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PRESENTATION OF R&D EXPENDITURES OF THE LARGEST BANKS IN POLAND

Abstract

Innovation is the foundation of economic development. The subject of this paper was to identify how banks communicate to their stakeholders about their R&D activities and spending. The financial statements and non-financial reports of the 6 largest banks in Poland in 2017-2022 were verified. It was decided to choose business entities from this sector, as it was considered that banks are characterized by high expenditures on modern technologies and innovation. It is a sector that is developing rapidly, using the latest technological solutions to meet the ever-growing needs of customers for new banking products and the security of their operation. Unfortunately, despite the high expenditure on intangible assets disclosed in the balance sheet, it turned out that the banks do not boast about their research. There is no precise information on what expenditures on development work or the increase in expenditure on software, patents or licenses are about. Such information cannot be found either in the notes or in the non-financial reports.

This paper contributes to the sustainability reporting literature by providing new insights into banks' R&D spending reporting practices. Although the subject of R&D expenditure appears quite often in the literature on the subject, it is quite rare in the context of financial statements and non-financial reports. There is, therefore, a research gap in this area.

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Introduction

The concepts of innovation and innovation are understood differently in the literature on the subject. There are two distinct trends in defining innovation, the first of which emphasizes the process itself (i.e. the sequence of events) and the second – the result, which is the new solution.

Within the first trend, there are explanations in which innovation is treated as a process of creative use of knowledge, transformation of knowledge possessed by the organization or acquired from outside – into new products, services or processes (Cavagnoli, 2011, p. 111). The procedural aspect is particularly clearly emphasized in these words: "Innovation is the process by which a perceived opportunity becomes a new idea, which finds widespread practical application" (Tidd, Bessant, 2009, p. 16). As a result, innovation is understood as a sequence of events that should ultimately bring benefits to the organization through the implementation of a new solution.

Looking through the prism of the second approach, in which attention is paid mainly to the result in innovation, it should be noted that nowadays more and more often not only the effect for the company itself but also for its stakeholders is taken into account (O'Sullivan, Dooley, 2009, p. 5). Currently, it is believed that innovation should be understood as the introduction of significant changes that improve the products/services of a given organization, its processes, procedures and business model, thus providing new value to stakeholders (Timmerman, 2009, p. 6). On the other hand, according to D. Smith, innovation is a new idea, practice or object (Smith, 2006, p. 6).

Innovation is the basis of economic development. The pace of this development in the case of industry and services is determined by the speed of the creation of new ideas and the concept of efficient use of resources. New ideas arise in the course of various research work. Investments in them are therefore the engine of the economy and contribute to long-term economic and social development.

The subject of this paper is research and development (R&D) and the way in which banks communicate to their stakeholders about their performance and expenditure. The 6 largest banks operating in Poland were selected as the research group. It would seem that banks are the entities that invest a lot in R&D, especially in the context of the changes being introduced, for example as a result of the Covid-19 epidemic.

The aim of this research paper is to find answers to the following questions:

1. How did the 6 largest banks operating in Poland report their R&D expenditure over the last 6 years?
2. Were banks willing to boast about their research in their financial statements?
3. Has there been an increase in expenditure on this type of research in these banks in the last 6 years?
4. What was the R&D work carried out by the analyzed banks about?

In order to answer the above questions, an analysis of information published by the 6 largest banks operating in Poland in the period 2017-2022 was carried out (reports for 2023 are not yet available at the time of writing this paper).

This paper is divided into 4 parts. In the first part, we will take a closer look at the definitions and scientific research on R&D expenditure in the literature on the subject. Next, you will find places where you can look for information on R&D in financial statements. In the third part, issues related to non-financial reporting will be discussed. In the next part, the results of the analyses and final conclusions will be presented.

1. R&D IN THE LITERATURE

Before considering a research problem, it is necessary to define and know the basic concepts, so to begin with, R&D activities and the various aspects related to it will be described in detail. The terms research and development have been coined by Polish and international organizations that collect and process data from various fields of human economic activity.

Research and development (R&D), according to the Cambridge dictionary, is a business activity that is based on improving existing solutions and creating new ones.

The term research and development refers to activities that can be defined as creative work carried out on a regular basis in order to increase the body of knowledge. This definition also includes knowledge about man, culture and society. R&D activities are also looking for new applications in already known areas. In addition, you should pay attention to whether it is a R&D or related activity. An innovative and new element and the lack of uncertainty in the area of science and technology determine its classification as a R&D activity (Frascati, 2015, p. 38-39).

Research and development is defined as the improvement of a product or process. It is worth mentioning that if the main purpose of an activity is to develop a market for a given product or to improve production, such work is not assigned to R&D (Sawulski, 2018, p. 14).

