Remittances and inequality in Eastern European countries

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Very preliminary draft

Abstract

In this paper we want to study the effect of remittances on income inequality in Eastern European countries. For doing so, we consider a country level panel dataset of Eastern European countries and we make use of difference in difference and instrumental variables techniques. Our preliminary results show a reduction in inequality in Eastern European countries that joined the European Union (EU).

1 Introduction

The relationship between globalization and income inequality has been widely studied, particularly in terms of the effects of increasing trade and FDI openness on income distribution. Much less is known about the impact of international migration.

Indeed, there is an increasing importance in globalization of international migration, considered either as labour flows or as capital flows - namely remittances. However, while studies on the determinants and on the effects of labour flows have flourished in last years, less authors have focused on remittances that represent one of the consequence of migration. Studies on the role of remittances investigate either origin countries of such flows, or receiving countries. The few empirical studies that have analysed the effects of remittances in receiving countries find a role of remittances, as a component of globalization, on income inequality and poverty. All these studies consider self-conducted surveys in less developed countries.

In our empirical paper, using a cross-country panel dataset on Eastern European countries, we study the relationship between received remittances and income inequality. The novelty of our studies can be found in the strategy that we use for understanding the role of remittances on globalization. In fact, in order to determine the role of remittances, we use difference in difference estimation and instrumental variables techniques as well as a fixed effect approach.

The empirical model uses a panel dataset at the country-level, like in Guangnon (2013) and studies how income inequality, measured by different indexes, is affected by remittances and other factors usually involved, like other components of globalization, technology, education and sectorial employment. Due to the heterogeneity of the group of countries considered, the model is at first estimated with fixed effects. However, in order to disentangle the role of remittances, we make use of difference in difference estimation techniques, comparing

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two groups of countries before joining the EU and after joining the EU. Afterward, we consider the values of remittances obtained with difference in difference as instrumental variable and we plug it in the original regression. In this way we disentangle the effects of remittances on inequality from the other variables considered in countries that joined the EU. Our preliminary results show a statistically significant reduction in income inequality due to remittances. Considering the effects on the income held by different percentile, we find that there is an increase in the income held by the lowest twentieth percentile thanks to remittances while no statistically significant change in income held by the upper twentieth percentile. Hence, remittances are send to the poorer strata of population in eastern European countries that joined the EU leading to a positive role of remittances as a whole on income inequality in those countries.

This paper is organized as follows: first a brief review of the literature is given. Then, the data and the countries considered are described using some stylized facts as well. Finally the estimation techniques and the preliminary results are presented.

2 Review of the literature

In this section we present first of all the empirical studies that focus on remittances and inequality. These studies have found contrasting results. Then, we present the theoretical model in which the previous empirical papers can be framed.

Overall, the empirical studies that have analysed the effect of international labour mobility on income inequality and poverty in sending countries have found mixed results. Katseli et al. (2006) claim that an important role in explaining these contrasting results is played by the heterogeneity in the economic structures of the countries analysed. Other issues that motivate these contrasting results are the impact of State policy, the skills of migrants, the history of migration, the industries involved, the investment climate, and the size and geographical location of the sending countries.

According to Marfouk (2007), emigration leads to large income gains for migrants and households in sending countries. Households in the home country receive a share of these gains through remittances. At the same time non-migrating workers in the sending country have higher wages due to a drop in local labour supply. This leads to a reduction of income inequality and poverty. The studies by Adams and Page (2005), Acosta et al. (2007) on Latin America, and Anyanwu (2011) Gubert et alia (2010) on African countries, find similar results. Labour flows help to reduce the number of people living in poverty and they stimulate economic activities. Remittances play a major role in reducing inequality and poverty.

