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THE IMPACT OF THE CREDIT EXPANSION PROCESS ON SOCIAL WELFARE IN THE AREA OF CENTRAL AND SOUTH-EASTERN EUROPE

Empirical
study

Keywords

Credit expansion
Social welfare
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GDP per person employed

JEL Classification

C01, E32, E51, I31, O15, O57

Abstract

This study aims at performing an econometric analysis of the credit expansion process and social welfare from a comparative perspective, with a focus on eight developing and advanced economies from Central and South-Eastern Europe (including the case of Romania). The author aims to better understand the real impact of the credit expansion process on social welfare through the financial dimension. In order to achieve this aim, the research seeks to analyze the short-term dynamics (from one quarter to the other) of the relationships between the total volume of credits given to the non-banking private sector by the credit institutions (highlighting thus the credit expansion process) and the GDP per capita and GDP per person employed (proxies for social welfare). The usefulness of the present study becomes higher given the fact that nowadays the socio-economic development is often assisted by a stronger and more acute crisis.

1. Introduction

This study aims at performing an analysis of the credit expansion process and social welfare from a comparative perspective, with a focus on eight developing and advanced economies from the area of Central and South-Eastern Europe (including the case of Romania). In order to achieve this aim, the econometric part of this research seeks to analyse the short-term dynamics (from one quarter to the other) of the relationships between the total volume of credits given to the non-banking private sector by the credit institutions (highlighting thus the credit expansion process) and the GDP per capita and GDP per person employed (proxies for social welfare).

The rest of the paper is structured as follows: part 2 briefly captures the current state of the literature in the field, part 3 presents the dataset and methodology used in the study, part 4 presents the results of the empirical analysis and part 5 resumes the main findings and future directions.

2. A brief literature review

The author noticed that in the last decades, there was an increased interest in examining the empirical evidence of credit expansion. Gorton and He (2008) argued that at a macroeconomic level, the relative banking performance of commercial and industrial credits is an autonomous source of macroeconomic fluctuations. The research of Apostoiaie and Percic (2013) revealed that there is a strong dynamics of the relationships between credit expansion and economic growth in almost all the twenty analyzed EU economies.

The topic of access to credit (credit expansion process) and welfare has been studied in a number of dimensions. Some studies have sought to quantify the impact of credit expansion on welfare through its effects on consumption (Gertler, Levine, and Moretti, 2009), while others have studied the welfare impact of credit by college enrollment (Levine and

Rubinstein, 2013) or by family structure (Hacamo, 2014).

The study of the impact of credit expansion on welfare through the financial dimension divided the researchers in two groups. On the one hand, there are researchers suggesting that the access to credit produces significant benefits for borrowers across a wide range of economic and wellbeing outcomes (Karlan and Zinman, 2007) and, on the other hand, there are authors claiming that the access to credit is not necessarily welfare-improving (Chiu, Dong and Shao, 2012). Moreover, the quantitative analysis made by Breu (2013) showed that the increased access to convenience credit experienced in the United States since 1990 has not been beneficial in terms of welfare.

The present study intends to complement the current research niche by performing an econometric analysis of the impact of the credit expansion process on social welfare through the financial dimension, with a focus on eight developing and advanced economies from the area of Central, Eastern and South-Eastern Europe.

3. Data used and methodological approach

Data

In the present research we included sets of data with a quarterly frequency of the GDP per capita and GDP per person employed as describing variables of the social welfare and of the total volume of credits given to the non-banking private sector by the credit institutions for a total number of eight developing and advanced economies from the area of Central and South-Eastern Europe (seven countries from European Union and one close neighbor of EU). The primary sets of data have an annual frequency, but the author converted them to quarterly ones using the linear-match last method of conversion. The analysed countries were divided into two income groups/clusters according to the World Bank classification: four high

income countries [HIC] (Czech Republic (CZ), Poland (PL), Slovak Republic (SK), and Slovenia (SL)) and four European upper middle income countries [UMIC] (Bulgaria (BG), Hungary (HU), Macedonia FYR (MK) and Romania (RO)).

