDP | % | +/- | the GlobalEconomy.com (Indicators) |
| *Inflation* | INF | Inflation, GDP deflator | % | +/- | World Bank Data (World Bank Indicators) |
| *Government consumption* | GVE | Government final consumption expenditure | % of GDP | +/- | World Bank Data (World Bank Indicators) |
| *Trade* | TRD | Openness of the economy | % of GDP | + | World Bank Data (World Bank Indicators) |
| *Investments* | GFC | Gross fixed capital formation | % of GDP | + | World Bank Data (World Bank Indicators) |
| *Unemployment* | UNEMP | Unemployment rate (% of total workforce, ILO estimate) | % | - | World Bank Data (World Bank Indicators) |
| *Population growth* | PG | Annual population growth | % | +/- | World Bank Data (World Bank Indicators) |

Source: authors elaboration based on the specialized literature

Working with panel data, which take into account both country and time period, it is possible that results may be biased due to heterogeneity, which is why both the least squares and generalized method of moments are used, which best highlight the influence and the sense in which the independent variables affect the dependent variable. In fact, the Generalized Method for Moments (GMM) is also the most widely used in econometric studies (Levine, Loayza and Beck, 2000; Kunt and Levine, 2001; Beck and Levine, 2004; Petkovski and Kjosevski, 2014). Both methods yield the same results, which is why we will only put the obtained outputs once.

According to the World Bank (World Bank Data, 2022), the annual growth rate of gross domestic product per capita is calculated at purchaser prices as the sum of gross value added and product taxes less subsidies, but excluding deductions for depreciation and natural resource depletion. In line with the literature (Petkovski and Kjosevski, 2014; Dobjanschi, 2018), economic growth is a variable that can successfully indicate the degree of development of a country and is directly correlated with the financial system, being influenced by different categories of factors, through which sustainable economic development is ensured in the medium and long term. In perspective, economic growth is an element that very well describes the country profile and the standard of living, identifying through its causes, possible drawbacks that hinder financial stability, such as the inefficiency of the banking sector, of governance or the prevalence of technology use among companies or the population. With the present study, we aim to reveal what effects the explanatory variables have and how they influence the rate of GDP growth, expecting a positive relationship between the development of the financial system and GDP growth. However, some authors (Machado, Saraiva and Vieira, 2021) consider that there is competition between the financial sector and the other part of the economy, which also targets physical capital and skilled labor, which does not always bring positive effects and may deregulate the allocation of resources, as skilled labor migrates to this area, leaving behind the productive sphere. There is also the issue of "bad finance", as it can lead to long-term negative effects on our dependent variable, but at the other end of the spectrum, a bad financial system is seen as reducing saving and investment, leaving room for speculation. However, sustainable economic growth is the result of effective coordination of all the components of the financial system, which help each other to achieve a degree of development conducive to the smooth functioning of economic operations (Figure 1).



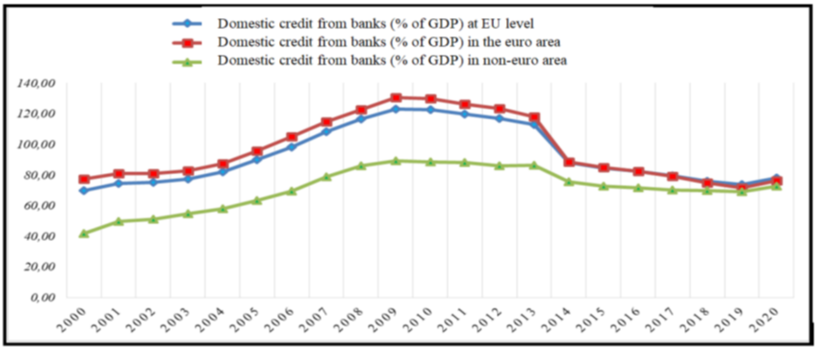

Source: Own elaboration based on World Bank Data (2022)

**Figure 1. Average GDP per capita growth rates in EU, euro area and non-euro area countries between 2000 and 2020**

Analysing the average growth rate of GDP per capita in the countries of the European Union, we find little fluctuation over the period under analysis (2000-

