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IMPACT OF GENDER DIVERSITY OF THE BANK'S MANAGEMENT BODY ON BANK'S PERFORMANCE AND RISK

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Purpose: The aim of this paper is to investigate whether there is a relationship between gender diversity and bank efficiency and security in the context of EU regulations stipulating that a more diverse executive board structure should monitor the governance and supervisory process more effectively in terms of enhancing the institution's resilience to risk factors.
Design/methodology/approach: The subjects of the analysis were commercial banks registered in the form of a joint stock company in Poland, Germany and France between 2018 and 2021. The results of the study on ROA and TCR were correlated with the author's coefficient of gender diversity of banks' management bodies.
Findings: The results demonstrate that as market uncertainty increased (in this case as a result of the Covid-19 pandemic), banks with a higher degree of management diversity generally performed worse. In contrast, a higher degree of management diversity before the Covid-19 pandemic had a positive or neutral impact on TCR levels, but as the pandemic erupted, TCR increased, regardless of the degree of bank management diversity.
Research limitations/implications: Future research should include the concept of neurobanking, which may prove helpful in reducing human risk in banks.
Practical implications: The findings provide that gender diversity of banks' management bodies does not have the effect of improving the efficiency of banks' operations and their security.
Social implications: The results of the research do not unequivocally show that a higher degree of diversity in banks' management bodies is a reliable way of solving the problems of increasing the efficiency of banks' activities and their security at the same time. Even the introduction of penalties for banks with insufficiently diverse management bodies by banking supervision will not eliminate the risky behavior of individuals whose actions are determined by the structure of their central nervous system.
Originality/value: This study introduces a novel perspective by examining the impact of gender diversity of the bank's management body on banks' performance and risk. The analysis is relevant both to researchers in finance theory and to practitioners involved in developing security rules for banks.
Keywords: banks, gender diversity, executive board structure, financial efficiency, total capital ratio, Covid-19.
Category of the paper: Research paper.

1. Introduction

The gender diversity of management bodies, including those of financial institutions, has been subjected to numerous studies in recent years. Many of them show a positive impact of gender diversity on company performance (Martin-Ugedo et al., 2019; Prashar, Gupta, 2020), while others show no evidence of a correlation between gender diversity and company performance (Vairavan, Zhang, 2020). In contrast, research by Khan et al. (2021) suggests that only gender balance in executive board structures can improve the company performance. Although gender diversity of management bodies is a topic in dispute, it has attracted the attention of not only academics but also legislators (Song et al., 2020).

Culture related factors that determine the behavior of bank employees, such as individualism or attitude to risk, are important elements which affect bank corporate culture, and – indirectly – the scale of risk taken by the bank. Corporate culture is also affected when ownership supervision is vested in natural persons who are members of the same family. In the case of banking sector, the so-called family businesses play a much less important role than in other economy sectors as they are mostly limited to small or niche banks (e.g. offering only private banking services). Nonetheless, even such banks are considerably different in terms of corporate culture as compared to large banks which operate in the form of joint stock companies and are listed on regulated markets (El Ghoul et al., 2016). The main difference involves much greater reputation concerns typical of the banks run by family members. This has a direct impact on planning. Family-owned banks are not bound by the time limits imposed by the term of office of statutory bodies while any modifications to the bank profile or its policy are correlated with generational changes.

Cultural factors which determine employees' conduct in different countries are highly important as they represent potential sources of systemic risk and also influence the course and scale of crises. During the last global financial crisis, banks in the countries where populations have strong aversion to risk and greater power distance achieved relatively better results. On the other hand, banks in individualist societies performed worse during the crisis, which was due to the fact that such communities promote individual achievement, self-orientation, focus on goals and efficiency (Boubakri et al., 2017). We can therefore conclude that cultural factors such as low aversion to risk and focus on individual achievement are important sources of risk involving long-term impact. It may take a generational transformation to change these factors, which may last even several decades. The above cultural factors are key to the banks operating mainly in their home countries. Global banks are exposed to them to a much lesser degree, which is due to their presence in many countries of different national cultures but also to a multi-cultural composition of their management bodies. Moreover, owing to their systemic importance, global banks have to comply with additional regulatory requirements, which decreases their flexibility and susceptibility to the national culture impact (Mourouzidou-

Damtsa et al., 2019). It specifically refers to global European banks of systemic importance, which are monitored and supervised directly by the European Central Bank. Nonetheless, cultural differences should be taken into consideration both in the strategies adopted by global banks and in the examination of individual banks' situation performed by financial security network institutions (Ashraf et al., 2016).

