CENTRAL EUROPEAN REVIEW OF ECONOMICS & FINANCE

2024
Vol. 49, No. 4

ISSN 2082-8500
e-ISSN 2083-4314

Patronat wydania:

Polskie Towarzystwo Ekonomiczne Oddział w Radomiu

Central European Review of Economics & Finance
Casimir Pulaski Radom University
Publishing Office
ul. Malczewskiego 29, 26-600 Radom, POLAND
https://cer.uniwersytetradom.pl/contact/, cer@uthra

Contents

Articles

ARTICLES

CENTRAL EUROPEAN REVIEW OF ECONOMICS & FINANCE
Vol. 49. No 4 (2024) pp. 5-22
DOI https://doi.org/10.24136/ceref.2024.012

Agata Aftowicz[1]

THE CURRENT STATE OF SUSTAINABLE DEBT INSTRUMENTS' MARKET IN POLAND

Abstract

The Polish market for sustainable debt instruments cannot be compared to the European Union one, however it is slowly growing. In order to conduct further research on these innovative instruments in the context of the challenge of sustainable changes in the economy, it is necessary to determine the current state of the market and its perspectives. The aim of this article is to analyze the situation in the sustainable debt instruments market in Poland, meaning primarily green bonds market. The subject of the study is the number and volume of emissions, entities present in the market, as well as an attempt to define future perspectives has been made. The work is based on the analysis of source documents, reports and press releases from issuers and investors, as well as published previous market analysis. Research is limited notably by access to information. Some issues may not be included due to the lack of official announcements. The results show that starting from 2016, there have been at least 43 emissions by entities operating in various economic sectors, including financial and energy sectors. The market in Poland exhibits a lack of clear, upward trajectory.

JEL: G10, O16, Q50.

Keywords: sustainable development, sustainable debt securities, green bonds, polish green bonds, green finance.

---

[1] Master, Doctoral student at Warsaw School of Economics, email: aa116875@doktorant.sgh.waw.pl.

Introduction

In recent years, sustainable finance has definitely been one of the main trends in finance in the world. There are many reasons, ranging from the desire to counteract climate change and to finance the energy transformation to the classic desire for investors' profit or the possibility of obtaining cheaper capital by enterprises (Laskowska, 2017). Green finance, which is a narrowing of sustainable finance, is considered one of the greatest innovations (Maltais & Nykvist, 2021). According to Siemionek-Ruskań et al., over half of respondents in Poland are interested in activities related to green finance (2022).

The concept of sustainable finance is inextricably linked to the issuance of sustainable debt instruments, most often green bonds. Since 2007, when first issuance was made by the European Investment Bank (EIB), these instruments have been increasingly more popular (Skuza & Modzelewska, 2020). Many green bond issues result in several oversubscriptions to the issues (Jones et al., 2020).

The European Union, next to China and the US, is one of the largest markets for sustainable debt instruments in the world (Koziol et al., 2022). The development of the market for sustainable debt instruments in the EU, including Poland, results not only from the beliefs of individual and institutional investors, but also from the fact that these instruments are a tool for companies thanks to which they can implement the assumptions of the "Fit for 55" package of legislative proposals.

The popularity of sustainable debt issuance in the European Union does not necessarily translate into vast amount of issues in each of the member states. France and Germany are leaders in this context (Eurostat, 2023). The market for the mentioned instruments in Poland seems to be in the initial phase of development. Due to the relatively small number of emissions and the problem with access to market data in Poland, there are only few studies on this topic. Much of the literature, even research published in 2023, is based on market data from 2021. This creates an incorrect picture of the current market situation. Because of new issues and emerging entities on the market, there is a need to systematize knowledge about the entire market. The main goal of the article is to analyze and assess the situation in the green bond market in Poland.

The article answers the following research questions:

1. How many sustainable debt instrument issuances have occurred in Poland, and which entities have participated in them?
2. In what economic sectors do issuers in Poland operate?

The data was obtained from available market reports, press releases from issuers and entities participating in issues, such as issue organizers and data from the website of GPW Catalyst. Collected information in this work will enable further research into the Polish green bond market, both from the perspective of issuers and investors.

The remaining part of this paper is structured as follows. First, the brief literature review is made to provide the definition of sustainable debt securities, as well as to summarize the current state of knowledge and research on the Polish market. The next part discusses collected market data. Based on the information, a market analysis is carried out and an attempt is made to determine the perspectives for the market. Eventually, the conclusions follow.

1. Review of literature

In order to properly analyze the market, the definition of sustainable debt should be provided. Due to the thematic scope of this article, only debt financial instruments such as bonds and covered bonds are discussed. However, it is important to mention that these are not the only currently available ways of sustainable financing for companies. In addition to the mentioned bonds, companies can use sustainability-linked loans, green loans or, in selected cases, also white certificates.

Sustainable debt instruments are debt instruments that are issued to finance sustainable investment projects. The purpose of the issue is the only distinction between sustainable bonds and conventional ones. The most frequently adopted divisions are proposed by the International Capital Market Association (ICMA). According to it, the distinction is as follows:

- Green bonds, designated as securities, allocate their proceeds toward funding or refinancing green projects.
- social bonds, those in which the proceeds are used to finance or refinance social projects,
- sustainable bonds, the issue of which is intended to finance or refinance sustainable projects, i.e. those that combine the project's green and social objectives.

Moreover, green bonds are divided for (Fierla et al., 2021):

- blue bonds, in which the funds are used to finance or refinance projects related to bodies of water, such as seas and oceans,
- forest bonds, which are supposed to finance or refinance responsible forest management.

Green bonds, as the type of sustainable debt instruments most frequently discussed in the literature, have also been divided according to detailed criteria. All of them comply with the Green Bond Principles (GBP) guidelines. These are (Lipowicz, 2020):

- Standard Green Use of Proceeds Bond,
- Green Revenue Bond,

  - Green Project Bond,
  - Green Securities Bond.

Furthermore, the sustainability-linked bonds (SLB) can be distinguished. Their unique feature is that the financial obligations they entail are connected to the issuer's performance in sustainability-related goals, specifically those within the ESG criteria (Liberadzki et al., 2021).

Various types of certificates that debt instruments may have should also be mentioned. The most popular providers include:

- ICMA, which is responsible for certificates under: Green Bond Principles (GBP), Social Bond Principles, Sustainable Bond Guidelines, Sustainability-Linked Bond Principles,
- Climate Bond Initiative (CBI), which created its certificate and requirements as part of the Climate Bond Standard,
- The Association of Southeast Asian Nations (ASEAN) and ASEAN Green Bond Standard, which was established on the basis of ICMA's GBP,
- EU Green Bond Standard, which is the latest certificate and a related set of recommendations for issuers.

There is no separate concept of green bonds in Polish law, therefore sustainable debt instruments are subject to the same regulations as classic corporate and municipal bonds (Lipowicz, 2023; Pęksyk, 2023). The Polish market includes treasury, municipal and corporate bonds, but also covered bonds issued by mortgage banks. In addition, sustainable debt instruments may be classified according to the above definitions. Issuers may also apply for one of the above-mentioned certificates (Laskowska, 2019).

The genesis of Poland's green bond market traces back to 2016, beginning with the inaugural issuance of global green treasury bonds. (Ślażyńska-Kluczek, 2022). It is worth adding that for this issue, the country received the Green Bonds Pioneer Awards granted by ICMA (Fierla et al., 2021). Despite being a pioneer in the issuance of treasury bonds, the corporate and municipal market in Poland did not develop like in other countries in EU. Financial institutions appeared among the issuers in 2017 (Laskowska, 2020). The majority of issuances, and therefore financing, took place through green bonds. However, other types of debt instruments should not be omitted and the entire market should not be generalized to green bonds only.

The advantages of issuing green bonds in Poland are pointed out by several authors (Laskowska, 2019; Mosionek-Schweda & Szmelter, 2018; Wiśniewski & Zieliński, 2021). According to survey research, the majority of corporate bond issuers in Poland would be willing to issue green bonds in the future (Gemra, 2021). The market also expects that new issues of green municipal bonds will take place in the coming years (Lipowicz, 2023). Hajdys also saw the opportunity for development of the market by increasing the interest of local companies, banks and local government units (2020).

Barriers to the development of the green bond market in Poland were also identified. These include the scarce number of green investments that could be financed by the issuance of green bonds, as well as the insufficient supply of green bonds compared to the demand for them (Sobik, 2023). Poor development of the described market also creates obstacles. According to Dmuchowski et al., the relatively small number of issues of sustainable debt instruments can be considered as one of the barriers to the energy transformation that Poland is facing (2021).

The most popular set of data on the sustainable debt instruments market in Poland is the report published in 2021, created at the request of the Polish Ministry of Finance (KPMG, 2021). There are no newer studies in the literature regarding the situation on the mentioned market.

2. Green bond market in Poland

The data for the analysis was obtained from press releases, information notes regarding individual issues, the Warsaw Sustainable Segment tab on the GPW Catalyst website, Climate Bonds Initiatives website and report, as well as information posted on LinkedIn by companies and people directly involved in organizing the issues. Additionally, emissions data from published market reports and articles were incorporated.

In order to better understand the Polish market, it is important to compare it with other European countries. Figure 1 shows the value of total issues in billions of USD in Poland and other European countries as for the end of 2022. Countries for which there is no data are excluded.

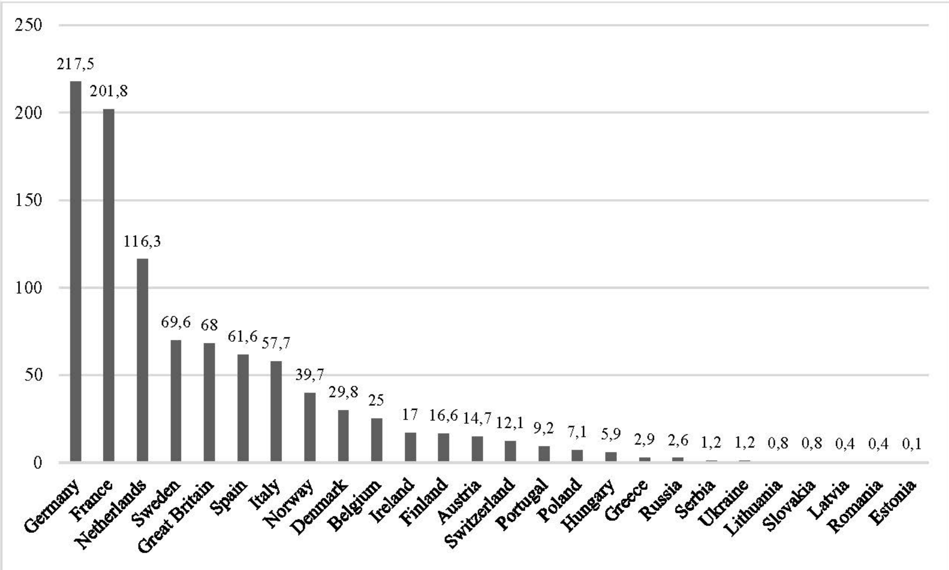

Figure 1. Total issue of green, social, sustainable bonds and SLBs per country (in billion USD)
Source: Author's own elaboration based on: Climate Bonds Initiative, Total Issues, https://www.climatebonds.net/market/data/

The total value of all issues in Poland is several dozen times lower than in France or Germany. Poland is also far behind the Scandinavian countries, the Netherlands, Great Britain, Spain and Italy. However, in comparison to countries in the region such as Hungary, Slovakia or the Baltic countries, the market in Poland is performing quite well. It is worth emphasizing that the above data concerns emissions of green, social, sustainable and sustainability-linked bonds, but only those with a label approved by the Climate Bonds Initiative.

The world's first issue of green treasury bonds by Poland in December 2016 was not the only such by this country. The next two took place in 2018 and 2019. The first issuance of corporate green bonds took place in 2017 and was made by Santander Consumer Bank. So far, the Polish market of sustainable debt instruments has included treasury bonds, municipal bonds, corporate bonds and covered bonds. As for the specific type of sustainable debt instruments on the Polish market, investors, both institutional and individual, have had the opportunity to invest in green bonds, sustainable bonds, sustainability-linked bonds and green covered bonds.

As for the end of the first quarter of 2024, 43 issues of various types of sustainable debt instruments were identified in Poland, primarily green bonds.

Table 1 presents all identified emissions, names of issuers and year of issue from 2016.

Table 1. All identified emissions in Poland from 2016

Type based on issuer	Issuer name	Year of emission	Type of debt instrument
Treasury	Poland	2016	Green Bond
Corporate	Santander Consumer Bank	2017	Green Bond
Treasury	Poland	2018	Green Bond
Corporate	PKO Bank Hipoteczny	2019	Green Covered Bond
Corporate	PKO Bank Hipoteczny	2019	Green Covered Bond
Corporate	ING Bank Hipoteczny	2019	Green Covered Bond
Municipal	Europejski Bank Inwestycyjny	2019	Green Bond
Municipal	Grudziądz (Miejskie Wodociągi i Oczyszczalnia)	2019	Green Bond
Treasury	Poland	2019	Green Bond
Corporate	Cyfrowy Polsat	2020	Green Bond
Corporate	Tauron Polska Energia	2020	Sustainability-linked Bond
Corporate	PKN Orlen	2020	Sustainability-linked Bond
Corporate	Columbus Energy (old name: New Energy Investments)	2020	Green Bond
Corporate	Globe Trade Centre	2020	Green Bond
Corporate	PKN Orlen	2021	Sustainability-linked Bond
Corporate	Famur (old name: Genevia)	2021	Green Bond
Corporate	Santander Bank Polska	2021	Sustainable Bond
Corporate	R.Power	2021	Green Bond
Corporate	R.Power	2021	Green Bond
Municipal	Europejski Bank Inwestycyjny	2021	Green Bond
Municipal	Łódź	2021	Green Bond
Corporate	PKN Orlen	2021	Green Bond
Corporate	mBank	2021	Green Bond
Corporate	Globe Trade Centre	2021	Green Bond

Continued Table 2.

Type based on issuer	Issuer name	Year of emission	Type of debt instrument
Corporate	Globe Trade Centre	2021	Green Bond
Corporate	Respect Energy	2022	Green Bond
Corporate	R.Power	2022	Green Bond
Corporate	R.Power	2022	Green Bond
Corporate	PKO Bank Hipoteczny	2022	Green Covered Bond
Corporate	Bank Ochrony Środowiska	2023	Green Bond
Corporate	Cyfrowy Polsat	2023	Sustainability-linked Bond
Corporate	Cyfrowy Polsat	2023	Sustainability-linked Bond
Corporate	Santander Bank Polska	2023	Sustainable Bond
Corporate	Ghelamco	2023	Green Bond
Corporate	Ghelamco	2023	Green Bond
Corporate	Ghelamco	2023	Green Bond
Corporate	Ghelamco	2023	Green Bond
Municipal	Europejski Bank Inwestycyjny	2023	Green Bond
Corporate	mBank	2023	Green Bond
Corporate	Bank Pekao	2023	Green Bond
Corporate	Anwim	2023	Sustainable Bond
Corporate	Ghelamco	2024	Green Bond
Corporate	Ghelamco	2024	Green Bond

Source: Author's own elaboration based on: KPMG 2021 and own research

The number of issues of debt sustainable instruments in Poland in individual years with categorization of type of issuers is presented in Figure 2.

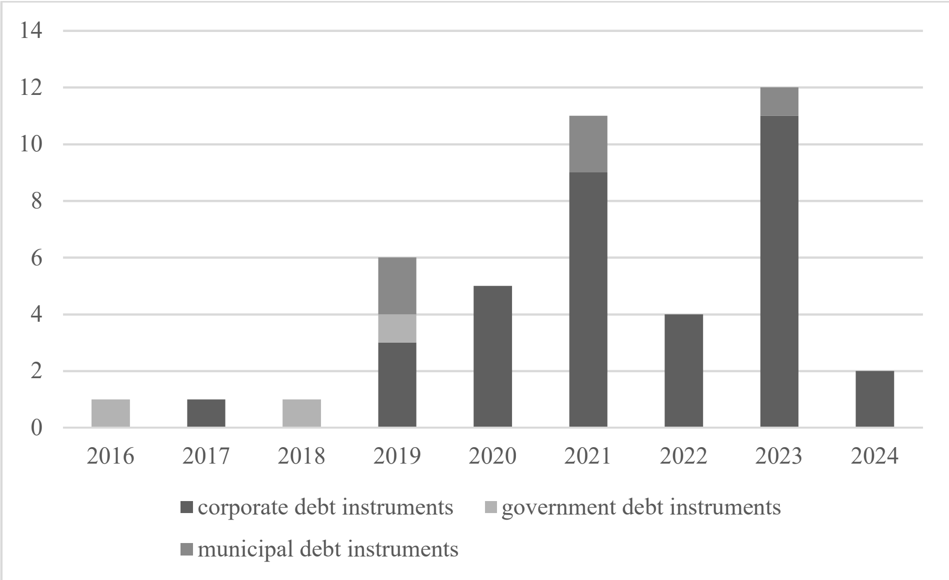

Figure 2. Number of issues of debt sustainable instruments with categorization of type of issuers in Poland

Source: Author's own elaboration based on: KPMG, 2021 and own research

The identified series of sustainable debt instruments were denominated in PLN, EUR, but also HUF. The issue values were converted into PLN at the average exchange rate published by the Central Bank of Poland on the issue dates. Most issues were made by enterprises, while sustainable debt instruments are the least popular way of obtaining financing by the state. The amount of municipal emissions is also relatively small. Corporate sustainable debt instruments account for over 81% of the entire market for these instruments in Poland.

In addition to the number of emissions, their size is also important. Figure 3 shows the total value of issues of the discussed instruments in particular years in Poland.