Polish legislation also defines what R&D is. Such activity has been recognized as an eligible cost under the Corporate Income Tax Act of 15 February 1992. Research and development activities according to Article

4a(26) are innovative activities that include scientific research or development work. According to this Act, R&D activities should be carried out systematically, and their aim is to increase the resources of knowledge that is to contribute to finding new applications. The glossary of this Act, when referring to the term development work and research, refers to the Law on Higher Education and Science. Pursuant to Article 4(2) of this Law, scientific research is an activity that can be divided into basic research and applied research. Basic research is empirical, but also theoretical work that contributes to the acquisition of new knowledge about the basic elements of phenomena and observable facts. At the same time, according to this Act, they are not aimed at direct commercial use. Meanwhile, applied research is an activity carried out with the intention of acquiring new skills or knowledge, the aim of which is to create new services, processes or products. Significant improvements can also be made.

On the other hand, according to Article 4(3) of the Law on Higher Education and Science, development work is an activity which consists of acquiring, combining, forming and using the knowledge and skills available at a given time. Particular attention was paid to the use of knowledge to create IT tools or software, to create production plans. In addition, the legislator points to the use of science to create new projects and changed, improved or completely new products, processes or services. Conventional and periodic amendments to them are excluded from this scope, even if such changes bear the hallmarks of improvements.

R&D activities can be associated with innovative activities. Some statistical studies combine these two concepts. However, they are not synonymous by definition. Work related to the innovation process, i.e. patents, licensing, initiating production and market research, is excluded from R&D. Some activities are fragmented in R&D, such as pilot plants, prototypes, industrial design and process improvement. The key criteria to distinguish R&D activities from non-R&D innovation activities are the presence of easy-to-see novelties in R&D activities and the elimination of the element of uncertainty in the area of science, technology or technology. The Frascati Handbook also points to the creation of new knowledge or the use of knowledge to create new applications.

Research and development activity has also been defined by the Central Statistical Office in Warsaw as the systematic conduct of creative works undertaken to increase the body of knowledge, including knowledge about man, culture and society, as well as to find new applications for this knowledge. R&D activities are distinguished from other types of activity by a perceptible element of novelty and the elimination of scientific and/or technical uncertainty, i.e. a solution to a problem that does not result from the current state of knowledge.

Research and development work in banks is particularly focused on investment and development of IT tools based on algorithms, which make human activity similar in its operation. In particular, work on artificial intelligence has recently become popular. The definition of artificial intelligence was proposed by, among others, a group operating at the European Commission called the High-Level Expert Group on Artificial Intelligence (AI HLEG). According to them, "Artificial intelligence (AI) refers to systems that operate in the physical or digital world, draw conclusions from the knowledge gained from this data, and select the best actions to take to achieve a set goal." (HLEG AI, 2018) Artificial intelligence is a field of computer science that aims to create systems capable of performing tasks that require human intelligence (Surma, 2017, pp. 66-69). Accompanied by artificial intelligence are Big Data analyses which offer opportunities for increased efficiencies, reduced costs, and greater customer satisfaction through the delivery of higher quality services/products (Belhaj, Hachaichi, 2021). Big Data and artificial intelligence (AI) are related fields that are contemporary pillars of technological innovation and cornerstones of the modern digital era (Gandomi, Haider, 2015, pp. 137-144). In the book "*Big Data and Artificial Intelligence in Digital*" the authors showed how recent advances in these technologies facilitate banks, FinTech, and financial institutions to collect, process, analyze, and fully leverage the very large amounts of data that are nowadays produced and exchanged in the sector (Soldatos, Kyriazis, 2022). Moreover, the development of natural language processing, machine learning, social networks and sentiment analysis allows to some extent to forecast financial markets (Zanc, Cioara, Anghel, 2019, pp. 459-466). Despite the benefits, AI adoption faces barriers such as a lack of organizational competence in data management and individual AI skills (Bérubé, Giannelia, Vial, 2021).

The activity of research and development includes three types of research, namely:

- basic research,
- used (including industrial) and
- development.

Basic research is considered to be such experimental or theoretical activity aimed at acquiring new knowledge related to the basis of phenomena and observable facts, the main purpose of which is not a specific use or application. Such research is supposed to broaden knowledge about the world, discover new laws or principles of science. They are usually characterized by a focus on the development of science and have a cognitive purpose. The researcher's interests determine the choice of the subject of research as well as cognitive methods. Targeted research often has a specific research goal and assumptions about the results that are a consequence of previously observed regularities. Targeting research creates a knowledge base that can help solve specific or potential problems in the future. The scope of targeted research may be influenced by the entity funding it (Sawulski, 2018, p. 14-15).

Applied research is work that is aimed at a defined and practical goal, and additionally original activities that expand knowledge. This research results in trial models of products, methods or processes. This is how we distinguish between basic research, which is aimed at expanding knowledge, and applied research, which is aimed at creating trial versions of projects. As a consequence, such research can be the basis for development and later implementation work. They are considered to be a bridge between basic research and the introduction of manufacturing techniques (Sawulski, 2018, p. 15).

