

Credit to Households. What Impacts the Growth in Slovakia?

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Abstract

Financial institutions have a special role in the economy. Monetary financial institutions take part on realizing monetary policy and provide economic subjects with necessary finances. Majority of credits are granted to households from banking institutions. Therefore the objective of this paper is to identify determinants of household credits in Slovakia. Credits to households are positively influenced by disposable income and negatively by unemployment rate, real interest rate and earnings from property.

Keywords: *financial institutions, banks, household credit, unemployment rate, interest rate*

JEL Classification: E41, E44

1. Introduction

A majority of studies relating to the issue of credits are concerned with monetary financial institutions (banks) and their relations towards households and corporate. In the EU within the process of financial intermediation, monetary financial institutions play important role for granting credits to private sector of the Euro Area (Calza, Manrique and Sousa, 2003). Banking system of transitive countries went through remarkable changes. For Slovakia the process of transformation was more expressive in comparison to other countries. Therefore this paper addresses the challenges to delve into the research of financial relations of monetary financial institutions and households.

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The splitting of Czechoslovakia on January 1, 1993, resulted in two separate states. It was a time of currency separation that started on February 8, 1993, broken trade relations among Slovak and Czech companies, and of building state infrastructure and tax reforms. The establishment of the Národná banka Slovenska (the National Bank of Slovakia – NBS), independent central bank, in 1993 and the elaboration of the banking system and institutions of the capital market facilitated the changes in the Slovak economy. In 1993 there were 28 commercial banks situated in Slovakia providing for debts services for economic entities. The volume of entire credits was growing, remarkably for households. Slovak banking industry was however, characterized in its initial phase by increasing amount of classified credits (in 1998 about 40% from the entire credits), insufficient risk management and a low capital adequacy.¹

To improve the competitiveness of the banking industry and the capital adequacy a process of restructuralization was of importance. There were three banks which went through. These were Slovenská sporiteľňa, Všeobecná úverová banka and Investičná a rozvojová banka. In 1999 equity of transforming banks was increased by SKK 19.9 billion and their bad credits (SKK 105 billion) were conveyed into two special financial institutions: Slovenská konsolidačná, a. s. (SK, a. s.) a stock company and Konsolidačná banka Bratislava a State Monetary Institution. Improvements of banking credit portfolio increased the capital adequacy and competitiveness of transforming banks which were further on privatized.

Following prospects of the banking sector of Slovakia were aimed at entering the European Union (EU) and joining the Economic and Monetary Union (EMU) of the European Union. Slovakia became a member of the EU in 2004 and a member of the EMU in 2009. Since 2009, Slovakia has used single Euro currency, and the banking sector applies practices of common monetary policy governed by the European Central Bank.

The objective of the paper is to present the determinants for household credits in Slovakia within the period of time 1995 Q1 to 2008 Q4.² The paper is organized

¹ E. g. by the end of 1996, the capital adequacy of banks was 7.73%, a decrease when compared to the previous year.

² Due to the changes in Slovak banking statistics the observed period of time is limited. The bottom is due to the data availability (quarter data) represented by 1995 Q1, whereas the top represents the 2008 Q4.

The changes in the statistics since January 1, 2009:

a) classification according to the Foreign Exchange changed from SKK, EUR, AFC (another foreign currency) into EUR, FC (foreign currency);

b) classification of a counterparty was changed from resident of SR, non-resident into:

- national resident units of Euro zone (resident units of SR) other Euro zone participating countries,
- rest of the world;

as follows. After the introductory part and the overview of corresponding literature there is a section devoted to the development of household credits, the relation to the GDP. Part four presents the data, model and results. The last one concludes.

2. Theoretical and Empirical Overview

From the theoretical and empirical point of view spending, income,³ and interest rates are possible determinants of credit growth. Additional variables are used when investigating a special segment of credits like e.g. households where unemployment rate, wealth and special characteristics of an applicant are possibly considered too.

