Agnieszka Wójcik-Mazur

Czestochowa University of Technology
e-mail: sokolica@wp.pl

THE EFFECT OF STRUCTURAL LIQUIDITY ON PERFORMANCE IN POLISH COMMERCIAL BANKS (MEASURED WITH MARGIN LEVEL) IN 2009-2016

WPŁYW PŁYNNOŚCI STRUKTURALNEJ NA RENTOWNOŚĆ POLSKICH BANKÓW (MIERZONĄ POZIOMEM MARŻY) W LATACH 2009-2016

Summary: The purpose of this article is to determine the impact of liquidity policy, which reflected mainly in the asset structure of Polish banks on the level of margin. The paper diagnoses the relationships between the levels of profitability (margin) generated by 4 biggest Polish commercial banks and their structural liquidity level. As an independent variable, the model design implied the level of margin, whereas liquidity risk predictors represented balance measures that identified the level of liquid assets, funding liquidity risk, share of loans in total assets and degree of involvement in the interbank market. The studies demonstrated that both the increase in liquid assets and the level of loans in total assets has a positive effect on the margin level. It means the rate of return of assets (include liquid assets) is still higher than cost of debt in Polish banks. However, it should be emphasized that the increasing contribution of the funding liquidity risk (measured as a ratio of loans to deposits) in the period of 2009-2016 was not accompanied by a statistically significant increase in the margin, which appears to be caused by the interest rate policy of the Polish central bank.

Keywords: liquidity risk, banks, margin.

Streszczenie: Celem artykułu jest określenie wpływu polityki płynnościowej kształtującej strukturę aktywów banku na poziom jego rentowności. W artykule zdiagnozowano relacje zachodzące pomiędzy poziomem rentowności (marżą) generowaną przez cztery największe polskie banki komercyjne a ich strukturalnym poziomem płynności. Dla określenia zależności skonstruowano model, w którym zmienną niezależną stanowił poziom marży, a do grupy zmiennych objaśnianych zaliczono ryzyko płynności mierzone udziałem kredytów do depozytów, kredytów do aktywów ogółem, udziałem aktywów płynnych w aktywach ogółem oraz stopniem zaangażowania na rynku międzybankowym. Przeprowadzone badania wskazały, że zarówno rosnący udział kredytów, jak i aktywów płynnych w aktywach ogółem, wpływa

na wzrost generowanej marży w polskich bankach. Taka zależność wskazuje, że w uwarun-
kowaniach polskiego systemu bankowego stopa zwrotu z aktywów (w tym płynnych) ciągle
przewyższa koszty związane z finansowaniem działalności banków. Dodatkowo należy pod-
kreślić, że zwiększający się udział ryzyka finansowania mierzonego udziałem kredytów do
wielkości pozyskanych depozytów (w latach 2009-2016) był statystycznie nieistotny w rela-
cji do generowanej marży przez banki. Ta zależność, jak się wydaje, wynika w szczególności
ze specyfiki polityki procentowej prowadzonej przez bank centralny w Polsce.

Słowa kluczowe: ryzyko płynności, bank, marża.

1. Introduction

One of the essential elements of maintaining the safety of the banking system is
keeping a sufficient level of financial liquidity within individual institutions.
However, in classical terms it is considered that buffer of liquid assets held by banks
generally provide the lower bank's return. Common opinion is that the increase of
that buffer share in total assets may limit a level of margin, return on assets and
capital. The empirical studies that identify the determinants of performance of
commercial banks represent a very wide area with endogenous variables being ROA,
ROE or the level of margin generated by an individual institution. Regardless of the
adopted modelling criteria (according to the degree of development, bank size or
geographical area the banks operate in), the group of independent variables includes
liquidity risk predictors. On the basis of empirical research we can observe that
the relation between the margin and the liquidity risk level is not always positive.
Nevertheless, the designation of these relationships is extremely important as it
points to the effectiveness of strategic decisions in determining the relationship
between the loan portfolio and the buffer of liquid assets. Decisions concerning the
share of liquid assets in the total assets of the bank, as well as the level of loans
to deposits ratio, are strategically important, not only because they have a strong
impact on the bank's interest income and the level of liquidity, but also on the risk
management process.

