

ANALYSIS OF BANKING BUSINESS AND ITS IMPACT ON FINANCIAL STABILITY OF ECONOMIES IN EURO AREA

Kiseľáková D., Kiseľák A.*

Abstract: The main objective of this article is to investigate banking business and analyze factors affecting financial stability of economies and changes in these factors over time using regression model with selected statistical indicators in macroeconomic environment with a focus on Slovakia as member of the Euro area. The method of empirical sector and trend analysis, regression analysis and economic modelling are used. The relationships between the dependence of the banking business profitability and macroeconomic growth have been surveyed and quantified using regression model spanning a period of ten years (2001-2010). Multiple regression model (Mod₁) accurately reflected the real development of the banking business sector in Slovakia. Since these sector variables are not dependent on the Slovak historical context, the model can be readily applied to other central European economies to improve the profitability and stability of financial enterprises against crises. There are found selected market factors affecting banking business that informed the analysis, such as effective liquidity management, quality of balance sheets assets, efficient management of interest policy, and increasing of profitability rate from long-term aspect.

Key words: banking business, macroeconomic environment, regression model, financial stability

Introduction

The development and dynamic growth of banking business and commercial banks as specific entrepreneurial companies in Slovakia are conditioned by the stability and macroeconomic development of Slovakia within the EU, Euro area and development on global financial markets. Potential problems of instability and liquidity of banking business can have a negative impact on the development of whole economy evidenced by the global crisis, which arose in the banking, financial sector of the U.S., and the global changes on financial markets. In response to the global crisis and tightening of banking business regulation, new, tighter global regulation rules of capital adequacy have been approved in September 2010 under the name Basel III with effects from 2013-2019.

What is main problem of banking business and impacts on financial stability on economies and which factors determine it most of all? The paper also investigates and points out selected factors of increasing of competitiveness of banking business in relation to the trends of profitability of commercial banks and to the changes in development of stability and rate of return of banking sector in global environment with the impacts on economy.

* **Assoc. Professor Ing. Dana Kiseľáková, PhD., Ing. Alexander Kiseľák**, University of Prešov in Prešov, Faculty of Management, Slovakia,
✉ corresponding author: dana.kiselakova@unipo.sk

In assessment and measurement of quality of banking business, it is appropriate to create and apply an assessment system in such a way, so as it includes the assessing criteria in three basic dimensions: interbank assessment of internal processes and financial results, market assessment – the assessment of bank performance rate and stability in relation to the actual and future conditions of competition at the bank market, the assessment of the satisfaction rate and loyalty of bank clients [10]. For financial sphere, to which this article is focused, there are the criteria having the nature of global financial indicators of rate of returns such as profit rate, rate of return on equity (ROE), rate of return on banking assets (ROA), net interest margin and others[14]. From long-term aspect, the financial criteria would be selected by a bank's strategy type. For a growth strategy, the turnover (volume) growth rate in the defined target segments and bank products is one of the important indicators. Within the basic strategy, for expected and quantified growth, it is possible to determine the ROA growth, hence the turnover (volume) growth in the client segments, which is based on the bank balance structure. The indicators of bank rate of return are oriented to the analysis of achieved profit/loss in connection with searching for an optimum relation between profit maximization on one hand and the necessity to account for the riskiness of banking activities and observe the bank liquidity on the other hand[2]. In relation to the stability, growth and competitiveness strategy in the longer term, it is necessary to pay continuous special attention to efficient and quality management of bank profitability [3].

Earlier empirical studies (e.g.[6],[7],[8]) deal with these problems and the analysis and investigation of relations between selected macroeconomic indicators from the point of view of economic and financial stability of economies, competitiveness, efficiency and profitability of banks. Additional empirical studies investigate the relations between profit rate, market concentration and competitiveness of banks. The macroeconomic framework, sphere of monetary policy and credit availability at a credit market in relation to the amount and allocation of capital and bank stability and liquidity is surveyed and analyzed in the further studies [11],[15]. A price and market interest rate has the considerable influence on the volume of loans provided and lending rates and this mutual relation of development of interest rates and credit market in the context of global changes is analyzed by Degryse, Havrylchyk, Jurzyk, Kozak [5] and Jorge [9]. He concluded that credit markets response to the changes of interest rate (especially to a decrease) with considerable delay, what can be influenced especially by the amount of equity of the commercial banks. Differences in the quantitative impact of macroeconomic factors among banking business sector and loan categories were evident in his study. The important presumption of the stability, rate of return and competitiveness of commercial banks is the efficient management of assets-and-liabilities structure [4] and especially the management of prices of credit transactions within the framework of that management and competitiveness [12]. The important instrument of banks in management of bank credit transactions is economic modelling [13]. A model, in an simplified way, means that mutual relation of items