The third type is development work, which is defined as an activity undertaken in a methodical manner, based on knowledge obtained as a result of R&D activities and practical experience. The Frascati Handbook also points out that development work generates additional knowledge that is aimed at creating new products, processes or improving previously created products or processes.

It is worth mentioning that the specification of the three types of R&D activities does not mean that basic research always has to lead to applied research and then to development work. Development work can result in many ideas for basic research. Basic research, on the other hand, can contribute to the development of new products or processes (Frascati, 2015, p. 47-48).

In the area of R&D, research is dominant that aims to compare R&D expenditure in different perspectives (countries, regions) and as a result of various economic events (e.g. Covid-19 pandemic, war in Ukraine). Examples include the following publications: A. Turczak, 2016, *Causal analysis of differences in the amount of expenditure on research and development in selected countries of the European Union and the world,* J. Heller, M. Bogdański, 2005, *Expenditures on research and development in Poland against the background selected European countries* or E. Walczak, 2012, *Factors of economic growth in European Union countries*. The publications also include an attempt to link entrepreneurship and R&D expenditure. From this point of view, the work of W. Gierańczyk, 2010, *Research and development as an element of entrepreneurship in European countries* and T. Janusz, J. Lis, 2003, *The role of the research and development base in the process of economic growth* was written. You can also find publications that try to indicate the reasons for the increase and limitations in R&D expenditure. Answers to these problems can be found in the collective work edited by S. Pangsy-Kania (ed.), 2007, *Knowledge and innovations in the development of Polish regions, driving forces* *and barriers*. The topic of R&D expenditure in international and domestic articles is also discussed by, among others: Czerniak J., 2006; Ciok S., 2009; David P.A., Hall B.H., Tolle A.A., 2000; Elk R. van, Verspagen B., Weel B., Wiel K. van der, Wouterse B., 2015; Ziółkowska W., 2016; Grabińska B., Grabiński K., 2018. These are only examples of scientific publications, but research and development expenses occur most often in the context of their impact on the financial result. The topic of R&D expenditure can also be found in monographs. For example, this topic is discussed in the book *Commercial and non-commercial organizations in the face of increased competition and growing consumer demands* (Vol. 9) by A. Ujwara-Gil (2010), A. Olechnicka (2008) *Polish science on the Internet? Space of science and innovation - research report*.

Although the subject of R&D expenditure appears quite often in the literature on the subject, it rarely appears in the context of financial statements. So there is a research gap here. The added value of this paper is to check to what extent the information on R&D contained in the published financial and non-financial reports is legible and clear to a potential investor. What are the directions of expenditure of the largest banks operating in Poland over the last 6 years?

2. Accounting recognition of r&d expenditure in the financial statements

From an accounting point of view, it is necessary to distinguish between expenditures on R&D. These are two separate concepts and refer to two successive stages, which in the end are supposed to bring some innovation. However, the terms development and research work are not defined in the Accounting Act, therefore for the purposes of practice it is necessary to use the definitions provided in International Accounting Standard IAS 38 "Intangible Assets".

Paragraph 8 of IAS 38 defines research as an innovative and planned search for solutions undertaken with the intention of acquiring and assimilating new scientific and technical knowledge. In addition, you can read examples of these works in this standard. Pursuant to § 56, research work includes, m.in:

- activities aimed at acquiring new knowledge;
- searching, evaluating and finally selecting how to use research results or other types of knowledge;
- searching for alternative materials, equipment, products, processes, systems or services;
- formulating, designing, evaluating, and finalizing new or improved materials, devices, products, processes, systems, or services.

At the research stage, the company is not able to prove the existence of an asset belonging to intangible assets that will meet the definition of assets, including generating economic benefits in the future. Therefore, expenditure incurred for research is recognized as an expense when it is incurred. This position is set out in IAS 38 and is consistent with the Polish Accounting Act.

On the other hand, development work, in accordance with paragraph 8 of IAS 38, is the practical application of research discoveries or other achievements of other knowledge in the planning or design of the production of new or significantly improved materials, equipment, products, technological processes, systems or services, which takes place prior to the commencement of serial production or application. For example, the following are included in the development work (par 59, IAS 38):

- design, manufacture and testing of prototypes and experimental models (before their implementation into serial production or use);
- design of tools, jigs, moulds and dies using new technology;
- design, construction and operation of a pilot line, the size of which does not allow for economically justified production for sale;
- designing, manufacturing and testing selected solutions for new or improved materials, equipment, products, processes, systems or services.

According to IAS 38, it is possible to capitalize development expenditure as an intangible asset, but only if the business entity is able to prove (par 57, IAS 38):

- the technical feasibility of completing the component so that it is suitable for use or sale,
- the intention to complete the asset and to use or sell it,
- the ability to use or sell an intangible asset,
- the way in which the intangible asset will produce likely future economic benefits, i.e. prove the existence of a market for the products generated by the asset or for the asset itself, or prove the utility of the intangible asset if the asset is to be used by an entity,
- the availability of technical, financial and other means to complete the development work and the use or sale of the intangible asset,
- the ability to reliably determine the expenditure incurred during development work that can be attributed to this intangible asset.

