

Katowice, 04.04.2023 r.

**Mgr Mateusz Muszyński**

Summary of the doctoral dissertation entitled  
**"STRUCTURE OF FINANCING OF COMMERCIAL BANKS IN POLAND  
UNDER THE NEW PRUDENTIAL REGULATIONS"**

written under the scientific supervision of prof. dr hab. Irena Pyka

auxiliary supervisor: dr Aleksandra Nocoń

The experience of the last decades shows that crises of banking systems related to improper handling of risk are often a turning point in the area of regulation of banking institutions. The effects of risk materialization may lead to a radical change in the concept of prudential policy, including the creation of a new hierarchy of its objectives and priorities. This scenario happened during the global financial crisis of 2007-2009, which by revealing all the weaknesses of the financial system based on particularism and self-regulation, caused a shift of the prudential policy paradigm towards ensuring financial stability. The supranational nature of the crisis resulted in a reconstruction of the existing supervisory architecture and harmonization of the legal systems of the European Union member states. Particular importance in this process was attributed to macroprudential policy, which was designed to cover the identified shortcomings of microprudential policy. At the European level, the post-crisis concept of the financial system was established in the CRD IV/CRR package, which applies from 1 January 2014. By introducing unified rules for licensing, conducting and supervising banking activities it set the framework for a new regulatory order.

The reorganization of the supervisory policy – in addition to institutional changes – also required the formulation of new instruments for regulating banking activity and equipping supervisory authorities with the ability to exert real influence on the banking system. The most important regulatory instruments in the CRD IV/CRR package include: establishing new requirements for the own funds, defining a new leverage ratio and introducing the short-term liquidity standard LCR (Liquidity Coverage Ratio) and long-term liquidity standard NSFR (Net Stable Funding Ratio). Pursuant to the regulatory provisions, the existing possibilities of the supervisory authorities to influence credit institutions have also been extended by new macro-prudential tools, which primarily include capital buffers. However, the parallel application of microprudential and macroprudential instruments has far-reaching implications

for the financial management of banking institutions. Never before have their activities been put under such strong regulatory pressure resulting from the introduction of complex and multidimensional prudential regulations. As a consequence, banks were obliged to meet new prudential requirements and to introduce the necessary modifications of their structure of financing.

The main objective of the dissertation is to identify and evaluate modifications in the structure of financing of commercial banks in Poland, taking place under the new prudential regulations. The conducted research resulted in the adoption of detailed objectives. They have been divided into theoretical-cognitive goals and application goals. The theoretical-cognitive purposes include:

1. Identification of key regulatory instruments affecting the modification of banks' funding sources,
2. Analysis of the sources of raising capital by banks operating in the domestic banking sector,
3. Identification of the possibilities of adapting the sources of financing of banks in Poland to the regulatory requirements in the field of capital adequacy, capital buffers, financial leverage and liquidity standards.

The adopted application goals include:

4. Identification of research methods enabling the assessment of changes in the structure of financing of commercial banks,
5. Analysis of changes in the structure of financing of commercial banks in Poland in the years 2010-2019,
6. Assessment of the effects of introducing new capital regulations on financing the growth of the own funds of commercial banks in Poland,
7. Assessment of the level of diversification of foreign sources of financing of the commercial banks in Poland, operating under the new prudential regulations,
8. Identification of changes in the term structure of foreign sources of financing of commercial banks in Poland, which occur under the influence of the implementation of the new liquidity regulations.

The conducted empirical research enabled to verify the formulated main hypothesis stating that the effect of the implementation of new prudential regulations is the modification of the structure and sources of financing of commercial banks in Poland. The following detailed hypotheses were set to verify the main hypothesis:

H1: The main source of creating own funds of commercial banks in Poland, operating under the new prudential regulations, was the retained net profit.

H2: Under the new prudential regulations, there was a decrease in the level of diversification of the foreign sources of financing of commercial banks in Poland.

H3: The introduction of liquidity regulations contributed to extending the maturity dates of liabilities of commercial banks in Poland.

