

## WORKERS' REMITTANCES AND ECONOMIC GROWTH: EVIDENCE FROM TURKEY

Kadir KARAGÖZ \*

### ABSTRACT

Workers' remittances constitute one of the most important sources of external finance for many developing countries. Although it shows a decreasing trend in recent years, Turkey which met with regular and massive labor migration to abroad after 1960s, is still one of the most remittance gain countries in the world. Empirical studies that implemented for various countries reveal workers' remittances may have increasing, decreasing or neutral affect on economic growth. In this paper, it is investigated that whether workers' remittances have growth impact on Turkish economy, by using data belong to 1970-2005 period. The time series regression findings show that remittance flow to Turkey have statistically meaningful but negative impact on growth. On the other hand, exports and domestic investments positively effect the economic growth, while foreign direct investment has no meaningful affect.

**Keywords:** Workers' remittances, Economic growth, Turkey, Time Series Regression.

**JEL classification:** F2, F24, J61

### ÖZET

İşçi dövizleri birçok gelişmekte olan ülke için en önemli dış finansman kaynaklarından birini oluşturmaktadır. Son yıllarda bir azalma trendi göstermekle birlikte, 1960'lardan sonra yurtdışına düzenli ve kitle halinde işgücü gönderen Türkiye hâlâ dünyada en fazla işçi dövizini çeken ülkelerden biridir. Birçok ülke için yürütülen ampirik çalışmalar işçi dövizlerinin ekonomik büyüme üzerinde artırıcı, nötr veya azaltıcı bir etkide bulunabildiğini göstermektedir. Bu çalışmada, 1970-2005 dönemine ait yıllık veriler kullanılarak, işçi dövizlerinin Türk ekonomisi üzerinde büyümeye yol açıp açmadığı araştırılmaktadır. Zaman

---

\* Ph.D., Inonu University, FEAS, 44280, Malatya, ☎ +90422 341 00 10, [kkaragoz@inonu.edu.tr](mailto:kkaragoz@inonu.edu.tr)

serileri regresyon sonuçları işçi dövizlerinin büyüme üzerinde anlamlı fakat negatif bir etkiye sahip olduğunu göstermektedir. Diğer taraftan, ihracat ve yurtiçi yatırımlar olumlu etkiye sahipken, yabancı yatırımlar anlamlı bir etkide bulunmuyor görünmektedir.

**Anahtar kelimeler:** İşçi dövizleri, ekonomik büyüme, Türkiye, zaman serileri regresyonu.

## 1. INTRODUCTION

International remittances are transfers of funds by workers (remitters) who are living and working in developed countries typically to their families who are still living in their home countries. Examples include Middle Easterners living in Europe, Latin Americans in the United States, and Koreans and Filipinos in Japan. Although the use of remittances varies from country to country, the recipients of remittances commonly rely on them for living costs, education and investments (Carrasco and Ro, 2007:1).

The remittances have become a popular issue in the international financial literature over a decade because of their volume and their potential to reduce poverty. Remittance flows have continued to increase hand-in-hand with rise in the number of migrants around the world and will likely continue to do so in the coming years. In 1995, remittances to developing countries totaled about \$57.8 billion and shot up to \$96.5 billion by 2001 (see Table-1). The World Bank estimated that in 2007 migrants sent home approximately \$238 billion, up 146% from 2001. As these numbers indicate, remittances have developed into an important source of income for many developing countries and, thus, may have significant effects on their economic stability and growth. The large size of remittances relative to other external flows and to the GDP in many countries suggests that the macroeconomic effects of remittances may be of critical importance in many countries. Worldwide top 19 remittance recipients receive more than 10 percent of their GDP in remittances.

