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THE NEXUS BETWEEN INCOME INEQUALITY, INTERNATIONAL REMITTANCES AND ECONOMIC GROWTH IN TURKEY[i]

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Abstract

In this study, the relationship between income inequality, remittances and economic growth in Turkey are analyzed using the annual data for 1977-2014 period. The ARDL method and Granger causality tests are used for this analysis. The empirical findings of the research suggest that the series are cointegrated and they move together in long-term. Also, income inequality and international remittances contribute to economic growth both in the long and short-term. The results of the Granger causality test show that there is a unidirectional causality running from economic growth to remittances and from remittances to income inequality.

JEL Code: *O11, O15, D13.*

Keywords: *Income Inequality, Remittances, Economic Growth, ARDL Bounds Testing.*

INTRODUCTION

In recent years, migratory movements are taking place all over the world. People leave their countries in the hope of better job opportunities and quality of life (Koechlin and Leon, 2007). The phenomenon of migration and remittances that migrants send to their families and friends living in their country of origin attract more and more attention from researchers and policy makers every day. Remittances are one of the major sources of foreign exchange in less developed and developing countries, which generally have insufficient financial

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resources for investment. In this globalizing era, the relationship between income inequality, international remittances and economic growth, along with the increasing of the labor mobility, has become a major debate for policy makers and development economists. Despite the economic growth, poverty and the gap between the rich and the poor (Easterly, 2001) still exist not only in less developed countries, but also in the developed world (Gaston and Rajaguru, 2009). Although there are many other factors, with globalization, labor force, the stage of economic development (of international labor market) and international mobilization are the most important factors influencing income inequality (Dreher et. al., 2008).

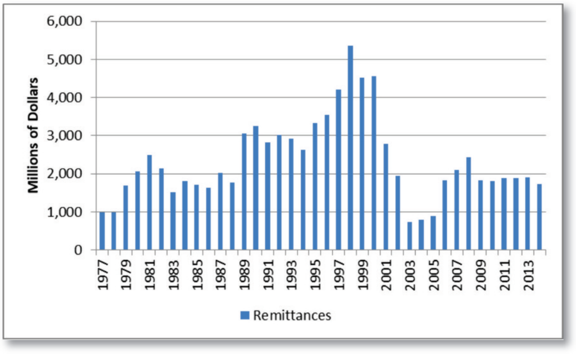
Remittance flows have proven to be a stable source of capital for developing countries because they are a reliable source since they do not depend on the same external factors as other private capital flows. In the literature, it is difficult to find consistent sources on the relationship between remittances and income inequality. Some empirical evidence show that international remittances have positive impact on income inequality (Stark et al., 1988; Taylor and Wyatt, 1996; Adams, 1989; Rodriguez, 1998; Lerman and Feldman, 1998; Adger, 1999), while others suggest that international remittances indeed reduce the income inequality (Barham and Boucher, 1998; Ahlburg, 1996; Handa and King, 1997; McKenzie and Rapoport 2004).

There are also important studies examining the effects of economic growth on income inequality (Bahmani-Oskooee et al., 2008; Meschi and Vivarelli, 2009; Roine et al., 2009; Shahbaz, 2010). Theoretically, more economic growth helps to reduce income inequality. Moreover, globalization is considered as an accelerating channel to promote economic growth that will ultimately balance income inequality. At the same time, this situation has led many researchers to investigate the Kuznets hypothesis, that is, the inverted U-shaped hypothesis. Kuznets (1955) stated that income per capita may increase income inequality at first, but later on, with the increase in incomes, the level of income inequality would eventually decrease. However, the number of studies examining this hypothesis at macro level is limited.

The trend of international remittances in Turkish economy is presented below. Remittances increased from \$ 1.8 million in the 1980s to \$ 2.8 million in 1990 and to \$ 5.3 million in 1998. The amount in 2003 is about \$ 700 thousand, and in 2014, the amount is \$ 1,7 million.

Figure 1:

Flow of International Remittance, Turkey, 1977-2014.



Source: World Bank, 2016.