However, the role of remittances is debated. Other scholars, like Taylor and Lopez and Feldman(2010), have shown that even though remittances contribute to welfare, they do not help to overcome poverty at the beginning. Since migration is selective, only the richest can afford the costs and risks of migrating and most part of remittances are not for the poorest households, but for the richest. In the World Bank report on migration (2006), remittances are considered having income stabilizing effects at both the macroeconomic level and at the household level. International migration generates great benefits for migrants and their families, increasing incomes for both of them. Moreover, migration helps to reduce poverty for many households. The World Bank claims that low-skilled migration reduces significantly poverty in developing countries thanks to remittances, that are less volatile,
less pro-cyclical than other capital flows. Remittances are fundamental not only in reducing poverty but also for smoothing household consumption by responding positively to adverse shocks, and for increasing household expenditure in education, entrepreneurship and health, areas fundamental for development. So remittances affect poverty, directly by increasing the income of origin households and indirectly by encouraging growth and access to capital. Even though the positive link between remittances and poverty seems demonstrated, the effect of remittances on income inequality is still controversial. Remittances seem to have a mixed impact on reducing inequality.

However, these mixed results can be framed in the theoretical context developed by Lipton (1980) and Docquier( ). For both scholars of remittances on inequality is different consider the short and the long run. In the short run, only people that belong to the richest strata of the population can afford the high costs and risks associated with migrating, and thus remittances sent by these migrants to the origin households increase inequality. In the long run, thanks to the establishment of networks, the risks and costs of migration gradually diminish, and the impact of migrants’ remittances on inequality results smaller. The selectivity of migration is to be taken into consideration for explaining a reduced income inequality in the long run. If at the beginning only the richest can migrate, the initial effect of migration is to deepen inequality. Then, thanks to the establishment of networks and to the evolution of migration systems, costs and risk are reduced. And so even the poorest households can participate in international migration. Hence remittances become income-equalizers, and they eventually reduce poverty in migrant-sending areas. Again, as explaind by Marfouk (2007), contrasting results found in empirical papers can be explained not only considering the theoretical framework developed by Docquier and Lipton, but also considering differences in geographic and historic circumstances, such as the distance from high-income destination countries and the existence of networks of earlier migrants. In fact, proximity to high-income countries (like for Eastern European countries) and established networks make the cost of migration shrinking and so migration can be afforded also by poorer households.

3 Data and stylized facts

The empirical analysis is based on a panel of 15 Eastern European countries: Albania, Belarus, Bulgaria, Croatia, Estonia, Hungary, Latvia, Lithuania, Macedonia, Moldova, Poland, Romania, Slovakia, Slovenia, Ukraine. The time period of our analysis pans 12 years, from 1997 to 2009.

All the data come from World Bank database, except for KOF index that comes from KOF database (Swiss federal institute of Technology Zurich), education, that comes from Barro-Lee database, and agricultural and industrial shares of employment that come from the International Labor Organization’s (ILO) LABORSTA database. Data symbols and sources are shown with more details in Table 1.

Eastern European countries are an interesting pool of countries since they have experienced similar historian path till the beginning of the 90s. However, in the post communism period, these countries experienced different paths of economic development and it is interesting to analyze the different evolution. These countries share a stable population, without sharp changes in the last fifteen years. Ukraine is the most populated country, followed by Poland. All the other countries are definitely less populated; the smallest is Estonia with
around one million people. In terms of GDP, the richest country is Poland, that has ten times the GDP of Slovenia. After Poland, but with one third of its GDP, there are Hungary and Ukraine. Finally the poorest country is Moldova, with a GDP of around $ 5 billion. According to World Bank’s classification based on GDP per capita, in 2009, only Ukraine and Moldova are classified in the “lower income countries” group, with an income per capita between $1.006 and $3.975. Lithuania, Latvia, Romania, Belarus, Albania, and Hungary are in the “upper middle income countries” group and the remaining countries are “high income countries”. The country with the highest income per capita is Slovenia. In 2000, only Slovenia was classified among “high income” countries.