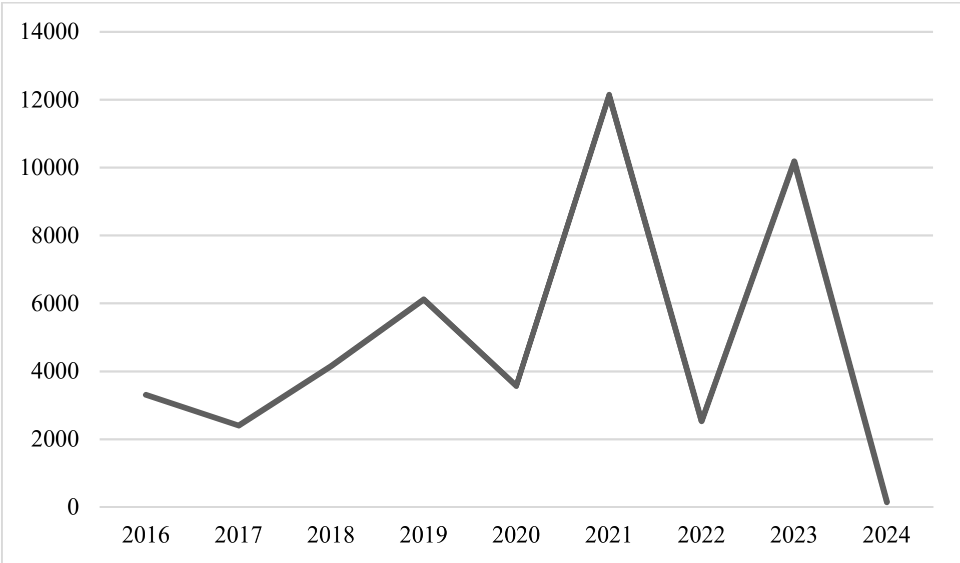

Figure 3. Total value of debt sustainable instruments' emissions in Poland (in mln PLN)
Source: Author's own elaboration based on: KPMG 2021 and own research

As it can be observed, the year 2021 was a record year in terms of total value of issue but also the second record year when it comes to number of issues per year. It is worth noting that despite one more issue in 2023, in comparison to 2021, the total value of all issues was lower. As the worst year for the market in Poland, 2022 should be considered, since only 4 emissions occurred. However, their total value was slightly bigger than the amount of one identified issue in 2017. It should also be noted that 2024 started quite optimistically and two issues were made in the first quarter, although the sum of proceeds collected from these issues is not significant. Analyzing the number of issues and the corresponding funds raised across individual years, it is revealed that there is no discernible specific trend. However, it's notable that up until 2021, there appeared to be an upward trajectory in this regard.

Taking into account the dominance of corporate issuers in the market, the segments, in which the issuers operate, must be taken into account when an analysis is being conducted.

In this case, the data did not change significantly in the analyzed years. Figure 4 below presents the division of issuers according to the type of their sector.

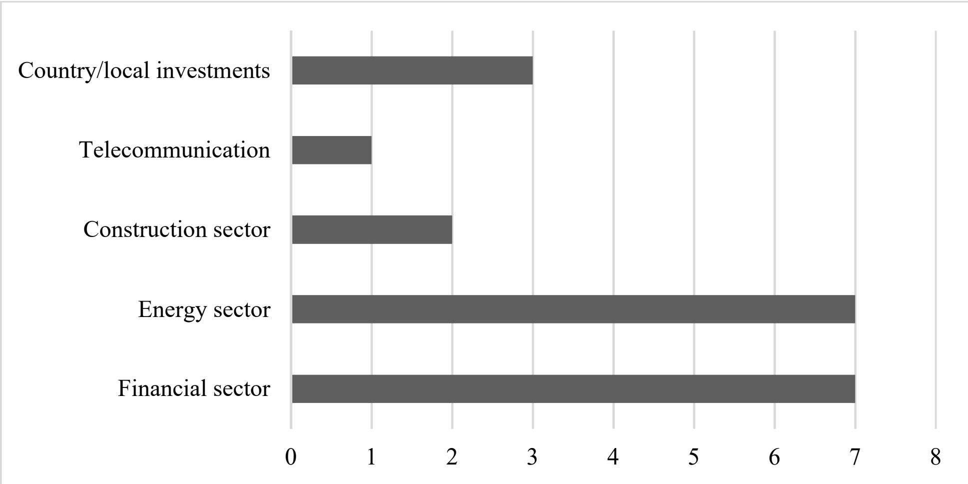

Figure 4. Issuer of sustainable debt instruments in Poland with division into the sectors in which they operate
Source: Author's own elaboration based on: KPMG 2021 and own research

Based on the collected data, it can be said that sustainable debt is most popular among issuers operating in the financial sector, more specifically commercial and mortgage banks, as well as enterprises operating in the broadly understood energy sector. These include companies related to fuel, energy supplies and renewable energy sources. On this basis, it can be concluded that this type of financing is used for the energy transformation in Poland.

With regards to the number of issuers, the next emissions are derived from state and local government units related to, amongst others, public transport and improvement of water and sewage infrastructure. Another sector, in which entities have noticed opportunities in issuing this type of debt, is the construction sector, where the issuers are related to sustainable construction. This is again related to trends in the European Union and regulations regarding low-emission or even zero-emission buildings. Moreover, the one issuer operating in the telecommunication industry, which used the issuance of sustainability-linked debt to refinance energy efficiency improvements or reduce its carbon footprint, should not be omitted.

Figure 5 shows the share of individual types of sustainable debt instruments in the Polish market.

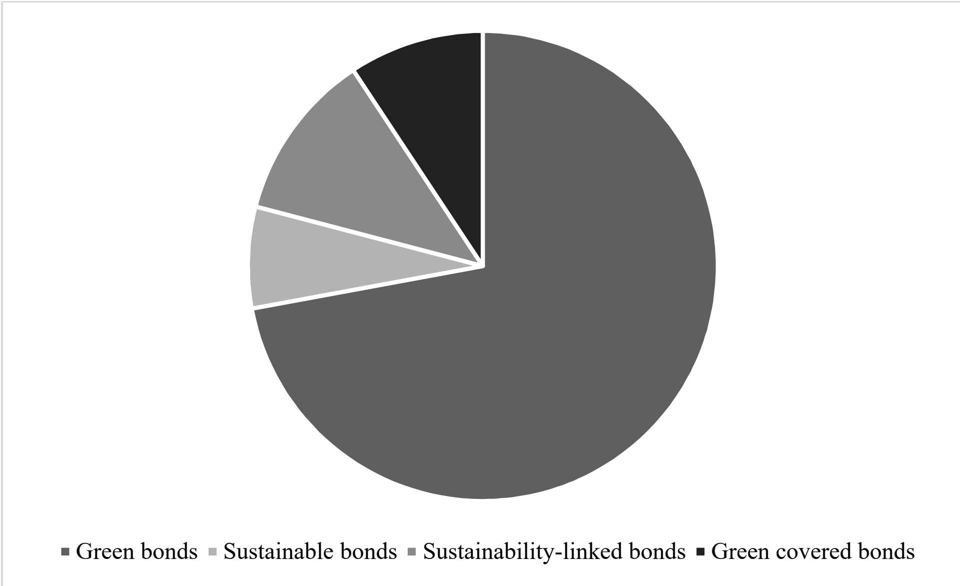

Figure 5. Types of debt sustainable instruments issued in Poland from 2016
Source: Author's own elaboration based on: KPMG 2021 and own research

Green bonds constitute to 72,09% of all instruments related to sustainable development in Poland. Green mortgage bonds and sustainability-linked bonds each account for 11,62% of the market and the smallest share is held by sustainable bonds with approximately 6,98%. This division of the market clearly shows why the sustainable debt market is often reduced exclusively to green bonds in the analysis.

There is also one remarkable case of the issue of green subordinated bonds by Bank Ochrony Środowiska. Despite little publicly available information on mentioned issue, one may ask whether investors on the Polish market value the aspect of investment sustainability so much that it compensates for the issues of a worse position in the so-called "pecking order". Both the motives of investors and issuers on the Polish market are not examined. However, based on foreign research, it can be expected that Polish investors, just like foreign ones, value the sustainable aspect of investment at the expense of profit (Grishunin et al., 2023).

Many identified issuers emphasize that the issue of sustainable debt instruments is part of the company's strategy related to sustainable development. On the Polish market, the number of sustainable frameworks and declarations of strategies that take into account ESG factors is increasing. Among institutional investors in the Polish market, banks and investment funds have been identified. Some of the issues carried out were entirely covered by one entity. However, some issues of bonds are available to individual investors. It is also worth noting that certain issues are organized by banks and brokerage houses, the data on which is made public.

Awareness should be paid to the limitations of the analysis performed, which include primarily the availability of information. The limited access to data that has already been mentioned several times makes it difficult to precisely analyze the market situation and makes a clear assessment impossible. Despite the tendency to boast about these innovative financing methods visible on the Polish market, it is likely that some of the issues covered entirely by one entity have not been publicly disclosed.

3. Market perspectives

If one desires to assess the perspectives of the debt financial instruments market in Poland, the attention should be paid to:

- forecasts regarding the whole bond market in Poland and global green bond market,
- the demand for green investments as well as green financial instruments,
- availability of data and research on the market,
- risks on the market, including geopolitical risk,
- national and EU regulations regarding energy transformation, the EU Green Bond Standard and others.

There are also many other factors affecting capital markets and the entire economy.

According to forecasts and data collected by the Polish Economic Institute, the global green bond market is expected to slow down in 2024. The value of green bond issues worldwide is expected to slightly increase and their total value will be much lower than in the record-breaking 2021. As for the forecasts for the bond market in Poland, they are not clear, but they are not negative either.

Undoubtedly, sustainable finance is one of the trends among individual and institutional investors around the world, including Poland. The demand for green bonds in Poland is high and can even exceed the supply several times. Such was the case during various issues in Poland, for example the one made by PKN Orlen in 2021 where the demand was 6 times higher. Taking this into account, one would expect the market to develop as a result of this increased demand, which may encourage issuers. Such a high demand also gives issuers the opportunity to offer lower coupons, which is an additional incentive to organize issue.

Moreover, the relatively small amount of research and reports on the sustainable debt instruments market may be one of the barriers for development. Investors, even institutional ones, have limited access to information about the market in Poland. The lack of new market analyzes may slow down further market growth. It is also worth mentioning the ongoing geopolitical risk in Poland related to war between neighboring countries. It can be suspected that this is one of the factors discouraging foreign investors, but also issuers considering relatively large debt issues in Poland.

Attention should also be paid to the growing number of EU regulations in the field of sustainable investments, for example the EU Green Bond Standard. On one hand, tightening market regulations is an opportunity for greater market efficiency by eliminating sources of information asymmetry. The threat of greenwashing is decreasing, however, actions taken towards making the requirements for issuers stricter may slow down the development of the market in the European Union, including Poland. If investors' requirements regarding the "greenness" of the debt instruments they purchase increase, fewer new issues may be made. The costs for issuers related to appropriate reporting and obtaining ratings, as well as, certifications will be too high for them to decide on green or, more broadly, sustainable emissions.

Determining the exact perspectives for the discussed market certainly requires further research, but based on the above considerations it can be concluded that there is still space for further market growth in Poland, which may occur due to high demand. The pace of this development and whether it will continue to be dynamic depends not only on the willingness of issuers, but also on the information available to investors and the regulations being introduced.

Conclusions

The research focuses on the analysis of the sustainable debt instruments' market in Poland. The aim of the work, which was to identify and determine the number of emissions and issuers, as well as to determine the economic sectors in which they operate, was achieved. All identified emissions from 2016 to the end of the first quarter of 2024 were included in the study.

The Polish market of sustainable debt instruments, including primarily green bonds, has been developing since 2016, although it is not as developed as in countries such as France or Germany, which are leaders in the European Union. It must be noted, however, that the market for these instruments and the sustainable development initiative itself in Poland are better developed than in Slovakia or Hungary, which are the countries often compared with Poland (Hadaś-Dych et al., 2022). Polish enterprises, especially banks and energy companies, recognize the potential of sustainable debt. Moreover, the opportunities offered by sustainable debt instruments are also noticed by other entities. This is manifested by announcements of further issues of green bonds, for example by City of Cracow Office, PGE and Bogdanka, as well as satisfaction with the effects of issues already made, for example by the City of Łódź Office.

Since 2016, 43 issues of sustainable debt instruments have been identified in Poland. The majority of issuers are financial institutions and enterprises related to the energy sector. Nearly three quarters of the market are green bonds, but emissions of green covered bonds, sustainable bonds and sustainability-linked bonds have also appeared in Poland. The most emissions took place in 2021 and 2023, 11 and 12 of them respectively. However, in terms of total issued value, 2021 was a record year for the market in Poland.

The market development perspectives for further development seem moderate considering the high demand, the increasing popularity of ESG aspects in financing and general business operations. In addition, an opportunity for increased emissions are the actions of the European Union and regulations regarding the EU Green Bond Standard, which is intended to reduce information asymmetry in the market and the risk of greenwashing. Nevertheless, it is worth noting that the growing number of legal regulations in this area and their severity may also cool down the market sentiment. Geopolitical risk and limited access to market information, which prevents investors from accurately assessing the situation, are also important.

In addition, this study enables further analysis of the sustainable debt market in Poland. The study could be expanded in the future to include an analysis of *greenium* (green premium) in Poland, as well as the variability of green bonds in relation to ESG performance communicated by issuers. Due to the lack of studies in the literature regarding sustainable debt instruments in Poland from the investor's perspective, it is worth examining, primarily what motivates them to make such investments.

References

1. Banga, J. (2019). *The Green Bond Market: A Potential Source of Climate Finance for Developing Countries*, Journal of Sustainable Finance and Investment. 9(1). 17-32. https://doi.org/10.1080/20430795.2018.1.
2. Climate Bonds Initiative (2022). *Sustainable Debt Global State of the Market*, https://www.climatebonds.net/files/reports/cbi_sotm_2022_03e.pdf/.
3. Climate Bonds Initiative, Total Issues, https://www.climatebonds.net/market/data/.
4. Dmuchowski P., Dmuchowski W., Baczewska-Dąbrowska A., Gworek B. (2021). *Green economy – growth and maintenance of the conditions of green growth at the level of polish local authorities*, Journal of Cleaner Production. Vol. 301. https://doi.org/10.1016/j.jclepro.2021.126975.

5. Eurostat, *Green and sustainability bonds issued by governments*, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Green_and_sustainability_bonds_issued_by_governments.
6. Fierla A., Węgrzyn P., Wierzbicka E. (2021). *Zrównoważone inwestycje. Finansowanie obligacjami i zabezpieczenie*, SGH Oficyna Wydawnicza. Warszawa. p. 31.
7. Gemra K. (2021). *Świadomość funkcjonowania green bonds na polskim rynku obligacji korporacyjnych*, Kwartalnik Nauk o Przedsiębiorstwie, 4, https://doi.org/10.33119/KNoP.2021.61.4.3.
8. Grishunin S., Bukreeva A., Suloeva S., Burova E. (2023). *Analysis of Yields and Their Determinants in the European Corporate Green Bond Market*, RISKS, https://doi.org/10.3390/risks11010014.
9. Hadaś-Dych M., Puszer B., Czech M., Cichy J. (2022). *Green Bonds as an Instrument for Financing Ecological Investment in the V4 Countries*, Sustainability. 14(19). https://doi.org/10.3390/su141912188.
10. Hajdys D. (2020). *Green Bonds as a source of financing pro-environmental actions in Poland*, Journal of Finance and Financial Law. Vol. 1(25). 49-63. https://doi.org/10.18778/2391-6478.1.25.04.
11. ICMA, *Green Bond Principles*, https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/green-bond-principles-gbp/.
12. ICMA, *Social Bond Principles,* https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/June-2020/Social-Bond-PrinciplesJune-2020-090620.pdf.
13. ICMA, *Sustainable Bond Guidelines*, https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/sustainability-bond-guidelines-sbg/.
14. ING, Financial Institutions. Sustainability, *Global ESG Bond Supply Outlook*, November 2023, https://think.ing.com/articles/global-esg-bond-supply-outlook-2024-slowing-down/.
15. Jones R., Baker T., Huet K., Murphy L., Lewis N. (2020). *Treating ecological deficit with debt: The practical and political concerns with green bonds*, Geoforum. Vol. 114. https://doi.org/10.1016/j.geoforum.2020.05.014.
16. Koziol Ch., Proelss J., Roßmann P., Schweizer D. (2022). *The price of being green*, Finance Research Letters. Vol. 50. https://doi.org/10.1016/j.frl.2022.103285.
17. KPMG (2021). *Perspektywy rozwoju rynku zielonych obligacji w Polsce*, https://www.gov.pl/web/finanse/raport-perspektywy-rozwoju-rynku-zielonych-obligacji-w-polsce.

18. Laskowska A. (2017). *Problematyka inwestowania ekologicznego na rynku finansowym w teorii ekonomii*, EKONOMIA. 48 nr 2. 159-183, http://dx.doi.org/10.12775/AUNC_ECON.2017.010.
19. Laskowska A. (2019). *Zielona obligacja skarbowa jako perspektywistyczny instrument rynku długu*, Studia Ekonomiczne. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach, 382, p. 109-122.
20. Laskowska A. (2020). *Zielone obligacje w Polsce – teoria i praktyka*, in: Grabowski M, Kotecki L. (2020). *Zielone obligacje w Polsce. Przewodnik dla Emitenta*, https://www.efcongress.com/wp-content/uploads/2020/10/Zielone-obligacje-w-Polsce_ebook.pdf.
21. Liberadzki M., Jaworski P., Liberadzki K. (2021). *Spread Analysis of the Sustainability-Linked Bonds Tied to an Issuer's Greenhouse Gases Emissions Reduction Target*, ENERGIES. 14(32). https://doi.org/10.3390/en14237918.
22. Lipowicz M. (2020). *Nowoczesne formy obligacji jako źródła gromadzenia kapitału przez polskie przedsiębiorstwa*. Zeszyty Naukowe Wydziału Zarządzania GWSH – Globalna Gospodarka, Zarządzanie, Prawo i Administracja, 13, p. 115-132. https://www.gwsh.pl/content/biblioteka/org/pdf/13_ZN_e-book.pdf#page=116.
23. Lipowicz M. (2023). *Rola i miejsce zielonych obligacji w finansowaniu zrównoważonego rozwoju*, Studies in Risk and Sustainable Development, Ryzyko i Rozwój Zrównoważony. Studia Uniwersytetu Ekonomicznego w Katowicach. 397. https://doi.org/10.22367/srsd.2023.397.6.
24. Maltais, A., Nykvist, B. (2021). *Understandingthe Role of Green Bonds in Advancing Sustainability*, Journal of Sustainable Finance and Investment. 11(3). 233-252. https://doi.org/10.1080/20430795.2020.1724864.
25. Mosionek-Schweda, M., Szmelter, M. (2018). *Zielone obligacje – nowy instrument finansowania inwestycji polskiego rządu*, Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu. 532. 215-224. https://doi.org/10.15611/pn.2018.532.21.
26. Parkiet, *Rok 2024 może, ale nie musi być rokiem obligacji*, December 2023, https://www.parkiet.com/inwestycje/art39639761-rok-2024-moze-ale-nie-musi-byc-rokiem-obligacji.
27. Pęksyk A. (2023). *Zielone obligacje jako dłużne papiery wartościowe finansujące inwestycje w tobie transformacji energetycznej*. Internetowy Kwartalnik Antymonopolowy i Regulacyjny. 2(12). 38-50. 10.7172/2299-5749.IKAR.2.12.3.
28. PFR dla Miast, Łódź, https://pfrdlamiast.pl/baza-miejskich-innowacji/zielone-obligacje-przyciagaja-ekologiczne-inwestycje.html.