The purpose of this study is to examine the dynamic relationship between international remittances, economic growth and income inequality by using time series data. This relationship is based on the view that immigration process is costly in the early stages, as the possibility of migration is limited by networks and information. For this reason, remittances will primarily benefit high-income migrant families, thus increasing income inequality. As the networks expand over time and as information moves toward social strata, low-income households will also have the opportunity to migrate, which will eventually contribute to a reduction in income inequality (Peterson, 2012). Our contribution with this paper is that out analysis is country specific. The availability of limited time series data at the macro level (Koechlin and León, 2007; Meschi and Vivarelli, 2009) has led researchers to use only panel and cross sectional estimation methods. However, the results of cross country studies have failed to address issues of how changes in income inequality affect the economic growth of that country (Forbes, 2000). Adams (2004) strongly advocated that due to the limitations of cross country studies, income inequality in a country and the effect of international remittances on economic growth should be examined using time series data. In this context, the number of studies examining the relationship between income inequality, remittances and economic growth is limited, except for the evidence provided by cross country analyzes (Qureshi and Wan, 2008).

In the literature, there is no empirical study on this subject in the country and period examined. In this context, the study is expected to contribute to the literature. In the second chapter of this study, which examines a current issue, a literature review is given. Thereafter, empirical analysis is presented. Finally, policy suggestions are made considering the findings.

Literature Review

In the literature, the relationship between remittances and income inequality, as well as the relationship of economic growth and income inequality, is generally examined within three groups of studies. The first group of studies focus on the relationship between economic growth and income inequality. These studies suggest that the effect of income inequality on economic growth may be positive or negative. However, a large number of studies support the view that the effect of income inequality on economic growth is negative (Hsing, 2005; Jong, 2010; Castelló-Climent, 2010; Herzer and Vollmer 2012; Binatli, 2012; Zouheir and Imen, 2012). On the other hand, some other studies suggest that income inequality has a positive effect on economic growth (Li and Zou 1998, Galor and Moav 2004, Frank 2008, Pede et al., 2012).

The second group of studies research the relationship between remittances and income inequality. The study of Adams (1991) in Egypt and Rodriquez (1998) in the Philippines shows that the international remittances have a positive effect on income inequality. Similarly, Lerman and Feldman (1998) find that international remittances tend to increase income inequality. Nguyen (2008) applied a fixed effects regression model to examine the effect of international remittances on income inequality. According to the results of the empirical study, in Vietnam, international remittances have improved the income and consumption of households receiving the remittances, but in general, income inequality has increased. In addition, Acosta et al. (2006), show that international remittances, even on a smaller scale, actually reduces income inequality as in the case of Latin America and Caribbean. Waheed and Shittu (2012) used the data of the Nigerian economy to examine the effects of (local) international remittances on income distribution. They have reached the conclusion that international remittances reduce income inequality, and that local remittances improve income distribution due to the enriching effect of education. Acharya and Leon-Gonzalez (2012) conducted a Living Standards Measurement Survey (LSMS) panel in Nepal to investigate the relationship between international remittances and income inequality. Their conclusions reveal that international remittances reduce poverty but worsen the income distribution.

The third group is based on the researches that explores the dynamic relationship between international remittances, economic growth and income inequality, and it is the combination of the previous two groups. The only research conducted in this group is done by Shahbaz et al. (2014) in Pakistan sample. The dynamic link between international remittances, income inequality and economic growth has been examined in the study. The findings suggest that income inequality and international remittances increase economic growth. Also, a bidirectional causality exists between income inequality and economic growth. The same is valid for the relationship between remittances and income inequality.

Data and Method

In this study, the relationship between income inequality, remittances and economic growth in Turkey are analyzed using the annual data for 1977-2014 period. Income inequality data is obtained from the Standardized World Income Inequality database, while remittances and economic growth data are obtained from the World Bank database. In this respect, the stationarity of the series is initially tested by the Augmented Dickey Fuller (ADF) method. The existence of cointegration between the series is examined via Pesaran et al. (2001) bound testing approach for long and short-term relationships. Furthermore, the existence of a causal relationship between the series is examined via Granger causality test.

In determining the relationship between the variables, an econometric method developed by Pesaran et al. (2001) is applied. This method, called the bound test (ARDL), is considered to be more flexible and practical when compared with Engle-Granger (1987), Johansen (1988) and Johansen and Juselius (1990) methods. One of the constraints of the mentioned methods include that the series in the model are not stationary, and they have to be made stationary by taking their difference. However, there is no such constraint in ARDL approach. That is, series included in the model can be stationary at different levels (Tang, 2003: 421). Besides, ARDL gives better results in small samples (Pesaran and Shin, 1997: 1-23). In addition, while endogeneity is an important problem in other approaches, in the ARDL approach, it is less important (Jalil, 2012: 311).