If these conditions are not met, the company reports the development expenditure as a period expense.

The Polish Accounting Act (abbreviated as the AA) takes a similar approach to recognizing expenditure on development work in the books. Pursuant to Article 33(2) of the AA, the costs of completed development work carried out by an entity for its own needs, incurred prior to the commencement of production or the use of technology, are classified as intangible assets if:

- the product or manufacturing technology is strictly defined and the development costs associated with it are reliably determined,
- the technical suitability of the product or technology has been identified and adequately documented, and on this basis the entity has decided to manufacture these products or use the technology,
- development costs are expected to be covered by revenues from the sale of these products or the use of technology.

On the other hand, according to the AA, it is possible to recognize the costs of development works as an intangible asset only from the moment of their completion, as indicated by the name of the asset – "costs of completed development works". According to IAS 38, the completion of development works is not a condition for reporting development costs as intangible assets, but proof that the means to complete them is sufficient. Therefore, the moment of recognizing development costs as intangible assets under Polish regulations is delayed than provided for in IAS 38. However, before the costs of development work are completed, all costs related to them are accumulated in the "Accrued expenses" account, according to Polish regulations. At the time of completion of these works, the sum of the costs incurred for them is settled depending on the effect obtained. If there is no economic effect of the development work, the costs of these works are directly related to the financial result in a given period (regardless of whether they have been completed or not). If, on the other hand, the development works are completed positively and the above-mentioned requirements of Article 33(2) of the AA are met, the costs of these works are transferred from the "Accrued expenses" account to the "Intangible assets" account".

3. Recognition of R&D expenditure in non-financial reporting

Non-financial reporting is inextricably linked to the concept of CSR. The Polish Agency for Enterprise Development defines CSR as a management strategy according to which economic entities voluntarily take into account social and environmental interests and relations with stakeholders, in particular with their own employees, in their activities. Non-financial reporting is inextricably linked to the concept of CSR. The Polish Agency for Enterprise Development defines CSR as a management strategy according to which business entities voluntarily take into account social and environmental interests and relations with stakeholders, in particular with their own employees, in their activities. Being socially responsible means investing in human resources, environmental protection and relations with the environment, as well as informing about the actions taken, as this contributes to the increase in the competitiveness of the company and is the foundation for sustainable social and economic development. The Commission accepts the claim that companies take social and environmental considerations into account voluntarily and underlines the importance of the relationship between the individual and its wider stakeholders (Bender, 2017, p. 46). The European Commission points out that only discretionary actions, i.e. those that are not obligatory and go beyond the accepted standards, can be treated as socially responsible Business entities use many ways of transmitting information in the field of social responsibility, including reports or websites (Macuda, Matuszak, Różańska, 2015, p. 117).

The most important organization disseminating the concept of an integrated report internationally is the International Integrated Reporting Council (IIRC), which was established in 2010. Integrated reports, which are an expression of the CSR concept, not only compare, but also combine and integrate financial and non-financial information (Anam, Kasprzak, 2017, p. 2). It is worth mentioning, however, that there are significant differences between generally understood CSR reporting and integrated reporting. The domain of integrated reporting is to focus on the value creation process over time, while social responsibility reports present the entity's impact on the environment and are addressed to a wider group of recipients (Krasodomska, 2015, p. 78).

In Poland, in accordance with Art. 49 section 1 of the AA, there is an obligation to attach the so-called reports on the management board's activities. The management report, prepared by the unit's manager, is, in a sense, a supplement to the financial report.

In 2014, Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU entered into force as regards the disclosure of non-financial and diversity information by certain large entities and groups. As a result, it increased the scope of compulsory disclosure of non-financial information by enterprises.

The new rules require larger companies in the European Union to disclose annually non-financial information on environmental, social and labor issues, respecting human rights and counteracting corruption (Krzysztofek, 2016, p. 338).

Pursuant to §70 of the Regulation of the Minister of Finance in Poland, the statement on the applicable corporate governance principles should include information on the diversity policy, i.e. "a description of the diversity policy applied to the administrative, management and supervisory bodies of the issuer in relation to, in particular, age, gender or education and professional experience, the objectives of this diversity policy, the method of its implementation and the effects in a given reporting period, and if the issuer does not apply such a policy, an explanation of such a decision". This requirement applies to periods beginning after December 31, 2016.

The directive, while leaving the company free to choose the form and method of disclosing data, allows for subjective disclosures and their use in the sphere of marketing activities. Moreover, it is likely that the company will refuse to publish mandatory non-financial information due to the fact that it constitutes the entity's trade secret. The regulations imposed on individuals do not contain any specific penalty for non-disclosure of data (Fijałkowska, 2016, p. 35).

