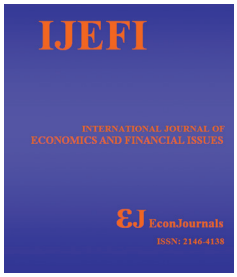

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Analytical View on the Financial and Social Stability within the Euro Area: Empirical Evidence from Slovakia

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ABSTRACT

This paper analyses global risks with focus on factors affecting macroeconomic development in regard to financial and social stability in empirical models from aspect of bank's credibility, in the economy of Slovakia within the Euro area. The relationships between the dependence of the financial stability, risk factors and macroeconomic development have been surveyed spanning a period of 14 years (2001-2014) through the methodology of construction of multiple linear regression models. Established factors of credibility in empirical models - the model of net profit as a model of bank's credibility and the model of capital adequacy as a model of the financial soundness - show common features for other economies. The important risk factor is the growth in the share of non-performing loans of customers and increasing unemployment rate in the economy, as one of the biggest problems in the EU. Empirical models can be applied in other countries and present implications for economic decision-making with focus on decreasing unemployment rate.

Keywords: Financial and Social Stability, Risks and Factors of Bank's Credibility, Regression Models
JEL Classifications: C23, G30, G32

1. INTRODUCTION

Financial and social stability is considered as a necessary precondition for the sound functioning and sustainable development of the real economy in every region. The global post-crisis world is changing current entrepreneurship, the financial theory and economic practice resulting in an increased focus on risks worldwide. Importance of stable financial systems to global economic and social growth has become even more pronounced in recent years. The financial sector is deemed to be stable when it is able to smoothly fulfill its core functions, even amidst substantial adverse shocks in the external and domestic macroeconomic environment. Issues concerning the modern financial management as a dialog between east and west are considered: Financial stability, credibility, liquidity and credit risk with social impact, overexpansion of the financial sector and financial markets, financial instruments innovations, global risk regulation and the efficiency of financial market supervision in the real economy.

The research questions and research problems are as follows:

What are the major critical problems faced by the sustainable macroeconomic development in regard to financial and social stability and risk factors affecting future trends? Is the key risk factor of Euro area financial and social stability a further deterioration in bank's credibility, fiscal, social and corporate responsibility, indebtedness and profitability owing to a weak macroeconomic and social development?

Current difficulties in the Euro area have been deteriorated by fiscal consolidation policies, which have suppressed internal demand without, in most cases, counterbalancing increases in exports. So far, employment and wage moderation strategies, which have been at the core of policy-making in many euro-area countries in the consequential of the global crisis, have had very limited effects in increasing competitiveness and creating new jobs. Potential problems of the instability in the entrepreneurship of financial and banking sectors can have a negative impact on the development of

whole economy and employment evidenced by the global crisis in 2007-2009, which arose in the banking, financial sector of the US and affected the global changes on financial markets and economic systems worldwide.

This paper is organized as follows: Section one identifies and focuses on risks in regard to financial and social stability of macroeconomic development and problems in unemployment rate within the Euro area. In the section two are discussed global risks in empirical studies. In section three is presented the used methodology with focus on commercial bank's credibility and soundness, based on rules of Basel III and on design of linear regression models. Section four demonstrates the creation of empirical models with application on Slovak conditions and empirical results, discussion in decreasing of unemployment rate and trends. In section five are conclusions of the empirical research with economic implications and challenges to next research.

2. DISCUSSION ABOUT RISKS IN EMPIRICAL STUDIES AND IN THE EURO AREA

Many of previous empirical studies (Stavarek, 2004; Stavarek and Sulganova, 2009; Lepetit et al., 2008; Weber et al., 2014; Grzebyk and Stec, 2015) dealt with the analysis and investigation of the relationship between selected macroeconomic and social indicators, considering the levels of development, financial and social stability of economies, competitiveness, and profitability management of commercial banks. The macroeconomic framework, monetary policy and credits availability at a credit market in relation to the amount of capital allocated, risks and bank liquidity was surveyed and analyzed by Brissimis and Delis (2009) and Hume and Sentance (2009). Pricing and market interest rate has a considerable influence on the volume of loans provided and lending rates. This mutual relationship between interest rates and the credit market in the context of global changes was analyzed by Mirdala (2012), Degryse et al. (2012) and Jorge (2009). Jorge concluded that the response of credit markets to changes in the interest rate (especially a decrease) with considerable delay can be influenced by the amount of equity in the commercial banks. The differences in the quantitative impact on macroeconomic factors (as gross domestic product [GDP] and employment) among banking sector and loan categories were evident in Louzis et al. (2012) study. De Grauwe and Ji (2015) demonstrated that in the European Monetary System, the fragility arose from the absence of a credible lender of last resort in the foreign exchange markets; whereas in the Euro zone, it was the absence of a lender of last resort in the long-term government bond markets that caused the fragility. Later on the national central banks that became part of the Euro system were strengthened.

