IMPACT OF INTERNATIONAL REMITTANCES ON INCOME INEQUALITY – THE CASE OF ASIAN COUNTRIES

By

Aisalkyn Musabaeva

THESIS

Submitted to
KDI School of Public Policy and Management
in partial fulfillment of the requirements
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ABSTRACT

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Migration in Asia is one of the sore points, because it brings significant consequences to the social and economic development of the countries. One of the results of migration is remittances. With increasing of the migration flows, the international remittances are increased dramatically. This research explores the impact of remittances on income inequality in Asian countries using annual data from World Bank, statistical committees and national banks of each country from 1970 until 2010. According to the previous researches conducted on this issue, the impact of remittances on inequality remains unclear. This relationship depends on several factors: 1) who receive remittances; 2) migration history; 3) methodological approach used (remittances considered as exogenous factor or remittances considered as a substitute for domestic earnings). In this paper will be used panel data model with 23 Asian countries and period of 40 years from 1970 until 2010. Number of observations is 920. The result after running the panel data fixed effects model showed that in the higher income economies the Gini coefficient will decrease more than in the lower income economies with the given increase in the share of remittances.

Dedicated to my beloved family and friends

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ABBREVIATIONS AND SHORTENINGS

GDP	Gross domestic product
CPI	Consumer Price Index
GINI	Gini coefficient
OLS	Ordinary Least Squares
GMM	Generalized Method of Moments
WB	World Bank
IMF	International Monetary Fund
FFR	Financing Facility for Remittances
IFAD	International Fund for Agriculture Development

INTRODUCTION

By 2011, the number of migration flows increased dramatically from 120 million in 2000 to over than 200 million migrants, which is almost 4 % of world population (Erica Marat 2009, 1). This number is growing year by year. In addition, there is a significant increase of migration flows from Asian countries over the last twenty years. Migration in Asia is one of the sore points, because it brings significant consequences to the social and economic development of the countries. One of the results of migration is remittances. With the increase in migration flows, the international remittances have also increased dramatically. During 17years, remittances in nominal and real value were constantly growing, except 2009, when international monies fell down because of the world economic crisis.

In 2010, the share of international remittances in GDP constituted almost 26% in Kyrgyzstan, 39% in Tajikistan, 22% in Nepal, etc. The real figure of remittances flows is much higher: there are no any sources on the exact amounts of unofficial transfers. Some researchers as well as politicians believe that such a serious money support could affect the existing inequality in the republic. However, the question on quantitative impact of foreig n remittances on income inequality in Asia remains unanswered. By increasing the income inequality in the recipient country, the number of social problems can be observed such as the increase of the gaps between rich and poor people. The growth of income inequality can also bring the increase of the poverty in the recipient country. One of the reasons of income inequality can be remittances. This research explores the impact of remittances on income inequality in Asian countries using annual data of World Bank, statistical committees and national banks of each country from 1970 until 2010.

According to the previous researches conducted on this issue, the impact of remittances on inequality remains unclear. This relationship depends on several factors, some

of them are 1) who receive remittances; 2) migration history; 3) methodological approach used (remittances considered as exogenous factor or remittances considered as a substitute for domestic earnings). Thus, the hypothesis of the paper is that the increasing flows of international remittances decrease income inequality in Asian countries. There is no well-developed general theoretical model for impact of international remittances on income inequality. In order to understand the international remittances influences income inequality, one needs to do empirical testing.

In the current paper, the model is based on the work of Ebeke and Le Goff (2009). Scholars used panel data model in order to prove the relationship between international remittances and income inequality. In this paper, a panel data model will be used, in the case of 23 countries and period of 40 years. In model described in this paper is the only one dependent variable – Gini coefficient. It measures the income inequality of the country. The range can be from 0 to 1 or from 0 to 100. The model includes five independent variables: international remittances as a share of GDP (only official) - the main independent variable, GDP per capita, consumer price index, interaction term of remittances as a share of GDP and GDP per capita and GDP per capita squared.

Coefficients of all explanatory variables except inflation (1% significance level) are significant at 5 % significance level. They are GDP per capita, GDP per capita squared and interaction term (rem/GDP and GDP per capita). P-value of GDP per capita squared is 0.050; p-value of interaction term is 0.000. Coefficient of remittances is significant at 1% significance levelwith probability (p-value) of 0.000, so we reject the Ho. The results showed us that the impact of remittances on income inequality depends on the level of development of the country and the initial level of income of the migrants.

The structure of the paper is the following: first, in the Theoretical background there

is analysis of the existing literature on remittances impact on income inequality. Then, in the Empirical justification part, the quantitative analysis and the results of the main econometric model will be described. Finally, the Concluding remarks and recommendations are at the end of this paper.

LITERATURE REVIEW

2.1. Theoretical background and analysis of literature on correlation between remittances and income inequality

Remittances can bring a number of positive effects, for instance, they support recipient country, but in some cases, increasing flows of remitted money can cause some negative effects to the economy of the recipient country. For example, remittances can have a negative effect on real exchange rate of the recipient country by appreciating local currency of the recipient country. This appreciation may lead to negative trade balance, which means low competitiveness of the country in the international market (Acosta et al.2007, 2) Remittances may increase poverty. (Wodon2003, 3) According to the statistics, major part of remittances spends on consumption. Therefore, when the amount of international remittances increases, people begin to consume more.

Thus, the demand on goods and services increases and this may lead to inflation, so the poor people cannot afford themselves many goods. This may lead to decrease of the economy's efficiency. One more effect that is negative is dependence of the country's economy on constant remittance flows. Government of the recipient country considers remittances as a constant channel of incoming money. It may not propose any regulations and policies in order to cover its deficits or debts, because international remittances as an additional source of income may finance all debts of the state. (Poprzenovic2007, 13) Migrant’s transfers can also increase income inequality in the recipient country. This issue we intend to examine in this paper.

