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ESG RISK MANAGEMENT IN BANKS – TOWARDS ITS MEASUREMENT

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ABSTRACT: The concept of sustainable development has been gaining importance and increasing society's awareness of the need to stop climate change, inequality, social exclusion, and inappropriate corporate practices. Banks increasingly integrate ESG objectives into their business activity. However, it is associated with their exposure to a new type of risk – the ESG risk. ESG risk management for banking institutions has now become not only a fashion and trend but an obligation that they have to fulfil. The main aim of the article is to identify ESG risk and methods of quantification, as well as to assess the exposure to ESG risk of commercial banks in Poland. That's why the paper presents an in-depth literature review in the field of ESG concept and ESG risk in banks. Then, it describes the adopted methodology of the empirical research. The third section covers a presentation of the obtained results, which include the analysis of ESG risk exposure of the largest banks in the world and selected commercial banks in Poland, mainly based on the volume of the carbon footprint they generate and finally, ESG risk ratings for Polish banks. The following research methods were used in the article: literature studies, case study analysis, observation methods and synthesis methods. The empirical research that was conducted allowed the verification of the research hypothesis, stating that commercial banks in Poland are aware of the need to measure and monitor ESG risk increases. The research indicated that some of the banks in Poland are at an advanced stage of ESG risk management, while the rest of them are just starting their activities in this area. Currently, banks' involvement in ESG issues globally is one of the leading market trends. It becomes not only an option but an imperative for institutions wishing to maintain their market position. Therefore, commercial banks in Poland can and should participate in the implementation of sustainable development assumptions in the coming years.

KEYWORDS: bank, ESG risk, ESG risk management, ESG risk measurement, carbon footprint

Introduction

The concept of ESG (Environmental, Social, Governance) and related opportunities and threats are becoming more and more important for financial institutions. In a banking system, there is a growing awareness of integrating ESG issues with banks' strategies, processes and financial instruments to generate value from medium- and long-term perspectives (Galetta et al., 2022). For banks, sustainable development is not only an ethical issue. At the beginning of the third decade of the XXI century, it was also an economic and existential issue. Although actions to protect the natural environment are becoming an inherent element of banks' business strategies, they generate a new type of risk – the ESG risk. However, the ESG risk is not a separate type of risk. It is a cross-sectional risk that affects banks' other types of financial and non-financial risks. Therefore, it impacts all traditional types of bank risk, such as: credit risk, market risk, operational risk, reputation risk and compliance risk (PKO Bank Polski S.A., 2022b). That's why banks should implement a holistic approach to ESG risk by integrating it into their risk management frameworks. However, this process requires adjusting banks' business strategies, taking into account the ESG risk in designing banking products and services, as well as pricing and sales decisions. Including ESG risk in broadly understood processes is essential for the future profitability of banks.

ESG risk is currently the subject of global dialogue among representatives of researchers, business practitioners and policymakers, as well as regulators and rating agencies. At the same time, from the financial institutions point of view, it generates growing requirements and reporting needs regarding their socially responsible activities, as well as quantification and protection methods. Moreover, the new regulations pose significant compliance challenges for banks.

The main aim of the article is to identify the ESG risk and methods of quantification, as well as to assess the exposure of commercial banks in Poland to the ESG risk. Moreover, the article includes an analysis of challenges related to ESG risk measurement, presenting selected methods of its quantification. The following research methods were used: literature studies, case study analysis, observation methods and synthesis methods. The conducted empirical research allowed the verification the research hypothesis stating that commercial banks' in Poland awareness of a need to measure and monitor ESG risk increases. The article fills the identified research gap in the area of ESG risk analysis and its measurement in commercial banks in Poland, constituting a significant contribution to the existing literature and banking practice.

The article has a theoretical and empirical nature. The first section presents the results of in-depth literature studies covering the current international literature in the field of ESG concept and ESG risk. In the beginning, the ESG concept and the resulting ESG risk were defined. Then, it was explained how the ESG risk affects banking institutions. The ESG factors and the issues of sustainable development in the banking sector were also reviewed, indicating possibilities of including ESG risk in the bank risk management system. The second section describes the methodology of the empirical research. The third section provides a detailed presentation of the obtained results, which were divided into two subsections. The first subsection includes the results of the broad case study analysis, where the measurement of ESG risk of commercial banks in Poland was analyzed, mainly based on the volume of the carbon footprint they generate. The second subsection shows the results of ESG risk ratings for Polish banks, carried out by Sustainalytics. The article ends with the "Discussion and Conclusions" section.

An overview of the literature

The ESG concept & ESG risk

Sustainable development has been a subject of interest to both academia and economic life practitioners for several decades (Von Carlowitz, 2000; Daly, 1973; Daly, 1996; Diwan & Livingston, 1979). However, a significant increase in interest in this issue and the practical implementation of its assumptions took place after the signing of the *Paris Climate Protection Agreement* (the *Paris Agreement*), which obliged 185 countries to change their approach towards a climate-friendly world economy (European Council, 2015a; 2015b). The Paris Agreement adopted in December 2015 was thus

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an important milestone for international climate policy. At the same time, it was declared to take action to stop global warming to 1.5 degrees Celsius compared to pre-industrial times. A second equally important document was the *United Nations' 2030 Agenda for Sustainable Development,* signed in 2015, which identified 17 Sustainable Development Goals (SDGs) focused on environmental and social objectives. Additionally, the *EU Sustainable Finance Action Plan* identified the urgent need to sustainability of finance, i.e. finance socially responsible activities, directing capital flows towards sustainable investments and integrating sustainable development into risk management systems (European Commission, 2018). The ESG issues are also taken up in the regulations and publications of many international financial institutions, including the Bank for International Settlements, the European Central Bank, the European Banking Authority, or the Network for Greening the Financial System (NGFS).

