Journal of Applied Economics and Business Studies, Volume. 4, Issue 4 (2020) 237-250 https://doi.org/10.34260/jaebs.4411

Journal of Applied Economics and Business Studies (JAEBS)
Journal homepage: https://pepri.edu.pk/jaebs
ISSN (Print): 2523-2614
ISSN (Online) 2663-693X

Foreign remittances and income inequality in Pakistan: A Pooled Regression Analysis

Sana Suleman[1*] and Ahmed Raza Cheema[2]

[1] PhD Scholar, Department of Economics, University of Sargodha
[2]Assistant Professor, Department of Economics, University of Sargodha

ABSTRACT

The people from developing countries like Pakistan move to developed countries to earn their bread and butter. Consequently, such migrants remit a handsome part of their earnings to their dependents living in homeland. Foreign remittances have multidimensional impact on the economy of a developing country. The study evaluates the impact of foreign remittances on income inequality in Pakistan by estimating the set of fixed effect and random effect models using the pooled data from eight household income and expenditure surveys between 1998/99 and 2015/16. Gini coefficient as well as generalized entropy measure is used to estimate income inequality, but the results remain intact. It is observed that foreign remittances have statistically significant favorable impacts on income inequality in Pakistan. Further, the results are robust and insensitive to control variables (e.g. income and poverty measures, headcount ratio, poverty gap and squared poverty gap). The policy measure is that Bureau of Emigration and Overseas Employment (BEOE) should be empowered to explore the job opportunities in developed countries. The government should assist the migrants through subsidizing the visa and migration processes to capitalize the foreign remittances.

Keywords

Foreign Remittances, Income Inequality, Gini Coefficient, Generalized Entropy, Pakistan

JEL Classification
B17, B27, D6

1. Introduction

People move from place to place to get better compensation for their services. Remittance is income sent back by migrants to their homes. It is proven to be a major financial tool for many household living all over the world. The remittances received at household level improve the living standard of that family. The received income is used in purchasing basic commodities, attaining good health facilities and gaining better education level and use in for further investment (Buch et al, 2004; El-Sakka and McNabb, 1999). The remittances are less

* sana_economist@yahoo.com

subject to economic and political conditions, so the welfare of the household is more stable at the country like Pakistan (Qureshi, 2016).

The remittances are the important component of BOP. Balance of payments of the countries of origin improves via inflow of remittances (Solimano, 2003; World Bank, 2006). The balance of payments of several third world labor exporting countries has been largely reliant on the inflow of foreign remittances from migrants (Nishat and Bilgrami, 1991; Azad, 2005). International remittances have major impact at macroeconomic level when remittances are 4% to 31% of GDP (World Bank, 2010). It is the largest source of foreign exchange in developing nations resulting in reduction in external borrowings (Ratha, 2012). Remittances can cause economic growth to accelerate by increasing aggregate consumption and investment (Anyanwu & Erhijakpor, 2010)

Foreign remittances over the decades are growing. Flow of remittances increased in all six regions of the world. At world level the overall remittances received in 2010 were 470$ billion, in 2015 596$ billion, and in 2017 633$ billion. The overall estimated flow of remittances at world level in 2018 was $689 billion (World Bank, 2018). These were 12.4 percent of total remittances which is $131billion in South Asia on the whole (World Bank, 2018). In 2019, annual remittance flows to low- and middle-income countries (LMICs) were $550 billion which were three times higher than official development assistance ODA in flows (World Bank, 2020). Remittance flows were larger than FDI in 2019 as shown in diagram I in appendix (World Bank, 2020).