Credit trades represent, on one hand, one of the basic business activities and are one of the most important items of the earning assets; i.e., they create approximately 50% of all assets in the balance of the European banks. However, on the other hand, bank credit portfolios are exposed to high risks that can result in considerable financial losses and affect financial and social stability. The price, value of a bank's assets depends on demand and supply, and market conditions in economic environment. Ochotnicky et al. (2011. p. 787) stated that, while making decisions regarding resources allocation toward active transactions, banks must take into account the risks associated with active transactions (expressed by a general rate of return) and credit transaction prices (expressed by interest payments), especially through the management of credit transactions prices and price competitiveness. Commercial banks aim to achieve the requested profitability of the diversified credit portfolio on a consistent and long-term basis, in accordance with the bank's adopted objectives and strategies, through credit risk management, accented Dietrich and Wanzenried (2011).

The credit risk of banks is one of the main specific problems in banking sector at the management of credit trades for the existence of the potential risk of credit portfolio, following from the reliability of clients (Poloucek and Stavarek, 2006; De Haas et al., 2010; Ferreira et al., 2014). Furthermore, Poloucek and Stavarek (2006) stated that improper credit risk management is considered as the one of most important, leading causes of bank crises. Poloucek and Stavarek (2006), Hellwig (1995. p. 730), and De Haas et al. (2010) reported the opinion that banks tend to have a less cautious approach toward the assessment of credit risk and the provision of credit transactions during periods of economic growth. Consequently, the quality of the credit portfolio will decrease, and this will become evident in a period of a recession through an increase in the amount and the share of non-performing loans in connection with labor market, as emphasized by Marcucci and Quagliariello (2009). Therefore, credit risk management for credit portfolios is one the most important tasks that ensure the financial liquidity and stability of the banking sector, considering the increased sensitivity of banks to credit risks and changes in the prices of financial instruments during a financial crisis, what is stated by Liao et al. (2009), Ebnother and Vanini (2007) and Kiselakova (2010).

Financial institutions are developing newer and more progressive procedures and creating effective positions to increase corporate responsibility and the efficiency of risk management (Poloucek and Stavarek, 2006; Ramke, 2006; Aebi et al., 2012; Hsu and Chen, 2015). Simultaneously, they seek newer approaches (advanced approaches), new financial tools and models for the transfer of financial risks, what was emphasized by Sivak et al. (2009). Central regulators make an effort to identify the substantial global factors with an impact on bank distress and predicting distress in European banks, in other banking systems as in Russia (Borodacheva et al., 2016) and trends in sustainable development, using many sophisticated methodologies and macroeconomic models within the framework of Basel II and Basel III.

Current global business risks can be summarized using the risk index published by Lloyd's, a global insurance company. The Lloyd's risk index (2013) assessed corporate risk priorities and attitudes among business leaders across the world. The findings were based on a global survey of more than 500 of the world's most senior business leaders and were focused on more pressing problems. Risk Index can detect and capture the main risks perceived by managers around the world, and how the managers

intend to deal with future risks. In 2013, the EU region managers ranked the following five risks as most important: High taxation, loss of customers (order cancellations), changing legislation, costs and availability of credits, excessively strict regulation. High taxation is now seen as the number one threat to global business according to the Lloyd's risk index and Siroky (2013) and as the biggest risk faced by business leaders after prolonged public and political exposure and debate (from 13th to 1st place in the last 2 years). Cyber security now sits squarely towards the top of the agenda for boards around the world with cyber risk moving from 12th to 6rd place, especially in the risk index in the Europe and it is necessary to insure risks much more sophisticated (Koraus, 2003; Garcia-Benau et al., 2013).

