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SUFFICIENCY OF BANKING CAPITAL: THE EXPERIENCE OF PORTUGAL

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ABSTRACT

This article delves into the escalating frequency of financial crises and their repercussions on national economies, emphasizing the imperative need for both the global community and individual nations to establish mechanisms that can effectively counter financial shocks. The primary line of defence within banking institutions is their own capital. Consequently, the adequacy of a country's own capital plays a pivotal role in determining the robustness of its banking system. The article presents an in-depth analysis of the dynamics of fundamental capital types, including own and borrowed capital, and other economic indicators, with a specific focus on the proportion of own capital within these factors in Portugal, an integral part of the European community.

The study employs correlation-regression analysis to explore the interdependencies among capital, liabilities, assets, income, and Gross Domestic Product (GDP). Regression models are developed to investigate the influence on a bank's own capital. The analysis substantiates the hypothesis regarding the interconnections among these key indicators. Based on the findings, recommendations are made for the implementation of a mechanism to ascertain capital sufficiency. The article places significant emphasis on identifying and utilizing instruments that facilitate the achievement of this objective, ultimately contributing to bolstering financial resilience in Portugal and beyond.

Keywords: financial crises, capital adequacy, banking institutions, equity, liabilities, economic indicators, regression models, Portugal

JEL Classification: G21, G28, G32

INTRODUCTION

The capitalization of banks is one of the key issues in the development of financial and credit systems worldwide. In certain countries, significant experience has already been accumulated in solving this problem, which can be useful for Ukraine.

Discussions about the sufficiency of capital in Ukraine have been ongoing since the inception of its own banking system. Often, Ukraine's banking system was considered undercapitalized. Bankers and economists identified a lack of capital in Ukrainian banks. The National Bank of Ukraine occasionally took legislative measures to force banks to increase their capital.

Most economists believe that capital should be maintained at a sufficient level because it serves several essential functions:

1. Operational function - having an adequate level of capital is necessary for a bank to initiate and continue its operations, subject to compliance with a certain capital level regulated by the country's legislative acts.
2. Trust function - depositors and creditors trust banks with higher capital levels.
3. Protection function, directly related to the previous function. In the event of bankruptcy or liquidation of a bank, capital acts as a kind of insurance reserve for deposits.

However, F. Mishkin (2018) points out that accumulating too much capital is not advantageous, as it affects the shareholders' income. For instance, when receiving a net profit of 1 million monetary units with assets totalling 100 million monetary units, if the equity

capital is 10%, shareholders receive an income of 10%. But if the equity capital is 5%, the shareholder's income is 20%, respectively.

It is evident that for successful operations in the financial market, banks utilize not only their own capital but also borrowed and loaned capital. These last two types of capital make up the biggest share in the capital structure of every bank.

LITERATURE REVIEW

Financial crises, which are becoming increasingly common worldwide, confirm the significant influence of the banking system on the economies of individual countries and the world as a whole. Scholars around the world have dedicated their work to questions regarding financial stability. International organizations such as the IMF, the Basel Committee, international banks, the Bank for International Settlements, the European Central Bank, and others focus their attention on post-crisis recovery efforts and the use of preventive measures to avoid future crises.

Meh, C. & Moran, K. (2008) emphasize the importance of analyzing the connection between the financial condition of banks and economic activity. A dynamic general equilibrium model has been constructed in which the balance of banks influences the propagation of shocks. After adverse shocks in countries with well-capitalized banking sectors, there is less reduction in bank lending and less pronounced downturns. Thus, bank capital enhances the economy's ability to absorb shocks. The model is used to shed light on debates regarding banking capital regulation.

In the financial stability review of the European Central Bank (ECB, 2009), it is written Following the intensification of the financial crisis in late 2008, euro-area banks have come under increased pressure to improve the size and quality of their capital buffers.

The article of Mishchenko, S.V. (2009) discusses issues related to ensuring the stability of the banking system during the global financial crisis of 2008-2009 and provides a rationale for improving methods and tools to overcome the negative consequences of the crisis.

Charles W. Calomiris (2009) from the Czech National Bank notes, that more recent banking system experience worldwide indicates a dramatic upward shift in the costs of banking system distress – an unprecedentedly high frequency of banking crises, many bank failures during crises, and large losses by failing banks, sometimes with disastrous consequences for taxpayers, who end up footing the bill of bank loss.

The article Jokipii, T. & Milne, A. (2011) explores the relationship between short-term capital buffers and portfolio risk adjustments. The estimates indicate that there is a positive bidirectional dependency. The management of such adjustments depends on the bank's level of capitalization.

