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SECURING BANKING ACTIVITY THROUGH SPECIFIC PROVISIONS (LOAN LOSS RESERVES): AN EMPIRICAL ANALYSIS OF POLISH LISTED BANKS 2011-2019

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Abstract: The author analysed specific provisions (loan loss reserves) as a hedging tool against expected losses in banking activity. The aim of the article was to conduct a theoretical and empirical analysis of loan loss reserves in the Polish listed banks in the period 2011--2019 The research hypothesis states that there is a significant variation in the level of loan loss reserves among Polish listed banks in 2011-2019. The research covered 12 Polish banks listed on the Warsaw Stock Exchange. The empirical study is based on the Bank Focus database. Furthermore, the situation of reserves in the Polish banking sector before the start of the COVID-19 pandemic was assessed, as well as signalling the changes in the level of credit losses in the Polish banking sector during the pandemic. The analysed banks were differentiated according to their level of loan loss reserves, coverage ratio, and the ratio of the amount of loan loss reserve to the total value of net interest revenue. The research results can also be used as a benchmark for decisions and actions taken by the regulatory and supervisory authorities, and may increase the trust the stakeholders have in the banking sector.

Keywords: bank, safety, expected losses, provisions, loan loss reserves.

1. Introduction

Banking activity is associated with the constant conflict between the need to ensure the safety of the funds held and the desire to maximise the profitability of banking operations. There is a negative correlation between safety and profitability, which means that an increase in the level of safety generally translates into a decrease in the bank's profitability. Moreover, the risk is an inherent part of banking activity, which means that banks operate under conditions of uncertainty. This leads to the need to effectively manage the bank in such a way that it is prepared to suffer losses caused by both internal and external factors.

One of a bank's core tasks is to provide loans. When the borrower has financial difficulties and is not able to pay the agreed installments and interest as scheduled, the loan is "non-performing" (European Central Bank, 2021); non-performing loans result in weakening banks' profitability because they generate losses. To prepare for these expected losses, banks need to create provisions, in other words, to put aside money to cover the losses they expect to incur. This money is then no longer available to provide new loans or to absorb other losses, which further reduces banks' earnings and weakens their condition (European Central Bank, 2018).

An important role is related to the expected losses which the bank determines based on available internal information and has a direct influence on them. A hedging tool against expected losses are provisions, namely loan loss reserves. Loan loss reserves are a hedging tool against expected losses, which are the first line of defence against insolvency and then bankruptcy. The literature on the subject indicates that the reserves play an important role in maintaining bank safety, as they are and should be adequate to the banking risk (Waliszewski, 2010, p. 209). In relation to this, it is important to examine the situation of provisions in the Polish banking sector in order to test its resilience to expected losses. In particular, the necessity to examine the situation between the last financial crisis and the beginning of the pandemic is important in order to be able to assess the condition and stage of preparation of the Polish banking sector for the economic slowdown caused by COVID-19. Furthermore, the changes in the level of credit losses in Polish banking sector were signalled during the pandemic, namely in 2020.

Currently there are no studies on the empirical situation of loan loss reserves in the Polish banking sector in the period between the global financial crisis and the COVID-19 pandemic. Hence, the author's motivation was to fill this gap by providing empirical calculations on provisions based on the analysis of 12 Polish listed banks in 2011-2019, and to conduct a theoretical and empirical analysis of loan loss reserves in the Polish listed banks in 2011-2019 years. The research hypothesis states that there is a significant variation in the level of loan loss reserves among Polish listed banks. As part of this analysis, selected indicators of asset quality were examined.

The research covered 12 Polish banks listed on the Warsaw Stock Exchange. The empirical study was based on the Bank Focus database and covered 2011--2019, namely the period of post-crisis regulatory changes in the European Union, introducing and implementing the CRD IV/CRR (Capital Requirements Directive IV/Capital Requirements Regulation) regulatory package. The article analysed literature and legal acts, as well as provided comparative and ratio analysis.

It is important to note that this article is the basis for the author's further research, aimed at verifying the dynamics of loan loss reserves during the COVID-19 pandemic, starting from 2020, and their impact on the level of security of Polish banks.

The theoretical part presents a definition, rules of creation, and the application of provisions in the Polish banking sector. The empirical part analysed the shaping and dynamics of their level in Polish listed banks and banking sector in 2011-2019.