Remittances may ameliorate some of the problems that plague developing countries, such as credit market failures, inequality in income and in opportunities, income volatility, and poverty. At the household level, remittances help to overcome such problems by supplying the resources necessary to acquire a house, open a business, and pay for education or health expenses, all of which are usually far beyond the reach of vast segments of the

population in the recipient countries. At a macro level, the positive financial and social externalities generated by remittances, which are likely to be large, and offer a stable source of foreign currency that can help prevent balance of payment crisis (Lopez-Cordova and Olmedo, 2006:7,8).

Migrants send money to their home countries through formal and informal channels. Formal channels include major money transfer operators (MTOs) and banks. Some migrants use formal channels, but language barriers as well as related costs for these services may deter remitters from using them. Consequently, most remittances occur through informal channels. For instance, migrants may carry cash home themselves or send cash through the mail or a friend (Carrasco and Ro, 2007:3,4). According to the findings of a survey of central banks in 40 developing countries which reveals by Luna Martinez (2005), in most countries existing data do not reflect the full amount of the remittance inflows, and most countries need to establish better mechanisms that would allow them to maximize the developmental effect of remittance inflows. In this context, Luna Martinez (2005) argues that by establishing new savings and investment instruments for remittance recipient households, a larger part of remittance flows might be channeled to finance productive investments, thus fostering economic growth.

On the other hand, there is no universal agreement yet on how to measure international workers' remittances to developing countries. Thus, the figures revealed do not reflect the true amounts. Given measurement uncertainties, notably the unknown extent of unrecorded flows through formal and informal channels, the true size of remittances flows may be much higher (perhaps 50 percent or more), with significant regional and country variation. Due to this common data deficiency, as Aydas et al. (2004:4) pointed out, empirical analysis on workers' remittances could merely emphasize the "official" aspect of its measurement.

**Table 1:** Workers' remittances to developing countries, 1990-2005 (billions \$)

	1990	1995	2000	2001	2002	2003	2004	2005
Developing Countries	31,2	57,8	85,6	96,5	113,4	142,1	160,4	166,9
<i>Lower middle income</i>	13,9	30,0	42,6	47,4	57,3	72,5	83,5	88,0
<i>Upper middle income</i>	9,1	14,5	20,0	22,3	23,0	27,8	33,0	33,8
<i>Low income</i>	8,1	13,3	22,8	26,8	33,1	41,8	43,9	45,0
Latin America and the Caribbean	5,8	13,4	20,1	24,4	28,1	34,8	40,7	42,4
South Asia	5,6	10,0	17,2	19,2	24,2	31,1	31,4	32,0
East Asia and the Pacific	3,3	9,7	16,7	20,1	27,2	35,8	40,9	43,1
Middle East and North Africa	11,4	13,4	13,2	15,1	15,6	18,6	20,3	21,3
Europe and Central Asia	3,2	8,1	13,4	13,0	13,3	15,1	19,4	19,9
Sub-Saharan Africa	1,9	3,2	4,9	4,7	5,2	6,8	7,7	8,1
WORLD (developing & industrialized)	68,6	101,6	131,5	147,1	166,2	200,2	225,8	232,3

Source: World Bank, (2006)

Despite the importance given to remittances from developed countries, South-South remittance flows make up 30-45 percent of total remittances received by developing countries, reflecting the fact that over half of migrants from developing countries migrate to other developing countries. Remittance flows to poor countries originate largely in the middle-income developing countries (World Bank, 2006:85).

Recent literature has posited that there exist positive relations between remittance and economic growth, capital accumulation and poverty alleviation of recipient countries. Though the results seem varied, most of them utilized cross country or panel data and therefore there is a need to validate it further into country specific case studies.

In this paper, we aim at to investigate if there is a growth impact of workers' remittances on Turkish economy. Wherefore, Turkey has been one of the prominent remittance receiver countries throughout the last forty years, it is reasonable to think workers' remittances able to have a meaningful impact on growth of Turkish economy. To this end, we employed an econometric procedure which heavily relies on relationship between foreign exchange sources (remittances, exports, foreign direct investments additional to gross domestic investments) and economic growth (namely, GDP per capita).