Higher spending of households should positively influence the growth of their borrowing, but an increase in income may either reduce the needs of households for external financing or stimulate the increase of spending and hence the demand for external financial sources. Higher interest rates reduce the demand for borrowing and so does the unemployment rate. Households do not intend to be indebted if their work and hence their income is not safe.⁴ From the point of view of lending institutions, an increase in interest rates stimulates the credit activities of banks, and an increase in income of households indicates households are better off to meet the requirements of banks for obtaining credits. Nieto (2007) points out that higher interest rates do not have to be accompanied by higher volume of credits granted to households, because an increase in costs for credits can be accompanied by higher risks that may result in a credit rationing described by Stiglitz and Weiss (1981).

The household wealth (real estate) should be positively related to credit growth, since the real estate wealth may reduce the asymmetrical information difficulties. It serves as collateral for banks hence households easier meet bank requirements. The property of households e.g. played a fundamental role when explaining the rise in credits of households in Spain (Nieto, 2007).

Calza, Gartner and Sousa (2001) and Calza, Manrique and Sousa (2003) observed the aggregate loans to the private sector of the euro area using standard factors of credit demand (GDP, prices) and a new measure of cost on loans (weighted average of bank lending rates). The results show the existence of

c) data presented in thousands of SKK were changed to data presented in thousands of EUR <www.nbs.sk>.

³ Income or economic activity stands for the income concept Nieto (2007).

⁴ Moreover they do not meet banks requirements for granting credits. There might be an argument for a positive relation (the loss of regular income increases the demand for finances) however, this can be related to borrowing from the non-banking financial entities.

a long-run relation between real loans, real GDP and real interest rate. Fidrmuc, Hake and Stix (2011)⁵ identified the determinants of foreign currency loans of households in nine CEECs countries. The results indicate that the rise in household loans in foreign currency depends upon the trust of households in their domestic currency. Nieto (2007) identified determinants of household credits in Spain. Household borrowing was positively determined in the long-run by real spending, gross wealth, and negatively impacted by the cost of loans, and the unemployment rate. Ke Chen and Chivakul (2008) observed the growth of household credits and credits constraints in Bosnia and Herzegovina. Features of an individual (age, education, qualification) were identified as determinants of household credit, while high income and wealth reduced their credit constraints. Pellenyi and Bilek (2009) did not find that education and wealth determined the credits in foreign currency in Hungary. Bialowolski and Dudek (2007) focused on household credits in Poland. They presented a model for identifying relations among credit market of households and the rate of obtaining small durables. The results show that under better developed credit markets, households are enabled to obtain the durables faster and in a shorter period of time.

Rubaszek and Serwa (2012) were searching for determinants of household credits in a life-cycle model using data from the OECD and the EU countries. Outcomes show that the value of household credits to GDP ratio is impacted by changes in the interest rate (the lending-deposit interest rate), individual income uncertainty, individual productivity persistence and the generosity of pension system (starting working at the age of 20 and working for 43 years).

Credit to households in Slovakia were empirically inspected mainly by foreign researchers within a group of countries Calza, Gartner and Sousa (2001); Calza, Manrique and Sousa (2003); Rubaszek and Serwa (2012); Polouček (2010). Domestic investigations of credit related topics were done among others by Husár and Szomolányi (2009), Sivák, Gertler and Kováč (2009), Šoltés and Vašková (2010), Želinský (2010), or the researchers of the NBS Hajnovič and Klasco (2011), Strachotová (2010), Beka (2007), Cár (2009), Krčmár (2010), Preisinger (1998). Jurča (2009) e.g. coped with demand for credits of households and non-financial entities in Slovakia and the euro area, considering the credit standards as possible credit determinant. He pointed out that the standards for household credits became more rigorous within the euro zone already in 2006 but, banks in Slovakia changed them nearly two years later.

Empirical papers individually focusing on household credits and their determinants are missing in Slovakia. This paper should fill in this gap.

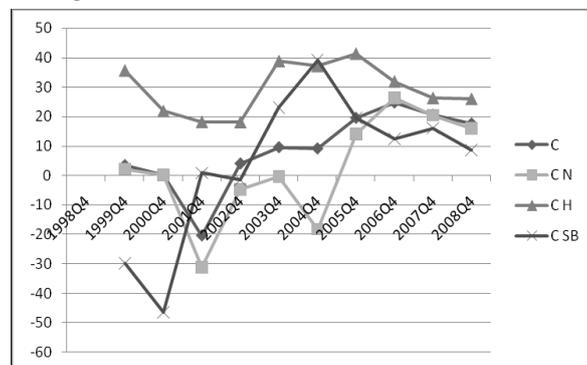
⁵ Authors point out, that Slovakia was due to the introduction of euro currency in 2009 not involved in the investigation.

