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**The effect of enterprise and household credit on economic growth and real exchange rate dynamics: Evidence from SEE countries<sup>1</sup>**

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**Abstract**

In this paper, we empirically assess the effects of the decomposed private sector credit on the economic growth and real effective exchange rate (REER) dynamics, for eight SEE countries. We construct dataset for Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Romania, Serbia and Turkey, for the period 1995-2014 with quarterly frequency by decomposing bank credit into households and enterprises so that we can assess their effects on both, the economic growth and REER. The empirical findings are based on panel data models. We find that enterprise credits are positively related with economic growth, whereas for the household credits the result is ambiguous. Regarding the impact of the decomposed credit on the REER, used as a measure of the price competitiveness of the specific countries, our findings suggest that both household and enterprise credits contribute to appreciation of the REER. However, unlike the theory, our findings did not show significant difference on the magnitude of the different credits on the appreciation.

**JEL Classification:** E44, E51

**Keywords:** household credit growth, enterprise credit growth, economic growth, REER, South-East Europe

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## 1. INTRODUCTION

In the last decade the interest on the impact of total private sector credit on different macroeconomic variables has increased. More concretely, in the academic literature has been evident an increase of the number of papers that focus their research on the impact of the private sector credit on the economic growth. Moreover, with the latest macroeconomic developments and the global financial crisis the need for analyzing the decomposed impact of the credit growth (household and enterprise credit) is increasing too. But, while the interest on the impact of decomposed credit on the economic activity has been pronounced, the research on the impact of decomposed private sector credit on the real effective exchange rate (REER) to some extent has been more limited.

Within the vast pool of research papers focused on the impact of the decomposed private sector credit on the economic growth, the majority of them are generally focused on studying this relationship in developing and developed countries while coming to conclusions that understanding the transmission channels of the credit to households and enterprises to economic growth is important and can give answers to the “credit growth nexus” puzzle (Sassi and Gasmi 2014, p.226). Beck et al. (2012) found that the credit to enterprises has positive impact on the growth, whereas lending to the households is insignificant. Regarding the impact of the decomposed private sector credit on the REER, the existing empirical evidence is scarce with the focus set on the impact of the overall credit expansion on the REER and no clear insight as to what are the drivers of the exchange rate dynamics. Still, it is expected that the credit granted to households is mostly used to increase the consumption, whereas credit granted to enterprises is mostly used for investments- thus leading to an increase in productivity (Badahir and Gumus, 2013).

Knowing the causal relationship between decomposed private sector credit and economic growth, as well as the relationship between decomposed private sector credit and REER is of high importance to the policy makers. We derive the main motivation for this research from that importance as well as the lack of research focused on the impact of decomposed credit on growth and REER in the ever-changing financial sector in transition economies. This way, the paper aims to empirically assess the effects of enterprise credit market and household credit market to economic growth and real effective exchange rate dynamics. We create a database over the period 1995-2014 using quarterly data, for a sample

of 8 transition countries (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Romania, Serbia and Turkey). The empirical analysis is based on panel data models. The estimates suggest that both household and enterprise credits are positively related with economic growth; and both household and enterprise credits contribute towards appreciation of the REER.

This paper is organized as follows: section 2 gives overview on the most prominent literature both for decomposed private sector credit impact on growth and REER, respectively; section 3 gives brief overview on the private sector credit activities in the sample of 8 SEE countries; section 4 describes methodology and data; section 5 discusses the empirical findings; and finally section 6 concludes.

## **2. LITERATURE REVIEW**

There is a vast and extensive literature analyzing the relationship between financial development and economic growth. According to most empirical estimations that generally use aggregate measure of credit allocated to the private sector (Beck, Levine and Loayza, 2000; Demirguc-Kunt and Maksimovic, 1998; Rajan and Zingales, 1998), the financial development together with a more efficient banking system have a positive macroeconomic impact (Levine, 1997, 2005; Wachtel, 2001). Levine (2005) suggests that financial institutions and markets can accelerate economic growth by influencing saving and investment decisions of the macroeconomic agents. On the other hand, a smaller part of the economists consider that financial intermediation is only a minor factor contributing towards economic expansion (Robinson, 1952; Lucas, 1988). But, while the focus of much of this literature has been the impact of the overall credit market development on the economic growth, there are considerably fewer studies investigating the distinctive macroeconomic impacts of the disaggregated credit market by sectors, i.e. the separate effect of the household and enterprise credit market development on the economic growth. In theory, there is a clear distinction between the roles of the household and enterprise credit on the economy with most of the theoretical and empirical literature focused on the enterprises and on their need for bank financing for their investment and production purposes (Levin, 2005). Using data on 71 countries over the period 1960-1995, Aghion et al. (2005a) proved empirically that enterprise

credit market development determines the convergence of economies to the world technology frontier. In the same way, Aghion et al. (2010), using panel data from 21 OECD countries, demonstrated that enterprise credit can lead to higher growth. But, while many theoretical and empirical studies have emphasized the positive effect of enterprise credit development on economic growth, very few analysis have been focused on the relationship between household credit development and economic growth. Additionally, the constructed models have pointed out to different results among themselves. Jappelli and Pagano (1994) show that the household credit market development (proxied by loan-to-value ratio for mortgages) is negatively correlated to GDP per capita growth. Namely, using a sample of 25 middle and high income countries, they conclude that promoting household credit development would lower the savings rate and consequently negatively effecting the economic growth. On the other hand, Galor and Zaira (1993) and De Gregorio (1996), using data for 20 OECD countries, argue that credit to households can enhance economic growth but only if it is invested in human capital and/or microenterprises. Analyzing the possibility of distinctive impacts of household and enterprise credit on GDP per capita growth, Beck et al. find evidence that enterprise credit raises economic activity while household credit has no effect. The analysis is done on a broad sample of 45 developed and developing countries over the period 1994-2005 using cross-country regressions and difference-in-difference estimator.

