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THE EFFECTS OF REMITTANCES ON POVERTY AND INEQUALITY ALLEVIATION IN SELECTED CENTRAL AND SOUTH-EAST EUROPEAN COUNTRIES

Abstract: In recent decades, the countries from Central and South-Eastern Europe (CESEE) have experienced sizeable emigration, accompanied by growing remittance inflows. In some countries, especially developing countries, remittances present a significant source of foreign exchange inflow and of income for poorer families. However, empirical research on the impact of remittances on poverty and inequality has yielded mixed results. Most studies find that remittances help alleviate poverty, while the impact on inequality is more ambiguous. This paper empirically examines the impact of remittances on poverty and inequality in 16 countries from the CESEE region. Using the Generalized Method of Moments, we evaluate two specific panel regression models for the impact of remittances on poverty and income inequality in this group of countries, ac-

counting for the different levels of economic development and different macroeconomic and institutional settings. In addition, the paper also examines whether different institutional quality impacts poverty and inequality. The paper's preliminary results indicate that remittances reduce poverty and inequality in the analyzed countries. The results of this paper could have significant implications for policymakers. Given that institutions appear to be important in the way remittances are used and for the benefits that they provide, the best way for governments to ensure that remittances play a role in reducing poverty and income inequality is to foster better institutional quality.

KEYWORDS: REMITTANCES, POVERTY, INEQUALITY, CESEE COUNTRIES.

JEL CLASSIFICATION: F24, I32, D31, C23.

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1. INTRODUCTION

The three decades since the beginning of the transition process in Central, Eastern and Southeastern Europe have been marked by continuous migrant outflows toward more advanced countries, due to social, economic and political reasons. As a result of the large percentage of emigrants and their strong ties with their families, the region is one of the most relevant remittance-recipient regions in the world. Peković¹ notes that according to the World Bank database, remittances in transition countries represent almost one fifth of the remittances in all developing countries.²

Remittances are an important source of external funding for low- and middle-income countries comparing with other external income flows as FDI and official development assistance. The growing importance of remittances as a source of funds for economic development, and poverty alleviation is also captured in the Sustainable Development Goals.³ Before the COVID-19 pandemic, remittances were maintaining an upward trend. Migrant remittances to low- and middle-income countries reached \$552 billion in 2019 (compared to \$27 billion in 1990), thrice the size of official development assistance and for the first time exceeding foreign direct investment.⁴ Furthermore, researchers argue that remittance flows to developing countries were more stable than other financial flows even when the global economy was affected by the 2009 global financial crisis.⁵ Also, for many transition countries, remittances have become a significant source of external financing, compared to foreign direct investments and official development assistance. In the first years of the transition process (beginning of the 1990s), remittances accounted for 1 percent of GDP in these countries, but during the last decade, their GDP share doubled.⁶ Analyzing remittance inflows data in the new EU members from Central and Eastern Europe, Peković⁷ points that a rapid growth can be observed in the year of their accession to the European Union, which can be partly explained by the large short-term outflow of labour from these countries to the old EU members, especially to Great Britain, Ireland and Sweden. In that sense, the remittance inflow in the Baltic

¹ Peković (2017)

² Emigrants remit for different reasons: altruism (based on the empathy with those left behind and the need to support them financially), coinsurance (based on the need to invest back home so that if anything happens to them whilst in the foreign country, they can return home) and savings (remitting money as a way to save for future investment or for bad times).

³ United Nations (2018)

⁴ See Pirlea et al. (2020)

⁵ See e.g. Ratha (2013); De et al. (2016); Georgievska Svrstinov et al. (2012)

⁶ Peković, op. cit.

⁷ Ibid.

countries was 60% larger in 2005 than in 2004. In 2004, the remittance inflow in Poland was doubled compared to the previous year and in 2005 it increased by 37%. Slovakia received remittances around 80% larger in 2005 than in 2004.

The impact of remittances flows on growth, poverty and income distribution has attracted a lot of attention from researchers, as they are considered play a vital role for the well-being of citizens and for supporting economic development in remittance recipient-countries. They help millions of households to exceed their subsistence level and contribute to improving health, education, living conditions, and even increasing entrepreneurship. Remittances that flow towards poor families directly contribute to poverty reduction. They increase the income of the recipient and can help smooth household consumption, especially in response to adverse shocks, such as crop failure, death of a family member, or a health crisis. In addition, remittances lead to increased household expenditure in areas considered important for development, particularly education, entrepreneurship and health and increase investments in both human and physical capital. In that sense, remittances may have positive impact on the macroeconomic level, expressed in the consolidation of the balance of payments and increased economy's output. They may also induce growth of the local economy by financing local or regional development projects. Low-skilled migration is considered particularly conducive to poverty alleviation. It is argued that, since low-skilled workers have low marginal productivity and higher probability of being unemployed, their migration can improve labor market conditions for other poor workers who stay behind.

Moreover, the countercyclical nature of remittances makes them a good shock-absorber during hard economic or financial crises, natural disasters, or wars. In Albania, in the late 1990s, during bank crisis and financial and economic distress, around 80% of households thanks to remittances exceed the bare subsistence level. So, the benefits of remittances can be summarized as poverty mitigating, spurring economic growth, savings, sectoral growth stimulation and investment in business, education and health in remittances recipient – countries.

Despite the large interest in the social and economic impact of remittances, most studies focus on low-income countries, while there is scarce literature on the effects of remittances in the countries of Central and Southeast Europe (CESEE). This paper attempts to fill this gap by examining the impact of remittances on poverty and inequality in 16 countries from the CESEE region, accounting for the different levels of economic development and different macroeconomic and institutional settings. The remainder of the paper is structured as follows. Section 2 briefly overviews the

empirical literature on the impact of remittances on poverty and inequality, Section 3 describes the methodology and data used in the research, followed by a discussion of the results in Section 5 and concluding remarks in Section 6.