In highly developed countries, the composition of management bodies, which is related to the corporate culture model adopted in a given country, has a considerable impact. In particular, the level of management bodies autonomy, including the number of their members, duration of the CEOs' terms of office and even gender diversity (Ahmadi et al., 2018). An interesting example was given in the study on the importance of gender of bank CEOs in terms of risk level in the institution they run. One of the studies was based on a sample of Polish cooperative banks. It showed that cooperative banks run by women have better capital adequacy and own funds to assets ratio. Credit risk level in the banks run by women is not different from credit risk level in the banks managed by men, while greater capital adequacy does not result from lower asset quality and is most probably connected with stronger aversion to risk among female CEOs (Skała, Weill, 2018). However, the studies on the influence of banks' management bodies with greater gender diversity, carried out in the USA, have shown that the increase in the number of women members of management bodies improves their results provided that an adequate level of diversity is achieved and that a bank has high capital ratios (Owen, Temesvary, 2018).

In accordance with current European regulations, the key role in ensuring balance in a bank management body in terms of knowledge, skills, diversity and experience is played by a nomination committee. His tasks include, among others deciding on a target for the representation of the underrepresented gender in the management body as well as preparing a policy on how to increase the number of the underrepresented gender in the management body in order to meet that target. In performing its duties, the nomination committee shall, to the extent possible and on an ongoing basis, take account of the need to ensure that the management body's decision making is not dominated by any one individual or small group of individuals in a manner that is detrimental to the interests of the institution as a whole (Directive 2013/36/EU).

EU regulations also stress the role of non-executive directors and independent supervisory board members, whose activity may not only improve management quality and the results achieved by individual banks but it may also reduce risk. Mere independence and adequate qualifications and experience demonstrated by these persons may not be sufficient as long as adequate mechanisms and procedures are not established to ensure that these can have effective influence on the bank's situation (Siclari, 2015). In particular, it is necessary to ensure that they are part of the integrated risk control and risk management system. A bank body, which includes such members, must be responsible for strategic supervision and for defining a business model of the bank. Control mechanisms in banks should involve diverse knowledge and experience of qualified experts (Thuiner, 2015).

2. Research problem

The literature review has shown that there is little analysis of the topic of gender diversity of banks' management bodies and its impact on bank security and efficiency. Therefore, the aim of this thesis is to investigate whether there is a relationship between gender diversity and bank efficiency and security in the context of EU regulations stipulating that a more diverse executive board structure should monitor the governance and supervisory process more effectively in terms of enhancing the institution's resilience to risk factors. In addition, an attempt was made to verify whether the gender diversity of the bank's management body had an impact on risk and efficiency performance during the period of both economic stability and instability caused by the Covid-19 pandemic.

The considerations undertaken in this article included the questions as follows, i.e: 1) What is the level of gender diversity of banks' management bodies in three given European Union countries?; 2) Did the instability caused by the Covid-19 pandemic increase the diversity of bank management bodies?; 3) Does greater diversity of banks' management bodies result in greater bank efficiency?; 4) Does greater diversity of bank's management bodies guarantee greater bank security?; 5) What other tools can contribute to reducing human risk in the banking sector?

3. Data and sample

In order to answer these questions, required data were obtained from 54 commercial banks registered in the form of joint stock companies in Poland (25), Germany (16) and France (13). The definition of the research sample including banks from these countries was the result of a desire to compare the performance of banks in Poland to banks from leading European Union countries, i.e. from Germany and France. However, due to the great diversity of banking sectors in the selected countries (for example, in Germany many banks operate in the form of a limited liability company or are public credit institutions, such as Landesbank or Sparkasse), the criterion for selecting the research sample was registration in the form of a joint stock company. The research period covered years between 2018 and 2021. The adoption of such a research period was driven by the desire to test whether a period of stability or instability in the economy affects the gender diversity of banks' management bodies and whether greater diversity in times of instability results in better performance in terms of bank efficiency and security. The required data were taken from published annual financial statements for 2018, 2019, 2020 and 2021. The dataset included: total capital ratio, net profit, own funds, total capital requirements and the number of women and men on the bank's executive board. None of the

individuals included declared themselves to be non-binary or of a gender other than female or male.

Originally, the database of entities surveyed consisted of 61 banks (30 Polish, 18 German and 13 French). In the course of data acquisition, five Polish banks and two German banks were excluded from the database due to, among others, missing individual data and ongoing liquidation proceedings. Of the Polish banks, Bank Nowy SA, Idea Bank SA, ING Bank Hipoteczny SA, Mercedes-Benz Bank Polska SA and Millennium Bank Hipoteczny SA were removed from the database. As for German banks, ING DiBa and J.P. Morgan AG were also removed. The final list of banks can be found in the appendix.

4. Methods

The following measures were used to determine the level of efficiency and security of the banks under study:

- Return on Assets (ROA) [%] representing the quotient of net profit and total assets.
- Total Capital Ratio (TCR) [%], which is the quotient of own funds and total capital requirements.