29. PKN Orlen, *PKN Orlen jako pierwsza spółka w Polsce wyemituje zielone euroobligacje o wartości 500 mln euro*, May 2021, https://www.orlen.pl/pl/o-firmie/media/komunikaty-prasowe/2021/maj/pkn-orlen-jako-pierwsza-spolka-z-polski-wyemituje-zielone-euroobligacje-o-wartosci-500-mln-euro.
30. Polish Economic Institute, *Miesięcznik Makroekonomiczny PIE*, December 2023, https://pie.net.pl/wp-content/uploads/2024/01/Miesiecznik-Makro_12-23.pdf.
31. Siemionek-Ruskań M., Lepszyński B., Fanea-Ivanovici M. (2022). *A comparative Analysis of Green Finance Awareness in Poland and Romania*, Journal of Environment Management and Tourism. 7(63): 1825-1834. https://doi.org/10.14505/jemt.v13.7(63).02.
32. Skuza S., Modzelewska A. (2020). *Zielone finanse publiczne w Polsce. Stan obecny i autorskie propozycje zmian*, Zeszyty Prawnicze Biura Analiz Sejmowych Kancelarii Sejmu. 1(62). 9-29. https://doi.org/10.31268/ZPBAS.2020.02.
33. Ślażyńska-Kluczek D. (2022). *Zielone obligacje jako metoda finansowania projektów inwestycyjnych*, Kwartalnik Nauk o Przedsiębiorstwie. 1. https://doi.org/10.33119/KNoP.2022.63.1.3.
34. Sobik B. (2023). *Green bonds – financial innovation for sustainability financing: The case of the Polish green bonds market and their development barriers*, Central European Economic Journal, https://doi.org/10.2478/ceej-2023-001017.
35. Wiśniewski M., Zieliński J. (2019). *Green bonds as an innovative sovereign financial instrument*, Ekonomia i Prawo. Economics and Law. 18(1): 83-96. doi:10.12775/EiP.2019.007.

ARTICLES

CENTRAL EUROPEAN REVIEW OF ECONOMICS & FINANCE
Vol. 49. No 4 (2024) pp. 23-44
DOI https://doi.org/10.24136/ceref.2024.013

Małgorzata Białas[1], Izabela Emerling[2]

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.

[1] PhD, AGH University of Science and Technology in Krakow, Faculty of Management, Department of Finance and Accounting, mbialas@agh.edu.pl, ORCID: 0000-0003-2703-4836.
[2] PhD, Cracow University of Economics, Faculty of Finance and Low, Department of Financial Accounting, izabela.emerling@uek.krakow.pl, ORCID: 0000-0002-9371-9430.

JEL classification codes: M14, M41, M42.

Keywords: R&D activities, financial statements, sustainability, financial and non-financial reporting.

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.

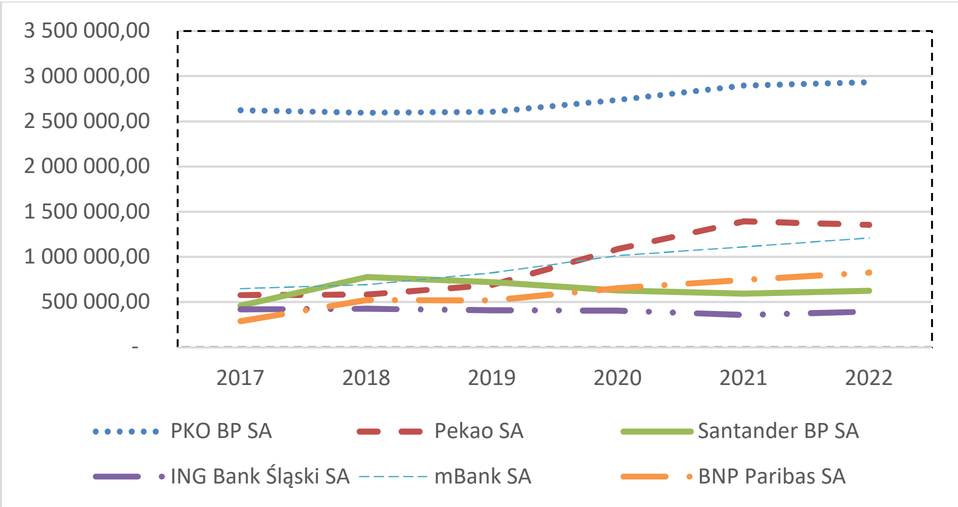

Figure 1. Carrying amount of intangible assets of the 6 largest banks operating in Poland in 2017-2022 / in thousands PLN/

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.

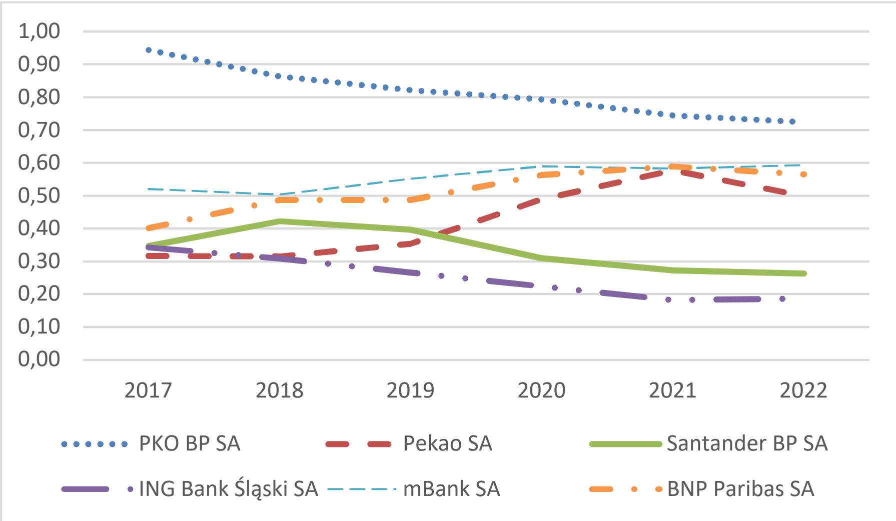

Figure 2. Share of intangible assets in the balance sheet total of the 6 largest banks operating in Poland in 2017-2022 /%/
Source: Own study based on financial statements of selected 6 banks from 2017 to 2022

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.

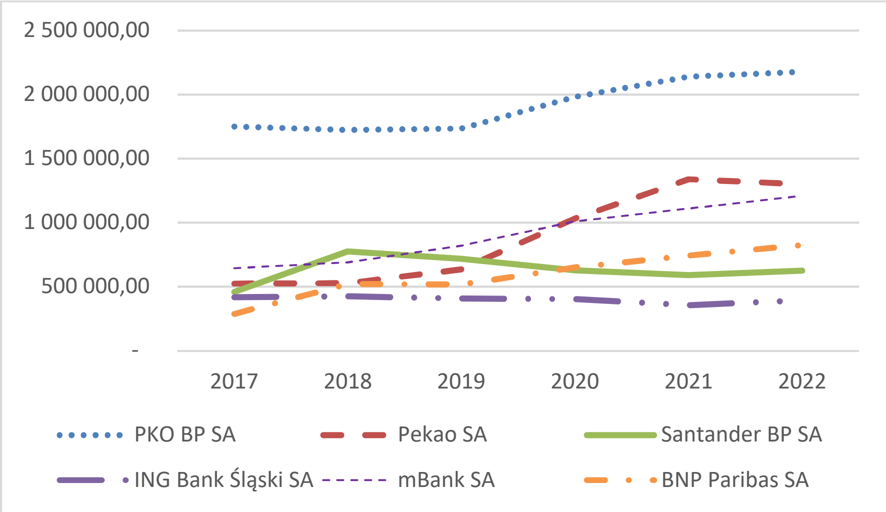

Figure 3. Carrying value of intangible assets (after eliminating goodwill) of the 6 largest banks operating in Poland in 2017-2022 / in thousands PLN/
Source: Own study based on financial statements of selected 6 banks from 2017 to 2022

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 expenditure on completed development works. 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).

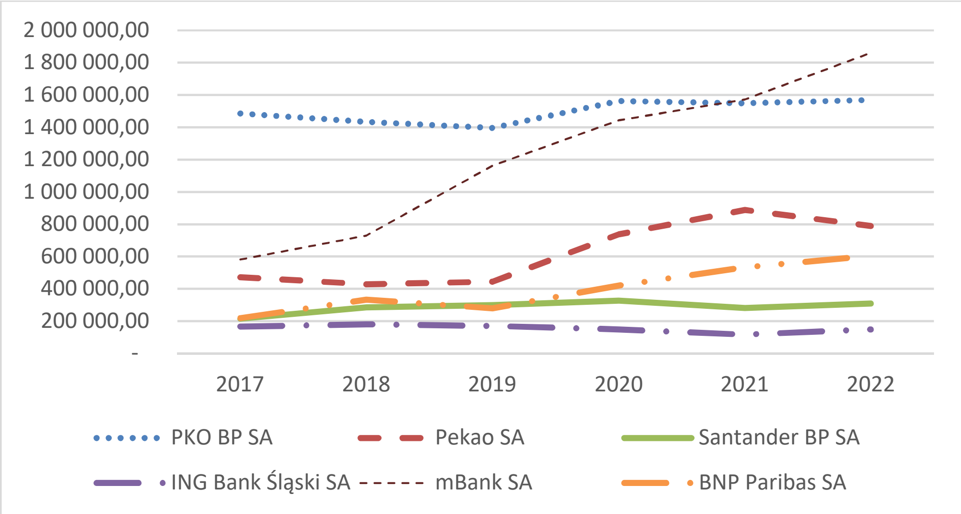

Figure 4. Carrying value of patents, licenses and software in the 6 largest banks operating in Poland in 2017-2022 / in thousands PLN/
Source: Own study based on financial statements of selected 6 banks from 2017 to 2022

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.

References

1. Act of September 29, 1994 on Accounting, as amended, consolidated text: Journal of Laws 2002, No. 76, item 694.
2. Anam L., Kacprzak J. (2017). *Raportowanie niefinansowe – Poradnik dla Raportujących*, wydanie II zmienione, Ministerstwo Rozwoju, Warszawa.
3. Bender N. (2017). *Społeczna odpowiedzialność biznesu w kontekście wytycznych Komisji Europejskiej, zaadaptowanych na potrzeby realizacji celów zrównoważonego rozwoju*, Zeszyty Naukowe Wydziału Informatycznych Technik Zarządzania Wyższej Szkoły Informatyki Stosowanej i Zarządzania, „Współczesne Problemy Zarządzania" Nr 1/2017, Uniwersytet Warszawski, Warszawa.
4. Belhaj M., Hachaichi Y. (2021), *Artificial Intelligence, Machine Learning and Big Data in Finance Opportunities, Challenges, and Implications for Policy Makers,* https://www.researchgate.net/profile/Yassine-Hachaichi/publication/369912767_Artificial_Intelligence_Machine_Learning_and_Big_Data_in_Finance_Opportunities_Challenges_and_Implications_for_Policy_Makers/links/6433b52f20f25554da20c124/Artificial-Intelligence-Machine-Learning-and-Big-Data-in-Finance-Opportunities-Challenges-and-Implications-for-Policy-Makers.pdf [accessed: 06.01.2024].
5. Bérubé M., Giannelia T., Vial G. (2021). *Barriers to the implementation of AI in organizations: Findings from a Delphi study (Proceedings of the Annual Hawaii International Conference on System Sciences)* https://doi.org/10.24251/hicss.2021.805 [accessed: 06.01.2024].
6. Cavagnoli D. (2011). *A Conceptual Framework For Innovation: An Application to Human Resource Management Policies in Australia*. „Innovation: Management, Policy & Practice", Vol. 13, April.
7. Ciok S. (2009). *Polityka rządu wobec wspierania działalności innowacyjnej*, [in:] H. Dobrowolska-Kaniewska, E. Korejwo (red.), Endo- i egzogeniczne determinanty obszarów wzrostu i stagnacji w województwie dolnośląskim w kontekście Dolnośląskiej Strategii Innowacji i badawczo-rozwojowej, Dolnośląska Agencja Współpracy Gospodarczej, Wrocław.
8. Corporate Income Tax Act of May 10, 2019 (Journal of Laws of 2019, item 865, consolidated text).
9. Czerniak J. (2006). *Efektywność nakładów publicznych na badania i rozwój*, „Annales Universitatis Mariae Curie-Skłodowska. Sectio H. Oeconomica", t. 40.
10. David P.A., Hall B.H., Toole A.A. (2000) *Is public R&D a complement or substitute for private R&D? A review of the econometric evidence*, „Research Policy", nr 29.

11. Elk R., Verspagen B., Weel B., Wiel van der B., Wouterse (2015). *A macroeconomic analysis of the returns to public R&D investments*, UNU-MERIT Working Paper Series, #2015-042.
12. Fijałkowska J. (2016). *Raportowanie informacji niefinansowych zgodnie z nową dyrektywą UE 2014/95/UE jako wyzwanie dla przedsiębiorstw*, Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, nr 436, Wrocław.
13. Frascati Manual (2015). *Guidelines for Collecting and Reporting Data on Research and Experimental Development*, OECD 2015.
14. Gandomi A., Haider M. (2015), *Beyond the hype: Big Data concepts, methods, and analytics*, International Journal of Information Management t. 35.
15. Gierańczyk W. (2010). *Badania i rozwój jako element przedsiębiorczości w krajach europejskich*, https://p-e.up.krakow.pl/article/view/275 [accessed: 06.01.2024].
16. Grabińska B., Grabiński K. (2018), *Wpływ wydatków na badania i rozwój na rentowność przedsiębiorstw*, „Zeszyty Teoretyczne Rachunkowości" Stowarzyszenie Księgowych w Polsce, tom 96 (152).
17. Heller J., Bogdański M. (2005), *Nakłady na badania i rozwój w Polsce na tle wybranych państw europejskich*, Studia Regionalne i Lokalne Nr 4(22).
18. IAS 38 Intangible Assets, Commission Regulation (EC) No. 1126/2008 of 3/11/2008 adopting certain international accounting standards in accordance with Regulation (EC) No. 1606/2002 of the European Parliament and of the Council.
19. Janusz T., Lis J. (2003). *Rola zaplecza badawczo-rozwojowego w procesie wzrostu gospodarczego* [in:] Nierówności społeczne a wzrost gospodarczy. W poszukiwaniu prowzrostowej strategii ograniczania nierówności, Zeszyt nr 4, Uniwersytet Rzeszowski, Rzeszów.
20. Krasodomska J. (2015). *Sprawozdawczość zintegrowana jako nowy obszar badań naukowych w rachunkowości*, Zeszyty Teoretyczne Rachunkowości, t. 82(138), Warszawa.
21. Krzysztofek A. (2016). *Dyrektywa 2014/95/UE oraz wynikające z niej zmiany,* Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, nr 450.
22. Law on higher education and science of August 30, 2018 (Journal of Laws 2018.1668).
23. Macuda M., Matuszak Ł., Różańska E. (2015). *The concept of CSR In accounting theory and practice in Poland*, Zeszyty Teoretyczne Rachunkowości, t. 84 (140), Stowarzyszenie Księgowych w Polsce, Rada Naukowa, Warszawa.
24. O`Sullivan D., Dooley L. (2009), *Applying Innovation*. SAGE, California.

25. Pangsy-Kania S. (red.) (2007). *Wiedza i innowacje rozwoju polskich regionów siły motoryczne i bariery*, Fundacja Rozwoju Uniwersytetu Gdańskiego & Instytut Wiedzy i Innowacji, Gdańsk.
26. Rubik J. (2018). *Raportowanie niefinansowe spółek Respect Index po zmianach*, Studia Ekonomiczne, Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach nr 369, Katowice.
27. Sawulski J. (2018). *Efektywność wydatków na badania i rozwój w Polsce na tle innych państw Unii Europejskiej*, Difin, Warszawa.
28. Smith D. (2006), *Exploring Innovation*. McGraw-Hill Education, UK.
29. Soldatos J., Kyriazis D., (2022). *Big Data and Artificial Intelligence in Digital Finance. Increasing Personalization and Trust in Digital Finance using Big Data and AI,* Springer, Glasgow.
30. Surma J. (2017), *Cyfryzacja życia w erze big Data. Człowiek, biznes, państwo*. Wydawnictwo Naukowe PWN, Warszawa.
31. Tidd J., Bessant J. (2009). *Managing Innovation. Integrating Technological*, Market and Organizational Change. John Wiley & Sons, Ltd. England.
32. Timmerman J.C. (2009). *A Systematic Approach for Making Innovation a Core Competency*. „The Journal for Quality and Participation", January, Vol. 31, No. 4.
33. Turczak A., (2016). *Analiza przyczynowa różnic w wielkości nakładów na badania i rozwój w wybranych krajach unii europejskiej i świata*, Studia Ekonomiczne. Zeszyty Naukowe, Uniwersytetu Ekonomicznego w Katowicach nr 276.
34. Tylec A., (2018). *CSR jako obszar raportowania niefinansowego w świetle rozszerzenia zakresu ujawnień*, Zeszyty Naukowe Politechniki Śląskiej, Seria Organizacja i Zarządzanie, Zeszyt 127.
35. Walczak E. (2012). *Czynniki wzrostu gospodarczego w krajach Unii Europejskiej*, „Wiadomości Statystyczne", nr 4.
36. Zanc R, Cioara T., Anghel I. (2019). *Forecasting Financial Markets using Deep Learning,* 2019 IEEE 15th International Conference on Intelligent Computer Communication and Processing (ICCP), IEEE, Cluj-Napoca, Romania.
37. Ziółkowska W. (2016). *Public Finance versus Economic Innovation*, „Zeszyty Naukowe Wyższej Szkoły Bankowej w Poznaniu", t. 69, nr 4.