Most of these countries, with the exception of Ukraine, has been characterized by high economic growth after 2000, thanks to the implementation of liberalization reforms. In contrast, during the transition period, from 1998 till early 2000s, most of these countries has experienced poor growth performance, with current GDP still far below pre-transition levels. During the middle 2000s, the best performing countries were the Baltic states, Latvia, Lithuania, and Estonia, closely followed by Slovakia. Up to 2000, high unemployment rate was an intrinsic characteristic of all post-communist countries. For most of them the peak was around 2000, than it slowly went down reaching the Eurozone level. The minimum point is in 2007, where almost all economics, except for Slovakia, had an unemployment rate lower than Eurozone. However in 2008, due to international crisis, unemployment started to growth and in 2010 it reached the level of 2000. Eastern European countries are increasingly integrated to the rest of the world, mainly the other EU countries, through trade. Another important channel of international integration, particularly during the transition, has been the inflow of FDI. These countries have been attractive for foreign investors thanks to low wages, low tax rates and the endowment of an educated workforce.

3.1 Migration and remittances

Since 1989, when post-communism period started, a growing number of citizens of Eastern European countries has emigrated mainly to Western Europe and North America and even within Eastern Europe (EU). This trend intensified with the enlargement of the European Union in 2004 (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia) and in 2007 (Bulgaria and Romania) (see Figure 2). The countries where remittances are of most importance are Lithuania, Ukraine, Albania and Moldova (23% of GDP). After an ascending trend throughout the 2000s, remittance inflows to Eastern Europe declined by 18.8% in 2009 as a result of the global economic crisis. As many receiving economies are involved in the global crisis and as employment opportunities decline, income of migrants declines, along with their ability to send money at home. However the general trend between 1995 and 2010 is increasing. In terms of size, Poland was the top recipient of remittances in 2009, at US$8.2 billion. For no country in this region are remittances negligible. The increasing importance of remittances in studying in Eastern European countries is also due to the fact that unlike foreign direct investment, remittances are countercyclical with respect to origin countries, while procyclical with respect to host countries (World Bank, 2006; Frankel 2009). Thus, when conditions in receiving countries worsen, remittances increase. Remittances inflows are obviously positively correlated with emigration. Stock emigration on population is more significant in countries like Albania, Croatia and Moldova. Starting from 1990 all the countries show an increasing trend in emigration, sharper for Albania and Bosnia.
since 1990. However in 2000 the trend inverted for Czech Republic and Slovak Republic.

3.2 Inequality

In transition economies, just after liberalization in the 90s, inequality measured by the Gini index rose sharply and steadily. These calculations are made by some scholars (like Milanovic, 1998 and Atkinson, Rainwater, and Smeeding, 1995) using private household survey, since until late 1990s official data by OECD, World Bank and Eurostat were not available. During the 90s, there was not only an increasing income differentiation within countries, but also growing differences among countries. Central European countries have registered only moderate increases in inequality: their Gini Index rose, on average, from 21 to 24. The increase was greater in the Baltics (from 23 to 34), with the greatest in Moldova and the Slavic Republics of the former Soviet Union (from 24 to 40). From 2000 on, Gini index has slowed down in many Eastern European countries (Figure 3). Highest values are to be found in Baltic states, while the lowest values are for Slovenia, Czech Republic and Poland. These countries are the best performing in all the inequality indexes considered. The European quality of life survey (EQLS) (2007) analyses income distribution. The results underline that in new member states - all the countries that joined EU after 2003 -, living standards are markedly lower than in the former EU15. Moreover, disparities in household incomes across Europe are deep, since Bulgaria and Romania have very low incomes as for EU15.

As it can be noticed in Figure 1, remittances give a significant contribution to Gross Domestic Product (GDP) in many poor and middle income countries. Economies that are particularly affected by remittances can be found in Central America, North West Africa, Eastern Europe and Indian Subcontinent. Eastern European countries are mostly affected by remittance flows. Moreover, Central and Eastern European countries are characterized by availability of data thanks to recent surveys conducted by the World Bank. Thus, our study is focused on this pool of countries.

4 Empirical analysis

In this section, we empirically analyze the relationship between income inequality, measured by the Gini Index and other measures of income distribution such as income percentiles, and international migration, measured by remittances. In addition to measures of international labour mobility, our empirical exercise considers other possible factors affecting income inequality.