In the model used in the study, the work of Shahbaz et al. (2014) is followed. In this direction, the related model can be expressed as follows:

$$GDP_t = \beta_o + \beta_1\, GINI_t + \beta_2\, REM_t + \varepsilon_t \tag{1}$$

In the equation, GDP, GINI, REM and ε_t represent economic growth, income inequality, remittances and error term, respectively.

Prior to the bound testing approach, applying the unrestricted error correction model (UECM) is required. After that, the bound test can be carried out. Peseran et al. (2001) stressed that in order for bound test to be valid, there should be no problems such as variance or autocorrelation in the unrestricted error correction model. The model created in this direction is formulated below.

$$\Delta GDP_t = \alpha_0 + \sum_{i=1}^{m} \alpha_{1i}\, \Delta GDP_{t-i} + \sum_{i=0}^{m} \alpha_{2i}\, \Delta GINI_{t-i} + \sum_{i=0}^{m} \alpha_{3i}\, \Delta REM_{t-i} + \alpha_4 GDP_{t-1} + \alpha_5 GINI_{t-1} + \alpha_6 REM_{t-1} + \varepsilon_{1t} \quad (2) \tag{2}$$

The expressions of the independent variables shown in the equation are the same as those of the equation 1. In addition, m represents optimal lag length, and Δ represents the differential operator.

The lag length to be used in the ARDL model is important for both long-term and short-term analysis. In the study, the optimal lag length is tried to be determined according to the Akaike Information Criterion (AIC). Considering that the series are annual, the lag limit is set to a maximum of four.

In the bounds testing approach, H_0: $\alpha_4 = \alpha_5 = \alpha_6$ hypothesis is tested. The acception or rejection of this hypothesis is determined via F-test, and it is compared to the table showing lower and upper critical values by Pesaran et al. (2001). If the sample is small, the critical values in the Narayan's (2005) study can be taken into account. If the value calculated is above the critical value, it is determined that there is cointegration relationship between the series. If the calculated value is between two critical values, the cointegration relationship cannot be interpreted. If the value is below the lowest limit, then the series are not cointegrated (Morley, 2006: 73).

Cointegration analysis examine the series that move together in long-term. If the series are moving together in long-term, whether a deviation is eliminated or not is determined via error correction model (Tarı, 2011: 435). In other words, the error correction model shows how long does it take for the series to converge after a deviation emerges (Jalil, 2012: 312). However, the error correction model may not function all the time (Tarı, 2011: 435).

Short-term analysis between variables is studied with ARDL error correction model. The model is adapted to the study as follows.

$$\Delta GDP_t = \alpha_0 + \sum_{i=1}^{m} \alpha_{1i}\, \Delta GDP_{t-i} + \sum_{i=0}^{m} \alpha_{2i}\, \Delta GINI_{t-i} + \sum_{i=0}^{m} \alpha_{3i}\, \Delta REM_{t-i} + \alpha_4 ECT_{t-1} + \varepsilon_{1t} \tag{3}$$

In the equation, ECT represents the error correction term. The error correction term (ECT_{t-1}) expresses the lagged values of the error terms obtained in long-term. The error correction term gives information about how much of the deviation between the series will improve after a period. In addition, it is also possible to calculate the number of periods after which the deviation will be eliminated by taking into account the relevant coefficient.

The existence and direction of the interaction between economic variables can be demonstrated by the Granger (1969) test. The variables subjected to this test are not separated as dependent or independent. The Granger causality test is performed through the following models.

$$X_t = \sum_{i=1}^{m} \alpha_i X_{t-i} + \sum_{i=1}^{m} \beta_i Y_{t-i} + u_t \tag{4}$$

$$Y_t = \sum_{i=1}^{m} \theta_i Y_{t-i} + \sum_{i=1}^{m} \gamma_i X_{t-i} + u_t \tag{5}$$

At this point, it would be useful to explain the equations discussed above. In the equation 4, when the past values of Y are added to estimation of X, and if this contributes the performance of prediction of X, then it means that Y affects X. The same condition is also valid for equation 5.

The hypothesis for Granger causality test are as below:

H_0: There is no causal relationship from Y to X.