It should be emphasized that this area of research has not been explored to date
for the Polish banking system. Due to the specific conditions of the Polish banking
system (its structural over-liquidity) it was considered as very important, to indicate
the impact of the balance sheet risk liquidity ratio (liquid, illiquid assets in total
assets and loans to deposits) on the level of margin generated by the largest Polish
commercial banks. For this reason, in the paper on the basis of the margin the group
of independent variables was estimated, including the liquidity risk. In the model the
liquidity risk ratio is demonstrated (in accordance with the empirical study) by the
relation of loans to deposits [Bonfim, Kim 2012; Dumičić, Ridzak 2013], the share
of liquid assets in total assets [Roman, Dănuleţiu 2013, Bordeleau, Graham 2010;
Acaravci, Calim 2013], loans in total assets [Horvath 2009; Claeys, Vennet 2003;

Gelos 2006] and engagement of the bank in the interbank market [Bonfim, Kim 2012].

Therefore, the analysis focuses on the evaluation of the effect of liquidity policy on the profitability level (margin), measured with the determination of the share of net interest income in earning assets. During the empirical study, the following research hypotheses were proposed and verified:

1. There is a negative relationship between liquidity risk measured with ratios of highly liquid or liquid assets in total assets and margin level,

2. Measure of funding liquidity risk (loans to deposits) is positively correlated with the margin index,

3. The predictor of involvement in the interbank market has an effect on the margin level.

2. Bank liquidity risk in empirical studies

Due to its specific character and dual nature (market risk and financing risk – Stopczyński [2016], liquidity risk continues to generate problems of both theoretical-cognitive and empirical nature [Iwanicz-Drozdowska 2012; Dziwok 2015]. The problems of liquidity risk have been widely explored in order to identify the series of essential problems analysed from the macroeconomic standpoint. One can agree with the statement of Nikolau [2009] that the empirical explorations in terms of liquidity in commercial banks represent the fragmentary approach to this subject matter since they are the component of macroeconomic problems identification and do not always focus on financial liquidity that represents the internal process of micro-management of the bank.

It can be emphasized that in macro examinations, the modelled liquidity is the problem considered in the context of:
- genesis, escalation and the scale of financial crisis [Gale, Yorulmazer 2013],
- the purposiveness of implementation of the instruments of monetary policy [Acharya et al. 2012; Przybylska-Kapuścińska 2011; Rezende et al. 2016; Acharya, Yoruzmaler 2008] and governmental assistance [Gorton, Huang 2004],
- the importance of the effect and economic effects of implementation of the macro-prudential regulations [Marcinkowska et al. 2014; Zaleska 2016; Bengui 2010] (including the system for deposit guarantees) and supervisory standards [Allen, Gale 2004].

The studies focused mainly on the micro analysis include:
- the analysis of the stability for the structure of sources of financing and the correlations between the financial risk in commercial bank (sources of finance) and market liquidity risk (of assets) [Brunnermeier, Pedersen 2009; Ratnovski 2009; Drehmann, Nikolau 2010],
- the diagnosis of the determinants of performance and liquidity of individual banking institutions (with respect to the effect of macroeconomic parameters).

In the indicated areas of explorations, the phenomenon of liquidity is in vast majority implemented as an exogenous determinant. This concerns in particular the studies focused on the macroeconomic problems from the standpoint of exploration of the scale and escalation of financial crises, supervisory regulations and institutional interventions.

However, in the narrower group of macroeconomic studies that implemented market (also asset prices) liquidity, one can distinguish between the general approach, where the liquidity level is determined internally and the structure of asset portfolio of the commercial banks is the element of internal choices, and the results from the strategy adopted for liquidity risk management. These problems are narrowed to explorations that take into account the evaluation of the process of liquidity collection by individual institutions [Gale, Yorulmazer 2013].

Through the evaluation of the effect of cash inventory on the performance, the purposiveness of such activities is identified. With this approach, two characteristic motivations for collecting cash were emphasized: the prudential motivation and strategic motivation. Both prudential and strategically motivated collection of cash funds in banks is the function of the expected variability of asset prices in the financial market. Therefore, the variability of the prices results from the opportunities for implementation of the asset market as a source of liquidity [Allen, Gale 2004]. With the strategic approach in terms of liquid asset portfolio management, banks expect a breakdown in the prices in the asset market (fire sales) and collect cash funds that allow them to purchase the assets of other banks. Therefore, banks form the structure of the portfolio and anticipate future changes in prices in the markets. Consequently, the accumulated cash is characterized by a higher expected rate of return [Diamond, Rajan 2011] and the growing variability of prices results from the conversion of assets into cash [Gale, Yorulmazer 2013]. This behaviour of banks disturbs the market balance through the limitation of the liquidity level and ineffective collecting of cash.