When it comes to analyzing the existing literature on the effect of the private credit growth on the REER, the situation is similar to the before mentioned aforementioned case of the impact of the credit growth on the overall economic activity. Namely, derived from the Balassa-Samuelson theory, the banking lending might contribute to the increase of the wages, which on the other hand puts overall upward pressure on the prices and thus causing the REER to appreciate. The bulk of the undertaken research is focused on the effect of the overall credit expansions on the REER without differentiating between lending to households versus lending to businesses. Following this method, Tornell and Westermann (2002, 2003) find that many middle income countries after liberalizing their financial markets experienced some kind of lending boom which was accompanied by real appreciation of their exchange rate. Mendoza and Terrones (2008, 2012), using data for 48 industrial and emerging economies over the 1960-2006 period, find that credit booms are associated with periods of real appreciation of the exchange rate in the build-up phase of the booms, while the opposite holds true in the downswing. Given how household and enterprise credit may impact differently the dynamic of

the REER through various channels (household credit growth has the potential to cause an increase in consumption, output and prices whereas business credit may lead to an increase in investment and labor demand, and thereby increase output), a sectorial differentiation of the credit expansion is of utmost importance. To the best of our knowledge, there is only one existing paper that provides evidence that the effect of the credit growth on the REER depends greatly on the sectorial allocation of the private credit. In this paper, by using a two-sector real business cycle model of a small open economy, Bahadir and Gumus (2013) find that real exchange appreciations during credit expansions largely result from increases in household credit, whereas the correlation of the business credit to the REER appreciation is still positive but much weaker. However, the intuition is that credits to both sectors have upward pressures on the REER- just the expected intensity is different, i.e. the expectation is that household sector credit growth has higher correlation to the appreciation of the REER because of its primary impact on the consumption that might initially increase domestic prices rather than output, relative to the enterprise credit growth.

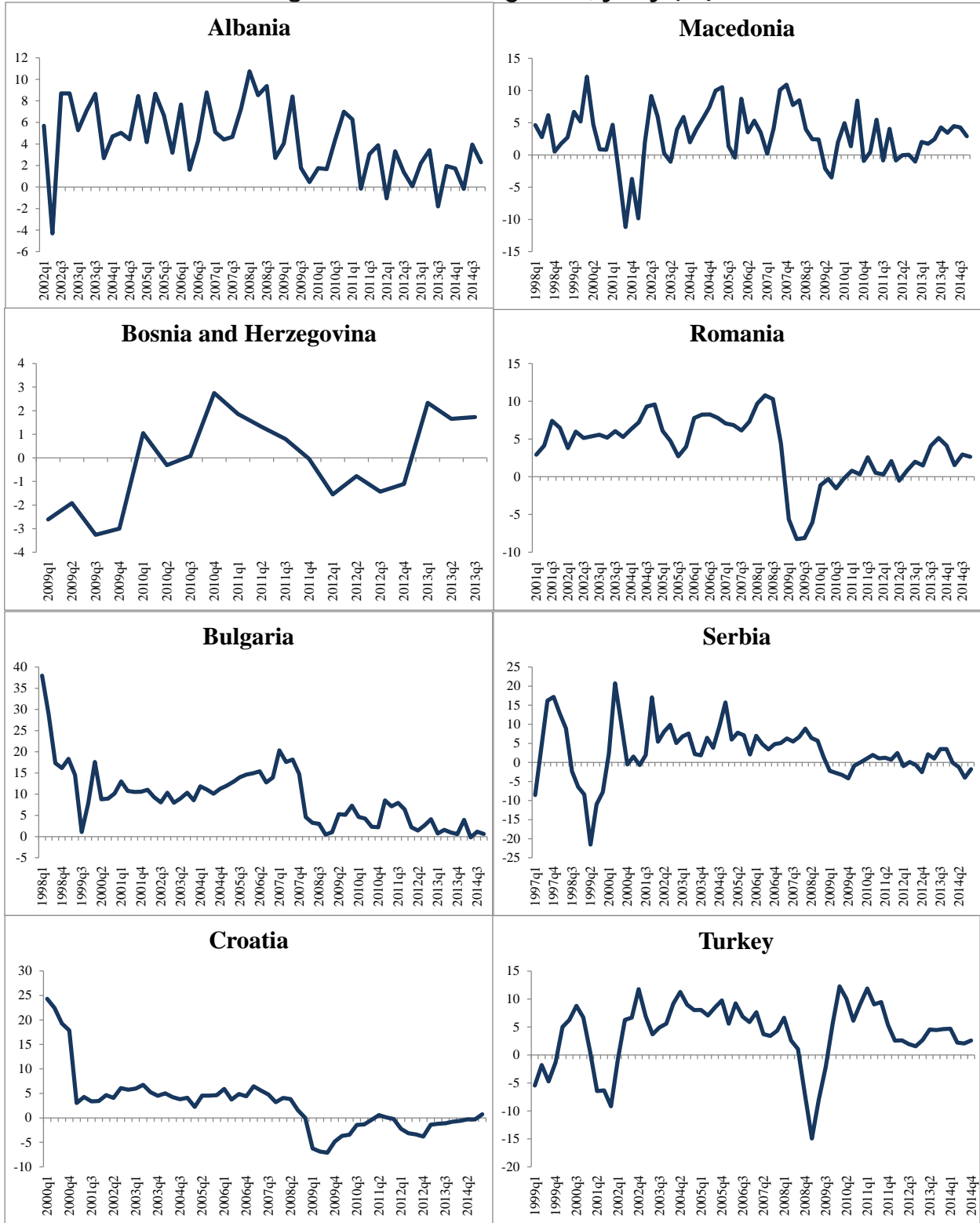
Summarizing the existing literature on the impact of the credit growth disaggregated by sector on the overall economic activity on one hand and the effect on the REER on the other hand, most of the results point out to an expected positive impact of the enterprise credit on economic growth while the effect of the household credit is ambiguous. Regarding the REER, the expansion in both types of credit seem to contribute to the appreciation of the real exchange rate but with different intensity.

### **3. OVERVIEW OF ECONOMIC GROWTH, REER AND PRIVATE SECTOR CREDIT ACTIVITY IN SEE**

Analyzing the overall economic activity of the countries in focus of this research, we can distinguish between two phases at which their economy has been functioning: the first period prior to the global financial crisis (the “boom” period) characterized by high and accelerating growth, and the second period (during and after the global financial crisis) that is primarily characterized by a sharp decline in the economic activity, to be followed by a more moderate positive growth. Looking more closely to the first period and the factors that supported such developments, we can conclude that the accelerated growth was driven by domestic as well as

external factors. Namely, at that time, a higher domestic consumption and rising capital inflow contributed to higher growth of their gross domestic product. Additionally, having in mind the positive relationship between the financial system and the GDP, the rapid growth of the private credit in this period, is thought to have provided positive contribution to the overall performance of the economy in these countries. On the other hand, during the second period of subdued economic growth, due to the accumulation of external vulnerabilities (of varying degrees), the analyzed economies were faced with sharp reversal of the economic trends with both foreign trade and domestic demand channels in work. Still, despite the significant fall in their exports and lower capital inflows, their banking sector generally remained stable.