Websites:

1. http://odpowiedzialnybiznes.pl/karta-roznorodnosci/aktualnosci-karta/nowe-obowiazki-prawne-zwiazane-ujawnianiem-informacji-niefinansowych-polityki-dotyczacej-roznorodnosci-analiza-tematyczna-fob/ [accessed: 16.01.2024].

2. https://dictionary.cambridge.org/dictionary/english/research-and-development [accessed: 01.12.2023].
3. https://www.bankier.pl/smart/najwieksze-banki-w-polsce-styczen-2024#najwieksze-banki-w-polsce-pod-wzgledem-aktywow [accessed: 08.01.2024].
4. https://ec.europa.eu/futurium/en/system/files/ged/ai_hleg_definition_of_ai_18_december_1.pdf, High-Level Expert Group On Artificial Intelligence. (2018). *A definition of AI: Main capabilities and scientific disciplines*; [accessed: 08.01.2024].

ARTICLES

CENTRAL EUROPEAN REVIEW OF ECONOMICS & FINANCE
Vol. 49. No 4 (2024) pp. 45-62
DOI https://doi.org/10.24136/ceref.2024.014

Sławomir Gąsior[1], Paweł Śwital[2]

VOLODYMYR ZLENSKY – LEADER COMPLETE

Abstract

This article aims to present the leadership building process of the President of Ukraine. It will also present an analysis of the potential of Volodymyr Zelensky, in exercising power and the struggle of his people against the Russian invaders. It will also demonstrate how the potential of leadership can be implemented in the engagement of state leaders to build world peace. The paper also outlines the assumptions of a leadership building process based on a person's value system and sources of leadership. The work also includes the experiences and lessons of Volodymyr Zelensky's hard service in regaining the sovereignty and independence of his homeland. It is also the intention of this work to identify the sources of leadership that inspired and guided this leader.

Keywords: leadership, President of Ukraine, Homeland, leader, governance, internal security.

JEL classification: D230, O310.

Paper type: Theoretical research article.

Introduction

The leader who united the world. Russia's full-scale assault on Ukraine in 2022 destabilised a time of peace and global security. It is significant that we

---

[1] Msc., Casimir Pulaski Radom University, Faculty of Law and Administration, e-mail:s.gasior@urad.edu.pl.
[2] PhD., Casimir Pulaski Radom University, Faculty of Law and Administration, e-mail:p.swital@urad.edu.pl.

all then discovered that the outbreak of a local conflict could escalate into another world war. It is particularly important that this was finally understood by the leaders of states who often did not believe in Russia's evil intentions. The aggression in Ukraine has shown the importance of the readiness of the whole nation to act in defence of the homeland and the not inconsiderable role of a leader who is able to rouse not only the nation but also the whole world to fight against a cruel invader. The violation of the security status quo of Ukraine, today, prompts almost the entire civilised world to support the country in its national defence. However, there is undoubtedly great merit in this action on the part of the leader of this state. Since the beginning of mankind, scholars have argued about who a true leader is. The works of the Chinese classics from the sixth century BC already mentioned that a leader should set moral standards and be able to distinguish between right and wrong. And Greek concepts of leadership showed that it must be just and wise. This was the path set out as early as the 4th century BC by Aristotle, who pointed out that a leader should possess knowledge, ethical values and be able to reach the hearts and minds of his fellow men. Volodymyr Zelenski is such a leader. How does the world view him? briefly from a comedian actor to a statesman full of dignity and charisma. Today he has acquired the status of an iconic hero. Faced with the war started by Russia in Ukraine in the first days of aggression, President Volodymyr Zelenski declared 'We will not surrender', an example of which was to remain in his homeland with his people. And in response to the United States offering the Ukrainian President help to evacuate him and his family, Volodymyr Zelenski was said to have replied „I need ammunition, not a lift' (Witwicka-Jurek 2022).

1. Leadership

In order to explain the phenomenon of President Volodymyr Zelensky, it is first necessary to consider the concept of the term leadership. According to the Dictionary of Synonyms, Wojciech Broniarek, it means commanding, directing, leading, superiority. The essence of leadership is also the ability to make difficult decisions, to make choices in complex, uncertain and risky situations and to take responsibility for the consequences of decisions. Leadership should also generate enthusiasm for action without using violence, force or coercion against subordinates, as the commanders of the Russian Federation use today. Subordinates need leadership because it reduces their uncertainty in threatening situations and in unpredictable changes. Leadership is charisma, which according to Max Weber is a personality trait, influencing others by changing their values and attitudes. The essence of leadership also lies in its sources. According to the Great Dictionary of Words Synonymous by Marta Tomczyk, source means the beginning, starting point, ground, cause, reason, genesis or basis.

What is it that makes some people able to carry crowds behind them, to convince them of their vision, to infect them with faith in their goals. As sources of success for these people, one can certainly point to certain character traits, behaviours that inspire trust in the leader and that make others want to follow him or her. Who, then, is a modern leader, we could say, is a person who is firm, courageous, strong, defending his or her ideals. So what is leadership? A gift that involves 'grabbing' people behind you, where it is necessary to have the ability to persuade and formulate messages so that others believe and feel what the leader feels. Without proper communication of one's vision and mission, it is impossible to win the support of crowds. The authors of one of the first studies on leadership – Lippitt and White – emphasised that in the pursuit of success, it is not what kind of person a leader is, but how he or she behaves that matters. In their studies, Lippitt and White spoke of a democratic style and an autocratic style. Other studies distinguish between a people-oriented style and a task-oriented style. What is important for the perception of a leader, however, is the consistency of behaviour with personality, values and goals. According to the researchers of the subject, a leader should care about his subordinates, motivate them and involve them in the decision-making process. Talk to them, share their ideas, but also listen carefully to what they have to say. A leader should also be assertive, with strong interpersonal skills to explain his or her objectives in a clear and lucid manner.

Great leaders are visionaries with a clear purpose, based on values that are important to them. The basis of a leader's vision is their values, i.e. what they live by and believe in every day. These form the building blocks of all leaders' actions and translate into their views. A determined leader must believe in what he or she proclaims, so that he or she is able to draw the crowds behind him or her. A characteristic of all leaders is belief in their values and views. He or she is characterised by a positive attitude, self-confidence, and the ability to infect others with this. His qualities are honesty, integrity, self-discipline, perseverance and a kind of intuition. A leader must act, move towards a goal and be able to make others move with him or her. He or she has highly developed social competences such as openness, communication, inspiration and empathy. A good leader is not only able to influence the people he or she leads, but, above all, easily establishes contact with them and builds a positive relationship. He believes in them and in them, so he is able to realise the potential of his subordinates.

Great leaders are not necessarily great in body, but by their actions, with consistent values and views behind them. People judge their leaders precisely by their actions, i.e. the decisions they take and the behaviour they display. Consistency of deeds and declarations, as well as professed views and values, is also important. What helps to create the image of a good leader is, above all, the trust of subordinates. If they do not believe in their leader's sincere intentions, they will not follow him or her.

The role of leadership has been studied for many years, following the search for more effective forms of social influence on subordinates, providing guarantees of high reliability. Today, leadership especially in an unpredictable world is taking on a new importance and its stature is increasing becoming an important determinant when trying to ensure security and peace. This new challenge stems from the large number of security threats, emerging armed conflicts and the power ambitions of some states. Therefore, the process of leadership formation is becoming very important in the area of ensuring world peace. Especially today in the face of threats from asymmetric actions, regular wars and states violating the territorial sovereignty of their neighbours. Interest in the idea of leadership in democratic armies became a priority when it became apparent that in modern armed conflicts the role of the leader in combat operations especially of an irregular nature was increasing. This has to do with the fact that leadership is the process of leaders influencing subordinates towards the accomplishment of a mission, indicating purpose, direction and arousing and reinforcing motivation. Ralph M. Stogdill noted in his research that the process of leadership involves the uncoerced direction and coordination of members of an organised group to achieve a group goal. In contrast, he assessed leadership as a property of a set of personality traits attributed to those who are perceived to use such interactions successfully (Stogdill, 1974, p. 7). It should be stressed that the phenomenon of leadership can only exist when it is a reciprocal relationship between an individual, whom we will call a leader, and a group that is systematically influenced by the leader. When there is no phenomenon of the group's submission to the individual's commands, there is no leadership relationship. A leader is undoubtedly a person who gathers others around him or herself, thanks to the creation of positive emotional bonds and the recognition he or she possesses, who is able to influence the behaviour of those around him or her and who sets the goal of joint action (Borkowski, Dyrda, Kanarski, Rokicki, 2001, p. 106). According to Iwona Majewska-Opiełka, a leader is a person who stimulates the process of setting and achieving goals in a specific group of people, releasing enthusiasm, abilities and the best character traits in themselves and others (Majewska-Opiełka 1998, p. 23).

When considering leadership in organisational groups, there are two essential elements that are needed to achieve this. These are the ability to effectively and joint implementation of tasks and to win (win) people to the planned mission (Gawliczek, Kanarski, 2002, p. 195). The essence of leadership can be defined as a distinction of predispositions and skills, and can be formal in nature, which is associated with the actions of superiors, and informal characterising the ability of individuals to win over their environment by exerting a certain influence on it. The leader is responsible for creating and implementing a vision for the organisation that enables it to survive and thrive. One of the most well-known classifications of leadership is the distinction made by Max Weber regarding dominion and power, which divides leadership into traditional, legal, and charismatic forms. The charismatic leadership of our protagonist is based on recognizing in him extraordinary, exceptional, and in some cases even supernatural personality traits.

In the late 1930s, research by R. White` and R. Lippitt, initiated an interest in leadership types, which continues to the present day, being the distinguishing features of the well-known leadership styles: autocratic, democratic, liberal. This division takes into account the way group goals are set and the preference of means of influencing people. In Zelensky's case, we are talking about a democratic leader, who creates partnership relations with group members, jointly sets goals and agrees on the type of tasks to be performed. According to the accepted assumptions, a leader is a person who is able to convince a subordinate team of his/her attitudes and value system, inspire individual members of the team to fulfil desirable social roles, and is able to lead human teams (Balasiewicz, Chojnacki, 1997).

On the basis of the aforementioned leadership types, the multidimensional and complex leader is distinguished, defined by specific natural, personality and cultural predispositions. In the performance dimension, the multidimensional leader is optimal. Although in reality we often deal with incomplete leadership, the identification of ideal types and types of leadership makes sense not only theoretically, but also practically. It allows us to answer the question of what is conducive to leadership, what enhances influence and what weakens the ability to rally people around the leader. Leading others will be someone who convinces people that he or she understands the problems facing them better than others. He or she proposes solutions, shows confidence when others have doubts, and takes decisive action that produces the results the group wants. Ultimately, leadership means an emotional bond between subordinates and the leader and the purpose he or she sets. It is in the emotional sphere that a leader gains followers, because with the leader comes what people need most; trust, confidence, strength, courage and belief in a better future. Security needs consist of good, undisturbed contact with the environment, as well as having social support, especially in the immediate circle. Needs of this type can be met to a large extent by a complete leader. Group social needs include the need to belong to an organisation and a team. Positive leaders ensure the harmonious development of the group, creating bonds between its members, establishing norms, patterns of behaviour, mutual trust. Their presence is conducive to stimulating activities that integrate everyone around the task at hand, appreciating the work and effort of individuals. Leadership competence can be seen as a set of experiences, knowledge and skills complemented by qualifications. It is also extremely important to influence individuals and groups to communicate effectively verbally and non-verbally. It is also important: building and developing teams, teamwork, cooperation, problem solving, building visions and their presentation, and dealing with difficult situations.

To create complete leadership, subordinates need to be influenced by formal and personal sources of leadership. It should not only focus on formal sources, but also refer to personal types, such as: morale, power of attraction or shared history (Lydka, 2013, p. 131-142). Focusing only on purely formal power may not be sufficient to shape the image of a leader. This is because, despite the area of possession of formal authority (systemic sources) and the associated authority to give orders to subordinates, there is also an area that is not fully sanctioned by formal authority, and these are the sources of personal leadership. The ability to use these two areas to subordinate subordinates constitutes a leader's position in a given environment. As a result of such behaviour, the importance of formal authority is implemented in favour of leading people, which naturally transforms into leadership, as the highest and most effective form of directing a human team. The interactions between the two increasingly marginalise aspects of formal command and imply a modern form of leadership (Lydka, 2013, p. 131-142).

Taking these conditions into account, the article undertakes an analysis of the phenomenon of the Ukrainian president, his sources of leadership, as the foundation of the leader's cognitive, emotional and behavioural processes. The experience of Volodymyr Zelensky, presented in this article, shows that in order to become a true leader one must understand that leadership is not just about giving orders. It requires knowledge of: motivation, value system, communication, relations between the individual and the group, functions and forms of leadership and negotiation skills (Dyrda, 1997, p. 21). The idea of modern leadership in NATO armies stems from the practice of training and combat operations conducted under conditions of increased risk and in situations where the usual rules of formal subordination have begun to fail. This is a consequence of the search for more socially effective forms of influence on subordinates that offer guarantees of high reliability. Overconfidence in the causal power of command causes superiors reasserting their infallibility to give orders without analysing the human factor as a superior value (examples of the Russian army).

On a practical level, representatives of numerous academic disciplines have attempted to analyse the issue of leadership on a personal and systemic level. However, it was most fully described by Terry Bacon in The Art of Effective Leadership, creating a model of leadership that describes every act of influencing human action. In order to accomplish a mission or task, Bacon's model distinguished five systemic sources of leadership that stem from the hierarchy in an organisation, which are position, resources, information, network and reputation. In addition to these, he also outlined five sources of leadership stemming from personal strengths: knowledge, expressiveness, attraction, morale and shared history (Bacon. 2014, p. 16). However, as the author points out each of the sources, can also act as a cause of its drain, meaning that it either gains us leadership power or deprives us of it. In discussing this topic, it is important to emphasise that sources of leadership enhance our ability to lead and influence others, but can also have a destructive effect on our influence.

2. Systemic sources of leadership

Position is one of the most important sources of leadership. Its power comes from our tendency to conform to social norms, and therefore from our willingness to accept the leader's right to influence us. Position determines a person's rights, obligations, responsibilities and scope of authority in an organisation. We generally conform as long as the leader's demands are within the limits of the leader's authority. In analysing the profiles of world leaders, it can be noted that no head of state has yet given speeches as often as Volodymyr Zelenski. The Ukrainian president has been releasing video proclamations to the nation and the world every day for more than a year. The presidential recordings have become a kind of war chronicle of the aggression against Ukraine. They document how the country, but also the president himself, has changed since the Russian invasion began (Gonczarenko, 2023). On 23 February 2022, just hours before the Russian attack on Ukraine, Zelenski recorded a special speech. In it, he addressed the citizens of Russia in a last-ditch attempt to stop the threat of war. „If we are attacked, you will see our faces, not our backs!" (Gonczarenko, 2023). In this speech, he warned the Russians that if they attacked Ukraine and wanted to take their country, their freedom and their children's lives, they would defend themselves. On the second day of the war, he made one of his most important and famous films. About half a minute of footage recorded in the evening in front of the presidential headquarters in Kyiv shows Zelensky himself and the country's top leadership. The main message was: „We are all in place, we are staying and we will fight" (Gonczarenko, 2023). Often superiors think that being given power makes us have authority and be leaders, nothing could be further from the truth. Today it is not enough to have power, today you need authority, charisma, morale and to be a partner to your subordinates, an attitude which is precisely that of the President of Ukraine, Volodymyr Zelenski. He has shown in his conduct that effective leadership cannot be based on orders and control, but on the ability to pull people behind his visions and ideas. Leadership derived from one's position increases with every success and decreases with every failure, this principle shows about the magic of Zelensky's achievements and successes. Leaders who are too focused on the mechanics of their role rather than on achieving the desired results will sooner or later destroy their careers with such a strategy (Bacon, 2011, p. 165). A case in point is the attitude of Vladimir Putin, who has nullified his dubious credentials by becoming an aggressor to other states, but also to Russian citizens. Position-based leadership is a prerequisite for managing by command and control. However, a sensible leader realises that position gives the right to reach for directive methods, but using his power in this way can lead to a drain on this source. Therefore, Volodymyr Zelenski uses these methods only when the necessary circumstances require it. On the other hand, he shares his position with other representatives of Ukrainian power, and in his messages to the people he often refers to shared power with the people. This is due to his awareness that in today's modern leadership, subordinates are more willing to engage in their tasks if the authority allows them to fulfil their civic duties without coercion and gives them the right to participate in the management and decision-making process and to maintain a secure autonomy. Despite the hierarchical structure that is the state, it was Zelenski who understood that directive methods should be used in moderation, but if necessary, they should be used with confidence and decisiveness, bearing in mind the authority that comes with position. An example of this was his resignation of senior government officials facing charges of corruption and collaboration with an aggressor. It is important to remember that leadership derived from position is most effective when complemented by another source. Position-based skills should go hand in hand with self-confidence, exercising built-up authority and avoiding being apodictic towards subordinates. Position is one of the most powerful sources of leadership we can have. Its power comes from the human tendency to conform to the social norms of the group to which we belong. Therefore, the President skilfully uses his position to lead and not just to influence, resulting not only in subordination, but also in the overwhelming commitment of the people to the defence of the Fatherland. Zelenski is aware that a position that is abused or apodictic can result in passive or active resistance to the leader. It should be added that a leader can also lose leadership when he or she damages his or her own moral authority and deprives himself or herself of the respect of the people in his or her sector (Bacon, 2011 p. 174). As a result of the ongoing war, Zelenski understands that he cannot afford, as a leader, to lose trust and credibility. He understands that a leader should care about his subordinates – motivate them, involve them in decision-making, talk to them, share their ideas, but also listen carefully to what they have to say.