The ESG (*Environmental, Social, Governance*) concept, which was created at the beginning of the XXI century, relates to activities including environmental protection, social responsibility and corporate governance (Clément et al., 2022). The basis of the ESG concept was Corporate Social Responsibility (CSR) (Sacconi, 2006; Przychodzeń & Przychodzeń, 2014), however with the difference is that the CSR concept focuses on business responsibility in order to create a specific company's image while the ESG covers more non-financial areas and concentrates on a measurable assessment of the adopted goals (Dathe et al., 2022; Gillan et al., 2020). Figure 1 presents three main pillars of the ESG concept. These pillars are of equal importance and do not have a specific hierarchical structure.

Figure 1. Main pillars of the ESG concept

The first pillar of the ESG concept is the protection and prevention of environmental degradation. This means that each business activity should develop its own environmental policy, allowing for measurable verification of the adopted assumptions and implementation of planned activities. This pillar draws particular attention to the need to define climate goals in the conducted activity through verification of energy consumption, pollutant emissions, supply of raw materials, water management and renewable energy. The second, equally important pillar of the ESG concept is social responsibility and human rights. It points to the need to ensure social equality in relation to sex, religion, and race, equal pay on the same positions regardless of gender, respect for workers' rights, as well as security and data protection. The third pillar concerns corporate governance, which influences trust in the enterprise and business. It covers such issues as: supervision over a company, structure of the company's management board, respecting disclosure obligations towards shareholders, remuneration of the management staff, respecting the rights of shareholders, tax transparency and counteracting corruption (Amara & Ahmadi, 2023).

Implementation of the above pillars of the ESG concept has now become not only an option, but an inherent feature of responsibility of every company, including banking institutions, determined to

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an increasing extent by new legal regulations. Moreover, responsible and sustainable development has become a tool for acquiring new customers, borrowers, investors and business partners. Therefore, opportunities and risks related to the implementation of the ESG concept have an increasingly real and measurable impact on banking activities. On the other hand, socially responsible activities, although generating many benefits, especially non-financial ones, also create a new type of risk – *the ESG ris*k (or *sustainability risk*) (KPMG, 2021). ESG risk is the risk of negative financial effects resulting from the impact of ESG factors on bank's customers or balance sheet items (PwC, 2022). The European Banking Authority defines ESG risk for institutions as the negative materialization of ESG factors through their counterparties or invested assets (EBA, 2021). In addition to negatively impacting institutions through their impacts on counterparties, ESG risks can also impact the financial system and economy as a whole, with potential systemic consequences. Therefore, a negative aspect of the ESG factors may be the impact on many different macroeconomic values, such as labor productivity, economic growth, public debt, GDP, and socio-economic changes. That's why ESG risk should be included in the financial decisions of financial markets and companies (Zioło & Spoz, 2022). These, in turn, through their impact on the economy, can affect financial institutions and, as a result, overall credit risk and market risk, which, finally, may affect their financial performance and solvency (EBA, 2021).

The ESG risk consists of three main types of risk: environmental risk, social risk and governance risk (see Figure 2). However, individual types of risk may interact one another, amplifying shocks and stresses, which may lead to the occurrence of external effects that may disrupt the appropriate functioning of the whole financial system or its parts (CFTC, 2020; IMF, 2019; NGFS, 2020).

Figure 2. Types and main drivers of the ESG risk

Source: author's work based on KPMG (2021) and EBA (2021).

The ESG risk is not a separate type of risk. However, it is a cross-sectional risk that affects traditional types of risk – both financial and non-financial risks (see Figure 3). ESG risk management, like the management of other types of risk, is an unavoidable and essential element of banks' operations. ESG risk management is carried out as a part of managing other types of risk and is performed by all departments/committees operating at a bank. The purpose of ESG risk management is to support sustainable development and creating bank's long-term value through integrated management of the impact of the ESG factors. Thus, ESG risk management takes into account a new perspective – the perspective of double significance, i.e. an impact of ESG factors on bank's operations, financial results and development, as well as an impact of a bank's activities on society and the environment.