3. Development of Household Credits

Total credit achieved a downward incline (over 20%) only in the year 2001Q4 compared to the same quarter of the previous year (Figure 1). The highest growth of credits was achieved in the section of households. It possibly refers both to standards policy of commercial banks and collaterals offered by households.

As Figure 2 presents, the growth of credits to households indicated frequent and higher changes from quarter to quarter. Apart from the very beginning (1995), household credits were marked by a positive growth. Their average interest rate for household credit was throughout the year 1995 about 5.4%.

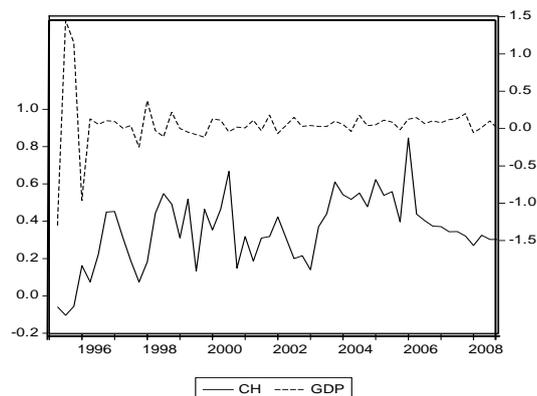
Figure 1
Annual Rate of Change of Credits



Note: C – Total Credits; CH – Household Credits; CN – Non-financial Entities Credits; CSB – Credits to Small Businessmen. Variables in nominal values.

Source: Calculations based upon the database of the National Bank of Slovakia <www.nbs.sk>.

Figure 2
Quarterly Rate of Change of Credit to Households and GDP in Slovakia



Note: CH – Credits to households on the left scale, the GDP on the right scale (log of variables in real values).

Source: Calculations based upon the database of the National Bank of Slovakia <www.nbs.sk>.

The new short-term credits to households were charged 15% up to 19%, the middle-term credits about 18% while for the long-term credits the interest rate was about 12.5%. In 1995 the growth of real GDP achieved 6.8% and in 1996 it was 6.9%. So there is a link between economic development and credit growth.

As Hofmann (2001) points out financial cycles and economic cycles are coincided. Economic prospects tend to increase consumption. Increased consumption requires companies to extend their working capacities hence increase the demand for workers and investments. All these factors stimulate the growth of credits. The first very steep peak in the credit growth is remarkable for 1996 as, the provision of the NBS introduced the rise of the minimum reserves rate (at 9%).

Another important change in the growth of credits to households was in 1997. That year, although the demand for household credits was rising, some of the households were credit constrained due to the fact that majority of bank credits were granted to the public sector for financing high way projects and other public activities,. In 1999 the growth of credits was achieved mainly due to the activities of the building savings banks and their credit services for households. And e. g. in 2002 households were motivated to increase their debts using the state support (4.5% in 2002) before it was reduced by two percentage points in July 2003. Further on, the credits to households grew up mainly due to the mortgage loans.

4. Variables and Model

The analysis is based on data derived from the database of the NBS and the Statistical Office of the Slovak Republic (SO SR). We apply quarterly data from 1995 Q1 to 2008 Q4. Following variables were used in modelling: credits to households in real terms (log); unemployment rate; average interest rate for credits to households; disposable income of households in real terms (log); earnings from property of households in real terms (log). Variables are expressed in real terms⁶ and in logs (apart from interest rate, unemployment rate). The ADF and PP tests were applied for testing the unit roots. Table 1 presents the results from the unit root tests.⁷

Variables are stationary in their first differences, they are integrated of order one. Accordingly they have to be modelled as I (1) (Hatrák, 2007; Husár, 1998). Series are integrated of the same order, the Johansen method was applied for testing the cointegration relationship.⁸

⁶ Variables were deflated with the consumer price index.