2. Theoretical background: definition, rules of creation, application of provisions in the Polish banking sector

Banks secure their activities through instruments that cover the related risk, which mainly includes provisions, own funds and capital buffers. These tools are used to cover various types of bank losses that can be classified into the following categories, e.g. (Figure 1) (*Operational risk transfer…*, 2003, p. 7):

- expected losses – always occur in banking activities, in particular are related to the loan portfolio, regardless of its degree of diversification, equal to the average loss on the loan portfolio (up to value x_1 in Figure 1). Specific provisions and general risk provisions should absorb these losses;
- unexpected losses – occur rarely in banking activity, but at an acutely high level and pose a significant threat to the bank (defined in Figure 1 by the value from x_1 to x_2). These losses are to be covered by the bank's own funds (i.e. regulatory capital);
- losses of a catastrophic nature – occur only under stress conditions, i.e. those which are very unlikely but possible (for instance systemic risk). These losses can cause bank insolvency and should be covered by capital buffers (from x_2 in Figure 1). According to Basel III, these losses can be absorbed by the conservation, countercyclical and systemic risk buffers.

Figure 1 shows that banks are required to have specific provisions that would protect against expected losses and an appropriate level of own funds, which are treated as a hedge against unexpected losses, as well as to maintain capital buffers to absorb catastrophic losses.

The main tools for managing banking risk against expected losses are provisions, including the general risk provisions and specific provisions, part of the owned, unused financial resources, created under the applicable regulations in the form of write-offs from profit or write-offs in costs, and kept in the event of unexpected needs or the financing of realised negative risk effects.

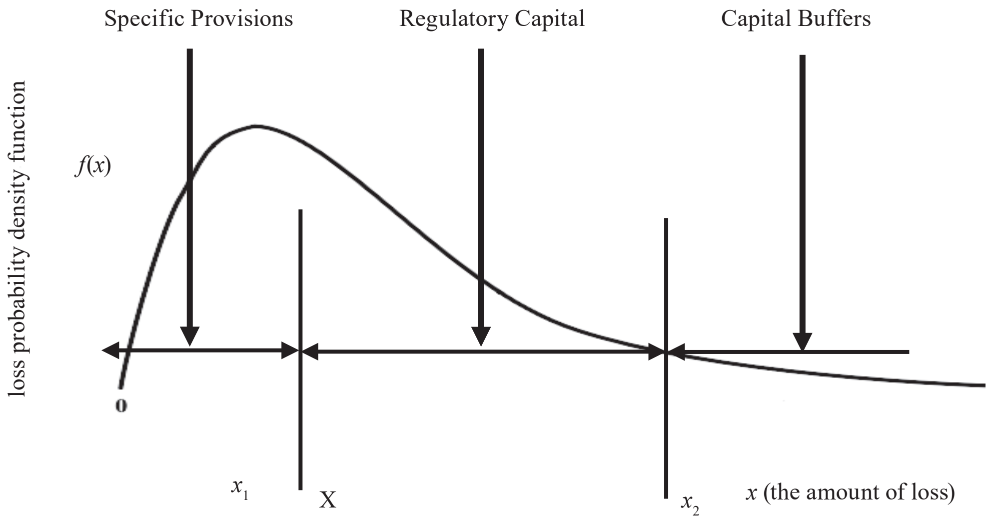

Fig. 1. Securing banking activity against operational risk losses

Source: own elaboration based on (Marcinkowska, 2009, pp. 282-283; *Operational risk transfer…*, 2003, p. 7).

The creation of a provision for the bank's general risk depends on the decision of an individual bank in order to cover the unidentified risk related to the conduct of its business. In Poland, the possibility of creating provisions for general risk results from art. 130 of the Banking Law (The Banking Law Act, 1997). It should be emphasised that the creation of general risk provisions depends on the financial result, the bank's financial strategy, as well as the owners' expectations, and is not related to a specific liability or a specific asset item, but its creation ensures the improvement of the bank's safety. In addition, in Poland banks may establish a general risk fund referred to art. 127 sec. 2 point 2 of the Banking Law, on the basis of a write-off made in the current financial year from the profit for the previous year (The Banking Law Act, 1997). Pursuant to the regulations in force, the general risk fund is classified as core capital in the financial statements. The general risk provisions is one of the liabilities (National Bank of Polish General Inspectorate of Banking Supervision, 2017, p. 88).

However, the bank's protection against expected losses relies primarily on a system of specific provisions, created in order to balance the risk arising from granted loans, bank guarantees and other receivables (Niewiadoma, 2005, p. 41). These provisions are prospective and relate to future, unspecified events. It is important that, on the one hand, write-offs in the form of specific provisions are treated as incurred losses, and on the other, they are still projections of future losses. They reflect expected losses, in other words potential losses, by which banks anticipate and anticipate future possible, but probable, actual losses due to customer defaults (Pogorzelski, 2014, p. 31).