within bank assets and between them, as well as factors that influence the most suitable way of solution of return of credit transactions, are specified by mathematical relations and statistical methods with the aim to make a profitable credit transaction and to have profitable bank as a whole. From the point of view of a bank, the moment of completion of a credit transaction is the selection of optimum option and implementation of as highest earnings as possible while observing the appropriate, acceptable risk. Banking models are undergoing continuous development and assume the view on bank as a multidimensional unit with broad variability of options. The quality of commercial bank can be measured, inter alia, by the share of earning assets in total amount of assets those points out in [10].

The main risks for financial stability of the commercial banks in relation with business activities include credit risk. It is possible to state that the credit risk of banks is one of the main specific problems in banking sector at the management of banking credit transactions for the existence of the risk of banking credit portfolio, highlight [5]. The result can be a worsened quality of the credit portfolio, which will become evident in the period of a recession by the increase of the share of non-performing, failed loans, what is emphasized by Marcucci and Quagliariello [11]. The management of credit risk of credit portfolios is therefore one the most important tasks for the financial liquidity and stability of banking sector in connection with increased sensitivity of banks to the credit risks and changes in the development of prices of financial instruments at the time of financial crises.

Methodology and Methods

The objective of this research paper is to investigate banking business, identify and analyze the selected factors affecting financial stability on economies and in Slovakia in relation with macroeconomic development using regression model. The following main methods are used to achieve the aim: the method of empirical sector and trend analysis, regression analysis, economic modelling and synthesis. In processing of study, the information from specialized economic and scientific literature, electronic information sources, statistical data of Statistical Office (SO) of Slovakia, available analytic data from the National Bank of Slovakia (NBS) balances, Analyses of the Slovak financial sector, Monthly bulletin of NBS and the European Central Bank (ECB) and statistics of the Slovak banking association (SBA), Eurostat and the European banking federation (EBF) were used.

Within the framework of the methodology the main problematic fields, which create the platform for scientific and economic discussion are analyzed:

- the analysis of stability and development of selected macroeconomic indicators
 - market factors, real GDP growth, the growth rate of the volume of assets of balance structure as one of the factors of the banking growth, loans (and deposits) volume, unemployment rate, quantification of dependencies between selected parameters by trend, regression analysis and regression model,

- the monitored time period is seven years (years 2004-2010) or ten years (2001-2010) and source data are in economic time series by Arlt, Arltova [1].

The presumptions of the regression analysis, regression modelling and procedure of the regression analysis:

- the presumption and quantification of linear dependence between dependent variables (Y) and selected independent variables (X), i.e. parameters from real financial environment of Slovakia which influence banking business, identification and quantification of factors, investigation of dependencies and influences of variables by the regression analyses,
- the analysis, whether it is possible to set up a statistically significant regression linear model (Mod) between dependent variable and independent variables (a simple or multiple linear regression model), which would correspond with the actual development in banking business of Slovakia,
- the construction and description of a linear regression model by relation, expressed by general equation.

The selected macroeconomic indicators and at the same time input parameters for the regression analysis on the annual basis, with the utilization of the available source data from the NBS statements, which are based on data of a sector analysis, applied in this study, are as it follows:

Table 1. Input parameters for regression modelling – selected major market factors in Slovakia

Y_1	the net profit of banks (million of EUR)
-	the balance amount of banks assets in million of EUR
X_1	the amount of real GDP in mil. of EUR
X_2	the unemployment rate (%)

Source: Authors' elaboration using NBS data

Based on the economic theory and the synthesis of knowledge of theoretical and empirical studies and survey results, there is formulated the following *hypothesis H*:

There is a dependence of the development of business banking sector on macroeconomic development and, consequently, the development of the balance amount and bank profit rate on the development of real economy, i.e. is expected the positive development of profit rate and development of banking sector in the period of economic growth, as well as a decline of unemployment rate. There is an increase of unemployment, an expectation of the economic sectors growth, as well as the same for banking sector, and the competition pressure to use more efficient instruments on the market is increased, in the period of economic depression.

The calculations were made using software GRET (GNU Regression, Econometric and Time series Library). In this paper, it was worked with relatively small number of observations in economic time series. The outputs obtained can be considered as partially representative in view of the fact that data from real

financial environment of Slovakia, reflecting real economic development, were used.