2. EMPIRICAL LITERATURE REVIEW

Despite a considerable number of studies discussing the impact of remittances on poverty and on inequality, empirical results are ambiguous and methodological issues exist. Conflicting results in estimation of remittances effect on income inequality might furthermore be explained up to certain extent by ambiguities in the research questions and statistical methods used. Investigations on the impact of remittances on poverty are split between those that find strictly positive relationship and those that found the relationship to be sensitive depending on the poverty proxy used. Overall, the findings on the studies that investigated the impact of remittances on poverty are in support of the poverty-alleviating effect.

Musakwa and Odhiambo⁸ found that the causality between remittances and poverty in South Africa is sensitive to the proxy used to measure the level of poverty. When they used the infant mortality rate as a proxy for poverty, poverty was found to Granger-cause remittance inflows in the short run. But, when they used the household consumption expenditure as a proxy for poverty, no causality was found between poverty and remittances. Azizi⁹ investigated the effects of remittances on poverty in 109 developing countries over the period 1990-2014 and concluded that remittances reduce poverty. He calculated that 10% increase in per capita remittances leads to a 1% decrease in poverty headcount, a 1.8% decrease in poverty gap, and 2.5% decrease in poverty severity. Arapi-Gjini et al.¹⁰ found that remittances alleviate both absolute and relative poverty levels and lead to a marginal increase in inequality in the case of Kosovo. They demonstrate that although poverty reduction effects are stronger in the short run, in general, remittances have a positive poverty reduction effect over time. In the very long run, the effects of remittances flatten-out, thus suggesting that receiving remittances impacts household poverty to a lesser degree. In that context, Mehedintu et al.¹¹ indicated that remittances tend to decrease as the migrant community become more stable in the country of destination, or as the economic conditions of the host country deteriorate. Nevertheless, they found

⁸ Musakwa and Odhiambo (2021)

⁹ Azizi (2021)

¹⁰ Arapi-Gjini et al. (2020)

¹¹ Mehedintu et al. (2019)

that remittances may have a significant positive impact on income or consumption and a significant negative impact on poverty in the emerging countries. They argue that remittances reduce poverty by increasing income, allow higher investment in physical assets, education, health, and also allow access to a wide range of knowledge. Therefore, they suggested that governments in the emerging countries need to develop appropriate policies in order to protect and to capitalize the massive flow of capital that can make an important contribution to alleviating poverty and reducing the number of people suffering from poverty. Peković¹² analyzed the impact of remittances on poverty in nine transition economies over the period 2002-2013 and found a significant impact of remittances on each of the three poverty measures (10-percent increase in remittances per capita will lead to a decline: on average a 4.7 % in poverty headcount, and also 5.2 % in poverty depth and 5.8 % in poverty severity).

In the empirical studies about the effects of remittances on income inequality researchers are inconclusive, mostly in the short-run framework. Some studies suggest that these transfers are sent to the poor, while other studies find that remittances are directed toward higher-income families, so widening the gap between rich and poor. Arapi-Gjini et al.¹³ argued that the short-run and long-run effects on income distribution may have opposite signs, depending on the initial distribution of wealth. They found that migration was beneficial for migrants' households by significantly raising their yearly income vis-a vis non-migrant households. Gjini et al.¹⁴ noted that migration has a slightly un-equalizing effect on income, overall, an increase in social welfare is to be expected in the remittance – receiving countries. According to Azizi¹⁵, remittances decrease inequality in developing countries. They found that remittances decrease the Gini coefficient, increase the income share held of the poorest decile and quantile, and decrease the income share of the richest quintile and decile in developing countries. McKenzie and Rapoport¹⁶ concluded that the effect of remittances on income inequality is subject to the migration history of the community. They argued that migration is expensive. Emigrated families must incur the direct costs of settlement and job searching in the host countries. Thus, in the first stages of migration, only wealthier families have the means to send members abroad and be rewarded with remittances. Therefore, the positive effects on income inequality in the short-run is absent. The

¹² Peković, op. cit.

¹³ Arapi-Gjini, op. cit.

¹⁴ Ibid.

¹⁵ Azizi, op. cit.

¹⁶ Mckenzie and Rapoport (2007)

investigation made by Koechlin and Leon¹⁷ is on the same line. They also found robust evidence of an inverted U-curve relationship between remittances and income inequality, which they explained with the effects from the formation of migrants' networks in the foreign country. These networks lower the opportunity costs for new migrants due to connections in the labor market, and settlement and information costs. In the initial stages of migration history, with high migration and information costs, the opportunity cost of the migration decision can only be afforded by people in the higher stances of income distribution. The remittances sent by these migrants have the effect of increasing the income inequality. In the later stages, when the migrants' networks are established, migration becomes affordable for households in the lowest levels of income distribution. When this happens, the migration and remittances sent by these migrants will tend to reduce income inequality.