## **2. WORKERS' MIGRATION FROM TURKEY**

### **2.1. Historical perspective**

It can be said that, “Turks were latecomers to the international migration market after World War II” (Icduygu et al. 2001). There has been, indeed, a Turkish migrant worker phenomenon long before World War II, but it was depended on individual decisions. If development of migrant labor flow is examined, depending on global economic dynamics, three separate but partially overlapped with respect to time phases can be distinguished, namely labor migration to Western Europe (from early-1960s to late 1970s), to Arabian countries (from mid-1970s to early 1990s), and to Russia and other former Soviet republics (from early-1990s by now).

The beginning of the Turkish labor movements dates from the bilateral agreement concluded between the Federal Republic of Germany and Turkey in 1961 with main objective of assisting the reconstruction of post-war Germany. Destination countries have been multiplied in the course of time and over 2 million Turkish workers have migrated for employment to 30 countries. Today, Germany is still by far the most important host country for Turkish migrants with some 2 million Turks, or just under two-third of the whole Turkish community abroad and is followed by France (Koksal, 2006:2). After the mid-1970s, the flow of Turkish workers to Europe stagnated, and was directed instead towards the Arabic peninsula and towards Russia after the dissolution of the Soviet Union.

The economic and political context in Turkey during the period of 1960-1980 is closely related with the trends in Turkish workers migration abroad. Although the first two of the Five Year Development Plans were reasonably successful to achieving their growth targets, they were less successful in bringing about basic structural transformation in the economy, or in distribution the gains from development to those most in need. Also, price stability was not achieved and employment generation was not sufficient (Aydas et al., 2004:6). Because of these failures and in view of the inflow of savings and remittances, “export of surplus labor power” became an increasingly attractive policy to the government. The outflow of migrant workers was primarily determined by host country demand and so

was subject to large fluctuations. Bilateral agreements shaped the initial stages of migratory flows. After then, migratory movements have gained their own dynamics and mechanisms quite independently.

Icduygu et al. (2001), by analyzing empirical data from Turkey, assert that a threshold of socio-economic development may lead to a higher level of migration. They also assert much has changed in Turkey since the early 1960s in both volume and type of migration, the heavy involvement of middle-level developed districts in migration continues to be significant.

## 2.2. Turkish workers' remittances

With respect to the scale of remittances to Turkey, the annual statistics of the Central Bank of the Republic of Turkey (CBRT) displays remittances flows through official channels. The flow of remittances along with time period 1964-2003 appears below in Figure-1. It can be seen that remittance inflow follows an upward trend with conjuncture waves.

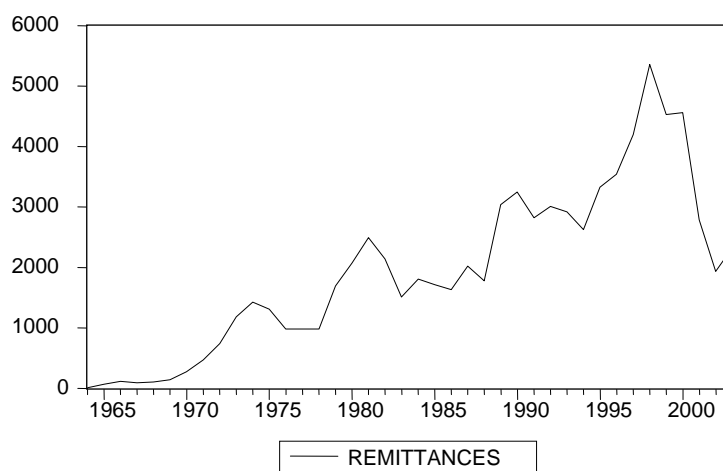


Figure 1: Workers' remittances in Turkey (1964-2003)