In this part of the paper, the theoretical background and analysis of the literature are provided. The issue of impact of international remittances on income in equality still remains unclear. Many researchers try to find remittances-income inequality relationship, but there

existed and exist argues on this topic. The works used in this paper were classified into three groups by author's findings and results: remittances increase income inequality, remittances decrease income inequality, and the inequality equalizing effect of remittances or mixed effects.

The findings of the first group of analyzed works (Viet; Docquier and Rapoport; Taylor et al.; Kimhi; Adams et al.) showed that international remittances may increase income inequality. For example, Taylor et al. considered remittances-income inequality relationship in the case of rural Mexico and proved empirically that "International remittances have an une qualizing effect on rural incomes; a 10% increase in remittances from migrants abroad increases the Gini coefficient by 0.3%" (2005, 19). In the case of Ghana, there was 17.4% increase of Gini with inclusion of international remittances. (Adams et al. 2008,24). In the case of Vietnam, Viet's findings implied that mostly rich people benefited from international transfers, so, remittances in Vietnam increased income inequality, but in a small magnitude.

The findings of the second group of analyzed literature (Pfau; Gubert et al.; Zhu and Luo; Acosta et al.) implied that international remittances can reduce income inequality. Using data from household survey in the case of Mali, Gubert et al. (2010) showed that remittances decrease Gini coefficient by about 5%. Zhu and Luo found that income inequality decreases when remittances increases. They considered rural Chinese province Hubei and they found out that Gini coefficient comprised 0.53 when they analyzed the scenario with no remittances and when the authors considered the case with international transfers, Gini index comprised 0.454. Therefore, remittances decreased income inequality."…participation in mi gration not only increases household income but also lowers inequality in rural areas. Poor households largely benefit from migration/remittances" (Zhu and Luo 2008, 20)

Acosta (2007) also got results on negative relationship between income inequality and remittances, he found out that 1% increase in remittances GDP ratio would lead to decrease of Gini coefficient to 0.06-0.12%. Pfau in his work in the case of Vietnam proved that remittances decrease income inequality:" international remittances reduce the Gini co efficient from 0.4113 to 0.3870" (2008, 15).

Finally, the last group, that comprises the rest of analyzed literature, found out mixed effect of remittances and income inequality. The authors used in their paper two methodological approaches: 1) remittances as exogenous factor and 2) remittances as endogenous factor. As a result, they got a mixed effect or in other words two different results by using these two methodologies. For example, by using the methodological approach when remittances are exogenous, the authors got income inequality decrease and when considering remittances as a substitute there is an increase of income inequality. Brown et al. (2007) in their study used both these approaches. With the first approach, they found out that remittances decrease income inequality. Gini coefficient decreased for 2.5%. While with the counterfactual approach, the results were opposite: the remittances tended to increase inequality in the state - Gini coefficient increased for 10%. Therefore, the different approach used could lead to different results for the same country. However, using the same approach other authors Poprzenovic; Koechlin and Leon; Zhu and Luo represented that the remittances have an egalitarian impact on income distribution.

All these results can be explained by the main conception of most analyzed literature - the impact of remittances on income inequality depends on who migrates and receive remittances (Docquier and Rapoport; Ebeke and Le Goff; Gonzalez-Konig and Wodon); migration history of the recipient country (Poprzenovic; Arslan et al.; Taylor et al.; Koechlin and Leon Poprzenovic; Taylor, Mora and Adams); types of migration whether internal or

international; and methodological approach used (almost all authors whose works were analyzed in current paper).

First, who migrates and sends money, or “initial distribution of wealth”Docquier and Rapoport, Ebeke and Le Goff, Gonzalez-Konig and Wodon stated in their works that remittances-income inequality relationship depends on who is migrating. If migrates a member of poor family then poor people will benefit from remittances, which means that income inequality decreases in the recipient country. If migrant is a member of rich family, then only rich families will receive remittances and Gini index increases. As Gonzalez-Konig and Wodon (2005, 2) wrote in their paper:

> Theoretically, whether remittances contribute to increasing or decreasing income inequality depends on who is migrating and remitting. If migrants come from poorer segments of the population, the impact of their remittances is more likely to contribute to a reduction in inequality because on average poorer families are going to receive the extra income from remittances. On the other hand, if migrants tend to be better off, remittances are more likely to be inequality increasing since comparatively richer families will benefit from the extra income.

The impact of remittances on income inequality also depends on who is receiving international transfers. If the low-income family receives the money transfers, remittances are more likely to decrease income inequality. If rich family receives international monies, remittances are more likely to increase income inequality.

Poprzenovic; Arslan et al.; Taylor et al.; Brown et al.; Kimhi; Koechlin and Leon noted the second factor of remittances-income inequality dependence - a historical background of migration of the recipient country. Their findings imply that the effect of remittances on inequality differs with the stage of migration history in the focusing country. Koechlin and Leon, (2006, 6). They indicated that at the early migration stage, only rich people could cover all the costs of migration, which was not cheap at that time. When more and more people started migrating, the costs of migration diminished because of networking. Migrants could get more information and assistance, so it was easier for them to move to another country.

To the same results came Docquier and Rapoport:”Hence, a decrease inmigration costs may generate higher inequality in the first stages of the migration history. In the long-run, however, lower migration costs are always beneficial in terms of reduced economic inequality” (2003)

Simply saying, if the history of migration is long enough in the recipient country or region, then the effect of remittances are more likely to decrease the income inequality. For example, Taylor (2005) in his work made two researches on the remittances and income inequality relationship in rural Mexico. They made them in 2005 and in 2010 respectively. In these researches, he demonstrated that in 2005 in the considered regions remittances had a positive effect on income inequality. In 2010, the statistics showed that in the same regions this positive relationship changed to the negative one, so the impact of remittances on income inequality became negative.

