THE IMPACT OF FINANCIAL SYSTEMS ON ECONOMIC GROWTH

Ksenija KRAVEC, Daiva JUREVIČIENĖ[2]

Business Management Faculty, Vilnius Gediminas Technical University,
Saulėtekio al. 11, Vilnius, Lithuania

Abstract. The article aims to determine the level of impact of the financial sector on economic growth. The financial sector's activities provide financing for business development, provide borrowing opportunities and provide comprehensive protection when concluding insurance contracts, which in the long run ensures economic growth. It is essential to understand which financial sector activities are most significant in economic growth. Borrowing and equity trading have been found to positively impact economic growth, while the market capitalisation of companies has been found to harm economic growth. The results can be used to develop growth plans for financial institutions that promote economic development.

Keywords: financial system, banks, financial markets, economic growth, stability.

JEL Classification: G20, F36, O40.

Introduction

The financial system consisting of the banking sector, insurance sector, and investment services sector forms a significant part of each country's economy. Under normal conditions, financial system participants aim to invest savings efficiently in productive industrial, service and household sectors that can increase the volume of their products and services locally. In this way, the financial system forms a crucial impact on the country's gross domestic product (GDP) growth by redistributing capital flows, aligning the interests of investors and borrowers, and by accepting and readdressing the risk due to uncertainty in the future, the form of issuing debt in the financial markets. To achieve these goals, it is essential to keep its macroeconomic, political and social environment as stable as possible.

Unfortunately, environmental stability cannot be guaranteed permanently, affecting and determining the expectations and inclination of investors' risk and tolerance toward uncertainty in the future (Cooley & Prescott, 1995).

The financial sector plays an essential role in mobilising savings, supporting payments and trade in goods and services, and promoting their efficient distribution (Vasiliauskas, 2002).

The research aims to assess the impact of financial system participants (banks, financial markets) on economic growth. Research is conducted based on analysis of scientific literature, however, the actual impact of the financial systems on economic growth is evaluated utilising regression analysis tools and comprehending the scale of influence through execution of multicriteria COPRAS method. Based on the scientific literature, the criteria for assessing economic growth was selected.

Regression analysis makes it possible to identify the most significant financial sector indicators in the context of economic growth; multicriteria valuation method helps to determine the slowest economic growth between countries.

The relationship between the financial sector and economic growth is non-linear. The key drivers of economic growth in the financial industry are domestic credit, non-performing loans, and the market capitalisation of listed companies, the stock market turnover ratio and the monetisation ratio.

Researchers have found that economic growth is faster in some countries than in others to control economic growth causality. The development of the existing local financial sector performance is uneven (Ang & McKibbin, 2007).

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* Corresponding author. E-mail: *ksenija.kravec@stud.vilniustech.lt*

Therefore it is essential not only to determine the rate of financial and economic growth but also to assess the impact of the financial sector in terms of economic growth rates.

1. Literature review

1.1. Determinants of economic growth

Economic growth increases public resources and the supply of public products (Brunnermeier & Sannikov, 2014). During the development of the economy, the state can tax the additional turnover generated and use the generated funds to invest in production and services such as health care, education, protection, and social security (McKibbin & Tang, 2000).

Despite the social benefits to society, economic growth also provides material benefits. Growth creates abundance, part of which directly enriches employers and employees. By acquiring additional resources, people improve their quality of life, which raises living standards to a new level and reduces the poverty line (Acheampong et al., 2021).

Economists agree that economic growth is driven by four main phenomena: human resources (1), physical capital (2), natural resources (3), and technology (4). Public policies in developed countries focus on the latter (Ugochukwu & Oruta, 2021).

Meanwhile, although rich in natural resources, less developed countries are lagging economically due to their inability to develop technology and improve the skills and education of their workers, the impact of financial maturity on economic growth is inevitably emphasized.

Financial growth creates economic growth through capital accumulation and technological progress, which affects savings, the provision of investment information, the optimization of capital, the mobilization and mobilization of additional funds, and the promotion of foreign investment (Chai et al., 2021). Countries with developed financial systems will likely experience sustainable economic growth (Fethi & Katircioglu, 2015).