An important role among the bank's specific provisions is loan loss provisions, which are created based on the risk assessment of credit exposures constituting balance sheet receivables and granted off-balance sheet liabilities of a financial and guarantee nature (The Polish Financial Supervision Authority, 2013).

The full list of the Polish classification of credit exposures according to the criterion of the timely repayment of principal or interest is presented in Table 1. Credit exposures to the State Treasury and natural persons, granted for purposes not related to business activity or running a farm, are classified according to the criterion of the timely repayment of capital or interest, while in the case of other credit exposures, on the basis of two independent criteria, i.e. timeliness repayment of principal or interest and the economic and financial standing of the debtor (Rozporządzenie Ministra Finansów z dnia 16 grudnia 2008 r.).

Table 1. Classification of exposures depending on the period of delay in repayment and the group of borrowers in Poland (as of 31/12/2019)

Time of delay in repayment of principal or interest	up to 1 month	1-3 months	3-6 months	up to 1 year	1-2 years	over 2 years
	Performing loans		Non-performing loans			
Exposures to entrepreneurs (business loans) and exposures to individuals arising from mortgage loans, off-balance sheet liabilities	Normal (0%)	Under observation* (1.5%)	Below standard (20%)	Doubtful (50%)	Lost (100%)	
Exposures (to natural persons) resulting from loans and retail loans (consumer loans for private persons, including: credit cards, installment loans, student loans)	Normal* (1.5%)			Lost (100%)		
Exposures to the State Treasury	Normal (0%)				Doubtful (50%)	Lost (100%)

* The required level of specific provisions for risk related to credit exposures classified as "under observation" and "normal" can be reduced by 25% of the general risk provision value.

Source: own elaboration on the basis of (Rozporządzenie Ministra Finansów z dnia 16 grudnia 2008 r.).

In Poland, the obligation to create specific provisions was introduced by the Regulation of the Minister of Finance of December 16, 2008. These provisions (in other words balance sheet receivables) are used to cover the risk related to specific and projected losses for certain exposures classified as under observation, below the standard, doubtful and lost exposures, e.g. (§ 3 section 2 point 2 of the Regulation of the Minister of Finance of December 16, 2008):

- 1.5% – for the under observation category;

- 20% – for the below standard category;
- 50% – for doubtful categories;
- 100% – for the lost category.

Pursuant to Polish law, exposures classified as below standard, doubtful and lost (Table 1) constitute the group of non-performing loans. Non-performing loans are claims where the debtors have defaulted on their credit agreement obligations, defined as loans with interest or principal overdue more than 90 days from the required repayment date. In addition, it is important to note that under the International Accounting Standards, receivables are distinguished that are or are not subject to the forbearance procedure, i.e. the process of renegotiating the terms of the contract in relation to debtors who, for economic or legal reasons, have or may have financial difficulties (EBA Final Draft Implementing Technical Standards, 2013). The purpose of forbearance activities is to restore the debtor's or issuer's ability to meet their obligations and to maximize the efficiency of managing difficult debts, i.e. to obtain the highest possible recoveries, while minimising the related costs.

The creation of specific provisions is obligatory, therefore failure to establish specific provisions in the required amount reduces the bank's own funds. It should be emphasised that specific provisions are dissolved once the reasons for their creation have completely ceased to exist. After the specific provisions are exhausted, the next source of coverage of the remaining losses is the general risk reserve and the general risk fund.

3. Research methodology

Specific provisions are considered to be those created against a reduction in the value of an asset. In financial statements, bank loan loss reserves are reflected on the asset side of a bank's balance sheet, the amount is subtracted from the gross amount of the loan portfolio. Specific provisions may reduce the value of an asset by creating a loan loss provision, as well as restoring the provision - net charge off or the amount written-off (Walter, 1991, p. 21).