Therefore, the result is that time or increasing of the migration history have an influence on the relationship between remittances and income inequality, because migration costs (passport costs, transportation, settlement, etc.) become lower. The impact of remittances became negative, because migration history increased for five years; it became longer in 2010 in comparison with the situation in 2005. Arslan et al (2010) showed the same effect. On the example of Mexican villages,he found out that in the village with long history remittances from USA decreased income inequality and in the village with little migration remittances increased income inequality. Brown et al. (2007), in his paper got the same effect, that in country with longer migration history remittances lead to decrease of income inequality. He considered this relationship in the case of two Pacific island countries Fiji and Tonga. The result is that in the country with longer migration history such as Tonga, remittances bring egalitarian effect and in Fiji income inequality increased.

There are three phases of migration: the “innovative stage”, the “early adopter stage” and the “later adopter stage” (Ebeke 2009, 7). The first “innovative stage”, in that period of time only richest people migrated, because they could pay the high costs of migration (passport, transportation, settlement, etc.) It was a stage of income inequality growth, because only better off population received remittances. The second “early adopter stage” is income inequality decreasing time because ordinary or poor people started to migrate. Finally, the third “later adopter stage” is again increasing income inequality period. This was explained by difference between two types of families: first type was with migrants who worked and sent money for many years and second type was without migrants. First families received remittances for a while and accumulated them, but the rest of families did not get monies from outside. That is why in “later adopter stage” it was increase of income inequality. Again, wealthy people got remittances (first type of families) and the others did not.

Next factor of remittances-income inequality relationship is that the results may vary depending on what kind of remittances was considered – international or domestic. Zhu and Luo (2008) in their study on internal remittances and inequality in China found out that internal remittances have egalitarian effects on rural incomes in China. The same findings were described by Kimhi (2010) for Dominican Republic and by Pfau (2008) for Vietnam. Kimhi in his research also stated that local remittances bring equalizing effects than international. Adams et al. (2008) earlier showed that international remittances generally have a greater impact on reducing poverty and increasing inequality than internal remittances: “For households with internal remittances, the inclusion of remittances causes the Gini coefficient to rise by 4% and for households with international remittances, the inclusion of remittances causes the Gini to increase by 17.4%”.

These results are not surprising. The costs of international migration are much higher than the costs of internal migration. We can suppose that the poorest population of the country, whose increased income could have led to equalizing effect, cannot actually afford international migration. Therefore, the main beneficiaries of international migration will be the class of rich and middle-income households. The international migration will lead to the increase of existing inequality, while internal migration will have smaller effect on inequality because of lower costs (so, poorest fraction of population will also participate in internal migration and get benefits from it). As you remember in the current research paper, we examine international remittances impact on inequality. According to these researchers, we can suppose that international remittances are more unequalizing (or less equalizing) than domestic ones.

From analyzed literature, all authors highlight that the results of remittances impact on income inequality could vary with the two approaches used: 1) remittances considered as exogenous factor; 2) remittances as a substitute for domestic earnings. Almost all authors used both of the methodologies and got different results. Let us consider each of them separately.

1) **Remittances considered as exogenous factor:** If to take worker's remittances as exogenous factor, one just need to add them to the existing income,so the received monies will be treated independently from domestic earnings. Therefore, increase of received foreign monies increases the income for the same amount. Pfau et al., Brown et al., Gonzalez-Konig and Wodon used this approach. However, it is important to mention that the use of this simple methodology could result in an overestimation of the impact of remittances on the distribution of income. According to Brown et al. (2007), this methodology can bring an overestimation of the remittances impact on income distribution, because it does not include opportunity costs of migration. This methodology does not

include opportunity costs, because here the counterfactual scenario with no migration and remittances is not considered. Therefore, the case when migrant does not go abroad and work at home is not considered, that is why they do not include opportunity costs of migration. That is why most of the current researchers use the second methodological approach.

2) Remittances as a substitute for domestic earnings: Remittances as a substitute for domestic income (as an endogenous factor) or counterfactual scenario without migration and remittances.Simply saying, one need to find out in which situation inequality level is lower or higher, in situation with remittances and migration or in a situation with no remittances and no migration. Scholars that used this approach are Zhu and Luo; Adams et al., Docquier and Rapoport; Gubert et al. First, one should test empirically the situation where there are no any migrants and migration, meaning that the migrant stays at home and works at the home country, then consider the same country and test the scenario where there is migration and remittances. “The focus of this approach is on determining whether inequality level is lower in the current scenario with migration and remittances, than in a scenario with no-migration”. (Gubert et.al 2010, 6)However, this approach is preferred to the first one, because of some methodological difficulties: “Most notably, the attempt to predict (estimate) the incomes of migrant households on the basis of the observed incomes of non-migrant households is subject to the problems of selection bias and endogeneity”. (Adams et al. 2008, 4)

By using this approach, Zhu and Luo (2008) found out that while considering the case with no migration, Gini index was 16.7% higher than in the case with migration and remittances. The same result got Acosta et al. (2007), considering the case of Latin America's countries. He found out that with the exception of Nicaragua and Peru, all countries hav e higher Gini coefficients for scenario with non-remittances income, suggesting that if remittances were exogenously eliminated– inequality would increase. (Acosta et al 200 7, 17)

After analyzing all the literature existed on this remittances-income inequality relationship, the conclusion can be made that impact of international remittances on income inequality depends on who receive remittances, migration history of the recipient country and methodological approach used.

