
Loan Product Policy and Rentability Based on Interest Rates in Czech Republic

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Abstract:

The Czech banking system is an innovation market driven by the power of new low-cost banks focused on young internet clients. We could say that it is profitable and one the most stable market in Eastern Europe.

The purpose of this article is to analyse the effect of the interest rates on the loan product policy of selected banks in the Czech Republic, specifically in connection with the banking products offered to the SME segment.

In particular, the final report focusses on measuring bank profitability based on interest rates on different products within a specific time period.

Final touch of this article is complemented by a calculation of the additional ROE for the commercial bank using model based on interest margin and profitability of provided loans.

We found out that the usage of different approaches of internal models with different combinations of key determinants can potentially increase the bank's profitability in the interval from 1,042 mil. to 24,300 mil. CZK.

Keywords: *Banking, marketing innovations, financial market, small and medium-sized enterprise.*

JEL Code: *G21, G23, O16.*

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1. Introduction

The aim of this research is twofold. Firstly, we provide empirical evidence of profitability development in the Czech banking sector from 2002 till 2016. We use the dataset of Czech banks, which covered about 90 % of the Czech banking sector. The Czech sector has developed similarly to the banking sectors of other Central European transition countries. *“The development of clients’ portfolios, the management of relationships with clients and their emotions, maintaining and increasing client satisfaction is crucial for banks in order to maintain their long-term profitability and growth, considering the growing competition in the banking sector. Competition pushes for a diverse product portfolio, putting emphasis on an individual approach, pricing strategies, modern technologies, development of alternative distribution channels, and a targeted communication mix supported by customer information management”* (Hes and Jilková, 2015).

Secondly, this research uses the product policy analyses and identify the banking loan product policy based on the product interest rates on the Czech financial market. Finally, correct settings of internal processes for capital requirement calculation and proper setup of collateral use as techniques to reduce credit risk in legislative term could significantly minimize the growth of equity and increase the additional profitability of invested capital.

2. Literature review

Previous studies measure the Czech banking sector profitability indicators such as Return on Assets (ROA) and Return on Equity (ROI). These indicators are based on macroeconomic factors. Models usually use linear regression model, which allows authors (Barth *et al.*, 1997; De Vauss, 2002) to examine the effect of independent variables on the dependent variables. The mentioned dependent variable ROA is usually based on Capital Adequacy (CA), Interest Margin Rate (IMR) and Gross Domestic Product (GDP). The next dependent variable ROE is usually based on ROA, Balance Sheet Total (BS), Inflation Rate (IR) and Interest Rates (IR) of Czech National Bank (CNB).

The banking sector is one of the most transforming environments of the present era (Petrů, 2016; Grima and Caruana, 2017; Thalassinos *et al.*, 2012; 2013). Athanoglou *et al.* (2006) examine the profitability of the bank sector based on dataset of credit institutions in South Eastern Europe, 1998–2002. Abreu and Mendes (2001) study the determinants of bank interest margins and profitability based on main bank characteristics, macroeconomic factors, financial and regulatory indicators. They evaluate the impact of financial crisis on the bank profitability in Portugal and Spain in the period 1992–1994. Setyawati *et al.* (2017) analyze the effect of the global crisis on the financial performance of Islamic banks. Al Shubiri *et al.* (2017) examine the factors that determine interest rate spread (IRS) of commercial banks. According to Scholleová (2012) the biggest problems in

connection with the global crisis hit the long inefficient firms (that survived only thanks to temporary excess demand) and growth-oriented businesses, which focused only on short-term time horizon.

Cipovová and Belás (2012) stated that the usage of appropriate methods for measuring credit risk in banking sector can bring substantial saving equity, through which the bank can accelerate their financial performance. The present approach is very current, because of the minimization effect in relation to the impact on new banking regulation Basel III to increase the profitability. Secondly, the paper focus on the profitability of selected banks on the financial market in the Czech Republic in terms of their product policies and interest rates on the market. Traditionally, new competitors on the market have offered great opportunities for bankers to innovate, connect with their traditional customers, and provide value-added service. In 2007 entered to the Czech banking system first small low-cost retail bank and introduced a modern banking focusing on digital connecting.

