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Article

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Bank Profitability Analysis and Forecasting: Lithuania Case

Viktorija Skvarciany, Justina Simanaviciute

Abstract

Purpose of the article: The purpose of this paper is to analyse commercial banks operating in Lithuania in terms of profitability, as it is one of the critical factors of economic development. Moreover, the profitability of commercial banks is a crucial factor for banks' financial stability which, in turn, has an impact on the stability of the whole financial system of a country. Variables representing banks profitability are as follows: return on equity (ROE), return on assets (ROA), and return on risk assets (RORA). What is more, the forecast of the above-mentioned variables was made in order to predict their values.

Methodology/methods: In order to analyse and assess the dynamics of the profitability indicators (ROA, ROE, RORA), the financial reports of six banks operating in Lithuania were analysed. After analysing the profitability indicators, the forecasts for three years were made using a moving average method.

Scientific aim: To analyse commercial banks profitability indicators and make a forecast. The forecast of the indicators makes it possible to conclude that the banking system of Lithuania will continue to carry out profitable activities

Findings: The findings of the research showed that the estimated values of ROA, ROE and RORA are stable. The results of indicators forecasting makes showed that the banking system of Lithuania would continue to carry out profitable activities.

Conclusions: Summarising the indicators of profitability group: return on equity, return on assets, and assets and equity ratio, it can be argued that the Lithuanian banking system is able to manage resources efficiently, in order to ensure the profitability of operations, despite market disturbances, such as the financial crisis of 2008.

Keywords: commercial bank, return on assets, return on equity, return on risk assets, moving average

JEL Classification: G21, M21

Introduction

Commercial banks are an essential part of the financial system since they manage the significant role of all financial transactions. These aspects give banks the status of one of the most active financial intermediaries. Banks are institutions seeking profit. Therefore, the goal of commercial banks is to achieve expected profitability.

The analysis of commercial banks profitability is vital because of the several aspects (Ben Ali, Intissar, Zeitun, 2018; Tan, Floros, 2018):

- Commercial banks profitability leads to financial stability;
- Commercial banks profitability lowers capital risk.

Actually, the analysis of profitability of commercial banks could help not only to study historical data but also forecast the future profitability. Forecasting is necessary not only for designing and modelling future activities of banks but also for commercial banks customers to feel secure as forecasting could help them manage their finance. Hence, the following objectives of the study are set:

- To perform commercial banks profitability analysis;
- To forecast the profitability of commercial banks.

In fact, the profitability of six domestic commercial banks operating in Lithuania was analysed in the current paper (*SEB*, AB; *Citadelė*, AB; *DNB*, AB; *Šiaulių bankas*, AB, *Swedbank*, AB, *Medicinos bankas*, and *UAB*). However, because of the merge of *DNB* and *Nordea* banks, profitability forecasting for five banks was calculated.

1. Theoretical Background

Bank profitability is one of the critical measures of bank performance and ought to be continuously analysed. Actually, scientists

are claiming that bank profitability is the synonym of bank efficiency (Yanikkaya, Gumus, Pabuccu, 2018). Moreover, there are plenty of studies investigating the relationship between bank concentration and profitability Ozili, Uadiale (2017). What is more, Tran, Lin, Nguyen (2016) claim that profitability has an impact on bank liquidity and capital. Bolt *et al.*, (2012) claim there is a linkage between bank profitability and the country's economic activity. Consequently, it could be stated that bank profitability is an indicator affecting other commercial banks performance factors and, hence, should regularly be analysed.

Before analysing the profitability of the banks, the measures of profitability ought to be stated. Actually, the most frequently used variables representing the bank profitability are as follows (Jamali, Karimi Asl, Hashemkhani Zolfani, Šaparauskas, 2017; Lambert, Riopel, Abdul-Kader, 2011; Mendonca, Alves e Souza, Carvalho, de Melo, 2018; Robin, Salim, Bloch, 2018; Tan, Floros, Anchor, 2017; Titko, Skvarciany, Jurevičienė, 2015):

- Return on assets (ROA) ratio;
- Return on equity (ROE) ratio;
- Return on risk assets (RORA) ratio.

Actually, bank profitability indicators are the ones of the leading indicators that help to forecast the performance of banks (Daly Frikha, 2017).

2. Methodology

An assessment of profitability is also crucial in determining how the relevant class of the bank's assets is able to generate profits. There are two indicators most frequently measuring the profitability of commercial banks: return on equity (ROE), return on assets (ROA) and return on risk assets (RORA). This pair of indicators must be maximised.