Results and Discussion- Economic survey of the Slovak Republic in 2004-2012 in Euro area

The recent financial crisis exposed the euro area to crucial test of long term sustainability. The original bold plan of creating currency union, of achieving nominal and consequently real convergence of its member states economies has not been fulfilled. The world economy already affected by the financial crisis 2007-2009 now stands in the precipice of potential next wave of global economic slowdown, subsequent development as sovereign debt crisis and euro crisis, and the threat of sharp increase in inflation and global unemployment. The euro changeover in Slovak Republic on January 1st, 2009 occurred during fallout from the global financial crisis, and sparked important concerns about the induction of inflation directly as a result of the currency change. One of the main global threats to economic growth and stability of euro area is the possibility of increasing sovereign debt and then increasing of inflation and price level and increasing of unemployment rate, too. In the context of current developments of consumer prices, as well as the expected growth of commodity, food, services and energy prices, it possible to expect an increasing rate of inflation growth (Medium-term prediction NBS, 2013). Increasing growth of inflation is expected in 2013 mainly as a result of increasing prices of food due to current economic trends and increasing commodity prices. As a result of continuous invigoration of economic activity and domestic demand we can expect an increase in inflationary pressures in Slovakia. In the context of Euro area and EU, these tendencies could be observed in the changes of HICP.

The table 2 presents the changes in the average inflation compared to EU and EA 16. In Slovakia, the inflation rate was quickly increased in 2011-2012 (in 2011 was inflation rate 4,1 %), according to predictions.

Table 2. Comparison of inflation rate and unemployment rate in % in Slovakia, EU-27 a EA-16

Year	2004	2005	2006	2007	2008	2009	2010
Real GDP growth %	5,1	6,7	8,3	10,5	5,8	-4,9	4,2
Inflation rate in Slovakia (HICP) %	7,5	2,8	4,3	1,9	3,9	0,9	0,7
Rate of growth (X_t/X_{t-1}) %	89,29	37,33	153,5	44,19	205,2	23,08	77,77
	%	%	7%	%	6%	%	%
Inflation rate EA 16 (HICP) %	2,2	2,2	2,2	2,1	3,3	0,3	1,6
Rate of growth (X_t/X_{t-1}) %	104,7	100,0	100,0	95,45	157,1	9,09	533,3
	6%	0%	0%	%	4%	%	3%
Inflation rate EU (HICP)%	2	2,2	2,2	2,3	3,7	1,0	2,1

Rate of growth (X_t/X_{t-1})	100,0 0%	110,0 0%	100,0 0%	104,5 5%	160,8 7%	27,03 %	210,0 %
Unemployment rate in % in Slovakia	18,1	16,2	13,3	11,0	9,6	12,1	14,4

Source: Researched and calculated by authors according the SO of Slovakia and Eurostat

The Slovak economy (by real GDP growth in 1,8 %) recovered very strongly after the impacts of global crisis in 2012 and will remain among strongest in EU and OECD. However, job creation is disappointing, domestic demand remains subdued and the external drivers of growth risk fading away. The fiscal resources gained in the run-up to euro accession quickly evaporated during the crisis, and public debt has increased considerably since 2008. The main priorities now are restoring public finance while fostering drivers of growth and ensuring the funding of items to promote growth such as education and active labour market policies. The crisis raised unemployment, which has increased by 6 percentage points since 2008. Long –term unemployment and regional disparities are high by international standards. The labour experiences of youth, the low skills are particularly poor. More emphasis should be placed on activation system and other active labour market policies.

Trend and Regression analysis

Based on the economic theory, the development of particular branches and sectors within economies of particular countries is conditioned by the development and advancement of the whole economy. To survey and quantify the dependency for a regression analysis, there are selected indicator a balance amount of banking business sector (the total amount of assets, with crucial share of earning assets) and an amount of real GDP. The trend of advancement of the balance amount of banking sector and profitability in banking sector of Slovakia is, to a large extent, similar to, interconnected with, dependent on the advancement of economy depending on economic growth, measured by the increase of amount of real GDP. If the economy grows, there is an assumption of a growth of the banking business sector as well, what is documented in Figure 1 and by the analysis shown in following table 3.