2020), with the exception of the two major crises that have had a significant impact on the financial system and economic growth. As a result of the growing financial imbalances (due to the increase in subprime loan defaults in the USA, the collapse of major banks such as Lehman Brothers and the lack of liquidity), the sharp fall in GDP growth in 2008-2009 was mainly caused by bank failures, which cut off access to finance for many companies, which were to suffer the same fate as credit institutions. As a result, the production of goods and services began to fall, the pressure increased on governments to cut wages, the number of unemployed rose and there was an unprecedented economic shock, which led to a fall in the average per capita GDP growth rate, reaching a negative -5.67% in the European Union in 2009. In terms of the categories of countries analysed, there are no significant differences compared to the EU average, with the lowest values in the same year reaching -6.27% in the euro area and -4.25% in the non-euro area, and the highest values in 2006 at 4.53% in the euro area and 5.70% outside the euro area. The same trend is also observed in 2020 as a result of the pandemic crisis, with a value of around -6%, caused by the bankruptcy of many firms, lockdowns and rising unemployment, with no significant differences between the 3 average growth rates during the pandemic crisis. Compared with the EU average as a whole, the same fluctuation trend is observed for both euro and non-euro countries, with a slight tendency for the average growth rate of non-euro countries to exceed the average growth rate. This comes against the backdrop of the use of the national currency, which is not subject to currency risk, and of the large colonists who prefer emerging economies as they offer cheap labor and low costs.

As for the main independent variable, domestic credit is the most widely used indicator of financial development and the depth of the banking sector (Al-Moulani and Alexiou, 2017) and is considered a proxy variable (Petkovski and Kjosevski, 2014; Ahmed and Bashir, 2016; Abeka *et al.*, 2021), which emphasizes a positive relationship between it and GDP developments. Thus, an increase in the domestic credit variable will lead to an increase in GDP, implying economic growth, while encouraging investment that could lead to higher inflation in the medium to long run. Koivu (2002) contradicts previous results, as he obtains a negative relationship between bank credit to the private sector and economic growth, showing an unsustainable growth in the private sector under different patterns of transition economies. Beck, Degryse and Kneer (2014) associate domestic credit with financial intermediation, emphasizing that sustained growth in domestic credit reduces volatility over long periods of time compared to short periods of time when the effects are weaker, one of the causes being the continuous modernization of financial systems, which directly influences the profitability and stability of the financial system. Guptha and Prabhakar (2018) opine that an increase in domestic credit extended by banks intensifies the volatility of economic growth in the medium term, explaining the dependent variable with high probability. Silva, Tabak and Laiz (2021) argues that private sector lending can cause high volatility in economic growth in the medium-run, but can be considered a relative source of economic growth in the long-run (Figure 2).




Source: Own elaboration based on World Bank Data (2022)

**Figure 2. Evolution of the share of domestic credit in GDP in the EU, euro area and non-euro area countries, 2000-2020**

As can now be seen in Figure 2, domestic credit follows the same trend in all three categories of countries, with a larger difference for non-euro area countries. Until 2013, the share of private credit granted by banks in GDP was quite high, above 80% in non-euro countries and above 100% in EU and euro area countries, but from 2014 onwards it declines. The sharp fall in domestic credit just a few years after the financial crisis of 2007-2008 appears to be a delayed effect of the financial crisis, with the tightening of credit conditions and the entry into the EU of weakly developed countries such as Romania (2007) and Bulgaria (2007). At the same time, the measures to limit lending are being taken against the background of the fairly high inflation resulting from the financial crisis, with major differences being observed between the euro area countries, which are close to the EU's total share, compared with the share of countries outside the euro area, due to higher levels of poverty, lower levels of development and underdeveloped capital markets. It can also be argued that the fall in lending is also due to the start of an increasing use of common monetary policies, with developed countries experiencing an increase in GDP, while the population and companies have decided to limit borrowing for precautionary reasons, especially in the face of the problems created by the financial crisis. However, private sector borrowing starts to pick up slightly in 2020 with the onset of the pandemic crisis, with borrowers affected to a lesser extent compared to the 2007-2008 economic shock.

The share of banking assets in GDP is an indicator that measures the efficiency and depth of the banking sector (Al-Moulani and Alexiou, 2017) and generates positive effects on economic growth. Demirgüç-Kunt and Levine (2001) argue that bank assets are in direct proportion to economic growth, providing a broad dimension on the banking sector. Azman-Saini and Law (2010) and Hismendi *et al.* (2021) emphasize a direct link between GDP growth and commercial bank assets, calculated as the ratio of commercial bank assets to the sum of commercial bank and central bank assets, believing that through the influence on foreign direct investment (if bank assets increase, investment increases), economic growth is achieved. The positive influence of banks' assets on economic growth is also related to their lending capacity, because as borrowing and borrowing requirements increase, so does financial development, which leads to an increase in the goods and services in the economy.