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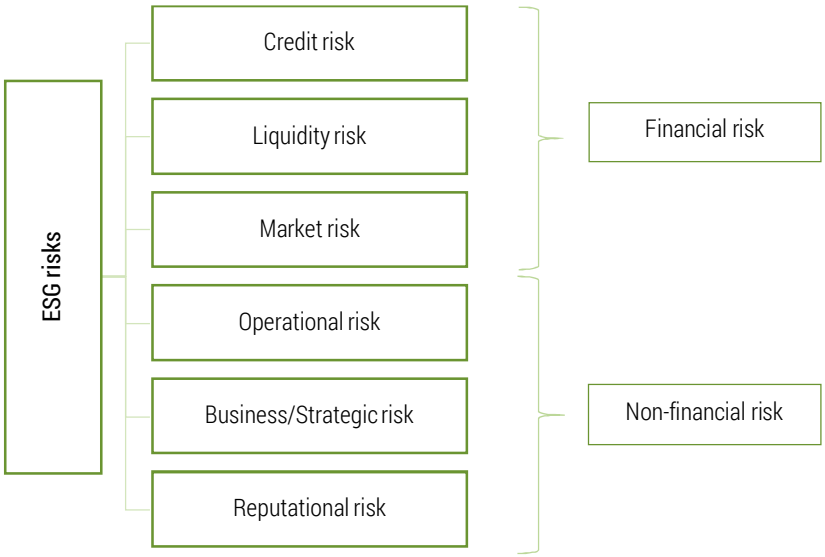

Figure 3. ESG risk among traditional types of bank risk
Source: author's work based on KPMG (2021).

Challenges in ESG risk measurement

Banking institutions, following the global trend, include sustainable development initiatives in their activities. At the same time, they are aware that a passive attitude even now eliminates them from the market. In the future, focus on social and environmental goals will be a necessity. Moreover, regulatory requirements related to the implementation of sustainable development principles force them to urgently need changes in almost every area of their activity.

Although many institutions (including banks) and supervision authorities have started to include ESG factors in their risk management systems, the practice of ESG risk assessment is still at an early stage of development. Once the importance of ESG variables has been outlined, the topic of their measurement was undertaken by Antolín-López and Ortiz-de-Mandojana (2023), Risso and Longarini (2023), Berg et al. (2019), Chatterji et al. (2016). Different organisations, companies, institutions and bodies have started to develop initiatives and guidelines for the assessment and measurement of ESG criteria using different lines and criteria (Arvidsson & Dumay, 2022). Banks all around the world are currently facing challenges related to the identification and measurement of ESG risk. There are no standardised practices in terms of both the methodological approach to ESG risk measurement and issues related to obtaining the necessary data or the purpose of the performed analyses, i.e. on the one hand, defining the risk appetite and, on the other – limiting and securing risk exposure. Measuring ESG risk is like measuring the immeasurable, which means that it is extremely difficult to measure some non-quantitative value without explicitly assessing its impact on the environment or financial results. Commonly used indicators (quantitative and qualitative), as well as methodological tools for assessing the impact of ESG risk, are very important to support the integration of sustainability aspects into financial decision-making and supervision, as well as to ensure a level playing field for all, prevent the so-called "green washing" phenomenon and ultimately increase transparency, consumer protection and information disclosure (Przychodzeń, 2013).

However, obtaining information from external sources plays a very important role in measuring ESG risk. Rating agencies that rate companies, countries or instruments and the accompanying risk currently also collect data on the exposure of counterparties (including banks) to ESG factors and risk. In addition, new, specialised institutions have also been established, which provide reliable information on companies' exposure to individual components of ESG risk. Thus, the biggest challenge in measuring ESG risk is data and the source of their obtaining. Other problems with collecting data for measuring ESG risk are also indicated (Olech & Flak, 2021):

1. New data sources – so far, some areas of banks' activity have not been monitored, while with the occurrence of a new type of risk, the exposure to individual ESG risk factors is an important aspect of data preparation, as well as the construction and application of ESG risk models.

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2. Integration – it involves a need to collect data sets that have not been integrated so far, unification of taxonomy, classification and measurement, a lack of harmonisation of reporting frameworks in different jurisdictions, which increases complexity for large financial groups, a lack of adaptation of existing systems in banks to store ESG data.
3. Standardisation – there is still a lack of standardisation in ESG risk measurement methodologies, an inability to verify ratings provided by external providers due to a lack of widespread methodology practice and a need to ensure compliance with ESG risk management strategy with a rating approach of external providers.
4. Data management – an important aspect of ESG risk measurement is taking into account the potential business risk resulting from incorrect ESG reporting and classification of invested funds. Maintaining transparency in the whole process of data collection and processing, both because of the large amount of necessary information and new types of data necessary to obtain, will also be a significant challenge.

Moreover, the ESG risk assessment methodology has not yet been precisely defined. The more that the ESG risk differs in its specificity from the previously known types of bank risk, therefore, its identification and measurement require recognition of the following issues. First, there is a considerable degree of uncertainty connected with the ESG operation, which means that the timing and impact of social responsibility activities are difficult to predict. Secondly, insufficient data – although banks report information important from the ESG point of view, such as the volume of CO_2 emissions, waste production, or compliance with the International Labor Organization (ILO) conventions, assessment of the impact of ESG factors on financial results remains a significant challenge. There is no relevant, comparable, reliable and user-friendly data to understand the potential impact of ESG risk on financial results. Although there are relevant legal regulations, such as the European Commission's proposal concerning the Corporate Sustainability Reporting Directive (Proposal, 2021), which indicates a need for more detailed disclosure of information on ESG factors from a wide range of economic entities, these data are still insufficient from the point of view of ESG risk measurement.