Cecchetti, S. G. (2015) considers, that prior to the financial crisis of 2007-2009, regulatory measures aimed at risk management within the financial system were woefully insufficient. Conclusions from regulatory changes over the past five years are as follows:

1. As a result of the adoption of the new "Basel III" standards, the system has become significantly safer.
2. The costs of increasing capital requirements turned out to be much lower than initially thought.
3. It is best to avoid changes over time in discretionary regulatory policies.

Is this conversation helpful so far? Werner, R. A. (2016) has demonstrated that capital adequacy-based banking regulation is ineffective, and credit guidance is preferable. This is evident in the case of Barclays Bank.

Admati, Anat R. & Hellwig, Martin F. (2019) continue to explore banking and financial regulations. Flawed claims continue to be made in the policy debate about banking and financial regulations, most recently in the context of proposals to weaken regulations meant to reduce the excessive reliance of banks on debt funding. Because the financial system remains dangerous and distorted and because regulations to reduce indebtedness, if properly designed and enforced, would be highly beneficial for society, flawed claims about the issues must not win the policy debate.

Edge, R. M. & Liang, J. N. (2020) study the implementation of macroprudential capital surcharges under Basel III. The likelihood of utilizing the countercyclical capital buffer (CCyB) is higher in countries with financial stability. It is sensitive to the growth of lending. CCyB is employed to mitigate systemic risk. Establishing CCyB entails the creation of a new macro-financial analytical process for the regular assessment of systemic risks.

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Scientists Edge, R. M. & Liangb, J. N. (2022) continue to investigate the use of the countercyclical capital buffer (CCyB) under Basel III. More effective management increases the likelihood of a country increasing its CCyB. The probability of raising CCyB is higher in countries with stronger Financial Stability Committees (FSC) as determined by those with tools and voting processes. The likelihood is even higher with an alternative governance structure where the FSC or the Ministry of Finance has direct authority to establish CCyB. Setting up CCyB involves establishing a new macro-financial process for regular assessment of systemic risks. Credit growth significantly influences the probability of increasing CCyB, while the gap between credit and GDP is negligible.

Helena Carvalho, Lucas Avezum, Fátima Silva (2022) investigate the relationship between the banks' solvency ratio and their funding costs using a proprietary dataset from Banco de Portugal for 21 Portuguese banks from 2006 to 2020. Their results suggest that the relationship between solvency and funding costs is negative and state-dependent, i.e., market participants become more sensitive to changes in solvency during economic downturns.

Bank capital is related closely to other economic indicators, many scientists study its impact on GDP and the economy as a whole. So, Nina Boyarchenko, Domenico Giannone & Anna Kovner (2020-2022) investigate the influence of bank capital on the GDP. Bank capital matters for the distribution of future GDP growth but not its central tendency. Growth in the aggregate bank capital ratio compresses the tails of expected GDP growth, a relationship that is particularly robust in reducing the probability of the worst GDP outcomes.

In this context, it is important to take into account the emergence of new types of risks, including innovation risk, when assessing capital adequacy. Mishchenko, S., Naumenkova, S., Mishchenko, V. & Dorofeiev, D. (2021) consider, that to maintain proper operational stability and uninterrupted execution of critical operations, the process of risk management of innovation in financial institutions is specified by types of technological, administrative, methodological, and organizational measures. Among these tasks, a key role is played by determining the adequate level of banking capital that corresponds to the risks the bank assumes.

Jondeau, E. & Sahuc, J.-G. (2022) assess the deficit of banking capital resulting from the financial crisis based on a macro-financial dynamic stochastic general equilibrium model. The study reflects the interaction between the financial and real sectors of the Eurozone economy. By using a combination of a significant positive risk shock and a negative investment shock, they have demonstrated that a crisis similar to that of 2008 would lead to a deficit of banking capital ranging from 2.2% to 3% of the Eurozone's GDP (€207–282 billion).

Bitara, M. & Tarazi, A. (2022) believe that banks should maintain high capital adequacy ratios on a medium-term horizon to absorb future losses.

Coutinho dos Santos (2022) considers that allocation of ownership control rights, growth opportunities, reputation in banking markets, financial flexibility, information signalling, and debt tax shields are significant internal determinants of bank capital structure choice. Capital structure choice does matter for bank value, and it can be explained within the framework of the corporate capital structure theory.