Acosta¹⁸ based on the analysis of micro-data from 59 developed and developing countries, found that remittances tend to increase inequality, although the magnitude is relatively small. Borja and Hall¹⁹ were arguing that declines in income inequality become more evident when examining the marginal productivity of remittances among different groups of families. Poor families that use remittances to relax credit constraints and expand small businesses would extract higher productivity per dollar than rich families, which are experiencing lower marginal productivity rates. Consequently, in the long-run this will reduce the income inequality and improve income-distribution in the remittance-receiving countries. Tokhirov et al.²⁰ analyzed income inequality in 27 post-communist countries, over the period 1991-2014, and discovered that the relationship between remittances and income inequality depends on the level of exposure to remittances. As a country becomes more dependent on remittances, the income inequality progress along U-shaped course. When remittances account for more than 20% of GDP, they intensify economic inequality. They conclude that in the post-communist countries with low economic dependence on remittances (such as the Baltic and Visegrad Group countries), remittances are expected to reduce income inequality due to a combination of two effects: remittances are mostly skewed in favor of lower income households and the distortionary nature of migration does not materialize. In contrast, remittances create a negative influence on income inequality where remittance flows account for a relatively large proportion of the national income

¹⁷ Koechlin and Leon (2007)

¹⁸ Acosta (2006)

¹⁹ Borja and Hall (2018)

²⁰ Tokhirov et al. (2021)

(such as lower income post-Soviet and Balkan countries). Bajra²¹ analyzed the effects on remittances on economic growth and income inequality in the Western Balkan countries. Using the method of instrumental variables, he found that regardless of the amounts of remittances sent, remittances do not have a large impact on economic growth and inequality since most personal remittances are used for household consumption. An increasing trend in the remittance inflow is due to the high level of migration. A high level of migration absorbs a large workforce and negatively affects labor markets and future economic growth and increases the population's dependency on remittances.

The complex relationship between remittances and income inequality is intensified when introducing the quality of institutions. In that context, findings of the research of Borja and Hall²² indicate that remittances in recipient countries with a solid institutional framework, reduce inequality by a greater magnitude. Koechlin and Leon's²³ findings show that institutions can help countries to reach more quickly the point at which remittances start to reduce inequality. Using interactive terms in the regression analysis, they showed how countries with higher educational levels, on the one hand, and higher levels of financial sector development, on the other hand, can more quickly reach the inequality-decreasing section of the relationship between remittances and income inequality.

3. THE INFLOWS OF REMITTANCES IN THE COUNTRIES OF CENTRAL AND SOUTHEASTERN EUROPE

Remittance inflows to the countries of Central and South-Eastern Europe generally followed the trends observed at the global level, but they were significantly more pronounced compared to the world and to low- and middle-income countries, especially in the past. For example, the average annual growth rate of remittance inflows in the countries of Central and South-Eastern Europe in the period 1995-1999 was 18,76%, while in the world and countries with low and middle income, the same rate was 5,03% and 7,55%, respectively. However, globally much higher annual growth rates of remittance inflows occurred from 2000-2004. During that period, an average annual growth rate of remittances of 13,46% was observed worldwide, 15,95% in low- and middle-income countries, and 27,03% in Central and South-Eastern Europe. In the following period, from 2005 to 2009, the average annual

²¹ Bajra (2021)

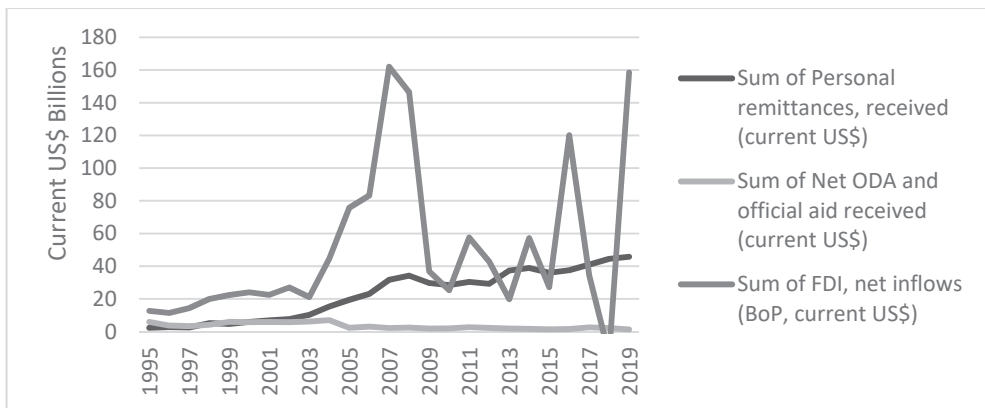
²² Borja and Hall, *op. cit.*

²³ Koechlin and Leon, *op. cit.*

growth rate of remittance inflows for the countries of Central and South-Eastern Europe, falls to 14,11%. As a result, the rates in the periods 2010-2014 and 2015-2019 in all three country groups were reduced to single digits.

