REMITTANCES AND ECONOMIC GROWTH IN TURKEY

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Abstract
Savings are one of the important determinants beyond the theories of economic growth. Therefore remittances and foreign direct investment inflows have importance for the countries having insufficient savings. This study examines the relationship between economic growth, remittances, foreign direct investment inflows and gross domestic savings in Turkey during the period 1974-2013 by using Autoregressive Distributed Lag approach. We found that remittances, foreign direct investment and gross domestic savings had positive impact on economic growth.

Key words: *economic growth; remittances; Autoregressive Distributed Lag analysis*

JEL Classification: *C32, F24, F43*

I. INTRODUCTION

Remittances are one of the important foreign exchange sources in the underdeveloped and developing countries which generally have inadequate savings for their investments. The remittances to developing countries are projected to reach US$435 billion in 2014 and US$454 billion in 2015 (World Bank, 2014). Therefore, remittance flows are very important for the underdeveloped and developing countries.

The remittances also became an important source of foreign exchange for Turkey which its production depends on the imported intermediate goods and energy sources during the period 1978-2000. The remittances to Turkey increased to USD 5.356 billion during the period 1978-1998 and then began to decrease and USD 919 million in 2013.

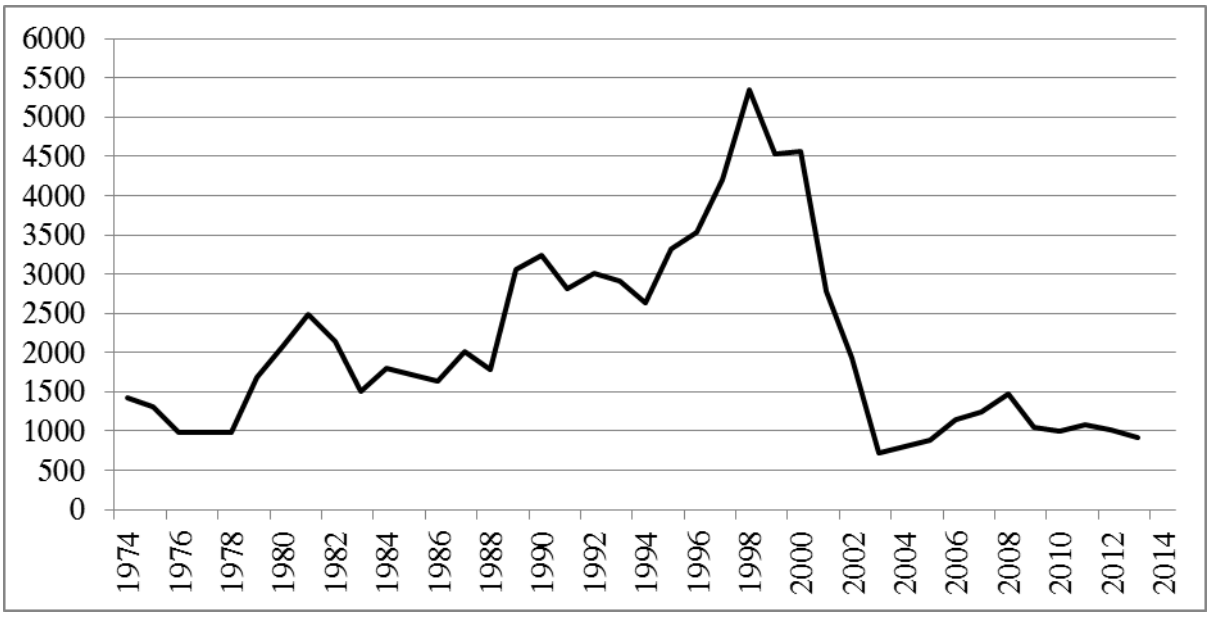

Chart 1 – Remittances to Turkey (current US million dollars) (1995-2010)

Remittances have potential to affect economic growth through direct and indirect channels positively and negatively. The major channels are as follows:

- Remittances increase the income of households, in turn increase consumption and thus affects aggregate demand and economic growth positively by multiplier mechanism (Arı and Ozcan, 2012).
- Investments made by remittances affect economic growth indirectly (Woodruff and Zenteno, 2004). In this channel remittances eliminate the negative impact of inadequate savings on economic growth partially
- Remittances affect economic growth indirectly by reducing the volatility, because remittances do not exhibit too much volatility against changes in the economy relative to FDI inflows and portfolio investments (Ramey and Ramey, 1995)
- Remittances affect economic growth indirectly by contributing to the development of financial sector (Giuliano and Ruiz-Arranz, 2009).