Third, there are significant methodological limitations. Most of the models used to estimate traditional risks use historical data. ESG factors, such as climate change, are not reflected in historical data. Thus, it is not obvious how to estimate certain risk parameters, such as the probability of default by borrowers or loss-given default (LGD). Other methodological limitations include translating ESG risks into financial risks, understanding their impact on the resilience of business models, and lacking a harmonised definition of the full range of sustainability-oriented activities. Fourthly, there is a mismatch in the time horizon. The consequences of the ESG factors, in particular environmental factors, have been observed over decades (e.g., climate scenarios analyse possible climate changes until the end of the XXI century). In the case of traditional risk management tools, strategic planning horizons are much shorter. They take into account current effects because their effectiveness is the highest in the short term. Fifthly, as mentioned above, the ESG risk is a cross-cutting risk that impacts to a varying degree in different business lines and thus affects different financial categories, which are reflected in the financial condition of banking institutions. For example, if there has been a degradation of the business areas financed by a bank loan, this may lead to higher credit losses or a loss of market value when the exposure is in the form of financial instruments. The ESG risk and the need for its management may also affect the existing banks' business models, methods of capital adequacy assessment or costs of their financing. Sixthly, difficulty in estimating the ESG risk exposure is due to its non-linearity (Olech & Flak, 2021). Most ESG risks, especially those related to climate risk, are non-linear. It causes complex chain reactions and cascading effects, which in turn can generate unpredictable environmental, geopolitical, social and economic dynamics (Bolton et al., 2020).

Research methods

The empirical research was carried out in 2023-2024 in two stages. The first stage included the analysis of the ESG risk in the Polish banking sector. That's why an extensive case study analysis of the ESG risk exposure of selected commercial banks in Poland was carried out. The assessment included the case study analysis of: activities undertaken by selected banks to implement the ESG concept in their operations, as well as the ESG goals, which are presented in separate documents – the ESG

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strategies. Finally, the ESG risk was detailed and analysed according to the methods used individually in selected banks. The research sample included 8 biggest commercial banks in Poland based on their total assets. The sample covered: PKO BP S.A., Bank Pekao S.A., ING Bank Śląski S.A., mBank, BOŚ Bank S.A., Santander Bank Polska S.A., Credit Agricole Bank Polska S.A., and Alior Bank S.A. Velo Bank S.A. was not included in the sample. When the research was conducted, the ESG data was not presented in the reports. The value of the total assets of the institutions included in the research sample constitutes 79% of the total assets of the Polish banking sector (KNF, 2022). That's why it should be assumed that the results obtained from the research are representative and reflect results for the whole banking sector in Poland. The research period included the last few years, which was different for individual banks. It covered the period from when they started to assess their carbon dioxide emissions till 2022 (when the newest data were available).

The second stage consisted of the analysis of the ESG risk according to the methodology proposed by Sustainalytics, which estimates ESG risk ratings for both individual entities and industries. Based on this data, the ESG risk ratings for Polish banks in 2024 were analysed. The research sample was exactly the same as in stage two – 9 top commercial banks in Poland from the point of view of their total assets. However, the Sustainalytics assesses ESG ratings only for 7 banks from the sample. Then, a scale of Polish banks' exposure to risk was interpreted based on a 5-point scale of ESG risk categories.

Complementary to the empirical research conducted, the following methods were used: the observation method, document analysis method, and synthesis method. All the results from specific stages are presented below in the following subsections.

Results of the research

ESG risk among commercial banks in Poland

The conducted case study analysis indicates that the ESG risk measurement and reporting process is at different levels in individual commercial banks in Poland. Some of them generate and provide very detailed data on the amount of greenhouse gas emissions, relating them to the adopted strategies and ESG goals. While the others are only at the initial stage of ESG risk and carbon footprint assessment. However, these banks declare that in the coming years, they will increase the level of detail in their measurements in order to fulfil the assumptions of the Paris Agreement and enter the path of climate neutrality.

The largest commercial bank in Poland – PKO BP S.A. – adopted ESG indicators in 2019 and included them for non-financial purposes of the bank's Capital Group for the following years. One of the adopted objectives is to reduce the bank's greenhouse gas emissions to 40 thousand tonnes in 2025, i.e. by 60% compared to 2019. In 2020, there was a clear reduction in the size of the carbon footprint in all scopes compared to 2019, when this calculation was first made and the inventory of greenhouse gas emissions was prepared (see Table 1). On the one hand, this is due to the bank's greater awareness of a need to assess the ESG risk, and on the other, the fact that this year was specific due to the coronavirus pandemic, which significantly reduced business trips and commuting of employees, and thus fuel consumption in vehicles. However, in 2021, there was a further reduction in greenhouse gas emissions at the bank by a total of 61.8% compared to 2019. In 2022, the bank decreased fuel and energy consumption and decided to purchase Guarantees of Origin for Energy from Renewable Energy Sources. As a result, the total emissions from scope 1 and 2 have been limited. In scope 3, a high increase can be observed. It was mainly caused by higher consumption of fuels used in vehicles, which was the result of an increase in the number of business trips and commuting to work.