⁷ PP test has greater power for small samples.

⁸ Number of lags (4 lags) was set in the VAR.

Table 1
Tests on Unit Root

Variable	ADF		PP	
	Constant	Constant and trend	Constant	Constant and trend
<i>C</i>	–	**	–	–
ΔC	*	–	***	***
<i>U</i>	–	–	–	–
ΔU	–	*	***	***
<i>R</i>	–	–	–	–
ΔR	**	–	***	***
<i>I</i>	–	*	–	***
ΔI	*	**	***	***
<i>PE</i>	–	–	*	–
ΔPE	–	–	***	***

Note. * Significance at the 10% level. ** Significance at the 5%. *** Significance at the 1% – no stationary; C – credits to households in real terms (log); U – unemployment rate; R – average interest rate for credits to households (average interest rate for credits to households was adjusted for inflation); I – disposable income of households in real terms (log); PE – earnings from property of households in real terms (log).

Table 2
Cointegration Test Results

Cointegration test					
Eigenvalue	H0: rank	Trace	95% Critical value	Maximum eigenvalue	95% Critical value
0.651	= 0	93.9*	68.5	53.7*	33.5
0.266	≤ 1	40.2	47.2	15.8	27.1
0.237	≤ 2	24.5	29.7	13.8	20.9
0.169	≤ 3	10.7	15.4	9.5	14.1
0.023	≤ 4	1.2	3.8	1.2	3.8

Notes: * Denotes rejection of null hypothesis at 5% significance level; Critical values. See Osterwald-Lenum (1992).

Both the Trace test and the Max-eigenvalue test indicate the existence of one cointegrating equation at the 0.05 level. Owing to this the error correction model was estimated.⁹ A long-run relation was modelled using the following semi log-linear form:

$$C_t = \lambda + \mathbf{B} \cdot \mathbf{X}_t + u_t \quad (1)$$

where

C_t – credits to households in real terms;

λ – intercept;

\mathbf{B} – vector of the components consisting of the coefficients $\beta_1, \beta_2, \dots, \beta_4$;

\mathbf{X}_t – vector of explanatory variables $X_{1t}, X_{2t}, \dots, X_{4t}$ (unemployment rate, interest rate, income, earnings from property);

u_t – error term.

⁹ Empirical studies estimate the relationships among series mostly by ECM or VECM.

The error correction model was estimated¹⁰ in the following form:

$$\Delta C_t = \omega_0 + \omega_1 (C_{t-1} - \lambda - \mathbf{B} \cdot \mathbf{X}_{t-1}) + \omega_2 \Delta C_{t-1} + \omega_3 \Delta U + \varepsilon_t \quad (2)$$

where

- Δ – first difference operator;
- ω_0 – intercept;
- $C_{t-1} - \lambda - \mathbf{B} \cdot \mathbf{X}_{t-1}$ – the Error correction term;
- C_t – credit to households in log and real terms;
- R_t – real interest rate for credit to households;
- I_t – disposable income of households in log and real terms;
- U_t – unemployment rate;
- ε_t – error term.

Household credits are in the long-run positively impacted by disposable income of households (I) – elasticity 2.82. Higher income of households drives households into borrowing.

Table 3

Results from the ECM Estimation

Variable	Constant	ECT	U(-1)	R(-1)	I(-1)	PE(-1)	Constant	$\Delta C(-1)$	ΔU
Coefficient	ω_0	ω_1	β_1	β_2	β_3	β_4	λ	ω_2	ω_3
Coefficient value	0.030	-0.048	-0.041	-0.034	2.816	-0.586	-23.823	0.499	-0.012
t statistics	[4.10]	[-2.77]	[-4.8]	[-3.44]	[31.68]	[-4.71]		[4.65]	[-2.21]
Number of observations	54								
Adjusted R2	0.39								

Table 4

Results from Residual Tests

Breusch-Godfrey Serial Correlation LM Test	3.957	(0.411)
Heteroscedasticity Test: Breusch-Pagan-Godfrey	0.230	(0.874)
Normality test: JB	0.514	(0.773)

Note: P-values in brackets.