As far as Pakistan is concerned, transfers flow to Pakistan have shown track record of variations in resources of remittances in last few decades. Remittances took first jump in the 1970’s, when during the construction boom millions of Pakistani temporary migrants were engaged in in the Persian Gulf. Before it UK was leading with 54% share in the total inflow of remittances. Near the end of 1980s, the portion of overseas remittances from UAE and Saudi Arabia came to be extensively high. These streams reduced during the cheap oil turmoil of 1980's and the 1990's when Arab economies were dwindling. The Gulf war in the early 1990's also had a drastic effect on remittances to Pakistan. Later, in 1990s USA announced the green card policy, which make it a favorite workplace of labors from Pakistan and a huge number of heads moved to USA which significantly contributed to the home remittances.

After 9/11 terrorism incident in USA, the instability arose in USA which forced Pakistani workers to transfer their investments to homeland and intensive growth in remittances started. In FY 2001-02 transfer of money to Pakistan increased more than doubled due to USA inflows. This scale of sharp increase in remittance inflows from all foreign Pakistanis is stretched to a decade (Hasan, 2012). Remittances from the USA raised most, from $73.3 million in 2000 to over $1.7 billion in financial year 2008-09 (kock, 2011). Further, remittances to Pakistan increased at the time of natural tragedies, too. In October 2005 earthquake which affected northern Pakistan and victims got back in the better position financially by the remittances sent back by the Pakistanis abroad (Suleri and Savage, 2006). The Foundation of Pakistan Remittances Initiative (PRI) in 2009 was an effort to attract more

remittances through official channels, due to which remittances grew from under $1 billion in 2000 to $7.8 billion in 2008-09 (Government of Pakistan, 2010).

There has been an intense growth in the stream of remittances to Pakistan in recent few years, too (SBP, 2015). Remittances to Pakistan raised by 25.8 percent in 2011 over the previous year, making Pakistan the fifth leading remittance-recipient emergent state (GOP, 2011). The remittances showed increasing trend on YOY. These were 13.2 $billion in 2012, 13.9$billion 2013, in 15.8 $billion 2014 (PRI, 2015). In 2015 Pakistan stood on 5th position in remittances receiving in the Asian economies (World Bank, 2016). Around the globe 9 million Pakistanis were working. Such Pakistanis made over US$ 19.3 billion in remittances in the year 2017(Ali, 2020). Pakistan received $2.097billion foreign remittances in December 2019 demonstrating a 15.25percent month on month (mom) increment when contrasted with $1.819bn transmitted in Nov 2019, and roughly 20pc increment than $1.748bn recorded in December 2018(SBP,2020). These substantial inflows of remittances assisted in dropping current account deficit, reducing poverty and growing foreign exchange reserves.

There is almost consensus that remittances reduce poverty, but about income inequality there are conflicting views. Milanovic, (1987), Stark et al. (1988), Adams (1991), Ahlburg (1996), Handa and King (1997), Barham and Boucher (1998), Rodriguez (1998), Lerman and Feldman (1998), Adger (1999), Adams et al. (2008), Beyene (2014), Devkota (2014), Taylor (1992), Taylor and Wyatt (1996), Adams (1989), Mishra (2007), Acosta et al (2008) showed that the remittances had adverse effects on income inequality. It may be outcome of different reasons. Remittances are included in top income quintile group because the migrants are from upper income groups and have adverse effect on income distribution in the country (Adams, 1991). The opportunity of migration may not generally be available among the populace. The poor household cannot move abroad easily due to financial issues and complex documentations (Morton et al. 2010). Remittances may not generally improve the circulation of income, and as opposed to what many accept they may indeed, add to inequality inside the nation at income level (Ravanilla & Robleza, 2003,). Usually remitters come from wealthier families and urban regions. These households can manage the expenses and risks related to migration (Rodriguez and Horton 1995; Rodriguez 1998; Taylor, Lopez and Feldman 2010; Devkota, 2014).Thus, only rich people has access to migration facilities and this is the reason the gap between rich and poor become widened and income inequality increased among masses.