The gender diversity of the bank's management board was determined in Equation (1) on the basis of the bank's gender diversity ratio, which was defined as the number of persons of the less represented gender related to the total number of persons on the board.

$$\text{diversity ratio} = \frac{\min(N_w, N_m)}{N_w + N_m} \times 100 \quad (1)$$

where:

N_w – number of women in the management body,

N_m – number of men in the management body.

The value of the diversity ratio can range from 0 to 50, where 0 means no gender diversity at all in the bank's management body (the entire executive board is composed exclusively of people of the same gender) and 50 means full diversity (the same number of men and women in the management body). The entities were grouped on the basis of the results obtained for the diversity ratio due to the significant diversity of the banks. Three diversity ratio ranges were defined, i.e. <0-16) - low diversity; <16-33) - medium diversity; <33-50> - high diversity. The results obtained are presented in Figures 1-3 and interpreter accordingly.

5. Results and discussion

The first part of the study analyzed the scale of diversity in terms of gender of the surveyed bank management bodies. According to the research conducted in Poland, in the pre-pandemic period, only 32-36% of bank management bodies were characterized by a diversity index exceeding 16, of which only among 16% of entities had the diversity index of at least 33. As many as 64% of the surveyed banks had a low diversity index (below 16). It was not until 2020 that the diversity of Polish banks' management bodies increased, resulting in a diversity ratio of <33-50> in 28% of the banks surveyed and <16-33> in 24% of the banks in question.

In 2021, the degree of banks' management bodies diversity in Poland followed a similar pattern to the one from 2020, although there was a 4 p.p. lower level of large in favor of small diversity. The above analysis therefore shows that the market instability caused by the Covid-19 pandemic resulted in a higher level of gender diversity for banks in Poland than in the pre-pandemic period (Figure 1).

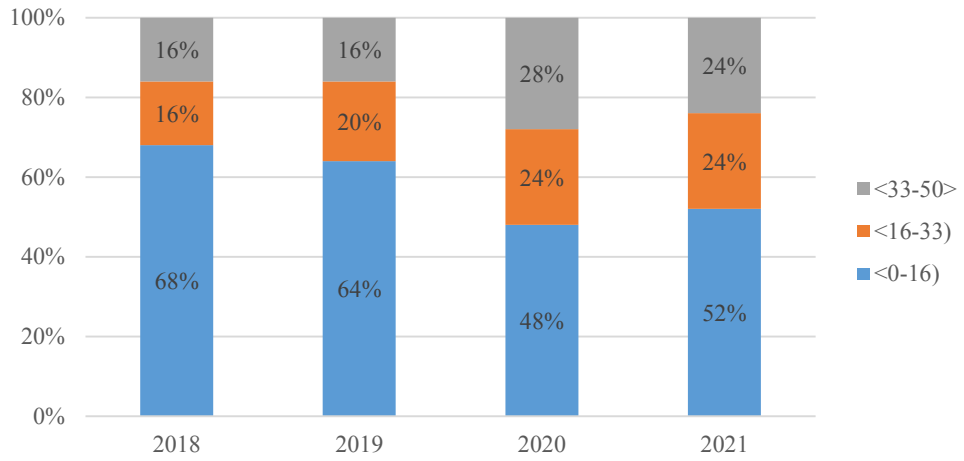

Figure 1. The diversity ratio of banks in Poland between 2018 and 2021.
Source: Own calculations.

When analyzing the data from German and French banks, there is no significant similarity in the degree of management diversity in the two countries. The greatest management diversity was observed in the French banking sector. For 38% of the banks surveyed in 2018, 2019 and 2021, the level of management diversity was highest, i.e. in the third range <33-50>. The lowest level of diversity was observed in 2018, when it was in the <0-16> range in 38% of French banks. In the following two years, the number of banks in this range gradually decreased, although it increased again in 2021, when 23% of banks had the lowest degree of gender diversity in their executive board structures (Figure 2).