The structure of the identification strategy is as follows: first we look at country level data, estimating a fixed effect of globalization, technology, education and remittances (our variable of interest) on inequality. Second, for clearing our estimation, we make use of difference in difference techniques before and after joining the EU for obtaining a value of remittances for those countries that entered EU. Then, we consider these estimation of remittances as an instrumental variable and we plug them into the original fixed effect regression. Doing so we find out the role of remittances on income inequality in Eastern European countries that joined EU.
4.0.1 Fixed effect analysis

Following the literature on globalization and income inequality, we include some variables characterising the degree of international involvement of the countries, in terms of both trade flows and inflows of foreign capital through FDI. Secondly, we control for the structure of the economy, including variables measuring the share of employment in agriculture and in industry over total employment. In fact, moving from agricultural sector to industry improves the distribution of income, rising income of low-earning groups. Thirdly, we control for income sources (labour and capital) and for the size of population. The econometric model is estimated using a panel dataset of 15 countries (Albania, Belarus, Bulgaria, Croatia, Estonia, Hungary, Latvia, Lithuania, Macedonia, Moldova, Poland, Romania, Slovakia, Slovenia, Ukraine). Data are taken from 1997 to 2009. We follow a general approach to study the relationship between the chosen measure of income inequality and the measure of international migration, in line with the paper by Jaumotte et al. (2013). The basic estimated equation is of the following fixed-effects type

\[
Y_{it} = \beta_0 + \beta_1 \text{Remittances}/GDP_{it} + \beta_2 \text{Technology}_{it} + \beta_3 \text{Globalization}_{it} + \beta_4 X_{it} + \beta_5 \text{Education}_{it} + \varepsilon_{it}
\]

(1)

where \(Y_{it}\) is inequality index after taxes in country \(i\) at time \(t\). As inequality index we considered both the 20/20 ratio, the Gini index, the income shared by the 80th percentile, and the income shared by the 20th percentile. Remi/GDP are remittances inflows as percentage of GDP of country \(i\). For considering globalization we use not only the KOF globalization index, but also trade openness and FDI openness index. \(X\) is a vector of additional control variables at country level, Education comes from Barro-Lee database. Technology is internet users. All the variables are taken in log. in line with the paper by Jaumotte et al. (2013), we take also the Gini index in log as it makes this bounded variable behaves more like a normally-distributed variable hence better to ordinary least squares estimation. To check for robustness of the results we could use also a logistic transformation of the Gini coefficient (making the variable completely unbounded). As described in the dataset section, all the data come from World Bank database, except for KOF index comes from Swiss federal institute of Technology Zurich and agricultural and industrial shares of employment that come from the International Labor Organization’s LABORSTA database. The panel analysis is unbalanced, since some data are missing. This matter is particularly important for the Gini index series. In line with previous studies, the data have been interpolated with weighted average in order to find rounded values for the missing data. Social contributions are not considered since Gini index is taken after tax. In table 1 the sources of data are described and in table 2 there is the correlation matrix between all the variables.

Our preliminary results show that remittances on GDP decrease the ratio between 20th higher percentile (80th percentile) and the 20th lower percentile, the so called 20/20 ratio, with robustness check (see Table 3). Hence, the difference between these two groups has decreased, leading to lower inequality. In fact, decomposing the income held by different percentile, remittances have a negative impact on the share of income of held by the upper
twentieth percentile. Actually, one more unit of remittances lowers the share of income for the 80th percentile of 10% (see Table 4). In addition, considering the share of income for the 20th percentile, remittances have a positive effect. The marginal change of share of income for the 20th percentile for one more unit of remittances received is of -10% . (see Table 4)

Moreover this decrease in the 20/20 ratio is reflected in the Gini index. Indeed when we analyse the impact of remittances on Gini index, this is statistically significant. The index of globalization has a negative and statistical significant impact on the lower middle earners (relative to the median). Regarding sectorial employment, employment in industry leads to a reduction in income held by the lower twentieth percentile.

Instead, considering the Gini index as dependent variable, just remittances survives the robustness check and it decreases inequality. However, our country level fixed effect results are not sufficient to explain the role of remittances on inequality, due to the not proper disentanglement of remittances from other factors such as migration. Thus, for having more reliable results we make use of difference in difference techniques and instrumental variables.