The following studies found that remittances had favorable effects on income inequality (Taylor et al. 2005; Mckenzie & Rapoport, 2007; Zhu and Luo, 2008; Chiwuzulum Odozi et al. 2010; Zhu and xubei, 2010; Pfau and Giang, 2011; Gubert et al , 2010; Bang et al,2016;Ahmad, 2017). The studies showed that emigration facility may be available to the lower classes (e.g. poor) and they send back money to their homeland and after some period of time their families become better off. In this way income inequality decreased among different classes. But, Beyene (2014) did not find any impact of remittances on inequality.

As far as Pakistan is concerned, here also mixed results regarding the relationships between income inequality and foreign remittances were produced by previous studies (e.g. Mughal and Diawara, 2010; Mughal and Anwar, 2012, Mushtaq et. al., 2017) using the time series data consisting of 30 observations. There are some reservations about the use of time series income inequality data. 1) Interpolated values were used more than the actual ones[1]. 2) Non-comparable[2] inequality data were used. 3) Only one inequality measure- Gini coefficient was used. Our study contributes to the existing literature of Pakistan in following ways: Firstly we use dis-aggregated data (i.e. province-level) to address mixed existing findings of the impact of the foreign remittances on income inequality for analysis. Secondly, our study uses the actual, comparable and larger data set consisting of 64 observations derived from micro datasets from 1998-99 to 2015-16. Thirdly, this study uses two inequality measures (Gini coefficient and generalized entropy[3]).

Remaining part of the paper is as follows: the second section explains the data used and empirical strategies employed. Then, section three discusses the results. The final section concludes and suggests some policy implications.

2. Data and Methodology

2.1 Data

There are so many Household Income and Expenditure Surveys (henceforth HIES) available from 1963 to 2015-16 (e.g. 1963/64, 66/67, 68/69, 69/70, 70/71, 71/72, 79, 84/85,85/86, 86/87, 87/88, 90/91, 92/93, 93/94, 96/97, 98/99, 2001/02, 04/05, 05/06, 07/08, 10/11, 11/12, 13/14, 15/16). There are three phases of change in questionnaires/methods of collection of data. First, there was one questionnaire from 1963 to 1987-88 consisting of 11 data sets. Second, in 1990 HIES questionnaire was revised and used from 1990 to 1996-97 consisting of 4 years. Thirdly, in 1998-99 again questionnaires were revised and data collection methods were improved. This questionnaire is being used for onward years. So, the previous studies (e.g. (Mughal and Diawara, 2010; Mughal and Anwar, 2012; Mushtaq et. al. 2017) used the time series data consisting of actually only 14 data points from 1963 to 2006, 1979 to 2007-08 and 1980-2010, respectively that was not comparable. These studies used more interpolated values than actual values.

But, this study uses all of the data sets (e.g. 1998-99, 2001-02, 2005-06, 2007-08, 2010-11, 2011-12, 2013-14, 2015-16) that are comparable and from where the variable foreign remittance can be measured. Between these surveys there is only one HIES data set for year 2004-05, where foreign remittances are not available. So the data for that year are not being used. There are four provinces including urban and rural areas in Pakistan. So by using one observation for urban and rural provinces each, we get eight observations for one year. By

[1] Pakistan's inequality data series are derived from HIES over time, but there are breaks between different HIES data sets. So a time-series approach requires interpolation for missing years. Thus, the previous studies used only actual 14 values and the others (about 16 values for income inequality) were interpolated.
[2] The data collection methods and questionnaires have changed over time. See for details data section.
[3] This measure satisfies all of the axioms to be fulfilled by an appropriate inequality measure see Cheema and sial 2013.

pooling the data we get 64 observations for the eight years. Such like data have never been used in Pakistan.

2.2 Methodology

This study estimates inequality measures in Pakistan before estimating long run relationship between foreign remittances and income inequality.