The return on equity (ROE) indicator allows one to measure the increase in the

assets of the shareholders and the added value created by them (Kyriazopoulos, Pantelis, Noulas, 2013).

$$ROE = \frac{\text{Profit before provisions and taxes}}{\text{Equity}}. \quad (1)$$

Based on the obtained results, the ability of the Lithuanian banking system to efficiently adopt equity investment decisions is evaluated. The higher indicator shows higher returns on equity.

However, it is important to assess not only the profitability of equity but also the management of the assets held, *i.e.* return on assets (ROA) (Kyriazopoulos *et al.*, 2013).

$$ROA = \frac{\text{Profit before provisions and taxes}}{\text{All the assets}}. \quad (2)$$

Using the asset profitability (ROA) indicator, one seeks to assess asset management efficiency, which ensures revenue generation.

However, given the financial institution's risk profile, both for clients and investors, risk-weighted assets are also included in profitability (RWA) and return on risk assets (RORA) is calculated:

$$RORA = \frac{\text{Profit}}{\text{Average value of RWA}}. \quad (3)$$

Indicators that include relevant assets are important concerning risk – they more objectively evaluate the profitability of organisations when assessing the asset risk in comparison to the asset ratio (Brauers, Ginevicius, Podviesko, 2014). Indicators show how much of the bank's earnings come from one euro of the risk-weighted assets. The higher the values of the indicators, the higher relevant profit is generated by the risk-weighted assets. In this case, the indicator allows taking into account not only the profitability of the activity but also the risk of investments.

After analysing the selected financial indicators and comparing the peculiarities of the activities of commercial banks operating in Lithuania, a forecast is made for the future in

order to find out possible trends.

For forecasting, one of the equalisation methods is chosen – the Moving Average method (de Souza, Ramos, Pena, Sobreiro, Kimura, 2018; Jurčikonis, Paršonis, Kazanavičius, 2006; Marshall Nguyen, 2017). The essence of the method's adaptation is described by its name, *i.e.* calculation of the average of the last n values of the time series. This allows to find a value for a new period (Pabedinskaitė, Činčikaitė, 2016):

$$A_t = \frac{D_t + D_{t-1} + D_{t-2} + \dots + D_{t-n+1}}{n}, \quad (4)$$

where:

A_t moving average,
 D_t monitoring in time series,
 n interval's length.

When choosing the interval's length n , it is essential to take into account data changes in the timeline. As the interval length n increases, the prediction stability increases and vice versa. A small length of the interval is advisable in unstable periods of time when it is important to detect short-period fluctuations since long interval lengths tend to reduce the response to random deviations (Marshall, Nguyen, 2017). When analysing financial indicators of banks that are characterised by volatile dynamics, several shorter interval lengths are selected to determine the most accurate forecast: $n=3$, $n=4$, $n=5$. In order to estimate the accuracy of the estimates, an error analysis is used for each selected length n of the interval. Two types of errors are analysed (Pabedinskaitė, Činčikaitė, 2016):

Average square error (MSE). Square of the error helps to single out large values of errors.

$$MSE = \frac{\sum (F_t - Y_t)^2}{n}. \quad (5)$$

Average absolute error (MAD). The error allows estimating the deviation in the same units of measurement used for the calculations. Since it is analogous to the standard

deviation, its accuracy is one of the highest.

$$MAD = \frac{\sum |F_t - Y_t|}{n}, \quad (6)$$

where:

F_t real value at t moment in time,
 Y_t forecast value at t moment in time,
 n the number of intervals.

Then looking at the error analysis, it is important to emphasize that the forecast in the given case can be regarded as more precise when the values of the corresponding errors are the smallest, *i.e.* the lower the error values, the more objective the forecast is.

3. Empirical Findings

In the research methodology, profit indicators are identified, and they are as follows:

- Return on equity (ROE).
- Return on assets (ROA).
- Return on risk assets (RORA).

In assessing the ability of the banking system to generate profits in the general sense, it is essential to analyse each bank individually. As a commercial bank is a profit-making organisation which primary objective is to maximise the ownership of owners, return

on equity (ROE) (Figure 1) becomes the primary element of this indicator group.