The level of specific provisions can be measured by the ratio of the amount of loan loss reserve to the total value of gross loan. The loan loss reserve over gross loan ratio indicator shows how much of the total portfolio has been provided for, but not charged off. It is a reserve for losses expressed as a percentage of total loans. Given a similar charge-off policy, the higher the ratio, the poorer the quality of the loan portfolio:

$$\textit{Ratio of the amount of Loan Loss Reserve to the total value of Gross Loan} = \textit{Loan Loss Reserve} / \textit{Gross Loans}. \tag{1}$$

This becomes an important analysis, directed to measure coverage ratio relates loan loss reserves to non-performing. The higher the coverage ratio, the better provided the bank is, and the more comfortable one will feel about the quality of assets and thus the safety of the banking sector:

$$\text{Coverage Ratio} = \text{Loan Loss Reserve} / \text{Non-performing Loans.} \tag{2}$$

At the time of making a loan loss provisions on an asset, net interest revenue is also taken into account. In order to assess both the profitability and safety of the bank, the ratio of loan loss provisions/net interest revenue is used:

$$\text{Ratio of the amount of loan Loss Reserve to total value of Net Interest Revenue} = \text{Loan Loss Provisions} / \text{Net Interest Revenue.} \tag{3}$$

Ideally, this ratio should be as low as possible. In a well-run bank, if the lending book is higher in risk, this would be reflected by higher interest margins. If the ratio deteriorates this means that risk is not being properly remunerated by margins.

Based on the above, an empirical study was performed for 12 Polish listed banks in 2011-2019, namely:

Powszechna Kasa Oszczędności Bank Polski S.A. (PKO Bank);
Santander Bank Polska S.A. (Santander Bank);
Bank Polska Kasa Opieki S.A. (Pekao Bank);
ING Bank Śląski S.A. (ING Bank);
mBank S.A. (mBank);
BNP Paribas Bank Polska S.A. (BNP Paribas);
Bank Handlowy w Warszawie S.A. (Bank Handlowy w Warszawie);
Bank Millennium S.A. (Millennium Bank);
Alior Bank S.A. (Alior Bank);
Getin Noble Bank S.A. (Getin Noble Bank);
Bank Ochrony Środowiska S.A. (Bank Ochrony Środowiska);
Idea Bank S.A. (Idea Bank).

The empirical study used data from the Bank Focus database and the annual financial statements of the analysed banks.

4. Research findings and discussion

4.1. The level and dynamics of the loan loss reserves of Polish listed banks in 2011-2019

Table 2 presents the results of the analysis of the loan loss reserves of 12 Polish listed banks in 2011 and 2019.

The highest level of loan loss reserves in 2019 was held by PKO Bank (16% of the value of provisions of all analysed banks), Pekao Bank (14%) and Santander Bank (12%), which is mainly determined by the size and scope of their operations (Table 2).

The high level of Alior Bank's provisions (12.2%) is also conditional on engaging in risky activities and having a large amount of non-performing loans. The group of banks with a low level of loan loss reserves in 2019 included Millennium Bank (4%), Bank Ochrony Środowiska (3%) and Bank Handlowy w Warszawie (2%).

Table 2. The level and dynamics of the loan loss reserves of Polish listed banks in 2011-2019 (PLN million)

Bank	2019				2011		Dynamics 2011* = 100%	
	mln zł	%	Deviation from average	Average Value	mln zł	%	mln zł	%
PKO Bank	7221	16	3498	above average	5 658	25	1563	28
Santander Bank	5244	12	1521	above average	1 415	6	3829	271
Pekao Bank	6470	14	2747	above average	4 623	20	1847	40
mBank	3190	7	−533	below average	2 388	10	802	34
ING Bank	2481	6	−1242	below average	1 114	5	1367	123
BNP Paribas Bank	3228	7	−495	below average	883	4	2345	266
Bank Millennium	1962	4	−1761	below average	1 217	5	744	61
Alior Bank	5449	12	1726	above average	351	2	5098	1454
Getin Noble Bank	4860	11	1137	above average	3 687	16	1174	32
Bank Handlowy w Warszawie	691	2	−3032	below average	1 236	5	−545	−44
Bank Ochrony Środowiska	1171	3	−2552	below average	239	1	932	389
Idea Bank*	2707	6	−1015	below average	0	0	2608	2612
Total reserves	**44 674**	**100**			**22 811**	**100**		
Average Value	**3 723**				**2 074**			**80**

* In calculating the dynamics of changes in Idea Bank, the author adopted 2012 as the base year.

Source: own elaboration based on data from the Bank Focus database and annual consolidated financial statements of the analysed banks.

The analysis of the average level of loan loss reserves in 2019, carried out in Table 2, allows the analysed banks to be divided into two groups, namely:

- banks above average – PKO Bank, Santander Bank, Pekao Bank, Alior Bank, Getin Noble Bank;
- banks below average – mBank, ING Bank, BNP Paribas, Bank Millennium, Bank Handlowy w Warszawie, Bank Ochrony Środowiska, Idea Bank.