The sample period covers 1993 (first quarter) to 2012 (fourth quarter) or 1993Q1-2012Q4. The primary data sources are the World Bank data base. In some cases where data was not fully available for bank loans for the entire period, the remaining variables were proxies generated using specific approximation methods (Romania for 1993Q1-1995Q4 and Slovak Republic for 2009Q1-2012Q4).

Methodology and tests

The first step of the research was to test the normality of the data sets for each country. The Jarque-Bera test for normality applied on the proposed sets of data showed that they don't follow a normal distribution. In order to convert to a normal distribution the author extracted the natural logarithms from the raw data sets.

Secondly, the author has tested the stationarity of the data sets. This was done by using the Augmented Dickey-Fuller test. After analysing the obtained results, the author concluded that all the data sets are stationary at the 2nd difference level, excepting the total volume of credits given to the non-banking private sector by the credit institutions and the GDP per capita in Bulgaria which are stationary at the 1st difference level. In order to verify the results of the Augmented Dickey-Fuller test, the Phillips-Perron test was also used as an alternative method and similar results were found. The author decided to apply 2nd Difference Unit Root tests for converting the data sets to stationary ones. Afterwards the research paper examines if there is any kind of short-term correlation between the two variables: on the one hand the total volume of credits given to the non-banking private sector by the credit

institutions (CR) as the describing variable of the credit expansion process and, on the other hand, the GDP per capita (GDPC) and GDP per person employed (GDPE) as describing variables of the social welfare. To establish if there is short-term – unidirectional or bidirectional – causality between the two variables the author have used the Granger analysis of causality (see Apostoaie, Percic and Cocris, 2013 for details).

4. The analysis of the short-term correlation between credit expansion and social welfare

When analyzing the co-movement between credit expansion (upwards or downwards changes of the logarithmic values of the total volume of credit given to the non-banking private sector by the credit institutions) and the GDP per capita (dynamics of the logarithmic values of the GDP per capita seasonally adjusted) using simple correlation analysis (see Table 1 and Figure 1 from the Appendices), one can notice that this is very strong in countries like Czech Republic, Poland, Slovenia and Hungary, the values exceeding the threshold of 0.50, moderate in Romania (0.262) and very weak in some countries like Bulgaria or Macedonia, where the value didn't exceed the limit of 0.1. Moreover, in Slovak Republic there seems to be even a negative correlation between credit expansion and the GDP per capita, but taking into consideration that the values are very close to zero, the author concluded that there is no correlation.

Although, as one can see, the results are not uniform in any of the analysed income groups/clusters, overall there seems to be a higher interdependence between the two variables in the high income countries (HIC) and a moderate to low interdependence in upper middle income countries (UMIC).

For a deepen analysis of the short-term correlation between credit expansion and social welfare (the synchronization of this

two processes) the author decided to make use of a visual representation of the total volume of credit given to the non-banking private sector by the credit institutions and GDP per capita (see Figure 2 from the Appendices). As one can see, the results are in line with the previous findings. The visual representation revealed that there is a quite strong dynamics of the relationships between credit expansion and social welfare in Czech Republic, Poland, Slovenia and Hungary. This results point towards a co-movement between the two variables that is almost coordinated.

Analyzing the short-term correlation between credit expansion (upwards or downwards changes of the logarithmic values of the total volume of credit given to the non-banking private sector by the credit institutions) and the GDP per person employed [GDPE] (dynamics of the logarithmic values of the GDP per person employed seasonally adjusted) (see Table 1 and Figure 1 from the Appendices), one can see that this is very weak in all the analysed countries, where the value didn't exceed the limit of 0.1. Like previously, in some countries (Poland, Slovak Republic and Bulgaria) there seems to be even a negative correlation between credit expansion and the GDP per person employed. There seems to be no connection between the correlation values and the income groups/clusters of countries.

Although there is quite strong evidence of co-movement between the credit expansion and the GDP per capita in some of the analysed countries, this does not imply that one variable influences the other. Therefore, further analysis should be employed to establish the causality. The results of the Granger analysis of causality are centralized in Table 1 from the Appendices.