In Turkey, since the mid-1960's, remittances have been an important source of foreign currency. Before then, remittances of Turkish emigrants were so small that they were not recorded in the Turkish balance of payments. Initially, if the weak amounts of remittances are due to the low numbers of migrants and their settlement expenditures, from 1964 to 1967, Turkish migrants have remitted their income almost entirely until the economic crisis in Germany. The dramatic increases between 1970 and 1974 can be explained by the

consecutive devaluations of the Turkish lira during that period. Later on, bad economic conditions across all European countries coinciding with global oil crisis ended in a decrease in remittances by 25% from 1975 to 1976 and despite numerous currency adjustments (in 1977, 1978, 1979) the government did not succeed in an increase because of the black market's premium in Turkey. There are several reasons behind the recovery observed in 1979-1982. Among them it is possible to mention the multiplication of the migrants' destination countries (particularly towards Arabian countries), the liberalization of capital movements, and the beginning of openings of the Turkish commercial banks' representative offices abroad. Additionally, short-term draft practice also may have contribution to this recovery process (Alper, 2005:38; Koksall, 2006:11).

Though the remittance flow declined in the early 1980s, the years of military administration, it stabilized in the second half of the 1980s and rose substantially in the second half of 1990s, following the economic crisis in 1994. Interestingly, however, the flow declined in 1999, the year of great earthquake disaster, which indicates the dominance of investment motive as the possible driving force of migrant remittances, rather than the motive of altruism (Aydas et al. 2004:8).

From the beginning of 2000s, it is seen a substantial decrease in the workers' remittance flow. This may be an outcome of demographic change in Turkish emigrants' sociological structure and their entrepreneurial skills, especially of settled in Western Europe. It is possible that the third generation of Turkish migrants in Western Europe does not think to remit their earnings. Moreover, entrepreneurship becomes more common in recent years among Western European Turkish migrants. Off course, this causes to decline in the remittances particularly in those investment-oriented.

A number of studies have been conducted on the remittance inflow to Turkey. Aydas et al. (2004) and Alper (2005) investigated the determining factors of workers' remittances in the case of Turkey. They show that the black market premium, interest rate differential, inflation rate, growth, both home and host countries' incomes and period of military regime have significantly affected remittance flows in Turkey.

As mentioned above, remittance inflow to Turkey, like as in the case of other developing countries, has been under the effects of inside and outside dynamics. With this

regards, Sayan (2004) indicates that dependence of recipient country (here Turkey) heavily on the remittance flows makes it possible to transmit the economic expansion/depression in the host country to the mother country. Transmitting the shocks in the business cycles from the large-size economy to the small-size economy does effects the balance of payments in small-size economy. Thus fluctuations in the remittances will affect the balance of payments and the macroeconomic stability of home country. Erdem-Yigit (2005) also concludes similar results in her study in which she examined the relationship between Germany-originated remittance incomes and business cycles in both Germany and Turkey. Empirical findings show that inward remittances form Germany and Turkish business cycles are closely related. On the other hand, Akkoyunlu and Kholodilin (2006) concludes opposite results which they used German-based data. They show that the remittances positively respond to the changes in the German output and do not react at all to the changes in Turkish output.

### **3. WORKER REMITTANCES AND GROWTH**

#### **3.1. Growth effect of remittances**

Remittances have a potential positive impact as a development tool for the recipient countries. The development effects of remittances can be decomposed into its impact on savings, investments, growth, consumption, and poverty and income distribution. The impact on growth of remittances in the receiving economies is likely to act through savings and investment as well as short-run effects on aggregate demand and output through consumption. Workers' remittances are a component of foreign savings and they complement national savings by increasing the total pool of resources available for investments (Solimano, 2003:6).