4.1 Difference in difference estimation and instrumental variable

We make use of difference in difference estimation techniques, comparing two groups of countries with parallel inequality index paths before joining the EU and after joining the EU. The theoretical scheme is the one presented by Card (1990). In our case the first of May 2004 Slovakia, Hungary, Poland, Slovakia, Latvia, Estonia, Lithuania, Czech Republic, and Slovenia entered in the European Union and in 2002 the pre-agreements were signed. Following these pre-agreements, due to new and initial liberalization of private transactions, more remittances have been received in the countries, while migration, trade and FDI started to increase just after the actual entrance into the European Union. Instead, Romania, Bulgaria, Moldova, Albania, Croatia, Belarus, Ukraine, and Macedonia were not inside the European Union at the time. Albania, Poland, Romania, Slovakia, Slovenia, Ukraine, Hungary, and Lithuania shared a common Gini inequality index historical path till 2002 (see Figure 3). It is important to notice that inequality was similar in paths, not in level, but this is sufficient for showing the difference in difference. Indeed, after EU pre-agreements, there has been a huge increase in remittances inflows, due to the pre-agreements as it can be noticed in Figure 4. Hence, to explore the effect of this large influx of remittances on the inequality index of countries entering the European Union in 2004 and signing the agreement in 2002, we have at first compared, the remittances received in the treated group and in the control group before and after the policy change. Afterwards, we have taken the difference of inequality in the New European countries before and after the policy in the difference in the control countries before and after the policy (the difference in difference). The effect on inequality of the inflows of remittances, of capitals and of goods, so of globalization in new european countries is determined, exclusive of other changes happening over time. We have considered both countries that signed the pre-agreements in 2002 (Slovakia, Hungary, Poland, Slovakia, Latvia, Estonia, Lithuania, Czech Republic, and Slovenia) and the ones that signed the pre-agreements in 2004 (Romania and Bulgaria) Using difference in difference techniques we have adjusted for the problem of unobserved differences between treated and untreated that are correlated with outcomes, hence solving the possible problem of overestimating the effect of entering the EU. Entrance in the EU is exogenous since the requirements for entering do not consider inequality. In addition, the problem of time -trends has been solved, hence the
2001 crisis does not modify the estimations. The identification strategy for understanding the
effect of remittances follows the following steps: first, the reduced form of the treatment on
the inequality index is performed, then, using a Two-Stage Least Squares technique (2SLS)
we introduce the treatment as instrumental variable in the fixed effect estimation defined
in the previous section, for solving any possible problem of endogeneity of remittances with
inequality. The reduced form for a generic member of any groups with repeated cross sections
is
\[
\text{Remitt}_i = \alpha_0 + \alpha_3(t_i \cdot d_i) + \eta_i \tag{2}
\]
\[t = 1 \text{ marks the post-treatment period}
\]
\[d = 1 \text{ marks the treated group}
\]
Our preliminary results show that the coefficient of the treatment is statistically significant
considering as dependent variable the Gini index (see table 3). This show that due to EU
enlargement inequality has actually increased.

Then, we would like to perform the 2SLS, firstly performing a fixed effect regression of
Remittances/GDP on T and get predictions for Remittances/GDP, say \(\hat{\text{Remitt}}\) secondly a
fixed effect regression Y (inequality index) on \(\hat{\text{Remitt}}\)
\[
\text{Remitt}_{i_t} = \hat{\beta}_0 + \hat{\beta}_1\text{treatpost}_{i_t} + \hat{\beta}_2\text{Technology}_{i_t} + \hat{\beta}_3\text{Globalization}_{i_t} + \hat{\beta}_5X_{i_t} + \hat{\beta}_6\text{Education}_{i_t} \tag{3}
\]
\[
\text{ineq}_{i_t} = \beta_0 + \beta_1\text{Remitt}_{i_t} + \beta_2\text{Technology}_{i_t} + \beta_3\text{Globalization}_{i_t} + \beta_5X_{i_t} + \beta_6\text{Education}_{i_t} + u_{it} \tag{4}
\]
By building predictions for remittances in the second stage through the instruments T we cor-
rect for the correlation between the error term and the independent variable. This produces
2SLS parameter estimates.