The solutions introduced by Directive 2014/95/EU and the amendment to AA result in large enterprises facing new tasks, including the need to create an appropriate information base. At the same time, it should be noted that there is no obligation to prepare a separate CSR, social or integrated report. This reporting is just one possible solution. Entities may also fulfill their obligations in the area of reporting non-financial data by disclosing the necessary minimum information in the prepared report on activities. At the same time, the information presented should be sufficient to assess the results, development, condition and impact of undertaken activities on the indicated areas, which means conscientious compliance with the principle of materiality (Tylec, 2018, p. 308).

Table 1 organizes and compares the scope of disclosures contained in the report on activities and the statement on non-financial information based on the provisions contained in the organizational structure.

Table 1. Disclosures in the management report and non-financial statement

Information included in the activity report	Information included in the statement on non-financial information
– events significantly affecting the entity's operations in the financial year and after its end, until the date of approval of the financial statements – expected development of the unit – major achievements in the field of research and development – current and expected financial situation – own shares – branches owned by the entity - Financial instruments	– a concise description of the entity's business model – key, non-financial performance indicators related to the entity's operations – description of the policies applied by the entity in relation to social and employee issues, the natural environment, respect for human rights, counteracting corruption and a description of the results of the policies applied – description of due diligence procedures – description of significant risks related to the entity's operations

Source: Own study based on: J. Błażyńska*, Standardization of non-financial reporting*, Studies and Works, College of Management and Finance, Scientific Journal 169, Warsaw School of Economics, Publishing House of the SGH, Warsaw, 2018, p. 13.

In terms of the above disclosures, entities have a lot of freedom in reporting non-financial information. Entities reporting non-financial data in the form of statements on non-financial information are subject to the obligation to disclose such data within 15 days from the date of approval of their annual financial statements, and when preparing a separate report, optionally together with the report on activities, to be published on the website of the economic entity, within up to 6 months from the balance sheet date, the statutory auditor confirms the preparation of this statement or a separate report (Rubik, 2018, p. 212).

In the case of non-financial reporting in the form of a separate document, there is no legally regulated nomenclature for such a report. The most common names are non-financial reports or sustainability reports.

4. Results of the conducted research

The research focused on the banking sector because it was recognized that entities from this industry are characterized by high expenditure on modern technologies and innovation. This is a sector that is developing very dynamically, using the latest technological solutions. Many new products were created relatively quickly as a response to the Covid-19 pandemic. An area of particular interest was research and development work and the way banks present information on this subject in their reports.

The aim of this research paper was to find answers to the following questions:

1. How have the largest banks operating in Poland reported their research and development expenses over the last 6 years?
2. Are banks willing to boast about their research in their financial statements?
3. Have the expenditure on this type of research increased in the last 6 years?
4. What did the R&D work carried out by the analyzed banks involve?

To answer the above questions, an analysis of information published by the largest banks operating in Poland in the period 2017-2022 was carried out. The largest banks in terms of assets included: PKO BP SA, Pekao SA, Santander BP SA, ING Bank Śląski SA, mBank SA, BNP Paribas SA (balance sheet total ranged from PLN 156.87 billion to PLN 444 billion). 6 banks were selected and their financial statements (mainly balance sheet and additional information) and non-financial reports for the period from 2017 to 2022 were analyzed. The focus was only on separate financial statements.

Information available in financial statements (i.e. balance sheet and notes) regarding the value of expenditure on innovation and research and development

Expenditures on research and development work, as previously written, are shown in the balance sheet in fixed assets under intangible assets. Figure 1 below shows the carrying amount of all intangible assets. As you can see, the PKO BP SA bank has the largest intangible assets. Other banks have intangible assets at a similar level, i.e. in 2017, the level ranged from PLN 287.9 million (in BNP Paribas SA) to PLN 648.19 million (in mBank SA). In the following years, expenditure on intangible assets increased and at the end of 2022 their value increased significantly. Bank Pekao SA increased the value of this balance sheet item to the greatest extent, by as much as PLN 777.55 million over 6 years. In turn, mBank SA increased the carrying amount of intangible assets almost twice (the difference between the end of 2017 and the end of 2022 amounted to PLN 561.58 million). BNP Paribas SA also spent over PLN 500 million over 6 years on this item. Only ING BŚ SA did not make significant expenditure on intangible assets and therefore their value at the end of 2022 decreased (mainly as a result of depreciation write-offs) and amounted to PLN 393.2 million.

It is clearly visible that in 2020 and 2021, expenditure on intangible assets increased significantly (probably due to the Covid-19 pandemic and the need to adapt IT solutions to the current situation). Pekao SA bank invested the most in this area (the balance sheet value at the end of 2020 increased by almost PLN 400 million compared to 2019, and the following year by another PLN 305.57 million).