In the wide group of empirical studies, modelling of the contagion risk and financial instability is determined by internal factors, including the liquidity level. However, essentially different approach is indicated for the identification of the sources of systematic risk. It should be emphasized that in empirical studies, the phenomena that cause systematic risk, resulting from the structure of the commercial bank balance, are modelled. In the explorations carried out by Acharya [2009], systematic risk is determined by the correlation of the rates of return on asset portfolios of individual banks. With the second approach, the risk of financing through exploration of the passive side of the bank that represents the evaluation of the structure of liabilities is analysed.

After the outbreak of the subprime crisis many economists accentuated the essential deficiencies in terms of theoretical concepts and explorations from the standpoint of the risk of financing liquidity of an individual institution. In the literature and empirical studies, authors indicate that this area of examinations is

referred to as financial risk which represents a significant component of the liquidity risk management in the micro area. This scope of empirical analyses is co-created by the investigations focused on the evaluation of the sources of financing in commercial banks proposed by Huang and Ratnovski [2010]. Their analyses reveal the negative effects of the growing contribution of the short-term sources of financing in liabilities in total in commercial banks. However, the dominant area in this group of studies is the area where financing risk is modelled in the context of the market (asset) risk. Strong correlations between market liquidity risk and financing risk in empirical studies were verified by Drehmann and Nikolau [2009]. The risk of market liquidity indicates the substantial similarities with the risk of bank financing mainly due to its low and stable level maintained in longer periods, with simultaneous tendencies to sporadic, but deep and rapid, growths [Nikolau 2009].

Currently a new area of research is modelling of determinants of liquidity risk in commercial banks, with the level of risk treated as the endogenous variable. It should be noted that in the dominant wide scientific discourse before the outbreak of the subprime crisis, the determinants of commercial banks performance, where the liquidity risk was represented as the exogenous variable, had been mainly explored. In this area of studies, liquidity risk represented one of many independent variables, and, consequently, the scope and direction of the effect of the liquidity risk on the level of generated performance of management of individual institutions was verified (treated as measures of return, mainly ROA, ROE and interest margin). Therefore, liquidity risk represented both a stimulant and destimulant in the estimated models. In this direction of research, the determinants of the performance of the banking sector were modelled for different approaches and divisions. However, in this broad group of studies, the effect of liquidity policy on the level of performance of the specific Polish banking system has not been examined.

Therefore, this study attempts to evaluate the effect of liquidity policy of banks on the level of the generated margin in four Polish banks. Furthermore, it should be emphasized that the Polish banking system is characterized by their specific nature. The analysis of the aggregated level of Polish banking system should also take into consideration regular operations of issuing money market bills that result from the systematic excess of the short-term liquidity. For this reason, identification of the effect of liquidity policy may have a different effect on the level of performance compared to the Eurozone countries, with EBC covering only the liquidity-providing operations.

3. Literature review

The studies of the performance and liquidity determinants of commercial banks represent a very broad field of research. Explorations have been focused on either a group of banks that operate in a specific country [Dietrich, Wanzenried 2009; Lui, Wilson 2010; Heffernan, Fu, 2010; Aburime 2008; Athanasoglou et al. 2008; Beck

et al. 2005; Cole 2008; Jeon, Miller 2004; Javaid et al. 2011; Imad et al. 2011, Lartey et al. 2013] or in selected groups of countries with respect to various division criteria, including the level of development [Micco et al. 2007 (the study of 119 countries); Bonin et al. 2005; Flamini et al. 2009; Iannotta et al. 2007; Hawtrey, Liang 2008], level of revenues (Dietrich, Wanzenried [2014] the study for 118 countries), financial system model that takes into consideration the specific nature of Islamic banking (mainly in terms of comparative analyses of these banks with respect to the conventional models, including the study by Sufian, Mohamad and Muhamed--Zulkhibri [2008]. Furthermore, the examinations have been also performed for the group of banks from a single country with division into the type of property or bank size. The results obtained for the relationships are not uniform for individual countries, criteria of division and the choice of measures.

