THE EFFECT OF REMITTANCES ON ECONOMIC GROWTH IN THE EMERGING COUNTRIES OF THE EUROPEAN UNION

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Abstract
With globalization, remittances play a particularly important role in the economies of emerging countries. In this paper we study the impact of remittances on economic growth for emerging countries in the European Union and the evolution of the share of remittances in their gross domestic product. The analysis is performed using two time-dependent regression models (linear and cubic), on data taken from the Eurostat database for the period 2005-2017. The results lead to the conclusion that, in the short term, it is expected that the share of remittances in gross domestic product to maintain the growth trend for most of the analyzed countries (Bulgaria, Czechia, Estonia, Latvia, Romania, Slovakia). The models estimate a downward tendency after 2018 for Poland and Hungary, while short-term decline and growth after 2020, for Lithuania. The regression results obtained are analyzed and interpreted and can be used as a starting point for consequent studies. It is important that remittance flows are primarily used to stimulate the economic growth of these countries by using them for improving health, education and entrepreneurship and less for consumption.

Keywords
remittances, economic growth, globalization, emerging countries, linear and cubic regression.

JEL Classification
C10, C13, C23, F24, O11, O47, O52.

Introduction

With globalization, many emerging economies in the world have turned into open markets with free flows of goods and factors, including through cross-border work. In these circumstances, the importance of remittances in the economies of developing countries cannot be ignored. People will continue to migrate as long as there is a demand for labor in developed countries. Remittances have emerged as a consequence of migration and are heavily rooted in human history, over time their economic importance and economic benefits being noticed. Remittances refer to the amounts of money transferred by migrant workers from the host country to the country of origin, for dependent persons in their home country. "Remittances" are current private transfers made by non-residents in their home country by workers who have been resident in the host country for more than one year. Transfers by migrants who live in a country for less than a year are classified as "employee compensation" (World Bank, 2010). In view of increasing remittances flows around the

world, especially in developing countries, it has become important to study the impact of remittances on the development of these economies.

Gross domestic product (GDP) as a macroeconomic indicator measures economic activity and indicates the strength of an economy by determining the value of all goods and services produced in an economy over a given period of time. Nominal GDP is commonly used to determine the economic performance of a whole country or region and to make international comparisons. Per capita GDP is used to eliminate the influence of the absolute size of the population, allowing for easier comparison of living standards between different countries.

The impact of remittances on economic growth has been studied by a number of researchers at the macroeconomic and household level, and many have found a positive remittance effect on economic growth, while others have found the opposite. Some authors believe that remittances stimulate economic growth and poverty reduction (Akobeng, 2016). Imai et al. (2014) examined the effects of remittances on GDP growth per capita for 24 Asian and Pacific countries and the results generally confirm that remittance flows have been beneficial to economic growth. The empirical analysis of the relationship between economic growth and remittances for African countries (Ahamada & Coulibaly, 2013) as well as for Saudi Arabia (Alkhathlan, 2013) has shown that workers' remittances have a negative effect on economic growth. Konte (2018) examines the impact of remittances on growth, using data for developing countries between 1970 and 2010, dividing the data into two growth regimes according to level of development, financial development and geographical location, noting that in a regime, remittances do not have a significant impact on growth, while in the second remittances the remittances have a positive and significant impact on the growth rate. Nsiah and Fayissa (2013) found a positive and long-term impact of remittances on growth in countries in Africa, Asia and Latin America and the Caribbean, while Lim and Simmons (2015) only examine the Caribbean sample and find no relationship long-term remittances and incomes. Meyer and Shera (2017) noted the impact of remittances on economic growth, using data from six countries with large remittances Albania, Bulgaria, Macedonia, Moldova, Romania and Bosnia Herzegovina between 1999 and 2013 and the results showed that remittances have a positive impact on growth. Clemens and McKenzie (2018) analyzed the correlation between remittances, population migration, poverty related to macroeconomic and microeconomic growth for 68 developing countries for the period 1990-2010 and concluded that remittances increase with increasing emigration and have a positive effect on poverty reduction, but the impact of remittances on economic growth is difficult to quantify. Sobiech (2019) analyzed the impact of remittances on economic growth on a sample of 61 developing countries for the period 1970-2010, and conclude that while in the short term remittances caused by population migration lead to poverty reduction, long-term remittances can stimulate growth, but the effect is only significant at low levels of financial development.

In conclusion, we can say that the studied literature suggests that there are different results regarding the existence of the causal relationship between remittances and economic growth, depending on the countries, the area and the analyzed period.