As one can see, just in two countries there is evidence of a short-term lead-lag relationship between the credit expansion and the GDP per capita. In Bulgaria and Romania the total volume of credit given

to the non-banking private sector by the credit institutions was the variable which influenced in a decisive manner the GDP per capita, in the sense that a growth in the volume of credits (credit expansion) was followed (with a delay of 4 to 6 quarters) by an increase in the GDP per capita (social welfare). In Czech Republic, Poland, Slovak Republic, Slovenia, Hungary and Macedonia FYR there is no apparent short-term causal relationship (a lead-lag type one) between the volume of credits and increase in the GDP per capita. Relations of unidirectional short-term Granger-type causality from the crediting activity towards the GDP per person employed were registered in Czech Republic, Bulgaria and Hungary (with a delay of 4 to 8 quarters).

5. Conclusions

The findings of this research revealed that there is a moderate dynamics of the relationships between credit expansion and social welfare through the financial dimension in the analyzed countries.

Analyzing the correlation between the credit expansion and the GDP per capita the author concluded that this is quite strong just in four from eight countries. Moreover, in the Slovak Republic there seems to be even a negative value. Although, the results are not uniform in any of the analyzed income groups/clusters, overall there seems to be a higher interdependence between the two variables in the high income countries (HIC). Analyzing the short-term correlation between credit and the GDP per person employed the results showed that this is very weak in all the analysed countries.

The results of the Granger analysis of causality revealed that in only two countries there is evidence of a short-term lead-lag relationship between the credit expansion and the GDP per capita and in three countries between the credit expansion and the GDP per person employed. The total volume of credit

given to the non-banking private sector by the credit institutions was the variable which influenced the social welfare through the financial dimension in the above mentioned countries, in the sense that a growth in the volume of credits (credit expansion) was followed (with a delay of 4 to 8 quarters) by an increase in the GDP per capita or GDP per person employed (social welfare).

The overall results place this research between those which claim that access to credit is welfare-improving and those which deny this, thus sketching the third group of researchers who suggest that credit expansion has a moderate impact on social welfare via the financial dimension. The author intend to improve his work by extending the panel of countries and making use of more descriptive variables of the social welfare like household income, income per capita, average salary, minimum salary, etc.

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References –

- [1] Apostoiaie, C.M., Percic, S. (2013). Credit Cycles and Business Cycles in Twenty EU Economies, *International Conference EMQFB2013 Proceedings*. Tîrgu-Mure , Romania.
- [2] Apostoiaie, C.M., Percic, S., Cocris, V., (2013). Analysis of the Credit and Business Cycles: Evidence from Twelve European Economies, *20th International Economic Conference – IECS 2013 "Post Crisis Economy: Challenges and Opportunities" Proceedings* (pp. 665-674) Sibiu, Romania.
- [3] Breu, M.R. (2013). The welfare effect of access to credit. *Economic Inquiry*, volume: 51, Issue: 1 (pp. 235-247).
- [4] Chiu, J., Dong, M. and Shao, E. (2012). On the Welfare Effects of Credit Arrangements. *Bank of Canada Working Paper 2012-43*.
- [5] Gertler, P., D. I. Levine, E. Moretti (2009). Do microfinance programs help families insure consumption against illness? *Health Economics* 18 (3), (pp. 257-273).
- [6] Gorton, G., He, P. (2008). Bank Credit Cycles, *Review of Economic Studies*, vol. 75(4), pp 1181-1214
- [7] Hacamo, I. (2014). Finance and Welfare: The Effect of Access to Credit on Family Structure. *Job Market Paper*.
- [8] Karlan, D., Zinman, J. (2007). Expanding Credit Access: Using Randomized Supply Decisions to Estimate the Impacts. *Center Discussion Paper no. 956*. Economic Growth Center: Yale University.
- [9] Levine, R., Y. Rubinstein (2013). Liberty for more: Finance and educational opportunities. *Working Paper 19380*, National Bureau of Economic Research.