With the specific nature of the banking systems operated in the countries of Central and Eastern Europe, the estimation of the determinants of the performance of commercial banks was performed for such countries as Czech Republic [Horvath 2009; Roman, Tomuleasa 2013], Romania [Andries, Cocris 2010; Petria et al. 2015; Roman, Tomuleasa 2013; Firtescu, Roman 2015] Bulgaria [Roman, Tomuleasa 2013, Firtescu, Roman 2015], Croatia [Kundid et al. 2011] and Estonia [Männasoo 2012]. Furthermore, comparative analyses were conducted for the banks operating in Lithuania, Hungary, Bulgaria, Poland and Romania [Roman, Tomuleasa 2015].

The interesting studies of the determinants of performance with consideration for the group of internal determinants of liquidity risk were documented by Roman and Tomuleasa [2013]. They estimated the group of independent variables for 7 countries from the Central and Eastern Europe with respect to the return on average equity (ROAE). Among the exogenous variables, the researchers distinguished between 2 balance measures that identified the level of liquidity risk, such as the ratio of loans to total assets (LA) and the ratio of liquid assets (cash and due from banks + available for sale securities + government securities) to total assets. Their analysis demonstrated a statistically significant relationship between risk of liquidity and return on equity only for 3 countries: Poland, Lithuania and Bulgaria. Nevertheless, the direction of the relationships is not consistent with what was expected, since it indicates that the increasing contribution of loans in total assets is accompanied by a decline in the return on equity in 3 countries. Furthermore, the effect of the measure that reflected the share of liquid assets in total assets is statistically insignificant in almost all the countries except for Bulgaria, for which the character of effect is not typical.

Against this background, the results of the research concerning the identification of the determinants of performance in Czech commercial banks should be emphasized [Horvath 2009]. The liquidity risk, which is an exogenous variable, was evaluated through a calculation of the ratio of loans to total assets. The study demonstrated that the increasing share of loans in total assets is accompanied by the increase in the margin reached in Czech banks. Similar relations were demonstrated by the multifaceted analysis of the effectiveness of commercial banks performed for

the banks operating in 36 countries with division into the "west" and "accession" countries (countries which became the EU members in 2004, i.e. Poland, Czech Republic and Hungary) and the banking systems of other European countries (non-accession) [Claeys, Vennet 2003]. The studies that took into consideration a group of determinants, including the liquidity that reflected the share of loans in total assets, showed that the increase in this value has a statistically significant effect on the margin. However, the biggest effect was observed in the group of accession countries. According to the authors, the increasing margin compensates the higher risk level connected with loan activities. The assets which are most cost-intensive include loans. Therefore, the above finding helps to support the hypothesis that more lending leads to wider margins and can be linked to the ability of the loan pricing to reflect both: risk and funding cost expectations. An additional analysis was performed for the balance measure that reflects the share of demand and savings accounts in total deposits. It should be emphasized that the statistically significant positive relationship diagnosed by the authors demonstrates that this source of financing is, compared to others, relatively cheap and its increasing share allows for increasing the margin.

Estimation of the performance determinants (interest margin) of banks operating in the Central and Eastern Europe (CEE) was also performed for 11 banking systems in the period of 1999-2010 [Dumičić, Ridzak 2013]. The effect of liquidity measure that reflected the influence of the loans to customer deposits ratio on the generated margin was evaluated. The estimation took into consideration the effect of both external and internal determinants, with another variant of modelling including macroeconomic variables. In one variant, all macro variables were replaced with the yield spread on the government bonds, acting as a synthetic macro variable. Furthermore, one of the variants also analysed was a regulatory cost variable. Such estimations revealed that for the variant with all macroeconomic variables, the indicated measure did not represent a statistically significant variable, whereas in the narrower model (that replaced the macro variables by synthetic macro variable); its effect was more noticeable.

The study performed with the example of the developing countries published by Gelos [2006] and in the developed countries, e.g. in the USA, published by De Prince and Morris [2007], indicated that the biggest banks are characterized by lower spreads and lower margins. With this group of studies, one should emphasize the analyses in terms of the determinants of the European banks performance that imply the independent variable of the liquidity risk (loans/assets) based on 13 developed European countries, with regard to the bank size. Large banks were the institutions with total assets of over US\$ 10,000 billion in 1998, whereas the rest was classified as the small banks [Staikouras, Wood 2004]. The analysis showed that the effect of this ratio in large banks is statistically significant yet negative, which means that the increasing ratio of loans is accompanied by the increase in costs connected with the necessity of additional funding and, consequently, the increase in the margin does not occur. Furthermore, this relationship in the small European banks is positive.