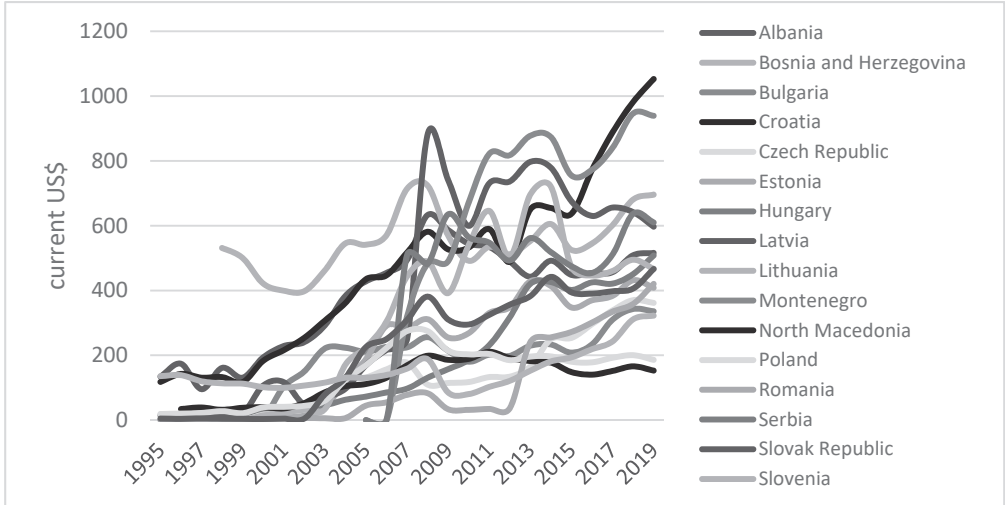
Chart 1 highlights the role of remittances compared to net official development assistance and official aid (net ODA). It clearly shows that until the early 2000s, the size of net ODA in Central and South-Eastern European countries was like that of remittance inflows. It is evident how later remittances drastically exceed the official development aid. Foreign direct investment (FDI) investments were more significant than the other two types of inflows already in the second half of the 1990s, and they grew more intensively until the global financial and economic crisis emerged. Since then, FDI inflows have been very volatile, whereas remittances have maintained the upward trend, and ODA has decreased over time.

Chart 1: *Inflows of remittances, official development assistance and remittances in Central and South Eastern European countries*



Source: Authors' calculations based on ("World Development Indicators | DataBank,").

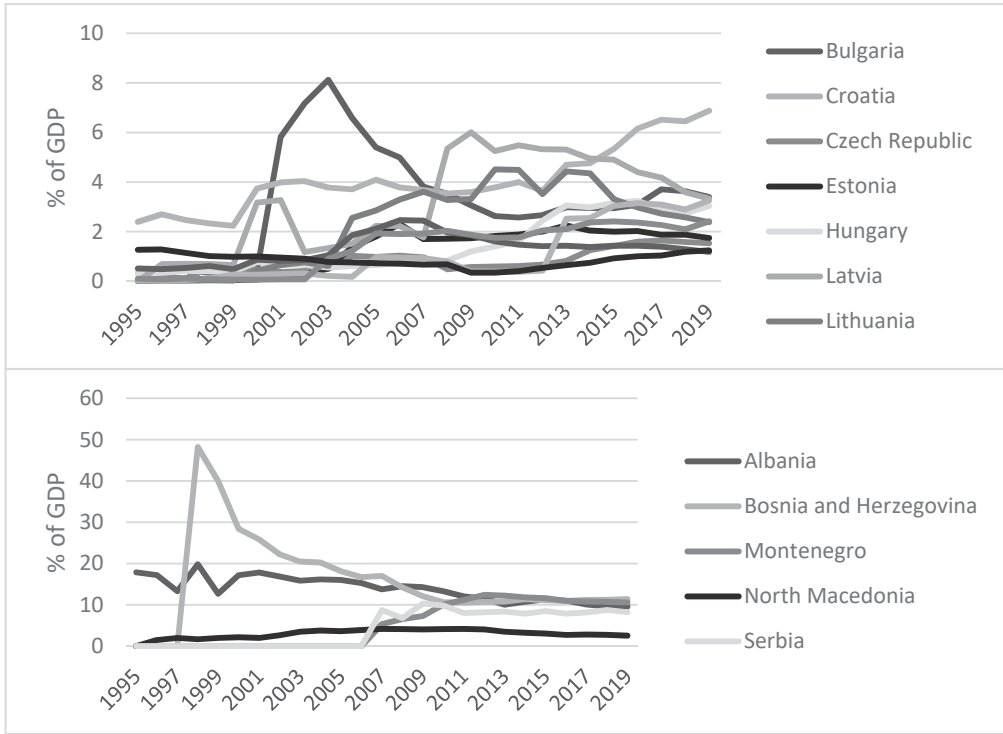
Chart 2: Inflow of remittances per capita in Central and South-Eastern Europe by individual countries



Source: Authors' calculations based on ("World Development Indicators | DataBank,").

Chart 2 shows the total inflow of remittances per capita in Central and South-Eastern Europe from 1995-2019. From 1995-2019, Montenegro had the highest average remittances per capita with 640,6 US\$; followed by Bosnia and Herzegovina with 551 US\$, Croatia with 468,7 US\$, Serbia with 466,7 US\$ and Latvia with 400,7 US\$. On the other hand, Romania (104,6 US\$), North Macedonia (123,6 US\$), Czech Republic (138,5 US\$), Poland (139,8 US\$), Slovenia (152,1 US\$) and Bulgaria (180,5 US\$) has the lowest average remittances per capita.

Chart 3: Remittances to GDP in EU countries (top) and non-EU countries (bottom) of Central and Southeastern Europe



Source: Authors' calculations based on ("World Development Indicators | DataBank,").

Regarding the ratio of remittance inflows to GDP in 2019, from the EU countries of Central and South-Eastern Europe (Chart 3 – top), Croatia, with 6,88%, has the highest ratio of remittances to GDP, followed by Bulgaria (3,39%), Latvia (3,33%), Romania (3,25%), Hungary (3,04%), the Slovak Republic (2,41%) and Lithuania (2,38%). On the other hand, Poland has a minor share of remittances in GDP - 1,18%, Slovenia 1,24%, the Czech Republic 1,52% and Estonia 1,74%. In the non-EU countries (Chart 3 – bottom), except for North Macedonia, with remittances in the amount of 2,51% of GDP, the other countries have larger shares of remittances in GDP: Bosnia and Herzegovina 11,37 %, Montenegro 10,54%, Albania 9,56% and Serbia 8,23%.