2.2. Theoretical model

There is no well-developed general theoretical model for the impact of remittances on income inequality. In order to understand the international remittances impact on income inequality we need to use empirical model.

Almost all authors who analyzed the relationship between remittances and income inequality used the theoretical model provided by Gabriel Gonzalez-Konig and Quentin Wodon (2005). The model has several assumptions:

1. Convex preferences over a single consumption good
2. Three types of families: rich, poor and middle
3. Each family has two members: An old worker and a young worker.
4. Workers among families have different incomes, but each member of a family has the same income.

5. The cost of migration is high enough and there is imperfect credit market, so families cannot borrow to pay migration costs.

6. Gains from migration are low enough, so that old workers do not migrate. Only young members of families migrate.

7. Gains from migration are continuous in income and zero only at two income levels (w- and w+). (Figure A, Appendix A).

8. Total income in the economy is equal to one.

From the assumptions 3 and 7 it results that according to member's age and income there are four types of workers: old workers do not migrate; workers with an income below w- (or poor workers) do not migrate; workers with an income above w+ (or rich workers) do not migrate either. The last type is all young workers with income in [w-; w+] (or middle class) migrate.

If total income of poor people P^- and rich people is P^+, so total income earned by middle class is $(1- P^- - P^+)$. When people begin to migrate, the proportions of income change. Konig gave, also, one assumption, that only middle class can migrate, because for rich and people is not essential to migrate. Rich families do not migrate, because there are no positive gains from migration. In addition, poor families do not migrate, because the migration costs are too high for them. That is why, when middle class workers migrate, then total income in the economy is reduced to:

$$1 – 0.5 (1- P^- - P^+) = 0.5 (1+ P^- + P^+)$$

Because only young members migrate, it is deducted half of the middle class income. According to equation above, it is easy to estimate part of total income earned by poor and rich people.

For poor families: $P^- / 0.5 (1+ P^- + P^+)$, or $2 P^- / (1+ P^- + P^+)$

For rich families: $P^+ / 0.5 (1+ P^- + P^+)$, or $2 P^+ / (1+ P^- + P^+)$

This model is oriented to specific country: there is no equal distribution of income among population, as it is seen above. Christian Ebeke (2009) considered this model in the example of developing countries and added two more elements that are important in the case of finding out relationship between remittances and income inequality. They are: a) migration costs varying with countries and b) the difference level development of recipient countries.

a) In the first element, authors assume that migration costs are different between countries.

In order to indicate this difference, "we use passport cost in the sending country as well as the distance between the source country and the main destination of its international migrants" (Ebeke and Le Goff 2009, 11) Christian Ebeke named Ca and Cb the migration costs faced my workers which indicate high and low costs of passports, where Ca>Cb. Description of different migration costs and forecasting of who will migrate is represented on Table A1 (Appendix A). There are two types of households: poor and rich one and two types of costs: high and low. Rich households can defray migration in both cases 3 and 4, whatever costs are high or low. When there are low costs, in second case poor household begin to migrate. In this case, number two, remittances may lead to income inequality decrease. The case number one is equivocal, we cannot predict whether they will migrate or not. Here, we need to consider the level of development of the sending country.

b) It is important to consider the level of development of home country in order to understand and define who can afford migration. There are two countries: poor and rich, two types of households: poor and rich. Table A2 describes this situation (Appendix A). Let us consider it with the help of indicating wages.

Christian Ebeke (2009) took W1 as the mean of the relatively poor country and W2 as the mean wage of the relatively rich country, where $W1 \leq W2$. Therefore, poor households of

the poorer country receive wage $W1^P$ and rich household earn the wage $W1^R$, where$W1^P$< $W1^R$.The same way with rich country: poor people earn the wage $W2^P$ and the rich households earn the wage $W2^R$, where $W2^P$< $W2^R$. There is an assumption, that households choose whether to migrate or not only by additional profit or gain from migration. In the eighth case on Table A2, there will be no migration, because rich households of the rich country do not interest in leaving the home country. There is no additional gain in income, because $W2^R \approx$ Wm (worker's wage in the host country). Conversely, rich people of poor countries do migrate, because $W1^R$ < Wm (case number 7). They have big financial interest in emigration. Of course, we can say that poor people of both poor and rich countries have an incentive to migration, because of $W1^P$ < Wm and$W2^P$ < Wm. In the case number 6, poor households of the rich country in comparison with poor people of the poor country can defray migration costs and have a gain from leaving the home country. That is why they migrate and in this case remittances will decrease income inequality in the recipient's country, because additional financial profit will enjoy less well-off population. The case number 5, again, describes again ambiguous situation, where we cannot forecast whether someone will migrate or not. In this condition, people will migrate only if migration costs are not high. To understand these two ambiguous cases 1 and 5, Christian Ebeke considered both migration costs and the level of development at once. The results can be seen on Table B (Appendix B).

"If we want to know where migrants are located in the income distribution, we have to combine both conditions necessary to migrate" (the financial capacity and the financial interest) (2009).