Naceur [2003] estimated the performance of banks in Tunisia and demonstrated that the higher level of loans increases the return over the whole sample analysed. The examination of the performance of Chinese banks by García-Herrero, Gavilá and Santabárbara [2006] also showed that the increase in this ratio was accompanied by the progression in the return ratios (ROA). However, it should be also emphasized that some authors have demonstrated that the rising volume of liquid assets has also a positive effect on the level of performance.

To fill the literature gap in the diagnosis of the performance of Polish commercial banks, this study attempted to evaluate the effect of liquidity policy on the performance (measured with the margin level) of the biggest Polish commercial banks. The study was based on the quarterly database that makes it similar to the concept presented by Micco, Panizza and Yanez [2007].

4. Methodological framework

This study attempted to evaluate the effect of liquidity risk on the level of generated margin in four biggest Polish commercial banks. A model with the endogenous variable, provided by the level of performance measured with the margin measure (net interest income to earning assets), was developed to diagnose the relationships. The group of independent determinants was formed by the measures based on balance sheet components that concerned the share of liquid assets, funding liquidity risk (loans to deposits) and relations between the receivables and liabilities in non-secured interbank deposits. Table 1 illustrates the structure of measures of liquidity. The model was estimated using the sample of four biggest commercial banks in

Table 1. Variable calculation method

	Dependent variable	
MO	Net interest income/earning assets	Financial statements (balance sheet, income statement)
	Independent variables	
ABAO	Cash, reserve requirement (in the central bank)/total assets	Financial statements (balance sheet, income statement)
APAO	Liquid assets (cash, reserve requirement, securities)/ total assets	Financial statements (balance sheet, income statement)
KD	Loans/deposits	Financial statements (balance sheet, income statement)
KAO	Loans/total assets	Financial statements (balance sheet, income statement)
INT	Interbank market loans/ interbank market deposits	Financial statements (balance sheet, income statement)

Source: own study.

Poland for the period of 2009-2016 on a quarterly basis. Source of data was the financial statements of selected banks (PKO BP S.A., Bank Pekao S.A., mBank S.A. and ING S.A.).

A linear dynamic model (ANT) was constructed [Szajt 2005; Dańska-Borsiak 2009; Suchecki 2012] in order to demonstrate the relationships between the liquidity risk determinants and the level of generated margin:

$$MO_{it} = a_i + \beta_{1n} APAO_{it-n} + \beta_{2n} ABAO_{it-n} + \beta_{3n} KD_{it-n} +$$
$$\beta_{4n} KAO_{it-n} + \beta_{5n} INT_{it-n} + \delta_n MO_{it-n+1} + \xi_{it},$$

where: MO_{it} – net interest margin calculated for the bank i in the period t, $APAO_{it}$ – liquid assets/total assets of the bank i in the period t, $ABAO_{it}$ – cash, reserve requirement (in the central bank)/total assets of i in the period t, KD_{it} – loans/ deposits of bank i in the period t, KAO_{it} – loans/total assets of bank i in the period t, INT_{it} – interbank loans/interbank deposits of i in the period t.

Because of the short time series, a sample of panel data was used. Data for 6 banks were analysed in terms of their similarity. The correlation between the features was then investigated assuming that they were linear. As a result of this trial, 4 banks were tested.

It should be stressed that the relationship between features in a built model does not need to be linear. Then the direction of the dependence should be consistent, but the level of impact may be imprecise, assuming a higher or lower level.

The model with the variables specific for the previous n quarters has been applied (each variable was delayed to the fourth order ($n \in 0 \ldots 4$) that corresponds

Table 2. Results of ANT model estimation (MO)

	Coefficient	Standard error	t-Student	p value	Significance
const	1.96574	0.78791	2.4949	0.0148	**
APAO_2	0.00913585	0.00479646	1.9047	0.0606	*
APAO_4	0.0325384	0.00912359	3.5664	0.0006	***
ABAO_4	0.0353069	0.0109374	3.2281	0.0418	**
KD	0.00877496	0.0409446	2.1431	0.0353	**
KD	0.00810399	0.00403779	2.0070	0.0483	**
KAO	0.0077702	0.00367017	2.1171	0.0375	**
KAO_4	0.0277072	0.00834077	3.3219	0.0014	***
INT	0.0723304	0.0374424	1.9318	0.0571	*
INT_4	0.0967103	0.0449378	2.1521	0.0346	**
MO_1	1.38143	0.0917335	15.0592	<0.0001	***
MO_2	0.352374	0.0967845	3.6408	0.0005	***

Source: own study.

to the analogous quarter from the previous year). Similar order of delay was used for the endogenous variable. Estimation was made using the panel method of least squares. The legitimacy of using this estimation was confirmed by the Brush Pagan test (LM = 1.69507, p = 0.192934). Eighty-eight observations were used (4 banks × 26 quarters – 4 × 4 delays). Estimation was performed using the Gretl package. The results are contained in Table 2.