4. DATA AND METHODOLOGY

4.1. Data and variables

The paper uses time series from 1995 to 2019 for 16 countries of Central and Southeastern Europe. The observations are averaged over three annual periods to avoid the short-term fluctuations characteristic of yearly data and reduce the impact of structural violations due to discontinuities. However, the analysis did not consider 2020 and the subsequent period due to the significant disruptions in economic activities during the pandemic caused by the Covid-19 disease. Table 1 shows the countries included in the empirical research.

Table 1: List of countries included in the empirical research

Balkan EU countries	Balkan non-EU countries	Baltic Countries	Visegrad Group
Bulgaria	Albania	Estonia	Czechia
Croatia	Bosna and Herzegovina	Latvia	Hungary
Romania	Montenegro	Lithuania	Poland
Slovenia	North Macedonia	-	Slovakia
-	Serbia	-	-

The data were obtained from several international databases. Data on household final consumption expenditure (used as a proxy for poverty), remittances, gross domestic product (GDP) per capita, gross fixed capital formation, inflation and gross enrollment ratio in tertiary school are taken from the World Bank's World Development Indicators database²⁴. The data for the Gini coefficient is obtained from the World Inequality Database²⁵ and the data for the Index of economic freedom from the Heritage Foundation database²⁶. Our critical variables of interest are remittances and their squared values. The remaining variables serve as control variables. More explanation of the variables is given in Table 2.

²⁴ "World Development Indicators | DataBank"

²⁵ "World Inequality Database"

²⁶ The Heritage Foundation

Table 2: *Explanation of the variables included in the empirical research*

Variable	Description	Source
Household final consumption expenditure	The market value of all goods and services, including durable goods (cars, washing machines, computers, etc.), purchased by households as a percentage of GDP.	World Development Indicators
Gini coefficient	The inequality coefficient is measured on a scale of 0 (perfect equality) to 1 (perfect inequality) on households' aggregate equivalent disposable income.	World Inequality Database
Remittances	Personal transfers and employee benefits are expressed as a percentage of GDP.	World Development Indicators
Logarithm of GDP per capita	Natural logarithm of real GDP per capita at constant national prices as of 2015.	World Development Indicators
Domestic investment	Investments include land improvements, purchase of plants, machinery and equipment, and construction of roads, railways, etc., including schools, offices, hospitals, private residential buildings commercial and industrial buildings.	World Development Indicators
Inflation	Annual percentage change in the cost of acquiring a basket of goods and services by an average consumer.	World Development Indicators
Gross enrollment ratio in tertiary school	The ratio of total enrolled students, regardless of age, to the population of the age group corresponding to the tertiary level of education.	World Development Indicators
Index of Economic Freedom	Measured based on quantitative and qualitative factors, grouped into four broad categories (rule of law, government size, regulatory efficiency and open markets).	The Heritage Foundation

Table 3 presents the descriptive statistics for the variables examined in the paper. Household final consumption expenditure has a mean value of 64,48% of GDP. The average Gini coefficient is 0,46, with a minimum of 0,34 (more equal income distribution) and a maximum of 0,56 (more unequal income distribution). On average, inflows of remittances for the entire period amount to 4,18% of GDP, with maximum of 38,85% of GDP. In terms of the logarithm of GDP per capita, the countries of the sample in the entire period have 8,98, with a minimum of 7,26 and a maximum of 10,06. On average, domestic investments amount to 23,29% of GDP, with minimum of 10,27% of GDP and a maximum of 37,93% of GDP. Inflation over the 24 years averaged 9,26%, with the lowest inflation rate of 0,68% and the highest inflation rate of 414,01%. Furthermore, in the same sample of countries and the analyzed period, 51,84% of the population of the age group corresponding to tertiary education enrolled in higher education. Finally, the Index of economic freedom on average for the countries is 62,79, with a minimum of 34,63 and a maximum of 78,37.

Table 3: Descriptive statistics of the empirical data

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Household final consumption expenditure	142	64,48	11,46	46,22	100,87
Gini coefficient	144	0,46	0,046	0,34	0,56
Remittances	137	4,18	5,43	0	38,85
Remittances²	137	46,71	147,36	0	1509,57
The logarithm of GDP per capita	144	8,98	0,62	7,26	10,06
Domestic investment	143	23,29	4,83	10,27	37,93
Inflation	138	9,26	36,45	-0,68	414,01
Gross enrollment ratio in tertiary school	135	51,84	18,97	11,28	94,86
Index of Economic Freedom	135	62,79	7,99	34,63	78,37

Source: Authors' calculations.

Table 4 presents the correlation coefficients between the variables from the three-year averaged panel data. As can be seen from the table, household final consumption expenditure as an indicator for measuring poverty has a statistically significant correlation with the Gini coefficient, remittances, the squared value of the

remittances, the logarithmic value of GDP per capita, the gross enrollment ratio in tertiary school and the Index of economic freedom. However, the Gini coefficient as an indicator for measuring inequality has a statistically significant correlation with household final consumption expenditures, remittances, the logarithmic value of GDP per capita and the gross enrollment ratio in tertiary school. These statistically significant correlation coefficients served us as a basis for determining the control variables in our models for evaluating the impact of remittances on poverty and income inequality, as well as the non-linear relationship between the same variables in Central and Southeastern Europe in the analyzed period.