On the other hand remittances have had some negative effects on economic growth. The most accentuated negative effect of remittances on economic growth is Dutch disease. The Dutch disease impact of remittances is arisen by expenditure (see Chowdhury and Rabbi (2014), Nikas and Blouchoutzi (2014), Lopez et al. (2007)).

We investigate the impact of remittances together with foreign direct investment (FDI) inflows and gross domestic savings (GDS) on economic growth in Turkey during the period 1974-2013 by using cointegration based on Autoregressive Distributed Lag (ARDL) approach. The remainder of the study is structured as follows. The next section overviews the existing literature on the nexus between remittances and economic growth. Section III introduces the data and the method, Section IV presents and discusses empirical findings of the study and Section V presents conclusion and policy implications.

II.LITERATURE REVIEW

There have been a great number of studies on the relationship between economic growth and remittances especially in developing and underdeveloped countries countries. These studies have reached mixed findings. Most of the studies have found a positive relationship between remittances and economic growth (see Pradhan et al. (2008), Nsiah and Fayissa (2011), Nyamongo et al. (2012), Arı and Ozcan (2012), Goschin (2014), Salahuddin and Gow (2015)), while some studies have found that there has been no relationship between economic growth and remittances (see IMF (2005), Ahamada and Coulibaly (2013), Kumar and Vu (2014), Lim and Simmons (2015)). On the other hand relatively few studies have found that there was a negative relationship between economic growth and remittances (see Chami et al. (2003), Karagoz (2009)).

Chami et al. (2003) investigated the effect of remittances on economic growth in 113 countries during the period 1970-1998 and found that there was a negative relationship between economic growth and remittances by using panel regression. On the other hand IMF (International Monetary Fund) (2005) examined the effect of remittances on economic growth in 101 developing countries during the period 1970-2003 and found that there was no statistically significant relationship between economic growth and remittances.

Pradhan et al. (2008) examined the impact of remittances on economic growth in 39 developing countries during the period 1980-2004 by using panel regression and found that remittances had positive effect on economic growth. Karagoz (2009) examined the impact of remittances on economic growth in Turkey during the period 1970-2005 by using Johansen cointegration and found that remittances had negative impact on economic growth. On the other hand Nsiah and Fayissa (2011) also investigated the impact of remittances together with some macroeconomic variables on economic growth in 64 countries from Africa, Asia, and Latin America-Caribbean by using panel unit-root tests, cointegration tests, and panel fully modified ordinary least squares and found that remittances had positive impact on economic growth.

Nyamongo et al. (2012) examined the impact of remittances and financial development on economic growth in of 36 African countries during the period 1980–2009 by using panel regression and they found that remittances had positive impact on economic growth, while the volatility of remittances had negative impact on economic growth. On the other hand Arı and Ozcan (2012) examined the impact of remittances on economic growth in 30 developing countries during the period 1996-2009 by using dynamic panel data analysis and found that workers' remittances had positive impact on economic growth.

Ahamada and Coulibaly (2013) investigated the causal relationship between economic growth and remittances in 20 Sub-Saharan African countries during the period 1980-2007 by using Granger causality test and found that there was no causal relationship between economic growth and remittances. On the other hand Senbeta (2013) examined the impact of remittances on the determinants of economic growth in 50 countries by using panel regression during the period 1970-2004 by using panel regression and found that remittances had positive impact on capital accumulation, while remittances had no statistically significant impact on total factor productivity.

Kumar and Stauvermann (2014) examined the impact of remittances on economic growth in Bangladesh during the period 1979-2012 by using ARDL model and found that remittances had positive impact on economic growth in the long run, and there was bidirectional causality between economic growth and remittances. On the other hand Kumar and Vu (2014) examined the relationship between remittances and economic growth in Vietnam during the period 1980-2012 by using ARDL bounds test and Granger causality test and found that there was no long run relationship between economic growth and remittances, while there was bidirectional causality between economic growth and remittances. Goschin (2014) also investigated the relationship between economic growth and remittance in 10 Central and Eastern European countries during the period 1996-2011 by using panel regression and found that remittances had positive impact on economic growth.