Inflation is one of the indicators specific to monetary policy (Beck, Degryse and Kneer, 2014; Petkovski and Kjosevski, 2014), which can have negative effects on economic growth and positive effects on financial sector volatility. Koivu (2002) emphasizes that an inflationary environment is characterized by uncertainty, which implies that financial intermediation can be unbalanced at any time, as information about investment projects is constantly changing and monetary assets start to be used less and less. Petkovski and Kjosevski (2014), although they identify in their models an inflation with a negative sign that affects GDP, contrary to many results, in the same study they also find a positive effect of it, due to the hyperinflation characteristic of the sample of countries chosen, which are individualized by planned economies The work of Kunt and Levine (2001), Beck and Levine (2004), Ahmed and Bashir (2016) is in agreement with Kareem, Olusegun and Arogundade (2017), who identify an inverse relationship between inflation and economic growth in both the long-run and the short-run. However, Dobjanschi (2018) does not observe an impact on gross domestic product, while Ginevičius *et al.* (2019) find that inflation negatively affects macroeconomic equilibrium through instability. Iqbal *et al.* (2021) find from their research that inflation has a significant and negative influence on economic growth, as an increase in this indicator discourages the financing of moderate and low return projects by investors and minimizes cash flows from firms to financial institutions due to the decrease in real income.

Government consumption is identified with government final public consumption expenditure and is considered by Silva, Tabak and Laiz (2021) as a statistically insignificant additional explanatory variable with a negative impact on economic growth. Economic activity is always also related to the efficiency of government management, which is why Caporale *et al.* (2015) argue that the variable in question is specific to fiscal policy, which limits growth in the medium and long term, especially if it is expansionary. Other authors such as Beck, Degryse and Kneer (2014) and Abeka *et al.* (2021) have observed an inverse relationship between government consumption and economic growth, because the more government spending increases (it does not imply a counterpart and is not aimed at productive activities), the lower the rate of economic growth will fall, as public goods and services are not remunerated by the population and public revenues are often not sufficient to cover them. At the same time, Beck, Degryse and Kneer (2014) argues that research has found an increase in financial sector volatility as a result of the directly proportional relationship between it and government consumption. Petkovski and Kjosevski (2014) are of the opinion that a higher government burden as measured by government final consumption expenditure denotes a lower development of the financial system, and hence a decrease in economic growth. A significant and negative influence of government spending (considered as a control variable) on economic growth is also identified by other authors, such as Ahmed and Bashir (2016), Guptha and Prabhakar (2018).

The degree of openness of the economy is considered, along with the others mentioned, as another control variable (Petkovski and Kjosevski, 2014), which is calculated as the share of the sum of imports and exports in GDP, according to World Bank Data (2022). While some authors consider the degree of openness of the economy as an additional variable that is not statistically significant for economic growth (Machado, Saraiva and Vieira, 2021), others find a positive relationship between it and economic growth (Levine, Loayza and Beck, 2000; Beck and Levine, 2004; Petkovski and Kjosevski, 2014; Abeka *et al.*, 2021. Rinosha and Mustafa (2021) observe a negative relationship between trade and economic growth in the case of Sri Lanka, as trade is on a downward trend due to significantly higher imports than deficit-generating exports. Beck, Degryse and Kneer (2014) are of the view that openness of the economy is a specific trade policy variable, which means higher internal and external trade leading to GDP maximization. In their turn, Ahmed and Bashir (2016) believe that the openness of the economy variable is not a determinant of economic growth, but Iqbal *et al*. (2021) contradicts this, arguing that trade openness is a crucial factor in the development of the financial system, and hence economic growth.