Christian supposed that households can migrate only when their wages are lower than the wage in the host country W < Wm, and if the wages in home country can cover migration costs W > C. There is no migration for rich households in rich countries, whatever the

migration costs are high or low. They do not have any incentive to migrate, because the difference between the wage they earn in home country and the wage in the host country is not essential. As Christian wrote, this difference could not cover the psychological costs of emigration. On the contrary, rich households in relatively poor countries have a big motivation to migrate. They can afford high emigration costs and to get additional profit from the wage difference $W1^R < Wm$ and $W1^R > C$. For poor people from rich country, they are, also, have a big incentive to leave home country and work somewhere else in foreign country. They also can defray migration costs, because they live in relatively rich country $W2^R > C$, and they can benefit from migration $W2^R < Wm$. In this situation, remittances could reduce income inequality in the recipient country, because poor people benefits from this. Relating to poor households of relatively poor country, they cannot migrate, because it is impossible to pay migration costs $W1^P < Ca$ (if they are high), even if they want to leave country because of financial perspectives $W1^P < Wm$. However, there is a possibility to migrate to a closest country with low migration costs $W1^P > Cb$, even their income is not very high, but enough to cover migration costs.

By summarizing the results given in Table B, it was described before that only in cases 3' (poor households in relatively poor country with low migration costs), 5' (poor households in relatively rich country with high migration costs) and 7' (poor households in relatively rich country with low migration costs) correspond to an income inequality reduction by worker's remittances. On the contrary, in cases 2' (rich households in relatively poor country with high migration costs) and 4' (rich households in relatively poor country with low migration costs) remittances may increase income inequality within home countries.

After analyzing this model we found out that, in the general case, somewhere international remittances may increase income inequality and somewhere they may lead to the

reduction of income inequality, it depends as it was written before on who migrates, historical background of the country, types of migration considered- domestic or international and methodological approach used. To understand the impact of remittances on income inequality in the case of Asian countries, there is a necessity of empirical testing of the hypothesis.

2.3. Empirical model specifications

Almost all scholars who analyzed relationship between remittances and income inequality used in their works different methodologies; someone used OLS Multiple Regression Model, others two-stage multinomial logit model. However, most of them specified in their paper model that uses IV (instrumental variable) - GMM (generalized method of moments estimator) approach and IV (instrumental variable) - OLS (ordinary least square method) approach. Some of the authors tested panel data model. They used data from household surveys of considered countries with such variables as Gini coefficient, remittances, migration population, distance between countries, education of migrated people, migration costs, etc.

In current paper, the model is based on work of Ebeke and Le Goff (2009). Scholars used panel data model in order to prove the relationship between international remittances and income inequality. In this paper will be used the same model, in the case of Asian countries and 40 year speriod. In model described in this paper is the only one dependent variable – Gini coefficient which represents income inequality and five independent variables: international remittances as a share of GDP (only official) - the main independent variable, GDP per capita, consumer price index, interaction term of remittances as a share of GDP and GDP per capita and GDP per capita squared. Number of observations is 920; time is from 1970 until 2010.

First, the White test was performed in order to in order to check for heteroscedasticity. The results showed us that we have heteroscedasticity problem, to get rid of this problem robust standard errors were performed. After performing the tests, we run panel data fixed-effects (within) regression.

EMPIRICAL PART

3.1. Methodology

In this part of this paper, there is a model specification, data description on considered variables and results after running a regression.

Methodology of this paper is the panel data model with a group of independent variables.

Our model looks like this:

$$y_{it} = \beta_o + \beta_i x_{it} + \alpha_i + v_{it}$$

Where X is the matrix of independent variables,

β_o- a constant and

$\alpha_{i\,-}$ is a country fixed effect(does not change over time, time invariant)

v_{it} – an error term (changes over time).

Our assumptions: $\{\alpha_i \sim x$ and $v_{it} \not\sim x\}$

In order to get rid of time invariant α_i, we performed difference in difference estimation or fixed effect estimation. Our final model looks like:

$$lgini = \beta_o + \beta_1 lrem + \beta_2 CPI + \beta_3 lngdpcap + \beta_4 lgdpxlrem + \beta_5 lngdpsq + v$$

Where

lgini – the logarithm of Gini coefficient,

lnrem – the logarithm of remittances as a share of GDP,

CPI-consumer price index,

lngdpcap- the logarithm of GDP per capita,

lgdpxlrem- the logarithm of the interaction (rem/GDP and GDP per capita)

lngdpsq- the logarithm of GDP squared.

3.2. The Variables

The dependent variable in current paper is Gini coefficient. “The Gini index measures the extent to which the distribution of income among individuals or households within an economy deviates from a perfectly equal distribution. A Gini index of 0 represents perfect equality, while an index of 1 implies perfect inequality.” (Koechlin and Leon 2006, 10)

The independent variable of interest for this study is international remittances. According to the International Monetary Fund’s (IMF’s) *Balance of Payments Manual*, remittances consist of three components:

• Compensation of employees comprising wages, salaries, and other benefits earned by individuals for work performed for and paid by residents of those economies other than those in which they are residents.

• Workers’ remittances cover current transfers by migrants employed in new economies where they are considered residents. A migrant is a person who comes to an economy and stays there, or is expected to stay for a year or more.

• Migrants’ transfers are contra-entries to the flow of goods and changes in financial items that arise from the migration of individuals from one economy to another. (Mogilevsky 2008,.4)

The values of the international remittances were taken in percentage term as a share of gdp of each country. In the model there is taken the logarithm of the remittances.

The matrix of control or independent variables consists of the following variables: the level of economic development of the home country, the inflation level, interaction term of remittances as a share of GDP and GDP per capita, and GDP per capita squared. Each of these variables may affect income inequality. GDP per capita represents the level of economic development. The inflation level is represented by CPI index. GDP per capita was taken as one of the independent variables, because changes in income can increase or decrease income inequality. Consumer price index measures changes in the price level of consumer goods and

services purchased by households[1]. CPI was taken, because it can affect income inequality through inflation.