AIMS AND OBJECTIVES

The primary objective of this article is to conduct a comprehensive examination of the capitalization levels within the banking system of Portugal. This investigation aims to delve into the intricate interplay among various forms of capital held by banks and their consequential influence on the financial performance of these institutions. Beyond this overarching aim, the study encompasses a set of specific objectives:

1. **Analysis of Capital Dynamics:** One of the foremost objectives is to meticulously scrutinize and understand the dynamics of the key types of capital, which encompass both proprietary (own) and borrowed capital. By assessing the evolution of these capital components over time, the research aims to provide insights into their growth, distribution, and fluctuations within the Portuguese banking sector.
2. **Exploring Capital-Performance Relationships:** A crucial goal of this study is to explore and unravel the intricate relationships between the various forms of capital (own and borrowed) and the performance indicators of banks. This involves examining how different capital sources impact vital financial metrics such as profitability, liquidity, and risk management. The study seeks to elucidate whether higher levels of own capital, for instance, are associated with greater financial stability and resilience.

3. **Proposing Mechanisms for Capital Sufficiency Determination:** Another pivotal objective is to formulate and present practical proposals and mechanisms for the assessment of capital sufficiency within the banking sector. These recommendations are intended to guide policymakers, regulators, and financial institutions in ensuring that adequate capital levels are maintained, which in turn can bolster the overall financial resilience of the banking system in Portugal.

In essence, this research article is not only concerned with analyzing the financial landscape of Portugal but also with contributing to the broader understanding of how capitalization and financial performance intersect. By achieving these objectives, the study strives to offer valuable insights and recommendations that can aid in strengthening the financial stability and resilience of the banking industry in Portugal and potentially serve as a model for similar investigations in other regions.

METHODS

To achieve the set goal, various research methods were employed in this study. The following methods played a crucial role in the analysis:

- *Comparative Method:* The comparative method was utilized to evaluate and contrast different types of capital. This involved assessing and contrasting the characteristics, strengths, and weaknesses of both own and borrowed capital in banking institutions.
- *Statistical Method:* The statistical method was applied for the purpose of creating graphical representations of the data. Graphs were constructed to visually depict the trends and relationships in the data, facilitating a clearer understanding of the patterns and variations within the economic indicators.
- *Correlation-Regression Analysis:* Correlation-regression analysis was a fundamental analytical tool used to determine the relationships between various forms of capital (own and borrowed capital), and how they influenced the overall economic performance of the bank. This involved examining the statistical correlation between these capital types and other key economic indicators like liabilities, assets, income, and GDP.
- *Correlation Matrix:* A correlation matrix was constructed to provide a systematic overview of the relationships between these variables. It quantified the degree and direction of associations between them.
- *Correlation Graphs:* These graphs were generated to visually represent the correlation coefficients and illustrate how capital types were interconnected with other economic variables. They allowed for the visualization of the strength and direction of these relationships.
- *Regression Equations:* Regression equations were formulated to model the impact of different variables on a bank's own capital. These equations helped in quantifying the influence of various economic factors on the adequacy of own capital.

The advantages of correlation and regression analysis include:

- *Finding Relationships and Dependencies:* Correlation and regression analysis allow for the exploration of relationships between variables, helping to understand the interconnections and dependencies in data.
- *Forecasting:* Regression models can be used to predict the values of one variable based on the values of another, aiding decision-making and planning.
- *Identification of Influential Factors:* Regression analysis helps identify which variables have the most significant impact on the dependent variable, which is valuable for decision-making and influencing processes.
- *Assessment of Strength and Direction of Relationships:* Correlation coefficients and regression parameters help determine the strength and direction of the relationships between variables.
- *Statistical Hypothesis Testing:* Correlation and regression analysis allow for statistical tests to determine whether the identified relationships are statistically significant.
- *Visualization:* The graphs and diagrams used in the analysis help visualize the relationships between variables, making the results more accessible and understandable.
- *Planning and Optimization:* Regression analysis can be used for process optimization and planning based on identified dependencies.
- *Scientific Research:* This analysis method is widely used in scientific research to study various phenomena and processes.

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- *Assessment of Impact of Factors:* Regression analysis allows for evaluating how changes in independent variables influence the dependent variable.
- *Model Validation:* Correlation and regression analysis help assess the adequacy and accuracy of statistical models, which is important in many fields, including economics and science.

The data analysis and the construction of the correlation matrix, correlation graphs, and regression equations were executed using Jamovi software in the year 2022. Jamovi is a widely used statistical analysis software that facilitates data visualization and statistical modelling, making it a valuable tool for this research study.

In summary, a combination of comparative, statistical, and correlation-regression analysis methods, facilitated by Jamovi software 2022, was employed to comprehensively explore the relationships between capital types and other economic indicators, contributing to the understanding of financial resilience and capital adequacy in the context of Portugal.

RESULTS

The primary goal of any bank's activities is to generate a profit. Banks earn profits through active operations, the main of which include lending, investment activities, and payment transactions.