2.2.1 Measuring Inequality

There are different methods to measure inequality. Some measures that are apparently sensible do not behave in a reasonable way. For instance, variance of any distribution is dependent on income scale: e,g; if incomes doubles it quadruples the estimates of inequality. This property of a measure is not appropriate. A measure of inequality is appropriate when it satisfies the set of axioms [see for detail, (Cheema and sial ,2013)].

This study estimates the following inequality measures to find the inequality in Pakistan:

2.2.1.1 Gini Coefficient

Corrado Gini a statistician developed Gini coefficient measure. It is the area between lorenz curve and line of equality divided by the total area below the line of equality and lorenz curve (Todaro, 2002) see figure-2.

GINI Coefficient = A/A+B

A: area between line of equality and Lorenz curve

B: total area below line of equality and Lorenz curve

Mathematically it is written as:

$$Gini = \frac{1}{2n^2\bar{Y}}\sum_{i=1}^{n}\sum_{j=1}^{n}\left|y_i - y_j\right|$$

The gini coefficient lies between 0 and 1.The value near to zero presents equality of income distribution. As the value approaches to one means the distribution of income becoming more unequal. Zero represents perfect equality, whereas one depicts perfect inequality. The first four axioms of measuring inequality, Gini coefficient fulfilled these too.

2.2.1.2 Generalized Entropy Measure

The general form of Generalized Entropy is as:

$$GE(\alpha) = \frac{1}{\alpha^2 - \alpha}\left[\frac{1}{n}\sum_{i=1}^{n}\left(\frac{y_i}{\bar{Y}}\right)^{\alpha} - 1\right]$$

Where n: number of individuals', y_i : the Individual i's income, i Є (1, 2…n) and $\bar{Y} = \left(\frac{1}{n}\right)\sum y_i$, the average income. GE measures ranges between 0 to infinity. The value zero represents equal income distribution. When GE approaches to higher values, it illustrates inequality of income. The α takes any value, denotes the difference of income at different

levels in the income distribution. GE measure is more sensitive for lower values of α for lower tail distribution and for higher values α for upper tail distribution. Usually, α takes the value of 0,1 and 2. Where α = 0 represents that the lower tail income has more weights for income differences; α = 1, implies that equal weights are given to the distribution; where as α = 2 applies more weights to upper tail gaps.

L'Hopital's rule implies that when GE uses the parameter 0 and 1, then it will become two of Theil's indices (Theil, 1967). The mean log deviation and Theil index are as given:

$$GE(0) = \frac{1}{n}\sum_{i}^{n} \log \frac{\bar{Y}}{y_i}$$

$$GE(1) = \frac{1}{n}\sum_{i=1}^{n} \frac{y_i}{\bar{Y}} \log \frac{y_i}{\bar{Y}}$$

2.2.2. Relationship between income inequality and foreign remittance

In order to find the long run relationship between income inequality and foreign remittances, the study pools the data by taking one observation from urban and rural areas each of four provinces from 1998-99 to 20015-16 making 8 observations per year in Pakistan. There are eight data sets. So, we use 64 observations for analysis. The characteristics of rural and urban areas of provinces in Pakistan are different. So following the framework used in studies of Mueller and Sial (1993) and Cheema & Sial (2012), techniques of Panel data are employed. At first the study estimate the fixed effect model whose functional form is given below:

$$inequality_{it} = (\beta + v_i) + FR_{it}\alpha + \varepsilon_{it}$$

$i = 1, 2....., n$

$FR_{it} = Foreign\,\mathrm{Re}\,mit\,\tan ces$

$\beta = \mathrm{int}\,ercept$

$\alpha = slope$

$\varepsilon_{it} = Error\,term$

After estimation of fixed effect model, F-test is employed to choose between pooled regression and fixed effect model. The null hypothesis is formulated as: the parameters are zero. The null hypothesis fails to accept at 5% level of significance. So, the fixed effect model is apt choice.