Appendices

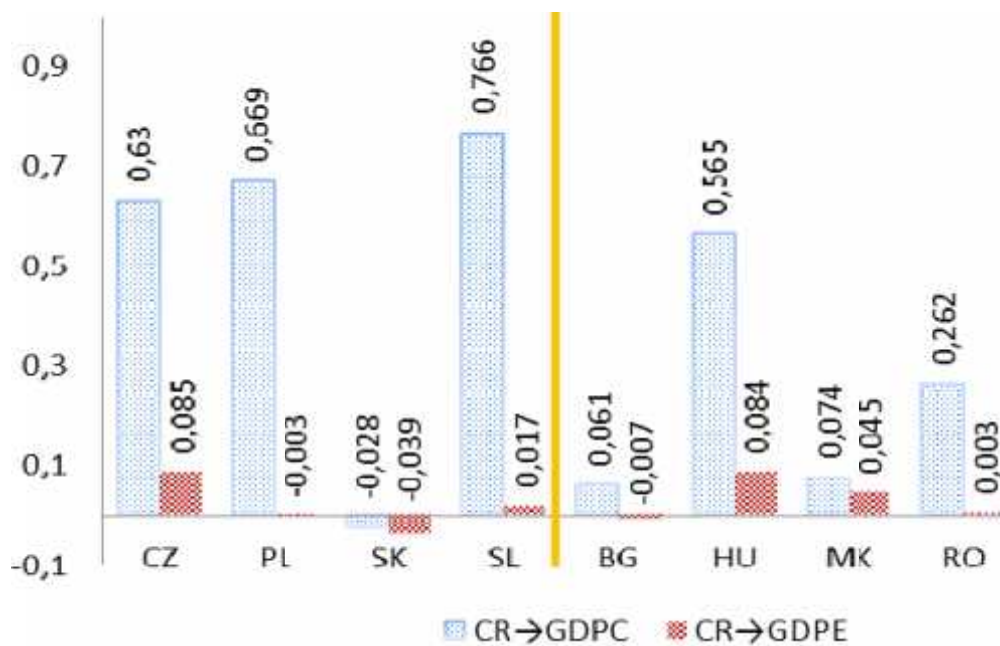