To carry out these active operations, a bank must have sources of resources, with the most significant being borrowed funds. Capital, in turn, serves as a substantial reserve and a source of trust in the bank.

The relationship between equity capital and borrowed capital is depicted in Figure 1.

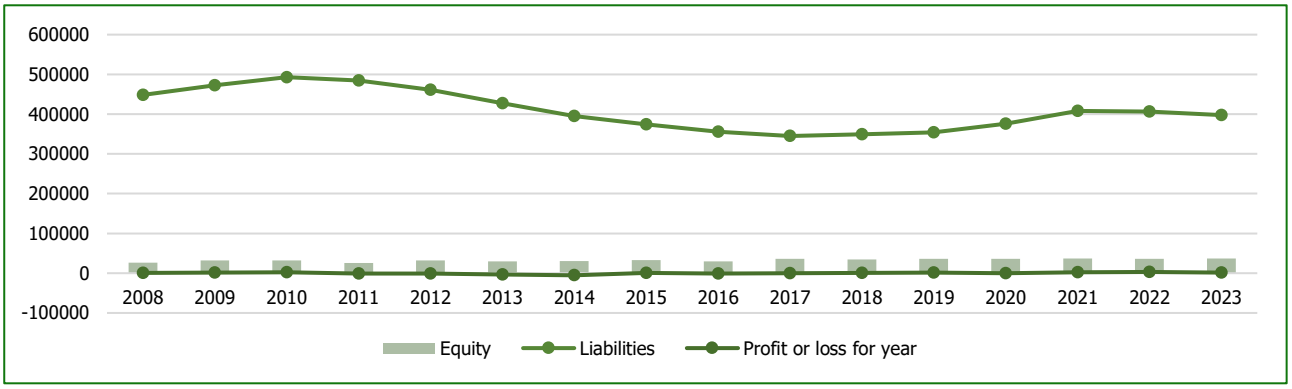

Figure 1. Equity, liabilities, and profit (EUR millions) in Portugal's banking system during 2008-2023 years. *(Source: Banco de Portugal)*

From Figure 1, it can be inferred that borrowed funds significantly outweigh equity capital. To provide a clearer illustration, let's visualize the specific weight of equity capital in GDP, liabilities, and the overall balance sheet (Figure 2).

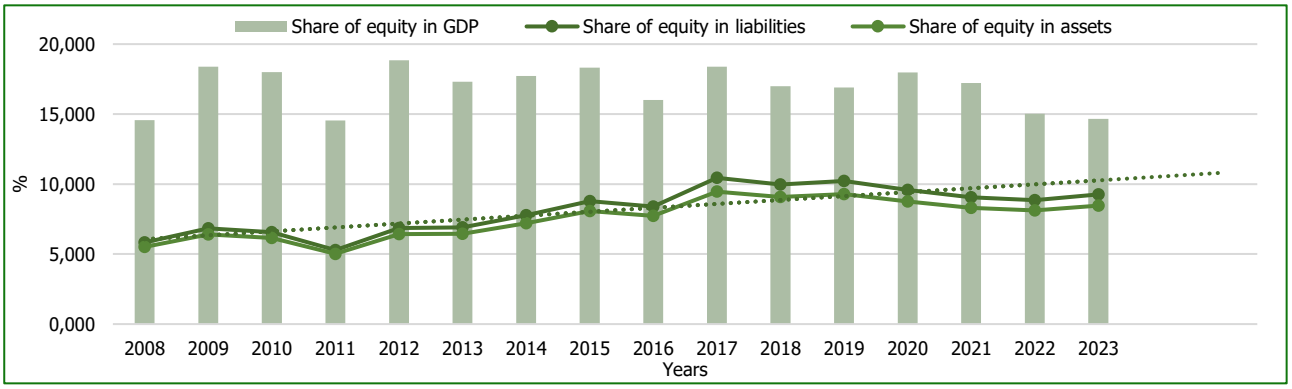

Figure 2. Share of equity in liabilities, assets and GDP in Portugal's banking system in 2008-2023 years. *(Source: Banco de Portugal)*

As evident from the chart, the specific weight of capital in liabilities increased until 2017, then exhibited an unstable trend until 2019, and began decreasing after 2019. Simultaneously, a forecast was established based on the trend, indicating that the specific weight is expected to increase. This is driven by the consistently growing risks in the banking sector.

Regarding the specific weight of capital in GDP, this indicator is rather volatile, attributed to the unstable dynamics of both variables.