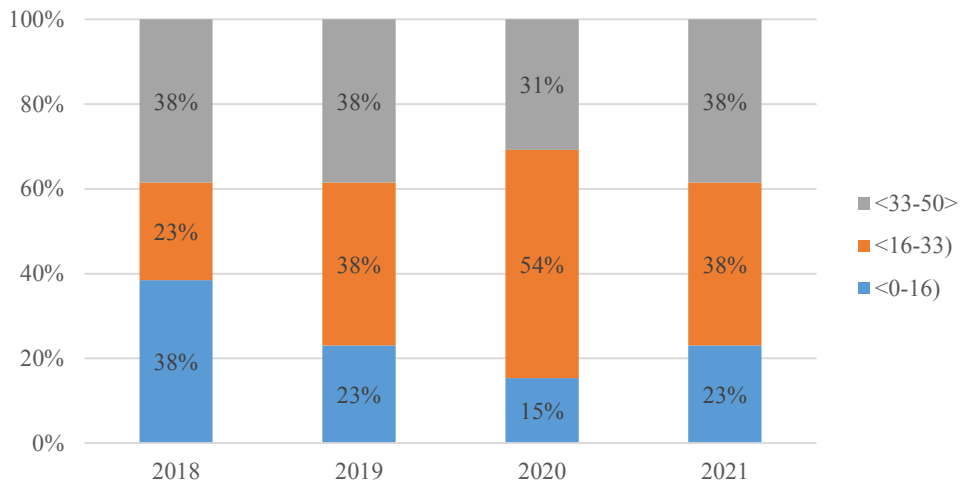

Figure 2. The diversity ratio of banks in France between 2018 and 2021.

Source: Own calculations.

In the German banking sector, on the other hand, the lowest degree of management diversity was observed among as many as 63% of banks in 2018 and 56% in the following three years. The range of the second diversity factor in the year immediately before and during the pandemic included the fewest surveyed German entities (19% in 2019 and 13% in 2020, respectively), and in 2021, a significant increase in the number of banks was observed in this range - up to 38% (this range included, among others, the three largest banks in Germany (Figure 3).

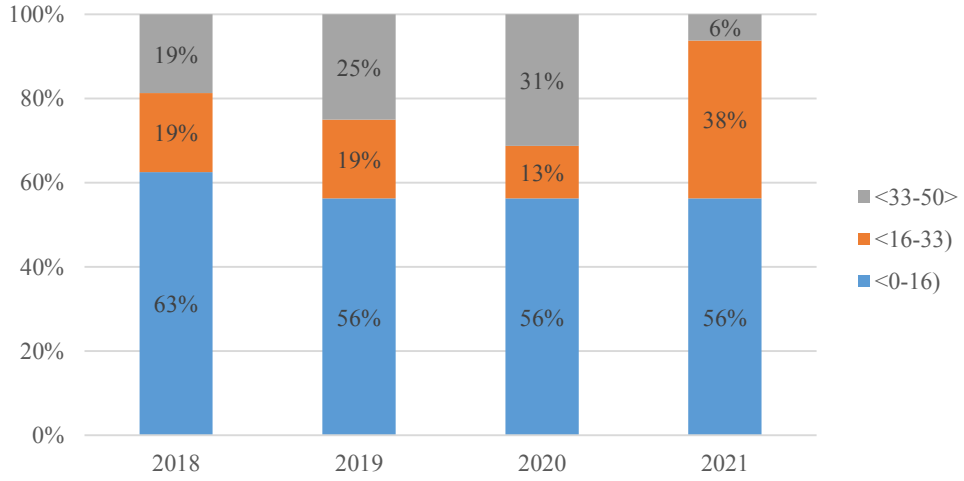

Figure 3. The diversity ratio of banks in Germany between 2018 and 2021.

Source: Own calculations.

In terms of the gender diversity of the management bodies, Polish banks rank similarly to those in the German banking sector compared to the two Western sectors surveyed. However, a relatively slow trend of increasing diversity can be observed in both sectors.

Another object of the analysis was to try to find a relationship between the yield of bank assets and the diversity ratio in each of the three banking sectors studied.

In the Polish banking sector in the years leading up to the Covid-19 pandemic, banks with lower management diversity had a higher yield of assets. The Covid-19 shock, the huge uncertainty in the market and the government's decisions to help the real economy resulted in a decline in the ROA of banks in each diversity range. However, among the banks with the highest degree of diversity, the lowest (negative) performance was observed in 2020, while the group of banks in the second diversity group saw negative ROA in 2021. Only the banks with the lowest degree of diversity did not record negative results during the Covid-19 pandemic. It can therefore be concluded that higher levels of management diversity were generally associated with lower bank efficiency (Figure 4).

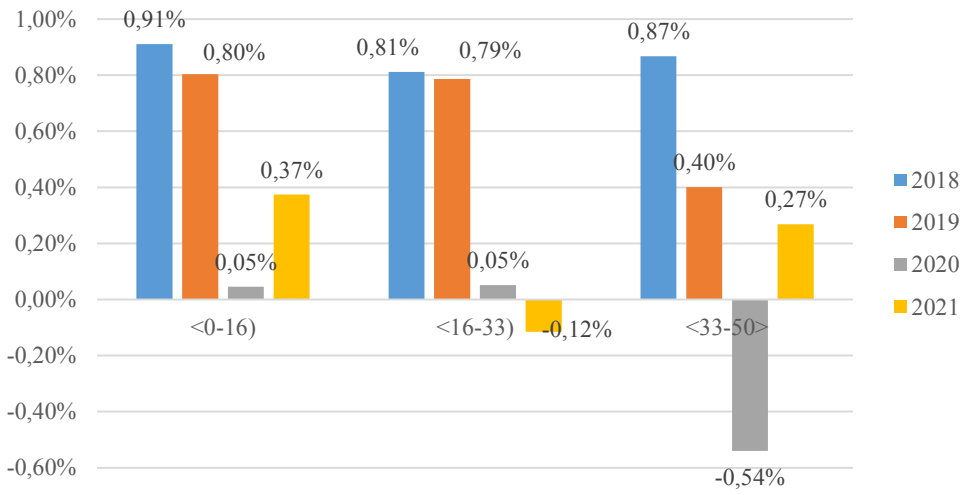

Figure 4. ROA of Polish banks by diversity ratio between 2018 and 2021.