3. Material and Methods

The research focuses on collecting and interpreting secondary data concerning the profitability of selected banks on the financial market in the Czech Republic in terms of their product policies and interest rates on the market. This research follows a formula for the function of the simple linear regression, where the coefficients of the regression functions are determined by least squares as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \varepsilon_i, \text{ or } Y = \beta_0 + \sum_{i=1}^n \beta_i X_i + \varepsilon_i \quad (1)$$

where Y is dependent variable, β_0, β_i $i = 1, \dots, n$ are the regression coefficients (or partial regression coefficients), X_i $i = 1, \dots, n$ are independent variables and ε_i is random folder $i = 1, \dots, n$. (Vauss, 2002).

The research paper uses commercial banks' benchmark financial performance ratios that are reliant on net returns such as:

$$\text{Return on Assets } (= \frac{EBIT}{A}) \quad (2)$$

$$\text{Return on Equity } (ROE = \frac{EAT}{OE}) \quad (3)$$

$$\text{Return on Investment } (ROI = \frac{EAT}{\text{Invested capital}}) \quad (4)$$

$$\text{Return on sales (ROS)} = \frac{\text{EAT}}{\text{Sales}} \quad (5)$$

The bank's financial performance is also strongly influenced by the Bank's interest rate policy. The Bank, in a strong competitive environment, sets an interest rate to cover the costs of liabilities, its operating costs and profitability. One of the significant ratios is the net interest margin (Belás, 2015)

$$\text{net interest margin} = \frac{\text{net interest income} - \text{net interest income from classified assets}}{\text{net assets}} * 100 \quad (6)$$

Other indicators which were used to calculate the extra profit from using internal models within the Chapter Result and Discussion were as such: additional bank earnings, capital savings in accessing internal models, the RWA multiplier (the risk weighted asset multiplied by the interest rate spread for credit transactions and the credit profitability coefficient we calculate as $1 - \text{non-interest costs (including IRS costs) on the loan} / \text{net interest income}$. It means that if we assume 40% non-interest costs, then credit profitability coefficient = $1 - (40 : 100) = 0.6$.

4. Results and Discussion

At the end of September 2017, the total amount of the Czech banking sector assets was CZK 7,346 billion and the most important asset item was loans to residents (volume - CZK 5,422 billion). The total deposits of residents, which are the most important item among banking sector liabilities, stood at CZK 4,152 billion. (ČNB, 2017). Several indicators are used to analyze bank performance. Bank performance management is closely linked to the effort to achieve maximum performance with minimal risk and maximum liquidity. Maximizing profits can be achieved in a number of ways (Belás, 2015):

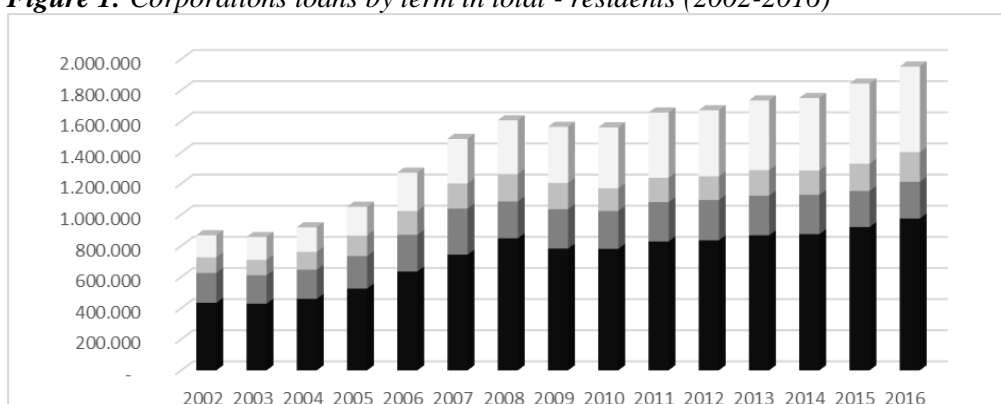
- By increasing the volume of assets particularly by increasing the value of the provided loans.
- Changing the structure of assets by increase the proportion of more profitable assets by providing loans with interest rates.
- Increasing loan turnover, for example by the provision of small loans to to a larger number of clients of the bank.
- Increasing interest rates on loans.
- Focus on more profitable banking services.
- Bank's profit should always be analyzed in relation to other indicators, such as risk, capital adequacy and others.