Figure 1 represents the trends in the return on equity in 2005–2017 and is characterised by high dynamics; however, market trends remain similar. The post-crisis period, after 2009, when all commercial banks operating in Lithuania suffered losses without exception, particularly stands out. For this reason, the equity return curve crossed the x -axis, expressing the negative value of the indicator. The most significant loss in 2009 was experienced by *SEB*, when ROE stood at -108.81 per cent. But in 2011 the organisation already managed to restore profitability and return it to the level of 19.39%. The result was conditioned not only by the increase of operating income but also the fact that income from the sale of shares of the bank's subsidiary *Enskilda* Ltd. to the *SEB* group is included in the income of 2011. A different situation emerges when analysing the indicator of *Medicinos bankas*. Figure 1 shows that in 2009, the ROE indicator of *Medicinos bankas* dropped to -0.15% , but in 2010, when losses before provisions and taxes increased, the ROE indicator decreased further (37.40%). It was due to the conservative over-estimation of the available financial

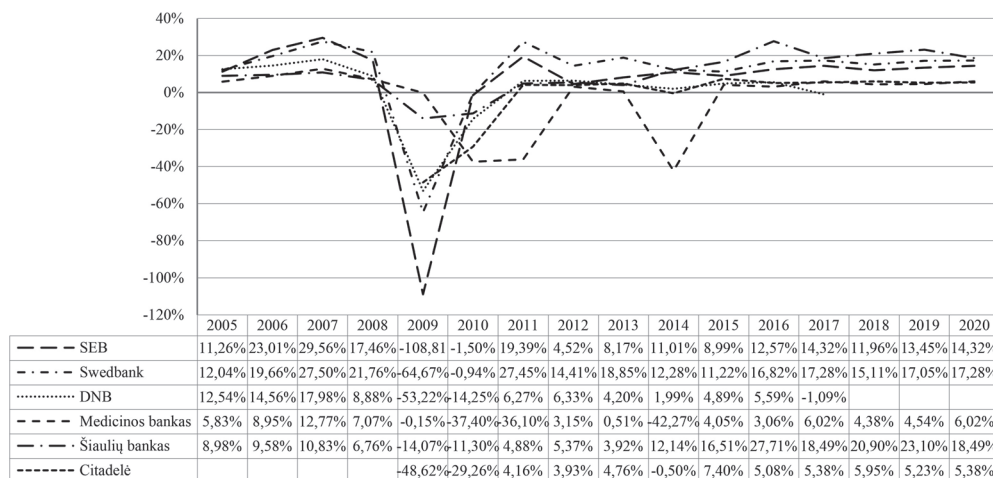


Figure 1. ROE: trends and forecast. Source: authors calculations and Swedbank (n.d.), Citadelė, n.d.; DNB, n.d.; Medicinos bankas, n.d.; SEB, n.d.; Šiaulių bankas, n.d.

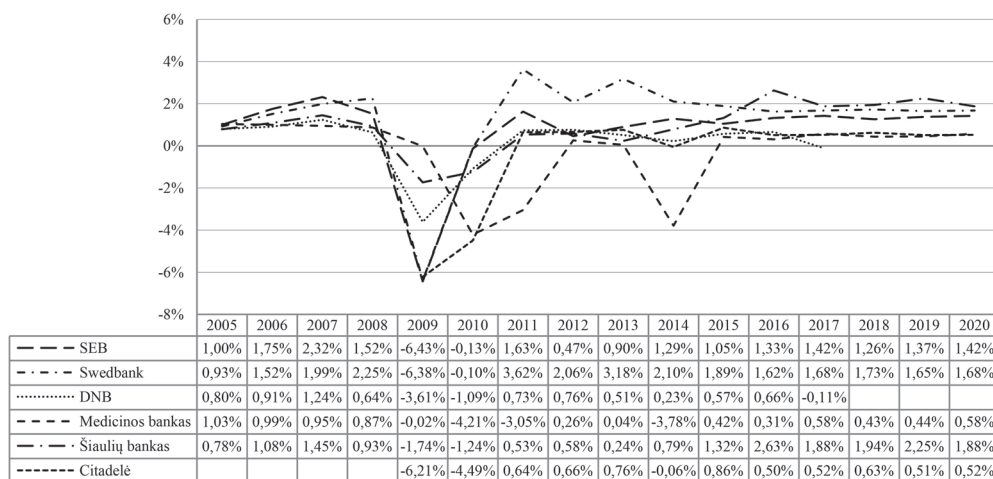


Figure 2. ROA: trends and forecast. Source: authors calculations and Swedbank (n.d.), Citadelė, n.d.; DNB, n.d.; Medicinos bankas, n.d.; SEB, n.d.; Šiaulių bankas, n.d.