Source: Own calculations.

Such a relationship was also observed in the case of French banks. During the study period, banks with a lower level of management diversity achieved the highest level of ROA (Figure 5).

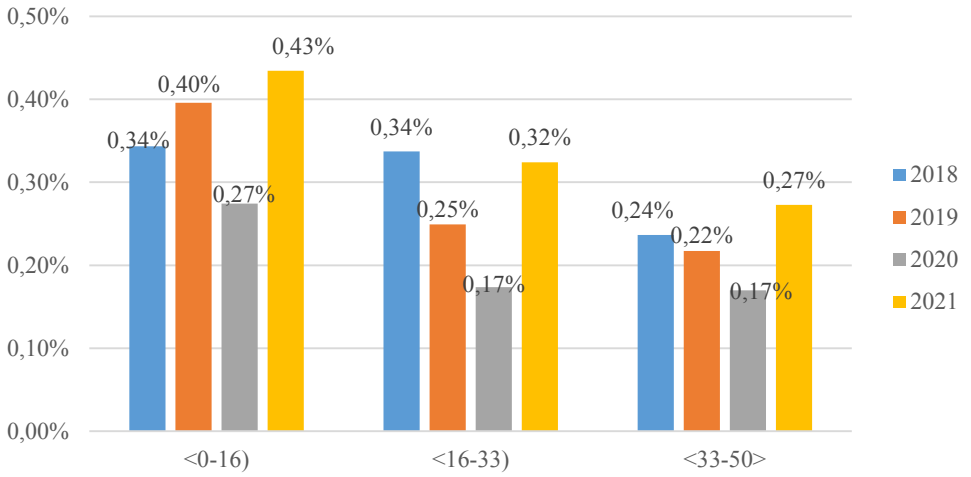

Figure 5. ROA of French banks by diversity ratio between 2018 and 2021.

Source: Own calculations.

In contrast, in the pre-pandemic period, German banks with a degree of diversity of 16 and above showed higher management efficiency, while during the pandemic higher efficiency was achieved by banks with a lower or medium degree of board diversity (Figure 6).

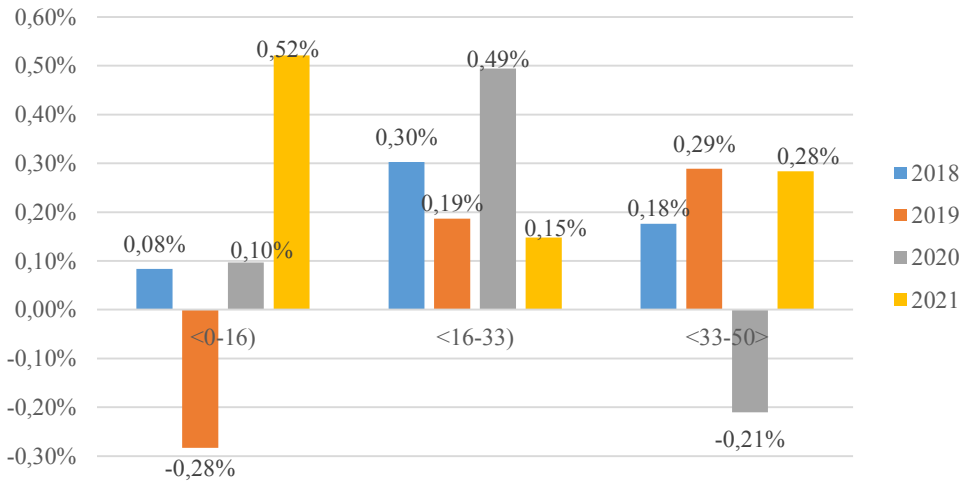

Figure 6. ROA of German banks by diversity ratio between 2018 and 2021.

Source: Own calculations.

When comparing the relationship between the profitability of bank assets and the degree of management diversity of all banks studied, it was observed that as market uncertainty increased (in this case as a result of the Covid-19 pandemic), banks with a higher degree of management diversity generally performed worse.