In turn, gross fixed capital formation is considered as a control variable by some authors (Iqbal *et al.*, 2021), which positively influences economic growth and puts its imprint on the economy by encouraging investment, exchange of technology and skills, maximizing aggregate income output. Thus, it was found that for low-income economies, the indicator is more representative and significantly influences their economy. Pavelescu (2008) identifies 3 types of capital, namely fixed capital, infrastructure and human capital, concluding that economic expansion depends on the distribution of growth by economic activities and it is recommended to acquire fixed assets (buildings), which is why it is necessary to consolidate expenditure to reach the investment stage. Thus, there is an overestimation of investment expansion, which leads to an increase in the share of gross capital formation. The correlation of capital accumulation with government spending is also realized, since part of it, such as infrastructure (which creates the prerequisites for economic growth by making the investment process more efficient) should not be neglected, fixed capital formation being provided by the private sector. Observations of other studies (Caporale *et al.*, 2015) identify gross fixed capital formation as an investment-specific indicator as the most representative and relevant component leading to economic growth. In a different perspective, Petkovski and Kjosevski (2014) consider gross capital formation as a "former gross domestic investment", formed as the sum of expenditure on additions to fixed assets and net changes in inventories, being a control indicator of investment. In turn, although not emphasizing this variable, Dobjanschi (2018) is of the opinion that gross capital formation is relevant for economic growth by incorporating in its composition the amounts recovered by firms through depreciation. Ginevičius *et al.* (2019) takes capital accumulation as a variable of financial sector development, which through the efficient allocation of resources and increased capital accumulation contributes to the growth of GDP per capita and implicitly causes a positive change in economic growth.

Unemployment rate (% of total labor force) highlights the percentage of the total labor force and is used in econometric studies as having a close relationship with economic growth (Ginting, Hutasoit and Peranginangin, 2021). The authors consider that a higher increase in the labor force that does not contribute to the production of goods and services will lead to a decrease in economic growth or a slowdown in growth as a result of the absorption of fewer people into the labor market. Rumbia *et al.* (2022) reaches results contradictory to previous ones (Mohseni and Jouzaryan, 2016; Ginting, Hutasoit and Peranginangin, 2021), as they find that the unemployment rate has a positive impact on economic growth, which is due to a long-run report of a decline in labor force and a subsequent report of a rise in GDP per capita. Soylu, Çakmak and Okur (2018) argues that the unemployment rate arises as a result of a country's economic structure, in developed countries it is caused by technological progress and in underdeveloped countries as a consequence of capital insufficiency. In line with other recent studies, other authors (Siddikee *et al.*, 2022; Obi and Jones, 2022) argue that long-term sustainable economic growth results in a commensurate decline in unemployment, but requires government intervention through intense economic reforms. However, other studies (Oviedo-Gómez, Viafara and Candelo, 2022) do not find a significant impact of unemployment on economic growth.

Population growth is in turn considered by Sahoo (2014) as a control variable, which has been found to have a positive and statistically significant impact on economic growth in research, an aspect due to labor force creation and demographic changes. The latter provide impetus and create conditions conducive for economic growth by targeting better quality and younger people. Abeka *et al.* (2021) confirms Sahoo's (2014) view and complements it by bringing Solow's growth model, whereby he argues that output per employee is an indicator that depends on population growth, savings and technological change, and the more labor productivity decreases, the more GDP growth will be felt, but this is as technologies start to replace labor. Headey and Hodge (2009) identify several hypotheses regarding the impact of population on economic growth, concluding that the young population does not have a significant impact on growth, while the adult population has a significant and positive impact on economic growth, with heterogeneity between the two as an adverse effect due to population density. They also identify different partial or total correlations between population and economic growth depending on the different factors taken into account, such as age, education, expenditure and resources (investment).

## 4. EMPIRICAL RESULTS AND DISCUSSION

Following the research carried out, the application of the GMM econometric model allows us to formulate the main ideas and conclusions regarding our analysis. The summary of the descriptive statistics of the variables are considered as a starting point for formulating the hypotheses (Table 2). The number of observations differs depending on the country's currency, as we have 19 countries that have already adopted the euro (399 observations), while there are 8 countries that are not yet in the euro area (168 observations), this sample also includes Denmark, as it uses the Danish krone as its national currency, although it benefits from the opt-out clause. The growth rate of GDP per capita fluctuates quite widely for the selected sample, ranging from a low of -14.46% (Estonia, 2009) to a high of 23.99% (the case of Ireland, 2015). This result highlights that there are no significant differences between countries using their national currency and those using the euro at first sight.