Lim and Simmons (2015) examined the relationship between real GDP per capita, investment and remittances in 13 Caribbean Community and Common Market countries during the period 1975-2010 by using Pedroni's and Westerlund's cointegration tests and they found that there was no long run relationship between real GDP per capita and remittances. On the other hand Salahuddin and Gow (2015) investigated the relationship between economic growth and remittances in Bangladesh, India, Pakistan and the Philippines during the period 1977-2012 by using panel Pedroni's and Westerlund's panel cointegration tests and panel mean group regression and found that remittances had positive impact on economic growth in the long run.

III.DATA AND METHOD

We examined the impact of remittances on economic growth in this study and also took the FDI inflows and GDS as control variables in a time-series analysis. Firstly, we conducted the stationarity tests of the time series with Augmented Dickey-Fuller test (ADF) (1981) and Phillips-Perron (PP) (1988) test. We then determined the long run relationship among the variables by cointegration test based on ARDL bound test approach.

Data

We used annual data of real gross domestic product (GDP) per capita growth, personal remittances as a percent of GDP, net FDI inflows as a percent of GDP and gross domestic savings as percent of GDP during the period 1974- 2013 to investigate the relationship between economic growth and remittances. All the data were taken from the database of taken from World Development Indicators of the World Bank (World Bank, 2015).

The variables used in the econometric analysis and their symbols are presented in Table 1. Eviews 8 software package was used in the analysis of the dataset.

Table 1. Variables used in the econometric analysis

Variables	Variables symbols
Real GDP per capita growth	GRW
Remittances as a percent of GDP	REM
Net FDI Inflows as a percent of GDP	FDI
Gross domestic savings	GDS

Method

In this study we defined economic growth as a function of remittances, FDI inflows and GDS. Therefore, the model can be expressed as follows:

$$GRW = f(REM, FDI, GDS) \quad (1)$$

We assume that these three variables have significant impact on economic growth and we investigate the long run relationship among these variables by cointegration method. The use of traditional cointegration methods such as Engle-Granger (1987), Johansen (1988) and Johansen and Juselius (1990) tests are required that the variables should be integrated in the same level. However, one of our variables (GRW) was found to be I(0), while the other variables (REM, FDI and GDS) were found to be I(1). Therefore we decided to use the ARDL cointegration in this study. Because ARDL bound test approach developed by Pesaran and Shin (1995) and Pesaran et al. (2001) allow us to apply cointegration tests to the time series having different integration levels. On the other hand ARDL bound test approach has better statistical properties relative to the Engle-Granger cointegration test, because ARDL approach uses the unconstrained error correction model and this approach also gives more reliable results in small samples relative to Engle-Granger and Johansen cointegration tests.

We transform the Equation (1) to the Equation (2) to have econometric form and include the error terms

$$GRW_t = \alpha_0 + \alpha_1 REM_t + \alpha_2 GDS_t + \alpha_3 FDI_t + \varepsilon_t \qquad (2)$$

ARDL uses autoregressive distributed lag for estimation of the defined function in Equation (1). The usual ECM (Error Correction Model) could be expressed as follows:

$$\Delta GRW_t = \beta_0 + \sum_{i=0}^{q} \beta_{1i} \Delta REM_{t-i} + \sum_{i=0}^{q} \beta_{2i} \Delta GDS_{t-i} + \sum_{i=0}^{q} \beta_{3i} \Delta FDI_{t-i} + \sum_{i=0}^{q} \beta_{4i} \Delta GRW_{t-i} + \gamma z_{t-1} + e_t \quad (3)$$

where

$$z_t = GRW_t - \alpha_0 - \alpha_1 REM_t - \alpha_2 GDS_t - \alpha_3 FDI_t \qquad (4)$$

We derived unrestricted error correction model (UECM) by using Equation (3) and Equation (4). Thus we would able to capture the long run and short run relationship among the variables in the study. We estimated the following equation for our ARDL mode.