Moreover, in 2019 all these banks (except for Bank Handlowy w Warszawie) had positive dynamics of changes in the level of loan loss reserves compared to 2011. The falling trend in changes in the level of provisions of Bank Handlowy w Warszawie may be explained by the significant decrease in the amount of non-performing loans in 2019 by more than 47%, which should be assessed positively.

4.2. Amount of loan loss reserve to the total value of gross loan of Polish listed banks in 2011-2019 (%)

Moreover, in terms of safety, it became necessary to analyse the ratio of the amount of loan loss reserve to the total value of gross loan. The results are presented in Figure 2. This ratio reflects the extent to which the bank's loans are secured with reserve funds in the event of expected losses.

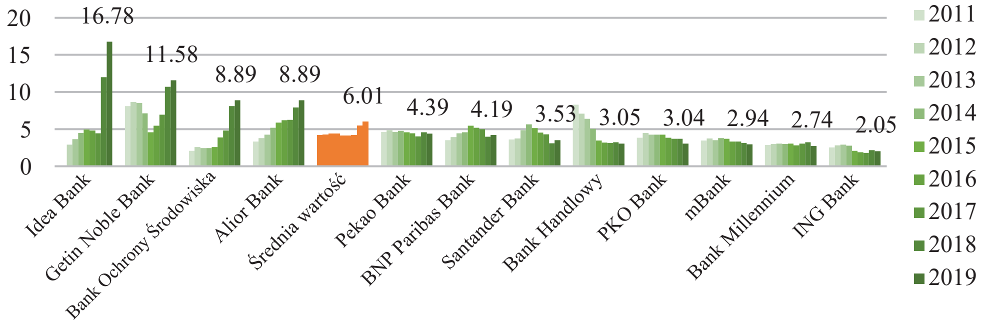

Fig. 2. Amount of loan loss reserve to the total value of gross loan of Polish listed banks in 2011-2019 (%)

Source: own elaboration based on data from the Bank Focus database and annual consolidated financial statements of the analysed banks.

Figure 2 shows that in 2019, Idea Bank (16.78%), Getin Noble Bank (11.58%), Bank Ochrony Środowiska (8.89%) and Alior Bank (8.89%), had the highest share of loan loss reserves in the value of the entire loan portfolio. This means that these banks had loan portfolios of lower quality. The banks with the highest loan quality in terms of the analysis of this ratio included ING Bank (2.05%), Bank Millennium (2.74%) and mBank (2.94%). Moreover, in 2011-2019, Polish listed banks had an average share of loan loss reserves of 4.59% of the value of the entire loan portfolio, which may indicate the average ability of the banking sector to cover expected losses.

The results of the analysis of the ratio of the share of loan loss reserves to the total value of gross loans should be interpreted from two perspectives. On the one hand, the high level of specific provisions indicates greater compliance with the absorption of expected losses. On the other hand, the high level of provisions indicates that these banks have a greater number of non-performing loans in their portfolio, and are therefore obliged to create higher provisions to hedge against higher risk. Therefore, the higher percentage of loan loss reserves in the total value of loans, the worse the quality of the loan portfolio. Confirmation of the above dependence is the situation of Idea Bank. An interesting case can be also seen in Millennium Bank, which had a non-performing loan ratio in 2019 of 4.47%, and the level of loan loss reserves in the total value of gross loans was 2.74%. This means that the level of non-performing loans is higher than the level of provisions, which may lead to inadequate hedging against the bank's expected losses, and that not enough provisions were established compared to the identified non-performing loans.

4.3. Coverage ratio of Polish listed banks in 2011-2019 (%)

Next, it was important to analyse the extent to which the loan loss reserves cover the bank's non-performing loans (coverage ratio). For this purpose, the coverage ratio was used, which is one of the measures of the quality of the bank's assets, and thus the safety of the banking sector. The analysis of the coverage ratio of Polish listed banks in 2011-2019 is presented in Figure 3.