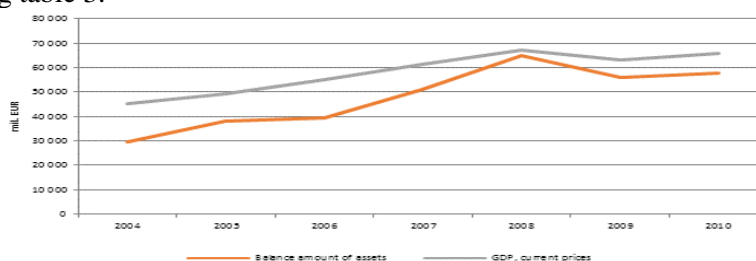


Figure 1. Interdependence between balance amount of assets and amount of GDP of Slovakia (current prices)

Source: Elaborated by authors according to Analytical data of NBS and SO of Slovakia

Within the regression modelling, the selected parameters from the given table of input data are analyzed using period of time of seven years for surveying of the dependencies.

Table 3. Development of balance amount (assets), credits, net profit of banking sector, amount of real GDP (mil. EUR) in Slovakia

Year	2004	2005	2006	2007	2008	2009	2010
Balance amount of assets mil. EUR	29,591.7	37,993.2	39,361.5	50,920.1	65,125.6	55,787.1	57,649.7
Growth rate		128.39%	103.60%	129.37%	127.90%	85.66%	103.34%
Loans to clients mil. EUR	11,089.3	15,420.7	17,935.9	24,508.4	31,730.9	31,876.2	33,534.9
Growth rate		139.06%	116.31%	136.64%	129.47%	100.46%	105.20%
Share of loans in assets	30.72%	37.96%	45.57%	48.13%	48.72%	57.14%	58.17%
Net Profit mil. EUR	280.459	360.718	423.534	582.663	549.266	278.748	513.87
Growth rate		128.62%	117.41%	137.57%	94.27%	50.75%	184.35%
Amount of GDP mil. EUR f. p.	37,105.4	39,578.6	42,944.1	47,487.3	50,417.5	48,067.9	49,788.5
Growth rate		106.67%	108.50%	110.58%	106.17%	95.34%	103.58%
Amount of GDP mil. EUR (current prices)	45,160	49,310	55,080	61,560	67,010	63,050	65,910

Source: Elaborated by authors according to Analytical data of NBS, 2004-2010, the Statistical Office of Slovakia, 2004-2010, Method ESNU 95, GDP f. p. (fixed prices) year 2005, [18]

In connection with checking our hypothesis H and for the construction of a model of net profit of banking business sector, were applied the first differences (absolute increases, year-to-year changes, Δ) in time t , $t-1$, $t+1$ of selected variables in the economic time series of 10 years (2001-2010). The parameters of the linear regression model Mod_1 were estimated, where the year-to-year change of the net profit of banking sector (Y_1) was the dependent variable and the year-to-year change of GDP amount (ΔX_1 in time t) and the year-to-year change of unemployment rate (ΔX_2 in time $t+1$) were the independent variables. The regression equation in the following shape was estimated:

$$\Delta Y_{1t} - Y_{1t-1} = -79,6713 + 0,0435815 \cdot \Delta X_{1t} - 26,5286 \cdot \Delta X_{2t+1} \quad (1)$$

Table 4. Basic table for model Mod_1 in mil. EUR, % (n=9 after adjustment)

	Coefficient	p-value	t-test		
const	-79.6713	0.05341	*	R-squared	0.801459
ΔX_1	0.0435815	0.02354	**	P-value(F)	0.007826
ΔX_{2t+1}	-26,5286	1,42559	*		

Source: Authors' calculations in software GRETL

The model as a whole is statistically significant at $\alpha=0.05$. If there is year-to-year increase of GDP by 1 million EUR, the banks' net profit will increase by EUR 0.0435815mil. at time t . If there is a year-to-year downturn of unemployment rate ($t+1$, t , in next year) by 1 percentage point, the year-to-year increase of net profit of EUR 26.5286 mil. will occur. With increasing unemployment rate the banking sector's net profit declines, since the ability of clients to pay loans provided by banks also declines with losing the jobs and worsening of clients' credibility and repay other clients' liabilities, across the loan portfolios. This regression model is most important for implications in real practice in Slovakia and comparable economic development in other countries in the EU, too.

Considering the given analyses, it is possible to state that one of the crucial factors of the stability, growth of rate of return of the banking business sector is a management of quality of balance sheet structure, i.e. the amount of assets in total (balance sheet amount) and a trend of the assets increase in total, especially their structure and price with a crucial share of earning assets (performing loans provided to clients), which, in the upshot, are reflected in the formation of a balance profit. The task of the management of assets and liabilities structure is also to manage a net interest margin, to moderate a risk of changes of interest rates, which are currently most important risks which the commercial banks are exposed to. The most important ones is the regression model (Mod_1) of net profit of the banking business sector in a macroeconomic environment and determination and quantification of influence of the factors of net profit increase. According to practical experience and theoretical assessments, there are no final models of banking management and banking conduct on the market developed. The results demonstrate significant economic and statistical relationships between various

determining factors of competitiveness and stability in real financial practice and implications for economic governance. Factors of competitiveness and decreasing risks show common features for banking sectors and business of other countries EU in context of proceeding impacts of global crisis based on the existence of common relationships and dependences. These can be applied at the building of resistance to risks and increase of financial stability of banking business sectors against crises.