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Table 1. Total carbon dioxide emissions according to the source of PKO Bank Polski S.A. in the years of 2019-2022 (in thous. tonnes of CO_2e)[1]

	2019	2020	2021	2022
Scope 1 – direct emissions resulting from:	**15.143**	**10.096**	**10.000**	**10.849**
fuel consumption in buildings	5.975	4.751	4.681	4.081
fuel consumption in vehicles	9.168	4.562	4.757	5.725
refrigerants	-	0.783	0.562	1.043
Scope 2 – indirect emissions resulting from:	**98.909**	**49.125**	**28.101**	**26.274**
purchase of electricity	71.340	25.864	4.590	3.335
purchase of thermal energy	27.569	23.262	23.511	22.939
Total emissions (Scope 1 + 2)	**N/A**	**59.221**	**38.101**	**37.124**
Well to Tank (WTT) emissions	-	-	-	3.987
Domestic and foreign business trips	N/A	0.289	0.195	0.513
Commuting of employees to work	N/A	0.000	3.341	8.694
Space rental	-	-	-	1.647
Scope 3	**N/A**	**0.289**	**3.536**	**14.841**
Total emissions (Scope 1 + 2 + 3)	114.052	59.510	41.637	51.965

Source: author's work based on PKO Bank Polski S.A. data (2020, 2021, 2022a, 2022c, 2023).

Bank Pekao S.A. has developed its own approach to managing ESG risk. In September 2020, the bank decided to create an ESG department, which is the center of competence in environmental, social and corporate governance issues. It concentrates on setting directions, coordinating activities, monitoring, and conducting non-financial reporting, which improves the management of ESG issues at the bank and Pekao capital groups. Moreover, in December 2020, the ESG Council was established, a new advisory body to the bank's management board, composed of senior managers representing the bank's key business and support units, whose involvement is important for ESG issues, and two members of the bank's management board. The main task of the ESG Council is to recommend necessary ESG activities to the management board. At the same time, the Council is an advisory body that allows consulting on a wide range of strategic ESG topics, taking into account the commercial perspective. Along with the creation of the Council, ESG coordinators representing individual organisational units of the bank relevant to ESG matters and representatives of all subsidiaries of the Pekao Group, covered by the consolidated reporting, were also appointed (Bank Pekao S.A., 2020). In the ESG strategy for 2021-2024, the bank declared that it will implement a number of activities aimed at climate neutrality. In terms of ESG risk, in 2021, the bank started to estimate its own emissions (in scope 1 and 2), setting itself the ambitious goal of reducing its carbon footprint until it achieves climate neutrality in 2030 (Bank Pekao S.A., 2021). In 2022, the Bank achieved the share of green financing in the gross financing at a level of 4.6%, exceeding the goal adopted in the Strategy (Bank Pekao S.A., 2023).

ING Bank Śląski S.A. has started measuring the volume of generated carbon footprint already in 2014. The total greenhouse gases in the bank in 2020 were reduced by as much as 33.1% compared to 2019 and by as much as 90% compared to the base year (2014). Moreover, the bank implements projects contributing to the reduction of its own carbon footprint and, at the same time, continues the policy announced in the Environmental Declaration in 2017 (ING, 2017) and updated in 2021 (ING,

[1] All presented calculations concern the amount of CO_2 emissions in bank's "own" operations – CO_2 emissions resulting from heat generation (scope 1), dependent on bank's operations – CO_2 emissions resulting from electricity purchased for bank's needs (scope 2), as well as business travels – CO_2 emissions related to transport and fuel combustion in the engines of company vehicles (scope 3). All calculations are presented on the basis of the market-based method.

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2021), in which it committed to achieve carbon neutrality by 2030 and a policy assuming an indirect impact on customers so that they undertake activities conducive to environmental and climate protection.

mBank also aims to systematically reduce the total carbon footprint. It defined a schedule and milestones (for 2025, 2030, 2050) to reduce the carbon footprint and achieve climate neutrality, in line with the objectives of the Paris Agreement. According to the estimates of the total carbon footprint, mBank reduces greenhouse gas emissions every year (see Table 2).

Table 2. Direct and indirect greenhouse gas emissions of mBank (in thous. tonnes of CO2e)

	2018	2019	2020	2021	2022
Scope 1 – direct emissions	4.391	4.211	1.93	3.295	3.554
Scope 2 – indirect emissions	11.944	11.211	7.442	12.65	4.566
Total emissions (Scope 1 + 2)	16.335	15.422	9.372	24.221	19.189

Source: author's work based on mBank data (2021, 2022, 2023).

In 2021, mBank also detailed the methodology of calculating the carbon footprint, estimating the amount of emissions in scope 1 and 2, but also in scope 3, which additionally took into account electricity consumption in all bank's buildings and heating from the central heating network (mBank, 2022). In 2022, the bank adopted the "Strategy for 2021-2025" that concentrated on ESG aspects. It started the next stage of reducing and reporting carbon footprint (mBank, 2023).