assets and the formation of special provisions, meant to cover credit risk. The market situation is stabilising in 2012 when slight deviations from the minimum changes in equity and profit before taxes and provisions are observed. However, in 2014 a variation of the *Medicinos Bankas*' equity profitability (-42.27%) is noticed, which is not characteristic of the banking system. This was due to an overestimation of the bank's investment property and loan portfolio, which resulted in the creation of additional provisions for covering potential risks. Assessing the biggest change in the banking system in 2009 it can be said that the average ROE was -48.26 per cent, while in 2017 it was 10.07 per cent. Having analysed the trends of commercial banks' ROE indicator, it can be concluded that the financial crisis has dramatically shaken the whole operation of the banking system, which also led to a decrease in the profitability of own capital. Analysing the forecast for 2018–2020 (Figure 1) by the moving average method (when $n=3$), it is observed that in 2020, a decline in the profitability of own capital is forecast for *Šiaulių bankas* and *DNB* bank. In the case of *DNB*, it reaches a negative level, which results in

operational losses. However, despite an insignificant decline, the profitability of the banking system will remain stable, in addition to higher critical points.

Besides equity, the kind of profit that can be generated by bank-managed assets is important too. The more effectively the assets are used, the higher the expected return on assets (ROA) (Figure 2).

As the profit before provisions and taxes is included in both the own capital and the profitability calculation formula, the ROA curves of banks (Figure 2) remain similar. In 2009, after the financial crisis is over, the banking system is in shock, and the lowest ROA indicator limit reached -6.38% (*Swedbank*), yet already in 2011 *Swedbank* manages to get hold of the situation and increase its profitability to 3.62%, reducing the level of loan impairment. It is the highest asset return (ROA) point for the entire analysis period. In 2014, *Medicinos bankas* suffers losses due to overestimation of investment properties: profitability decreases to -3.78%, but already in 2015 the situation gets better by raising the ROA rate to 0.42%, reducing the loan impairment losses and increasing interest income. It means that one euro of a

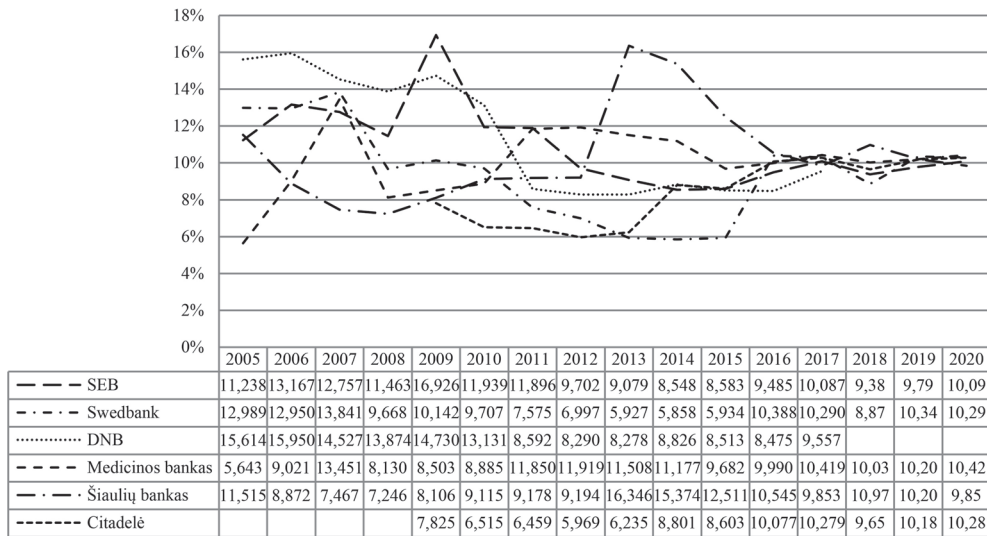


Figure 3. RORA: trends and forecast. Source: authors calculations and Swedbank (n.d.), Citadelė, n.d.; DNB, n.d.; Medicinos bankas, n.d.; SEB, n.d.; Šiaulių bankas, n.d.

bank earns a profit of EUR 0.42 before taxes and provisions. Thus, after the normalisation of market conditions after the financial crisis, raising the profitability of bank assets to an acceptable level required a reasonable amount of time. The graph (Figure 2) shows that the situation normalises in 2015 when changes in the profitability of assets become negligible. By applying the forecast, using the moving average method ($n=3$), the downward trend remains the same for the same banks – Šiaulių bankas and DNB. However, no significant market irregularities are expected. In this case, it is likely that the profitability of the banking system will remain at the same level.