Since the treatment is significant we can consider the results of the difference in difference.
In table 5 results for the estimates of remittances as an instrumental variable are shown.
Remittances have a significant, negative, effect on income inequality measured as twenty on
twenty ratio. Close to significance is the impact of remittances on Gini index. Considering
the quantile distribution of income, remittances have a positive and significant impact on the
income held by the lowest twentieth percentile. Instead the highest twentieth percentile is not
affected by remittances. This lead to conclude that remittances received by Eastern European
countries now included in European Union reach the lower strata of population. This fits
perfectly the second stage of Lipton theory, for which, when costs of migrating reduce (due
in this case to the entrance in EU, to probably the creation of migrants networks in previous
years and to a reduction in remittances cost) also the poorer can afford to migrate and
hence send back remittances. Thus, remittances lead to a reduction in income inequality.
Other factors that affect income inequality are human capital, sectorial employment, and
globalization. ICT affects significantly the twenty on twenty ratio increasing inequality. In
fact, just the highest twentieth percentile are positively and significantly affected by internet.
This probably is due to the high costs of owning an internet connection in the early years
of 2000s. Another important result is the significant negative sign of human capital on the
income held by the lowest twentieth percentile. This should be carefully analysed considering
microlevel data on education and income inequality.
5 Conclusions

We show that our fixed effect results for EU Eastern European countries are supported by our estimations with remittances instrumented. Thus, remittances decreases income inequality both considering Gini index and twenty on twenty ratio. The magnitude of the effect of remittances is obviously different, due to the different techniques used, but significance and signs are likewise. Regarding the other variables considered, signs are held constant considering the different techniques but significance differs. Other factors that affect significantly income inequality considering both techniques are sectorial employment and globalization. These results are consistent with the second stage of Lipton theory, for which, after the reduction in migration costs, remittances lead to a reduction in income inequality. Considering the income held by the lowest and the higher twentieth percentile, both estimations find a positive and significant impact of remittances on the income held by the lowest twentieth percentile while no significant effect on the higher twentieth percentile. Thus, through this role of remittances, we can say that migrants that send home remittances come from the lower strata of population. This can be explained, in frame with Lipton and Docquier theory, by migrants’ networks created during '90s, by close geographical proximity of these countries with rich Western Europe, and by the entrance in EU. All these facts determine to lower the cost of migrating from Eastern Europe in Western Europe.

6 References


Dumont J-C. and Lemaˆ ıtre G. (2005) "Counting Immigrants and Expatriates in OECD Countries: A New
Perspective”, Paris: OECD.
European quality of life survey (EQLS) (2007)
Appendix

Figures:

Figure 1. Personal remittances received in the World on GDP in 2011.

Source: World Bank Indicator data.

Figure 2. Emigration on population

Source: World Bank
Figure 3. Gini index after tax

Source: World Bank
Figure 4. Slovakian and Romanian remittances over GDP confronted with GDP

Source: World Bank
# Tables

## Table 1: Variables definition

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Variable</th>
<th>Description</th>
<th>Source</th>
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<tbody>
<tr>
<td>giniindex</td>
<td>Gini Index</td>
<td>Gini Index after tax</td>
<td>World Bank</td>
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<tr>
<td>twenty</td>
<td>Twenty on twenty ratio</td>
<td>Twenty on twenty ratio</td>
<td>World Bank</td>
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<td>Perc_50</td>
<td>Income share held by the highest 20th percentile</td>
<td>Income share held by the highest 20th percentile</td>
<td>World Bank</td>
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<td>remi</td>
<td>Remittances</td>
<td>Remittances inflows</td>
<td>World Bank</td>
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<tr>
<td>tradeopen</td>
<td>Trade openness</td>
<td>Import/Export/GDP</td>
<td>UNCTAD</td>
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<td>Education</td>
<td>Berg Lee index for education</td>
<td>Berg Lee database</td>
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<tr>
<td>internet</td>
<td>Internet users</td>
<td>Internet users per 100 people</td>
<td>World Bank</td>
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<td>KOF globalization index</td>
<td>Economic globalization + Political globalization + part 3 of Social globalization</td>
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## Table 2. Correlation matrix

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<th>fdi</th>
<th>kofglobal</th>
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<td>.486</td>
<td>.347</td>
<td>.128</td>
<td>.116</td>
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### Table 3. Results with fixed effects.