Figure 1 – Real GDP growth, y-o-y (%)



Source: Authors calculation based on data from the Central Banks.

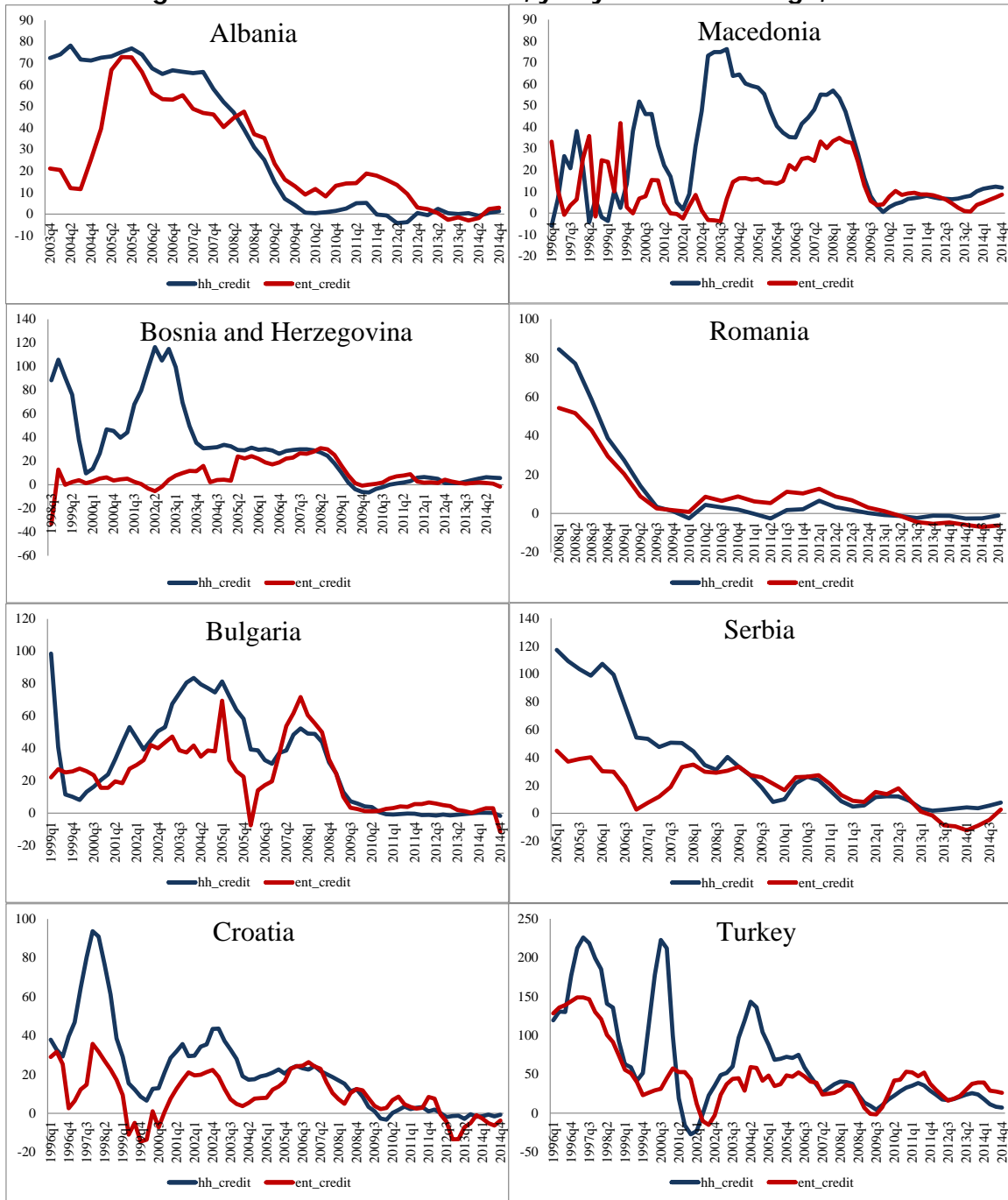
Analyzing the private credit development in these countries, we can spot a rather long list of similarities among the individual characteristics of their financial sectors. Bank credits are main drivers of the overall credit activity, due to the fact that other financial instruments like bonds and stocks are underdeveloped. Having in mind the aim of this paper, Figure 2 presents development of the desegregated private sector credit (as a year percentage change from 1995 to 2014<sup>3</sup>) in the analyzed countries. A couple of observations can be drawn for all the countries. At the beginning of the time series, the level of the credit allocated to the enterprises is higher than the level of household credits for each of the countries analyzed. Moreover, the annual growth of the enterprise credit (the absolute change) in this period and up until the beginning of the global financial crisis is higher than the annual total change of the household credit in most of the analyzed countries (Albania, Macedonia, Bulgaria, Serbia, and Turkey). Then, with the start of the financial crisis and in line with the GDP's downward movement, we see a sharp deceleration of the enterprise credit growth as well as a slowdown of the household credit growth. Still, the drop in the enterprise credit is more significant compared to the households sector and it even crosses onto the negative growth rates' territory. In such conditions, in the aftermath of the crisis we can make the interesting observation where credit granted to households outweighs the credit granted to enterprises in some of the analyzed countries (Bosnia and Herzegovina, Croatia, Macedonia, Romania, Serbia). This development most likely can be linked to the slow pace of economic growth and banks' perceptions for better credit risk management and diversification. Namely, by approving smaller amounts of loans to households, there is smaller probability for loans to become non-performing; unlike granting loans to firms which most of them have experienced liquidity issues during the crisis.

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<sup>3</sup> Different time series length, depending on data availability.