Comparing the two categories of countries with the EU (Table 2) does not show extraordinarily large differences between them, but it appears that the average economic growth is higher in non-euro countries than in the European Union and euro area countries, even though the latter category includes some of the most developed countries. The higher value of average growth is due to cheaper labor and foreign investment, which is more visible in these countries, precisely because of the attraction of investors through qualified and cheaper staff, especially as employees are paid in national currencies, which have been suffering from a continuous depreciation in recent times (minimum, maximum and median growth are the same as the average). Following the same direction, we observe that euro area countries deviate from the average economic growth by 4.16%, while non-euro countries deviate by only 3.34%. Regarding the Skewness indicators, we find that in the case of economic growth, for all three categories of countries analyzed, Skewness has a negative value, indicating a left asymmetry, while for the other variables, it is positive (except for population growth in non-euro countries), indicating right asymmetry, which means that overall, the model will be right skewed. In the Kurtosis case, all the values are positive, showing a leptokurtic distribution, the values of the variables are close to their means, being individually homogeneous, also observed for regression coefficients (Table 3).

**Table 2. Descriptive statistics of the variables**

| | *GDPgrowth* | *PRVC* | *BAS* | *INF* | *GVE* | *TRD* | *GFC* | *UNEMP* | *PG* |
|---|---|---|---|---|---|---|---|---|---|
| | | | | **Total EU countries** | | | | | |
| *Mean* | 1,998 | 92,831 | 91,523 | 2, 682 | 10,807 | 118,863 | 22,325 | 8,634 | 0,227 |
| *Median* | 2,004 | 85,356 | 90,600 | 2,009 | 19,467 | 103,241 | 22,008 | 7,540 | 0,239 |
| *Max.* | 23,999 | 304,951 | 219,080 | 43,180 | 27,935 | 380,104 | 53,591 | 27,470 | 3,931 |
| *Min.* | -14,464 | 7,115 | 12,390 | -9,666 | 11,882 | 45,418 | 10,578 | 1,810 | -3,847 |
| *Std. Dev.* | 3,963 | 52,450 | 40,873 | 3,660 | 2,906 | 62,420 | 4,228 | 4,360 | 0,843 |
| *Skewness* | -0,199 | 1,074 | 0,492 | 5,105 | 0,310 | 1,691 | 1,184 | 1,456 | 0,207 |
| *Kurtosis* | 6,531 | 4,266 | 2,932 | 48,138 | 2,904 | 6,165 | 9,355 | 5,409 | 5,293 |
| *Jarque-Bera* | 128,372 | 146,941 | 23,031 | 50599,14 | 9,297 | 507,120 | 1086,615 | 337,630 | 128,372 |
| *Comments* | 567 | 567 | 567 | 567 | 567 | 567 | 567 | 567 | 567 |
| | | | | **Euro area countries** | | | | | |
| *Mean* | 1,724 | 101,981 | 95,965 | 2,168 | 19,532 | 126,334 | 22,072 | 8,839 | 0,376 |
| *Median* | 1,738 | 95,0085 | 98,190 | 1,878 | 19,232 | 112,926 | 21,706 | 7,760 | 0,355 |
| *Max.* | 29,999 | 304,951 | 206,10 | 20,061 | 26,243 | 380,104 | 53,591 | 27,470 | 3,931 |
| *Min.* | -14,464 | 13,165 | 17,170 | -09,666 | 11,882 | 45,419 | 10,578 | 1,810 | -2,258 |
| *Std. Dev.* | 4,169 | 50,537 | 36,979 | 2,457 | 2,619 | 70,678 | 4,452 | 4,548 | 0,867 |
| *Skewness* | -0,032 | 1,179 | 0,170 | 1,402 | 0,159 | 1,378 | 1,297 | 1,467 | 0,318 |
| *Kurtosis* | 6,926 | 4,866 | 2,967 | 14,063 | 3,184 | 4,647 | 10,209 | 5,441 | 4,475 |
| *Jarque-Bera* | 256,322 | 256,322 | 1,945 | 2165,23 | 2,245 | 171,46 | 975,964 | 242,163 | 42,909 |
| *Comments* | 399 | 399 | 399 | 399 | 399 | 399 | 399 | 399 | 399 |
| | | | | ***Non-euro countries*** | | | | | |
| *Mean* | 2,648 | 71,100 | 80,975 | 3,905 | 20,460 | 101,120 | 22,926 | 8,147 | -0,127 |
| *Median* | 3,134 | 52,545 | 65,530 | 2,621 | 19,848 | 91,999 | 22,410 | 7,135 | -0,067 |
| *Max.* | 11,144 | 223,834 | 219,080 | 43,180 | 27,935 | 168,340 | 37,287 | 19,920 | 1,347 |
| *Min.* | -7,701 | 7,115 | 12,390 | -1,425 | 14,016 | 48,521 | 16,602 | 2,010 | -3,848 |
| *Std. Dev.* | 3,348 | 50,613 | 47,373 | 5,374 | 3,415 | 29,159 | 3,583 | 3,849 | 0,663 |
| *Skewness* | -0,657 | 1,323 | 1,150 | 4,607 | 0,236 | 0,726 | 0,939 | 1,266 | -1,274 |
| *Kurtosis* | 3,916 | 3,916 | 3,473 | 29,357 | 2,147 | 2,670 | 4,313 | 4,223 | 8,549 |
| *Jarque-Bera* | 17,962 | 53,502 | 38,640 | 5457,05 | 6,663 | 15,540 | 36,780 | 55,378 | 260,977 |
| *Comments* | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 |