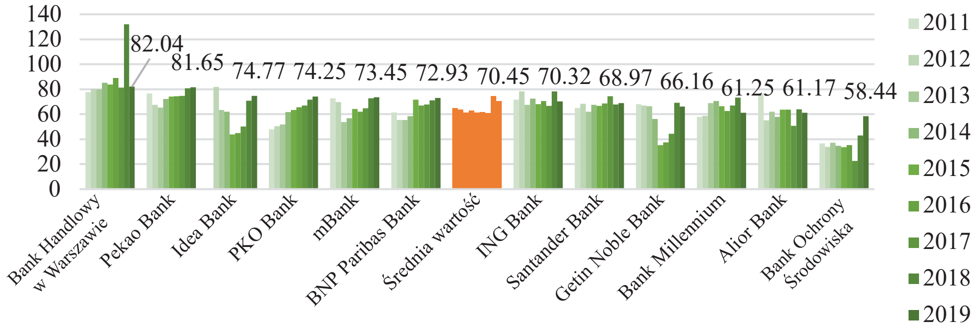

Fig. 3. Coverage ratio of Polish listed banks in 2011-2019 (%)

Source: own elaboration based on data from the Bank Focus database and annual consolidated financial statements of the analysed banks.

As shown in Figure 3, the highest coverage ratio in 2019 was for Bank Handlowy w Warszawie (82.04%), Pekao Bank (81.65%) and PKO Bank (74.77%). This shows that the non-performing loans of these banks were secured by provisions in the range of 74%-82%. The high level of the coverage ratio means that the bank is prepared to materialise the risk and its impact on the bank's financial results will be less severe. It is worth noting that Idea Bank was also among the banks with a high degree of coverage of non-performing loans by provisions in 2018-2019. The high level of the coverage ratio of this bank was conditioned by the increase in the value of non-performing loans in 2018-2019, which led to the need to make appropriate provisions. The Idea Bank coverage ratio in 2019 can be assessed as sufficient to protect against expected losses as a result of the materialisation of the risk resulting from non-performing loans.

The results of the analysis of the level of provisions created to cover non-per forming loans, presented in Figure 3, also indicate a group of banks with a lower level of the coverage ratio in 2019, namely Bank Ochrony Środowiska (58.44%), Alior Bank (61.17%) and Millennium Bank (58.44%). The lower level of this ratio indicates that these banks have a lower level of coverage of irregular loans with provisions, which may lead to the need to improve the quality of loans by increasing the level of provisions or reducing the volume of non-performing loans.

4.4. Amount of loan loss reserve to total value of net interest revenue of Polish listed banks in 2011-2019 (%)

At the time of making a loan loss provisions on an asset, net interest revenue is also taken into account. In order to assess both the profitability and safety of the bank, the analysis of the ratio of loan loss provisions divided by net interest revenue is presented in Figure 4.

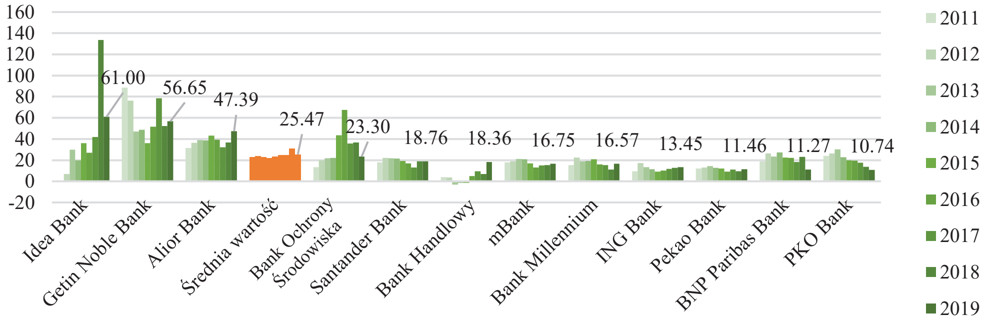

Fig. 4. Ratio of loan loss provisions/net interest revenue of Polish listed banks in 2011-2019 (%)

Source: own elaboration based on data from the Bank Focus database and annual consolidated financial statements of the analysed banks.

Figure 4 shows that the value of the ratio of loan loss provisions / net interest revenue differed significantly in 2011-2019. In the analysed period, the average value of this ratio in Polish listed banks was 24.61%. Comparing the level of this indicator in 2019, the banks can be divided into two groups, namely:

- banks with a low level of this ratio, i.e. high quality of assets, including PKO Bank, BNP Paribas, Pekao Bank, ING Bank, Bank Millennium and mBank;
- banks with a high level of this ratio – thus low asset quality, including Alior Bank, Getin Noble Bank and Idea Bank.

It should be emphasized that each bank in its activities should strive to keep this ratio as low as possible. The group of banks with a low level of this ratio can be described as well-managed banks in terms of the risk taken and interest income received, respectively. Yet, a higher level of this ratio means that the risk taken by banks belonging to the second group is not adequately remunerated, e.g. the loan portfolio is more exposed to risk, which is reflected in higher interest margins.