Figure 2 - Private sector credit, y-o-y nominal change, in%

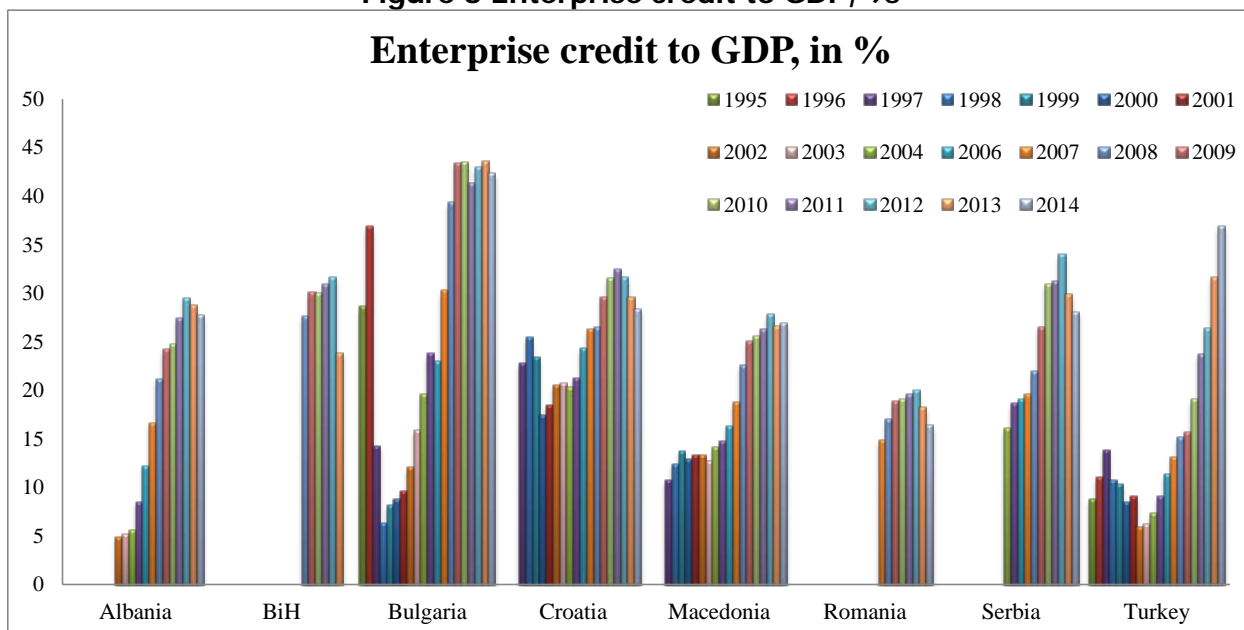


Source: Authors' calculations based on data from Central banks websites.

Figures 3 and 4 present the changes of enterprise credit-to-GDP and household credit-to-GDP ratio, respectively. Several observations can be made based on the graphs. In most of the countries both credit levels started very low (except for the enterprise credit for Croatia and Bulgaria). Then, until early 2000s the credit growth was moderate for most of the countries,

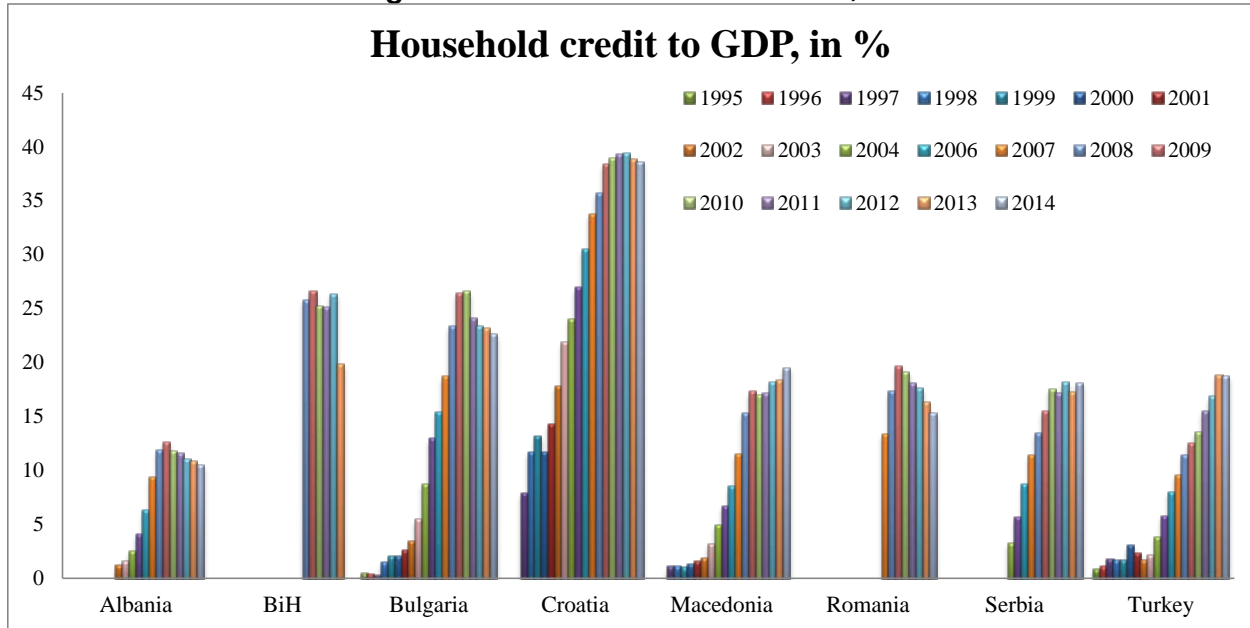
and started growing more rapidly during the boom period until early to mid-2008. The credit faced the phase of stagnation as a result of the crisis, but the growth started to recuperate slowly. As can be seen by figures 3 and 4, most of the countries recorded lower levels of enterprise and household credit to GDP compared to the level prior the crisis. Turkey is the only exception within these figures and can be noted that especially enterprise credit swiftly rises during the crisis. The highest average credits to GDP ratios have Bulgaria and Croatia, for enterprise and household sector credit, respectively.

**Figure 3 Enterprise credit to GDP, %**



Source: Authors' calculations based on data from Central banks websites.