Source: Own calculations based on World Bank (2022) and the Global Economy (2022)

According to Table 3, there are significant differences between countries using the euro as their national currency and those outside the euro area, out of the 8 variables chosen, 7 are significant for the EU, 6 are statistically significant for the former and only 4 for the latter. Thus, according to the results, government consumption, population growth and asset utilization rate have a significant and negative impact on economic growth, while the openness of the economy and inflation (significant only for the EU) also have significant implications on the dependent variable, but this time positive. However, things are different in non-euro countries, where only government consumption and domestic credit have significant positive effects, while population growth and the asset ratio have negative and significant negative impacts on growth.

**Table 3. Estimating the regression equation**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| ***Dependent variable: GDPgrowth*** | | | | |
| | | **Total EU countries** | | |
| *C* | 3,709881 | 2,012602 | 1,273734 | 0,2033 |
| *PRVC* | -0,014154 | 0,005518 | -2,564859 | 0,0106** |
| *BAS* | -0,014671 | 0,005193 | -2,825004 | 0,0049* |
| *INF* | 0,083077 | 0,035096 | 2,367100 | 0,0183** |
| *GVE* | -0,241511 | 0,098961 | -2,440474 | 0,0150** |
| *TRD* | 0,025775 | 0,009023 | 2,856466 | 0,0045* |
| *GFC* | 0,139552 | 0,038549 | 3,6200133 | 0,0003* |
| *UNEMP* | -0,043342 | 0,041097 | -1,054623 | 0,2921 |
| *PG* | -1,320474 | 0,239458 | -5,514426 | 0,0000* |
| | | **Euro area countries** | | |
| *C* | 6,458347 | 3,533748 | 1,827620 | 0,0685 |
| *PRVC* | -0,017083 | 0,006500 | -3,851669 | 0,0090* |
| *BAS* | -0,016410 | 0,005883 | -2,789236 | 0,0056* |
| *INF* | 0,179466 | 0,065944 | 2,721482 | 0,0068* |
| *GVE* | -0,324134 | 0,122958 | -2,636147 | 0,0088* |
| *TRD* | 0,027992 | 0,010500 | 1,548336 | 0,0080* |
| *GFC* | 0,076786 | 0,049592 | -2,628013 | 0,1224 |
| *UNEMP* | -0,028801 | 0,055659 | -0,517458 | 0,6052 |
| *PG* | -1,202136 | 0,312108 | -2, 628013 | 0,0001* |
| | | **Non-euro countries** | | |
| *C* | 0,613615 | 5,955858 | 0,103027 | 0,9181 |
| *PRVC* | 0,098334 | 0,029614 | 3,320560 | 0,0012* |
| *BAS* | -0,153260 | 0,031910 | -4,802889 | 0,0000* |
| *INF* | 0,053697 | 0,034575 | 1,553069 | 0,1228 |
| *GVE* | 0,094582 | 0,175939 | 0,537582 | 0,5918 |
| *TRD* | 0,000412 | 0,021188 | 0,019455 | 0,9845 |
| *GFC* | 0,230469 | 0,063936 | 3,604698 | 0,0004* |
| *UNEMP* | -0,025913 | 0,057882 | -0,447698 | 0,6551 |
| *PG* | -1,526896 | 0,349857 | -4,364213 | 0,0000* |

Note: *;** - Variables are significant at 1% and 5% significance level.