In this paper we studied the impact of remittances on economic growth for the emerging countries in the European Union (EU). We analyzed the evolution of remittances received from European Union and from worldwide, and then used different regression models to estimate and predict the evolution of remittance share in gross domestic product of emerging countries. In order to estimate this share we used two univariate time-dependent polynomial regression models. In this respect, we have used data for the emerging countries of the European Union (Bulgaria - BG, Czechia - CZ, Estonia - EE, Hungary - HU, Latvia - LV, Lithuania - LT, Poland - PL, Romania - RO, Slovakia - SK) concerning GDP, individual GDP per capita, remittances received from the EU countries and remittances from worldwide. The data series for the period 2005-2017 were taken from Eurostat, and

were processed using the EViews econometric software. This study includes the analysis of the share of remittances in gross domestic product for EU emerging countries, which is a novelty in this configuration of macroeconomic indicators. The results obtained are analyzed and interpreted from an economic point of view and can be used as a support either for subsequent studies or for the government policy of emerging EU member states.

Data, models and results

Data analysis. The macroeconomic indicators used for the analysis in this study are: GDP, GDP/capita, remittances received from EU countries (REM_EU), global remittances (REM_W), share of remittances in nominal gross domestic product (S_REM). The values of these indicators over the period 2005-2017 for the 9 emerging EU Member States were taken from the Eurostat database (2019). The data are organized in two-dimensional form, cross-sections - containing information on the value of the indicators analyzed at the level of each year, and time series - containing information for the indicators obtained between 2005 and 2017 for each of the nine emerging EU countries. Theoretical models are estimated and the data are processed using econometric, data processing and analysis software EViews 9.5 (2019). The statistical data collected from Eurostat shows that before 2005 there few remittance values available only for a very small number of countries. This motivates the period 2005-2017 of choice in this study. The evolution in time of remittances from worldwide and from EU shows that the value of remittances has a sinuous trend with increases and decreases, except for Hungary, which has seen a steady increase in remittances (fig. no. 1). It is noticed that with the global crisis, the level of remittances has been affected (for instance, in Romania the value of remittances has dropped dramatically).

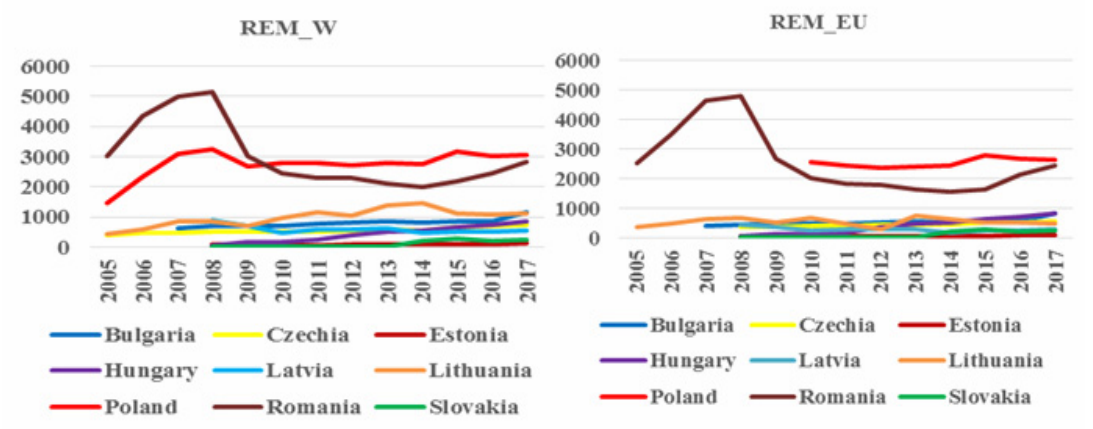

Fig. no. 1 Evolution of REM_W and REM_EU for EU emerging countries

Source: Own processing according to the Eurostat database

Analyzing the evolution of GDP and GDP/capita (fig. no. 2) it is observed that both indicators have registered a permanent increase in the 9 emerging EU states, with the exception of 2009 compared to 2008 when 8 of them (excluding Bulgaria which has kept the same value) recorded a consistent decrease. The share in GDP of remittances received from EU countries (S_REM_EU), or from worldwide (S_REM_W), are represented in fig. no. 3. From fig. no. 3, it is noted that the share of remittances in GDP has seen quite significant positive or negative variations in each country. Making the effect of the global crisis felt, people are sending less money to their country of origin, while the number of people who send money to their country of residence has diminished. At the same time, the

negative value is also due to the fact that the growth rate has in some cases exceeded the rate of increase of remittances.