Random Effect Model

In order to check the role of foreign remittance on income inequality, the random effect model is estimated and that is given as follows:

$$inequality_{it} = \beta_0 + \beta_1 FR_{it} + (\mu_i + v_{it})$$

$$H_0 : \beta_1 = 0$$

$$H_1 : \beta_1 \neq 0$$

Where inequality= Gini coefficient, GE (0), GE (1), FR=Foreign remittance

The null hypothesis as: variance is zero for cross sections. Breush-Pagan LM test is used to select between pooled regression and random effect model. The null hypothesis fail to accept at 5% level of significance by using chi-square test showing that random effect model is optimal. After this, the Hausmen test is used to choose between the fixed effect and random effect models. The null hypothesis formulated under this technique as: individual effects are independent of the model regressors (Hausman 1978;Park, 2008). The hypothesis of Hausmen test can be written as

$$H_0 : COV(\beta, X_i) = 0 \quad Random\ Effect\ Model$$

$$H_1 : COV(\beta, X_i) \neq 0 \quad Fixed\ Effect\ Model$$

Hausman test specifies that random REM is the optimal selection.

3. Empirical Results

The study estimates income inequality and foreign remittances, from these surveys to find the long run relationship between them. The study also calculates per capita income and poverty measures (e.g. Headcount ratio (henceforth HC), Poverty gap (henceforth PG) and Squared poverty gap (henceforth SPG) from these surveys to use them as control variables. A set of Descriptive statistics is presented in the table 1.

Table 1: Descriptive statistics

variables	N	MEAN	SD	MIN	MAX
Gini (%)	64	26.478	5.299	18.12	37.6
GE (0) (%)	64	11.860	4.7034	5.3	23
GE(1) (%)	64	11.8671	4.744	5.33	23.92
FR (Rs p.m.)	64	1885.78	1433.34	0	6712.19
INCOME (Rs p. m.)	64	2724.69	1647.70	813.7888	7144.311
HC (%)	64	20.264	12.35	2.14	57.047
PG (%)	64	3.58	2.92	0.24	14.88
SPG (%)	64	0.98	0.97	0.05	5.26

Gini=Gini coefficient, GE=Generalized entropy, FR=Foreign remittances, HC=Headcount ratio,PG= Poverty gap, SPG=Squared poverty gap, p.m= per month

Source: Authors' own calculations

*zero remittances were calculated in rural areas of Sindh from HIES 2001-02. So, minimum value of remittance is 0 for this year.

To find the relationship between inequality and foreign remittances in the long run, this study estimated the random effect model using the pooled data consisting of 64 observations and the results are provided in the table 2.

After applying different statistical tests, this study concludes that our preferred model is random effect. However to lend further credibility to our results this study also estimates the

fixed effect model. The results of both models show that there is negative and statistically significant relationship between income inequality and foreign remittances. When remittances increase, income inequality decreases. Our findings are robust and not sensitive to fixed effect and random effect models. The results are consistent with those of Taylor et al (2005) in Mexico, Acosta et al (2007) in latin American countries, Ebeke and Le Goff (2009) in Mediterranean basin countries, Kimhi (2010)in Dominican Republic, Wouterse (2010) in intra-African, Odozi (2010) in Nigeria , Margolis(2013) in Algeria.

Checking of Robustness

In order to check the robustness of our empirical analysis, we include some variables like income, and poverty indices[4] (e.g. headcount ratio, poverty gap and squared poverty gap). Income is an important variable to affect income inequality. Many studies focused the relationships between income inequality and economic growth (Simon Kuznets,1955; Paukert,1973; Ahluwalia,1976; Papamek & Kyn,1987; Tsakoglou,1988; Randolph & Lott,1993; Jha, 1996; Dawson,1997;Eusufzi 1997; Mubaku, 1997; Huang, 2004; Deiniger and Squire, 1996 & 1998). As far as poverty is concerned, there is positive relationship between income inequality and poverty (Cheema & Sial, 2012; Ali & Tahir, 1999; Saboor, 2004). The results of the robustness checks are presented in table 3. The results still show a negative and statistically significant relationship between income inequality and foreign remittances in Pakistan. So, we can conclude that our findings are robust and not sensitive to the inclusion of these controls as the determinants of income inequality. These results are consistent with those of Taylor et al. (2005), Mckenzie& Rapoport (2007), Zhu and Luo (2008), Chiwuzulum Odozi et al. (2010), Zhu and xubei (2010), Pfau and Giang (2011), Bang et al. (2016), Ahmad (2017). Income inequality is negatively related with income, but it not statistically significant. So, Income has no effect on income inequality. Income inequality is positively related to poverty, but this relationship is statistically insignificant.