Researches also show that the stability of financial systems is a result of economic growth and a stimulus to it. The development of the financial sector contributes to the provision of financial support to small and medium-sized enterprises (SMEs) (Asongu, 2014). SMEs tend to be labour-intensive, creating more jobs than large companies, significantly impacting economic growth. Also, the development of the financial sector makes financial solid laws and regulations. Lack of regulation in the financial industry can inevitably become a negative consequence (Thompson, 2013).

1.2. The functions of a financial system

The financial sector consists of financial intermediates and financial markets, and the distribution of funds is the main function of the sector (Song et al., 2021).

Traditionally, central banks have two main objectives: monetary and financial stability. Disruptions in the financial system affect the real economy regarding output, inflation and other macroeconomic indicators. Meanwhile, monetary instability may adversely affect the country's financial stability.

Modern society is inevitably dependent on the financial system serving as one of the leading inventories. An event of capital or funds distribution disparity occurs in every economic system. It is either a surplus of funds in a specific area or a deficit.

The financial system serves as an intermediary and organizes the reallocation of capital from surplus to deficit units (Gurvich & Prilepskiy, 2015). The financial system forms a structure of different financial institutions and markets and regulations and laws, practices, standards, transactions, claims and liabilities.

Credit cost and value are being established with the assistance of the financial system. Therefore, the funds' cost increase can adversely impact consumption, production, employment, and economic growth. On the contrary, minimizing the cost of credit can positively influence and enhance the mentioned factors.

Figure 1. Main functions of financial system, according to Asongu (2014)

The financial system serves by ensuring the below functions (Figure 1):

– *Savings Function*: The financial system organizes the flow enabling the increase of public savings.

Financial claims which ensure future revenue are issued by money and capital markets.

With this set-up, societal needs and better level goods and services can be guaranteed by producers owning the claim. In case of saving level drop, growth attributable to investments and life quality decline;

– *Liquidity Function*: minimum risk is ensured if money is distributed as deposits compared to other financial instruments.

However, due to inflation minimizing the total value, the urge to invest in financial instruments such as stocks and bonds remains stable even though the higher risk level and lower degree of liquidity are present. Financial markets can transform investments into actual money;

– *Payment Function*: financial systems provide a convenient payment method for goods and services.

Due to the simplicity, the cost and duration of payment transactions are reduced.

– *Risk Transferring Function*: protection against life, health and income risks is provided by financial markets by selling life, health and property insurance policies.

Hedging or reducing the potential risks associated with various instruments is offered as a part of standard services within financial markets.

– *Policy Function*: the financial system is controlled by most governments to control macroeconomic indicators such as interest rates or inflation.

Economies nowadays require many investments towards fixed assets that are then utilized to provide goods and services. Usually, the resources required are too immense that neither a government nor a company can meet the need. Selling financial instruments such as shares and bonds can quickly raise necessary funds from various sources. A company or a government that has issued a financial claim generates the repayment of the borrowed funds from expected future revenue. With the currently developed economies, the production and income growth are proven to occur from the ability of companies to turn savings into investments and future income supported by financial markets.

Economists believe that the essential role of the financial sector in ensuring economic growth is to reduce the costs of information, requirements and transactions (Fethi & Katircioglu, 2015). One can achieve this through several specific functions performed by financial systems. Carstens et al. (2004) summarized five critical tasks that the financial system plays in promoting growth:

– Mobilization and mobilization of savings;
– Provision of information on potential investments and capital allocation;
– Investment supervision and corporate governance;
– Facilitating trade, diversification and risk management;
– Facilitating the exchange of goods and services.

Through these functions, the development of the financial sector stimulates economic growth, not only by encouraging private sector development but also by supporting the public sector in investing in infrastructure and enabling households to invest in human capital, which benefits from equalization (Figure 2).

According to a new report on global financial development issued by the World Bank initiative, the turmoil since the Global Crisis is highlighted (World Bank, 2019).

Recommendations are presented to help strengthen financial systems and prevent negative consequences.

Targeted measurement of financial growth rates is crucial in assessing progress in the stability and development of the financial sector in the context of economic growth (Hudson, 2011).