However, it should be noted that the increase in the share of equity capital in 2012 was influenced by both capital growth (it increased) and a decrease in GDP. Therefore, considering such a situation unequivocally positive is inappropriate. In 2017, the increase in the share of capital was achieved through simultaneous growth in both capital and GDP, which can be considered a better situation than in 2012. The increase in the share of capital in GDP in 2020 occurred in a situation where both capital and GDP decreased, but the decline in the latter indicator proved to be more significant in the context of the crisis.

The most important financial stability indicators are the next: Common Equity Tier 1 ratio (CET 1 ratio) and Capital adequacy - Regulatory tier 1 capital to risk-weighted assets (FSI). The dynamics of financial stability indicators are presented in Figure 3

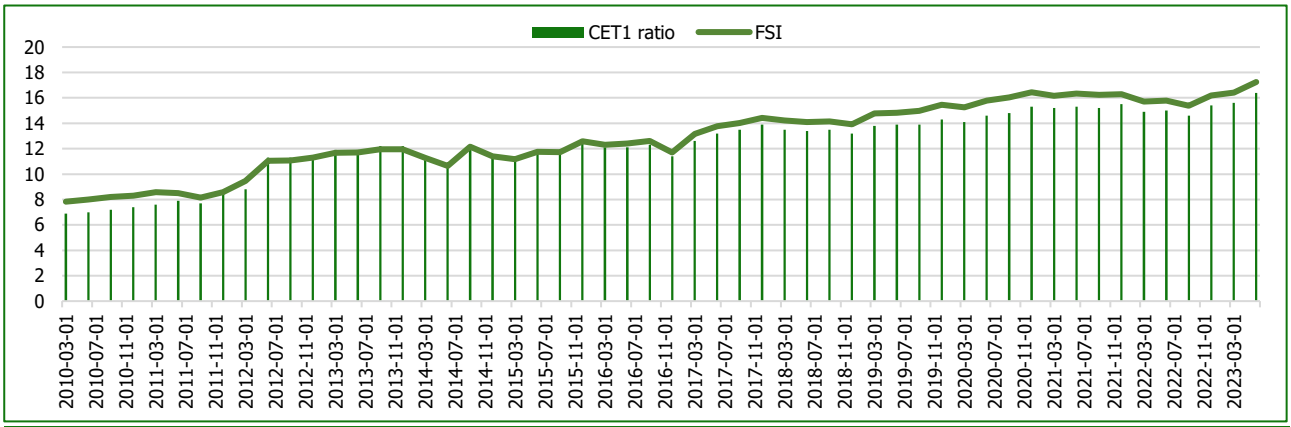

Figure 3. Common Equity Tier 1 ratio (CET 1 ratio) and Capital adequacy - Regulatory tier 1 capital to risk-weighted assets (FSI) in Portugal in 2010-2023 years. *(Source: Banco de Portugal)*

Analyzing the data from Figure 3, it can be asserted that banks comply with the capital adequacy requirements established by the Basel Committee on Banking Supervision, even with a significant margin. Moreover, there is a noticeable and consistent growth in both indicators, even during years of financial crises, such as the COVID-19 crisis. Perhaps the adherence of Portuguese banks to regulatory capital requirements enables the banking system to function quite successfully. In contrast, it should be noted that overcoming the financial crisis of 2007-2009 was not as successful. The government had to provide support to the banking system, and under such conditions, certain banks exited the financial sector.

The next step in the study involved constructing a correlation matrix between key indicators such as equity capital (A), liabilities (B), total bank assets (C), annual profit (D), and minority shareholders' profit (E).

Table 1. Correlation Matrix. Note. *p < .05, **p < .01, ***p < .001

		A	B	C	D	E
A	Pearson's r	—				
	df	—				
	p-value	—				
B	Pearson's r	-0.545*	—			
	df	14	—			
	p-value	0.029	—			
C	Pearson's r	-0.490	0.998***	—		
	df	14	14	—		
	p-value	0.054	< .001	—		
D	Pearson's r	0.490	0.043	0.082	—	
	df	14	14	14	—	
	p-value	0.054	0.874	0.762	—	
E	Pearson's r	-0.431	0.552*	0.541*	0.213	—
	df	14	14	14	14	—
	p-value	0.095	0.027	0.030	0.429	—

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The correlation matrix confirms a strong connection between total assets and liabilities, liabilities and equity capital, as well as between the profit of minority investors and liabilities and total assets. It should be noted that the relationship between these indicators is positive.

Regarding the link between equity capital and the studied indicators, it is mostly negative and insignificant, except for the connection between equity capital and liabilities. Therefore, the smaller a bank's equity capital, the more it needs to attract funds. The results also affirm that the relationship between capital and investor profit is inverse, although it's not very strong (0.431). Interestingly, the connection between capital and overall bank profit is positive but not very tight (0.490).