Within the EU, the financial and economic crisis and concomitant recession in 2009 initiated a worrying increase in the indebtedness, especially in Greece, Ireland, Portugal, Spain and Italy. The situation required changes in the management of debt for many Euro area countries. The new agency – The European Financial and Stability Facility was created by the Euro area nations, the IMF and the European Central Bank (ECB) in May 2010. Immediately after launch, the agency provided the financial aid Euro 110 milliard to Greece and Euro 85 milliard to Ireland, and in further years, too, against the sovereign default risk.

The EU as a whole and the Euro area had a revival in 2010, in 2011 a slow GDP real growth (1.5%) and in 2012 slowdown of GDP growth (Euro area recession −0.8% in 2012, −0.4% in 2013), as it was affected by the risks of sovereign countries (high deficits and rising public debt of some countries, a weakened banking sector due to the global crisis, debt crisis in the Euro area, unemployment). On the positive macroeconomic development trend of Slovakia, supported by exports in the EU in 2010 and 2011, followed the development in the banking sector of the Slovak Republic, but in 2012 and 2013 the GDP real growth slowed (from 1.6% to 1.4%). The unemployment rate vibrated about 14.0% (in the Euro area about 11.6%).

After 2 years of negative performance, the Euro area economy returned to low growth in 2014 (+0.9% of GDP growth) and +1.6% in 2015. The upturn, however, progressed slowly and its impact on risks to financial stability, although positive, was relatively limited so far.

National Bank of Slovakia (NBS) identified the following global risks that could affect domestic financial stability in its Financial Stability Report (2015):

- Escalation of financial instability to the Euro area periphery affecting otherwise stable Euro area core, falling growth and employment and possibly falling back into recession
- Low interest rates environment-negative impact on the business model of banks, decrease in interest rates, including long term rates putting gradual downward pressure on profits over the long-term horizon, net interest income falls as a result of a decrease interest spreads
- Risk arising from negative interest rates on deposits – crucial impact on bank's strategy
- Increase in credit risk costs in the event of adverse macroeconomic developments
- Slowing growth and risks of further developments in emerging market economies, especially China, price volatility on markets
- Potential further increase in oil prices, and prices of other commodities leading to an inflationary spiral causing a domestic price increase further decreasing household disposable income
- Defer in planning for midterm financial consolidation in developed countries (the US and Japan).

As the global crisis and its ensuing development enters its 8th year, more businesses appear to have become much more realistic about the degree to which they can mitigate the risks inherent in the wider macroeconomic, regulatory and natural environment.

3. METHODOLOGY AND DATA

The main purpose of this paper is to analyze global risks with focus on factors affecting macroeconomic development in regard to financial and social stability in models from aspect of bank's credibility in the economy of Slovakia within the Euro area, based on rules Basel III, using multiple regression modeling.

Empirical sector data from electronic information sources and annual reports from the Analyses of Slovak financial sector and individual, balance sheets of commercial banks, statistical data from NBS, ECB, Eurostat and Statistical Office of the Slovak Republic were obtained. To meet the objective of the study following scientific, mathematical and statistical methods were used:

- The statistical method of regression analysis and correlation analysis to examine the relationship of dependence with the use of software solutions,
- Multiple regression modeling, analyzed the monitored period of 14 years - for the first phase (2001-2014), and 10 years - for the second phase (2004-2014), source data are in economic time series, in Table 1.

Within the framework of the methodology the main scope, which creates the platform for scientific and economic discussion, is analyzed:

- The analysis of current status of macroeconomic and financial stability of banking sector in Slovakia (29 operating commercial universal banks, including branches of foreign banks) in relation to selected indicators and indicators of the growth of economy in Slovakia, as a small open economy within the Euro area,
- The analysis of development of selected macroeconomic, social (unemployment rate) and financial indicators – capital adequacy as one of the factors of the financial soundness, the quantification of dependencies between selected parameters by trend, regression and correlation analyses and regression models.