Table 4: Correlation analysis of empirical data

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Household final consumption expenditure	1,000								
(2) Gini coefficient	0,348*	1,000							
(3) Remittances	0,758*	0,178*	1,000						
(4) Remittances ²	0,593*	0,047	0,878*	1,000					
(5) The logarithm of GDP per capita	-0,857*	-0,207*	-0,562*	-0,437*	1,000				
(6) Domestic Investment	-0,106	-0,105	0,193*	0,208*	0,112	1,000			
(7) Inflation	0,063	0,051	-0,111	-0,060	-0,202*	-0,296*	1,000		
(8) Gross enrollment ratio in tertiary school	-0,454*	0,229*	-0,240*	-0,272*	0,673*	-0,094	-0,164*	1,000	
(9) Index of economic freedom	-0,560*	0,085	-0,425*	-0,471*	0,597*	0,175*	-0,291*	0,630*	1,000

* $p < 0.1$

Source: Authors' calculations.

4.2. Methodology of empirical research

The paper examines the effects on poverty and income inequality of remittances as the primary exploratory variable and a set of other control variables. Two separate models are created, where the first model examines the impact of remittances on

poverty, and the second model examines the effects of remittances on income inequality of the sampled countries. We do not rule out the possibility that the relationship between remittances from abroad and poverty or income inequality may be non-linear, and we construct the models accordingly. The selected frameworks are adapted from Tokhirov et al.²⁷ and each of them represents a two-way error component model with an integrated error term:

$$Pov_{it} = \alpha + \beta_i X1_{i,t} + \gamma_1 Rem_{i,t} + \gamma_2 Rem_{i,t}^2 + u_t + \varepsilon_{i,t} \quad (1)$$

$$Ineq_{it} = \alpha + \beta_i X2_{i,t} + \gamma_1 Rem_{i,t} + \gamma_2 Rem_{i,t}^2 + u_t + \varepsilon_{i,t} \quad (2)$$

where Pov_{it} measures poverty through household final consumption expenditure (due to incomplete data series of poverty measures, we use this variable as a proxy, as has been done in some previous studies²⁸) for period t in country i , and $Ineq_{it}$ measures income inequality through the Gini coefficient²⁹ for period t in country i . $X1$ is the set of the control variables in the first model measuring the impact of remittances on poverty, and $X2$ is the set of the control variables in the second model measuring the impact of remittances on income inequality. The control variables in the first model consist of the logarithm of GDP per capita, domestic investments, the Gini coefficient, inflation, the gross enrollment ratio in tertiary school and the Index of economic freedom, and in the second model, the same variables without the Gini coefficient, which is the dependent variable. $Rem_{i,t}$ and $Rem_{i,t}^2$ are the remittance variables. Remittance variables can be endogenous to the control macroeconomic variables for various reasons such as reverse causality³⁰ or simultaneity³¹. Including a quadratic term in a regression model is a conventional approach to detecting the existence of a non-linear relationship between variables.

Several evaluation techniques can be applied to Equations (1) and (2). The simplest and easiest way to estimate the above equations is the use of the method of ordinary least squares. Also, fixed effects (FE) and random effects (RE) models are some of the standard choices. However, estimating the equations with these models is problematic because poverty and inequality are persistent over time, causing the error terms in both models to be serially correlated.³² Bias caused by serial correlation

²⁷ Tokhirov et al., op. cit.

²⁸ Bang et al. (2022); Chea (2021); Kakhkharov et al. (2021); Musakwa and Odhiambo (2022)

²⁹ Chea, op. cit.; Koechlin and Leon, op. cit.; Vacaflares (2018)

³⁰ Adams and Page (2005)

³¹ Meyer and Shera (2017)

³² Koechlin and Leon, op. cit.

can be avoided if lagged values of the dependent variable are introduced as the independent variable:

$$Pov_{it} = \alpha + \theta Pov_{i,t-1} + \beta_i X1_{i,t} + \gamma_1 Rem_{i,t} + \gamma_2 Rem_{i,t}^2 + u_t + \varepsilon_{i,t} \quad (3)$$

$$Ineq_{it} = \alpha + \theta Ineq_{i,t-1} + \beta_i X2_{i,t} + \gamma_1 Rem_{i,t} + \gamma_2 Rem_{i,t}^2 + u_t + \varepsilon_{i,t} \quad (4)$$

However, there is still a high probability that the dependent variables and the error term $\varepsilon_{i,t}$ are correlated. Even if the assumption of exogeneity between the lagged value of the dependent variable and the error term is met, Monte Carlo simulations show that fixed and random effects models are inconsistent for panels that have a smaller number of periods and are constant over time.³³ Given that data for Central and Southeastern European countries are limited due to transformations in their systems and averaging of data for analysis purposes, the probability that static regression methods generate inconsistent estimates is high. As a result, we need to consider a dynamic model.

To address the above questions and ensure that the estimates are robust, this study uses Arellano and Bond,³⁴ two-way system Generalized Method of Moments (sys-GMM). In addition, the proposed technique accounts for country-specific fixed effects by taking the first differences of the variables:

$$Pov_{it} = \theta Pov_{i,t-1} + \beta_i X1_{i,t} + \gamma_1 Rem_{i,t} + \gamma_2 Rem_{i,t}^2 + u_t + \varepsilon_{i,t} \quad (5)$$

$$Ineq_{it} = \theta Ineq_{i,t-1} + \beta_i X2_{i,t} + \gamma_1 Rem_{i,t} + \gamma_2 Rem_{i,t}^2 + u_t + \varepsilon_{i,t} \quad (6)$$

However, even after accounting for differences, initial endogeneity is still possible. The solution is to use instrumental variables that are related to the independent variables in the equation but not associated with the error term. The two-way GMM solves that endogeneity problem by using past values of the included independent variables as instruments to correct for endogeneity³⁵

5. DISCUSSION OF EMPIRICAL RESULTS

This section presents the results of our research on the impact of remittances on poverty and inequality. Since the estimates of equations (1) and (2) using fixed effects can be biased, we present the results of estimated equations (3) and (4) using a two-

³³ Forbes (2000); Tokhirov et al., op. cit.