The final object of the analysis was to see whether higher levels of management diversity improve bank security. The results of the study showed that only in the case of German banks, those with the highest level of Total Capital Ratio were the ones with the highest degree of management diversity (Figure 7).

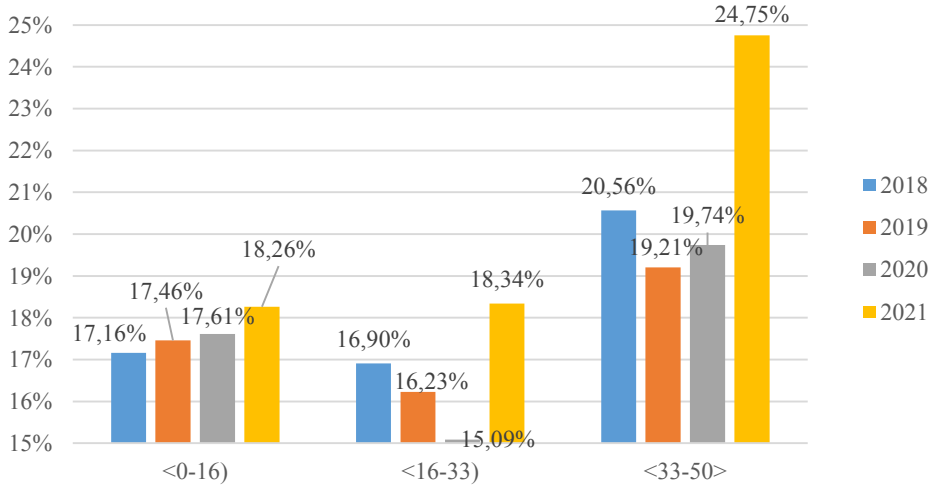

Figure 7. TCR of German banks by diversity ratio between 2018 and 2021.

Source: Own calculations.

For French banks, a similar situation, i.e. the highest level of Total Capital Ratio shown by banks with the highest degree of management diversity, occurred only before the pandemic. Indeed, with the outbreak of the pandemic, it was the banks with the lowest degree of diversity that reached the highest levels of Total Capital Ratio (Figure 8).

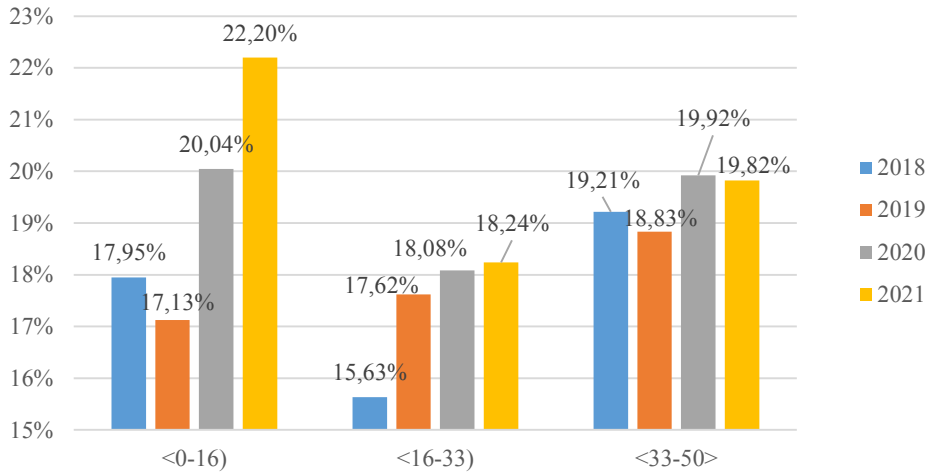

Figure 8. TCR of French banks by diversity ratio between 2018 and 2021.

Source: Own calculations.

The case of Polish banks, on the other hand, is quite ambiguous. Within this group of banks, the banks with the highest levels of Total Capital Ratio were those with the highest levels of diversity (2019 and 2021) or those with the lowest levels of diversity (2018 and 2020). Nevertheless, the small differences between the levels of Total Capital Ratio in Polish banks allow us to conclude that it practically does not depend on the degree of gender diversity of banks' executive board structures (Figure 9).