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

Table 1: Selected economic indicators of Slovakia, risks and capital requirements indicators for regression modeling - variables

Year/Indicator	Y_1 – net profit of banks million Euro	X_1 – real GDP growth rate (%)	X_2 – unemployment rate (%)	X_3 – share of non-performing loans (%)	X_4 – the volume of GDP million Euro	X_5 – net interest margin of banks	Y_2 – capital adequacy ratio of banks (%)
2001	322.17	3.20	19.20	-	40,164.60	-	-
2002	393.11	4.10	18.50	-	42,005.30	-	-
2003	375.64	4.80	17.40	-	44,011.10	-	-
2004	407.87	5.50	18.10	7.15	46,237.00	2.87	18.69
2005	462.10	6.50	16.20	3.74	49,314.20	2.15	14.79
2006	523.66	8.50	13.30	3.26	53,429.70	2.42	12.98
2007	582.66	10.40	11.00	2.77	59,036.60	2.36	12.78
2008	508.59	5.80	9.60	3.21	62,431.50	2.62	11.09
2009	278.75	−4.70	12.10	5.50	59,350.10	2.85	12.57
2010	513.87	4.20	14.40	6.07	61,976.50	3.04	13.41
2011	674.24	3.30	13.50	5.75	63,285.40	3.16	13.41
2012	491.37	1.60	14.00	5.36	64,975.10	2.72	15.99
2013	549.37	1.40	14.20	5.28	66,875.20	2.99	17.23
2014	560.22	2.50	13.20	5.50	73,162.30	2.95	17.35

Source: Author's calculations and processing according to the NBS annual reports, balance sheet. NBS 2001-2014, SO of Slovakia, year 2001-2008 conversion rate 1 EUR=30.126 SKK. GDP: Gross domestic product

- The presumption and quantification of linear dependence between dependent variables (Y) and selected independent variables (X), i.e., parameters from real environment of Slovakia which influence the credibility of banking sector, identification and quantification of factors, investigation of dependencies and influences of variables by the regression and correlation analyses,
- The analysis, whether it is possible to set up a statistically significant regression linear model (Mod) between dependent variable and independent variables (a multiple linear regression model), which would correspond with the actual macroeconomic and financial development of Slovakia,
- The construction and description of a linear regression model by following relation, expressed by general equation.
- The task of modeling is to estimate the regression coefficient β in the general equation (Mendenhall et al., 2006):

$$y=\beta_0+\beta_1x_1+\beta_2x_2+\ldots+\beta_nx_n+\varepsilon \quad (1)$$

Where,

- y is the value of a dependent, explained variable Y (a criterion) in the observation
- $x_1, x_2 \ldots x_n$ is the value of the independent variable, explaining X (a predictor) in the observation 1, 2 … n
- β_0 is the regression constant (an intersection of the regression line with the axis x)
- $\beta_1, \beta_2 \ldots \beta_n$ is an unknown regression coefficient of the variable X
- ε is a random error of the observation.

The regression problem is solved by the known method of least squares (OLS method, examined by Wuchun et al., 2015) which selects b (the estimations of the unknown parameters β) in such a way so that to minimize the sum of squares of residua e. Based on the sample of n observation of variables X and Y, the method of least squares will estimate the unknown parameters β in such a way, so that the sum of squares of residua to be minimum. The residuum e is a difference, a deviation between actual value of a dependent variable y and the value calculated from the regression function by the substitution of the value x. The total F-test of the research hypothesis or the significance of F expresses the significance or reliability of the model as a whole. P value, P test expresses a probability of the significance of each parameter. The level of significance α is 5%, i.e. 0.05. The disadvantage of the method of the linear regression is a disability to catch the nonlinear dependence between variables and other external influences.

The selected macroeconomic indicators, risks and capital requirements 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 based on the methodology of NBS, applied in this paper, are indicated in Table 1.

Based on the economic theory and on the basis of the knowledge synthesis of theoretical and empirical studies and the examination results, hypotheses were formulated as follows:

- H_1: There is a dependence of the development of financial stability of the banking sector on macroeconomic and social development and subsequently, the development of credibility and profitability of the banking sector on the sustainable development of the real economy, i.e. during the period of economic growth, we expect a positive trend in the profitability and development of the banking sector, as well as a decrease in the unemployment rate. During the economic downturn unemployment is increasing; growth of economy sectors is expected to slow, including the banking sector too; increasing the share of non-performing loans in context of credit risk and unemployment on labor market, and increasing competitive pressure on the more effective use of financial instruments on the market are also expected.
- H_2: It is supposed that the risk of growth of non-performing loans and unemployment rate influence the growth of capital adequacy as a factor of financial stability and soundness of commercial banks in the changes of the real economy.