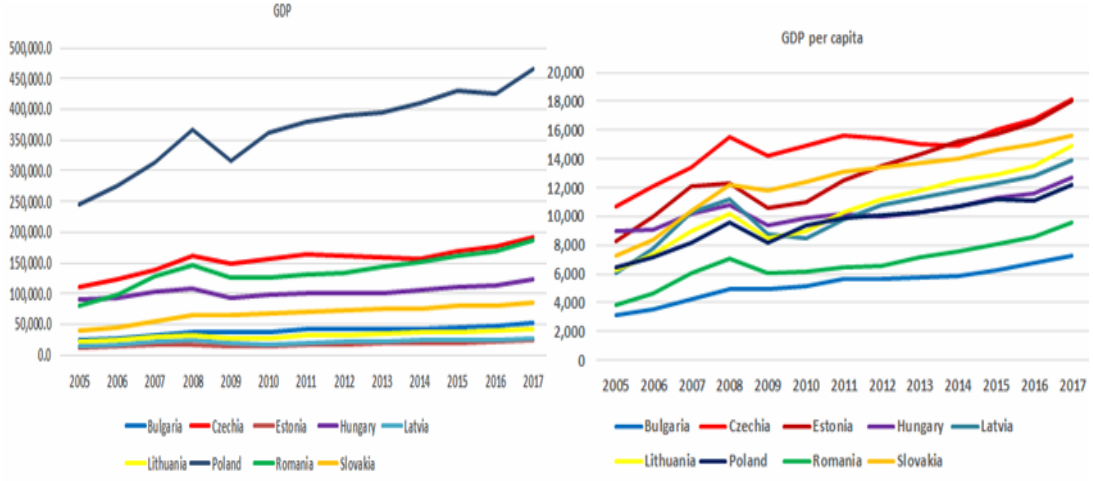

Fig. no. 2 Evolution of GDP and GDP/capita for EU emerging countries

Source: Own processing according to the Eurostat database

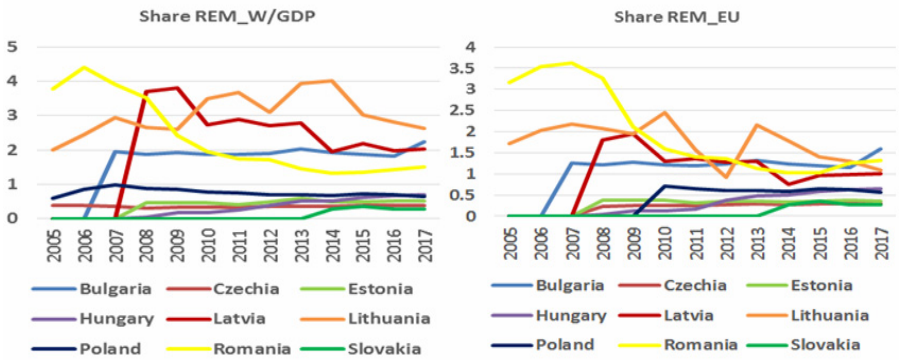

Fig. no. 3 Evolution of S_REM_W and S_REM_EU for EU emerging countries

Source: Own processing according to the Eurostat database

Estimation of the share of remittances into GDP. In order to estimate and forecast the share of annual remittances into the gross direct product different regression models can be used. Analyzing the graphs in fig. no. 3, we chose to use two different polynomial regression models, namely (1) the linear time regression model and (2) the cubic model:

$$y_t = a_0 + a_1 t, \qquad t = 1, \dots, n, \tag{1}$$

$$y_t = b_0 + b_1 t + b_2 t^2 + b_3 t^3, \; t = 1, \dots, n. \tag{2}$$

While the linear model allows only to establish an increasing or decreasing tendency of the data set, the cubic model may provide more interesting information. The signs of the coefficients of t, t^2, t^3, or specific relations between them determine the shape of the approximating curve. Thus, the dependent variable follows a N-shaped curve if $b_3 > 0$, and

there exist two real critical values of variable t, namely $t_{1,2} = \frac{-b_2 \pm \sqrt{b_2^2 - 3b_1 b_3}}{3b_3}$, if $b_2^2 - 3b_1 b_3 > 0$. In this case, as $t_1 < t_2$, to t_1 a local maximum value of the dependent variable y corresponds, while to t_2 a local minimum value. The results of the estimation using the linear model (1) are given in table no. 1, those obtained using the cubic model (2) are given in table no. 2. Here the dependent variable is either the share of the remittances form EU countries or the share of the remittances from worldwide in GDP.