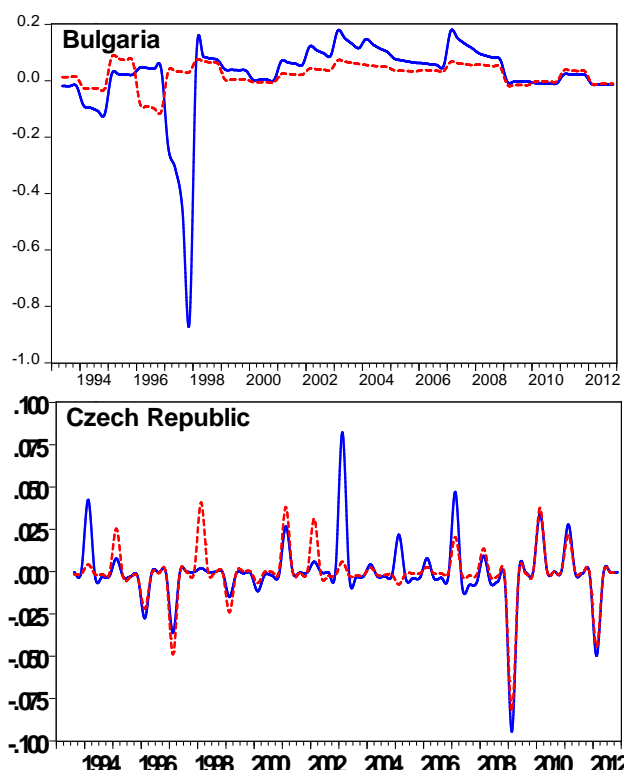
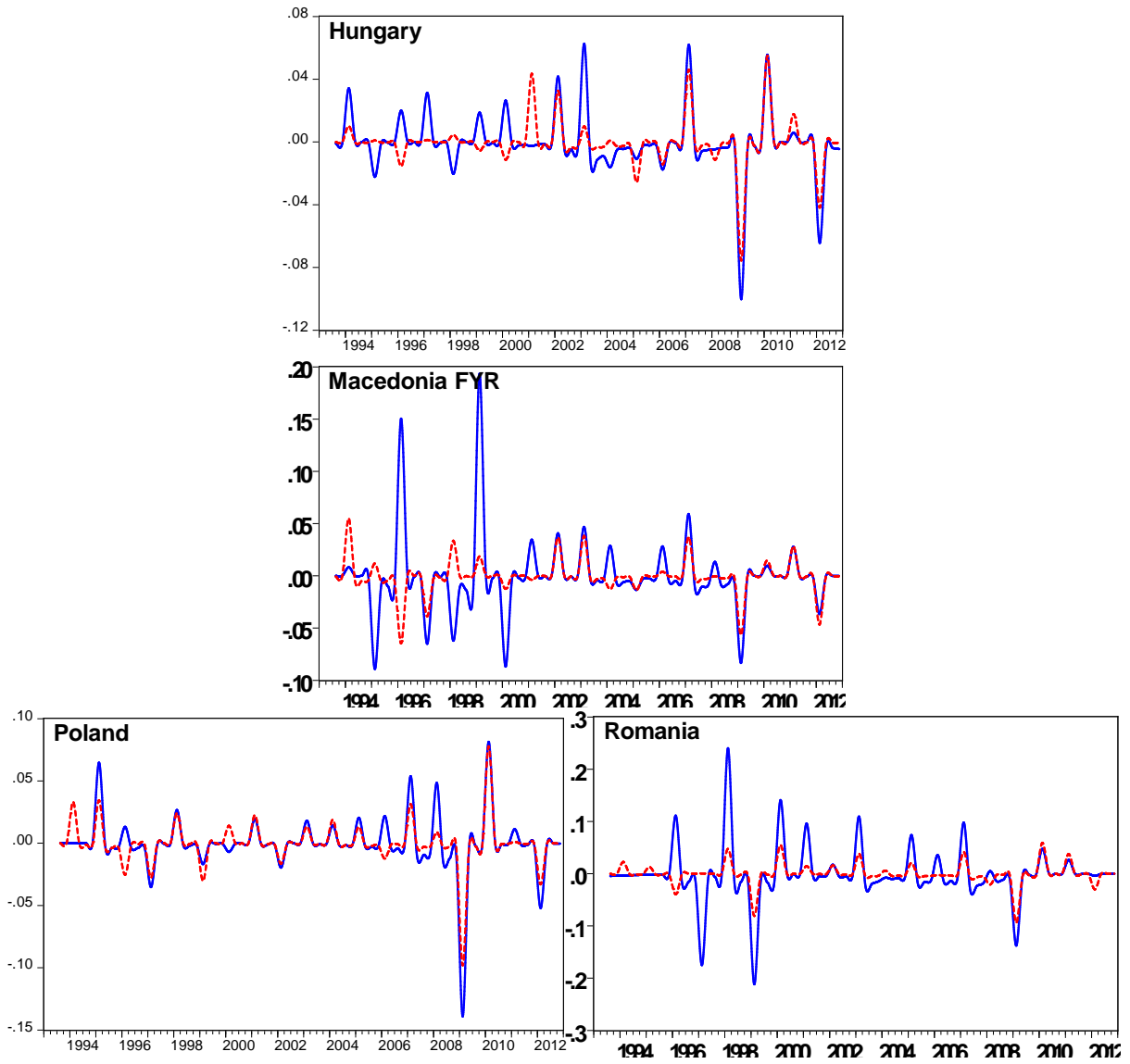