BOŚ Bank S.A., one of the most "green" commercial banks in Poland, has been scrupulously estimating the volume of the generated carbon footprint for several years. Greenhouse gas emissions related to the bank's activities in 2020 amounted to 3.87 thous. of tonnes of CO_2e, which is 49% less than the year before. The most significant emission was related to heat energy consumption, amounting to 2.87 thous. of tonnes of CO_2e (nearly 74% of the total carbon footprint). Emissions related to electricity consumption in the bank's facilities in 2020 amounted to only 136 tonnes of CO_2e (compared to almost 3.31 thous. tonnes of CO_2e a year before), which is mainly the result of using over 94% of electricity from renewable sources, guaranteed by a certificate of origin. Importantly, the amount of greenhouse gas emissions, compared to 2007, when the first bank's report was prepared, this indicator decreased by over 57% (BOŚ Bank S.A., 2021). In June 2021, the "Development Strategy of Bank Ochrony Środowiska S.A. for 2021-2023" was adopted. It includes, among others: economic consequences of the COVID-19 pandemic and the war in Ukraine, as well as EU and national projects aimed at achieving climate neutrality. In 2022, BOŚ Bank S.A. made over 1,000 pro-ecological transactions worth over 1.6 bln PLN. The projects implemented by the bank contribute annually to the production of 82.7 GWh of energy from renewable energy sources, reducing consumption and reducing heat losses by 26.5 thous. GJ, reduction of carbon dioxide emissions by 89.6 thous. tons and reducing dust emissions by 40 tons.

Santander Bank Polska S.A., a subsidiary of the Spanish Santander Group, implemented an update of its climate policy at the end of February 2021. It includes the end of providing financial services to clients from the energy sector who derive 10% or more of revenues from burning steam coal. The bank also plans to completely eliminate hard coal and lignite mining from its loan and investment portfolio from all subsidiaries by 2030. Thus, by 2030, it intends to fully adjust its portfolio in the energy sector to the Paris Agreement requirements.

When it comes to carbon footprint reporting, as a measure of ESG risk, the bank adopted the *Net Zero strategy* (Santander Group, 2021), which assumes that the whole Santander group will be zero-emission by 2050. The reduction covers both internal emissions caused by electricity consumption and business trips, as well as emissions that are the result of the bank's financing – credit, advisory, and investment services- provided to clients from all segments. In 2020, the bank achieved neutrality in terms of internal CO_2 emissions. This was possible through the switch to green energy (100% of the energy purchased directly by the bank comes from RES), as well as the purchase of carbon credits, i.e. green, certified assets that offset the emissions. Analyzing the bank's carbon footprint, it is noticed that every year, it reduces CO_2 emissions in all scopes (see Table 3) (Gogolewski, 2021).

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Table 3. CO_2 emissions of Santander Bank Polska S.A. in 2017-2022 (in thous. tonnes of CO_2e)

	2017	2018	2019	2020	2021	2022
Scope 1 – direct emissions	3.57	2.74	3.32	2.03	5.96	5.26
Scope 2 – indirect emissions	28.55	28.12	25.36	4.39	15.51	14.23
Scope 3 – residual indirect emissions	6.79	7.32	8.48	3.28	0.10	0.87
Total emissions (Scope 1 + 2 + 3)	38.91	38.18	37.16	9.70	21.57	20.36

Source: author's work based on Santander Bank Polska S.A. data (2020, 2021, 2022, 2023).

Credit Agricole Bank Polska S.A., in accordance to the Strategy 2022, declares activities aimed at reducing the negative impact on the environment, including reduction of carbon dioxide emissions and paper consumption. The bank has been reporting the carbon footprint measurement in all three scopes since 2018. However, every year it reduces CO_2 emissions. In 2020, it achieved a result of 27,236 tonnes of CO2e (scope 1 – 1,783 tonnes of CO2e, scope 2 – 4,057 tonnes of CO2e, scope 3 – 21,396 tonnes of CO2e), which was lower by 47% than in 2019 and 32% than in 2018. Such a large reduction in CO_2 emissions resulted from a few aspects. First of all, it was a move from the bank's headquarters to a new building with a high energy efficiency LEED Platinum certificate. Moreover, the bank signed an annex with an energy supplier, whereby 95% of the bank's branches are powered by wind and hydro energy, and it reduced business trips and switched to remote work.

On the other hand, Alior Bank S.A. is one of those commercial banks in Poland that are still at an early stage of estimating and reporting the volume of their carbon footprint. In 2021, the bank announced a tender for an energy audit and measurement of its carbon footprint. However, the bank declares that it does not have a direct negative impact on the natural environment. As a part of its business activities, it extends the cardless offer (virtual card), thus limiting the production of plastic and promoting paperless activities by introducing the possibility of digital signing of contracts. Moreover, it modernises its branch network to reduce plastic and utility consumption, which significantly contributes to the reduction of greenhouse gas emissions. In 2021, Alior Bank put emphasis on maintaining the previously chosen direction in rational waste management through selective garbage collection or the use of filtered tap water (Alior Bank S.A., 2022).

The conducted case study analysis indicates that, in terms of ESG risk measurement, commercial banks in Poland mostly rely on the volume of the generated carbon footprint. They express other issues related to ESG in a qualitative manner, presenting activities undertaken in the areas of environment, social responsibility, and corporate governance. However, they do not have a quantitative dimension, which would allow for a measurable assessment of the ESG risk of these institutions. This means that there is still a long way to go in the area of ESG risk measurement.