Moreover, the paper also uses other inequality measures GE (i.e. GE (0) and GE (1)) that satisfies all of axioms to become a suitable inequality measure (Reyes, 2005; Atkinson, 1970; Allison, 1978; Champernowne, 1974; Cowell, 2011; Cheema and Sial, 2012). Again our results remain intact. So, we can conclude that income inequality is negatively and statistically significantly related with foreign remittances.

4. Conclusions and Policy Suggestions

The study established the role of foreign remittances on income inequality by estimating the set of fixed effect and random effect models using the pooled data from eight household income and expenditure surveys between 1998/99 and 2015/16. Gini coefficient and generalized inequality measures are used to measure income inequality. The results depicted that income inequality is inversely related with foreign remittances in Pakistan. The results

[4] These poverty indices were estimated applying the same technique as was applied by Cheema and Sial (2012).

are robust and not sensitive to income and poverty measures (e.g. headcount ratio, poverty gap and squared poverty gap).

Bureau of Emigration and Overseas Employment (BEOE) is a centralized agency of the Federal Government for processing recruitment demands of the Pakistani manpower through Licensed Overseas Employment Promoters, etc. for the different manpower importing countries in the world especially in the Middle East. The government should empower BEOE to explore the job opportunities in developed countries and assist the poor migrants through subsidizing the visa and migration processes to capitalize the foreign remittances.

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Appendix

Figure-1

Figure-2

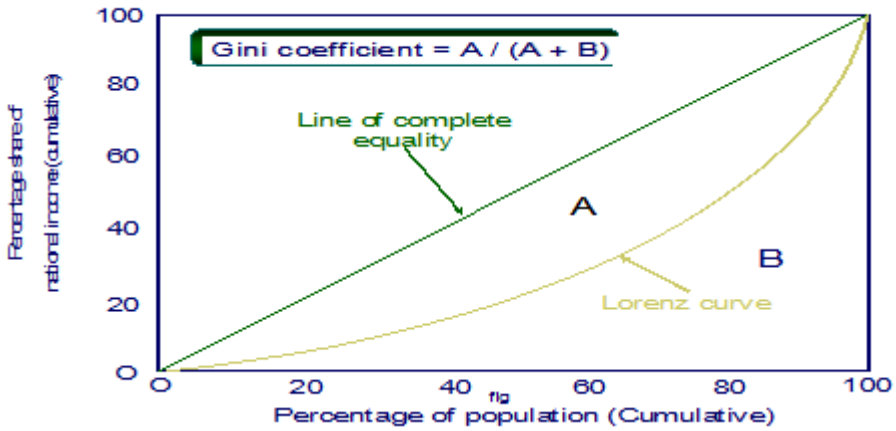

Table 2 Relationship between income inequality and Foreign remittances in Pakistan

	Fixed Effect Results			Random Effect Results		
variables	Gini	GE(0)	GE (1)	gini	GE(0)	GE (1)
constant	27.546	12.8965	12.962	27.494	12.84	12.91
	(61.64)***	(30.69)***	(30.72)	(17.49)	(9.24)	(19.19)***
FR	-.00056	-.0005	-.0005	-.0005	-.0005	-.0005
	(-2.94)***	(3.03)***	(-3.19)***	(-2.70)***	(-2.78)***	(-2.94)***