The verification of the adopted research hypotheses and the fulfilment of the objectives set out in the dissertation required the use of various research methods. The theoretical part uses the method of critical analysis of both national and international literature (literature study). The considerations carried out in the dissertation required paying attention to the legal aspects of the regulatory environment. Therefore, the method of document analysis, the method of cause-and-effect analysis and the method of synthesis were also used. The empirical verification was based on the data derived from the non-consolidated annual financial statements and reports of the management boards of commercial banks in Poland for the years 2010-2019. The dissertation also uses data from databases, statistics and studies of the National Bank of Poland and the Polish Financial Supervision Authority. Particular attention was focused on financial analysis - analysis of structure and dynamics and indicator analysis. The method of indicator analysis was used to identify and assess changes in the structure of banks' funding, term structure of foreign sources of funding and to calculate the amount of net profit retained by banks. Both indicators of own design proposed by the Author and standardized indicators included in national and EU regulations were analysed. The reasons of creating the banks' own funds from the particular sources of financing were identified thanks to the analysis of the documents. The indicator used to measure the diversification level of the foreign sources of funding was based on the Herfindahl-Hirschman Index. This index was adapted to the research needs identified in the thesis. In the dissertation, the national and foreign literature, acts of national law and legal acts of the European Union have been used.

The structure of the work was subordinated to the adopted goals and research hypotheses. The first chapter discusses the regulations in the banking sector. The considerations began with the indication of the main reasons for regulating banking activity. It was pointed out that prudential regulations developed alongside structural regulations as one of the types of banking regulations. The purpose of applying prudential regulations was presented and their classification was made on the basis of various criteria. The chapter also indicates the imperfections of the supervisory and regulatory paradigm determining the functioning of banking institutions during the global financial crisis. Then, the most important assumptions of

the post-crisis policy of regulating the activities of banks at both micro- and macroprudential level were presented. The first chapter also discusses the structure of the CRD IV/CRR regulatory package and, on this basis, identifies the most important microprudential and macroprudential instruments, the application of which obliges banks to modify their funding structure. Prudential instruments regulating the level of capital of banking institutions and those affecting their liquidity were distinguished. Then the following instruments were presented and precisely characterised: new capital adequacy ratios and the rules of their calculation, financial leverage ratio, short-term liquidity coverage ratio LCR and the net stable funding ratio NSFR. Significant attention was paid to the established capital buffers and the solutions introduced in the domestic banking sector.

The considerations in the second chapter concern the structure of financing of commercial banks. At the beginning, the concept of the structure of financing of banking institutions and the determinants of its formation were discussed. It was pointed out that the selection of banks' funding sources requires parallel consideration of banks' capital needs at both the commercial and prudential levels. Then, the possibilities of classifying the sources of bank financing were presented. This chapter also analyses the most important sources of bank funding, with reference to the applicable national regulations. When considering the use of particular sources of financing, the opportunities and threats associated with them were highlighted.

The third chapter is entirely devoted to the analysis of the consequences resulting from the introduction of new prudential regulations for the structure and sources of financing of the banks. Research has shown that the prudential requirements imposed on banks in terms of capital adequacy lead to an increase in the demand for bank capital, including the capital of the highest quality - identified with Common Equity Tier I capital (CET1). It was noted that the improvement of the quality of banks' own funds determines the acquisition of capital from clearly defined sources. The possibilities of creating the components of the own funds were precisely analysed. The third chapter of the dissertation also considers the effects of using macroprudential instruments in the form of capital buffers for the sources of financing. Taking into account the fact that all capital buffers maintained by credit institutions must also be constructed on the basis of Tier I capital, the difficulties that may accompany banks in raising additional capital have been demonstrated. The chapter indicates that changes in the demand for bank capital with specific characteristics are also the result of the regulation of the financial leverage and the introduction of harmonized liquidity standards. Therefore, the effects of the introduction of the leverage ratio, the short-term liquidity norm LCR and the long-term liquidity

norm NSFR were analysed, and then possible strategies were presented that allow banks to maintain them at a level complying with the adopted regulatory requirements.

The fourth chapter begins with the presentation of the time and subject scope of empirical research. In its further part, the research methodology was described and the research procedure used in the dissertation was presented and discussed in detail. The research procedure was divided into five stages, which were: analysis of the indicators of the structure of financing, assessment of the capital position of the banks, analysis of the main sources of the growth of the own funds, assessment of the level of diversification of foreign sources of financing and analysis of changes in the term structure of foreign sources of financing.

The fifth chapter focuses on the empirical verification of changes in the structure of financing of the banks. The research sample consisted of eleven largest commercial banks in Poland, identified due to their balance sheet total as at December 31, 2019. The research period covered the years 2010-2019, enabling the identification and assessment of changes in the structure of financing in the period preceding the introduction of new prudential regulations (years 2010-2013) and during their application (2014-2019). The research covered the period up to 2019 due to the fact that the following years are the period of the global Covid-19 coronavirus pandemic, which significantly affected the business activity of banking institutions around the world, including Poland. Banks' decisions regarding the structure of financing were then subordinated to current goals and challenges. Therefore, the financial results, as well as the structure of financing of banks after 2019, may significantly differ from the financial data for previous years, and thus distort the results obtained and the conducted considerations.