The next step involves constructing a Linear Regression model. In this case, the equity capital of the bank (A) was taken as the dependent variable, while the following were considered independent factors: liabilities (B) and annual profit (D). The model excluded variables such as total bank assets (C) and profit attributed to minority investors (E) after checking for multicollinearity.

The obtained model is reasonably adequate, as $p < .001$, and $R^2 = 0.561$.

Table 2. Model Coefficients – A.

Predictor	Estimate	SE	t	p
Intercept	49679.9334	5574.8936	8.91	< .001
B	-0.0417	0.0135	-3.08	0.009
D	0.8632	0.3088	2.80	0.015

Therefore, the regression equation is as follows:

$$Y = 49679^* - 0.0417\ X1^* + 0.08632\ X2 \quad (1)$$

Hence, liabilities have a reverse impact on the size of equity capital.

Next step. We also constructed linear regression, taking the equity capital of the bank (A) as the dependent variable, with the following as independent factors: annual profit (D) and profit belonging to minority investors (E). The model excluded variables such as liabilities (B) and total bank assets (C) after checking for multicollinearity.

The obtained model is reasonably adequate, as $p < .001$, and $R^2 = 0.540$.

Table 3. Model Coefficients – A.

Predictor	Estimate	SE	t	p
Intercept	33756.76	776.316	43.48	< .001
B	1.02	0.323	3.17	0.007
D	-6.94	2.380	-2.92	0.012

Therefore, the regression equation is as follows:

$$Y = 33756^* + 1.02\ X1^* - 6.94\ X2 \quad (2)$$

Hence, the total profit impacts the size of equity capital.

The conducted correlation-regression analysis has confirmed that the size of equity capital is directly proportional to a bank's profit and inversely proportional to its liabilities. This validates our hypothesis that the size of equity capital should not be an absolute value but rather a relative one. Each bank should have an equity capital size that is a function of risk, volatility, diversification, and concentration. In other words, economic capital is the most critical aspect of a bank.

There is a need to develop an effective mechanism for determining the sufficiency of bank capital.

The peculiarity of the mechanism for determining the sufficiency of banking capital in Portugal lies in the fact that it is necessary to consider that the banking system of Portugal is part of the European banking system. In line with this objective, the principles and indicators that the Central Bank of Portugal will use must correlate with those widely accepted by the European Central Bank. This is because even the interest rates set by the Central Bank of Portugal directly depend on the interest rates of the European Central Bank (Figure 4).

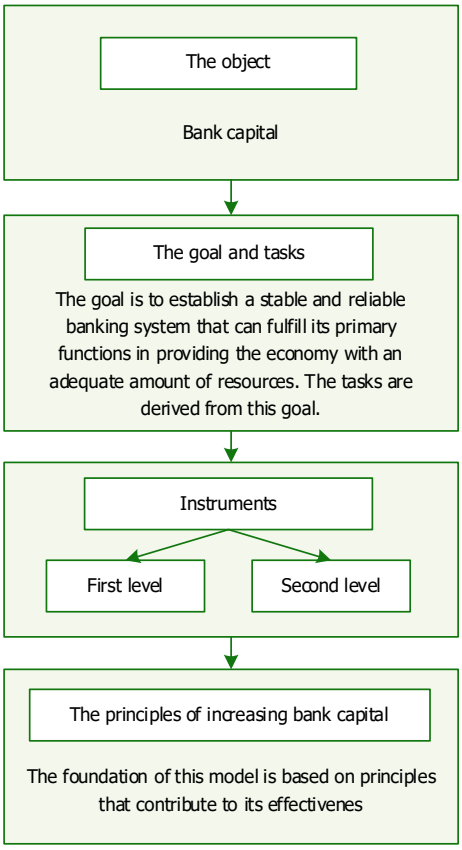

Figure 4. The conceptual model of the mechanism for determining the sufficiency of bank capital.

Analyzing the proposed model of the mechanism for increasing bank capital, it should be noted that the immediate object is bank capital, as all actions are directed toward achieving its optimal size. The optimal capital size is one that enables the banking system to function effectively both during periods of stability and in the face of financial shocks. If a bank, in accordance with the requirements of the Basel Committee, forms sufficient capital buffers, it not only allows it to avoid bankruptcy but also to maintain lending levels to the economy.