H_1: There is causal relationship from Y to X.

Empirical Analysis and Findings

Before applying ARDL approach and Granger causality test, some preliminary tests related to the variables are performed and the stationarity of the series is checked.

Unit Root Testing

After the Augmented Dickey Fuller test, it is determined that the series are not stationary in their levels, but they become stationary after taking their first differences. Therefore, the ARDL model is justified. The findings are reported in Table 1.

Table 1: Results of Dickey Fuller (ADF) Unit Root Test

Variables	ADF Test Statistics	Significance Level %1	%5	%10
GDP	-2.85(0)	-4.27	-3.55	-3.21
GINI	-2.54(0)	-4.28	-3.56	-3.21
REM	-1.75(0)	-4.27	-3.55	-3.21
∆GDP	-5.17*(2)	-3.66	-2.96	-2.61
∆GINI	-3.44*(1)	-3.66	-2.96	-2.61
∆REM	-4.45*(3)	-3.66	-2.96	-2.61

Note: *Fixed model is preferred in determining the unit root. Below the ADF test part, the values in parenthesis denote optimal lag length of the variables determined according to Schwarz Information Criterion; and * denotes the stationarity at 1% level of significance.*

Cointegration Analysis

In order to carry out the cointegration test, initially, UECM (Unrestricted Error Correction Model) in the equation 2 is estimated. In this context, the F statistic of the model estimated is compared with the critical values of Peseran et al. (2001) and Narayan (2005). The findings are reported in Table 2.

Table 2: Results of the Bound Testing

k	F-statistic	Critical Values	Pesaran et al. (2001) Critical Value Lower Limit	Upper Limit	Narayan (2005) Critical Value Lower Limit	Upper Limit	Decision
		%10	2.63	3.35	4.13	4.89	
2	5.08*	%5	3.01	3.87	5.06	5.93	There is
		%1	4.13	5	7.09	8.26	cointegration.

Note: ** denotes 1% level of significance. The critical values represent the critical values calculated for Case III, k=2 that takes place in the studies of Pesaran et al. (2001;300) and Narayan (2005;1988). Since the study is carried out with UECM annual data, the maximum is "3". Also, the results of the estimation are obtained according to Schwarz Information Criterion (SIC).*

Long-Term Analysis

After the findings obtained, the long-term relationship is estimated via ARDL (Autoregressive Distributed Lag) model. As a result, it is found that the optimal lagged long-term ARDL model is (1,0,0) model, and the findings are presented in Table 3.

Table 3: Estimation of ARDL (1,0,0) Model and Long-Term Coefficients

Variables	Coefficient	t-statistic	Probability
$LNGDP_{t-1}$	0.393	3.044	0.000
LNGINI	-1.064	2.714	0.034
LNREMI	-0.433	2.184	0.431
C	-4.223	-2.671	0.257
	Long-Term Coefficients		
LNGINI	4.490	-3.619	0.000
LNREMI	0.714	2.755	0.000
C	-6.960	-3.551	0.000
	Diagnostic Tests		
R^2= 0.97	F stat.= 289.49 (0.00)	χ^2_{BG}= [1.38] (0.40)	F_{RR}= [0.11] (0.60)
$\bar{R}^2$= 0.97	DW = 2.005	χ^2_{JB} = [17.91] (0.00)	χ^2_{BPG}=[3.22] (0.04)

Note: *In the diagnostic tests, DW, BG, RR, JB and BPG denote Durbin-Watson statistics, Breusch-Godfrey autocorrelation test, Ramsey model specification error, Jaque-Bera normality test and Breusch-Pagan-Godfrey heteroskedasticity statistics, respectively. Values in parenthesis show the probability values.*

The diagnostic tests applied to the findings are presented at the bottom of Table 3. It is shown that the model is quite acceptable. In long term, the effect of income inequality and remittances on economic growth is positive and statistically significant. CUSUM tests of the model also show that the regression coefficients are consistent (Figure 1-2).