Financial integration, globalisation, and information technology innovation have significantly increased the interdependence of financial systems (Baur, 2012). Over time it has become more important to compare financial sector stability indicators of different countries correctly
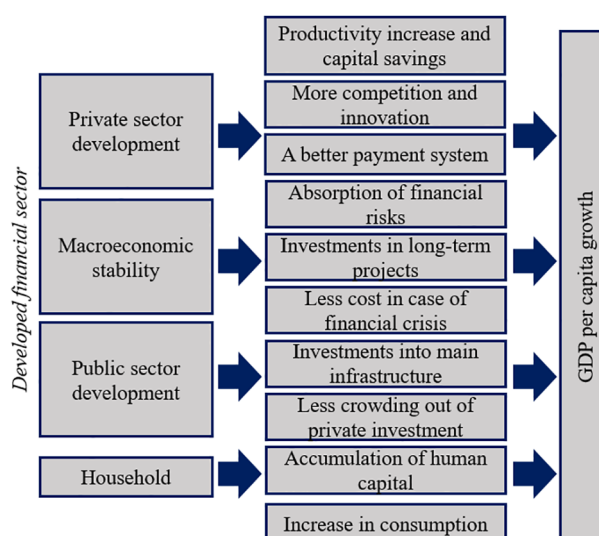

Figure 2. The link between Financial sector development and economic growth, according to Zhuang et al. (2009)

by using the same methodology, which can be generally accepted on an international scale if there is a need to distinguish the differences in the impact on the economy (Čižo et al., 2020).

In practice, however, the applicability of such measurements is quite complex due to complicated and subjective multidimensional indicators (Brunnermeier & Sannikov, 2014).

Despite its complexity, assessment of financial sector's stability is proposed to be performed using standard quantitative indicators as described in the report published by the World Bank on Bank Regulation and Supervision a Decade after the Global Financial Crisis (World Bank, 2019).

The 4×2 valuation concept is presented for the assessment of the financial sector, which identifies four data sets that reflect the characteristics of a well-functioning financial system: financial depth (1), affordability (2), productivity (3) and stability (4) (Asteriou & Spanos, 2019).

In response to the past decades of global financial crises, national and international institutions pay increasing attention to the financial system's stability. Central banks must monitor and analyse all potential sources of risk that require systemic monitoring of individual parts of the financial system in terms of its components and macroeconomic conditions (Qamruzzaman & Jianguo, 2018).

One should take several steps to assess the financial system's overall stability and contribution to the economy (Altay & Topcu, 2020). Central banks consider the separate and aggregate nature of financial intermediaries, markets and infrastructure sustainability.

To improve the quality and comparability of financial data, the International Monetary Fund (IMF) has taken the initiative to cooperate with national authorities to develop a single methodology for developing financial stability indicators (Sainz-Fernandez et al., 2018).

According to proposed structure of assessment criteria published by World Bank (2019), financial stability

indicators are divided into two groups. The first group consists of 12 key indicators related to the banking sector. Key indicators of financial stability are related to the five main areas of the banking system's activity. They are compatible with the methodology used to assess the stability of individual financial institutions internationally (capital adequacy, asset quality, management soundness, earnings, liquidity, and sensitivity to market risk). The remaining 27 are recommended indicators belonging to the second group and cover several other banking sector's indicators and non-financial institutions (corporations, households, financial markets and real estate markets).

The main objective of the financial stability indicators system is international comparability and simplified methodology, which must be ensured when publishing the data on financial sector results.

2. Methodology

The course of the research consists of several stages:

(1) Selection of a sample of economic growth assessment, selection of indicators of financial systems based on the analysis of scientific literature;

(2) Constructing a regression model based on the dependence of economic growth on financial sector indicators;

(3) A multi-criteria assessment of countries in terms of financial sector performance in the context of economic growth.
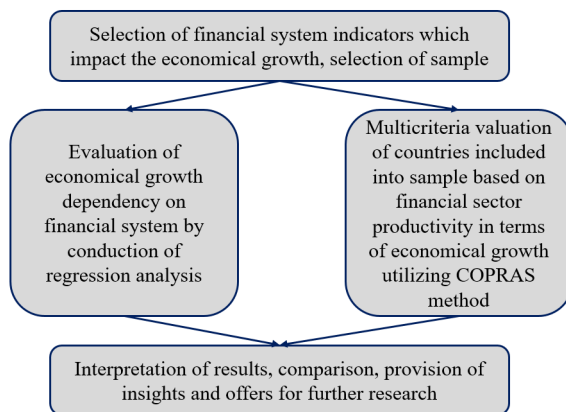
The research scheme is presented in Figure 3.