Source: based on World Bank Data (2022) and the GlobalEconomy.com (2022)

Domestic credit appears contradictory in the three categories, because although it is significant, in the euro area and the EU as a whole it has a negative impact on economic growth, as in all EU countries, while in the 8 countries that have not yet abandoned the national currency (including Denmark) it has the expected positive effect, results in line with Ahmed and Bashir (2016) and Abeka *et al.* (2021). The fact that credit institutions extend a large amount of credit to the private sector in euro area countries may create dependence and discourage firms' financial stability in the long run, leading to high volatility and a decrease in productivity, the inverse relationship obtained is in agreement with Petkovski and Kjosevski (2014), Ahmed and Bashir (2016) and Guptha and Prabhakar (2018). The positive influences of domestic credit on non-euro area countries may be due to a lower degree of development of this category, with more intensive financing needed to modernize firms' transaction systems and make new investments in physical assets or securities, together with a greater willingness to save on the part of the population. With these two results, we find the influence of domestic credit on economic growth up to a certain threshold, manifesting the inverted U-curve (Bui, 2020), which means that the main independent variable has reached the maximum threshold where economic growth is in the same direction for non-euro countries, while in the EU and euro area countries, growth is negative due to excess credit, which can trigger an increase in domestic demand as the current account deficit widens (Lazea, 2017).

Bank asset ratio is a specific indicator of banking depth (Al-Moulani and Alexiou, 2017), which provides a consistent picture of the bank-based financial sector. Although previous studies have shown a positive relationship between economic growth and banking sector development through this indicator (Demirgüç-Kunt and Levine, 2001; Azman-Saini and Law, 2010; Hismendi *et al.*, 2021), our results show the opposite, in the sense of exerting a very tight influence on economic growth, but negatively on all EU countries, regardless of their category. This phenomenon can be explained by bank restructurings and their orientation towards the capital market, purchases of fixed assets such as medium and long-term securities, which involve lower risks. At the same time, following the crisis of 2007-2008 and probably the current pandemic crisis, the banking sector will take precautionary measures so as to apply an adapted policy that will encourage more lending to the real sector rather than holding securities and reserves, as people and companies need liquidity.

Regarding government consumption, our results on the euro area and the European Union are in agreement with Beck, Degryse and Kneer (2014), Petkovski and Kjosevski (2014), Caporale *et al.* (2015), Ahmed and Bashir (2016), Guptha and Prabhakar (2018), Silva, Tabak and Laiz (2021), Abeka *et al.* (2021), while the direct relationship between government consumption and economic growth with respect to non-euro countries is sobering. However, we believe that this is due to inflation and destabilization of the financial system, which does not provide sufficient resources, requiring government intervention in the economy to support it, as was the case with the pandemic and the health crisis. Even so, being in the stage of largely bank-based economies, non-euro countries can be encouraged to consume through government spending, thus stimulating economic activity by encouraging a shift towards lending rather than investment.

According to other studies (Levine, Loayza and Beck, 2000; Beck and Levine, 2004; Petkovski and Kjosevski, 2014; Abeka *et al.*, 2021; Iqbal *et al.*, 2021), the degree of openness of the economy has a significant and positive impact on the European Union as a whole and on the countries that use the euro, which is also normal, as transactions can easily be conducted in the same currency and within the same union. In the case of non-euro countries, the variable does not exert significant influences, approving the opinion of Machado, Saraiva and Vieira (2021), this being due to the instability and increased sensitivity to shocks, as countries are highly dependent on the exchange rate, which often leads, through currency depreciation, to a deficit in the external balance of payments.

As for gross fixed capital formation, although the variable has a positive impact on the economic growth rate, in euro area countries it is not significant, while in the EU and non-euro area countries it is significant, in line with the results obtained by Pavelescu (2008), Petkovski and Kjosevski (2014), Caporale *et al.* (2015), Dobjanschi (2018), Ginevičius *et al.* (2019) and Iqbal *et al*. (2021). On the case of the Union as a whole, this variable appears significantly positive, implying that there is a desire for high financial development through investment in the securities sector and as much involvement of banks in these transactions as possible. Fixed capital is indispensable for enterprises, which for the euro area countries is more stable and more important, with high development exerting its influence, especially through the capital market, compared to smaller countries with lower development and income, which depend on the banking sector to continue operating.