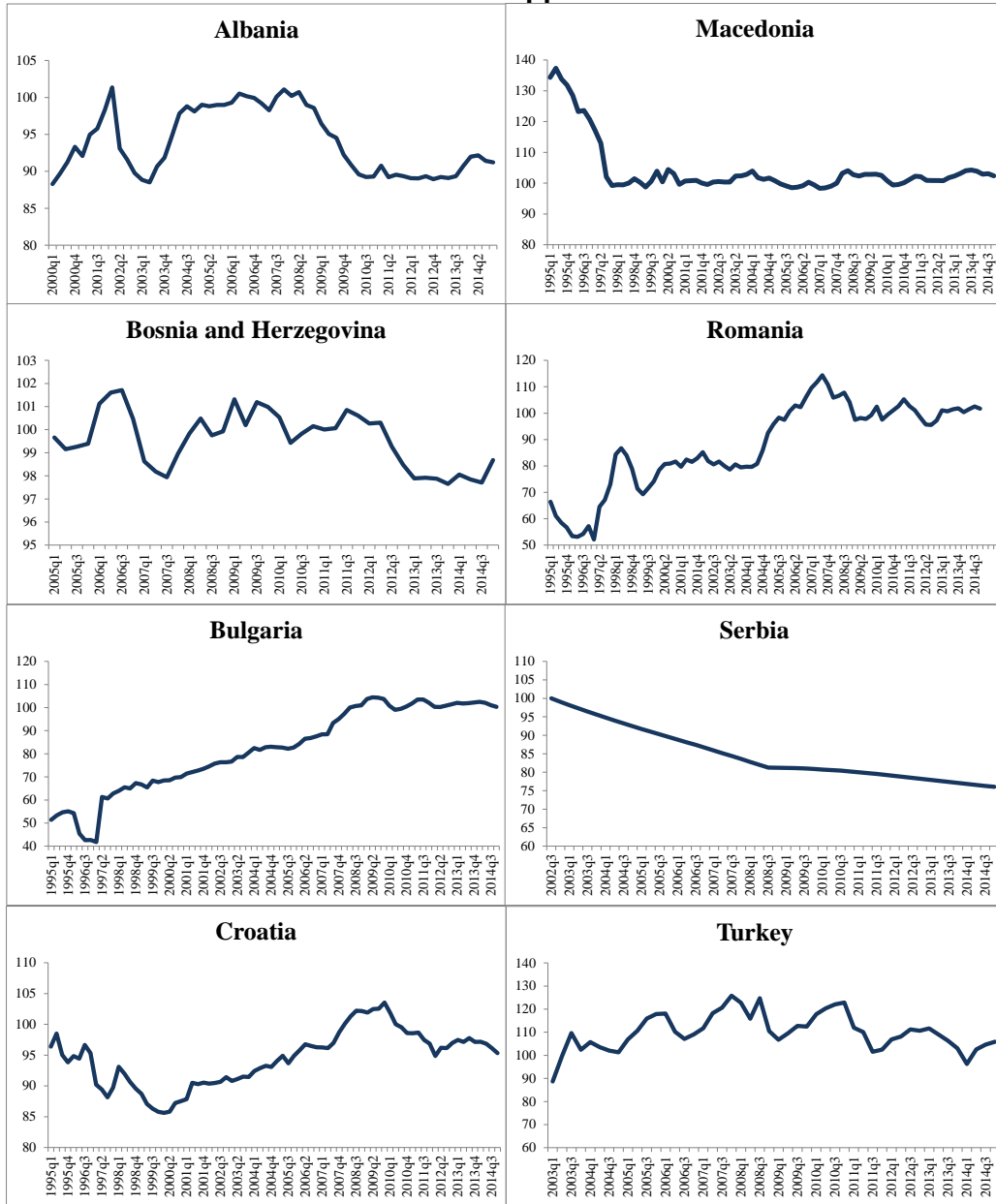
**Figure 4 Household credit to GDP, %**



Source: Data from Central banks websites.

Regarding the real exchange rate dynamics of the analyzed countries, as it is noticeable from the Figure 5, the movements of the REER (CPI based) in the period of positive economic growth are divergent mainly depending on the exchange rate regime that is adopted adequate for the economic conditions in the respective country. Within the overall pattern, there seems to be an even distribution between countries that have depreciating and countries that have appreciating currencies over the period of interest.

**Figure 5– CPI based Real Effective Exchange Rate (index 2005=100) upward movement= appreciation**



Source: Data from Central banks websites.

Seeing as the overall movements of the disaggregated credit growth in the analyzed countries are generally in line with the economic activity in the period under observation, it is only natural to wonder about the degree of this synchronization. Is the enterprise credit fueling the economic growth and countries' competitiveness considered by REER or are the economic

activity and REER more correlated with the household lending? We will try to answer these questions in the next sections.

#### **4. DATA AND METHODOLOGY**

Investigating what factors determine the economic growth and REER requires complex procedure and inclusion of many variables. This paper considers two main regressions in order to investigate the effect of the variables on the economic growth and REER. In the equations (1) and (2) below, the most used variables are taken as suggested by the theory in order to keep parsimoniousness of the model, having in mind that we deal with limited panel data set. For model construction and selecting variables, we follow the study by Sassi and Gasmi (2014) and Bahadir and Gumus (2013) for the economic growth and REER, respectively. However, our estimation methodologies are constrained to the specification of the data set; hence we do not fully follow the methodologies in the two referent papers.

##### **4.1. METHODOLOGY**

Using different panel model estimation techniques and two main model specifications, we attempt to empirically assess the effect of household sector credit and enterprise sector credit on the economic growth and REER for a sample of comparable countries with similar banking sector features (with exception of Turkey in some aspects). Working with fairly small dataset ( $N < 10$   $T < 20$ ) we were limited on the choice of estimation technique. To get the best out of the data we first estimated panel fixed effects (FE) model where we have evidence of serial correlation in the residual and endogeneity problem. Following the empirical evidence, we further proceeded with the dynamic specification of the model and we estimated system GMM. Due to the data limitation, the diagnostics of the model are limiting its prediction power, however obtaining the similar size and sign of the variables from both estimations is important. Finally we estimate alternative dynamic panel specification with AR (1) residual to include the dynamics in to the static model. The AR (1) process assumes that the disturbance in the error term might lead to more efficient parameter estimates.