In terms of profitability of banks, quality assets and financial strength of the bank is important. They are analyzed with some indicators, which monitor and compare the development trend as well as the change in their ratio. In particular, it is analyzed:

- Creation of provision and allowances.
- Ration between owner's capital and total assets in bank.
- Own and foreign capital in a bank.

“The volume of loans to residents households amounted to CZK 1,501 billion in September 2017. The structure of loans to resident non-financial corporations by original maturity (which totalled CZK 1,043 billion in September 2017), long-term loans have the largest share. The volume of long-term loans amounted to CZK 567 billion in September 2017 (54% of the total volume of loans to the sector). The share of non-performing loans in the total volume of loans to non-financial corporations has also been declining since end-2010, from 9% in December 2010 to 4.4% in September 2017” (CNB, 2017).

Figure 1: Corporations loans by term in total - residents (2002-2016)



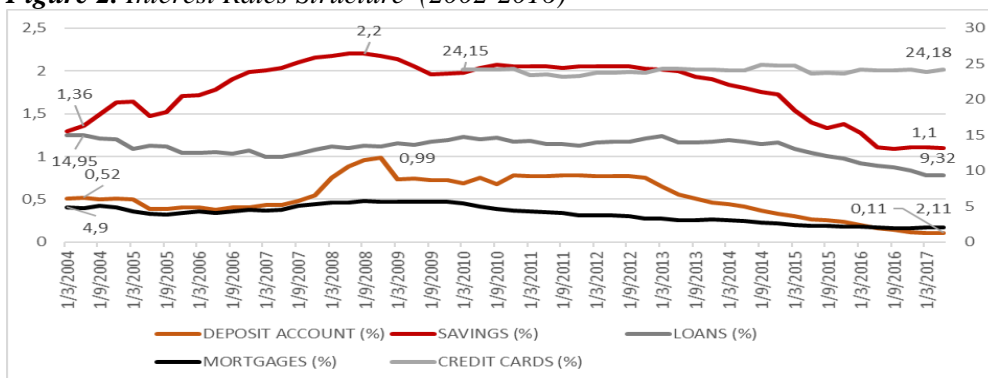
Source: Author according to CNB-ARAD statistics, 2017 (CZK+FC, volume in million).

Record-low interest rates on the loan market are a global phenomenon in Europe, and the basic CNB interest rate is at 0,5% on the inter-bank market. Since the end of 2009 loan interest rates have been consistently decreasing, is now at its' lowest. The sharp rise in property prices, a shortage of flats, a trend in purchasing of real estate for investment, or a low rate of mortgage lending is not only confirmed by real estate agents, but also supported by statistical data. Figure 2 shows the development of interest rates from 2002 to 2016. On the other hand, this market situation could be problematic because it could lead to a property bubble caused by demand, speculation, and optimism. The steep rise in property prices at the beginning of 2017, has gradually reached the level of prices in the 2008 crisis. This was solved by CNB in April 2017. The Bank Board of the Czech National Bank decided with immediate effect to terminate foreign exchange interventions. This decision lead to an increase in mortgage interest rates above the 2% border.