These dependences and interconnection between development of financial stability of the banking sector and the development of the Slovak economy, and also relation of credit risk development through the use of selected indicators during the reporting period are under review and construction of regression models in this paper. The next parts further verify the validity of the research hypotheses using several parametric statistical test characteristics, depending on the nature of the analysis period. Calculations were performed using statistical software GNU Regression, Econometric and Time Series Library. It is also notes that have been worked with a relatively small number of observations in economic time series. Obtained outputs can be considered as representative partially due to the fact that the used data were real data from the Slovak Republic, reflecting the real economic, financial and social development within the Euro area.

4. EMPIRICAL RESULTS AND DISCUSSION

4.1. Factors Affecting the Financial Stability in Slovakia - Multiple Regression Modeling

To examine the risk factors in regard to financial and social stability from the aspect of the bank's credibility and profitability development in the context with H_1 verification and to construct a model of the net profit of the banking sector, we used regression modeling of selected parameters in economic time series of 14 years (2001-2014) which are listed in Table 1.

In the context with H_2 verification and to construct a model of capital adequacy of commercial bank as factor of financial soundness we used parameters for 10 years (2004-2014), which are listed in Table 1.

In connection with checking H_1 and for the construction of the first model of net profit of banking sector, we applied the first differences (absolute increases, year-to-year changes, Δ) in time *t, t*–1, *t*+1 of selected variables in the time economic series of 10 years (2001-2011). We estimated the parameters of the linear regression model Mod_1, 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 volume (ΔX_4 in time *t*) and the year-to-year change of unemployment rate (ΔX_2 in time *t*+1) were the independent variables. We estimated the regression equation in the following shape:

$$\Delta Y_{1t} - Y_{1t-1} = -79.6713 + 0.0435815.\Delta X_{4t} - 26.5286.\Delta X_{2t+1} \quad (2)$$

The model as a whole is statistically significant at α = 0.05 and explains 80.14% of the variability of depended variable (adjusted R^2) (Table 2). We expected that with the growth of the unemployment rate, net profit of the banking sector is decreasing, with the loss of job creditworthiness of clients, the ability of bank loans repayment and other obligations of clients are deteriorating, credit risk and the level of non-performing loans are increasing and there is the need to increase the capital adequacy of banks. The increasing of unemployment rate results in the decreasing banking sector's net profit, losing the jobs results in worsening of clients' credibility and ability to pay loans provided by banks and other clients' liabilities, in connection with problems on labor market.

If there is year-to-year increase of GDP by 1 million EUR, the banks' net profit will increase by EUR 0.04358 million. If there is a year-to-year downturn of unemployment rate (*t*+1, *t*, in next year) by 1%s point, the year-to-year increase of net profit of 26.5286 million EUR will occur.

The creditworthiness of clients, the ability of repayments can theoretically be derived from the development of the unemployment rate in the economy and the situation on labor market, which represents a potential of specific credit risk. This regression model is economically and statistically significant and most important for implications in real practice in Slovakia and comparable economic development in other countries in the EU.

In the context of regression modeling, we estimated the parameters of the second linear regression model Mod_2 of net profit of banking sector, where the dependent variable is the net profit of the banking sector in millions of EUR (Y_1) and independent variables GDP growth rate in % (X_1 at time *t*) and the unemployment rate in % (X_2 at time *t*). We estimated the regression equation in the following form:

$$Y_1 = 671.581 + 13.1866 * X_1 - 17.583 * X_2 \quad (3)$$

Model as a whole is statistically significant according to the F-test at significance level of 5% (P value (F) 0.055394). The individual parameters of the model have expected dependence direction. When raising economic growth by 1% point, one unit, net profit of the banking sector is increasing by EUR 13.2 million, assuming constancy of other parameters. When the unemployment rate is growing by 1% point, profit of banks is dropping by EUR 17.6 million, assuming constancy of other parameters. Estimate of the constant is statistically significant at the 5% significance level, the parameter estimate of economic growth at the level of 9% and unemployment at 7% level. This model as a whole explains 39.9% of the variability of the dependent variable (adjusted R^2) (Table 3). Variability of net income is affected by