Source: Authors's own calculations

Table 3: Role of foreign remittances on income inequality (gini coefficient)

	FIXED EFFECT MODEL								RANDOM EFFECT MODEL							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
FR	**-.00056 2.94)****	**-.00052 -2.62)*****	**-.0005 (- 2.54)****	**-.0005 (- 2.45)****	**-.0005 (- 2.40)****	**-.0005 (- 2.50)****	**-.0005 (- 2.41)****	**-.00049 (- 2.36)****	**-.0005 (- 2.70)****	**-.0005 (- 2.37)****	**-.0005 (- 2.31)****	**-.0004 (- 2.24)****	**-.0004 (- 2.20)****	**-.00049 (- 2.31)****	**-.00048 (-2.26)***	**-.00047 (-2.21)****
income	-	-.0001 (- 0.70)				-.00003 (-0.15)	-.00004 (-0.19)	-.00003 (-0.17		-.00009 (-0.51)				-.00007 (-0.27)	-.00003 (-0.17)	-.00002 (-0.11)
hc			.0224 (0.83)			.01815 (0.46)					.0113 (0.39)			.0046 (0.11)		
pg				9.65 (0.89)			7.992 (0.57)					7.071 (0.62)			6.0318 (0.42	
spg					31.71 (1)			28.048 (0.73)					26.178 (0.79)			24.679 (0.62)
Role of foreign remittances on income inequality (GE (0) of generalized entropy)																
FR	-.0005 (- 3.03)***	-.0005 2.76)**	(- -.0005 (- 2.75)**	-.0005 (- 2.67)**	-.0005 (- 2.63)**	-.0005 (- 2.69)**	-.0005 (- 2.62)**	-.0005 (- 2.58)**	-.0005 (- 2.78)**	-.0005 (- 2.50)**	-.0005 (- 2.50)**	-.0005 (- 2.45)**	-.00049 (- 2.40)**	-.0005 (- 2.48)**	-.0005 (- 2.47)**	-.00049 (-2.27)**
income		-.00007 (- 0.47)				-.00006 (-0.27)	-.00005 (-0.25)	-.00003 (-0.20)		-.00004 (-0.28)				-.00009 (-0.39)	-.00004 (-0.22)	-.00002 (-0.13)
hc			.0101 (0.39)			.0030 (0.08)					-.0012 (-0.05)			-.0108 (- 0.28)		
pg				4.568 (0.45)			2.558 (0.19)					1.901 (0.18)			.5280 (0.04)	
spg					16.404 (0.55)			12.405 (0.34)					10.633 (0.34)			8.889 (0.24)
Role of foreign remittances on income inequality (GE (1) of generalized entropy)																
FR	-.0005 (- 3.19)***	-.00053 2.83)**	(- -.0005 (- 2.82)**	-.0005 (- 2.75)**	-.0005 (- 2.71)**	-.00053 (- 2.75)**	-.00052 (- 2.69)**	-.0005 (- 2.64)**	-.0005 (- 2.94)**	-.00056 (- 2.97)**	-.0005 (- 2.55)**	-.0005 (- 2.51)**	-.0005 (- 2.48)**	-.0004 (- 2.09)**	-.00046 (- 2.27)**	-.000470 (-2.34)**
income		**-.0001** (- 0.82)				-.0001 (-0.47)	-.0001 (-0.52)	-.00009 (-0.48)		.00115 (0.91)				.0038 (1.88)*	.00289 (1.66)*	.0024 (1.55)
hc			.0175 (0.69)			.0050 (0.14)					.0055 (0.20)			.06283 (1.46)		
pg				6.876 (0.67			2.659 (0.20)					4.109 (0.48)			21.50 (1.47)	
spg					22.539 (0.75)			12.72 (0.35)					16.60 (0.53)			55.18 (1.42)

Source: Authors' own calculations