<table>
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<tr>
<th>Variable</th>
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<th>Gini (with robust se)</th>
<th>20/20 (with robust se)</th>
<th>20/20 (with robust se)</th>
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<td>-0.0040**</td>
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</tr>
<tr>
<td>internet</td>
<td>0.0001</td>
<td>-0.0000</td>
<td>-0.0035</td>
<td>0.0005</td>
</tr>
<tr>
<td>Industry share</td>
<td>0.0019</td>
<td>0.0017</td>
<td>-0.1123</td>
<td>-0.1159</td>
</tr>
<tr>
<td>Agri share</td>
<td>-0.0030</td>
<td>-0.0033</td>
<td>-0.0254</td>
<td>-0.0372</td>
</tr>
<tr>
<td>kof global</td>
<td>0.0026</td>
<td>0.0581</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fdi</td>
<td>0.0004</td>
<td></td>
<td>0.0035</td>
<td></td>
</tr>
<tr>
<td>Trade open</td>
<td>0.0006</td>
<td></td>
<td>0.0099</td>
<td></td>
</tr>
<tr>
<td>_cons</td>
<td>-0.5231</td>
<td>-0.6165</td>
<td>5.7728</td>
<td>6.1113</td>
</tr>
</tbody>
</table>

Legend: * p<0.05; ** p<0.01; *** p<0.001

In the first column, results for:

$$Gini_{it} = \beta_0 + \beta_1 Remittances/GDP_{it} + \beta_2 Technology_{it} + \beta_3 KOFGlobalization_{it} + \beta_5 X_{it} + \beta_6 Education_{it} + \epsilon_{it}$$

In the second column, results for:

$$Gini_{it} = \beta_0 + \beta_1 Remittances/GDP_{it} + \beta_2 Technology_{it} + \beta_3 TRADE_{it} + \beta_7 FDI_{it} + \beta_5 X_{it} + \beta_6 Education_{it} + \epsilon_{it}$$

In the third column, results for:

$$Twenty\_ratio_{it} = \beta_0 + \beta_1 Remittances/GDP_{it} + \beta_2 Technology_{it} + \beta_3 KOFGlobalization_{it} + \beta_5 X_{it} + \beta_6 Education_{it} + \epsilon_{it}$$

In the fourth column, results for:

$$Twenty\_ratio_{it} = \beta_0 + \beta_1 Remittances/GDP_{it} + \beta_2 Technology_{it} + \beta_3 TRADE_{it} + \beta_7 FDI_{it} + \beta_5 X_{it} + \beta_6 Education_{it} + \epsilon_{it}$$
Table 4. Results with fixed effects considering the highest twentieth percentile and the lowest twentieth percentile.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Perc_80 (with robust se)</th>
<th>Perc_80 (with robust se)</th>
<th>Lower_20 (with robust se)</th>
<th>Lower_20 (with robust se)</th>
</tr>
</thead>
<tbody>
<tr>
<td>remi</td>
<td>-0.1303*</td>
<td>-0.1033*</td>
<td>0.0412***</td>
<td>0.0336***</td>
</tr>
<tr>
<td>indexofhum</td>
<td>0.0048</td>
<td>-0.5240</td>
<td>-0.1622</td>
<td>-0.0433</td>
</tr>
<tr>
<td>internet</td>
<td>-0.0076</td>
<td>0.0254</td>
<td>-0.0007</td>
<td>-0.0100</td>
</tr>
<tr>
<td>Industry_share</td>
<td>-0.2538</td>
<td>-0.2024</td>
<td>0.1275*</td>
<td>0.1092*</td>
</tr>
<tr>
<td>Agri_share</td>
<td>-0.0565</td>
<td>-0.0426</td>
<td>0.0384</td>
<td>0.0351</td>
</tr>
<tr>
<td>kofglobal</td>
<td>0.1754</td>
<td>-0.0484*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fdi</td>
<td></td>
<td>-0.0308</td>
<td></td>
<td>0.0068</td>
</tr>
<tr>
<td>Tradeopene</td>
<td></td>
<td>0.0310*</td>
<td></td>
<td>-0.0058</td>
</tr>
<tr>
<td>_cons</td>
<td>4.3665</td>
<td>3.5828</td>
<td>1.9818</td>
<td>3.6537</td>
</tr>
</tbody>
</table>