4.1 Loan Product Policy Based on Interest Rates in the Czech Republic

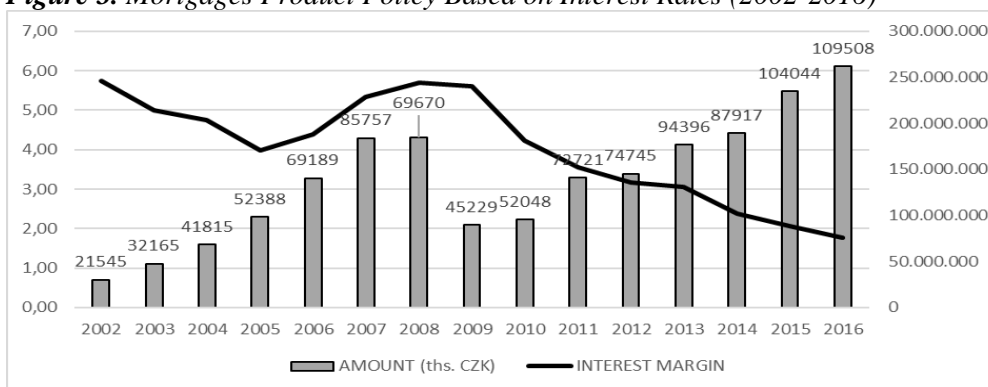
There are a lot of banks offering mortgage loans because it is a very popular and profitable product. Three banks have the biggest market share: Hypotéční banka (27,79%), Česká spořitelna (26,87%) and Komerční banka (24,85%). There are a lot of smaller banks offering this product, for example Raiffeisenbank (8,61%) and UniCredit Bank (8,61%). Through the multiple-linear regression model we can investigate the dependency between the dependent variable (volume of mortgages loans) and independent variables (disposable income, GDP, unemployment, inflation, wage and exchange rates). According to previous research, the independent variables, the rate of disposable income growth and GDP were statistically insignificant (significance level 0.05) and indicators were eliminated from the model. On the other hand, inflation, exchange rate and wage level and the change in these variables have a positive impact on the dependent variable, which is the volume of mortgages loans. In Figure 2 we can see the number and volume of mortgage loans based on average mortgage interest rates.

Figure 2. Interest Rates Structure (2002-2016)



Source: Author according CNB – ARAD statistics, 2017 (%).

Figure 3. Mortgages Product Policy Based on Interest Rates (2002-2016)



Source: Author according CNB – ARAD statistics, 2017 (%).

Interest rates on mortgage loans declined slightly to around 4% p.a., between 2002 and mid-2005. From 2005 till 2008 mortgages were a very popular banking product.

In 2008, interest rates sharply increased to almost 6% p.a., which was caused by the rising risk from the mortgage loans due to the Global Financial Crisis 2008. The mortgage crisis in the USA, which eventually exploded into a global crisis, led to a sharp decline in the number and volume of negotiated mortgage loans, 50% less than the number of mortgages in 2007. Since 2009, the number of newly-agreed mortgages is once again increasing, 102,000 new mortgage loans were negotiated in 2015. In the whole history of the Czech mortgage market, the current interest rates was seen in the lowest value in April 2017. Based on the results of the regressive model, there are main results as (Jílková and Kořátková 2017):

- GDP shows no significant impact on the volume of mortgages provided;
- The number of mortgage loans is positively based on the inflation rate, exchange rate and the wage;
- The number of mortgage loans is negatively based on unemployment.

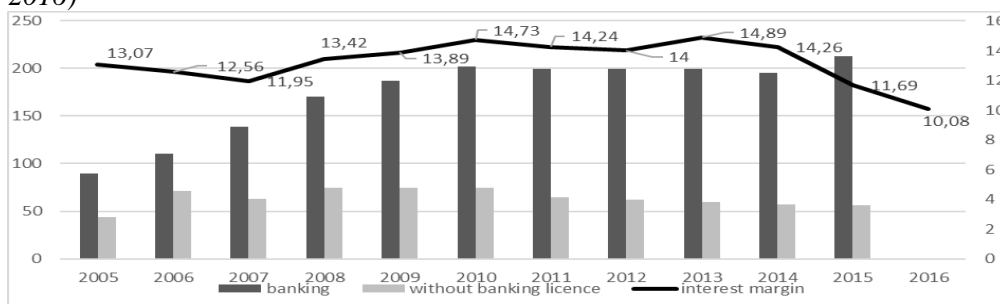
According to the graph, the default model could be changed and rewritten to the following equation:

$$\text{Mortgage_loan volume} = \beta_0 + \beta_1(d_Real\ Estate\ Prices) + \beta_2(d_Unemployment) + \beta_3(d_Interest_Rate) + \beta_4(d_Wage) + \beta_5(d_Disposable_Income) + \varepsilon \quad (7)$$

where mortgage loan volume is dependent variable, $\beta_0, \beta_i \ i=1, \dots, n$ are the regression coefficients (or partial regression coefficients), Real Estate Prices, Unemployment, Interest Rate, Wage and Disposable Income are independent variables and ε_i is random folder $i = 1, \dots, n$.

The consumer short term loan market in the Czech Republic is currently divided into two parts according to the type of consumer loan provider. On one side are banks and savings banks, and on the other side, are other companies not operating under a banking license (Figure 4).

Figure 4. Loan and Credit Card Product Policy Based on Interest Rates (2002 – 2016)



Source: Author according CNB – ARAD statistics, 2017.

The initial growth trend emerged across the industry and there was a strong interest in this financial service until 2008, when both records reached peak levels, although the financial crisis had triggered problems in the US mortgage market. At that time, it seemed that the Czech market would not be hit immediately. The effects of the economic recession have also led to more strict conditions for approving new loans, which has limited the supply of newly negotiated contracts. Since 2013, there has been a slight positive change, meaning a decrease in the volume of loans provided by non-financial institutions. Loan volumes typically show positive growth at the end of the year, so the last quarter is very successful for providers, this is due to automatic increase in consumption during Christmas.

4.2 Impact of banking key determinants on additional Return on Equity

Banks in relation to regulations most often present opinions that they must incur high costs of regulation. According to Ozdemir (2009), a permanently improved rating system can reduce credit losses to support the long-term profitability and competitive advantage of the bank. The lower need for the required equity can therefore be transformed into credit expansion, which brings additional growth in profitability and profitability of the bank. The additional net profit from using internal models can be quantified using the model (own source):

$$EAT_{add} = (C_s * mRWA * i_m * c_c) * (1 - T) \quad (8)$$

where:

EATadd – additional net profit of the bank;

Cs – saving capital in the internal models approach;

mRWA – Risk Weighted assets multiplier;

i_m – interest margin on credit transactions;

c_c – coefficient of profitability of loans (we calculate 1 - non-interest costs on the loan (including costs on internal rated standards) / net interest income, eg if we assume 40% non-interest costs, then kn = 1 - (40:100)=0.6);

T – tax rate (19%).

Additional return on equity is calculated using the formulas such (own source):

$$ROE = \frac{EAT_{add}}{OE_s} \quad (9)$$

where:

ROEa – additional increase in ROE;

OE_s – amount of equity in the standardized method for calculating capital adequacy.

The amount of additional ROE is primarily determined by the following factors:

- Validation of the internal rating system by the bank (Probability of default (PD) affects the risk weighted assets level of credit transactions), which determines the volume of equity savings (eg, if the PD is reduced by 20%, the saving of the equity according to our calculations (Cipovová, Belás, 2012) is another 11%, etc.);
- interest margin that is determined by the interest rate on credit coverage sources (primary and secondary deposits) and the interest rate on credit transactions with the possibility of increasing the degree of subjective measured risk through internal ratings (the bank has the possibility to raise the risk premium of the loan);
- operating expenses on credit products.

Let's assume that the volume of RWA (risk-weighted assets) for bank credit risk is \$ 1 billion. The required amount of equity capital using the Standardized Approach method without the use of external ratings is approximately EUR 80.0 million (8.0%) and the average saving of the IRS equity capital is 30%, 40% and 50%. The values of the additional ROE in % are shown in Table 1. As a result of different situations modelling, Table 1 is a managerial table which allows to optimize a structure of active trades of the bank in the context of increasing of financial efficiency and minimize credit risk for bank management (Belás *et al.*, 2012).