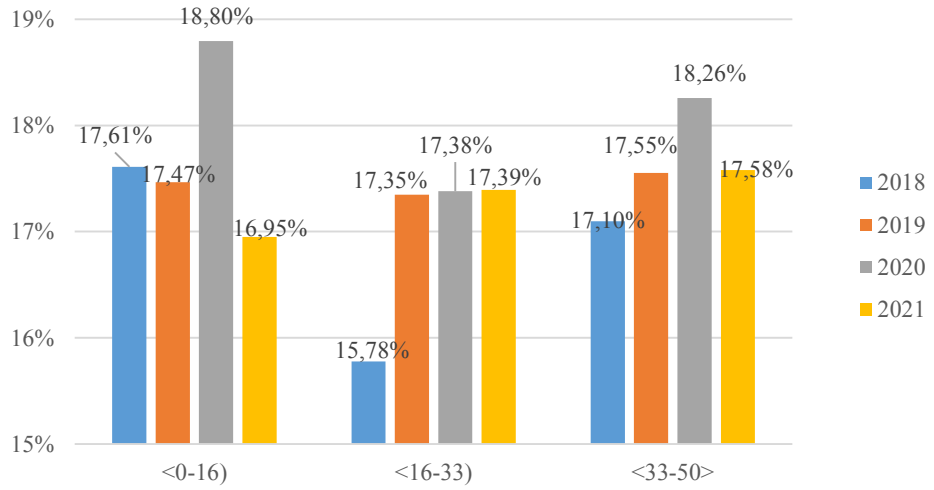

Figure 9. TCR of Polish banks by diversity ratio between 2018 and 2021.

Source: Own calculations.

At the same time, it is worth noting that in the first year of the pandemic (2019), the Total Capital Ratio increased in all surveyed banks regardless of the degree of diversity (with the exception of German banks with a medium degree of management diversity). In summary, it can therefore be concluded that a higher degree of management diversity had a positive or neutral impact on the TCR level before the pandemic, while with the outbreak of the pandemic the TCR increased regardless of the degree of management diversity of the banks. Only the example of the German banking sector proves that a higher diversity guarantees a higher security of banks, regardless of the circumstances.

The analysis carried out and the results of the research do not conclusively show that a higher degree of diversity in bank management is a reliable way of solving the problems of increasing the efficiency of banks' operations or their security.

6. Gender diversity of the bank's management body is not enough

Diversification on bank's management body although fully reasonable – may not be considered as instruments which will help us effectively solve the problem of human risk in the banking sector. Even a system of penalties imposed on the banks with not diversified management bodies, will not eliminate risky behavior of certain individuals, determined by the structure of their central nervous system (Koleśnik, 2022).

The research has shown that in terms of reducing human risk in the process of bank risk management, in order to measure risk propensity, the desired level of reaction of the nucleus accumbens (part of the striatum in the brain) should be defined. More intense activity of this brain area occurs when an individual expects a financial benefit. It should be also noted that this measure would refer both to risk propensity in the case of expected profit amounts and to the occurrences involving extraordinary profit. Its level would provide us with a specific greed threshold since a person whose activity of the nucleus accumbens is below this threshold would not be prone to the temptation of taking a greater risk only because in the past a similar event or operation accidentally generated a high risk. Expectation of increasing rewards (profit) intensifies the activity (oxygenation) of the nucleus accumbens, which, on the other hand, is not provoked by the prospect of greater punishment (loss) (Knutson et al., 2001a). Results of other studies confirm that making decisions which can lead to earning a profit or incurring a financial loss is also connected with the activity of other brain areas. It was also shown that the fact which brain area becomes more active depends both on whether we expected a profit or a loss and on the final result (Table 1).

Table 1.
Brain areas active depending on the profit earned or loss incurred

Brain area	Profit		Loss	
	realized	non-realized	realized	non-realized
Orbitofrontal cortex			X	X
Anterior cingulate cortex			X	
Ventral striatum		X		X
Dorsal striatum	X			
Insula	X		X	
Thalmus	X		X	

Source: Wrase et al., 2007.

It should be noted that some of the brain areas are activated in more than a single situation, as shown in Table 1. Structures such as the insula, thalmus and medial prefrontal cortex were found to be particularly active in the decision-making processes which resulted in profit or loss (Knutson et al., 2000). Other studies found centers of activity in the ventral striatum and in the forebrain as well as some differences in the activity of these areas depending on whether the expected profit was realized or not (Knutson et al., 2001b).

In terms of reducing human risk using the concept of neurobanking, it is essential that – despite very promising results of the abovementioned studies – certain processes occurring in the central nervous system (CNS) are more complex and the current knowledge is not sufficient to provide a precise neurological model of individuals responsible for risk management in the banks.

Nevertheless, a new, long-range trend to reduce human risk in banking should be based on the concept of neurobanking, which should include a definition of neurorisk, i.e. a risk resulting from the pathology of certain structures of the CNS in individuals managing the bank. Taking into account the progress of neurological research devoted to finance (Ruff, Huettel, 2014), neurobanking could be seen as an emerging sub-domain of banking, and not only as one of the numerous analytical approaches. Neurobanking should therefore become a sub-domain of banking, dealing with the influence of the structure and functioning of the human CNS on the security of individual banks and the entire banking system (Flejterski, 2009). It should aim to identify the CNS structures which are responsible for increased propensity to take risk in banking and to develop a neurological model of people responsible for the level of risk run by the bank. Presented in such a way, the concept of neurobanking may be challenged on the grounds of possible discrimination of people whose CNS will not meet certain criteria. This objection, however, seems invalid if we look at the consequences which may arise when the most important risk management decisions in banking are taken by people whose anatomic structure and functioning will naturally make them more inclined to take action which involves greater risk. A clearly defined model of CNS structure would be a development of medical models which are now applied e.g. in aviation. The concept of neurobanking will therefore make it possible to fully respect the rule that the banking supervisory bodies have long shared, which claims that individuals managing banks, especially those responsible for risk, must guarantee due performance of their duties (Koleśnik, 2011).