PKO BP SA bank invests in intangible assets every year, which is why there is no such spectacular change on the chart as in the case of Pekao SA bank.

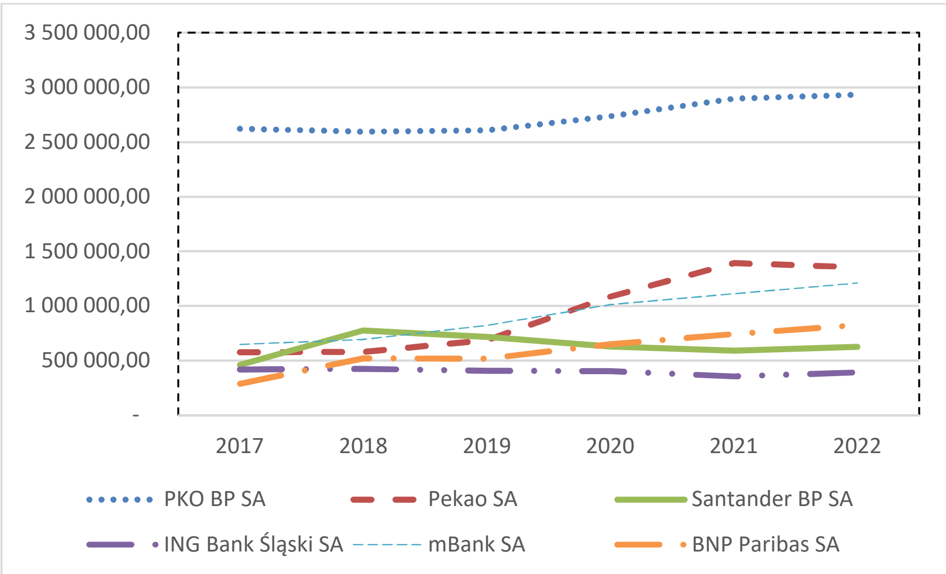

Figure 1. Carrying amount of intangible assets of the 6 largest banks operating in Poland in 2017-2022 / in thousands PLN/
Source: Own study based on financial statements of selected 6 banks from 2017 to 2022

However, analyzing the value of the balance sheet item alone is not sufficient. You should also look at the share of intangible assets in the balance sheet total. The value of the calculated indicators is presented in Figure 2.

An increase in the share of intangible assets in the balance sheet total in Pekao SA bank is clearly visible. These indicators also increased in mBank SA and BNP Paribas SA. In the remaining banks, the share of intangible assets in the balance sheet total decreased.

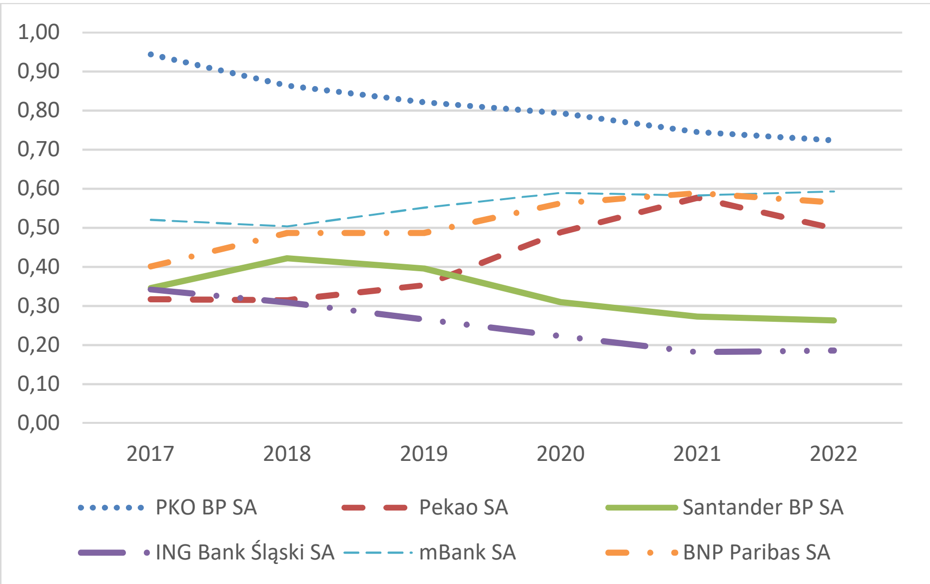

Figure 2. Share of intangible assets in the balance sheet total of the 6 largest banks operating in Poland in 2017-2022 /%/

Source: Own study based on financial statements of selected 6 banks from 2017 to 2022

Intangible assets disclosed in the balance sheet include various categories, including: goodwill. This is a position related to the takeover of another business entity. Positive goodwill occurs when the purchase price of another entity or its organized part is higher than the fair value of the acquired net assets. This category therefore has little to do with innovation and research. If we eliminated goodwill from intangible assets, the carrying value of intangible assets would be as shown in Figure 3.