#### 4.1.1. The effect of decomposed private sector credit on economic growth

To estimate the effect of decomposed private sector credit on the economic growth we run cross country growth regression that takes the following form:

$$gdppc_{it} = \beta_0 + \beta_1 init\_inc\_pc_{it} + \beta_2 hh\_gdp_{it} + \beta_3 ent\_gdp_{it} + \beta_4 gc\_gdp_{it} + \beta_5 cpi_{it} + \beta_6 t\_open_{it} + \varepsilon_{it} \quad (1)$$

Where:

- $gdppc_{it}$  is the GDP per capita expressed as logarithm
- $init\_inc\_pc_{it}$  is logarithm of GDP per capita – in our case the first year of the available data for each country
- $hh\_gdp_{it}$  is the credit to the household sector credit as a share of GDP, expressed as logarithm
- $ent\_gdp_{it}$  is the enterprise sector credit as a share of GDP, expressed as logarithm
- $gc\_gdp_{it}$  is the government consumption as a share of GDP, expressed as logarithm
- $cpi_{it}$  stands for the annual consumer price index, expressed as logarithm and
- $t\_open_{it}$  is the rate of trade openness measured as the sum of exports and imports as a share of GDP, expressed as logarithm

The coefficient of interest of the first question in this study are  $\beta_2$  and  $\beta_3$ , the enterprise sector credit and household sector credit, and their impact on the dependent variable - the economic growth. The enterprises use credit for investment purposes in order to increase their productivity, enhance the competitiveness and achieve higher profit. Thus, the expected effect of the enterprise credit is positive on the economic growth. The household credit has unclear effect on the growth, i.e. the household credit affects the economic growth positively when used for housing or human capital purposes that induce positive multiplicative effect on the overall economic activity. In contrast, the household credit effect is negative when consumption purpose of the household credit prevails that it could worsen the trade balance or increase the price level. Additionally, other variables are included to control for other factors that affect the growth. Therefore, the initial income is included with an aim to encompass the growth

convergence effect as suggested by the neoclassical economic growth theory. This concept relies on the presumption that each country converges to its equilibrium growth level i.e. the countries with lower initial income experience higher growth relative to countries with high initial income level and thus the sign should be negative. As additional control variable we include trade openness. The theory suggests that trade openness is related to higher degree of trade liberalization and exhibits positive impact on the economic growth by enabling faster and easier exchange of goods and services and especially in a case when export rises. However, if the higher trade openness is related to higher import due to lower competitiveness of the domestic firms, then the trade openness has negative impact on the growth. The government consumption is included in order to capture the government spending on infrastructure and investment that tends to positively affect the growth, i.e. the expected sign is positive. However, the sign of this variable could be negative in a case of inefficient use of government funds that reduces GDP growth. Economic literature is in favor of the negative impact of the inflation on the growth, especially in the long run.

#### 4.1.2. The effect of decomposed private sector credit on real exchange equilibrium dynamics

To estimate the effect of decomposed private sector credit on the REER we run cross country regression that takes the following form:

$$reer_{it} = \beta_0 + \beta_1 productivity_{it} + \beta_2 hh\_gdp_{it} + \beta_3 ent\_gdp_{it} + \beta_4 hc\_gdp_{it} + \beta_5 cf\_gdp_{it} + \beta_6 t\_open_{it} + \varepsilon_{it} \quad (2)$$

Where:

- $reer_{it}$  is the real effective exchange rate
- $GDP\ per\ capita_{it}$  as logarithm, as a proxy for productivity<sup>4</sup>
- $hh\_gdp_{it}$  is the credit to the household sector credit as a share of GDP, expressed as logarithm
- $ent\_gdp_{it}$  is the enterprise sector credit as a share of GDP, expressed as logarithm

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<sup>4</sup> In the latter stages authors have attempted to include the productivity (GDP per employees) variable, however such change has not improved the paper, so it was decided for the initial version to be kept.

- $hc\_gdp_{it}$  is the household consumption as a share of GDP, expressed as logarithm
- $cf\_gdp_{it}$  is the gross fixed capital formation standing for the investment as a share of GDP, expressed as logarithm and
- $t\_open_{it}$  is the rate of trade openness measured as the sum of exports and imports as a share of GDP, expressed as logarithm

Similarly as in the first sub-question, in the second sub-question of the study as well the coefficient of interest are  $\beta_2$  and  $\beta_3$ , the enterprise sector credit and household sector credit, but in this case their impact on the dependent variable – Real effective exchange rate. According to literature, the effect of the enterprise credit on REER might be appreciation or depreciation depending on the following: (1) which sector (tradable or non-tradable) in the economy is more in debt, (2) the labor cost spillovers between them and (3) whether that spillover effect causes the overall price level to increase. Namely, as the Balassa-Samuelson theory suggests, the enterprise credit increases the productive capacity of the firms in the tradable sector and that triggers rise of wages in the mentioned sector. Moreover, the wages in the firms of the non-tradable sector rise as well in order to discourage their labor force from leaving and thus the overall price level increases. If this is the case, then the mentioned variable affects the REER to appreciate. In contrast, if the higher indebtedness causes higher productivity with less costs and the price level not to increase, then the effect is depreciation of the REER. The household credit is expected to have appreciating pressure on the REER, i.e. the credit granted to the household sector is expected to have positive influence due to the fact that this credit is aimed at smoothening the consumption in the economy hence puts more pressure on the prices level and consequently the REER appreciates, but if household credit is more used for housing or enhancement of the human capital than it might depreciate the REER. Additionally, other variables are included to control for other factors that affect REER. Namely, GDP per capita is included in the regression as a proxy variable to capture productivity. The Balassa-Samuelson concept is worth mentioning here again and indicates that the higher productivity growth in the tradable sector is expected to pull the wages in both the tradable and the non-tradable sector which eventually results in higher domestic inflation and appreciation of the REER. Similarly, the capital formation variable may have positive or negative effect on the REER through the productivity level and labor cost spillovers between the tradable and the non-tradable sector in the domestic economy. The trade openness affects the REER as well and



usually the effect is ambiguous. A rise in trade openness is expected to depreciate the REER in a case when the trade openness triggers worsening of the trade balance. In contrast, if the trade openness is related to higher export, then REER will appreciate. The expected sign of the household consumption is not straightforward as well, again mostly depending on its effect on the tradable and non-tradable sector. Namely, if this variable affects positively the non-tradable sector, then it is expected the REER to appreciate through the price channel unlike the case when the mentioned variable affects more the tradable sector and consequently the REER depreciates. However, in this study we will not attempt to distinguish between tradable and non-tradable sector, but according to the obtained sign we might consciously draw some conclusion about the transmission channels.