Legend: * p<0.05; ** p<0.01; *** p<0.001

In the first column, results for:

\[ \text{Highest}_{20i} = \beta_0 + \beta_1 \text{Remittances/GDP}_{it} + \beta_2 \text{Technology}_{it} + \beta_3 \text{KOFGlobalization}_{it} + \beta_4 X_{it} + \beta_5 \text{Education}_{it} + \epsilon_{it} \]

In the second column, results for:

\[ \text{Highest}_{20i} = \beta_0 + \beta_1 \text{Remittances/GDP}_{it} + \beta_2 \text{Technology}_{it} + \beta_3 \text{TRADE}_{it} + \beta_4 \text{FDI}_{it} + \beta_5 X_{it} + \beta_6 \text{Education}_{it} + \epsilon_{it} \]

In the third column, results for:

\[ \text{Lowest}_{20i} = \beta_0 + \beta_1 \text{Remittances/GDP}_{it} + \beta_2 \text{Technology}_{it} + \beta_3 \text{KOFGlobalization}_{it} + \beta_4 X_{it} + \beta_5 \text{Education}_{it} + \epsilon_{it} \]

In the fourth column, results for:

\[ \text{Lowest}_{20i} = \beta_0 + \beta_1 \text{Remittances/GDP}_{it} + \beta_2 \text{Technology}_{it} + \beta_3 \text{TRADE}_{it} + \beta_4 \text{FDI}_{it} + \beta_5 X_{it} + \beta_6 \text{Education}_{it} + \epsilon_{it} \]
Table 5. Results with remittances instrumented

<table>
<thead>
<tr>
<th>Variable</th>
<th>diffdiff</th>
</tr>
</thead>
<tbody>
<tr>
<td>treatedpost_cons</td>
<td>1.403*</td>
</tr>
<tr>
<td></td>
<td>3.378***</td>
</tr>
<tr>
<td>N</td>
<td>195</td>
</tr>
</tbody>
</table>

Legend: * p<0.05; ** p<0.01; *** p<0.001

Table 5bis. Remittances as IV, 2SLS results.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Ginilv</th>
<th>20/20 lv</th>
<th>Highest20lv</th>
<th>Lowest20lv</th>
</tr>
</thead>
<tbody>
<tr>
<td>remi</td>
<td>-0.012</td>
<td>-0.152*</td>
<td>-0.303</td>
<td>0.171*</td>
</tr>
<tr>
<td>indexofhum</td>
<td>0.031*</td>
<td>0.404***</td>
<td>0.847**</td>
<td>-0.392**</td>
</tr>
<tr>
<td>internet</td>
<td>-0.000</td>
<td>0.015*</td>
<td>0.043*</td>
<td>-0.015</td>
</tr>
<tr>
<td>Industry_share</td>
<td>-0.24***</td>
<td>-0.251***</td>
<td>-0.617***</td>
<td>0.261**</td>
</tr>
<tr>
<td>Agri_share</td>
<td>-0.004***</td>
<td>-0.025</td>
<td>-0.065*</td>
<td>0.021</td>
</tr>
<tr>
<td>kofglobal</td>
<td>0.006***</td>
<td>0.056**</td>
<td>0.139**</td>
<td>-0.058**</td>
</tr>
<tr>
<td>_cons</td>
<td>0.095</td>
<td>19.859***</td>
<td>72.555***</td>
<td>-6.566</td>
</tr>
</tbody>
</table>

Legend: * p<0.05; ** p<0.01; *** p<0.001