Nieto (2007) used total wealth as one of explanatory variables and found a positive influence on the household credits in Spain. Since we have used property earnings of households, one can expect a negative influence on credits to households (elasticity -0.59). The higher the earnings from holding properties, the lower the needs to finance the consumption (investment activities) from banking sources. Credit growth is negatively influenced by unemployment rate with semi elasticity -0.04 comparing to Spain observed by Nieto (2007), the

¹⁰ Estimation in EViews.

coefficient of unemployment rate was in the long-run -0.01 . There is a negative connection among credit to households and costs on credit to households (semi-elasticity of -0.034). A semi-elasticity of -5.08 was identified in Calza, Manrique and Sousa (2003), or -1.6 by Nieto (2007).

The coefficient of adjustment ω_1 of the error-correction term is -0.048 . The response of credits in restoring long-run equilibrium is not very fast. In Calza, Manrique and Sousa (2003) observing the loans to private sector in the EU, the coefficient of adjustment was -0.075 , and -0.27 in Nieto (2007). Inspecting the short-run relationship among series the growth of credits to households is in the Slovak Republic positively influenced by credits of the previous period with elasticity of 0.499 and negatively by unemployment rate with semi-elasticity of -0.012 . The elasticity of credit (four lags) 0.335 was e. g. in the short-run relationship identified by Calza, Manrique and Sousa (2003) in the euro area.

Verification of the parameter stability

This section presents outcomes from testing the stability of the model. It starts with computing the recursive residuals (Figure 3), followed by CUSUM of Squares Test (Figure 4); test on parameters estimated recursively (Figure 5) and Chow test (Table 5). Test on recursive residuals indicates some deviation from the interval therefore Chow test on possible structural breaks was performed in 2005 and 2006 respectively (see table 5 for results). The plots of the recursive coefficient estimates and the CUSUM of Squares test indicate the parameters are constant over the observed period of time.