Figure 3. Research process on the impact of financial systems on economic growth (source: compiled by the authors)

Linear regression. A linear regression analysis is used to determine the impact of the financial sector on economic stability.

Linear regression analysis is applied when the interval variable depends on one or more other variables. The variable Y is the dependent variable, and the variables X, Z, and W are explanatory variables.

The important thing is that all supposed dependencies are linear.

According to Čekanavičius and Murauskas (2000), the formal linear regression model is written as follows (1):

$$Y = C + b_1 X + b_2 Z + b_3 W + e, \tag{1}$$

where: e shows the residual error; C is a constant; all coefficients b_1, b_2, b_3 are unknown.

Estimates $\widehat{C}$, $\hat{b}_1$, $\hat{b}_2$, $\hat{b}_3$ are obtained from the sample data. The regression equation for the approximate value of Y is thus obtained (2):

$$Y = \hat{C} + \hat{b}_1 X + \hat{b}_2 Z + \hat{b}_3 W. \tag{2}$$

In this study, the equation is used for quantitative analysis of the dependencies of the variables. The coefficients determine whether the value of the dependent variable Y increases or decreases as the variables X, Z, and W increase.

It is essential to check the model's suitability, even if the data are suitable for regression analysis.

According to Čekanavičius and Murauskas (2000), the appropriate regression model is defined by such factors as the coefficient of determination (which helps to measure the differences between the modelled and observed dependent variable phenomena), ANOVA value (checking for exceptions in the data), and normality of residual errors in the histogram.

Application of the COPRAS method. According to Podvezko (2011), the COPRAS method is a multi-criteria estimation in a complex proportional way, which differs from other multi-criteria estimation methods in essential properties that allow a more accurate estimate of the calculation results.

The author also highlights such advantages of the method as the short time required for calculations, simplicity, and transparency.

The method also differs in that different rules apply to the normalization of the original data.

According to Živatkauskienė and Živatkauskas (2016), forming the matrix of normalized values D, the values of dimensionless criteria are obtained (3):

$$d_{ij} = \frac{x_{ij}q_i}{\sum_{j=1}^{n} x_{ij}}; \quad i = \overline{1,m}; \quad j = \overline{1,n}, \tag{3}$$

where: x_{ij} is j criteria value in j alternative; m – criteria number; q_i – the importance of i criteria.

The sum of the dimensionless estimated values d_{ij} obtained for each criterion x_i is always equal to the significance q_i of this criterion (4):

$$q_i = \sum_{j=1}^{n} d_{ij}; \quad i = \overline{1,m}; j = \overline{1,n}. \tag{4}$$

The value of the significance q_i of the criterion in question is distributed proportionally for all alternatives a_j, taking into account their values x_{ij}.

The sum of the normalized indices for each element j is calculated in the next step. Both decreasing indices S_{-j} and increasing indices S_{+j} describe alternatives.

The amounts of normalized indices are calculated according to the following formulas (Živatkauskienė & Živatkauskas, 2016) (5):

$$S_{+j} = \sum_{i=1}^{m} d_{+ij}; \quad S_{-j} = \sum_{i=1}^{m} d_{-ij};$$

$$i = \overline{1,m}; \, j = \overline{1,n}, \tag{5}$$

The significance of the compared alternatives is determined by the positive indicators S_{+j} and the negative indicators S_{-j}.

The relative significance Q_j of each alternative a_j is calculated according to formula (6):

$$Q_j = S_{+j} + \frac{S_{-\min} \times \sum_{j=1}^{n} S_{-j}}{S_{-j} \times \sum_{j=1}^{n} \frac{S_{-\min}}{S_{-j}}}; \quad j = \overline{1,n}. \tag{6}$$

Based on the calculated relative values of Q_j, the priorities of the alternatives are determined. The higher the value of Q_j, the higher the priority of the alternative.