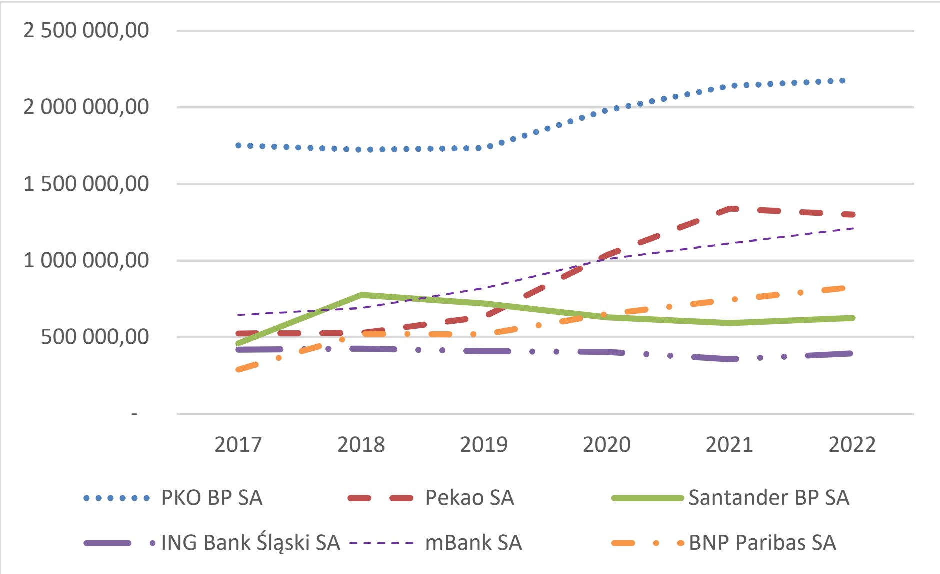

Figure 3: Carrying value of intangible assets (after eliminating goodwill) of the 6 largest banks operating in Poland in 2017-2022 / in thousands PLN/
Source: Own study based on financial statements of selected 6 banks from 2017 to 2022.

Despite the elimination of goodwill from intangible assets, the order of banks that have the most intangible assets on their balance sheets has not changed. PKO BP SA continues to dominate, and at the end of 2022, ING Bank Śląski SA still has the lowest value (Figure 3).

Of course, there are different items in intangible assets. One of them is <u>expenditure on completed development works</u>. When analyzing the financial statements of the 6 largest banks operating in Poland in 2017-2022, it was noticed that only Pekao SA bank showed such an item in its financial statements, which is presented in Table 2.

Table 2. Value of development costs at Pekao SA bank in 2017-2022 / in thousands PLN/

Categories	2017	2018	2019	2020	2021	2022
Development costs	1073.00	3.00	-	1276.00	2711.00	444.00

Source: Own study based on the financial statements of Pekao SA bank from 2017 to 2022

Unfortunately, Pekao SA bank did not provide detailed information in its financial statements about what these development works involved.

The next item in intangible assets concerns patents, licenses and software. They can be associated with various types of innovations (e.g. software that allows customers to perform new banking operations).

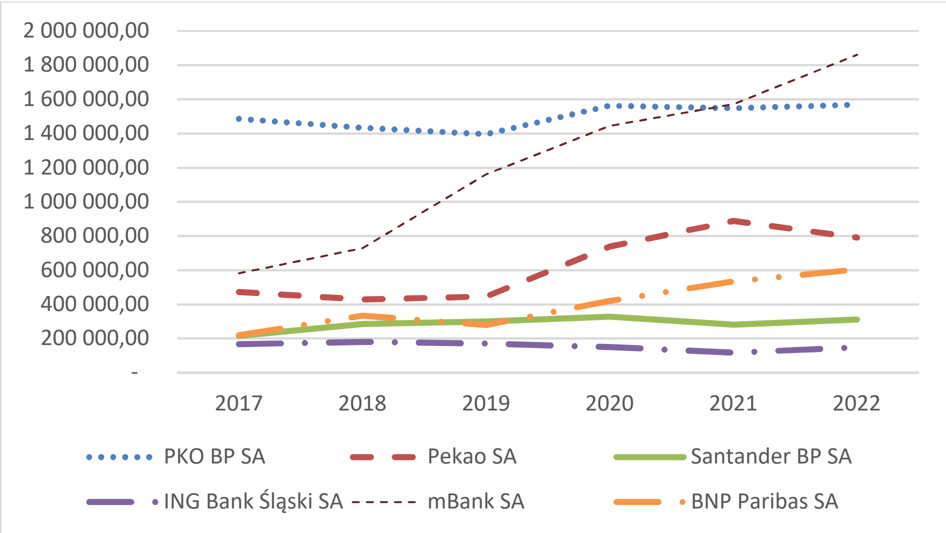

Figure 4. Carrying value of patents, licenses and software in the 6 largest banks operating in Poland in 2017-2022 / in thousands PLN/
Source: Own study based on financial statements of selected 6 banks from 2017 to 2022

Of the banks analyzed, the leader is, of course, the largest bank in Poland, PKO BP SA. In the years 2017-2022, the carrying value of its patents, licenses and software is approximately PLN 1,500 million. It is interesting that since the beginning of the analysis period, mBank SA has been constantly investing in this type of value and, as a result, in 2021 it manages to exceed the value of PLN 1,860 million.