Figure 3
Outcomes from the test on Recursive Residuals

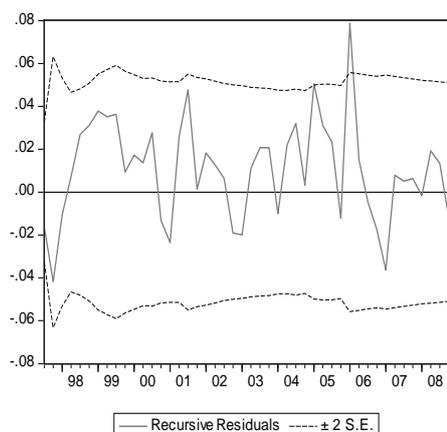


Figure 4
Results of CUSUM of Squares Test

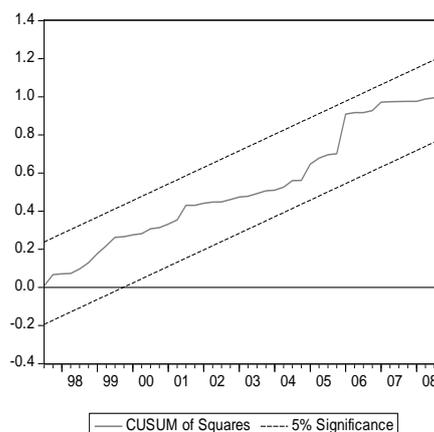


Figure 5
Plots of Parameters Estimated Recursively

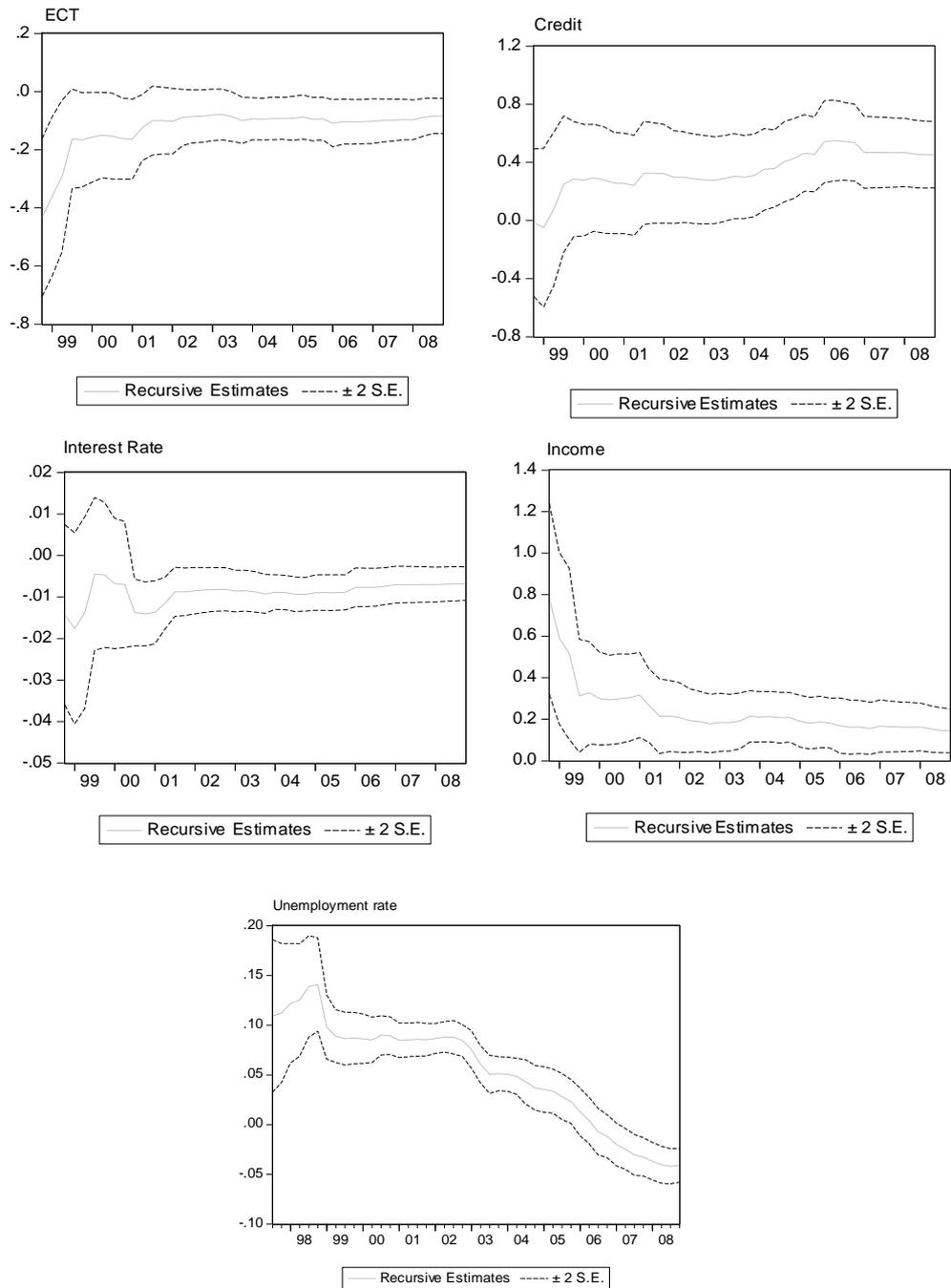


Table 5
Outcomes from the Chow Breakpoint Test

Break date	2005 Q4	2006 Q1
All regressors	4.280	4.119
	(0.369)	(0.390)

Note: P-values are in brackets.

There was however, only a temporary external impact on the determinants of the credit to households.

Conclusion

Monetary financial institutions finance the needs of economic subjects hence stimulate the growth of the economy. Therefore it is important to inspect the determinants of credit growth especially for households, for which banks are the main sources of necessary finances.

The results show that in the long-run household's debt is positively impacted by disposable income of households. Unemployment rate, interest rate and earnings from holding property negatively influence the credits to households in the long-run. In the short-run credits are positively determined by credits of the past period and negatively by unemployment rate. Empirical research on the credit issue regarding the households is of importance not only for experts from the banking industry (e. g. setting appropriate marketing tools, adjusting the interest rates on time etc.) and financial market, but for the clients as well. It is useful for all the parties involved having knowledge about the determinants of the credit to help them making a good decision being either lender or borrower.

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