The significance Q_j of alternative a_j shows the extent to which the chosen alternative fits the economical growth factor model.

Meanwhile, significance $Q_{\max}$ defines the most appropriate alternative.

At this stage, it is also possible to calculate the degree of utility – the degree of conformity of the a_j alternative. According to Zavadskas et al. (2007), the degree of usefulness of alternatives depends directly on the system, values and significance of the indicators. As the significance of the analyzed alternative increases, so does the degree of its usefulness. The efficiency degree N_j can be calculated according to the formula (7) (Živatkauskienė & Živatkauskas, 2016):

$$N_j = \left(Q_j : Q_{\max} \right) \times 100\% , \tag{7}$$

where: Q_j and $Q_{\max}$ are the compliance values of the alternatives obtained from the given formula.

Quantitative regression is essential to determine the impact on the economic growth of financial systems, which is why linear regression is used. Still, certain financial systems may also have different effects on economic stability in various countries' economic situations according to the indicators of the financial system.

3. Results of the impact of financial systems on economic growth

Based on the data collected in the analysis of the scientific literature, it is proposed to estimate GDP to examine economic growth. However, to ensure the practicality of the study, the indicator of GDP growth (per cent) is chosen.

The sample of independent variables includes the following indicators:
– domestic credit by the financial sector;
– monetisation ratio, bank capital to assets ratio;
– the value of non-performing loans of banks;
– turnover from trading in shares;
– market capitalisation of domestic enterprises.

The data is analysed according to the European and International Organization for Economic Co-operation and Development countries indicators (44 countries in total).

Indicator data is collected from the World Bank database and represents the set of figures for the year 2020. The information was further analysed in the SPSS program (Table 1). Assessing the impact of financial sector variables on GDP growth in selected countries gives the following dependency equation:

$GDP \, growth = -9.881 +$

$0.495 \left(domestic \, credit \, by \, financial \, sector \right) +$

$0.913 \left(turnover \, from \, shares \, trading \right) -$

$0.489 \left(market \, capitalization \, of \, enterprises \right).$

From the obtained equation, it can be seen that significant indicators of financial systems are formed domestic credit, turnover from trading in shares and market capitalization of domestic enterprises. The latter indicator of market capitalization has a negative impact on economic growth.

Table 1. Regression model: Impact of the financial sector on economic growth

Indicators	Non-standardized coefficients	Standardized coefficients	Collinearity statistics	
			Tolerance	VIF
Constant	−9.8809			
Domestic credit by financial sector	0.0605	0.4948	0.5476	1.8261
Turnover from trading of shares	0.0221	0.9132	0.9986	1.0014
Internal market capitalization of enterprises	−0.0727	−0.489	0.5473	1.8271

If the assessment of economic growth did not include financial sector indicators, economic growth would be 9.881% lower, proving the importance of the financial sector's role in developing the economies across all tested scope of countries.

The study eliminates some indicators due to the identified insignificance. These are monetization, bank capital to assets ratio, and the value of bank non-performing loans. The determination coefficient is 54.38%. Although the given figures show the relationship between the financial sector and economic growth indicators, further study should include additional indicators for financial systems for more accurate interpretations.

The influence of financial systems in different countries is examined below. Countries were ranked

according to the most conducive indicators of financial systems. The results of the countries' ranking using the multi-criteria method considering the financial sector situation are presented in Table 2.

Table 2. Results of the COPRAS method. Ranking of countries according to financial system indicators