The main purpose of this conceptual model of the mechanism for increasing bank capital is to create a stable and reliable banking system that fulfils its primary functions of providing the economy with an adequate amount of resources. It should be noted that the primary goal is not only to ensure the economy of Portugal with an adequate amount of resources but also to support its financial stability, which directly influences the financial stability of the European banking system. Based on this, the main tasks include:

- reducing the tax burden to legalize bank income and increase capital through profits;
- developing the stock market to increase capital through securities operations on the secondary market;
- measures to enhance transparency and information disclosure, which create conditions for increasing capital through the issuance of securities;
- building trust in banks among the public to attract additional funds;
- creating conditions for merger and acquisition processes to consolidate funds from multiple banks.

The foundation of the proposed model of the mechanism for increasing bank capital is the principle of determining the sufficiency of bank capital. Among the key principles, in our opinion, the following should be emphasized:

- to comply with the requirements for banking activities established by the European Central Bank;
- aligning the size of bank capital with the risks inherent in banking activities;
- establishing universal and mandatory conditions for all banks;
- applying preventive and punitive measures for violators of established norms;
- simultaneous supervision of banks on an individual and consolidated basis;
- monitoring the accuracy of information provided by banks;

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- enhancing the legislative framework to enable banks to conduct their activities more effectively.

Instruments represent the economic levers that will help achieve the goal and determine the real and optimal size of a bank's capital, and based on this, take measures to increase it.

It should be noted that there is a significant number of indicators that characterize the sufficiency of capital. In our opinion, all indicators can be divided into macroeconomic, or the first level, and micro-level, or the second level.

Indicators of the first level are the next:

- the ratio of bank capital in different European countries;
- the ratio of bank capital to GDP;
- the ratio of foreign and domestic bank capitals;
- the level of concentration of bank capital;
- the establishment and compliance with regulatory values;
- the impact of monetary and credit policy instruments on bank capital.

Indicators of the second level are the next:

- the growth rate of bank capital;
- the ratio of bank capital to assets;
- the ratio of bank capital to liabilities;
- the ratio of bank capital to funds of legal entities;
- the ratio of bank capital to deposits of individuals;
- the ratio of bank capital to bank income;
- the ratio of bank capital to bank expenses;
- the relationship between the growth rate of bank capital and assets.

DISCUSSION

The conducted research confirms various directions of researchers and provides a foundation for further developments. Therefore, considering Admati, Anat R. & Hellwig, Martin F. (2019) viewpoint that banks shouldn't issue debt rather than more equity, which will later be converted into shares, it has been determined that equity and borrowed capital are inversely related. Consequently, if a bank has lower equity capital, it needs to raise more funds. Essentially, both forms of capital represent costs for the bank. In the case of equity capital, dividends serve as the cost, and the bank determines how and in what quantity to pay them. When it comes to borrowed and raised funds, interest payments must be made unconditionally. Therefore, the appropriate balance between equity and borrowed capital remains a subject of debate and requires further study.

Scholars also point out that determining the necessary amount of equity capital by considering only risk-weighted assets is not appropriate because other factors affecting the bank's risk of bankruptcy need to be taken into account. The article also explores the relationship between equity capital and other indicators, such as profit and bank assets. Furthermore, suggestions are made regarding the need to consider a range of indicators that can be categorized into first and second-level indicators when determining the adequacy of capital. Based on this, there is a debate surrounding the definition of the concept of economic capital that a bank should hold, taking into account the riskiness of its activities. Moreover, it should be noted that economic capital should serve as a reserve to cover not only the risks related to the bank's active operations but also take into account country risk, systemic risk, and others.

N. Boyarchenko, D. Giannone & A. Kovner (2020) have been researching the impact of banking capital on the Gross Domestic Product (GDP) for several years. We have also examined the dynamics of the share of equity capital in GDP, identifying its significant volatility. This analysis requires a more detailed investigation of both the numerator and the denominator of the mentioned ratio. The numerator represents equity capital, while the denominator corresponds directly to the GDP. In the examination of this ratio in Portugal (figure 2), its volatility was noted, as during financial crises, there was a simultaneous reduction in both the numerator and denominator or a decrease only in the denominator, maintaining the relative weight at the previous level or even increasing it. An increase in the share can indicate not a positive trend of increasing banking capital but, conversely, a decrease in GDP.

The impact of macroprudential policy, mediated through the countercyclical capital buffer (CCyB), on credit risk during periods of uncertainty is under investigation by Benbouzid, N., Kumar, A., Mallick, S. K., Sousa, R. M. & Stojanovic, A. (2022). The CCyB effect arises from its influence on the capital ratio (the ratio of equity capital to total assets). Tightening the CCyB increases capital while loosening the CCyB has no impact on capital. Thus, risks emanating from the banking sector during periods of heightened uncertainty can be mitigated through CCyB regulation. Macro-prudential policy aimed at encouraging banks to maintain a higher level of capital during good times is justified for restraining risks in financial markets during downturns. Therefore, central banks should focus on establishing countercyclical capital buffers that help mitigate the adverse impact on the banking sector during financial crises.