3.3. Data description and limitations

The number of observations is 920. It includes Asian countries and forty years of time period. In current paper, only 23 of them were considered, because of the data absence. The countries were dropped because there is no data on the main dependent and main independent variables. Some countries have data on Gini coefficient, but do not have the data of remittances and vice versa. The annual data for Gini index for each country was taken from the World Bank data set for the period from 1970 until 2010. Results can be rough and biased because of unbalanced panel data. The data on Gini is available not for all countries and not for all years.

There were some problems with data on remittances, because it is available only on official international transfers sent through official channels. The lack of the data on unofficial remittances prevents to get reliable results on remittances - income inequality relationship. The official data for international remittances is available both from the World Bank dataset.

The data on other independent variables (CPI, GDP per capita) were taken also from the World Bank dataset.

3.4. Empirical Results

In this section are described results after running a regression model. STATA was used to perform the regression. Empirical analysis was started with White test in order to check for heteroscedasticity. The results showed us that we have heteroscedasticity problem, to get rid of this problem robust standard error tests were performed. After performing the tests, we run panel data fixed-effects (within) regression.

[1]The Oxford Dictionary of Economics

Table 1: Fixed-effects regression

Lgini	Coef.	Std. Err.	T	P>|t|	[95% Conf. Interval]	
Lrem	0.2215831	0.0526382	4.21	0.000	0.1173169	0.3258493
Lngdp	0.3153507	0.1589424	1.98	0.050	0.0005163	0.6301851
lgdpxlrem	-0.0346884	0.0084171	-4.12	0.000	-0.0513611	-0.0180158
Cpi	0.0001444	0.0003589	0.40	0.688	-0.0005666	0.0008553
lngdpsq	-0.0215414	0.0108978	-1.98	0.050	-0.0431279	0.0000451
_cons	1.889624	0.5616971	3.36	0.001	0.7770099	3.002238

Now, the model looks like:

lnGini = 1.889624 + 0.2215831lrem + 0.3153507 lngdp-0.0346884 lgdpxlrem+0.0001444cpi -0.00215414 lngdpsq,

Coefficients before independent variables show how they reflect dependent variable:

- *1% increase in remittances as a share of GDP will increase income inequality for 0.22 %,*
- *1% increase in GDP per capita will increase income inequality for 0.32 %,*
- *1% increase in interaction term of remittances as a share of GDP and GDP per capita will decrease Gini for 0.03%.*

The results are showed on the Table 1. R squared is 19%, meaning that 19% of variations of Gini coefficient can be explained by these given independent variables. Coefficient of the main dependent variable - remittances is significant at 1% significance level with probability (p-value) of 0.000, so we reject the Ho. Within the interval of 99 %, we are confident that there is a positive relationship between international remittances and income inequality. It means that increase of international remittances may increase income inequality

in considered countries. Even though we got positive relationship, we couldnot say that there could not be negative relationship between these two variables, because it depends on how these remittances were used. There is a possibility that here exists the effect, where some part of remittances used as investment and lead to income inequality decrease and another part of remittances used on consumption and lead to income inequality increase. Therefore, these two directions have different signs and they could mutually suppress each other, so as a result there is a possibility to have neither positive nor negative impact of remittances on income inequality. Additionally, we should focus on one more variable – the interaction term.

One more variable with significant coefficient is an interaction term (remittances as a share of GDP and GDP per capita) with p-value of 0.000. That means that the effect of remittances on income inequality depends on the existing income level of the migrants. In this case, we have gotten the negative relationship (-0.03%) between the interaction term and the Gini coefficient. Because of the interaction effect, with the given increase of remittances, the income inequality will decrease more in the countries with higher GDP per capita than in the countries with lower level of income.

Thus, the effect of the remittances depends on the initial development level of the country. One of the reasons that can explain such pattern might be the level of education in the countries. It might be that in the countries with higher income, the education level is high, so the migrants are high qualified. In opposite, migrants are less qualified in the countries with lower income. Low-qualified migrants earn less and send less in comparison with high-qualified migrants send. That means that the gap between poor and rich people will shrink less in the countries with the lower income levels.

According to the theory, there is a possibility that in higher income countries people can cover the costs of migration in comparison with the countries with lower income where people sometimes cannot cover all expenditures of migration, meaning that share of

remittances is likely to be larger in the countries with high-income levels. This might be one more explanation of our result that in higher income countries Gini coefficient will decrease more than in the lower income countries. (We should point out that we do not compare developed and developing countries. We consider developing countries where some of them have higher income level and others have lower income.)

POLICY IMPLICATIONS

From the results of this paper, there is a positive relationship between international remittances and income inequality. However, this relationship depends on the level of income of the recipient country. In the future government of the country should construct policies to decrease the negative consequences of remittances in order to decrease Gini coefficient. Some researchers suggest reducing gaps between rich and poor people by imposing property taxes for luxury goods or to introduce progressive income tax.

Remittances can be used as an effective toolkit for the economic development strategy and the reduction of the poverty and income inequality. According to Vargas-Silva (2009), international transfers are considered as a right policy to fight with poverty, especially for Asia, where two thirds of the poorest people of the world live. Many migrants from developing Asian countries are from the low-income households, and the transfers that they send are used in some countries to cover the basic needs. The examples of such countries are Indonesia, Philippines, Cambodia, Kyrgyzstan, Vietnam, Tajikistan, etc. According to the research conducted by ADB, remittances can be an effective tool to fight against the poverty. This happens, first, because migrant's transfers increase the incomes of the receiving households, which can be used either for consumption or for investment. In this case, when international monies are used for investments is the key point of the effectiveness of the remittances, because it can be used for the human capital investment. People can spend more

money on the education and health care. They also can be used for the investment for the businesses, so remittances foster development of the business environment. This creates new labor places for people to work and earn money.