Figure No.1 Short-term correlation between the credit expansion and the GDP per capita / GDP per person employed in 1993Q1-2012Q4. Source: Author's calculations





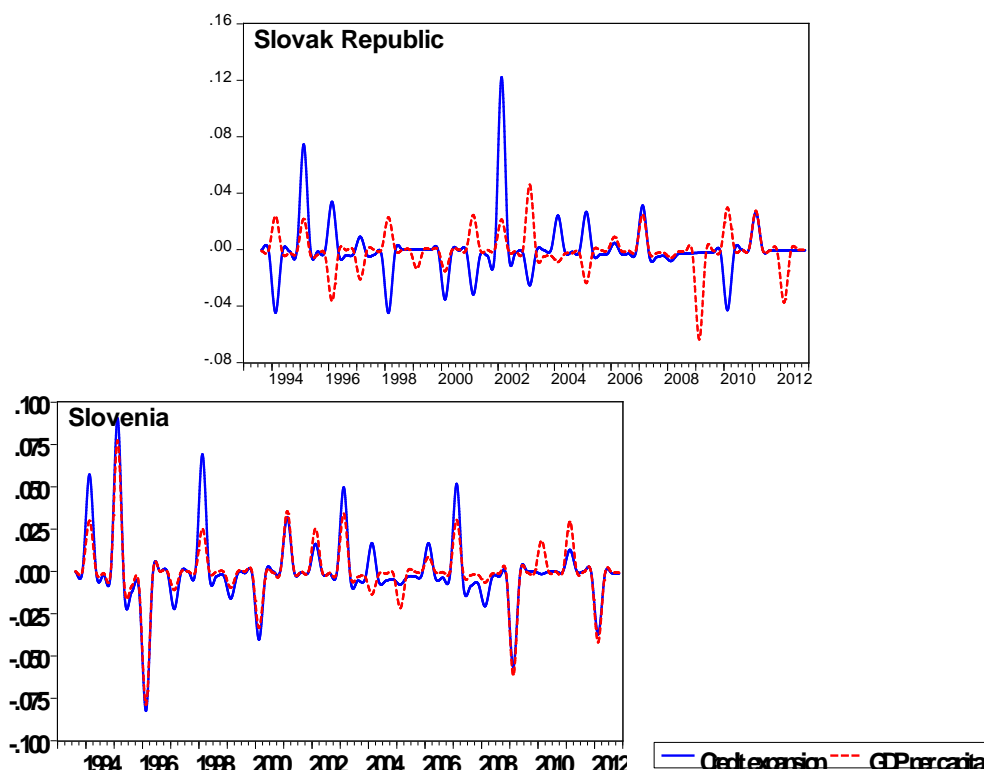


Figure No.2 Dynamics of the credit expansion and GDP per person in eight European economies during the period 1993Q1-2012Q4. Source: Author's calculations

Table No.1.

Short-term correlations Granger-type causality between the credit expansion and the GDP per capita / GDP per person employed in 1993Q1-2012Q4

High income countries (HIC)					Upper middle income countries (UMIC)				
Country Code	Corr. value	Type	VAR order	F-Stat.	Country Code	Corr. value	Type	VAR order	F-Stat.
CZ	0.630	CR⇔GDPC	1	-	BG	0.061	CR⇔GDPC	6	2.03*
	0.085	CR⇔GDPE	4	2.26*		-0.007	CR⇔GDPE	4	3.06**
PL	0.669	CR⇔GDPC	4	-	HU	0.565	CR⇔GDPC	1	-
	-0.003	CR⇔GDPE	1	-		0.084	CR⇔GDPE	8	3.25***
SK	-0.028	CR⇔GDPC	1	-	MK	0.074	CR⇔GDPC	4	-
	-0.039	CR⇔GDPE	1	-		0.045	CR⇔GDPE	1	-
SL	0.766	CR⇔GDPC	1	-	RO	0.262	CR⇔GDPC	4	2.93**
	0.017	CR⇔GDPE	1	-		0.003	CR⇔GDPE	4	-

Note: *, ** and *** denote the significance at the levels 10%, 5% or 1%; The VAR order has been selected by using the informational criteria AIC (Akaike), SC (Schwarz) and HQ (Hannan-Quinn), the Akaike criterion having priority.

Source: Author's calculations