$$\Delta GRW_t = \beta_0 + \sum_{i=0}^{q} \beta_{1i} \Delta REM_{t-i} + \sum_{i=0}^{q} \beta_{2i} \Delta GDS_{t-i} + \sum_{i=0}^{q} \beta_{3i} \Delta FDI_{t-i} + \sum_{i=0}^{q} \beta_{4i} \Delta GRW_{t-i} + \theta_1 GRW_{t-1} + \theta_2 REM_{t-1} + \theta_3 GDS_{t-1} + \theta_4 FDI_{t-1} + u_t \qquad (5)$$

There will be long run equilibrium provided that $GRW_t = \Delta REM_t = \Delta GDS_t = \Delta FDI_t = 0$. So the long run coefficients of the model can be calculated by using $-\frac{\theta_2}{\theta_1}$ for REM, $-\frac{\theta_3}{\theta_1}$ for GDS and $-\frac{\theta_4}{\theta_1}$ for FDI.

The null hypothesis $H_0: \theta_1 = \theta_2 = \theta_3 = \theta_4 = 0$ is tested for the long run relationship among the variables. If the null hypothesis is accepted, it means that there is not long run relationship among the variables. On the other hand if the null hypothesis is rejected, it means that there is long run relationship among the variables. Testing of the null hypothesis is implemented by comparing the computed F-statistic value obtained from Wald test with the critical values provided by Pesaran et al. (2001). On the other hand Narayan (2005) implies that when the sample size is smaller than 100, the critical values provided by Pesaran and Pesaran (1997) and Pesaran et al. (2001) may not be correct. So Narayan (2005) tabulated the critical values for the small samples. If the computed Wald F statistic is larger than upper bound value, the null hypothesis is rejected. On the other hand if the computed F is lower than lower bound value, the null hypothesis is accepted.

IV.EMPIRICAL APPLICATION AND MAJOR FINDINGS

Unit Root Tests

We tested the stationarity of the variables by ADF and PP tests, because macroeconomic time series may not exhibit stationarity over time. The results of stationarity tests were presented in Table 2. We found that GRW was stationary at level, while REM, GDS and FDI variables were stationary after first differencing.

Table 2. Results of stationarity tests

Variable	Level	Model	ADF		PP	
			t-Statistic	Prob.	Adj. t-Stat	Prob.
GRW	Level	Constant	-6.218471*	0.000000	-6.224865*	0.000000
	Level	Constant + Trend	-6.180965*	0.000000	-6.272683*	0.000000
REM	Level	Constant	-1.333172	0.604100	-1.984340	0.292200
	Level	Constant + Trend	-2.737029	0.228300	-3.077637	0.125700
	First Difference	Constant	-5.585051*	0.000000	-5.713592*	0.000000
	First Difference	Constant + Trend	-5.480371*	0.000300	-5.594105*	0.000200
GDS	Level	Constant	-1.944195	0.309400	-1.899486	0.329200
	Level	Constant + Trend	-1.713947	0.726000	-1.560409	0.790300
	First Difference	Constant	-5.690527*	0.000000	-5.416588*	0.000100
	First Difference	Constant + Trend	-5.763716*	0.000200	-9.140514*	0.000000
FDI	Level	Constant	-1.837623	0.357400	-1.732700	0.407400
	Level	Constant + Trend	-3.594808**	0.043700	-2.491898	0.330200
	First Difference	Constant	-5.497418*	0.000000	-9.462141*	0.000000
	First Difference	Constant + Trend	-5.422459*	0.000400	-9.454299*	0.000000

* stationary at 1% , ** stationary at 5% , *** stationary at 10%

Cointegration Test

We used cointegration test based on ARDL approach, because the integration levels of the variables are different and there are no variables which have I(2) or higher integration levels. We took maximum lag length as 6 and the optimal lag length was found to be 5 for all the variables except FDI in according to Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC) and Hannan-Quinn information criterion. We selected ARDL (5,5,5,6) model as a consequence of information criterion.

Table 3. Minimum value for information criterion

AIC	SC	Hannan-Quinn
ARDL(5,5,5,6)	ARDL(5,5,5,6)	ARDL(5,5,5,6)

The results of ARDL (5,5,5,6) model estimation were presented in Table 4.