When the government set the right policies to foster the economic development of the country, it is possible to get good results. The same situation is with the international remittances; if to use them in a right way, they have many advantages. The government should construct policies to involve remittances in the development strategy for the country. Nowadays, we have many international organizations, which goal is to decrease poverty in developing countries and they successfully use migrant's transfers as one of the tools. For instance, the FFR (Financing Facility for Remittances) project of the International Fund for Agricultural Development developed some programs to support migrants and their families. There is a project for the Pilipino women-migrants to teach them how to save and invest in their future. They are trained on budgeting, goal setting, saving and investing, so these women can invest their money for their future (FFR Update 2011, 2). This program gives an insight to the one of the ways in which international money can be used for the economic development. In addition, there are some programs, for example in Romania, where they teach and give advice to the migrants on successful business start-ups in their home country by using the remittances as their first capital (FFR Update 2011, 3)

According to Vargas-Silva (2009), international organizations can help people to understand that they can use migrant's transfers for taking more risky loans to open the small businesses:

> This task is very relevant for Asian developing countries, because in addition to dealing with credit market shortcomings, migration can be an instrument in dealing with insurance market inefficiencies. It is possible to ponder that the possibility of receiving remittances may allow the household to enter more profitable, but riskier businesses, given that if things go south, remittances can be used as a source of support for the household (2009, 19)

Because the remittances are considered as a continuous flow of the money, they can be used as a source of a lender of last resort. That is why people can take more risky loans by knowing that they can pay back with the international monies send by their migrant family member. This gives people an opportunity to start an entrepreneurial activity, so they can increase their income. The problem here is that people do not know about such opportunities, that is why here international organizations should provide with their assistance.

> Nonetheless, even with all these potential benefits of remittances in terms of small business formation, many households lack the understanding and expertise necessary to start these enterprises. International organizations can be of great assistance if they provide advice to households in this regard. Spreading this information will facilitate the use of remittances as a tool for development (Vargas-Silva et al. 2009, 19).

International remittances can be efficient tool for the economic development if to know how to use them in a right way. In this case, the question is addressed to the governments of the countries, whether they can construct proper policies to use international monies to improve economic situation and decrease the income inequality and poverty.

CONCLUSION AND RECOMMENDATIONS

The purpose of this paper was to analyze relationship between international remittances and income inequality in Asian countries. Along with the remittances impact on many different economic issues, the relationship of remittances and income inequality attracts much attention of the economists. Although many researches were conducted on this issue, the impact of remittances on inequality remains unclear.

The hypothesis of the paper is that there is a negative relationship between international remittances and income inequality in Asian countries.

Determination of the impact of international remittances on income inequality brought different results to different scholars. Many researchers try to find remittances-income inequality relationship, but there existed and exist argues on this topic. The works that was used in this paper were classified into three groups by author's findings and results: remittances increase income inequality, remittances decrease income inequality and, the last one includes such results as inequality equalizing effect of remittances or mixed effects.

There is no well-developed general theoretical model of remittances impact on income inequality. The underlying idea of the relationship between international remittances and income inequality depends on several factors: the empirical approach used, the migration history, and with who is receiving remittances. In order to understand the international remittances impact on income inequality we need to use empirical model.

In order to test our hypothesis empirically, paned data fixed-effects regression was used in this paper. In model described, there is the only one dependent variable Gini coefficient and five independent variables. The independent variables are remittances as a share of GDP - as a main independent variable, GDP per capita (represents the level of

economic development of home country), CPI – the inflation level, interaction term of remittances as a share of GDP and GDP per capita and GDP per capita squared.R squared is 19%, meaning that 19% of variations of Gini coefficient can be explained by these given independent variables. Coefficient of remittances is significant at 1% significance level with probability (p-value) of 0.000, so we reject the Ho. With 99 %, we are confident that there is a positive relationship between international remittances and income inequality. The results showed us that we have here positive sign relationship between Gini index and international remittances. Coefficients of remittances as it was written before and inflation are significant at 1% significance level. The reduction of Gini coefficient is larger in the country with higher income level than in the country with lower income level with the given increase in the remittances. This shows that relationship of remittances and income inequality depends on the level of development of the country.

Coefficients of all explanatory variables except inflation are significant at 5 % significance level. They are GDP per capita, GDP per capita squared and interaction term (rem/GDP and GDP per capita). P-value of GDP per capita squared is 0.050; p-value of interaction term is 0.000.

The results that were got in this research can be biased and underestimated, fi rst of all, is usage of only official data on remittances, no one count and record unof ficial data and there are no any sources of such data. Next reason is that on income inequality may have an effect many other variables that were not included in current research.

Recommendations for further studies:

In order to get more accurate results, it is necessary to take bigger sample. Big sampling will give more opportunity to explain the correlations between variables. It will be possible to conduct the same research in the case of the all Asian countries if we could find data on Gini and remittances. Because in the most countries' remittances are constantly increasing and they have an impact on the economy, it will be better to have some institutions or organizations which will record the unofficial remittances flows.

APPENDICES

APPENDIX A

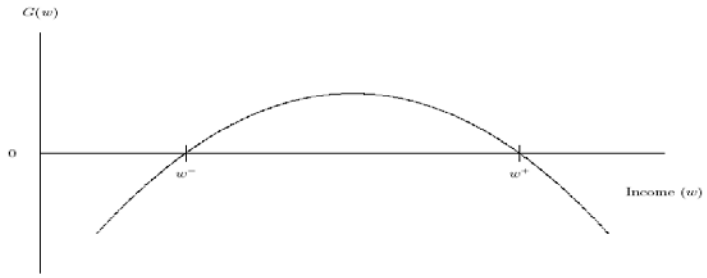

Figure 1: Gains from migration for different incomes.