Table 2: Model 1: Mod_1 in million EUR (T=10 after adjustment)

Dependent variable: Y_1		
Variable	**Coefficient**	**p value t-test**
Constant	−79.6713	0.05341*
ΔX_4	0.0435815	0.02354**
ΔX_{2t+1}	1.42559	−26.5286*
Adjusted R^2	0.801459	
p value (F)	0.007826	

Source: Authors' calculations in GNU Regression, Econometric and Time Series Library program. **Indicates significance between 1% and 5%. *Indicates significance between the 5% and 10% levels

Table 3: Model 2: OLS, using observations 2001-2014 (T=14)

Dependent variable: Y_1				
Variable	**Coefficient**	**Standard error**	**t-ratio**	**p value**
Constant	671.581	135.439	4.9586	0.00057***
X_2	−17.583	8.73171	−2.0137	0.07173*
X_1	13.1866	7.06862	1.8655	0.09168*

Source: Author's calculations in GNU Regression, Econometric and Time Series Library program. ***p value below 0.01 indicates statistical significance at the 1 % level. *Indicates significance between the 5% and 10% levels

other factors that we have not included in the model. With reference to the performed LM test we adopted the null hypothesis of absence of residues autocorrelation. With reference to the performed White test, we adopted the null hypothesis of absence of residues heteroskedasticity.

For the second phase of our research, in connection with checking H_2 and to construct the first regression model of capital adequacy, we estimated the parameters of the linear regression model Mod_3, where the dependent variable was capital adequacy (Y_2) in % and the independent variables share of non-performing loans in % (X_3 at time t) and unemployment rate (X_2 time t) in %, which represent the development of the credit risk. We estimated the regression equation in the following form:

$$Y_2=11.2012-1.57211*X_3+0.966365*X_2 \quad (4)$$

Model as a whole is statistically significant according to the F-test at significance level of 5% (P value (F) 0.000666). The individual parameters of the model have expected dependence direction (if banks are expecting a deterioration in economic conditions and increase of credit risk, they have an obligation to "stock up the capital," increase the capital adequacy). When the share of non-performing loans is growing by 1% point, one unit, capital adequacy is declining by 1.572% point, assuming constancy of other parameters. When the unemployment is growing by 1% point, capital adequacy is increasing by 0.966% point, assuming constancy of other parameters. Estimate of the constant is statistically significant at the 10% significance level, estimation of other parameters on the level of 5%. This model as a whole explains 88.35% of the variability of the dependent variable (adjusted R^2) (Table 4).

Subsequently, we estimated the parameters of the second linear regression model Mod_4 of capital adequacy, where the dependent variable was capital adequacy (Y_2) in % and the independent variables share of non-performing loans in % (X_3 at time t) and net interest margin (X_5, time t), which represent the development of the credit risk and the need of increase of capital and more effective risk management. We estimated the regression equation in the following form:

$$Y_2=23.1141-7.03226*X_5+2.04189*X_3 \quad (5)$$

Model as a whole is statistically significant according to the F-test at significance level of 5% (P value (F) 0.012971). The individual parameters of the model have expected dependence direction (if commercial banks are expecting a deterioration in economic conditions and increase of non-performing loans and credit risk, they have an obligation to "stock up the capital," increase the capital adequacy and more effective to manage net interest margin. This model as a whole explains 68.67% of the variability of the dependent variable (adjusted R^2) (Table 5).

Based on the conducted analyses, it can concluded that there is a dependence, confirmed response relationship between the net profit of the banking sector and development of real growth rate of GDP in Slovakia, and development of unemployment rate with economic and social impacts of the bank performance and financial stability. Interrelationship to others factors and statistically significance were confirmed in regression models. When testing dependencies in the regression analysis, it was found for H_1 and H_2, that also significant economic and statistical dependence between the studied parameters of the real Slovak macro environment and impact indicators for regional macroeconomic development has been confirmed (Table 6).

The constructed models with social impact constitute major implications for the real practice in the Slovak Republic and because of the similar relationships and dependencies in the EU economy they may also be useful in other EU countries. Hypotheses were confirmed.