ESG risk ratings

Despite many challenges and difficulties in measuring ESG risk, there are organisations and initiatives in the world that develop their own – very detailed – methodology of quantification. One of the methods of measuring the ESG risk of a single bank is presented by Sustainalytics (2024), which estimates ESG risk ratings for both individual entities and industries. The methodology for determining ratings for individual entities takes into account the exposure and management of ESG risk factors such as corporate governance, business ethics, data privacy and security, human capital, ESG integration – financials, and product governance. Each of the above categories is assigned a value from 1 to 10, with 1 being the lowest level of risk in that category and 10 – the highest one. Then, the obtained total risk exposure is verified by analysts, who additionally adjust the obtained results for qualitative issues, which are not taken into account at a current level. On this basis, the final ESG risk rating of a given bank is determined. For the appropriate interpretation of the risk exposure, a 5-point scale of ESG risk categories was developed (see Table 5).

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Table 5. 5-point scale of ESG risk categories

Negligible	Low	Medium	High	Severe
0-10	10-20	20-30	30-40	40+

Source: author's work based on Sustainalytics data (2024).

It reflects a level of ESG risk in relation to the total value of a company. ESG risk ratings are developed and presented for companies from various industries, including banking institutions. Table 6 shows the ESG risk ratings for selected commercial banks in Poland in 2024.

Table 6. ESG risk ratings for selected commercial banks in Poland in 2024

Bank	ESG Risk Rating	Level of risk	Ranking based on banking industry results (in total 1,027 banks participated in ratings)*
Alior Bank S.A.	24.3	Medium Risk	388
Bank Millennium S.A.	23.6	Medium Risk	360
PKO BP S.A.	23.5	Medium Risk	355
Bank Pekao S.A.	23.4	Medium Risk	352
Santander Bank Polska S.A.	19.5	Low Risk	231
ING Bank Śląski S.A.	14.7	Low Risk	110
mBank S.A.	13.0	Low Risk	77
Bank Ochrony Środowiska (BOŚ Bank) S.A.	12.2	Low Risk	62
BNP Paribas Bank Polska S.A.	10.2	Low Risk	39

*1st = lowest risk.

Source: author's work based on Sustainalytics data (2024).

The highest ESG risk has been assigned to Alior Bank S.A., with a rating of 24.3. It means that the bank is characterised by medium risk, which places it in the 388 position among all entities in the banking industry participating in ratings. Bank Millenium S.A., PKO BP S.A. and Pekao S.A. are also characterised by medium ESG risk, accordingly taking positions 360, 355 and 352. Low ESG risk – below 20 – was assigned to Santander Bank Polska S.A., ING Bank Śląski S.A., mBank S.A., Bank Ochrony Środowiska S.A. and BNP Paribas Bank Polska S.A. This is also confirmed by the results of the conducted case study analysis, which indicated that these are the most "green" commercial banks in Poland, which measure their carbon footprint in detail, conduct very intensive activities to green their loan portfolio, focus on financing sustainable investments, as well as implement the ESG concept in their activities. These actions are reflected in the ratings assigned to them, which place the indicated banks respectively in 231, 110, 77, 62, and 39 positions in the ranking of all world banks for which ESG risk ratings were developed. It is worth noting and positively assessed the very low risk of BNP Paribas Bank Polska S.A. Its parent company – BNP Paribas – a large French financial group, pays a lot of attention to activities for the protection of the natural environment and social responsibility, which is also reflected in the Polish subsidiary's policy and strategy.

Discussion and conclusions

Banking institutions are exposed to ESG risk directly – through their own business activities, as well as indirectly – through services provided to their clients (e.g. financing clients from industries that do not meet ESG standards). At the same time, improper ESG risk management or a complete lack of orientation towards this new type of risk may adversely affect their financial performance, stability and reputation. However, banks are more often under pressure from supervision authorities and regulators, legislators, and the public to integrate ESG risk management into their risk management systems. Integrating ESG risk with the existing risk management framework seems to be the

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first and the basic action for banks that want to achieve sustainable development objectives. In particular, ESG risk should be integrated into the credit risk analysis as a part of credit or investment decisions at the customer, transaction and portfolio levels.

From banks' perspective, ESG risk measurement remains a difficult and unresolved issue. While many institutions publish some fragmented data or indicators to reflect their exposure to ESG risk, these measures are still incomparable for the sector. On the other hand, there are also opponents of the ESG risk measures who indicate that the correlation between different ESG measures and published ratings is only 30%, while the correlation coefficient of credit ratings is 99% (Gada, 2022).

The theoretical and empirical studies that were conducted allowed the achievement of the main objective of this article. Moreover, they indicated that the trend towards further, more detailed, and comparable measurement of ESG risk in banks will continue. It seems that the driving force of further actions will be, on the one hand, regulations and, on the other hand, banks' awareness that the sooner they integrate ESG risk measurement and management into their risk management systems, they will be better positioned to benefit from future trends.

The conducted case study analysis indicates that, in terms of ESG risk measurement, commercial banks in Poland mostly rely on the volume of the generated carbon footprint. They express other issues related to ESG in a qualitative manner, presenting activities undertaken in the areas of environment, social responsibility, and corporate governance. However, they do not have a quantitative dimension, which would allow for a measurable assessment of the ESG risk of these institutions. This means that there is still a long way to go in the area of ESG risk measurement.