## **4.2. DATA**

For the purpose of the analysis of the effect of household and enterprise credit growth over economic growth and REER, we created database on quarterly data from 1995-2014, subject of data availability (the panel is unbalanced). Our dataset is consisted of 8<sup>5</sup> countries from SEE region, with data obtained mainly from the central banks of the respective countries, the International Financial Statistics (IFS) website and the World Bank WDI data base. Tables 1 and 2, give detailed variable construction, source and descriptive statistics, respectively.

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<sup>5</sup> Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Romania, Serbia, Turkey.

**Table 1 – Variables and data sources**

<b>Variable name</b>	<b>Variable description</b>	<b>Data source</b>
<b>reer</b>	CPI based real effective exchange rate (increase in the index suggest appreciation). Expressed as logarithm.	National banks' websites.
<b>gdppc</b>	Real GDP of the country divided by the population. Expressed as logarithm.	National banks' websites for GDP, IFS for population
<b>hh_gdp</b>	Total claims of deposit money banks on households as a share to GDP. Expressed as logarithm.	National banks' websites.
<b>ent_gdp</b>	Total claims of deposit money banks on enterprises as a share to GDP. Expressed as logarithm.	National banks' websites.
<b>capform_gdp</b>	Gross fixed capital formation as a share of GDP. Expressed as logarithm.	National banks' websites.
<b>govcons_gdp</b>	Total government consumption as a share of GDP. Expressed as logarithm.	National banks' websites.
<b>hhcons_gdp</b>	Total household consumption as a share of GDP. Expressed as logarithm.	National banks' websites.
<b>init_inc_pc</b>	Initial income per capita is the log real GDP per capita in the first year of the data availability for each country. Expressed as logarithm.	National banks' websites for GDP, IFS for population
<b>t_openess</b>	Sum of exports and imports as a share of GDP. Expressed as logarithm.	National banks' websites.
<b>cpi</b>	Consumer price index (2010=100). Expressed as logarithm.	IFS and national statistical offices

Table 2 presents summary statistics of the variables used for the analysis of the two broad questions. The descriptive statistics for the key variables used in estimating the two model specifications show that over the sample period the average index of the REER in the sample is 95, whereas the average growth rate per capita is 14.6%. The household credit to GDP and enterprise credit to GDP ratios are 21.8% and 13.5%, respectively. Both ratios have maximum of 40% and 45%, for households and enterprises respectively, but also the minimum is around 0 for both variables.

**Table 2 – Summary statistics**

	reer	gdppc	ent_gdp	hh_gdp	t_open	cpi	gc_gdp	hc_gdp	cf_gdp	init_inc_pc
mean	95.00	14.62	0.14	0.22	0.18	86.59	0.04	0.04	0.06	0.02
max	125.80	1131.64	0.40	0.45	0.25	139.00	0.07	0.07	0.32	0.07
min	41.80	-16.02	0.00	0.05	0.09	2.00	0.00	0.00	0.00	0.00
sd	12.50	98.01	0.10	0.10	0.04	24.87	0.01	0.01	0.03	0.02
p25	89.30	0.88	0.05	0.14	0.15	75.00	0.03	0.03	0.05	0.00
p75	101.80	7.65	0.19	0.28	0.21	104.00	0.05	0.05	0.07	0.03
N	417	412	437	437	416	437	400	400	400	429

## 5. ESTIMATION RESULTS

This section presents the results of the two main sub questions of the paper. Before proceeding to the results it is worth mentioning that even though we have very small and limited sample, the number of the explanatory variables does not change the stability of the estimated coefficients from the main variables.

### 5.1.1. The effect of decomposed private sector credit on the economic growth

Table 3 contains the estimated parameters regarding the determinants of the economic growth. Generally, the results of the key variables confirm the theoretical predictions for the impact of the decomposed credit variables on the economic growth. The panel FE estimates are presented in the columns (1) and (2), columns (3 – 5) present the estimates of the alternative dynamic panel specification with AR (1), and finally column (6) presents the two steps GMM. Our panel FE regressions show positive and significant effect of both household and enterprise credit on the economic growth. Since the panel FE estimates are having issues with the serial correlation, we attempted to include dynamics in the model. For the small panel model as ours best option was to estimate the alternative dynamic model with AR (1). The estimates reported in columns (3 – 5) show positive and highly significant impact of the enterprise sector credit on the growth, whereas the impact of the household credit is ambiguous and statistically insignificant. The estimates of the two steps GMM presented in the column (6) are not statistically significant, due to the limitation of the data; hence we could not find valid instruments. However, their economic significance is in line with the alternative dynamic model with AR(1), suggesting that credit allocated to the enterprises has positive impact on the

growth, whereas the impact of the credit allocated to the households is ambiguous, as it gets different signs with different model specifications, yet it is not statistically significant.

Overall, the estimates of the enterprise credit to GDP variable are positive with similar magnitude and statistically significant in the considered specifications. Thus, the outcome of the enterprise credit variable indicates that firms rationally and efficiently utilize credit for investment purposes and they stimulate the economic growth.

**Table 3: Household Credit, Enterprise Credit and Economic Growth**

Dependent Variables	Economic Growth (Eq. 1)					
	Fixed Effects	Fixed Effects	Fixed Effects with AR(1)	Fixed Effects with AR(1)	Fixed Effects with AR(1)	two step GMM
Methodology	(1)	(2)	(3)	(4)	(5)	(6)
Economic Growth (-1)			0.760***	0.760***	0.747***	0.832***
Household Credit	0.156***		0.011		-0.016	-0.220
Enterprise Credit		0.103***		0.054***	0.075***	0.350
Initial Income Per Capita	0.019	0.024	-0.097***	-0.099***	-	0.443
Trade Openness	-1.189***	-1.344***	-0.218***	-0.238***	-	-3.002
Government Consumption to GDP	-0.093	-0.110*	-0.022	-0.021	-0.016	-3.779
CPI	0.560***	0.0734***	0.117***	0.112***	0.138***	0.727
Number of observations	400	400	387	387	387	375

\*\*\*, \*\*, \* indicates statistical significance level at 1%, 5% and 10%

Source: Authors' Calculations

The effects of the control variables generally are in line with the theory. The estimated parameter of the initial income per capita variable is in line with the neoclassical convergence theory. Namely, its statistical and economical significance suggest that countries included in the sample are converging to their equilibrium growth suggesting that the countries with lower initial income experience higher growth relative to countries with high initial income level. The negative sign of the trade openness estimate suggests that the countries' openness is more

related to import, which might have negative impact of the economic growth. Countries should adjust their policies in order to achieve higher degree of trade liberalization, which will ensure faster and easier exchange of goods and service, which on the long term has positive effect on the economic growth. The parameter in front of the CPI variable is positive and statistically significant. However, it is inconsistent to the theoretical suggestions which are in favor of the negative impact of the inflation on the growth, especially in the long run. This effect might be contributed to the heterogenous sample where some of the countries experienced increased price level during the period observed. Finally, the government consumption estimates are negative and statistically insignificant (except in one case). The relevance of including government consumption in the model is based on the expectations that government spending is directed towards infrastructure which tends to positively affect the growth. However, the results from our model did not support such effect of the government expenditures in the sample of countries considered in this paper. The enterprises use credit for investment purposes in order to increase their productivity, enhance the competitiveness and achieve higher profit. Thus, the expected effect of the enterprise credit is positive on the economic growth.