³⁴ Arellano and Bond (1991)

³⁵ Hall (2004)

way system GMM panel data analysis. Equation (3) refers to the impact of remittances on poverty. As an independent variable, household final consumption expenditures are taken, and the leading independent variables are remittances and the squared variable of remittances to examine linear and non-linear dependencies. In addition, this model takes the following variables as control variables: the logarithm of GDP per capita, domestic investments, the Gini coefficient, inflation, the gross enrollment ratio in tertiary school and the Index of economic freedom. The results of the estimated equation are shown in Table 5.

Before explaining the results, it is necessary to check the instruments' validity and ensure the consistency of the estimation through the GMM method. The lagged values of the variables should serve as valid instruments, and the obtained system GMM scores can be considered consistent. The estimated regression passes both specification tests. Furthermore, the null hypotheses of no first-order and second-order serial correlation cannot be rejected at the 5% level. Therefore, the instruments used in the analysis are valid, the p-value of the Sargan tests is higher than 5% and the null hypotheses that claim this cannot be rejected.

Turning to the variables of interest, it is clear that remittances from emigrants and their squared value are statistically significant at 5% and 1%, respectively. The coefficient for remittances is positive, and the coefficient of squared value of remittances, which examines the non-linear relationship between the variables, is negative. This means that in the initial stages, remittances from abroad increase household final consumption expenditures. The increase in remittances by one p.p. of GDP increases final consumption expenditures by 2,5 p.p. However, the negative coefficient before the squared variable of remittances tells us that in later stages or when a more significant number of emigrants send remittances to their home country, they are no longer the same increase in final consumption expenditures but lead to their decline. Most likely, this can be explained by the fact that after a while, emigrants begin to take people from their immediate surroundings. Once those people also start sending remittances to their families and it multiplies in several stages, it forces families to save or invest most of that money instead of spending it. This confirms the inverted U-curve relationship between remittances and household final consumption expenditures.

Table 5: Two-way system GMM analysis of the model for measuring the impact of remittances on poverty

Dependent variable: Household final consumption expenditure	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Household final consumption expenditure (-1)	,336	,235	1,43	,152	-,124	,796	
Remittances	2,521	,862	2,92	,003	,831	4,21	***
Remittances²	-,13	,044	-2,94	,003	-,217	-,044	***
Inflation	,404	,162	2,49	,013	,086	,722	**
Index of economic freedom	-,044	,063	-0,69	,488	-,167	,08	
Gross enrollment ratio in tertiary school	,096	,084	1,15	,25	-,068	,261	
The logarithm of GDP per capita	-8,344	4,679	-1,78	,075	-17,514	,826	*
Domestic investment	,186	,093	2,01	,045	,004	,367	**
Gini coefficient	-19,722	38,536	-0,51	,609	-95,251	55,807	
Constant	111,949	67,413	1,66	,097	-20,177	244,076	*
Mean dependent var	61,814		SD dependent var		9,510		
Number of obs	110		Chi-square		455735,549		
AR(1)	-1,51		Sargan test		9,61		
Prob > z	0,132		Prob > chi2		0,212		
AR(2)	-0,23		Hansen test		5,29		
Prob > z	0,822		Prob > chi2		0,625		

*** $p < .01$, ** $p < .05$, * $p < .1$

Source: Authors' calculations.

About the other control variables, inflation significantly affects but has a positive sign compared to what is expected. Expectations of people can explain it. The people in these countries have faced terrible hyperinflations in past periods and had severe consequences from such crisis periods. When they expect inflation to rise and the goods and services they buy to become more expensive, they increase their consumption in the initial periods to continue saving. The logarithm of GDP per capita and domestic investments significantly affect final consumption expenditures. The logarithm of GDP per capita has a negative sign which means that as GDP per capita increases, people spend more of their income on durable goods, saving or investing. On the other hand, domestic investments tend to increase household final consumption expenditures. The economic freedom index does not significantly affect household final consumption expenditures. However, it has a negative sign: the increased freedoms in an economy make people invest more.

Regarding the impact of remittances on income inequality, the estimated regression passes both specification tests. The null hypotheses of no first-order and second-order serial correlation cannot be rejected at the 5% level. The instruments used in the analysis are valid, the p-value of the Sargan tests is higher than 5% and the null hypotheses that claim this cannot be rejected.

Remittances and their squared value are statistically significant at 5% and 1%, respectively. The coefficient of remittances is positive, and the coefficient of the squared value of remittances, which examines the non-linear relationship between the variables, is negative. Similar to when we reviewed the impact of remittances on household final consumption expenditures, when we test the effects of remittances on the Gini coefficient, remittances in the initial stages increase the Gini coefficient, but decrease it in the later stages. Moreover, here again, the inverted U-curve is proven. Koechlin and Leon³⁶ explain it with the fact that in the initial stages of migration history, with high migration and information costs, the opportunity costs of the decision to migrate can be afforded only by people in higher positions in the income distribution. The remittances sent by these migrants have the effect of increasing income inequality. However, because migrants in each country tend to establish a community that maintains close relations with their home communities and attracts people from their immediate surroundings, once this happens, migration and the remittances sent by migrants tend to reduce income inequality.

³⁶ Koechlin and Leon, op. cit.