2.1. Resources

The power by which we lead and influence others comes not only from the role we play, but also from our access to the resources we have control over and how skilfully we manage them. This source of leadership comes from having resources and exercising control over them that others need or desire (Bacon, 2011 p. 174). This is one type of leadership that Volodymyr Zelenski had to face very seriously due to Russia's aggression against his country and economic constraints. The loss of control over resources was the aggressor's goal in order to discourage the people from power. Scarcity is the key, and the secret of power derived from access to resources is to use them to the benefit of the people. This required the Ukrainian president to go to considerable lengths to secure his country from economic, social, defence and protective decline. He realises that a person with strong power resulting from access to resources will achieve the support of the people. In contrast, the hunger and threat to security that comes from a lack of support from power will result in a lack of relationship building, opportunities for conflict resolution and clarification of misunderstandings. The power that comes from access to resources depends not only on the scarcity of resources, but also on how relevant they are to the people. If we want to exert influence, it is not enough that we exercise control over resources, but how we share them. Resources are also human potential, which is why Volodymyr Zelensky's guiding idea is that soldiers in the current situation are the greatest asset to be invested in and to be protected and developed. So his goal has become the acquisition of modern armaments, ensuring the security of the country, citizens and frontline soldiers. Another is to acquire resources of the kind that have become most important for the functioning of the state at this point in time. The Ukrainian leader realises that Russia's key to exerting influence over his people is a scarcity of resources. That is why he uses the principle of leadership resulting from the use and fair distribution of resources for the benefit of the people and not just for the sake of power.

2.2. Information

Information, like knowledge, is a source of power. When we work in an organisational structure, what we know and what we can do is priceless. Therefore, access to important information is vital. Zelenski proved this by basing his operations on close cooperation with the superpower states in cyber warfare or the ability to observe from satellites in space around the earth, for example, the movements of enemy troops. In the current era, access to information and data that others do not have can be a source of powerful influence in situations of kinetic and non-kinetic operations. Information about the enemy, his actions is a not inconsiderable source of influencing him, e.g. through the use of accurate shelling, which is related to the economics of battlefield resources, but also propaganda warfare. It is also extremely important to obtain information, in the right form and at a specific time. This is shown by the pre-emptive actions of air defence against air strikes by Russia's missile attack means. We now categorise the five elements of power resulting from information are: acquisition, dissemination, organisation, retrieval interpretation and access. All of them allow to influence an opponent through the effective disposal of information (Bacon, 2011 p. 206). Adequate data is, of course, a prerequisite resulting from access to information. The equipment for processing it, configured with armaments to ensure that it can be used by Ukraine's defenders, is also an attribute. Therefore, the merit of the President of Ukraine soliciting not only data from partners, but also equipment using data on, for example, the stationing, movement or equipment of enemy units, is not inconsiderable. The ability to interpret information in order to draw conclusions from the data at hand is also extremely important. This is why Zelensky's requests to train Ukrainian soldiers on Western battlefield systems, so heavily guarded for non-NATO armies, were essential. It is important to emphasise here that sources of information are only as reliable and valued as the precision of the information we obtain. Information can also become a drain on a leadership source. If someone provides inaccurate data or offers incorrect or misleading interpretations. A wise leader should also know that one cannot believe everything that is written or said. This is also where the leadership of Zelensky and his staff, who were not fooled by the assurances of the enemy using disinformation activities, showed itself. The bottom line is that people who can obtain the right data, in the right form and at the right time, gain leadership from information.

2.3. Networking

Having an extensive network of contacts -is a very important source of power in terms of leadership and influence. This has been demonstrated by the President of Ukraine, his work in organising meetings in Ukraine for world leaders and participation in world salons facilitates the flow of information and increases the scope of persuasion. He is building a team of active members of world leaders in support of Ukraine. He does this through mutual respect with foreign partners and the admiration of the entire democratic world for its valiant nation. The modern world functions through the many interactions and influences we have on each other. It is through it that Ukraine receives innovations and modern weaponry and subsidies for the functioning of the state. We can call the President of Ukraine the link between his country and the outside world, who has a tremendous power of influence, able to infect many people with enthusiasm to support his homeland. The power that comes from networking is based on the social capital we build when we create links with our compatriots and people outside the country. Zelenski shows his comrades in combat every day that social capital is a combination of attraction, mutual need and mutual commitment in the struggle for independence. In the process, he has shown that mutual trust, sensitivity, respect and the ability to assess the situation and listen carefully are essential (Bacon, 2011 p. 230). In the midst of an ongoing war, he built a strong network of contacts with his compatriots online, through social networking sites, which became useful channels for information and maintaining contact with the outside world.

The power derived from networking is an emergent (emergent, derivative) phenomenon that attracts others to us and helps us build lasting bonds that keep people with us, this is how we create and perpetuate networking. To summarise this resource, it is worthwhile to build your network from the beginning and continuously. The President of Ukraine, thanks to his excellent networking skills by maintaining professional and personal ties, is perceived as a reliable, competent and also noble person.

2.4. Reputation

Reputation is an assessment of a person's overall value by the community to which he belongs. Zelenski's reputation is not only the value he has earned through his professional ethics, but through his trustworthiness, sensitivity, loyalty to the nation, respect for others, openness to cooperation and sharing of merit with others. People with high reputation ratings are much more effective in leadership and influence because it is one of the most important sources of leadership (Bacon, 2011 p. 254). According to Ukrainians, the reputation of their leader is the great value of the role he plays for his nation because his behaviour is perceived to be noble and in line with moral principles. Reputation is an effective mechanism for reinforcing social norms, as well as desirable behaviour and attitudes. Thus, any action that goes against the rules of the community can lead to a lowering of our rating in the community. This is shown by Zelenski in the trials of people in power or oligarchs, where reputation can also be a drain on those in power if lost through betrayal, corruption or fraud.

3. Personal sources of leadership

3.1. Knowledge

An important aspect that affects the image of a leader is his or her knowledge and experience. A leader should be an expert in a given field, and if he or she is not, he or she should have advisors in his or her entourage. This is precisely the method used by the Ukrainian president, who in matters of military and strategy, bases his knowledge on commanders who build their experience on: cooperation with NATO troops, missions abroad and fighting battles against invaders since 2014. It probably doesn't take anyone to convince them that without knowledge of historical issues as well, modern leaders would not be so successful . It is thanks to the experience of his homeland that Volodymyr Zelenski is able to plan effectively and look to the future, as well as evoke respect for his actions from those around the world. People with skills and knowledge, have greater potential and are likely to surpass the achievements of those who only have power. Knowledge and experience is a power that not only enhances our ability to exercise control over others, but also gives us the ability to lead and influence other people. Knowledge in leadership is what we know, how we know how to do things, influenced by our skills, talents and abilities. All of these attributes were built and assimilated by the Ukrainian president during his admittedly short presidential tenure, following the principle that the longer we learn, the more knowledge we have and the more influence we can have in society. Leadership derived from knowledge is displayed by Zelenski, who by mastering new skills, developing leadership talents and demonstrating his abilities, enables others to benefit from Ukraine's achievements to rebuild a sovereign and independent state. Knowledge gives power when others recognise and value what you know and can do, and when you share it. This is precisely the behaviour that characterises our hero. It is important to emphasise that we admire those who have knowledge and above-average skills, but until they are adequately used, they will not build a leadership position. Volodymyr Zelenski knows this very well, communicating daily with his citizens and the outside world in the struggle to help his homeland. The power that comes from knowledge grows from what you know. The more you know, the more power you have, provided that other people notice and appreciate your involvement. We can distinguish between several types of knowledge, and these are procedural and institutional knowledge. An important type is personal knowledge; it gives information about people. It allows you to better motivate work, action and struggle. It can transform an informal network into a team. These values for management and team-building have been used by the President of Ukraine, who, with insight into his people, is able to remedy difficulties and threats. He also learns from his experiences and demonstrates sound knowledge when dealing with foreign partners. He realises that it is a persuasive tool that is able to find common ground between divergent viewpoints and to win approval among those who were initially hostile to his demands for support for Ukraine. Operating from a position of credibility and skill gives Volodymyr Zelensky a significant advantage over Vladimir Putin when it comes to the respect and trust of world leaders.

3.2. Ekspressivity

Expressivity is the ability to communicate persuasively and effectively. It is used by Zelenski to motivate, inspire, fire the imagination and stir emotion in the world as well as in his own people. His rhetoric, eloquence, metaphors, images that stir the emotions and imagination, patterns of behaviour, gestures, body language, inspire the entire democratic world. Expression goes hand in hand with a predisposition to lead and influence others. This is because expressive people communicate more often and are therefore more visible. The President of Ukraine is able to express his thoughts and feelings, making others aware of the idea of a free Fatherland. He is assertive in the face of Ukraine's traitors, thus showing his leadership in the nation and being seen as a competent and influential person. The research also showed that the most influential people did not dominate through intimidation or threats but offered more solutions.

Ukraine's leader is a great rhetor who knows how to build arguments and give evidence to achieve goals for the good of his country. His speeches are powerful, in tune with the surrounding reality and emotionally moving.

He uses images and metaphors in his speeches, also using repetition to reinforce his extraordinary speeches. With his own enthusiasm in speaking about the tragedy of his people, as well as bold gestures towards those leaders who are sceptical to support Ukraine achieves victory. With open speeches and commitment he encourages possible allies, but also sceptics, to support his state. Zelenski speaks from the heart and his concepts resonate with the nation's beliefs. He attracts the whole world by inspiring through creating bonds and gaining trust with other nations. His tactic to those doubting that Russia is leading the annihilation of the Ukrainian people is to ask insightful questions about how they would act if it involved their country. This expressiveness greatly enhances his ability to influence people's interactions within their nation, but also in the world for peacebuilding in Ukraine. In summary, of all the sources of leadership, it is expressivity that has the greatest potential impact.

3.3. The power of attraction

The power of attraction is the ability to make others like oneself. It then creates the phenomenon of referent leadership, which results from identifying and likening oneself to the person of the leader. Attraction power can also result from similar values, attitudes and beliefs. Zelenski has shown in his action that he is not only an icon of resistance, but also one of the one of the main actors of action. As a leader, he knows how to perfectly construct messages aimed at different audiences, thus attracting people to him. He is able to inspire and convince them and motivate them to take action. This allows people to have a positive attitude towards him, to be open to working with him or helping Ukraine. His ability: to inspire compassion, a willingness to help the other person, a common goal to fight the invader, responsibility, charisma is the source of the leadership that is the force of attraction. Parallels are also important in this phenomenon, Zelenski uses this in cooperation with countries that have also been exposed in their history to fight with an aggressor. The unusual phenomenon of the power of attraction is charisma, which was defined by Max Weber as a personality trait of a person that distinguishes them from others by supernatural superhuman powers or qualities. Weber also believed that charisma is a gift from God, but in today's world we think of it as a person who is sincere, authentic, self-confident, energetic, assertive and a visionary open to people. Similar beliefs, values, authenticity, shared experiences, is what attracts us to each other The President of Ukraine knows this and uses it in his public speeches around the world, he realises that if we respect someone, he attracts us to himself and inspires recognition. Attention is drawn to his sincerity, directness and kindness, empathy, ability to arouse sympathy, but also authenticity. Draining the power of attraction, is acting contrary to the truth, contradictory values, inability to listen to subordinates, lack of sensitivity, these aspects are what Zelenski tries to highlight by showing the attitudes of his enemy Vladimir Putin.

3.4. Moral

Morale is an extremely important personal source of leadership, it enhances the ability to lead others and influence because people trust noble individuals and see them as role models. Zlenski, through his wisdom, knowledge, courage, humanity, fairness and humility, inspires trust and gains great interpersonal skills. Morale is a fundamental element of a person's credibility and underpins the other personal sources of leadership. For leaders, it is the strongest magnet that attracts followers. Analysing the character of our hero, we find in him the ideal of a leader because he authenticates our values and beliefs that he fights for his homeland . Zelenski knows that he must create strong ties with the democratic world and his compatriots. At the same time, he realises that if they see stains on his honour, the power of his leadership and influence will diminish significantly. Why high morale is so important in a leader. As Kevin Cashman defines, when we lead others through the nobility of our character, we inspire in others authenticity, desire to achieve, openness, trust, courage, consistency and compassion (Cashman, 2008, p. 45). Zelensky's high morals are: wisdom, courage, integrity, determination and, finally, tirelessness. It is also important that the world regards him as a noble, authentic and reliable man. The drain on morale is most often pride, excessive pride and self-confidence, these qualities often disqualify leaders, one must assume that this does not threaten the President of Ukraine. For true leadership is about skilfully exerting influence and not using one's power because that is ‘immoral’, according to. Cashman, high morale is something deeper and broader than deeds or achievements because it stems from the very essence of a person. This idea suggests that if you do the wrong thing, your end could come at any moment, and then there will be no time to change the course of events. Therefore, authentic leadership is based on high morale, if it is lacking it means we are not fit to lead others.

3.5. Common history

A shared history is a resource resulting from shared experience, intimacy and trust. A unique form of collaboration due to the existence of a positive relationship between two people, leader and subordinate. It causes us to have respect for each other, but also for others, to be reliable, agreeable and predictable. The longer we know each other, the greater the predictability. The shared history also carries over to people we do not know, but we share a common baggage of experiences and memories. This is one of the stages of building leadership. Despite the threats to his life, Zelenski is present where the most horrific Russian atrocities took place, such as in Bucha, Irpin, and even on the front line, where difficult battles are fought, as on 20 December in Bakhmut on the 300th day of the war (Kamińska, 2023).

This source is built by the President of Ukraine gradually depending on getting to know each other, mutual respect and attachment. He builds this through interactions and constant contact with his soldiers on the front line. He shows that he belongs to this group of warriors with whom he identifies, and builds a closeness, a bond that makes them follow him in this fight to liberate the homeland. This ability of his to lead and influence others grows despite the still ongoing war. This is possible because he effectively builds a close relationship with the nation. Leadership stemming from a shared history is created in stages as people get to know each other, create a record of joint actions, mutual respect, trust and attachment. Zelensky's strength of influence stemming from a shared history builds on personal contact with compatriots and interacting with them. Within this source of leadership, the creation of a virtual history through social media is extremely important. In recent years, this has been one of the newest and most rapidly growing online tools as communicators. This tool Zelenski uses to great effect. It allows him or her to expand his or her capacity to lead and influence others, as it has a huge and rapid reach through social media. A virtual story does not put up walls and limitations, but only widens the number of those who are or want to be with us or like us. The leadership source drain resulting from a shared story arises when we don't tell the truth, we want to get too much without giving anything in return. This is because closer knowledge and reality checks can have the opposite effect. The leadership source of a shared story is used well Zelenski knows that it is a unique power of influence, resulting from shared experience, trust and interaction between leader and follower, sender and recipient of persuasion. Such an art of relationship-building relies on the mutual fusion of relationships. The President of Ukraine realises that leadership resulting from a shared history is not permanent, it grows or diminishes depending on the attitudes, feelings and needs of each person in the relationship. That is why I nurture it by getting to know each other with whole nations of the world, but individuals, keeping the trust in my position intact.

Conclusion

Today, Ukraine and its president are a symbol of a romantic freedom spurt with a simultaneous sense of belonging to Western civilisation. So who is the contemporary leader? Taking into account the above-mentioned descriptions of Volodymyr Zelensky's personality, it can be said that he is a courageous person, who strongly defends his views, believes in his goal, commands respect and is a great authority for millions of people. As a leader, he has also shown himself to be decisive, with strong interpersonal skills, who explains the goals of defending the Fatherland in a clear and lucid manner. What is important for others' perception of Zelensky's leadership is the consistency of his behaviour with his personality, values and goals. It can be said that Volodymyr Zelenski has transformed overnight into a leader of the nation and one of the most important and influential leaders of the free, democratic world. His daily speeches and comments shape the decisions of the leaders of many countries of the globe and their assessment of what is happening in Ukraine, co-leading the resistance against Russia . The past year has shown that Zelenski has tremendous political talent and has become a model of a wartime leader, a symbol of steadfastness, an inspiration to many. He has shown that he is able to analyse reality from day to day, on the fly, to present it in daily speeches, and on top of that, to present such relevant conclusions and demands that they become the subject of political discussions by the leaders of the main Western countries.

Summarising the above, it can be said that the conscious activity of superiors should evolve from the level of formal authority to the level of respect for the leader and commitment in subordinates, which will at the same time be identified with leadership. The Ukrainian president showed us that if you want to be a leader you have to change the attitudes of your subordinates, you have to motivate them, build well-functioning teams, have visions and be a good manager. These considerations lead to the conclusion that having only the professional qualifications necessary to fulfil one's duties does not today condition effective leadership and leadership of human teams. Seeing leadership as an enabler of management enables more effective action and leads to the integration of the team and creates interpersonal relationships that allow for partnership and cooperation between the leader and subordinates and creates a leadership position. However, it is not us who decide whether we become leaders. This is decided by subordinates and colleagues taking into account the skills, attitudes presented, values and their compatibility with the statements made. If you want to be more influential as a leader, nothing counts as much as your personal power of influence and desire to lead.

References

1. Bacon T. (2014). Sztuka Skutecznego Przywództwa, Gdańskie Wydawnictwo Psychologiczne, Sopot.
2. Balasiewicz A., Chojnacki, W. (1997), Podstawy projektowania programów kształcenia w perspektywie integracji z NATO, Ministerstwo Obrony Narodowej, Warszawa.
3. Borkowski J., Dyrda M., Kanarski L., Rokicki B. (2001). Człowiek w organizacji. Podręczny słownik psychologii zarządzania i dziedzin pokrewnych, Elipsa, Warszawa.
4. Broniarek W. (2005), Gdy Ci słów zabraknie, Haroldson, Brwinów.
5. Cashman K. (2008), Leadership from the inside out, Berret-Koehller Publishers, California.

6. Dyrda M. (1997). Sprawowanie funkcji dowódczych, Psychologia w wojsku, Wojskowe Centrum Edukacji Obywatelskiej, Warszawa.
7. Gawliczek P., Kanarski L. (2002), O perspektywach przywództwa w Siłach Zbrojnych RP, Myśl Wojskowa nr 2.
8. Gonczarenko R., Wołodymyr Zełenski to jego Putin nie docenił najbardziej https://www.dw.com/pl/wo%C5% 82odymyr-ze%C5% 82enski-to-jego-putin-nie-doceni%C5%82-najbardziej/a-64801271, [dostęp: 23.02.2023].
9. Jak być dobrym przywódcą ?https://poradnikprzedsiebiorcy.pl/-jak-byc-dobrym-przywodca-cz-3-jak-cie-widza-tak-cie-pisza-kilka-slow-o-wizerunku-przywodcy, [dostęp: 23.02.2023].
10. Kamińska A. M., https://polskieradio24.pl/5/1223/artykul/3115255, narodziny-przywodcy-wolodymyr-zelenski-symbol-i-wzor-oporu-przeciw-agresji-rosji, [dostęp: 23.02.2023].
11. Łydka W. (2013), Źródła przywództwa w organizacji, Zeszyty Naukowe AON nr 2(91).
12. Majewska-Opiełka, I. (1998), Umysł lidera, Wydawnictwo Medium, Warszawa.
13. Stogdill R. M. (1974), Handbook of Leadership, Free Press, New York.
14. Tomczyk M. (2008), Wielki słownik wyrazów bliskoznacznych, Krakowskie Wydawnictwo Naukowe, Kraków 2008.
15. Witwicka-Jurek K., Potrzebuję amunicji, a nie podwózki https://wiadomosci.radiozet.pl/Swiat/Zelenski-odrzucil-propozycje-USA.Potrzebuje-amunicji-a-nie-podwozki, [dostęp: 26.02.2022].