4.5. The situation of reserves in the Polish banking sector during the COVID-19 pandemic (in 2020)

As can be seen from the above results of the empirical study, in the period before the pandemic (2011-2019), the dynamics of all the analysed indicators increased, namely:

- in the average level of loan loss reserve to the total value of gross loan from 4, to 6.01 (Figure 2);
- in the average coverage ratio from 64.71 to 70.45 (Figure 3);
- in the average ratio of loan loss provisions / net interest revenue from 22.99 to 25.47% (Figure 4).

The above-described trend of changes in the analysed indicators proves that before the pandemic started, Polish banks put more emphasis on increasing the level of banking security, and less on the level of profitability, which should be assessed as positive changes taking place in this period. In other words, an increase in the level of safety generally translated into a decrease in the bank's profitability in the analysed years.

The above-mentioned trend continued in 2020. As seen in the report of National Polish Bank in 2020, a decrease in the profitability of this sector should be noted in the Polish banking sector, which may pose a challenge to the stability of the Polish banking sector in the long term (Narodowy Bank Polski, p. 7).

Even before the pandemic, the profitability of the banking sector in Poland was gradually declining (Table 2, reflecting the increase in the reserves of Polish listed banks). As a result of the pandemic, loan loss provisions and write-offs in 2020 increased respectively by 78.1% and 39.2% (Informacja na temat sytuacji sektora bankowego w 2020 roku, 2021, p. 9). The reduction of Polish banks' profitability was mainly due to the increase in provisions and write-offs (+11.5 percentage points to 28.4% at the end of 2020), mainly due to the increase in the provisions established for the risks associated with the pandemic (Komisja Nadzoru Finansowego, 2021, p. 12).

In 2020, the number of banks incurring losses increased (to 34 from 26 at the end of August 2019). Losses were recorded mainly by smaller and medium-sized banks, their share in the banking sector's assets increased to approximately 11% (from 6% at the end of August 2019) (Narodowy Bank Polski, 2020, p. 24). Furthermore, the National Polish Bank forecasted that in coming years, a deepening decline in the profitability of the banking sector can be expected. The main reason for this will be a further increase in write-offs for credit risk due to the delayed effect of the economic slowdown related to the COVID-19 pandemic. In addition, there may be a deterioration in the quality of loans for borrowers who have run out of credit moratoria or other forms of assistance have expired.

5. Conclusion

The main tools for managing banking risk against expected losses are provisions, including general risk provisions and specific provisions. The bank's protection against expected losses relies primarily on a system of specific provisions, created in order to balance the risk arising from granted loans, bank guarantees and other receivables. An important role among the bank's specific provisions is played by loan loss provisions, which are created based on the risk assessment of credit exposures. In Poland, the obligation to create specific provisions was introduced by the Regulation of the Minister of Finance of 16 December 2008. According to Polish law, exposures classified as below standard, doubtful and lost constitute the group of non-performing loans. Non-performing loans are claims where the debtors have defaulted on their credit agreement obligations, defined as loans with interest or principal overdue more than 90 days from the required repayment date.

The creation of specific provisions is obligatory, therefore failure to establish specific provisions in the required amount reduces the bank's own funds. After the specific provisions are exhausted, the next source of coverage of the remaining losses is the general risk reserve and the general risk fund.

The results of the empirical study on Polish listed banks in 2011-2019 show that:

- in 2019, Idea Bank, Getin Noble Bank, Bank Ochrony Środowiska and Alior Bank had the highest share of loan loss reserves in the value of the entire loan portfolio. This means that, these banks had loan portfolios of lower quality. The banks with the highest loan quality in terms of the analysis of this ratio included ING Bank, Bank Millennium and mBank;
- the highest coverage ratio in 2019 was for Bank Handlowy w Warszawie, Pekao Bank and PKO Bank. This shows that the non-performing loans of these banks were secured by provisions in the range of 74%-82%. The high level of the coverage ratio means that the bank is prepared to materialise the risk and its impact on the bank's financial results will be less severe. The results of the analysis of the level of provisions created to cover non-performing loans, presented in Figure 3, also indicate a group of banks with a lower level of the coverage ratio in 2019, e.g. Bank Ochrony Środowiska, Alior Bank and Millennium Bank;
- the value of the ratio of loan loss provisions/net interest revenue differed significantly in 2011-2019. The average value of this ratio in the Polish listed banks was 24.61%. In that period, the value of this ratio, as well as the ratio of the amount of loan loss reserve to the total value of gross loan, was the highest in the three analysed Polish banks, namely Idea Bank, Getin Noble Bank and Alior Bank, which indicates the low quality of assets of these banks;
- before the start of the pandemic, Polish banks had place more emphasis on increasing the level of banking security, and less on the level of profitability, which should be assessed as positive changes taking place in this period;
- a decrease in the profitability of the Polish banking sector continued during the pandemic in 2020, mainly due to the increase in provisions established for the associated risks.