Figure A. Gains from migration for different incomes
Gabriel Gonzalez-Konig and Quentin Wodon (2005, 7)

Table A1. Migration costs and financial capacity to migrate

TAB. 1 – Migration costs and financial capacity to migrate

		COUNTRY	
		High costs	**Low costs**
		a	**b**
HOUSEHOLD	**Poor**	? (1)	*Migration* (2)
	Rich	Migration (3)	Migration (4)

Note : Wrintings in italics indicate that in these cases, migration and remittances can lead to a reduction in income inequality.

Ebeke, Christian, and Maelan Le Goff. (2009, 34)

Table A2. Level of development and financial interest to migrate

TAB. 2 – Level of development and financial interest to migrate

		COUNTRY	
		Poor	**Rich**
		1	**2**
HOUSEHOLD	**Poor**	? (5)	*Migration (6)*
	Rich	Migration (7)	No migration (8)

Note: A familiy is called "rich" or "poor" according to the relative location it occupies in the distribution of income at origin. It is not a measure of the absolute poverty but a measure of the relative poverty. Thus, some households living in richer developing countries are called "poor" even though they may live over the poverty threshold defined by the World Bank.

Ebeke, Christian, and Maelan Le Goff. (2009, 35)

APPENDIX B

Table B. Level of development, migration costs and migration

Table 3: Level of development, migration costs and migration

		COUNTRY			
		High migration costs		Low migration costs	
		a		b	
		Poor	Rich	Poor	Rich
		1.a	2.a	1.b	2.b
HOUSEHOLD	Rich	Migration (2')	No migration (6')	Migration (4')	No migration (8')
	Poor	No migration (1')	*Migration (5')*	*Migration (3')*	*Migration (7')*

Ebeke, Christian, and Maelan Le Goff. (2009, 36)

APPENDIX C

Table C. List of Asian countries
(* shows 23 countries used in regression)

Afghanistan	Turkmenistan
Bangladesh*	Uzbekistan
Bhutan*	China*
Brunei	Japan
Cambodia*	North Korea
India*	South Korea
Indonesia*	Mongolia
Laos*	Taiwan
Malaysia*	Azerbaijan*
Maldives*	Bahrain
Myanmar	Iran*
Nepal*	Iraq*
Pakistan*	Israel*
Papua New Guinea	Jordan*
Philippines*	Kuwait
Singapore	Lebanon
Sri Lanka	Oman
Thailand*	Qatar
Vietnam*	Saudi Arabia
Kazakhstan	Syria
Kyrgyzstan*	U.A.E.
Tajikistan*	Yemen
Armenia*	
Georgia*	

APPENDIX D

Table D1. Remittances share in GDP, million dollars of USA

Ranking of Asian countries that were considered in current paper

	1970	*1980*	*Rank*	*1990*	*Rank*	*2000*	*Rank*	*2010*	*Rank*
ARM						4,575835	**5**	10,62587	**7**
AZE						1,083561		2,766601	
BGD		1,869574	**5**	2,585122	**5**	4,175134	**7**	10,81333	**5**
BTN								0,316606	
KHM						3,298466	**8**	3,28633	
CHN				0,054895		0,402331		0,89492	
GEO						8,945353	**2**	6,908804	**10**
IND		1,499998	**6**	0,750863	**9**	2,799646	**9**	3,128618	
IDN				0,145071		0,721241		0,978837	
IRN						0,529192			
JOR		20,03819	**1**	12,41875	**1**	21,80006	**1**	13,20311	**4**
KGZ						2,286726	**10**	27,62954	**2**
LAO				1,259301	**6**	0,038037		0,559934	
MYS				0,420726	**10**	0,365038		0,546897	
MDV				0,790371	**8**	0,35187		0,214108	
MNG						1,055505		4,45972	
NPL						2,029361		22,06151	**3**
PAK		8,643514	**2**	5,01436	**2**	1,453638		5,478613	
PHL		1,929098	**4**	3,306132	**4**	8,591038	**3**	10,73353	**6**
LKA		3,769314	**3**	4,989396	**3**	7,138818	**4**	8,385577	**8**
TJK								39,96968	**1**
THA		1,184195	**7**	1,140389	**7**	1,382589		0,553653	
VNM						4,298658	**6**	7,7612	**9**

Source: World Bank Database

Table D2. Top 10 countries of the world, remittances as a share of GDP

Rank	*1980*	*1990*	*2000*	*2010*
1	Lesotho, 60.99%	Lesotho, 78.57%	Lesotho, 61.99%	Tajikistan, 40.87%
2	Cape Verde, 28.16%	Samoa, 38.37%	Bosnia-Herzegovina, 29.19%	Lesotho, 27.6%
3	Jordan, 20.03%	Tonga, 21.096%	Jordan, 21.8%	Kyrgyzstan, 26.4%
4	Dominica, 14.55%	Cape Verde, 19.27%	Samoa, 18.77%	Moldova, 23.25%
5	Tonga, 13.3%	Kiribati, 18.1%	Cape Verde, 16.11%	Haiti, 22.21%
6	Egypt, 11.76%	St. Kitts & Nevis, 12.11%	Haiti, 15.77%	Samoa, 21.3%
7	Somalia, 9.4%	Egypt, 9.93%	Moldova, 13.96%	Tonga, 19.38%
8	Portugal, 9.145%	Dominica, 8.37%	El Salvador, 13.44%	Kosovo, 17.82%
9	Pakistan, 8.64%	Grenada, 8.31%	Jamaica, 9.89%	Honduras, 16.9%
10	Burking Paso, 7.7%	Morocco, 7.77%	Georgia, 10%	Guyana, 16.5%

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