Given the above analyses and constructed regression models following can be stated, a crucial factor in the management of financial stability from the aspect of the banking sector credibility and profitability is:

- The management of credit quality of loans portfolios,
- Management of the quality the balance sheet structure,
- The volume of total assets (balance sheet total), particularly their structure and
- The price of assets with the determining share of earning assets (loans to solvent customers), which is ultimately reflected in the balance sheet profit making on the long term basis

Table 4: Model 3: OLS, using observations 2004-2014 (T=10)

Dependent variable: Y_2				
Variable	**Coefficient**	**Standard error**	**t-ratio**	**p value**
Constant	11.2012	5.58942	2.0040	0.09192*
X_3	−1.57211	0.27292	−5.7603	0.00119***
X_2	0.966365	0.260367	3.7116	0.00995***

Source: Author's calculations in GNU Regression, Econometric and Time Series Library program. ***p value below 0.01 indicates statistical significance at the 1 % level. *Indicates significance between the 5% and 10% levels

Table 5: Model 4: OLS, using observations 2004-2014 (T=10)

Dependent variable: Y_2				
Variable	**Coefficient**	**Standard error**	**t-ratio**	**p value**
Constant	23.1141	4.28983	5.3881	0.00168***
X_5	−7.03226	2.14947	−3.2716	0.01700**
X_3	2.04189	0.463116	4.4090	0.00452***

Source: Author's calculations in GNU Regression, Econometric and Time Series Library program. ***p value below 0.01 indicates statistical significance at the 1 % level. **Indicates significance between 1% and 5%

Table 6: Correlation coefficients matrix, using the observations 2004-2014

5% critical value (two-tailed)=0.6664 for n=10							
Y_1	Y_2	X_1	X_2	X_3	X_4	X_5	
1.0000	−0.2543	0.6008	−0.2033	−0.2884	0.3089	0.0667	Y_1
	1.0000	−0.0125	0.8462	0.5881	−0.5648	0.0617	Y_2
		1.0000	−0.0180	−0.5631	−0.3118	−0.5463	X_1
			1.0000	0.6314	−0.6709	0.0922	X_2
				1.0000	−0.0702	0.7858	X_3
					1.0000	0.4249	X_4
						1.0000	X_5

Source: Author's calculations in GNU Regression, Econometric and Time Series Library program

- The role of the capital adequacy as factor of financial soundness and management structure of assets and liabilities is also to manage the net interest margin, mitigate the risk of changes in interest rates, which ranks among the most serious risks to which commercial banks are exposed, and effectively manage credit risk reduction and decrease the share of non-performing loans.

Externally, the most significant, established risk is that the Euro area economy experiences falling growth and employment and possibly can fall back into recession. This situation reflects mainly low levels of domestic demand, weaker global economic growth, low inflation or even deflation and the gradual escalation of geopolitical risks and risks of highly indebted countries. The problem of sovereign default risk is a tricky one for bankers, policy makers, politicians and investors alike, as stated Nyambuu and Bernard (2015). There was a slowdown in the years 2011-2013 in global economic development, sovereign defaults of several countries, and the reduction of the profitability indicators of the banking sector and increasing of global risks.

4.2. Discussion and Trends in Regard to Financial and Social Stability in the Euro Area

Dynamics of development of the banking sector in Slovakia has been demonstrated in several indicators in economic time series. Comparable results were also recorded in several countries of the EU and Euro area banking sectors (for example Baltic countries), as the report of NBS (2015) stated. As mentioned, generating the profit on a long term basis is one of the factors essential for financial stability, credibility, and competitiveness and growth dynamics of commercial banks. It can be pointed out that increasing profitability and credibility of the banking sector have a positive impact not only on the stability and growth of the banking sector, but also on the stability, growth and sustainable development of the whole economy.

Development trends in terms of stability on the liability side are represented by faster growth of primary deposits than loans - Loan to deposit ratio, in the Slovakia is the average 88%, which is a favorable trend according to the European Bank Federation. According to Index of Stability the soundness of banks in Slovakia in four fields – profitability, liquidity, capital adequacy, credit quality - the commercial banks in Slovakia are considered as stable sector of the economy in the Euro area (World Economic Forum, 2013). Development trends on the asset side represent a continuing trend of credit growth especially in the retail sector (positive trend), but also the burden proliferation of households' loan repayments in proportion to disposable income and the potential threat of job loss (negative trend).