Unfortunately, the only bank that described its intangible assets (i.e. software) was PKO BP SA. The additional information states that the bank incurred expenditure on the Integrated IT System (IS). The total value of expenditure on IS in the years 2005–2021 amounted to PLN 1,462 million. The net carrying amount of IS as at December 31, 2021 was PLN 629 million. The expected service life of the system was set at 24 years.

Other banks do not precisely inform their stakeholders about the purposes of the expenses incurred when investing in patents, licenses or software. The reader of financial statements must guess for himself what are the reasons and consequences of the bank's investment in software and licenses. This is a pity, because, as you can see, these are significant amounts and it would be good for a potential investor to find out whether these are software necessary to provide customer service at the current level, or whether the bank is planning to implement another new service that will give it a competitive advantage over others banks.

Information available in non-financial reports regarding the value of expenditure on innovation and research

In order to verify what non-financial information banks include in their reports on management board activities and CSR documentation in the 6 largest banks were reviewed. Unfortunately, no information was found there regarding research and development activities or information on expenses related to these activities, although the financial reports clearly show that such work was carried out in banks. This is knowledge that banks should be proud of, according to the authors, because it proves that these institutions are constantly modifying their IT systems and adapting them to the ever-growing needs. It is therefore possible that banks, by publishing this type of information, would change the way they are perceived by investors and stakeholders. It should be considered whether this information should not also be a mandatory part of non-financial information published by banks.

Counclusion

The considerations presented in this research paper present only a sample of the problems related to information on research and development activities and expenditure on them occurring in economic entities. However, it should be stated that they are very important from the point of view of the interests of each enterprise and the perception of the entity by stakeholders. The aim of this paper was to present disclosed financial and non-financial information regarding R&D activities on the example of the largest banks in Poland. This goal was achieved by analyzing financial and non-financial reports published by banks in 2017-2022.

Banks are characterized by high expenditure on modern technologies and innovation. This is a sector that is developing very dynamically, using the latest technological solutions to meet the constantly growing needs of customers for new banking products and the security of their operation. Following this lead, it would seem that banks should be proud of information about R&D activities. Unfortunately, despite the high expenditure on intangible assets disclosed in the balance sheet, it turned out that banks do not boast about their research. There is no detailed information on development expenditure or the increase in expenditure on software, patents or licenses. Such information cannot be found either in the notes or in the non-financial reports.

Discussion

Answering the research questions:

1. How did the 6 largest banks operating in Poland report their R&D expenditure over the last 6 years?
   Financial and non-financial reports of the 6 largest banks operating in Poland were analyzed in terms of reporting their R&D expenses. Unfortunately, no information was found in non-financial reports regarding research and development activities or information on expenses related to these activities. On the other hand, it can be seen in the financial reports that banks make such expenditures, e.g. on IT systems.
2. Were banks willing to boast about their research in their financial statements?
   Banks incur significant expenditures on their development (mainly by investing in licenses and software). For example, in the PKO BP SA bank, in the period under review, the balance sheet value of its patents, licenses and software amounted to approximately PLN 1,500 million. It was the only bank that described its intangible assets on which it spent significant amounts of money. This concerns the Integrated Information System (SI), on which a total of PLN 1,462 million was spent in the years 2005-2021. Unfortunately, the remaining banks did not provide information on the purposes of the expenditures incurred when investing in patents, licenses or software.
3. Has there been an increase in expenditure on this type of research in these banks in the last 6 years?
   Analyzing the financial reports of banks, it can be seen that in the balance sheet the value of such intangible assets as patents, licenses and software is most often growing, which indicates that expenses are made for this purpose. Most often, these are not significant increases (except for mBank), but only in the case of Pekao SA does this value gradually decrease.
4. What was the R&D work carried out by the analyzed banks about?
   Unfortunately, there is no precise information on this subject in the banks analyzed. The only conclusions can be drawn based on the financial statements, which show that the banks make expenditures on intangible assets, mainly software. Only the PKO BP SA bank has more detailed information on the software it develops.

Due to the fact that financial and non-financial information is an important element of reporting in the field of corporate social responsibility (CSR), the research conducted leads to the following conclusions. Work is still required to improve the non-financial information provided both in Poland and in the European Union (EU) member states. The finding of a lack of necessary information in published reporting on R&D expenditure in the banking sector may inspire relevant institutions to specify the list of mandatory information provided to stakeholders.

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