The case study analysis also showed that commercial banks in Poland implement the ESG concept into their operations. Some of them have been identifying ESG risk for several years – both direct and indirect, and also trying to estimate the scale of this risk. Others, in turn, are only at the beginning of this path, preparing measures to assess their exposure to ESG risk. This allows us to confirm the adopted research hypothesis. Due to the lack of uniform and comparable measures, the volume of their carbon footprint, i.e. the total amount of greenhouse gas emissions, is commonly used to estimate the ESG risk in banks. These data are reported and published by banking institutions in annual reports or separate documents on ESG issues. A comparative analysis of the carbon footprint of commercial banks in Poland leads to the conclusion that every year, all analysed banks implement initiatives and introduce changes aimed at reducing CO_2 emissions. These are unequivocally positive actions. Nevertheless, they should further expand the ESG risk measurement methodology by providing more detailed data on this aspect.

However, another aspect should also be taken into account: Which commercial banks are more likely to adapt to the ESG concept – those with state-owned capital or foreign capital? It appears, based on the conducted case study analysis, that banks which are subsidiaries of international parent companies (financial conglomerates) are further in the path to ESG concept implementation. However, commercial banks with Polish private and state capital also try to introduce these aspects. Nevertheless, this issue should be studied thoroughly and might be the subject of further in-depth research undertaken by the Author. It also should be mentioned that except banks' willingness to use the ESG concept, there are many factors which may delay its practical implementation. The following ones are:

- mounting geopolitical uncertainty in Central and Eastern Europe,
- economic and social threats,
- sanctions against Russia,
- considerable increase in the prices of fossil fuels (oil and gas) and risk of energetic crisis,
- growing inflation,
- lack of appropriate regulations for green transformation, which may support its realisation.

The above-indicated aspects may not only slow down the energy transition but also periodically drive up greenhouse gas emissions and make climate neutrality more difficult. Furthermore, Polish banks' currently face also many other challenges like: non-performing mortgage loans in PLN and CHF, lawsuits, bank tax, high interest rates and falling demand for loans, which may also reduce their enthusiasm and possibilities for the ESG concept implementation.

Including ESG risk in the risk management systems in banks creates a new paradigm of bank risk management, which requires rethinking the whole risk structure, its management, data collection, development of measures and reporting. Thus, risk management in banks takes a more holistic approach to assessing individual business areas for a bank's success.

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Aleksandra NOCOŃ

ZARZĄDZANIE RYZYKIEM ESG W BANKACH – W KIERUNKU JEGO POMIARU

STRESZCZENIE: W ostatnich latach koncepcja zrównoważonego rozwoju zyskuje na znaczeniu i zwiększa świadomość społeczeństw dotyczącą takich problemów jak: potrzeba zahamowania zmian klimatu, nierówności i wykluczenia społeczne oraz niewłaściwe praktyki korporacyjne. Banki w coraz większym stopniu włączają cele środowiskowe i klimatyczne do prowadzonej działalności. Z drugiej jednak strony zaangażowanie banków w działalność ESG wiąże się z ekspozycją na nowy rodzaj ryzyka, jakim jest ryzyko ESG. Zarządzanie ryzykiem ESG stało się obecnie już nie tylko modą i trendem, ale obowiązkiem instytucji bankowych. Celem artykułu jest identyfikacja ryzyka ESG oraz metod jego kwantyfikacji, jak również ocena ekspozycji na ryzyko ESG banków komercyjnych w Polsce. Dlatego też w artykule dokonano pogłębionych studiów literaturowych z zakresu koncepcji ESG oraz ryzyka ESG w bankach. Następnie scharakteryzowano przyjętą metodologię badań empirycznych. Część trzecia obejmuje prezentację uzyskanych wyników, obejmujących analizę ekspozycji na ryzyko ESG największych banków na świecie oraz wybranych banków komercyjnych w Polsce, głównie w oparciu o wielkość generowanego przez nie śladu węglowego, a także ratingów ryzyka ESG w polskich bankach. W artykule wykorzystano następujące metody badawcze: studia literaturowe, metodę analizy case study, metodę obserwacji oraz metodę syntezy. Przeprowadzone badania empiryczne umożliwiły weryfikację hipotezy badawczej głoszącej, iż zwiększa się świadomość banków komercyjnych w Polsce potrzebą pomiaru i monitorowania ryzyka ESG. Wykazano, iż część banków komercyjnych w Polsce jest na zaawansowanym etapie zarządzania ryzykiem ESG, z kolei pozostała część dopiero rozpoczyna działania w tym zakresie. Obecnie zaangażowanie banków w kwestie ESG w ujęciu globalnym jest jednym z wiodących trendów rynkowych. Staje się ono nie tylko możliwością, ale bezwzględnym imperatywem podmiotów chcących utrzymać swoją pozycję rynkową. Zatem banki komercyjne w Polsce nie tylko mogą, ile w najbliższych latach powinny włączyć się w realizację założeń zrównoważonego rozwoju.

SŁOWA KLUCZOWE: bank, ryzyko ESG, zarządzanie ryzykiem ESG, pomiar ryzyka ESG, ślad węglowy

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