Amount of capital of commercial bank reflected in the concept of capital adequacy is a measure of its financial strength and financial soundness. It may be pointed out that the existing regulatory capital adequacy rules of Basel II were in practice insufficient, since they failed to protect the banks as creditors against insolvency during the global financial crisis in 2007-2009. Therefore, central regulators revised existing rules and in September 2010 new reform of capital rules regulatory was approved, i.e. strengthening of global capital standards and improving the quality of regulation based on Basel III rules effective from 2013. The Basel committee for banking supervision arranged the need to meet the new stricter demands on capital adequacy and the minimum amount of liquidity in the time period till 2019 to mitigate the impacts on the banking sector and financial markets. The aim is to strengthen the global macroeconomic and financial supervision and reduce the effects of financial instability. The main question is how the new rules will affect the costs, availability of credits and profitability and credibility of banks on the longer term basis in the real economy.

In November 2013 the ECB realized a Comprehensive evaluation of banks in preparation for the fulfillment of tasks in the consistent of single supervisory mechanism for financial market supervision, based on rules Basel III. This assessment consisted of three parts: (i) Risk assessment in terms of supervision on the quantitative and qualitative assessment of major risks, including liquidity risk, leverage and funding (ii) review the adequacy of the quality of assets, including asset pricing and collateral(asset quality review) (iii) stress testing the resistance of the banking balance sheets under stress scenarios. Comprehensive assessment represented about 85% of Euro area banking system (130 banks) and was intended to strengthen transparency, private sector confidence in the stability of commercial banks in the Euro area, the quality of their balance sheets and to sustainable development of global financial systems. From November 2014 SSM was launched in the Euro area as the first pillar of Banking Union. But how is the perspective of the long-term financial stability of the Euro area?

5. CONCLUSIONS

In this paper, it was analyzed the development of risks and selected factors of macroeconomic and social development, in regard to financial stability of the banking sector in Slovakia from the point of credibility and profitability in relation to selected indicators and indicators of economic growth through the conducted analyses and regression models.

Principal findings: When constructing regression models we have designed novel regression models, corresponding to the real development in Slovakia (Mod_1, Mod_2, Mod_3 and Mod_4) By testing the dependencies within regression and correlation analysis, we found that the theoretical assumptions of interdependence and conditionality of development of the banking sector measured by profitability development and development of the real economy, measured by annual real growth rate of GDP and unemployment rate during the reporting period of 14 years, were proved in the real practice, too. Important is the model of the net profit of the banking sector in the macroeconomic and social development (Mod_1) and quantification of the impact factors of the net profit growth through the examined factors - as the model of bank's credibility. Capital adequacy model Mod_3 and Mod_4 is a reflection as a model of the financial soundness of the banking sector in Slovakia, and in general in banking sectors, too. Most significant effect on the increase of credit risk is the growth in the share of non-performing loans of customers and increasing unemployment rate in the economy, as the biggest problem in the EU and the Euro area. Social impact represented the development of unemployment

rate as social consequence and effects of global crisis. Our findings – decreasing of unemployment rate with economic and social impacts of the bank performance and financial stability - indicate that comparable models based on the existence of common features also for banking sectors and economies in the EU, relationships and dependencies can be applied in other countries in the managerial practice. Results of the examination within a regression modeling with application to Slovak Republic conditions demonstrate economic and statistical dependence of key factors of stability in real practice and represent implications for economic decision-makings (decreasing of unemployment rate on labor market) and financial decisions (decreasing of non-performing loans).

The results and novel regression models accurately reflect the real macroeconomic development with focus on trends in decreasing unemployment rate.

One of the major trends in bank financial management, in addition to the rules of international regulation of Basel III, are stricter capital adequacy requirements, an additional capital buffer, the stronger solvency and the diversification of potential risks within the risk management and establishment diversified loan portfolios to ensure adequate liquidity, credibility, profitability of the banking sector and acceptance of risks involved in the real economy. These facts can be associated with findings of Poloucek and Stavarek and with studies by Ebnother and Vanini (2007), De Haas et al. (2010), Liao et al. (2009), Marcucci and Quagliariello (2009), Ferreira et al. (2014). This is a platform for the next research and challenges in innovative professional management decision-making processes of financial and social stability between East and West.

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