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The role of intellectual capital in building the competitiveness of banks in Poland

The banking sector in Poland at the turn of the 20th century and the 21st century experienced increased competition resulting mainly from the inflow of foreign capital to this sector. In addition, there were strong general economic perturbations, including: the financial crisis of 2008 after the collapse of Lehman Barthes (sometimes the beginning is indicated in 2007, when two funds of the Bear Stearns bank collapsed in July) or the crisis as a result of the SARS COV-2 pandemic and it spills over to the entire world economy. In parallel, the global economy was moving from the Industry 3.0 to 5.0 model, which meant the acceleration of technological changes such as automation, digitization, and personification. As a consequence, the complexity of new technologies and the scale of their application in banking grew steadily. Additionally, new entities appeared (development of FinTech companies) and new regulations (including MIFID, MIFID II, PSD2 Directive). All these elements, and in particular the increase in digitization and customer expectations combined with regulatory requirements, created new challenges for banks. Banks were forced to take actions to strengthen their economic foundations (constant care for economic capital - tangible assets), but at the same time to increase their attractiveness, creating the brand of the 21st century organization (capable of building socio-economic values) by using the full potential of intangible resources , including intellectual capital.

The study undertook an assessment of the impact of changes taking place in the modern economy, related to the growing role of intellectual capital, on the competitiveness of banks in Poland. Competitiveness is understood as building a bank's long-term competitive position based on the accumulated competitive potential, the possibility of using the ability to compete in specific conditions of the external environment and achieving a sustainable competitive advantage. The subjects of the research are commercial banks operating in Poland and listed on the Warsaw Stock Exchange (WSE). The research period covers the years 2009–2020.

Purpose and hypothesis of the work. The aim of the study is to assess the impact of intellectual capital on the competitiveness of commercial banks in Poland. The main hypothesis (HG) is: a bank's intellectual capital is an important factor in building its long-term competitive position. In order to verify the HG, three detailed hypotheses were formulated:

H1: In the business models of contemporary banks, the inseparable elements of the capital structure are intellectual capital and economic capital.

H2: A bank's intellectual capital is based on the synergistic strength of its three subsystems: innovative capital, organizational capital and institutional capital.

H3: The assessment of a bank's competitive position requires a multidimensional assessment of all layers of capital accumulated by the bank (including economic capital and intellectual capital subsystems).

The synthetic measure is a proprietary proposition of a research tool, its structure was based on indicators relating to economic capital and three subsystems of intellectual capital (innovative, organizational and institutional capital). The author, on the basis of a group of 10 listed commercial banks in Poland in 2009-2020, created a synthetic measure (aggregate measure) of banks' competitiveness on the basis of selected diagnostic indicators related to the assessment of intellectual and economic capital, which, according to the author, have the greatest impact on competitiveness. Thanks to this created rankings of banks in terms of their competitiveness and presented a specific impact (importance) of individual diagnostic indicators on the summary assessment of their competitiveness.

The structure of the dissertation. The dissertation consists of seven chapters as well as an introduction and an ending. Additionally, an appendix with details of the quantitative research included in the dissertation is attached.

The first chapter consists of three sections. The first one was devoted to the specificity of competition in the banking sector, methods of measuring competition (concentration and efficiency measures) and the possibilities of using ratio analysis in this area. The second sub-chapter assesses the building of competitiveness in the financial services sector in the light of empirical research. The methods and measures most often used in the research on the competitiveness of banks so far have also been presented. The last part of the first chapter is devoted to the difficulties of identifying all determinants of the competitiveness of modern banks, in connection with new challenges and the specificity of sources of competitive advantage of banks in the era of knowledge-based economy. The chapter ends with an analysis of the possibilities of using the potential of intangible assets in building a competitive advantage, in the light of the theoretical considerations to date. The analyzes contained in this chapter are an important element of the process of verifying the first hypothesis (H1).

The second chapter focuses on the presentation of the concept of intellectual capital (IC) and elements of the IC structure in the banking sector. This chapter consists of two subsections. The first one presents the genesis and problems of defining intellectual capital, as well as the difficulties of unambiguous identification of its structure elements. The second section discusses the principles of research and measurement of the bank's IC, including the shortcomings of reporting the level of its use. The key aim of the chapter is to review the method of measuring intellectual capital of banks in the light of theory and empirical research. Based on the analysis of available studies, the author's

concept for the assessment of the bank's intellectual capital subsystems was also presented. The analysis carried out in the chapter allowed to a large extent to verify the second detailed hypothesis (H2), and also partially supports the verification of the first hypothesis.