The usage of different approaches of internal models with different combinations of key determinants can potentially increase the bank's profitability in the interval from 1,042 mil., to 24,300 mil., CZK. For medium-sized banks (with a volume of profitable assets eg., 200 bil., CZK), it represents a growth of average net profit of 2.534 billion CZK which means an increase of additional ROE (in the range of 1.3 to 30.4%). If the coefficient of profitability of loans is 30%, interest margin on credit transactions is 1% and saving of equity by 30%, the additional increase in ROE will represent 1,3%. But if the coefficient of profitability of loans is 50%, interest margin on credit transactions is 50% and saving of equity by 50%, the additional increase in ROE will represent 30,4%.

Table 1. The development of additional ROE in % depending on interest margin and coefficient of profitability of loans

Interest margin	Coefficient of profitability of loans in %											
	60 %			50 %			40 %			30 %		
Capital saving in %	50	40	30	50	40	30	50	40	30	50	40	30
5 %	30,4	20,0	13,0	25,3	16,9	10,8	20,2	13,5	8,9	15,2	10,1	6,5
4 %	24,3	16,2	10,4	20,2	13,5	8,7	16,2	10,8	6,9	12,1	8,1	5,2
3 %	18,2	12,1	7,8	15,2	10,1	6,5	12,1	8,1	5,2	9,1	6,1	3,9
2 %	12,1	8,1	5,2	10,1	6,7	4,3	8,1	5,3	3,5	6,1	4,0	2,6
1 %	6,1	4,0	2,6	5,1	3,4	2,2	4,1	2,7	1,7	3,0	2,0	1,3

Source: Own source.

A high-quality internal rating system can greatly support the bank's financial performance, and our calculations have shown that the usage of internal models in banking practice brings significant change in profitability (Cipovová and Belás, 2012a) through significant equity capital savings, allowing the bank's credit activity to accelerate. Using internal models with different combinations of key determinants can potentially increase bank profitability from \$ 1,042 million CZK to 24,300 million CZK. In the case of a medium-sized bank (with a volume of profitable assets, eg., CZK 200 billion) that change represent an increase in profit of about 2.534 billion CZK and additional ROE (between 1.3% and 30.4%) and ROA (from 0.1% to 2.4%) increase.

5. Conclusion

This research has examined the Czech banking system and the loan product offer of the main banks on this market. The financial system is an innovative market driven by the power of new low-cost banks and very low level of interest rates. These two facts have main impact to the product policy and bank performance and profitability. Literature review dealing with internal and external determinants of bank performance and profitability.

In addition this paper also investigates the impact of the interest margin and coefficient of profitability of loans on the development of additional return on equity. The results showed that record-low interest rates on the loan market are a global phenomenon in Europe, and the basic CNB interest rate is at 0,5% on the Czech inter-bank market. Since 2009, the number of newly-agreed mortgages is increasing and the current interest rates was seen in the lowest value in April 2017. The purpose of this research is twofold. Firstly, we examine selected indicators of the banking sector in the Czech Republic in the period 2004-2015. We use the dataset of Czech banks, which covered about 90% of the Czech banking sector. Secondly, we constructed a model which can calculate the additional ROE for the commercial bank using advanced internal rating model to calculate capital adequacy (Cipovová and Belás, 2012a). The model performs as a multiplier of key determinants based on interest margin and profitability of provided loans. Finally, we can say that in our model brings significant equity capital savings, allowing the bank's credit activity to accelerate. Using internal models with different combinations of key determinants can potentially increase bank profitability from \$ 1,042 million CZK to 24,300 mil. CZK. In the case of a medium-sized bank (with a volume of profitable assets, eg CZK 200 billion), that change represent increase in profit in about 2.534 billion CZK and additional ROE (between 1.3% and 30.4%) and ROA (from 0.1% to 2.4%) increase.

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