The model is characterized by an adequate fit to the empirical data (R^2 = 0.989, $F_{(11,76)}$ = 601, $p < 0.001$), whereas its random component shows the lack of autocorrelation (r_0 = 0.023, DW = 1.907), homoscedasticity ($\chi^2_{(77)}$ = 78.329, $p = 0.436$) and normality ($\chi^2_{(2)}$ = 3.347, $p = 0.188$).

Homoscedasticity of the residual component confirms the correct selection of objects to the sample, potentially increasing the usefulness of the model for possible forecasting. The results at this stage encourage the construction of an expanded model with more objects.

5. Conclusion

The estimations demonstrated that the share of loans in total assets has a significant and positive effect on the level of the generated margin. This estimated relationship, consistent with the expected one, means that the increasing share of loans is accompanied by a stronger increase in the net interest income with respect to the value of assets that generate incomes. However, it should be emphasized that the increase in liquid assets' share in the total assets points to the same direction of the effect. Progression of liquid assets in total assets of the biggest Polish banks causes, analogously to the level of loans, an increase in the margin and adopts a statistically significant value. Therefore, it can be accepted that the generated profit on liquid assets represents an alternative form of financing of free cash funds that do not limit bank's performance.

The analysis of the specific nature of the Polish banking system reveals the nearly systematic excess financial liquidity of the banking sector that results in liquidity-absorbing operations focused on regular issuing of money market bills. Therefore, it can be expected that this type of investment does not substantially reduce the generated profitability since total value of liquid assets has a positive effect on the margin. Similar conclusions were presented by Bordeleau and Graham [2010], who diagnosed the effect of liquidity on the level of generated profitability based on American and Canadian banks in 1997-2009. The estimation revealed the presence of a non-linear relationship. Furthermore, these authors demonstrated that the banks which have liquid assets increase their profitability only to a specific limit. Nevertheless, as suggested by the authors, there is a point beyond which holding further liquid assets diminishes profitability, all else equal.

It is also essential that the stronger increase in new loans with respect to the dynamics of the acquired deposits has also a positive effect on margins, although

this relationship is statistically unsatisfactory. This relation appears to result from the policy of the Polish central bank. The base percentage rates announced by the Polish National Bank were lowered 18 times in the analysed period. Therefore, it can be expected that the reductions in the percentage rates led to a more substantial decline in the revenues compared to costs. Interest rate reductions were not symmetric, for the very low interest rates maintained for liabilities, and their further reduction was considerably lower than for the loan operations. Consequently, the effect of the growing ratio of loans to deposits was accompanied by the increase in margin (at significance level of 5%). Similar relations are observed for the interbank market with respect to the level of the generated margin. With this interpretation, the increase in loan operations referred to the dynamics of acquisition of the capital in the form of passive interbank operations has an effect on the increase in the margin, but the effect is statistically insignificant.

The unexpected direction of the relationship characterizes the share of cash and obligatory reserves in total assets. Although this relation does not show a statistically significant level, the potential increase in the share of cash in total assets should not have a positive effect on the margin level. However, financial resources accumulated by Polish commercial banks in the form of the reserve requirement in the central bank also generate institutional revenues at the level of 0.9% of the reference rate. This level of the interest rate may have a positive effect, but it is so unclear that it adopts the statistically insignificant values. Stronger relationships in empirical studies were found by Acaravci and Calim [2013] who analysed a sample of Turkish banks. According to the model estimated by these researchers, share of cash in total assets had a positive (and statistically significant) effect on the level of margin in both: the group of local private banks and foreign loan institutions.

The estimations that identify the relationships between the level of liquidity and the value of the generated margin in 4 biggest Polish banks showed that the loans and also liquid assets generate the increase in margin. This diagnosis suggests that the rate of return of assets (include liquid assets) is still higher than cost of debt in Polish banks.

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