7. Conclusion

The considerations undertaken in this article were to test whether there is a relationship between the gender diversity of banks' executive board structures and their efficiency and security, and whether greater management diversity in times of instability results in better bank efficiency and security outcomes.

The research conducted on a sample of 54 banks from Poland, Germany and France shows that the degree of management diversity in each of the three sectors is different. The highest management diversity was observed in the French banking sector, while the lowest in the German sector. In terms of management diversity, Polish banks rank at a similar level to those in the German banking sector when compared to the two leading EU banking sectors. In both cases, a trend of increasing banks' management diversity was noted, albeit relatively slow. The market instability caused by the Covid-19 pandemic increased the degree of diversity in each of the banking sectors studied.

Comparing the relationship between the yield of bank assets and the degree of management diversity of all the banks studied, it was noted that as market uncertainty increased (in this case caused by the Covid-19 pandemic), banks with a higher degree of management diversity generally performed worse.

The study revealed, however, that a higher degree of management diversity before the Covid-19 pandemic had a positive or neutral effect on TCR levels while with the outbreak of the pandemic TCR increased regardless of the degree of bank management bodies diversity. Only the example of the German banking sector proves that a higher diversity of bank management boards guarantees a higher security of banks, regardless of the circumstances.

The analysis carried out and the results of the research do not unequivocally show that a higher degree of diversity in banks' management bodies is a reliable way of solving the problems of increasing the efficiency of banks' activities and their security at the same time. Even the introduction of penalties for banks with insufficiently diverse management bodies by banking supervision will not eliminate the risky behavior of individuals whose actions are determined by the structure of their central nervous system.

The solution to this problem could be neurobanking, which, as a sub-discipline of banking, would deal with the impact of the structure and functioning of the human central nervous system on the security of the individual bank and the banking system as a whole. The implementation of the concept of neurobanking would make it possible to ensure that all bank managers would provide a guarantee of due performance of their operations.

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Appendix

Table 2.
The final list of banks

Poland		France		Germany	
1.	Alior Bank S.A.	1.	Banque Palatine	1.	Aareal Bank AG
2.	Bank BPH S.A.	2.	BNP Paribas Group	2.	Bank für Sozialwirtschaft AG
3.	Bank Handlowy w Warszawie S.A.	3.	BPCE	3.	BHW Bausparkasse AG
4.	Bank Millennium S.A.	4.	CIC Banque Transatlantique	4.	Commerzbank AG
5.	Bank Ochrony Środowiska S.A.	5.	Credit Agricole	5.	Deutsche Bank AG
6.	Bank Pocztowy S.A.	6.	Credit du Nord	6.	Deutsche Pfandbriefbank AG
7.	Bank Polska Kasa Opieki S.A.	7.	Dexia Credit Local	7.	DKB Deutsche Kreditbank AG
8.	Bank Polskiej Spółdzielczości S.A.	8.	Groupe Credit Mutuel	8.	Hamburg Commercial Bank AG
9.	BNP Paribas Bank Polska S.A.	9.	HSBC France	9.	HSBC Trinkaus &Burkhardt AG
10.	Credit Agricole Bank Polska S.A.	10.	La Banque Postale	10.	IKB Deutsche Industriebank AG
11.	Deutsche Bank Polska S.A.	11.	PSA Banque France Group	11.	Oldenburgische Landesbank AG
12.	DnB Bank Polska S.A.	12.	RCI Banque SA	12.	Santander Consumer Bank AG
13.	Getin Noble Bank S.A.	13.	Societe Generale	13.	Teambank AG
14.	ING Bank Śląski S.A.			14.	UBS Europe S.E.
15.	mBank Hipoteczny S.A.			15.	UniCredit AG
16.	mBank S.A.			16.	Wüstenrot Bausparkasse AG
17.	Nest Bank S.A.				
18.	Pekao Bank Hipoteczny S.A.				
19.	PKO Bank Hipoteczny S.A.				
20.	Plus Bank S.A.				
21.	Powszechna Kasa Oszczędności Bank Polski S.A.				
22.	Santander Bank Polska S.A.				
23.	Santander Consumer Bank S.A.				
24.	SGB-Bank S.A.				
25.	Toyota Bank Polska S.A.				

Source: Own elaboration.