The third chapter of the dissertation describes the changes and determinants of competitiveness in the banking sector in Poland. The chapter consists of three subsections. At the beginning, the participation of foreign capital in the banking sector and the stages of the re-Polonization process were discussed. The consolidation processes in the banking sector were also presented, which was used, *inter alia*, to additionally justify the selection of a research group of 10 banks. The second subchapter assesses the banking sector in Poland through the prism of assets, profit, employment, volume, loans and deposits as well as performance indicators (ROA, ROE, CIR, NIM) in 2009–2020. The last subsection presents the development of non-financial competitiveness determinants in the banking sector in Poland, including: digitization of distribution channels, dynamics of introduced innovations.

The issue of FinTech development as a new challenge for banks in Poland was also emphasized. The aim of the chapter is to determine the state of development of the banking sector in Poland, including in terms of non-financial aspects, which is to be a reference point in the research of individual banks from the research group later in the dissertation. The conducted analysis serves to verify the first detailed hypothesis (H1). The last subsection is also important for the verification of H2.

Chapter four assesses the potential of a research group of banks with the use of selected parameters. Chapter four was divided into six sections, in which the ROA, ROE, CIR, NIM ratios were analyzed for 10 banks. Then, the study included the value of their profit and assets, the number of customers and the volumes of loans and deposits. The study also took into account the number of internet and mobile banking customers, the number of employees and the value of the benefits offered to them. The last subsection presents the awards and distinctions awarded to banks. All analyzes cover the period 2009-2020. The aim of the chapter is to identify the leaders of individual processes among the 10 banks in the research group, which is the basis for the competitive advantages obtained. This chapter serves to verify the first detailed hypothesis (H1). The obtained conclusions are also auxiliary for the H2 verification.

Chapter five presents case studies of 10 banks in the research group. Case study for each entity includes an identical research scheme: development history, organizational structure, pillars of development strategy, innovative activity and implementation of CSR principles. The chapter includes 10 subsections for: Alior Bank, BNP Paribas Bank, mBank, Citi Handlowy, Millenium Bank, Bank Pekao, PKO BP, Santander Bank, BOŚ Bank and ING Bank Śląski. In the case of BNP Paribas, Millenium, mBank, Santander, ING and Citi, attention was additionally paid to possible similarities or differences in the scope of activities carried out between them and their parent companies. The purpose of this chapter is to compare the principles of bank development, directions of the evolution

of their offers, development assumptions and to indicate common elements of their strategies, including those emphasizing the role of intellectual capital. In each case, the pressure on specific IC subsystems (organizational, innovative, institutional) was analyzed as reflecting the role (key, significant, additional) of a given aspect for a specific bank. The case study of banks is the basis in the process of verification of the first (H1) detailed hypothesis, as well as supports the verification of H2.

Chapter six presents the methods of statistical analysis used to assess the impact of intellectual capital on the competitiveness of banks in Poland. The chapter is divided into four sections in which the justification of the research methods was made, the database and limiting factors were defined. The theoretical foundations of the linear ordering methods and classification trees are presented. The aim of the chapter is to indicate the grounds for adopting certain statistical methods as the main research tools in the dissertation. Chapter six, like chapter seven, are used to verify the third detailed hypothesis (H3).

The last chapter is devoted to the characteristics of the results of the empirical analysis of the impact of intellectual capital on the competitiveness of banks in Poland. The chapter consists of three subsections. The first one presents the evolution of the synthetic measure of banks' competitiveness in the years 2009–2020. In the second section, the bank's intellectual capital and its impact on competitiveness were assessed on the basis of the obtained values of the synthetic measure. The final results of the application of classification trees in the analysis of banks' competitiveness in the years 2009–2020 are presented. The results of the research became the basis for the assessment of the use of multivariate analysis to assess the impact of intellectual capital on the competitiveness of banks in Poland.

The analysis of the determinants of competitiveness in the banking sector in Poland led to the conclusion that qualitative issues are becoming more and more important. Today, customers subjectively choose a bank that not only guarantees stability and security, but also a personalized and innovative offer and high quality of service. Thus, in addition to the significant importance of the bank's economic capital, the emphasis is also on the elements of intellectual capital (offer-structure, innovations, relationships). Studies of the literature on the subject and empirical research, as well as analyzes, including the indicators and characteristics most often used in banking sector research, led to a positive verification of the second detailed hypothesis (H2), which said that the intellectual capital (IC) of a bank is based on the synergistic power of its three subsystems : innovative (INN), organizational (ORG) and institutional (INS) capital.