Table no. 1 Estimation of S_REM_EU and S_REM_W, period 2005-2017, linear model

Co	S_REM_EU		S_REM_W	
	c	t	c	t
BG	0.483691	0.083814	0.769748	0.123703
CZ	0.028237	0.025844	0.335381	0.002812
EE	0.070263	0.029243	0.069719	0.043533
HU	-0.1702	0.064432	-0.15672	0.066628
LV	0.578809	0.057066	1.15823	0.128159
LT	2.220418	-0.06907	1.15823	0.128159
PL	-0.07775	0.065927	0.849574	-0.01317
RO	3.599519	-0.23029	4.173171	-0.26065
SK	-0.11083	0.028674	-0.11158	0.028877

Source: Own processing in EViews according to the Eurostat database

Table no. 2 Estimation of S_REM_EU and S_REM_W, period 2005-2017, cubic model

Country	S_REM_EU				S_REM_W			
	c	t	t^2	t^3	c	t	t^2	t^3
BG	-0.9671	0.9413	-0.1234	0.0051	-1.390	1.3656	-0.1735	0.0069
CZ	-0.1482	0.1103	-0.0091	0.0003	0.4299	-0.0484	0.0067	-0.0003
EE	-0.2474	0.1921	-0.0197	0.0007	-0.278	0.2093	-0.0178	0.0005
HU	0.0921	-0.0979	0.02445	-0.001	0.0383	-0.0584	0.0195	-0.0009
LV	-1.4115	1.1416	-0.1421	0.0053	-2.694	2.1570	-0.2543	0.0089
LT	1.6167	0.2520	-0.0408	0.0015	2.0377	0.0775	0.0434	-0.0036
PL	-0.0239	-0.0556	0.0311	-0.002	0.5190	0.2005	-0.0335	0.0015
RO	3.4095	0.1839	-0.1054	0.0062	4.4022	-0.1067	-0.0660	0.0045
SK	0.0987	-0.0760	0.0122	-0.001	0.0999	-0.0770	0.0123	-0.0004

Source: Own processing in EViews according to the Eurostat database

Several regression coefficients useful to compare the quality of the fit of the two selected models are reported in table no. 3. Comparing these values we may conclude that the best fit is provided by the cubic model.

Results and economic significance. Interpretation of the empirical estimations obtained using the two regression models are summarized in table no. 4. The monotony results provided by the linear model lead to the conclusion that REM_EU share in GDP is increasing for 7 of the emerging EU countries and decreasing for 2 of them, Lithuania and Romania. The same holds for S_REM_W for 8 countries, except for Poland where the linear model shows a decreasing trend.

Table no. 3 Regression statistical coefficients

Country	Model	S_REM_EU			S_REM_W		
		R^2	SER	SSR	R^2	SER	SSR
BG	linear	0.448402	0.378121	1.572734	0.43141	0.577662	3.670633
	cubic	0.840334	0.224906	0.455245	0.836776	0.34217	1.053722
CZ	linear	0.690697	0.070348	0.054437	0.160586	0.026147	0.00752
	cubic	0.864948	0.051391	0.023769	0.817997	0.01346	0.001631
EE	linear	0.522015	0.113824	0.142514	0.607145	0.142438	0.223174
	cubic	0.788437	0.083718	0.063079	0.820294	0.106504	0.102087
HU	linear	0.936838	0.068052	0.050941	0.966525	0.050437	0.027982
	cubic	0.979953	0.042384	0.016168	0.989715	0.030908	0.008598
LV	linear	0.118906	0.631863	4.391764	0.145355	1.264051	17.57606
	cubic	0.634426	0.449961	1.822182	0.665969	0.873655	6.869465
LT	linear	0.340611	0.390886	1.680711	0.145355	1.264051	17.57606
	cubic	0.440555	0.398046	1.425965	0.716758	0.371435	1.241678
PL	linear	0.654581	0.194801	0.417424	0.18749	0.569041	3.561889
	cubic	0.79767	0.164826	0.244507	0.630202	0.075643	0.051497
RO	linear	0.763771	0.52096	2.985397	0.803355	0.524549	3.026667
	cubic	0.9186	0.338084	1.028706	0.932565	0.339595	1.037925
SK	linear	0.619558	0.091395	0.091884	0.618505	0.092248	0.093607
	cubic	0.77509	0.077689	0.05432	0.773569	0.07857	0.055559