Table 4. Estimation of ARDL (5,5,5,6) model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GROWTH(-1)	-3.495445	0.645071	-5.418695	0.0010
REMITTANCES(-1)	10.22926	2.489960	4.108204	0.0045
GDS(-1)	0.317222	0.218079	1.454619	0.1891
FDI(-1)	14.74733	3.322394	4.438766	0.0030
D(GROWTH(-1))	2.611095	0.627932	4.158248	0.0043
D(GROWTH(-2))	2.215039	0.491223	4.509235	0.0028
D(GROWTH(-3))	1.732820	0.395924	4.376652	0.0032
D(GROWTH(-4))	1.150115	0.315992	3.639699	0.0083
D(GROWTH(-5))	0.681465	0.208732	3.264787	0.0138
D(REMITTANCES(-1))	-8.590710	2.362741	-3.635909	0.0083
D(REMITTANCES(-2))	-8.249858	1.841484	-4.480005	0.0029
D(REMITTANCES(-3))	-5.497260	1.807535	-3.041302	0.0188
D(REMITTANCES(-4))	-6.908109	1.737344	-3.976246	0.0053
D(REMITTANCES(-5))	-8.310406	1.488922	-5.581493	0.0008
D(GDS(-1))	-1.006815	0.282683	-3.561636	0.0092
D(GDS(-2))	0.333687	0.295386	1.129662	0.2958
D(GDS(-3))	-0.045456	0.326484	-0.139230	0.8932
D(GDS(-4))	-0.537238	0.334002	-1.608487	0.1518
D(GDS(-5))	0.727434	0.290179	2.506842	0.0406
D(FDI(-1))	-7.059455	2.231369	-3.163733	0.0158
D(FDI(-2))	-11.99861	2.729562	-4.395802	0.0032
D(FDI(-3))	-9.026196	2.060138	-4.381354	0.0032
D(FDI(-4))	-2.403075	1.283554	-1.872204	0.1033
D(FDI(-5))	-0.029040	1.440559	-0.020159	0.9845
D(FDI(-6))	-7.057706	2.149313	-3.283704	0.0134
C	-26.22601	8.397902	-3.122923	0.0168
R-squared	0.972144	Mean dependent var		0.224403
Adjusted R-squared	0.872658	S.D. dependent var		6.503476
S.E. of regression	2.320770	Akaike info criterion		4.546835
Sum squared resid	37.70181	Schwarz criterion		5.725902
Log likelihood	-49.02278	Hannan-Quinn criter.		4.943555
F-statistic	9.771639	Durbin-Watson stat		1.648222
Prob(F-statistic)	0.002307			

Later we applied LM test to see whether there was autocorrelation problem or not. The results presented in Table 5 indicated that there was no autocorrelation problem. On the other hand the results of normality and heteroskedasticity tests presented in Table 6 showed that there were no problems.

Table 5. Autocorrelation test results

Lag	F-statistic	F Prob
1	0.282082	0.6144
2	0.307904	0.7480
3	0.230566	0.8710
4	0.205094	0.9200
5	3.965674	0.2136
6	2.470414	0.4519

Table 6. Diagnostic test from the ARDL lag estimates

Test types	**LM Version**	**p value**	**F version**	**p value**
Normality	χ^2(2)=0.838177	0.657646	Not applicable	-
Heteroscedasticity	χ^2 (25) 25.63222	0.4274	F(25,7)=0.974109	0.5625

The result of the cointegration test was presented in Table 7. We found that there was long run relationship among the variables, because the calculated F value based on Wald Test 12.74697 is larger than upper critical value provided by Pesaran et al. (2001) and Narayan (2005). Therefore, we can establish ARDL model to determine the long run and short run relationship among the variable.