ARTICLES

CENTRAL EUROPEAN REVIEW OF ECONOMICS & FINANCE
Vol. 49. No 4 (2024) pp. 63-86
DOI https://doi.org/10.24136/ceref.2024.015

Klaudia Zielińska-Lont[1]

FINANCIAL STABILITY REFORMS IN EUROZONE AND CHINA – EXPERIENCES IN IMPLEMENTING BASEL STANDARDS

Abstract

The aim of this article is to evaluate the existing differences in managing financial stability in the European Union (EU) and China and the net impact that changing prudential requirements had on credit institutions over the years. The first part of the article presents an overview of the regulatory reforms undertaken in both regions. Second part presents the results of a quantitative comparative study using multivariate comparative analysis, measuring the relative financial condition of the largest credit institutions from China and the EU. Results confirm that the new prudential requirements and gradual economic slowdown have collectively diminished the competitive advantage of Chinese banks versus its EU competitors. Study concludes that financial stability in China has been negatively impacted over the course of last five years and that the ongoing reform of the country's financial safety net is both timely and needed.

JEL codes: F36, G21, G28, G32.

Keywords: Basel Committee, credit institutions, financial stability, multivariate comparative analysis.

[1] PhD, Department of International Business and Trade, Faculty of Economics and Sociology, University of Łódź.

Introduction

The collapse of regional banks in the United States in the beginning of 2023 and then bankruptcy of the Swiss entity, Credit Swiss, has restarted the discussion about safeguarding financial stability among academics and analysts. This article studies the measures undertaken to manage and safeguard financial stability, often understood as stability of the banking sector, in the two host-regions of some of the largest credit institutions of the world – the European Union (EU) and China.

Growing number of reports and academic articles signals concerns over China's slow economic recovery, problems of the domestic real estate market and a rising number of small, high-risk credit institutions and shadow banking (see Lin, Morgan et al. 2018; Kauko 2020; Prasad 2023). These concerns cannot be unsubstantiated, since they have collectively triggered China to announce a major overhaul of the national financial safety net. This includes a restructuring of the institutional setup of the national supervisory bodies, a new draft Financial Stability Law and ongoing works around the application of Basel III capital requirements. The new framework was to modernize the prudential oversight over the country's financial conglomerates and help addressing the growing concerns over strong ties between the state and the domestic banking institutions managing its multi-billion debt (Chorzempa, Véron, 2023). The ongoing reform of China's safety net creates a good opportunity for a comparative analysis to Europe's experiences in addressing regulatory loopholes past the financial crisis of 2008 and the sovereign debt crisis that followed. Although the EU's reforms have been triggered after the crisis has already emerged, their aims remain closely aligned with those pursued in China as of 2023.

The European Union is an interesting region to study in terms of financial stability and regulatory oversight not only because of the size of its banking sector, but also due to the unique nature of its supranational financial safety net, the banking union. The elaborate regulatory framework for financial institutions in the EU applies directly to 112 significant institutions, setting the benchmark for cross-border, coordinated supervision over banks active in the region and globally.

The aim of this article is to evaluate the differences in managing financial stability in the European Union and China and the net impact changing prudential requirements had on credit institutions over the years. Study results are expected to contribute to international literature through highlighting the residual differences in regulatory oversight over the world's largest credit institutions originating from China and the EU. The results are also to extend the knowledge about the influence of changing prudential requirements and worsening economic conditions on the relative performance of Chinese banks when compared to its large global competitors.

In order to achieve the stated goal, a comparative analysis of both quantitative and qualitative nature will be performed. First, general considerations around the regulatory framework established for financial institutions will be presented in contrast at a macroeconomic level. Then, a comparative analysis based on a dedicated synthetic measure, building on a set of popular financial indicators calculated for selected systemically important institutions from both regions will be performed to quantify the commercial implications of the changing regulatory regimes described in the first section. Finally, conclusions will be presented, summarizing the results of both qualitative and quantitative research.

This study contributes to international literature through evidencing the applicability of Multivariate Comparative Analysis (MCA) tools to studying the phenomenon of financial stability and consequences of changing prudential requirements imposed on commercial banks. The results evidence the considerable yet diminishing competitive advantage of Chinese banks over their EU-based competitors, stemming from quick growth of China's economy and less strict regulatory oversight. Results also pointto the timeliness of the ongoing reforms aimed at improving financial stability in China.

1. Financial stability – definitions, best practices, safeguards in EU and China

Financial stability is a term which does not have a single, universally agreed definition. The discussion on the phenomenon has started in XIX century and is still ongoing. It should be noted here each time an economic crisis occurs, the discussion becomes more intense again.

First time the term financial stability was used in the context of the banking sector was by Holland, a member of the US Federal Reserve System's Board of Governors in 1975 (see Urbanek ed., 2012, p. 19). Among the first central banks to quote the concept of financial stability as part of its strategic aims were Bank of England and Banque de France (Zielińska-Lont, 2021, pp. 16-17). The existing definitions of financial stability can be divided into two groups – "positive" and "negative". First group of definitions focuses directly on stability of financial sector. Under this group, Crockett (1997, p. 8) states that the financial system is stable if it does not permanently lose liquidity or become insolvent. Kaufman (1998, pp. 45-46) focused more on the banking system, which – according to him – needs to be capable of absorbing losses when assets price bubbles burst. For two other academics, Trichet (2000, p. 197-199) and Duisenberg (2001), financial stability means that financial institutions work harmoniously, and international exchange rates are stable and predictable. Close to their interpretation is a definition presented by the Padoa-Schioppa (2002, p. 20), who defined financial stability as a state in which financial system is resistant, experiences no disruptions in the payment settlement system and allows for optimal allocation of resources in the economy. As such, it is also to be able to absorb external shocks. Issing (2003) states that a stable financial system is able to permanently ensure proper performance of its functions, enabling the transfer of funds from holders of excess capital to investors. Schinasi (2006, p. 82) states that a stable financial system not only ensures seamless transfer of funds, but also provides information necessary to evaluate investment risks and helps stabilizing the economy in the event of a financial shock. Some definitions also discuss financial stability in a broader macroeconomic perspective – banking system can only be deemed stable in the long term, if it is underpinned by a responsible monetary policy and efficient regulatory oversight over the financial sector (Constâncio, 2014; Aikman, Haldane et al., 2015, pp. 1072-1109).

Second, "negative", group of definitions of financial stability aspire to describe the phenomenon through characterizing the state of instability. Davis (2001, p. 2), perceives financial instability as a state of an increased risk of financial crisis, which, in turn, he defines as a collapse of the financial system that loses the ability to service payments and grant loans. Similarly, Chant (2003, p. 3) considers financial instability as any situation on the financial markets that may lead to disturbance in how the financial system functions. According to Ferguson (2003) financial instability is a state when the valuation of assets is disturbed and access to financing is limited. Mishkin (2011, p. 11) describes financial instability as a disturbance in the flow of information that results in the financial system being unable to transfer funds to profitable investment opportunities.

Finally, it is worth quoting financial stability definitions that are used by selected central banks. The European Central Bank (ECB) (2021) defines financial stability "as a situation where the financial system, including financial intermediaries, financial markets and financial market infrastructure,e is able to withstand shocks and emerging financial imbalances. This limits the possibility of disturbances in the financial intermediation process that would be so severe as to disturb the profitable allocations of savings." The Federal Reserve System (FED) (2021) has financial stability set as one of its six goals, stating that the financial system is stable when its institutions are able to offer its products, resources and services to households, communities and business, for the benefit of economic growth. The People's Bank of China (Central Bank of China) does not offer an outright definition of financial stability, yet defines prevention of systemic risk accumulation, its procyclicality and potential contagion effect, as central element of its macro-prudential policy. The draft Financial Stability Law stipulates that maintaining financial stability requires strict supervision of financial institutions, addressing sources of systemic risk, preventing moral hazard and protecting the rights of all the citizens.

1.1. Basel Capital Accords – universal recommendations on ensuring financial stability

As outlined in the previous paragraph, financial stability is very often understood as stability of the banking sector. This sector's significance therefore justifies strict regulatory oversight over banks. Today, in the global world, when credit institutions operate in multiple different countries at the same time, the authorities have recognized the need for common regulatory standards and coordinated supervision over large financial institutions. Recommendations on regulatory requirements, widely accepted by many countries, are designed and issued the Basel Committee on Banking Supervision (BCBS). The Basel Committee was established in mid 1970s under the auspice of the Bank for International Settlements. In 2024 BCBS is comprised of 45 members – central bank and supervisory body representatives from 28 jurisdictions. It should be underlined that the Basel Committee is a forum, where countries cooperate for efficient regulation of credit institutions – the Committee issues technical standards and recommendations and, as such, they are not legally binding. Nonetheless, many countries choose to implement Basel's solutions into their legal systems.

Basel recommendations are known as Basel Capital Accords. Until 2023 BCBS released four accords. The first one, known as Basel I, was established in 1988, when the Basel Committee recommended establishing minimum capital requirements, calculated against the bank's credit risk exposure. Furthermore, the Accord presented the definition of risk-weighted assets and a minimum ratio of the banks' own funds to its risk-weighted assets. The institution's regulatory capital value calculated this way had to present no less than 8% of its risk-weighted assets (BCBS, 1988). Basel I was amended several times to further specify the requirements.

In 2004 Basel Committee presented a revision of the Basel Capital Accord, called Basel II, which was updated again two years later. It introduced an updated credit risk assessment, with more detailed guidance on how to calculate the operational risks borne by the banks and at the same time recommended obliging the banks to publish data on their risk exposure and capital adequacy (BCBS, 2003, p. 398). Notwithstanding the considerably more detailed form of the revised recommendations, Basel II was not implemented efficiently or broadly. One of the reasons, and possibly also the consequences, was the global financial crisis of 2007. As an increasing number of banks was facing bankruptcy, it became apparent that even proper implementation of Basel II would not be sufficient to safeguard financial stability. In 2008 BCBS announced measures to fill the gaps identified during the crisis and to better capture the bank's actual risk exposure (BCBS, 2008).

Basel Committee presented Basel III in 2010. The new Accord contained new guidelines for maintaining high-quality capital and for covering the banks' liquidity. Basel III focused mainly increasing and reinforcing the bank's core capital which is available at hand and its value is relatively insensitive to extreme market conditions. In addition, the default capital requirement was to be supplemented with a capital conservation buffer, set administratively to enhance the credit institutions' loss absorbing capacity during economic shocks. Similarly, a countercyclical capital buffer was proposed to enable supervisory authorities to adjust the level regulatory capital requirement according to the phase of the economic cycle. This was to prevent accumulation of risk on one hand and overly restrictive requirements that could impact access to credit on the other (BCBS, 2010). Moreover, in addition to suggesting the minimum level of financial leverage ratio of at least 3%, Basel III introduced two new liquidity ratios – Liquidity Coverage Ratio (LCR) and Net Sable Funding Ratio (NSFR). The LCR was responsible for reinforcing short-term liquidity and NSFR was to ensure long-term balance between the maturity of assets and liabilities (BCBS, 2013b; 2014).

In 2017, further amendments to the Basel III were presented. Given their relatively broad scope, they are frequently referred to as Basel IV by many academics. Basel IV was set to limit the freedom of the intra-bank approach to valuating asset risks. More limited scope for bank's individual approach to risk modelling was set to ensure that all the ratios that were to be maintained and publish according to the Basel Accords, were both more accurate and comparable between the regulated institutions (BCBS, 2017).

The recommendations issued by the Basel Committee progressively increased the stability of the banking system and compelled banks to independently cover losses they might incur under their business activities. Table 1 presents a brief overview of changes made by BCBS to their recommendations in terms of capital requirements.

Table 1. Own funds requirements of credit institutions according to Basel I, II and III

Buffer type	Basel I	Basel II	Basel III
Solvency ratio	8%	8% (incl. 2% for CET1)	8% (incl. 4.5% for CET1)
Capital conservation buffer	0%	0%	2.5%
Countercyclical capital buffer	0%	0%	0%–2.5%

Source: Own work based on Basel Committee on Banking Supervision (1988; 1999; 2001; 2004; 2006; 2008; 2010).

The discussion on establishing a more resilient banking sector is still ongoing. Basel Committee is now challenged to address problems such as financial digitalization, banks' exposure to crypto assets and climate related financial risks. At the same time, global presence of an increasing number of financial institutions makes coordinated oversight and common regulatory standards more important than ever before. The following chapters will discuss Basel recommendations implementations in both China and the Eurozone, hosts of several of the world's largest credit institutions.

1.2. Basel recommendations implementation in the European Union and in China

Over the past decades China has grown to become one of the most powerful and largest economies in the world. China's very quick economic growth is a very interesting topic for many academics, but the financial architecture in this country remains a relatively unexplored. Nowadays China hosts several of the largest banks in the world, measured by their assets value. At the same time, the financial architecture in China is not as complex as in the European Union or in the United States because of both historical and political influences.

Looking briefly at the history of the country's financial sector, China was first operating a "monobank system" in the planned economy, when People's Bank of China (PBOC) played a role of the central bank and financial supervisor (Lardy, 1998). Since the late 1970s creation of commercial banks and financial firms was allowed. This was the turning point that has contributed to the fact that now China has a huge and developed financial sector. Cherzempa and Veron (2023) point to the fact that Chinese banking system is the world's largest in terms of aggregated assets. Since 2018 four of the world's largest banks by the total assets owned originate from there – the Industrial and Commercial Bank of China, China Constructing Bank, Agricultural Bank of China and Bank of China. The characteristic feature of the banking sector in the Republic of China is the fact that commercial credit institutions remain under state ownership. Under such circumstances, it should be underlined that Chinese financial sector cannot be deemed free from the political influences of the Chinese Communist Party (CCP).

In terms of regulatory oversight, in 1992 Chinese government established the China Securities Regulatory Commission (CSRC). Six years later, in 1998, the Chine Insurance Regulatory Commission (CIRC) was established for oversight of insurance companies and in 2003 China Banking Regulatory Commission (CBRC) was created. Since then, China was operating a traditional sectoral model of supervision, with the PBOC playing the role of a coordinator. The CBRC took control of safeguarding the banking sector stability and promoting innovation and competitiveness among Chinese credit institutions (Zielińska-Lont, 2020, p. 65). Basel recommendations have also been implemented into Chinese law, set to take effect in early 2004, but in limited scope and in a selective way, particularly with respect to related public disclosure obligations stemming from Basel II (Cousin, 2011). A more detailed analysis by Brehm and Macht (2004, pp. 316-327) signalled that the truly major source of non-compliance stemmed from the political dependence of the Chinese supervisor rather than transposition of the legal provisions. In any case, it needs to be emphasized that it was an enormous challenge for the CBRC to supervise the major Chinese credit institutions, which, according to the International Monetary Fund (2018), were experiencing credit growth rate of around 20% per year.

The sectoral supervision model continued to exist in China for fifteen years since the establishment of the CBRC. During that period, Basel III standards were implemented to the Chinese financial supervisory architecture through two consecutive documents issued by the CBRC over the course of 2012 (BCBS, 2013a). BCBS (2013c, p. 12) reported that the implemented capital requirements regarding the domestic's credit institutions were even more strict than recommended but could fall below the standard in case the Chinese sovereign debt rating would be reduced. It was also reported that the Chinese authorities signalled considerable commitment towards improved compliance with the Capital Accord along the review procedure performed by BIS in 2013. Nonetheless, certain deviations remained in place, including non-inclusion of public disclosure requirements on information regarding credit quality i.e., share of loans deemed to be impaired and the related loss allowance.

In 2015 China's authorities have established a deposit insurance agency although during the initial years this agency operated within the structures of the central bank (Desai, 2016). Four years later a Deposit Insurance Fund Management was created as a subsidiary of the Chinese central bank. In 2017 China established the Financial Stability and Development Committee, which managed all the supervisory agencies and was tasked with taking the lead on pursuing a broader financial reform. Financial supervision architecture was reformed in 2018, when China Banking and Insurance Regulatory Commission (CBIRC) was created and made responsible for banking and insurance sector supervision[2]. It was also responsible for the systemically important financial institutions. Furthermore, central bank of China got more responsibilities for the supervision on financial market. This reform has marked the transition from a sectoral supervision model towards a partially-integrated one, similar to the Two Agency model pursued in France and Italy (Calvo, Crisanto et al., 2018). Nonetheless, according to IMF (2017) China's supervisor was not equipped with sufficient to effectively supervise such a huge and complex financial system.

In March 2023, so five years after last reorganisation, China's authorities have adopted a new package of reforms. According to the announced reform the China Banking and Insurance Regulatory Commission was reformed into the National Financial Regulatory Administration (NFRA) mid-May 2023,

[2] New created agencies were consolidated two agencies Chine Insurance Regulatory Commission and China Banking Regulatory Commission.

also taking over some of the supervisory tasks from the PBoC and the securities regulatory authority. The NFRA has therefore become directly responsible for consumer and investor protection and has also taken the lead on numerous anti-fraud investigations in credit institutions throughout China. The new "superregulator" has been formed directly under the auspice of the State Council, so the political drive of the institution remains in place.

The history of regulatory oversight over credit institutions in Europe is naturally much longer and more complex than in China. For the purposes of this article, it should be noted that Member States operate different regulatory frameworks (as indicated in table 2) but the Euro area countries have also managed to develop a supranational framework for prudential supervision. The Eurozone is therefore a very interesting subject of an analysis, with a very far-reaching scope of international integration in terms of regulatory oversight.