Source: Own processing in EViews according to the Eurostat database

The cubic model seems to provide a better approximation for the evolution of the data, attested by the statistical coefficients in table no. 3. If the regression curve has is "N"-shaped, there is an increase up to the first turning point (2005 + x in table no. 4), then a decrease to the second turning point (2005 + x in table no. 4), followed by an increase. This is the case for S_REM_EU for BG, CZ, EE, LV, LT and RO, or for the S_REM_W indicator for BG, EE, LV, PL and RO. As the regression curve has the "Inverted N" shape, it shows a decrease up to the first turning point, then an increase to the second turning point, followed by a decrease. This is the case for S_REM_EU variable for HU, PL and SK, and for S_REM_W in the cases CZ, HU, LT and SK. Based on the two estimation models, we can formulate the following concluding remarks regarding the evolution of the share of remittances received from EU in GDP, for the 9 emerging EU countries:

- for BG, CZ, EE, LV, RO and SK, S_REM_EU shows an increasing tendency for the next period, according to both models;

- for HU, the upward trend is maintained in the short term (2005 + 13), according to cubic model, followed a downward trend;
- for LT, the downward trend of S_REM_EU should maintain short-term (2005 + 15), followed by a growth period;
- for PL, the linear model indicates an upward trend, while the cubic pattern indicates a downward trend after 2015.

Table no. 4 Interpretation for the empirical estimation results

Co.	S_REM_EU				S_REM_W			
	LMT	Cubic model			LMT	Cubic model		
		Shape	FTP	STP		Shape	FTP	STP
BG	increasing	"N"	6	10	increasing	"N"	6	10
CZ	increasing	"N"	11	12	increasing	"Inverted N"	5	13
EE	increasing	"N"	8	12	increasing	"N"	10	15
HU	increasing	"Inverted N"	2	13	increasing	"Inverted N"	2	13
LV	increasing	"N"	6	12	increasing	"N"	6	13
LT	decreasing	"N"	4	15	decreasing	"Inverted N"	-1	9
PL	increasing	"Inverted N"	1	10	decreasing	"N"	4	11
RO	decreasing	"N"	1	10	decreasing	"N"	-1	11
SK	increasing	"Inverted N"	4	18	increasing	"Inverted N"	4	17

Note. LMT - Linear model tendency; FTP - First turning point; STP - Second turning point
Source: Own processing in EViews according to the Eurostat database

Conclusion

Remittances are a vital source of financial support that directly increases the income of families who migrate to other countries to work, and can lead to increased investment in health, education, and even the creation of new small businesses. As a result of the increase in remittances (after the decrease due to the global crisis in 2009 compared to 2008) and their stable nature, remittances have become a topic of interest for more and more emerging economists. The reality is that the value of remittances is assumed to be significantly higher, taking into account unregistered flows through formal and informal transmission channels.

It is noticed that after the global crisis there is a reconfiguration of the EU countries where the labor force of the emerging EU countries is migrating. At the same time, the data recorded in Eurostat is incomplete due to the fact that only a small part of the outputs are "officially captured". In the EU there are 9 countries receiving significant remittances, namely the emerging countries, having an annual GDP per capita below 19,000 Euros. The biggest nominal values of these remittances are recorded by Poland and Romania. Only three of the emerging countries, namely Bulgaria, Romania and Lithuania, account for more than 1% of nominal GDP for the remittances received from EU, while the share of remittances received from the worldwide in nominal GDP records the highest values for Lithuania, Bulgaria and Latvia, with a percentage above 2%. After the global crisis, there is an increase in both the volume of remittances and their share in GDP for all emerging analyzed countries. The estimation models used in this paper lead to the conclusion that, in short-term, it is expected the share of remittances in GDP to maintain the growth trend for most of the analyzed countries. The models estimate a downward tendency after 2018 for Poland and Hungary, while short-term decline and growth after 2020, for Lithuania.

Following trends in remittances, policymakers can make informed decisions to protect and capitalize on this massive capital flow, which is three times higher than official social assistance flows. Europe continues to be a significant source of remittances for countries inside the EU borders, due to the fact that EU citizens can move freely to the EU labor market and thus 2 out of 3 Euros remain in the EU countries. Real flows of remittances across Europe are considered to be substantially higher than those from official data, as legislation on migrants' entry and exit in the country of origin allows them to return home frequently, bringing home their money earned abroad. Remittance flows are vital in emerging countries, but it is important that they are used more heavily to improve health, education, entrepreneurship and less for consumption (currently most remittances being used for consumption) so that the impact of remittances leads to the economic growth of these countries.

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