Summary

In this study, the factors most affecting financial stability on economies were identified in three areas: effective bank liquidity management, quality of balance sheets assets and increasing of bank profitability rate from long-term aspect in stable macroeconomic environment, measured by real GDP. It was not possible to deal with other indicators within the banking business (f.e. Capital adequacy, higher share of deposits to loans) and to cover all the changes and dependencies between them, in this study. It results from the outcomes that despite these changes, commercial banks will increasingly have to realize their potential by higher quality and prices of offered products and services with utilization of their competitive advantage such highlights in [16], [17]. The necessity to direct the banking business to more efficient, active and quality management of liquidity and rate of return, management of quality of balance sheet structure, efficient management of interest policy and net interest margin, management of credit risk in connection to expected development of interbank interest rates on financial markets are the important factors of banking business stability and growth in the market economy in the following period. From the aspect of strategic development and consolidation and integration processes, it is possible to emphasize also the processes of mergers and acquisitions in the international scale, implemented also within the economy of the Slovak Republic in the EU and Euro area.

The European common currency has come under pressure from large national debts, problem of stability of European monetary union towards euro area crisis and impacts of global crisis, ultimately requiring a rescue package close about billion Euros. Are the EU authorities preparing for a euro breakup or for euro preservation and regulation of stability of world banking business with Basel III? The answer brings for all economies only the future.

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ANALIZA BANKOWOŚCI ORAZ JEJ WPŁYWU NA STABILNOŚĆ FINANSOWĄ GOSPODAREK W STREFIE EURO

Streszczenie: Głównym celem artykułu jest zbadanie działalności bankowej i analizy czynników wpływających na stabilność finansową gospodarek i zmiany tych czynników w czasie, przy użyciu modelu regresji z wybranych wskaźników statystycznych w otoczeniu makroekonomicznym, z naciskiem na Słowację jako członka strefy euro. Zastosowano metodę empirycznego sektora, analizę trendów, analizę regresji i modelowania ekonomicznego. Relacje między zależnością rentowności biznesu bankowego i wzrostu

makroekonomicznego zostały przebadane i określone ilościowo za pomocą modelu regresji obejmującego okres dziesięciu lat (2001-2010) . Modelu regresji wielokrotnej (Mod1) dokładnie odzwierciedla rzeczywisty rozwój sektora usług bankowych na Słowacji. Ponieważ te zmienne sektora nie są zależne od kontekstu historycznego Słowacji, model można łatwo zastosować do innych gospodarek Europy Środkowej w celu poprawy rentowności i stabilności przedsiębiorstw finansowych przed kryzysami.

Znaleziono wybrane czynniki rynkowe wpływające na działalność bankową, które to informowały analizę o takich czynnikach jak efektywne zarządzanie płynnością, jakość aktywów, bilanse, skuteczne zarządzanie polityką odsetek i zwiększenie wskaźnika rentowności w aspekcie długoterminowym.

Słowa kluczowe: działalność bankowa, otoczenie makroekonomiczne, model regresji, stabilność finansowa.

銀行業務分析及其對經濟在歐元區金融穩定

摘要：本文的主要目的是調查銀行業務和分析影響經濟和變化隨著時間的推移金融穩定這些因素採用回歸模型在宏觀經濟環境選擇的統計指標，重點斯洛伐克作為歐元區成員的因素。實證部門和趨勢分析，回歸分析和經濟模型的方法被使用。的銀行業務盈利能力的依賴和宏觀經濟增長之間的關係進行了調查，並利用回歸模型跨越一個為期十年（2001-2010年）量化。多元回歸模型（MOD1）準確地反映在斯洛伐克的銀行業務部門的真正的發展。由於這些部門的變量是不依賴於斯洛伐克的歷史背景下，該模型可以很容易地應用到其他中歐經濟，提高對危機的金融企業的盈利能力和穩定性。

還有影響銀行業務發現選擇的市場因素通報分析，如有效的流動性管理，資產負債表的資產質量，利率政策的有效管理，以及盈利率從長遠的方面越來越多。

關鍵詞：銀行業務，宏觀經濟環境，回歸模型，金融的穩定