At the end of the dissertation, the obtained research results were discussed in a synthetic way and the implementation of research goals was summarized.

The research shows that in the years 2010-2019 almost all banks gradually increased the value of their own funds. Even before the introduction of new prudential regulations, most banks had maintained high capital adequacy ratios. This means that commercial banks in Poland were prepared to meet the stricter capital requirements. The main component of the own funds of the banks during the period of new prudential regulations was the Tier I capital. The remaining part of the own funds was made up entirely of supplementary funds (Tier II).

The research indicated that the main source of creating own funds of the banks in the years 2010-2013 was retained net profit. It was also found that during this period, banks raised more capital by issuing shares than by issuing subordinated bonds. During the period of new prudential regulations, the importance of funding sources used by banks to create their own funds has changed. The amount of capital raised by the issuance of shares clearly decreased and

turned out to be lower than the amount of capital raised by the issuance of subordinated bonds. On the other hand, the total amount of net profit retained in banks has significantly increased. The obtained results enabled the positive verification of the first auxiliary hypothesis stating that the main source of creating own funds of commercial banks in Poland, operating under the new prudential regulations, was the retained net profit.

The conducted empirical research also allowed the positive verification of the second detailed hypothesis, assuming that under the new prudential regulations, there was a decrease in the level of diversification of the foreign sources of financing of commercial banks in Poland. A decrease in the value of the *DHH* diversification ratio has been observed since 2014, that is from the moment when new prudential regulations formally entered into force in Poland. The reasons for that should be connected with the rules of creating Tier II capital, which is an element of the new structure of banks' own funds, the introduction of the regulatory leverage ratio, the introduction of the LCR short-term liquidity standard and the NSFR long-term liquidity standard. Banks systematically limited funding from the interbank market, and instead significantly increased funding with deposits from the non-financial sector. Due to the greater attractiveness of the issuance of subordinated bonds resulting from the possibility of qualifying them to the supplementary Tier II capital, the importance of the issuance of other debt securities also decreased.

The dissertation showed that the values of the short-term liquidity coverage ratio LCR and the net stable funding ratio NSFR for most banks were clearly above the regulatory minimum applicable in a given year. It was also shown that most banks complied with national quantitative liquidity requirements, both short- and long-term, expressed in terms of M2 and M4 ratios. This indicates a good liquidity situation of banks in 2010-2019 and thus informs that they did not have to make significant transformations in the structure of the balance sheet in order to adapt to the regulatory requirements of short-term liquidity norm LCR and long-term liquidity norm NSFR. Taking into account the criterion of maturity of liabilities to banks and liabilities to customers, it cannot be stated that under the influence of prudential regulations, commercial banks in Poland turned towards increasing the long-term foreign financing. Based on the obtained results, the third auxiliary hypothesis, assuming that the introduction of liquidity regulations contributed to extending the maturity dates of liabilities of commercial banks in Poland, was negatively verified.

Verification of detailed hypotheses conducted in the research allowed to positively verify the formulated main hypothesis stating that the effect of the implementation of new

prudential regulations is the modification of the structure and sources of financing of commercial banks in Poland. The key changes included:

- increased role of deposits from the non-financial sector in the structure of financing,
- decreased role of deposits from the financial sector in the structure of financing,
- increased role of net profit as a source of Tier I capital and as a source of raising the overall capital position,
- decreased role of share issuance as a source of Tier I capital and as a source of raising the overall capital position,
- increased role of issuance of subordinated bonds as a source of creating Tier II capital and as a source of raising the overall capital position,
- decrease in the level of diversification of the foreign sources of financing.

The conducted research clearly shows that commercial banks in Poland, operating under the new prudential regulations, have transformed their structure of financing. Therefore, the considerations presented in the dissertation make a significant contribution to the issue of shaping the structure of financing of banks in Poland. However, the results obtained in the dissertation and the conclusions formulated on its basis should be viewed from the perspective of the relatively short period of validity of the new prudential regulations. It is worth to mention that the prudential regulations were not implemented uniformly and therefore the effects of their application in the banking sector could have appeared with a certain delay. The full impact of their application on the structure of financing of commercial banks in Poland will therefore be possible to present in a couple of years, and at the same time will strongly depend on the introduction of the future regulatory changes.