Currently, the most researched area pertains to the social sphere, corporate governance (ESG), and the performance efficiency of companies, with only a limited number of studies dedicated to the banking sector. Ersoy, E., Swiecka, B., Grima, S., Özen, E. & Romanova, I. (2022) examined the impact of ESG indicators and ESG components (environmental, social, and governance) on the market value of U.S. banks from 2016 to 2022. They used market value as an indicator of a bank's worth. It is worth noting that a promising direction is to investigate a similar market in Eurozone countries where the banking sector plays a significant role in the financial industry.

We have investigated that banks in Portugal adhere to the established regulatory capital requirements. This, undoubtedly, has a positive impact on the financial stability of the banking system. However, this matter requires further avenues of research, as the intensity of the influence of regulatory indicators on the stability of the banking sector is an intriguing question. Further exploration is needed to gain insights into this aspect.

Kristóf, T. & Virág, M. (2022) have demonstrated that the risk of bankruptcy for banks in the EU-27 can be modelled using machine learning. Profitability, capital adequacy, and managerial capabilities are the strongest predictors of bank bankruptcy within the EU-27. However, more complex models such as decision tree modelling, deep learning neural network models, and logistic regression models can be applied to assess the risk of bank bankruptcy. Utilizing these models for the determination of bank bankruptcy risk for each individual country is a promising direction for our future research.

CONCLUSIONS

Hence, it can be deduced that bank capital stands as a pivotal component within the banking industry, functioning as a wellspring for conducting the bank's active operations, and these operations, in turn, are instrumental in generating profits for the bank. The extensive analysis of bank capital and its intricate interplay with various indicators within the Portuguese banking system has unearthed several key findings.

Firstly, it has become evident that the size of a bank's own capital exhibits a significant correlation with the scale of the bank's liabilities. This correlation implies that as a bank's activities and responsibilities expand, so too must its own capital expand in order to maintain a proportionate and well-balanced financial structure.

Additionally, this analysis has revealed that the size of a bank's own capital bears an inverse impact on the profits earned by minority investors. In other words, as a bank's own capital grows, the portion of profits available to minority shareholders diminishes. This emphasizes the importance of striking a careful balance between bolstering own capital for stability and ensuring that the interests of all stakeholders, including minority investors, are adequately considered.

In light of these insights, it becomes apparent that prescribing a fixed, one-size-fits-all figure for the size of bank capital is an oversimplification. Rather, what emerges as the primary criterion for bank capital adequacy is its capacity to align with the risks the bank undertakes. In essence, bank capital should be sufficiently responsive to the challenges and uncertainties that the bank may face in its operations. To this end, it is imperative that banks establish a well-defined and systematic approach to ensuring the adequacy of their capital.

This approach should encompass the development of an internally driven mechanism tailored to the specific needs and risk profile of the bank. In doing so, the bank can better navigate the dynamic financial landscape and maintain both financial stability and the interests of its stakeholders. Therefore, the sufficiency of bank capital is not an arbitrary number but a strategic imperative that requires careful calibration and a systematic, internally controlled approach to meet the unique demands of each bank within the broader banking ecosystem.

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ADDITIONAL INFORMATION

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ДОСТАТНІСТЬ БАНКІВСЬКОГО КАПІТАЛУ: ДОСВІД ПОРТУГАЛІЇ

Фінансові кризи, які останнім часом усе частіше завдають ударів по економіці країн, дали зрозуміти, що світова спільнота та окремі держави повинні створювати умови, які дозволять протистояти фінансовим стресам. Захисну функцію в банківських установах виконує безпосередньо власний капітал. Тому достатність власного капіталу визначає стресостійкість банківської системи країни. У статті проаналізовано динаміку основних видів капіталу: власного та залученого, – а також інших економічних показників та питому вагу власного капіталу в них у Португалії, яка є частиною європейського співтовариства. За допомогою кореляційно-регресійного аналізу проаналізовано взаємозв'язок між капіталом, зобов'язаннями, активами, прибутком, а також ВВП. Побудовані регресійні моделі впливу на власний капітал банку. Проведений аналіз підтверджує гіпотезу щодо взаємозв'язку між показниками. На основі проведеного аналізу сформульовано пропозиції щодо впровадження механізму визначення достатності капіталу. Значна увага приділена визначенню інструментів, які допомагають у досягненні поставленої мети.

Ключові слова: фінансові кризи, адекватність капіталу, банки, власний капітал, зобов'язання, економічні індикатори, регресійна модель, Португалія

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