### **5.1.2. The effect of decomposed private sector credit on real exchange equilibrium dynamics**

Table 4 contains the estimated parameters regarding the determinants of the REER dynamics. The panel FE estimates are presented in the columns (1 - 3), columns (4-6) present the estimates of the alternative dynamic panel specification with AR (1), and finally column (7) presents the two steps GMM. Our panel FE regressions show positive and significant effect of both household and enterprise credit on the REER. The estimates from alternative dynamic model with AR (1) reported in columns (4-6) show positive and highly significant impact of both enterprise sector credit and household sector credit. The estimates of the two steps GMM presented in the column (7) are not statistically significant and to some point not economically significant.

In line with economic theory, the estimates of the enterprise sector credit and household sector credit have an appreciation effect on the REER. Unlike the theoretical expectations for the stronger impact of the household credit sector on the REER appreciation,

we cannot draw strong conclusion that this sector has stronger impact on the REER dynamics, since the magnitude of the estimates are varying. The estimates for appreciation impact of the enterprise sector credit implicitly suggest that the tradable sector of the economy gets more credit, relative to the non-tradable sector. That probably suggests that the productivity in the economy increases and causes labor cost spillovers from the tradable to the non-tradable sector, and at the end it causes overall increased price level. As mentioned above in the section 3, we cannot distinguish between tradable and non-tradable sector in this paper, however the potential channel for this effect might be the one explained in the previous sentence. Similarly, the positive impact of the household sector credit implies an appreciation of REER. Implicitly we can conclude that the credit granted to the household sector is used for smoothening the consumption, rather than housing and/or human capital enhancement.

**Table 4: Household Credit, Enterprise Credit and REER**

Dependent Variables	REER (Eq. 2)						
	Fixed Effects	Fixed Effects	Fixed Effects	Fixed Effects with AR(1)	Fixed Effects with AR(1)	Fixed Effects with AR(1)	two step GMM
Methodology	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Independent Variables							
REER (-1)				0.360***	0.803***	0.769***	4.327
Household Credit	2.551***		0.015**	0.014***		0.017***	-0.630
Enterprise Credit		0.046***	0.029**		0.095***	0.011*	1.001
GDP per capita	10.709***	0.180***	0.164***	0.088***	0.054***	0.082***	-0.008
Trade Openness	-	-	-	-	-	-	0.226
Household Consumption to GDP	24.306***	0.265***	0.266***	0.108***	0.061***	0.070***	
Capital Formation to GDP	-0.366	0.001	0.002	-0.001	-0.005	-0.004	-0.183
	-0.09	0.020**	0.016*	0.009*	0.010***	0.013***	-0.187
Number of observations	380	380	380	367	367	367	375

\*\*\*, \*\*, \* indicates statistical significance level at 1%, 5% and 10%

Source: Authors' Calculations

The effects of the control variables are generally in line with the theory. The estimated parameter of the productivity is in line with the Balassa Samuelson theory; it indicates an appreciation effect on the REER while being statistically significant. This effect coming from the enterprise channel is in line with the Balassa Samuelson theory as well, and in the medium term suggests that one can expect the increase in the credits to enterprises to result in increase of the productivity in the companies and to the last instance will pressure wages in the real sector to increase. Trade openness causes depreciation and the coefficient is statistically significant. Capital formation has appreciation effect and the coefficient is statistically significant. Similarly like productivity, this coefficient is suggesting that the increase in investment probably has positive impact on productivity and the spillover effect has appreciation impact on the REER. The household consumption, even though statistically insignificant, is in line with the theoretical expectation. In general, our results suggested that expansion in household and enterprise credit results in appreciation of the REER, with slightly higher appreciation transmitted through the enterprise credits, relative to the household credits.

## **6. CONCLUSION**

This paper analyzed the impact of household and enterprise credit on the economic growth and REER, respectively. The analysis was conducted on a sample of eight countries from SEE covering the period from 1995 to 2014 (depending on data availability). The results obtained by applying panel methods are generally in line with the theory. The estimation from the panel cross country model, different specifications indicated that enterprise credit has positive impact on the economic growth, whereas the impact of the household sector credit is ambiguous. Same analysis applied on the REER is indicating that decomposed credit to private sector causes appreciation of the REER.

The impact on the economic growth suggests that credit allocated to enterprises boosts up the economic growth. In particular the enterprise credit sector impacts the enterprise' rational behavior; hence the credit allocated to that sector is used for investment purposes. Furthermore, the impact of the decomposed credit on the REER is positive and this result indicates appreciation of the REER which is in compliance with the convergence theory. Namely, the estimates for a positive impact of the enterprise sector credit implicitly suggest that the

tradable sector of the economy gets more credit, relative to the non-tradeable sector. That suggest that the productivity in the economy increases and causes labor cost spillovers from tradable to non-tradeable sector, and at the end it causes an overall increase of the price level. Similarly, the household sector credit has an upward pressure on the REER.

Our paper contributes to the literature on the effects on decomposed private sector credit on two key macroeconomic variables, economic growth and REER, suggesting that private sector credit observed through different allocation channels can differently affect the economy. This means that key policy makers should closely observe sectorial credit allocation, rather than total private sector credit in context of the economic growth and REER dynamics. Consequently, they can use the specific sector credit to stimulate the economic agents to utilize credit for investment purposes and enhancement of human capital. In this manner, the economies will experience stable economic growth in future, mainly based on higher productivity and consequently preservation of competitiveness.



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