Table 2. Supervision models applied in Europe

Supervision model	Country
Integrated	Austria, Bulgaria, Croatia, Estonia, Finland, Greece, Ireland, Italy, Latvia, Lithuania, Malta, Slovakia,
Partially integrated	Belgium, France, Germany, Italy, Netherlands, Slovenia, Spain
Sectoral	Cyprus, France, Luxembourg, Portugal

Source: Own elaboration

Eurozone's authorities have organized supervision over the financial market differently for macro- and microprudential levels. For macro-prudential supervision, responsibility has been transferred onto the European Central Bank and the national central banks. Tasks related to micro-prudential supervision were divided between three institutions: European Banking Authority (EBA), European Insurance and Occupational Pensions Authority (EIOPA) and European Securities and Markets Authority (ESMA). At macro-prudential level the banking union was established, building on three pillars – Single Supervisory Mechanism (SSM), Single Resolution Mechanism (SRM) and European Deposit Insurance Scheme (EDIS).

Basel Committee recommendations have been introduced in the European Union (i.e. not only Euro Area Member States), through the adoption of directives that further had to be implemented into national law of the Member States. First EU-level implementation took place in 2006 and transposed the provisions of Basel Acord II as Capital Requirements Directive (CRD) and Capital Adequacy Directive (CAD) (Directive 2006/48/EC; Directive 2006/49/EC). They were then revised through a new directive in 2009 (Directive 2009/111/EC, CRD II) and again in 2010 (Directive 2010/76/EU, CRD III). Amendment from 2009 allowed for the inclusion of hybrid capital when calculating the capital requirements for banks. The modification from 2010 obliged credit institutions to introduce renumeration policies for managers in a manner that did not encourage excessive risk taking. It is worth to underline that the adoption and subsequent implementation of the revised recommendations took place during the global crisis.

In 2013 the European Union introduced the Capital Requirements Directive IV (CRD IV) and the Capital Requirements Regulation (CRR) (Directive 2013/36/EU; Regulation (EU) No 575/2013). This legislative package implemented Basel III recommendations, although with some modifications. According to CRD IV, credit institutions became obliged to publish information about their own funds. Measures were also introduced to limit the reliance on rating agencies in terms of assessing investment risk. What is more, new requirements have been introduced regarding the financial leverage level and size of capital buffers. In this respect, CRD IV has also detailed the size of different global systemically important institutions to establish five categories, each of which could have a different size of capital buffer defined. Finally, and as specified in the third Basel Capital Accord, CRD IV/CRR package introduced two new liquidity ratios – LCR and NSFR.

In 2016 European Commission (EC) proposed further changes to the CRD and CRR – called CRD V and CRR II, which were implemented three years later. The new amendments increased the risk weights for trading assets while reducing them for transactions with clearing houses (Directive (EU) 2019/878; Regulation (EU) 2019/876). In October 2021 the EC adopted a new Capital Requirements Regulation and Capital Requirements Directive proposal – called CRD VI and CRR III respectively. The amendments proposal was a consequence of the Covid-19 pandemic and its impact on the banking sector. The new legislative package has placed more emphasis on the green transition of the economy and requirements for credit institutions in this respect. Obligations stemming from Basel Accord aimed at ensuring that credit institutions do not undervalue risks related to asset price volatility, thereby lowering the level of capital they need to maintain to cover their exposures (Neisen, Röth, 2023). Moreover, comparisons between risk-based capital ratios across banks were to be simplified, restoring confidence in ratios and soundness of the sector overall. Political agreement on the latest legislative package was reached in June 2023 and the finalized acts will enter into force from 2025, with major parts of CRR III applying as of January and a deadline for national implementation of CRD VI set for mid-2025.

In spite of the shared aspiration to introduce a high standard of regulatory oversight over the largest financial institutions, the EU and China appear to be much apart not only in terms of advancements in reinforcing their safety nets, but also in terms of the size of the institutions they oversee (see figures 1 and 2). At the same time, the significance of cross-border activities of EU- and China-based banks is also very different, at least in the near future, as the Chinese institutions remain largely focused on the domestic economy. Nonetheless, globalization inevitably reinforces the ties between these institutions over time. The study results presented below are to depict the differences between credit institutions originating from EU and China and how they have been developing over the past decade, as new prudential requirements and thresholds have been imposed on them.

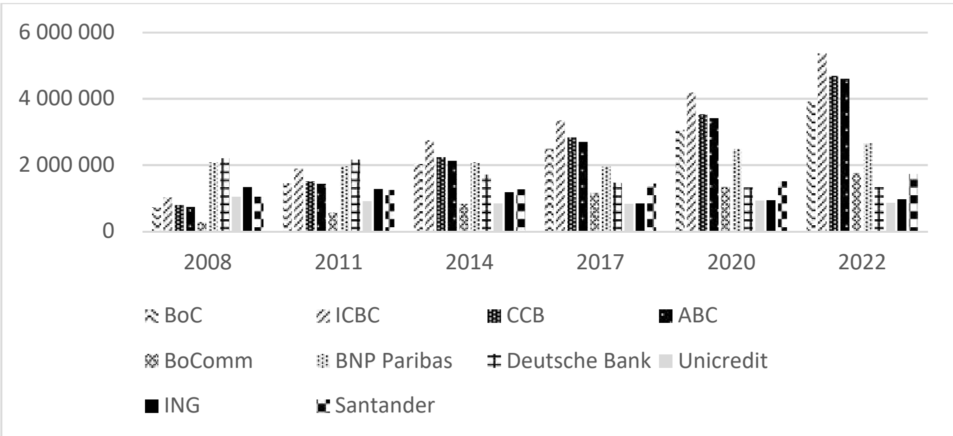

Figure 1. Total assets value (mln EUR)
Source: Own work based on consolidated financial statements of the studied institutions

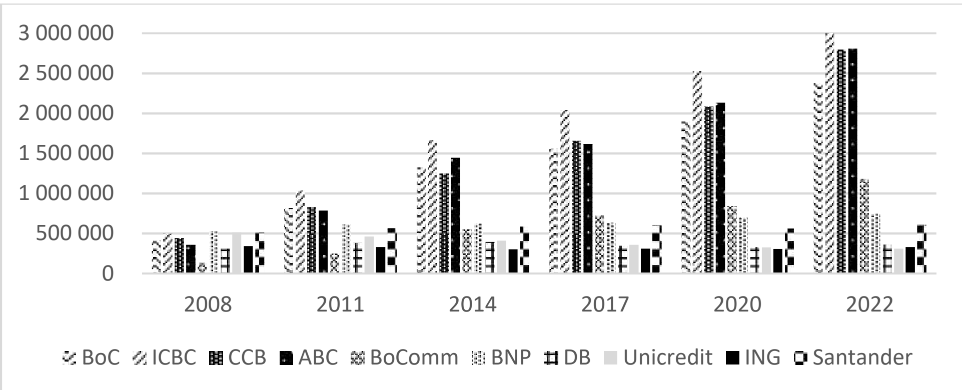

Figure 2. Risk-weighted assets (mln EUR)
Source: Own work based on consolidated financial statements of the studied institutions

Overall, it can be stated that the process of introducing prudential requirements, however more advanced in the Eurozone, is relatively similar in both regions. While EU banks have more experience with regulatory requirements, consecutive updates to the size and scope of the capital buffers, in particular, have made the process of adapting to the new obligations no less cumbersome to them. It is therefore interesting to analyse the financial aspects of meeting the prudential requirements imposed on credit institutions and study how well the banks have managed through the process. The main hypothesis for this part of the study is that China's largest credit institutions have largely outperformed the EU banks throughout the research period, benefitting from more favourable economic conditions in Asia and fast economic growth driving the demand for funding in both public and private sector. An additional hypothesis is that, with a growing list of economic problems reported for the Chinese economy since 2022, the relative stability of the country's financial institutions versus the EU will be weakened in the last year of the research period.

2. Data and methodology/empirical results

The study builds on a set of widely used indicators to perform a multivariate comparative analysis (MCA) of the analysed credit institutions. This tool is useful to analyse and rate objects and processes that cannot be directly measured (Panek, 2009, pp.58-74) and stability of contemporary financial institutions is undoubtedly a complex, multi-layer phenomenon that cannot be easily observed and studied. In the presented study, a synthetic indicator was applied to verify selected bank's loss-absorbing capacity, liquidity, and profitability indicators concurrently. Different studies analysing EU and Chinese banking sectors are typically focused on the different financial indicators either analysing the asset size and/or profitability of the banks. The MCA enables a more comprehensive analysis that can reflect the net impact of increasingly strict prudential requirements and changing economic conditions on the performance of some of the world's largest credit institutions. The resulting measure can also be used to test the impact of changes to the regulatory environment of banks in the spirit of the Basel Committee recommendations.

The study was conducted on a sample of ten credit institutions – five of them were chosen from China and five from Eurozone. Chinese institutions – Bank of China (BoC), Industrial Commercial Bank of China (ICBC), China Construction Bank Corporation (CCB), Agricultural Bank of China (ABC) and Bank of Communication (BoComm) – are the largest operating in the country and at the same time among the largest in the world in terms of the operated asset base. From Eurozone – ING, Santander, BNP Paribas, UniCredit and Deutsche Bank were selected – all of them have for many years been categorized as Globally Systemically Important Banks. The data was collected for the period 2008-2022 to capture the gradual implementation of Basel recommendations. All the information have been collected from consolidated financial statements of each capital group to study the global performance of the institutions and to analyse their stability as a whole.

To serve its purpose, the created synthetic measure should concurrently reflect changes in the bank's liquidity, profitability, and risk exposure to capture different aspect affected by the Basel-recommended prudential requirements. Basel Committee recommendations on establishing increasing capital and liquidity requirements have impact on the financial condition of financial institutions. Even if increased gradually, the studied credit institutions are very large and any changes to the structure of their assets and labilities translates into significant financial transfers. Indicators considered for the analysis were selected on the basis of their popularity and easiness of interpretation (Wiśniewski, Skoczylas, 2002, p. 159). As already mentioned, the potential components of the composite measure were selected from three groups – profitability indicators, risk exposure indicators and liquidity indicators. The considered list was as follows:

- Liquidity indicators:
  - Loans/deposits

$$L/D = \frac{loans\ to\ customers}{deposits\ from\ customers} \tag{1}$$

  - Net Stable Funding Ratio[3]

$$NSFR = \frac{available\ stable\ funding}{required\ stable\ funding} \tag{2}$$

- Profitability indicators
  - Return On Equity

$$ROE = \frac{net\ profit\ for\ year\ y}{average\ value\ of\ equity\ during\ year\ y} \tag{3}$$

  - Return On Risk-Adjusted Assets

$$RORAA = \frac{net\ profit\ for\ year\ y}{average\ value\ of\ risk{-}weighted\ assets\ in\ year\ y} \tag{4}$$

[3] It needs to be stressed that while the Basel Accords provide a detailed outline of how the NSFR should be calculated, the available data granularity would not allow for a precise calculation for all the studied banks. Instead, a simplified estimate was provided, comparing the value of granted loans, derivatives, other securities and assets on one hand and the value of deposits, long-term funding, provisions and equity on the other.

- Operating costs level

$$OPEX = \frac{operating\ expenses\ in\ year\ y}{average\ value\ of\ assets\ in\ year\ y} \tag{5}$$

- Risk-exposure indicators
  - Quality of receivables

$$QoR = \frac{impaired\ \&\ doubtful\ loans}{total\ value\ of\ loans} \tag{6}$$

- Provisions level

$$P_l = \frac{loan\ loss\ provisions}{total\ value\ of\ loans} \tag{7}$$

- Tier 1 ratio

$$T_1 = \frac{Tier\ 1\ capital\ i\ year\ y}{average\ value\ of\ risk\text{-}weighted\ assets\ in\ year\ y} \tag{8}$$

First step of constructing the synthetic measure is an examination of correlation matrices between the selected indicators. Due to strong linear correlation with ROE, Provisions level and NSFR, RORAA, QoR and L/D respectively had to be excluded from further analyses. Table 3 presents the final shape of the correlation matrix. Relatively strong correlation has still been calculated for Tier 1 and operating costs level, yet it was decided that this level was acceptable and largely coincidental. The decision follows the approach of Moore et al. (2013), where correlation at levels around 50% is described as weak or average.

Table 3. Correlation matrix for synthetic indicator's components

ROE	Provisions level	Operating costs level	Tier 1	NSFR	
1.000	-0.1437	-0.1404	-0.1733	-0.2476	**ROE**
	1.000	0.0172	-0.2874	-0.2975	**Provisions level**
		1.000	-0.4549	-0.0319	**Operating costs level**
			1.000	0.0084	**Tier 1**
				1.000	**NSFR**

Source: Own work

Before moving on to the next stage of constructing the synthetic measure, the values of individual components will be briefly discussed. Contrary to the common belief, the observed gap between the operating costs level of banks from the two regions is in favour of the Asian entities in spite of them being owned by the state (figure 3). Similarly, the return on equity offered by Chinese institutions was much higher (figure 4). In both cases, however, the gap between the regions is narrowing down, which likely results from slower economic growth in China over time and rising prudential requirements imposed on banks.

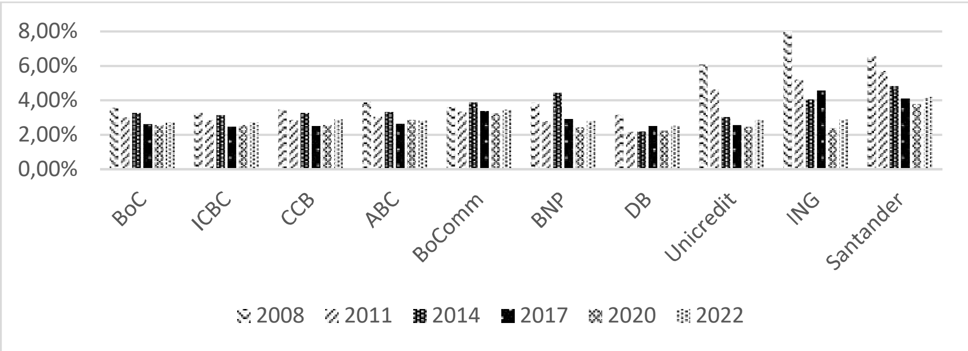

Figure 3. Operating costs level (%)
Source: Own work based on financial statements of the studied institutions

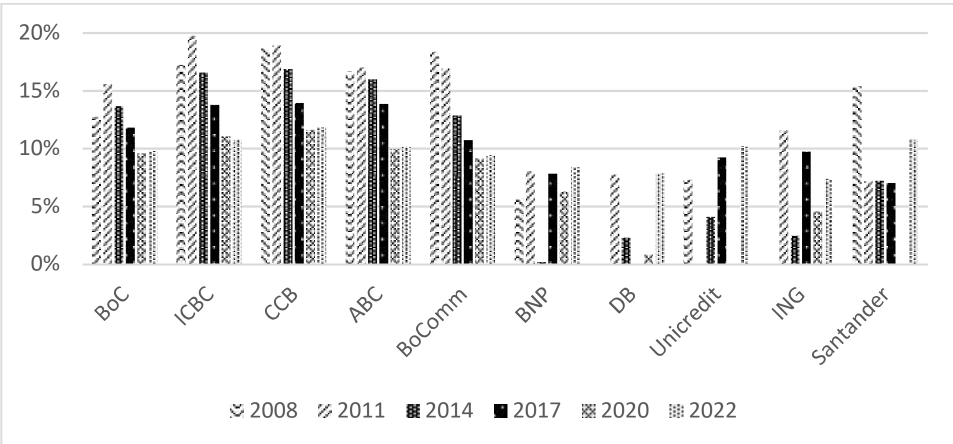

Figure 4. Return on Equity (%)
Source: Own work based on financial statements of the studied institutions.
Note: to keep the figure transparent ROE of 0 was shown for the years where banks incurred losses

Figure 5 shows that the provisions level maintained by the Chinese institutions was relatively high when compared to the levels reported by most EU-based banks. This was in spite of Chinese banks facing less strict prudential requirements. It deserves to be noted that variations in provisions level observed on figure 5 also tend to stem from changes to internal valuation of risks, as the case was for e.g. Unicredit.

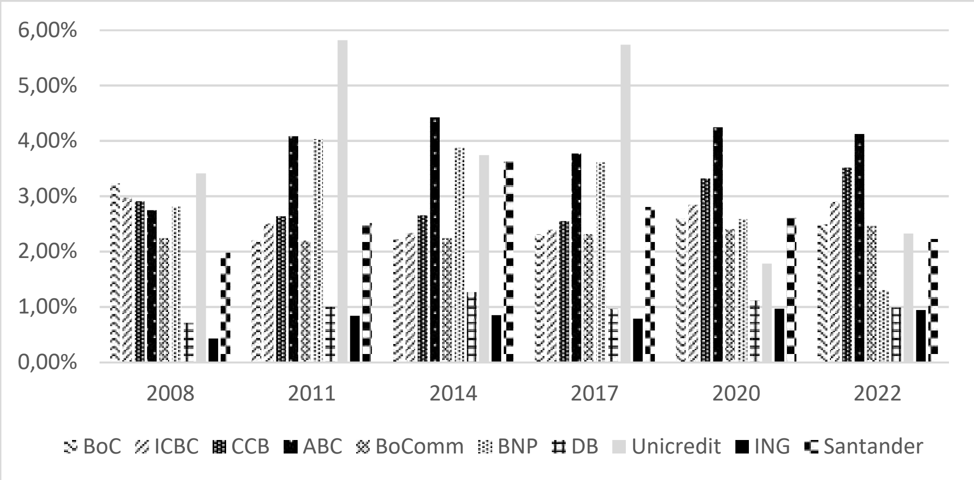

Figure 5. Provisions level (in %)
Source: Own work based on financial statements of the studied institutions

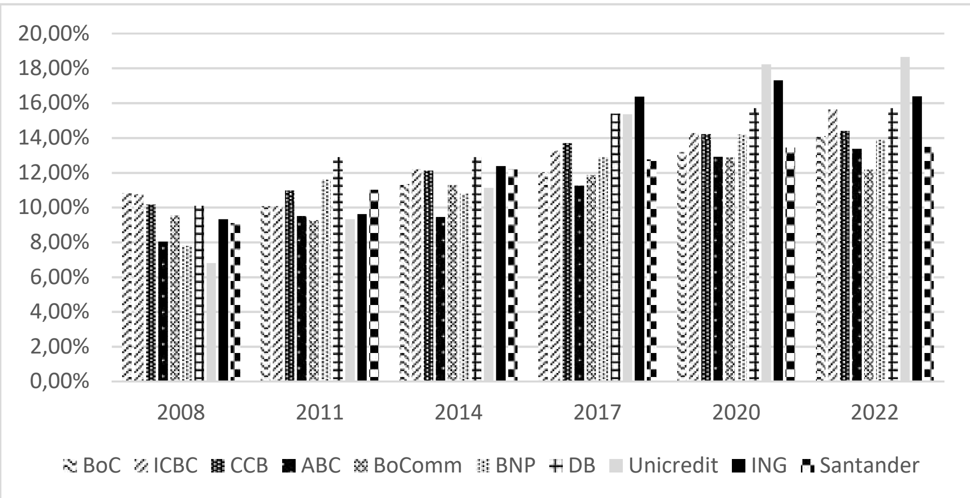

Figure 6. Tier 1 ratio (in %)
Source: Own work based on financial statements of the studied institutions

Figure 6 presents the changing level of tier 1 ratio for the research group over the course of the years. Apart from a clear upward trend observable for all the banks, a higher share of high-quality capital for EU banks can also be noted especially in the last three years selected for presentation. Similar conclusion can be drawn from analysing the calculated level of NSFR, as presented on figure 7. More importantly, the results suggest that three out of five Chinese banks just barely meet the 100% NSFR threshold, while BoC and ICBC are below it. Overall, it can be stated that analysing data on figures 3 to 7 in isolation does not allow substantiate making firm judgements over the condition and performance of banks in the two regions – on one hand Chinese credit institutions seem to be a lot more profitable, yet on the other they seem to be falling behind in terms of developing a robust capital reserve.