Since bank-owned assets are classified into risk categories, it is important to evaluate not only the profitability of the common assets but also how the assets deemed risky can generate profits. The RORA indicator is used for this purpose. Calculating the RORA indicator values for 2005–2017, there are limitations:

1. In their financial report in 2005, *SEB* and *Swedbank* do not present a breakdown of risk-weighted assets;

2. In the financial report of 2016 of the *Medicinos bankas*, there is no breakdown of risk-weighted assets. For this reason, no objective forecast is possible using the moving average method when $n=3$;
3. *Šiaulių bankas* in its financial reports does not present a breakdown of risk-weighted assets for the period 2018–2013;
4. *Citadelė bankas* in its financial reports does not present a breakdown of risk-weighted assets for the period 2011–2013.

Due to the substantial shortage of data provided, the indicator is not evaluated, and its graph is not provided, as the analysis, in this case, would be unreliable and biased.

After assessing the return on equity (Figure 1) and assets (Figure 2), it is important to determine the basis of the assets of commercial banks operating in Lithuania, whether it is assets or equity. The assets/equity ratio is used for this purpose (Figure 3).

Analysing the assets/equity ratio of the Lithuanian banking system in 2005–2017, (Figure 3), the general trend in the development of commercial banks cannot be singled out, except for 2016–2017, when values of the analysed bank indicators acquire similar

values (~10%). For this reason, the values of assets and equity are analysed by distinguishing the trends and causes of each bank. In 2009, the value of *SEB Bank's* assets/equity ratio increased significantly (48%). However, in 2010 the indicator normalises (11,939) due to economic recovery. Equity growth was also driven by partial coverage of *SEB Bank's* losses by *Skandinaviska Enskilda Banken* and the issuance of indefinite subordinated debt emission. These measures were taken in order to strengthen the bank's capital base. *Swedbank's* assets/equity ratio trends 2005–2015 show a downward trend. The sharp decrease of the indicator's value in 2008 was determined by the net loss incurred during the accounting year, which reduced the amount of equity. Actually, the same results were obtained by Rinkevičiūtė and Martinkutė-Kaulienė (2014) who conducted research on bank profitability using the same indicators ROA and ROE.

However, in 2016 a sudden positive change in the indicator (+75%) appears due to a decrease in equity and an increase in bank assets. The decrease in equity (37%) was determined by the reduction in retained earnings as a result of losses incurred in previous periods. Analysis of the trends of the *DNB's* asset/equity ratio, presented in Figure 10, shows that the asset/equity ratios remain stable, except in 2011, when the indicator falls to 8,592, as equity growth was driven by changes in retained profit: due to the net profit earned in the year 2011, retained earnings increased to 1,116 thousand EUR (in 2010: EUR 72,328 of retained loss). The most significant difference of *Medicinos bankas* is seen in 2007, when in the pre-crisis period the loan portfolio is increasing, which determines the increase in the total value of the bank's assets. With the onset of the financial crisis and the decline in the loan portfolio, the ratio turns down due to the overall decrease in assets. However, in 2011 due to economic recovery, the increase in the value of the indicator as a result of the increase in

assets managed by the bank is noticeable. According to the graph (Figure 3), the indicator of *Šiaulių bankas* reaches the maximum value (16,346) in 2013. Such dynamics were determined by taking over the assets of *Ūkio bankas*, which was recognised as insolvent with its operating license permanently cancelled. It increased the total value of the assets managed by the bank.

The *Citadelė Bank* has a constant asset/equity ratio, with no significant exceptions during the analysis period. Thus, after analysing trends in the asset/equity ratio of commercial banks operating in Lithuania between 2005 and 2017, it can be concluded that the major changes were caused by the decrease in equity due to losses incurred during the financial crisis or exceptional cases such as merging of a part of the bank and an additional emission. Therefore, it can be argued that the asset/equity ratio of the Lithuanian banking system in the normal economic conditions is constant, with no major fluctuations. Since in 2016 the market was normalised, it also influenced the forecasting, using the moving average method (when $n=3$). No critical changes are estimated from 2018 to 2020, all the commercial banks operating in Lithuania will remain at a similar level. Therefore, it can be argued that the participants in the Lithuanian banking system manage their assets and equity systematically and stable.

Conclusions

Summarizing the indicators of profitability group: return on equity, return on assets, and assets and equity ratio, it can be argued that the Lithuanian banking system is able to manage resources efficiently, in order to ensure the profitability of operations, despite market disturbances such as the financial crisis of 2008. The profitability of operations is also supported by the real management of assets and equity, which does not represent

critical changes throughout the analysed period. For this reason, the forecast of the indicators makes it possible to conclude that the banking system of Lithuania will continue to carry out profitable activities. In other words, all the analysed profitability indicators are going to increase, which means that the banking system will be able to stay sound and stable. However, the profitability indicators are not the only determinants of commercial banks soundness, hence, those factors will be analysed within macroeconomic factors that show the overall economic situation of a country.

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