The analysis of the research group of banks, based on the efficiency indicators and numerical characteristics concerning the state of assets, profit, volume of loans, deposits, employment, value of employee benefits and the size of remote and traditional distribution channels, led to the conclusion that banks as the basis for building a long-term position competitive, use the efficiency in managing economic capital (EK), but the use of intangible resources of intellectual capital is a

multiplier of EK and the basis for successogenic business models of the 21st century. , innovative and institutional).

The case studies of 10 banks in the examined group made it possible to point out that the bank development strategies emphasized activities in the context of building the image of an innovative entity, focused on changes improving the quality of the organization system, as well as activities aimed at creating the image of a socially responsible bank. All activities were components that build intellectual capital - in the layer of innovation, organization and relations, respectively. It was presented that the greatest emphasis in the strategy is placed on personalization of the product offer, quality of customer service and digitization, as well as on employee competences. Analysis of the indicated case studies of 10 banks of the research group (in chapter V of the dissertation) and analysis of the research group using selected parameters (in chapter IV of the dissertation) against the background of the sector (research in chapter III of the dissertation) led to a positive verification of the first detailed hypothesis (H1), which said that in the business models of modern banks, inseparable elements of the capital structure are intellectual capital and economic capital.

In the light of the research based on the analysis of the provisions of the banks' strategy and their annual reports from the period under study, the foundations for building the position of a leader in the research group were: innovation, modern organizational structure and a system of multi-level developed relationships (including, in particular, with customers). They contributed to the multiplication of economic capital. It was on this basis that the first hypothesis was positively verified, stating that in the business models of contemporary banks, the inseparable elements of the capital structure are intellectual capital and economic capital. The potential accumulated in economic capital is multiplied by exploring the potential contained in structures, relationships and innovations, to create added value to the constantly evolving standards of the contemporary banking sector. This is the basis for a positive verification of the main hypothesis (HG) of this dissertation that the intellectual capital of a bank is an important factor in building its long-term competitive position. In order to make a full version of the main hypothesis formulated in this way, it is also necessary to verify the third detailed hypothesis (H3): the assessment of a bank's competitive position requires a multidimensional assessment of all layers of capital accumulated by the bank (including economic capital and intellectual capital subsystems).

On the basis of the conducted research, the role of intellectual capital in the assessment of the bank's competitive position was revealed, both with the use of a synthetic measure and classification trees. The fact that economic capital is indicated as key does not undermine these results, because, as assumed in the dissertation, it plays the role of a necessary foundation in building the competitiveness of banks. Additionally, in the study with the use of a synthetic measure - in order to emphasize its importance - a weight of 0.6 was assigned to EK. the quantitative research methods used allowed for a more comprehensive assessment of the role of CA in building the bank's competitiveness, with a clear separation of all subsystems of intellectual capital. Therefore, it can be concluded that the third

hypothesis that the assessment of the bank's competitive position requires taking into account all capital components (capital stratification) was positively verified. Thus, finally, the positive main hypothesis of this dissertation was verified in the light of the applied qualitative and quantitative methods.

Taking into account the analysis of the literature on the subject and empirical research and the conducted research on the banking sector in Poland, as well as the detailed research of the research group (specified in the dissertation), which showed that innovation, adjustments to the organizational system and appreciation of the importance of relations (three subsystems of intellectual capital) areas in banks' business strategies as allowing them to build a sustainable competitive position, The author considered that she presented arguments in favor of positive verification of the main hypothesis. A bank's intellectual capital is an important factor in building its long-term competitive position. Economic capital is the necessary base. Both types of capital work synergistically to create added value.

Changes in modern banking cause a visible decline in the importance of traditional (financial) competitiveness factors as the only evaluation parameters. The basis for building long-term competitiveness and sustainable development of banks (including in Poland) seems to be contemporary intellectual capital as a multiplier of economic capital. Intellectual capital (IC) is the total activity of human capital, manifested in three areas that bind and whose development is driven by: innovation (INN), structures (ORG) and relations (INS). IC is responsible for the creative use of material resources owned by organizations (banks) and immaterial by creating the basis for innovative solutions, the principles of exploring the accumulated experience in the sphere of organization of processes and structures, and the ability to flexibly respond to changes taking place in the market environment.

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