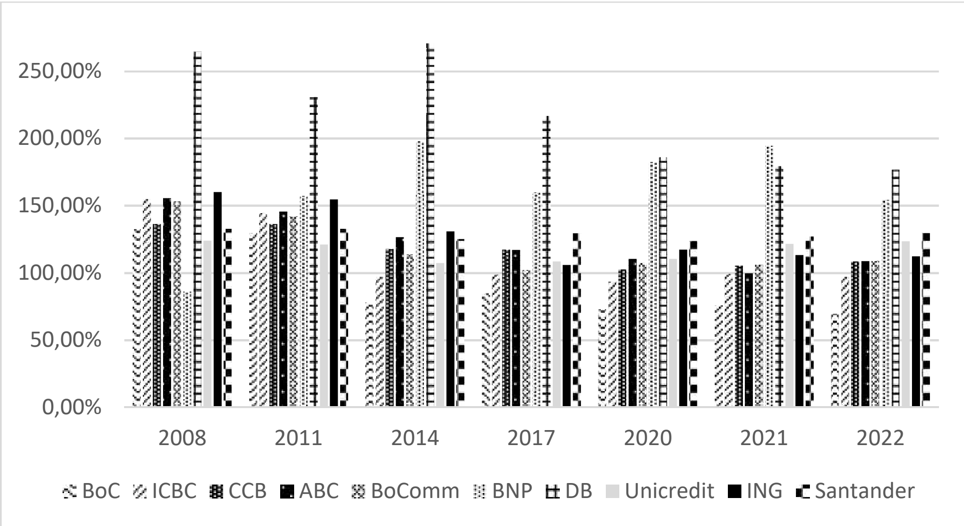

Figure 7. Net Stable Funding Ratio, NSFR (in %)
Source: Own work based on financial statements of the studied institutions

In the next stage the components of the synthetic measure had to be normalised to ensure their comparability and additivity (Walesiak, 2014). The normalisation method selected for this study required dividing the synthetic measure's components into stimulants, destimulants and nominants. Stimulants are indicators, high values of which are deemed desirable. Conversely, destimulants value should be as low as possible, whereas nominants are indicators, the value of which should fall within a defined range. The normalised ratios, which were used in the study were summed up to the synthetic measure for each of credit institutions according to the formula:

- Stimulants

$$n_{ij} = \frac{x_{ij} - \min x_{ij}}{\max x_{ij} - \min x_{ij}} \tag{9}$$

- Destimulants

$$n_{ij} = \frac{\max x_{ij} - x_{ij}}{\max x_{ij} - \min x_{ij}} \tag{10}$$

- Nominants

$$n_{ij} \begin{cases} 1 \quad for \quad x_{i0} \le x_{ij} \le x_{hi} \\ \frac{x_{ij} - \max x_{ij}}{\max x_{ij} - \min x_{ij}} \quad for \quad x_{ij} < x_{i0} \\ \frac{\min x_{ij} - x_{ij}}{\max x_{ij} - \min x_{ij}} \quad for. \quad x_{ij} > x_{hi} \end{cases} \tag{11}$$

Normalized values could be summed into a single, synthetic value allowing subsequent analyses. However, since the value on its own is not easy to interpret, the studied credit institutions have been divided into four groups on the basis of the results, following the approach proposed by Nowak (1990) i.e. banks have been divided on the basis of the calculated values distribution, using the normalized value's mean ($\overline{n}$) and standard deviation (σ):

$$\begin{cases} I \in (-\infty, (\overline{n} - \sigma)) \\ II \ \in < (\overline{n} - \sigma), \overline{n}) \\ III \ \in < \overline{n}, (\overline{n} + \sigma)) \\ IV \ \in < (\overline{n} + \sigma), \infty) \end{cases} \tag{12}$$

Table 4 presents four groups for the analysed banks. First group presents the "worst in class" credit institutions according to value of the synthetic measure. Conversely the fourth group includes the best performing credit institutions in a given year out of the analysed group. For transparency, only four selected years have been presented in the table.

Table 4. Classification of banks according to the synthetic measure in selected years

Year	Group	Name of bank				
2008	1	UniCredit				
	2	ING	BoC			
	3	ICBC	BoComm	BNP	Deutsche	Santander
	4	CCB	ABC			
2011	1	UniCredit				
	2	ING	BoC			
	3	ICBC	BoComm	BNP	Deutsche	Santander
	4	CCB	ABC			
2014	1	UniCredit	ING			
	2	BNP	Deutsche			
	3	BoC	ICBC	CCB	BoComm	Santander
	4	ABC				
2017	1	Deutsche				
	2	BoC	ING	Santander		
	3	ICBC	CCB	ABC	BoComm	BNP
		UniCredit				
	4					
2020	1	Deutsche	UniCredit			
	2	Santander				
	3	BoC	ICBC	ABC	BoComm	BNP
		ING				
	4	CCB				
2022	1	Deutsche				
	2	BoC	BNP	ING		
	3	ICBC	ABC	BoComm	UniCredit	Santander
	4	CCB				

Source: Own work based on consolidated financial statements of the studied institutions

Multiple changes in the group composition have been recorded over the years, although it is striking that not once over the analysed period (2008-2022) was a Chinese bank classified in the group of worst performers. Only Bank of China was categorized as a group II bank in most years, while CCB and ABC have been identified as best performers in several years. Among EU-based banks, Unicredit and Deutsche Bank have experienced the largest fluctuations in their relative position, with the latter ranked as a worst performer consequently since 2015. This is likely due to the bank's long record of law suits and scandals that have negatively affected its reputation and financial standing. Overall, it can be stated that the synthetic measure-based analysis is a lot more conclusive than studies of financial ratios performed in isolation. In the case of this study, synthetic measure places Chinese banks in a favourable light when compared to their EU-based competitors. It deserves to be noted, however, that the available data does not take into account the tensions arising in China's real estate market and the impact it might have had the standing of the banking sector (Hoyle, Jain-Chandra, 2024).

Conclusions

History of developing and maintaining regulatory oversight over the financial sector is naturally much longer in Europe than in China and both sectors remain quite different from each other. One of the major differences between them is far greater fragmentation and much stronger international focus of EU-based banks versus strong concentration of the Chinese banking sector and much greater focus of the major banks on the domestic economy. This results in EU oversight being increasingly organized through cross-border coordination and oversight, particularly within the framework of the banking union. At the same time, the size of China's "big four", each being larger than several EU's biggest competitors combined, poses a major challenge to regulatory authorities. The size of Chinese institutions can also raise serious concerns over the well-known "too-big-to-fail" dilemma, the scale of which could become the subject of a separate study.

The results of the study indicate that China increasingly implements Basel Committee recommendations in terms of introducing prudential and public disclosure requirements, allowing more informative comparative analyses of financial data available in the public domain. At the same time, strong ties between the supervised credit institutions and the state are set to remain in place, which can weigh heavily on financial stability and may question the efficiency of regulatory oversight. While the 2023 integration of regulatory authorities into a single body follows a popular trend in organizing supervision in many developed countries, China's financial stability reform does not intend to break the links between the political spheres and financial institutions.

Quantitative results of multivariate comparative analysis also confirm that the reform of prudential supervision and the economic slowdown have negatively affected Chinese credit institutions when compared to their EU-based competitors. While a comparative analysis of this sort cannot signal any outright threat to financial stability just yet, the results confirm that the reform of China's financial safety net is both timely and needed. Past experiences of Eurozone's Member States should also encourage China's authorities to reinforce regulator's independence and limit the ever-growing bank exposure to domestic sovereign debt.

The study results are in line with the growing number of reports and studies evidencing economic slowdown in China and increasing problems with loan repayments on one hand and fast development of shadow banking on the other. This suggests that the proposed synthetic measure could become a useful tool for the new regulatory authority, NFRA, to monitor the relative condition of the different supervised credit institutions over time and in response to changing economic conditions. The synthetic indicator also proves to be more informative when it comes to evaluating the resultant impact of changes to different aspects of credit institution's functioning.

References

1. Aikman, D., Haldane, A., Nelson, B. (2015), *Curbing the credit cycle*. "The Economic Journal", No. 125(585), 1072-1109, https://doi.org/10.1111/ecoj.12113.
2. BCBS (1988), *International convergence of capital measurement and capital standards*, Basel.
3. BCBS (1999), *A new capital adequacy framework. Consultative Paper*, Basel.
4. BCBS (2001), *Overview of the New Basel Capital Accord*, Consultative Document, Basel.
5. BCBS (2004), *International convergence of capital measurement and capital standards*, Basel.
6. BCBS (2005), *International Convergence of Capital Measurement and Capital Standards. A revised framework*, Basel.
7. BCBS (2006), *International Convergence of Capital Measurement and Capital Standards. A revised framework,* Basel.
8. BCBS (2008), *Basel Committee on Banking Supervision announces steps to strengthen the resilience of the banking system*, Basel.
9. BCBS (2010), *Basel III: a global regulatory framework for more resilient banks and banking system*s, Basel.
10. BCBS (2013a), *Assessment of Basel III regulations – China*, Basel.
11. BCBS (2013b), *Basel III: the Liquidity Coverage Ratio and liquidity risk monitoring tools*, Basel.
12. BCBS (2013c), *Regulatory Consistency Assessment Programme (RCAP). Assessment of Basel III regulations – China*, Basel.
13. BCBS (2014), *Basel III: the Net Stable Funding Ratio*, Basel.
14. BCBS (2017), *Basel III: Finalising Post-Crisis Reforms*, Basel.
15. Brehm, S. Macht, C. (2004), *Banking Supervision in China: Basel I, Basel II and the Basel Core Principles. Banking Supervision*, "Zeitschrift für Chinesisches Recht", No. 4, 316-327.
16. Calvo, D., Crisanto, J. C., Hohl, S., Gutiérrez, O. P. (2018), *Financial supervisory architecture: what has changed after the crisis?*, "FSI Insights on policy implementation", No. 8.
17. Chant, J. (2003), *Financial Stability as a policy goal*, [in:] Chant, J., Lai, A., Illing, M., Daniel, F. *Essays on Financial Stability,* Bank of Canada, No. 95, 1-28.

18. Cherzempa, M., Véron, N. (2023), *Will China's new financial regulatory reform be enough to meet the challenges?*, "Bruegel Policy Brief", Brussel.
19. Constâncio V. (2014), *Making macro-prudential policy work*, https://www.ecb.europa.eu/press/key/date/2014/html/sp140623_1.en.html, [accessed: 3.11.2023].
20. Cousin, V. (2011), *Banking in China*, Palgrave Macmillan, London. https://doi.org/10.1057/9780230306967
21. Crockett, A. D. (1997), *Why is financial stability a goal of public policy?*, "Economic Review", Federal Reserve Bank of Kansas City, No. 4.
22. Davis, E. (2001), *A typology of financial instability. Financial Stability Report*, Central Bank of Austria.
23. Desai, S. (2016), *A Regional Comparison of China's New Deposit Insurance System*, Federal Reserve of San Francisco.
24. Directive (EU) 2019/878 of the European Parliament and of the Council of 20 May 2019 amending Directive 2013/36/EU as regards exempted entities, financial holding companies, mixed financial holding companies, remuneration, supervisory measures and powers and capital conservation measures.
25. Directive 2006/48/EC of the European Parliament and of the Council of 14 June 2006 relating to the taking up and pursuit of the business of credit institutions.
26. Directive 2006/49/EC of the European Parliament and of the Council of 14 June 2006 relating on the capital adequacy of investment firms and credit institutions.
27. Directive 2009/111/EC of the European Parliament and of the Council of 16 September 2009 amending Directive 2006/48/EC, 2006/49/EC and 2007/64/EC as regards banks affiliated to central institutions, certain own funds items, large exposures, supervisory arrangements and crisis management.
28. Directive 2010/76/EU of the European Parliament and of the Council of 24 November 2010 amending Directive 2006/48/EC, 2006/49/EC as regards capital requirements for the trading book for re-securitisations, and the supervisory review of remuneration policies.
29. Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directive 2006/48/EC and 2006/49/EC.
30. ECB (2021), *Financial stability*, https://www.ecb.europa.eu/pub/financial-stability/html/index.en.html, [accessed: 3.02.2024].

31. FED (2021), *Promoting Financial System Stability*, https://www.federalreserve.gov/aboutthefed/files/pf_4.pdf, [accessed: 13.03.2024].
32. Ferguson, Jr. R. W. (2003), *Capital standards for banks: the evolving Basel Accord*, Federal Reserve Bulletin, No. 8.
33. Hoyle, H., Jain-Chandra, S. (2024), *China's Real Estate Sector: Managing the Medium-Term Slowdown*, https://www.imf.org/en/News/Articles/2024/02/02/cf-chinas-real-estate-sector-managing-the-medium-term-slowdown [accessed: 3.05.2024].
34. IMF (2017), *People's Republic of China: Financial Sector Assessment Program- Detailed Assessment of Observance of Basel Core Principles for Effective Banking Supervision*, "IMF Country Report", No 17(403).
35. IMF (2018), *The People's Republic of China. Financial sector assessment program. Systematic oversight of financial market infrastructures – technical note, "*IMF Country Report", No. 18 (192).
36. Issing, O. (2003), *Monetary and financial stability: is there a trade-off?.* https://www.ecb.europa.eu/press/key/date/2003/html/sp030329.en.html, [accessed: 15.03.2024].
37. Kaufman, G. G. (1998), *Central banks, assets bubbles, and financial stability*, "Working Paper", Reserve Bank of Australia, No. 9709.
38. Kauko, K. (2020), *The vanishing interest income of Chinese banks as an indicator of loan quality problems*, https://cepr.org/voxeu/columns/vanishing-interest-income-chinese-banks-indicator-loan-quality-problems, [accessed: 20.04.2023].
39. Lardy, N. R. (1998), *China's Unfinished Economic Revolution*, Brookings Institution Press, Washington D.C.
40. Lin, J. Y., Morgan, P. J., Wan, G. (2018), *Slowdown in the People's Republic of China. Structural Factors and the Implications for Asia*, Asian Development Bank Institute, Tokyo.
41. Mishkin, F. S. (2011), *Monetary policy strategy: lessons from the crisis*, "NBER Working Paper Series", No. 16755.
42. Moore, D. S., Notz, W. I., Flinger, M. A. (2013), *The basic practice of statistics*, W. H. Freeman and Company, New York.
43. Neisen, M., Röth, S. (2023), *CRR III: The EU Implementation of Basel IV – the Next Generation of Risk Weighted Assets*, John Wiley & Sons, New York.
44. Nowak, E. (1990), *Metody taksonomiczne w klasyfikacji obiektów społeczno-gospodarczych*, PWE, Warszawa.
45. Padoa-Schioppa, T. (2002), *Central banks and financial stability: exploring a land in between*, European Central Bank, Frankfurt am Main.
46. Panek, T. (2009), *Statystyczne metody wielowymiarowej analizy porównawczej*, Oficyna Wydawnicza SGH, Warszawa.

47. Prasad, E. (2023), *Has China's Growth Gone from Miracle to Malady?*, Brookings Papers on Economic Activity, Washington D.C.
48. Regulation (EU) No 2019/2876 of the European Parliament and of the Council of 20 May 2019 amending Regulation (EU) No 575/2013 as regards the leverage ratio, the net stable funding ratio, requirements for own funds and eligible liabilities, counterparty credit risk, market risk, exposures to central counterparties, exposures to collective investment undertakings, large exposures, reporting and disclosure requirements, and Regulation (EU) No 648/2012
49. Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012.
50. Schinasi, G. J. (2006), *Safeguarding financial stability. Theory and practice*, IMF, Washington D.C.
51. Trichet, J. C. (2000), *Independence and accountability. Developments in central banking*, Banque de France, Paris.
52. Urbanek, P. (ed.) (2012), *Nadzór korporacyjny a stabilność sektora finansowego*, Wydawnictwo Uniwersytetu Łódzkiego, Łódź.
53. Walesiak, M. (2014), *Przegląd formuł normalizacji wartości zmiennych oraz ich własności w statystycznej analizie wielowymiarowej*, „Przegląd Statystyczny", No. 61(4), 363-372.
54. Wiśniewski, T., Skoczylas, W. (2002), *Teoria i praktyka analizy finansowej w przedsiębiorstwie*, Fundacja Rozwoju Rachunkowości w Polsce, Warszawa.
55. Zielińska-Lont K. (2020), *China's largest credit institutions in light of Basel III implementation*, [in:] Rosińska-Bukowska, M., Zielińska-Lont, K. (eds.)., *Chin's economic growth – selected financial aspects*, Wydawnictwo Uniwersytetu Łódzkiego, Łódź, http://dx.doi.org/10.18778/8220-096-6
56. Zielińska-Lont, K. (2021), *Banking Unions' impact on financial stability – holistic approach*, Wydawnictwo Uniwersytetu Łódzkiego, Łódź, https://doi.org/10.18778/8220-745-3.