In turn, inflation and unemployment are two control variables that go hand in hand, in an inverse relationship, because in order to limit the effects of one, the other must be neglected, which will change in the opposite direction of restrictive policies. In our case, inflation is statistically significant in the case of the European Union and euro area countries, compared to non-euro area countries, where it does not show significant influences. Although high unemployment acts to lower economic growth, it is not statistically significant, in agreement with Oviedo-Gómez, Viafara and Candelo (2022). The unemployment rate can be explained by the increasing development of technology and the decline in employment in the wake of the crises, which is why it is no longer a relevant variable for the economy, and even less so for the banking sector, which has moved a large part of its activities online. As for inflation, it directly and positively explains economic growth in the EU and euro area countries, showing a positive insignificant positive influence on those outside the euro area. Our results are in line with Petkovski and Kjosevski (2014) and identifying in the paper by Stoica, Roman and Rusu (2020) that inflation is beneficial to the early stage of entrepreneurial activity and gross fixed capital formation, we find that by increasing the explanatory variable, exports are encouraged as the national currency depreciates and the exporter (borrower) is advantaged. Thus, investment is given an impetus to produce more goods and service, which leads to economic growth and even to the development of the banking system through the collection and payment transactions carried out by banks for their customers.

Population growth in both categories of states and in the EU total appears in inverse proportion to economic growth and is statistically significant, in agreement with Sahoo (2014) and *Abeka et al*. (2021). Although normally expected to be positively correlated, GDP falls when population increases, as in recent years there has been a growing phenomenon of people migrating to other economies, to which they contribute by doing skilled work, many studying in the country and then preferring to leave for a better paid job. Stoica, Roman and Rusu (2020) identify a positive relationship between population growth and entrepreneurship, which can be considered as a determinant of economic growth through investment.

At the end of the empirical study, we can observe a greater influence of the development of the financial-banking system on economic growth in the euro area countries compared to those outside the euro area, in terms of the degree of national development, greater openness to technology and innovation, risk-taking and avoidance of depreciation of the common currency, which identifies problems in terms of the standard of living in countries that have retained central bank independence. The banking sector can easily lay the foundations for sustainable economic growth through the multiple roles it plays in an economy, such as easily facilitating maturity transformation (short-term finance can become long-term credit), providing day-to-day banking services, credit instruments and financing trade or large infrastructure projects, taking and managing risks, helping companies to hedge interest rate risk, helping local and state budgets and balancing the demand and supply of funds. The explanatory variables chosen refer directly or indirectly to one of these roles, proving that irrespective of a country's level of development or the currency used, banks will support the economy and be the mainstays of investment, business development and the improvement of living conditions for the population.

## 5. CONCLUSIONS

Using a multiple linear regression model, our study aimed to examine the link between banking system development and economic growth in the EU Member States.

Our empirical results show that there are no significant differences between the development of the banking sector in the European Union and euro area countries compared to those outside the euro area. Through the main independent variable, i.e. the share of domestic credit granted by banks to the private sector, which is considered as the most widely used indicator of the financial development and depth of the banking sector, we find a close and direct link between banking sector development and economic growth.

Although not directly measuring banking performance and efficiency, the other explanatory variables chosen in the econometric model (bank asset ratio, government consumption, gross fixed capital formation, population growth) have been found to be significant for economic growth, as they are related to the banking sector. The only variable that does not have a significant impact on the GDP growth rate in the EU countries is the unemployment rate, which has been on an upward trend in recent times due to the restructuring of the workforce as a result of digitalization, bankruptcies or the closure of firms in the wake of the pandemic crisis.

The banking sector can easily lay the foundations for sustainable economic growth through the multiple roles it plays in an economy, such as easily facilitating maturity transformation (short-term finance can become long-term credit), providing day-to-day banking services, credit instruments and financing trade or large infrastructure projects, taking and managing risks by helping companies to hedge interest rate risk, helping local and state budgets and balancing the demand and supply of funds. The explanatory variables chosen refer directly or indirectly to one of these roles, proving that irrespective of a country's level of development or the currency used, banks will support the economy and be the mainstays of investment, business development and the improvement of living conditions for the population.

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