Country	Significance of the alternative	Degree of efficiency	Priority
Japan	0.09	100	1
Turkey	0.074	82.197	2
Estonia	0.068	75.24	3
Norway	0.058	64.086	4
America	0.054	59.776	5
Sweden	0.053	58.333	6
Republic of Korea	0.046	50.882	7
Chile	0.037	40.942	8
United Kingdom	0.035	38.358	9
Costa Rica	0.03	33.591	10
Australia	0.026	29.282	11
Mexico	0.025	27.496	12
Iceland	0.022	24	13
Poland	0.021	23.334	14
Denmark	0.021	23.171	15
Hungary	0.02	22.634	16
Czech Republic	0.019	21.242	17
Germany	0.018	20.253	18
Colombia	0.017	19.315	19
Bulgaria	0.017	18.887	20
Croatia	0.016	18.199	21
New Zealand	0.016	17.661	22
Romania	0.015	16.895	23
Spain	0.015	16.277	24
The Netherlands	0.015	16.188	25
Belgium	0.014	15.771	26
Slovak Republic	0.014	15.55	27
Switzerland	0.014	15.208	28
Austria	0.014	15.008	29
Latvia	0.012	13.699	30
Ireland	0.012	13.505	31
Israel	0.012	13.48	32
France	0.011	12.527	33
Slovenia	0.011	12.174	34
Greece	0.01	10.615	35
Canada	0.009	10.283	36
Italy	0.008	9.414	37
Portugal	0.008	9.36	38
Malta	0.008	9.1	39
Luxembourg	0.008	9.037	40
Cyprus	0.006	6.541	41

The application of the COPRAS method requires the direction of the impact of criteria (indicators) to be determined: indicators of financial systems that maximize economic growth include indicators of domestic credit by financial sector, monetization, bank to capital ratio, turnover from trading in shares; while the factors limiting economic growth are: the value of the bank's non-performing loans and the market capitalization of the country's companies.

As no expert judgment is used in the study and the importance of the indicators is not clearly distinguished in the scientific literature, all indicators are assigned the same significance weights (W = 0.16667), which are then used to normalize the values of the indicators.

The significance of the alternatives is calculated, and the degrees of efficiency are presented. One can see that the leading country is Japan, with an efficiency of 100%.

Consequently, to improve the economic performance of other countries with a similar structure in the financial sector, Japan can be used to develop further plans.

Despite the differences in economic indicators, Turkey, Estonia, Norway, Sweden and the United States can be included in the same group according to the financial sector's performance, with 58–82% estimated efficiency rates.

According to the financial infrastructure indicators, the following countries are ranked the lowest: Slovenia, Greece, Italy, Portugal, Malta and Cyprus (efficiency rates of only 15%).

All other countries of the European Union and the International Organization for Economic Co-operation and Development can be divided into a middle group according to the indicators of the financial systems.

Conclusions

The link between the functioning of the financial system and economic growth is a widely discussed topic in the context of economic development. Recent literature suggests a consensus on the vital role of the financial sector in promoting and sustaining economic growth. The sustainability of financial infrastructure creates economic growth through capital accumulation and technological progress, which affects savings, the provision of investment information, capital optimisation, the mobilisation and mobilisation of additional funds, and the promotion of foreign investment. The development of the financial sector promotes economic growth, not only through the private sector but also by supporting the public sector and investing in infrastructure and enabling households to invest in human capital. Despite the complexity of measuring the impact on economic growth, the World Bank proposes assessing the financial sector's stability using standard quantitative indicators.

Linear regression analysis is performed to determine the impact of financial systems on economic growth, enabling the selection of significant variables and understanding the direction of effects.

Borrowing and equity trading have been found to impact economic growth positively. The market capitalisation of companies has been found to have a negative impact on economic growth.

The situation of the financial sector in different countries is assessed using a multi-criteria assessment of the indicators of the financial system in the context of economic growth – the COPRAS method is used.

The top country is Japan – to improve the economic performance of other countries with a similar structure in the financial sector, Japan can be used to develop further plans. Despite the differences in economic indicators, Turkey, Estonia, Norway, Sweden and the United States can be included in the same group in terms of financial sector performance. Slovenia, Greece, Italy, Portugal, Malta and Cyprus have the lowest financial infrastructure, which means that the current financial structure in these countries does not create favourable conditions for economic development.

By combining the countries in clusters based on the performance of financial sector, further economic development proposals can be suggested with alignment to the level of current financial sector stability.

The results of such a study could be used to develop economic development plans on a global scale. Current research analyses the current pattern of the synergy between GDP growth and financial systems performance. However, to establish long term plans for economic enhancement for specific clusters, the range of historical data should be taken into account.

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