Table 7. Results of cointegration test

F statistics	Critical values at 5% significance level	
	Lower bound value	Upper bound value
Pesaran et al. (2001)	3.23	4.35
Narayan (2005)	3.548	4.803

The long run coefficients of the variables were found to be statistically significant and remittances, FDI inflows and gross domestic savings had positive impact on economic growth. Long run coefficients of the variables were calculated as 2.93 ($-\frac{\theta_2}{\theta_1}$) for REM, 0.91 ($-\frac{\theta_3}{\theta_1}$) for GDS and 4.22 ($-\frac{\theta_4}{\theta_1}$) for FDI. Also because the coefficient of the lagged dependent variable was found to be negative, error correction system direct our model to equilibrium in the long run.

Moreover we used cumulative sum (CUSUM) and CUSUM of squares tests of structural break for the long run relationship equation and we found that there were no structural breaks as seen in Figure 1 and 2.

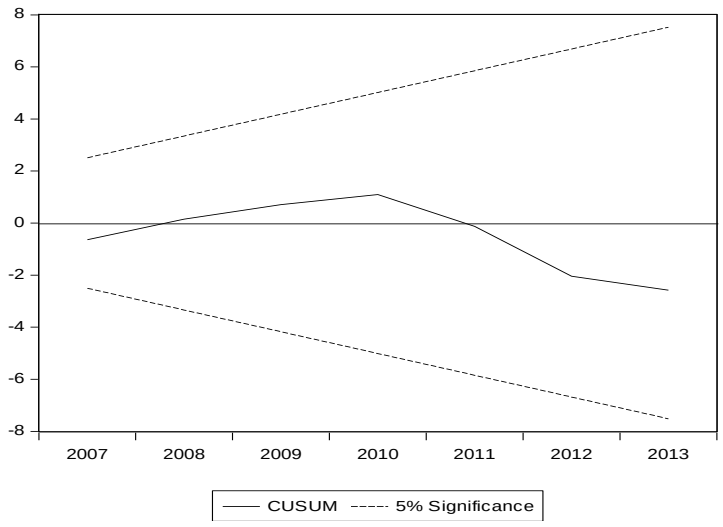

Figure 1– CUSUM test

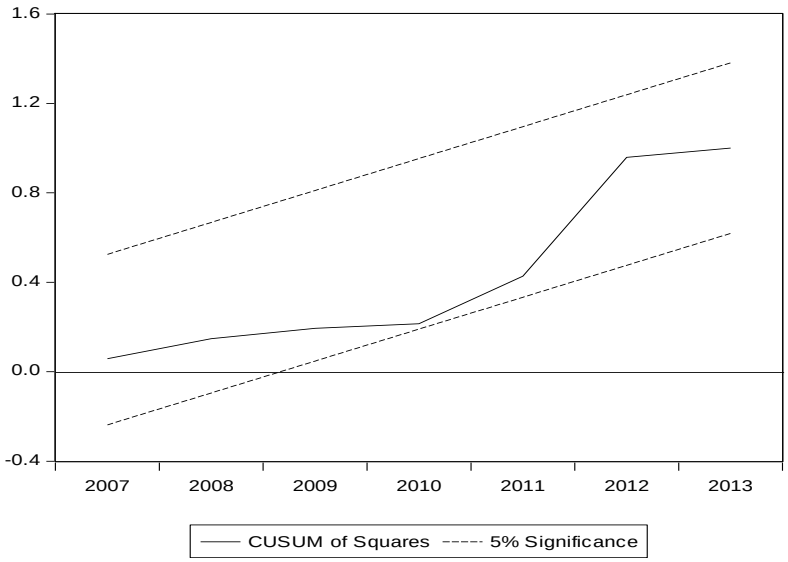

Figure 2 – CUSUM of Squares test

V. CONCLUSION

We examined the impact of remittances, FDI inflows and gross domestic savings on economic growth in Turkey during the period 1970-2013 by employing cointegration test based on ARDL approach in this study. The cointegration test indicated that there was a long run relationship among economic growth, remittances, FDI inflows and gross domestic savings. On the other hand the long run coefficients of the estimated ARDL model demonstrated that remittances, FDI inflows and gross domestic savings had positive impact on economic growth.

Our findings are consistent with general trend in the literature and the study indicated that remittances and FDI inflows affect economic growth positively. So it is very important especially for the developing and less developed countries to attract remittances and FDI inflows in order to achieve sustainable economic growth. In this regard it exhibits importance that the countries should create an investment environment which has sufficient institutional infrastructure

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