Figure 1:
CUSUM Test

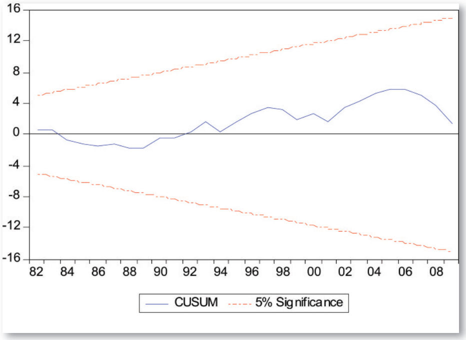
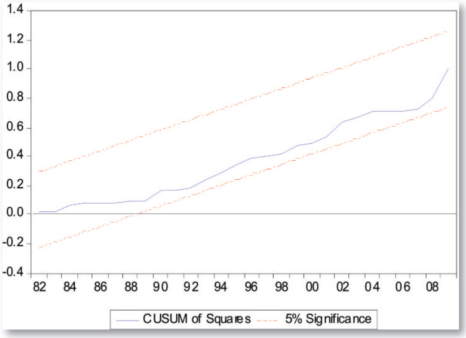


Figure 2:
CUSUM Q Test



Short-Term Analysis (Error Correction Model)

After determining the series are cointegrated in the long-term, short term analysis is carried out. The results of the error correction model estimation revealed that the most convenient model is (1,0,0) model. The results are reported in Table 4.

Table 4: Estimation of ARDL (1,0,0) Model and Short-Term Coefficients

Variable	Coefficient	t-statistics	Probability
ΔLNGINI	1.012	1.815	0.043
ΔLNREM	0.430	1.635	0.885
C	0.000	0.017	0.986
ECT_{t-1}	-0.637	-6.196	0.003
	Diagnostic Tests		
$R^2 = 0.65$	F stat.= 3.34 (0.00)	χ^2_{BG} = 1.29 [3] (0.25)	F_{RR} = 2.03 [1] (0.03)
$\bar{R}^2 = 0.59$	DW= 1.23	χ^2_{JB} = 3.43 (0.05)	χ^2_{BPG} = 3.04 (0.87)

Note: *In the diagnostic tests, DW, BG, RR, JB and BPG denote Durbin-Watson statistics, Breusch-Godfrey autocorrelation test, Ramsey model specification error, Jaque-Bera normality test and Breusch-Pagan-Godfrey heteroskedasticity statistics, respectively. Values in parenthesis show the probability values.*

The coefficient of the error correction term is negative and statistically significant. In this context, it is seen that the deviation between the series would be eliminated after approximately 2 periods (1/0.63). Also, the diagnostic tests show that the model is acceptable.

Granger Causality Test

The findings obtained through Granger causality analysis are reported in Table 5. The findings suggest that there is a unidirectional causal relationship running from economic growth to remittances, and from remittances to income inequality.

Table 5: Results of Granger Causality Test

Direction of Causality	F Statistics	Probability Value	Decision
DLNGINI =>DLNGDP	0.120	0.883	There is no causality.
DLNGDP=> DLNGINI	0.235	0.798	There is no causality.
DLNREM=>DLNGDP	2.170	0.132	There is no causality.
DLNGDP=>DLNREM	5.023	0.011**	There is causality.
DLNREM=>DLNGINI	2.680	0.082***	There is causality.
DLNGINI=>DLNREM	1.013	0.372	There is no causality.

Note: *Optimal lag length is determined as 1 considering FPE, AIC, SC and HQ criterion. *, ** and *** denote level of significance of 1%, 5% and 10 %, respectively.*

Conclusion

Recently, the phenomenon of remittances has started to catch the attention of researchers and authorities. This paper analyzes the dynamic relationship between income inequality, international remittances and economic growth in Turkey for the 1977-2014 period. According to our results, in short and long-term, income inequality and international remittances stimulate economic growth. The results of the Granger causality test suggest that there is a unidirectional causality running from economic growth to remittances, and from remittances to income inequality. Our findings are consistent with the study of Shahbaz et al. (2014).

This study presents several suggestions for policy makers. Despite the gradual increase in per capita income, widening gaps in income inequality is present in Turkey. However, the role of economic growth in reducing the inequality is less convincing in the sample of Turkey. Since wealth is not well-distributed in the country, a policy reform that modifies the tax structure and ensures the poor can utilize the benefits of the economic growth equally is required. Remittances may affect economic growth directly or indirectly through different channels and different directions. The findings of this research present that remittances affect the growth positively. Therefore, the remittance recipient households contribute growth process by creating human capital through education and health expanses, by forming multiplier effect through consuming more or by making investments through savings.

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