The empirical study presented in this paper contributed to the conclusion that in the period between the global financial crisis and the start of the COVID-19 pandemic, the situation of reserves in the Polish banking sector showed a high level of safety. In relation to this, the Polish banking sector entered to COVID-19 pandemic in 2020 in good condition, with stable financing, a strong capital base and a high level of loan loss reserves. In 2019, in the Polish banking sector:

- the average level of loan loss reserve to the total value of gross loan was 6.01%;
- the average coverage ratio – 70.45%;
- the average ratio of loan loss provisions/net interest revenue – 25.47%.

The research limitation is the fact that the study covers only 12 Polish listed banks. Furthermore, in order to generalise the presented average results of the Polish banking sector, the average values of the corresponding ratios of the 12 Polish listed banks in individual years were used. This approach has some limitations, namely it excluded from the study of cooperative banks and other commercial banks. This drawback is only theoretically significant, because the role of cooperative banks in the entire banking sector is much smaller, and the failure of a single bank operating on the local market does not generate such a large systemic threat as the collapse of a large commercial bank. It should be noted that the share of other commercial banks not included in this empirical study (lending and deposit banks whose shares are not listed on the stock exchange) have a different specificity of operation, but play a much smaller role in generating systemic risk.

One should also note that the time range of the conducted research was 2011--2019, selected to cover the period of post-crisis regulatory changes in the European Union, e.g. introducing and implementing the CRD IV/CRR regulatory package, which came into force on 1 January 2014. The selected period included three crisis years (2011, 2012, and 2013), namely before the implementation of the CRD IV/CRR package and the period of its implementation (2014-2019), completed at the end of 2019. The period of nine years is long enough to be able to check what changes occurred in individual years in the level of safety of the Polish banking sector. Nowadays, it is also important to assess the impact of the COVID-19 pandemic on the level of safety from the perspective of loan loss reserves of Polish listed banks and the banking sector, which will undoubtedly constitute an area of the author's further research.

The results of the conducted research can be used in the practical activities of banks in terms of adjusting their operation to the regulatory requirements. Furthermore, the results can also be used as a benchmark for decisions and actions taken by regulatory and supervisory authorities, as well as increase the trust the stakeholders have in the banking sector.

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ZABEZPIECZENIE DZIAŁALNOŚCI BANKOWEJ PRZEZ REZERWY CELOWE: ANALIZA EMPIRYCZNA POLSKICH BANKÓW GIEŁDOWYCH W LATACH 2011-2019

Streszczenie: W artykule przeprowadzono analizę rezerw celowych jako narzędzia zabezpieczającego przed stratami oczekiwanymi. Celem była teoretyczna i empiryczna analiza rezerw na straty kredytowe w polskich bankach giełdowych w latach 2011-2019. Sformułowano hipotezę badawczą stanowiącą, że istnieje znaczące zróżnicowanie poziomu bezpieczeństwa pod względem rezerw na straty kredytowe wśród polskich banków giełdowych. Przedmiotem badania było 12 polskich banków notowanych na Giełdzie Papierów Wartościowych w Warszawie. Badanie empiryczne opierało się na bazie danych Bank Focus. W artykule wykorzystano metodę analizy literatury i aktów prawnych oraz analizę porównawczą i wskaźnikową. Ponadto dokonano oceny stanu rezerw w polskim sektorze bankowym przed wybuchem pandemii COVID-19, jak również zasygnalizowano najważniejsze zmiany w tym zakresie w czasie trwania pandemii. Analizowane banki zostały zróżnicowane ze względu na poziom rezerw przeznaczonych na straty kredytowe, wskaźnik pokrycia oraz stosunek wysokości rezerwy na straty kredytowe do łącznej wartości przychodów odsetkowych netto. Wyniki badań mogą być wykorzystywane jako punkt odniesienia dla decyzji i działań podejmowanych przez organy regulacyjne i nadzorcze. Wyniki badań mogą również zwiększyć zaufanie interesariuszy do sektora bankowego.

Słowa kluczowe: bank, bezpieczeństwo, oczekiwane straty, rezerwy, rezerwy na straty kredytowe.