Table 6: Two-way system GMM analysis of the model for measuring the impact of remittances on income inequality

Dependent variable: Gini coefficient	Coef.	St.Err.	t- value	p- value	[95% Conf	Interval]	Sig
Gini coefficient (-1)	,138	,155	0,89	,373	-,166	,442	
Remittances	,007	,003	2,13	,033	,001	,014	**
Remittances²	-,001	0	-3,15	,002	-,001	0	***
Inflation	0	,001	-0,40	,687	-,002	,001	
Index of economic freedom	0	,001	-0,32	,752	-,002	,001	
Gross enrollment ratio in tertiary school	,001	0	2,99	,003	0	,002	***
The logarithm of GDP per capita	-,063	,011	-5,58	0	-,085	-,041	***
Domestic investment	,002	0	5,77	0	,001	,002	***
Constant	,87	,144	6,04	0	,588	1,152	***
Mean dependent var		0,463					
Number of obs		110					
AR(1)		0,08					
Prob > z		0,937					
AR(2)		0,32					
Prob > z		0,749					
			SD dependent var			0,047	
			Chi-square			499433,569	
			Sargan test			13,27	
			Prob > chi2			0,066	
			Hansen test			6,13	
			Prob > chi2			0,524	

*** $p < .01$, ** $p < .05$, * $p < .1$

Source: Authors' calculations.

Of the other control variables, the Index of economic freedom has a negative sign, which is expected but not statistically significant. The gross coefficient of enrolled students in higher education significantly and positively affects the Gini coefficient. The logarithm of GDP per capita significantly affects the Gini coefficient. Growth in per capita income reduces inequality. On the other hand, domestic investments in the initial stages increase the Gini coefficient, but the effect is relatively insignificant.

6. CONCLUSION

This paper empirically examines the effect of remittances in the alleviation of poverty and in reduction of inequality in Central and Southeast European countries. Previous empirical studies have not resulted in unambiguous results, but in general indicate that remittances tend to reduce poverty in developing countries. On the

other hand, the effect on reducing inequality, the literature has provided diverging results. Although there is a growing body of literature covering the impact of remittances, this paper generally complements the lack of literature on remittance-related issues in the CESEE region. Also, limited research has been done to study the remittances-inequality and remittance-poverty relationship within non-linear specifications. To contribute to the existing knowledge about these relationships, we investigate empirically in a nonlinear setting how international remittances affect the income inequality and poverty patterns in 16 countries of Central and Southeast Europe during the 1995-2019 period.

Despite the numerous limitations in the availability of data for transition countries, the results are largely consistent with theoretical views and previous empirical studies for developing countries. The results indicate that in the initial stages, remittances increase inequality, however, in the later stages, they reduce inequality, thus providing evidence of an inverted U-curve relationship between the two variables. This supports previous theoretical work on endogenous migration costs, also confirmed in some empirical studies. Namely, in the initial stages of migration history, with high migration and information costs, the opportunity costs of the decision to migrate can be afforded only by people in higher positions in the income distribution. The remittances sent by these migrants have the effect of increasing levels of income inequality. However, because migrants in each country tend to establish a community that maintains close relations with their home communities and attracts people from their immediate surroundings, once this happens, migration and the remittances sent by these migrants will tend to reduce income inequality.

Our results imply an inverted U-curve between remittances and household final consumption. This means that in the initial stages, remittances increase household final consumption expenditures but in later stages or when a more significant number of emigrants send remittances to their home country, they no longer increase final consumption expenditures but lead to their decline. Most likely, this can be explained by the fact that after a while, emigrants begin to take people from their immediate surroundings. Once those people also start sending remittances to their families and it multiplies in several stages, it forces families to save or invest most of that money instead of spending it.

One important limitation of this study is the fact that we did not have data series for poverty measures for all analyzed countries, and we had to use a proxy for capturing the effect of remittances on poverty alleviation. It remains as a future task to examine

the role of remittances in reducing poverty more thoroughly with other poverty measures. In addition, theory and empirical studies also argue that institutional quality plays a role in strengthening the effect of remittances on poverty and inequality. However, in our study, we could not prove this, as the economic freedom index was not a statistically significant variable, despite having the expected sign. This can be addressed in future studies by using other indicators of institutional quality.

Despite the shortcomings, the results of the paper support the argument that remittances can play an important role in improving the quality of life of recipient households and in alleviating poverty and economic inequality, provided that poor households are the major recipients of these financial inflows. Several policy implications can be drawn from our findings. The continuous outflow of workforce from these countries weakens their labor markets and could lead to a lack of workforce and an increasing age dependence ratio of population, which makes the countries more dependent on remittances. In order to enhance the benefits from remittances, policy makers can take several policy measures, such as policies for development of the financial system, leading to reduced costs for sending remittances through formal channels. This would also enhance the monitoring of the level of remittance inflow to the countries. In addition, this should be accompanied by household level data gathered through surveys, which would include also the informal flows. It is important for policy creation to know the amount of remittance received and the way they are used. Evidence has shown that remittances are mostly used for investment and consumption of consumer durables, utilities, health expenditures and housing. Furthermore, it is suggested that in addition to keeping ties with the diaspora, migrants should be encouraged through state policies that remittances be invested more in capital projects beyond household consumption. However, facing poor quality of institutions, poor remittance recipients may hesitate to use remittances for long-term effective economic activities, such as education, health, and developing or expanding new businesses. This would negatively affect poverty and inequality in the longer term and would diminish the opportunities of family members to increase their human capital and earn better livelihoods on their own. Policymakers interested in enhancing the benefits of remittances among the poor can tackle institutional shortcomings by facilitating the procedures to open a new business, by promoting transparency regarding property rights documentation, and by reinforcing the law enforcement.

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