For some recipient countries, remittances are large enough to have broader macroeconomic implications. As Ratha (2003:164) pointed out, remittances augment the recipient individuals' incomes and increase the recipient country's foreign exchange reserves. If remittances are invested, they contribute to output growth, and if they are consumed, then also they generate positive multiplier effects. By generating a steady stream of foreign-exchange earnings, they can improve a country's creditworthiness for external borrowing, and through innovative financing mechanisms (such as securitization), they can expand access to capital and lower borrowing costs. While large and sustained remittance inflows can



contribute to currency appreciation and so affect the production cost-sensitive trade goods (such as labor-intensive manufactures). Furthermore, the “Dutch-disease” effects of remittances are of relatively minor concern insofar as remittances grow gradually over long periods (World Bank, 2006: 86). Additionally, remittances are more stable in comparison with other source of external finance such as official development aids (ODA) and foreign direct investments (FDI), and may be countercyclical. Large remittance inflows, however, can lead to exchange rate appreciation and lower export competitiveness.

Although the evidence on the effect of remittances on long-term growth remains inconclusive, in economies where the financial system is underdeveloped, remittances appear to alleviate credit constraints and may stimulate economic growth, via financing education and health and increasing investments. Some analysts and scholars argue that remittance benefits are only felt at the individual receiver level, but some case studies suggest that the benefits of remittances to individuals have spill-over effects that can translate into a positive impact on the local economy (Carrasco and Ro, 2007: 9). To the extent that they increase consumption, remittances may increase per capita income levels and reduce poverty and inequality, even if they do not directly impact growth.

On the other hand, large outflow of workers, especially skilled workers, can reduce growth in labor-skilled countries. Remittances may also indirectly affect labor supply, by encouraging some remittance-recipient households to choose more leisure than labor.

### **3.2. Review of literature**

Much of the current literature on the workers’ remittances has concentrated on two broad strands. Studies related with macroeconomic, especially growth impact of remittances constitute one of them (the other one is concerns determining factors of remittance inflows – for detailed literature review see Hagen-Zanker and Siegel, [2007]).

Various studies on the effect of remittances to economic growth have shown mixed results. For instance, Chami et al. (2003), covering 113 countries found that remittances had a negative effect on growth. The authors of the study attribute this negative effect on the moral

hazard problem that remittances create. Essentially, the study concluded that income from remittances allows receiving families to decrease their own work and productivity, which then translates into a reduction in the labor supply for the developing country.

In a study conducted by IMF (2005) about the impact of remittances on growth over an extended period (1970-2003) for 101 developing countries found no statistical link between remittances and per capita output growth, or between remittances and other variables such as education or investment rates. However, this inconclusive result attributed to measurement difficulties arising from the fact that remittances may behave countercyclical with respect to growth.

Faini (2002) and Ang (2007) found that the impact of remittances on growth is positive. Faini (2002) argues that remittances overcome capital market imperfections and allow migrant households to accumulate positive assets. Ang (2007) shows the relationship between workers' remittances and economic growth at the national and at the regional levels in the case of Philippines. He found that at the national level remittances do influence economic growth positively and significantly. When he broke down his analysis at the regional level to confirm the national results, he found that mixed results giving rise to his anecdotal observations that remittances do not positively affect economic growth. In sum, he concludes that remittances have to be translated to value-added activities and investments which are more foundational sources of development and growth.

Glytsos (2005) using data for 1969-1998 for Egypt, Greece, Jordan, Morocco, and Portugal shows that the impact of remittances on output varies over time and across countries. For Egypt, Jordan, and Morocco the growth-generating capacity of rising remittances characteristic is smaller than the growth-destroying capacity of falling remittances. Therefore the large fluctuations in the real value of remittances contribute to large fluctuations of output growth and cause instability in the economies concerned.

Remittances, like aid, may be more effective in a good policy environment. For instance, a good investment climate with well-developed financial systems and sound institutions is likely to imply that a higher share of remittances is invested in physical and human capital. Giuliano and Ruiz-Arranz (2005) show that in the economies where the financial system is underdeveloped, remittances alleviate credit constraints and work as a

substitute for financial development, improving the allocation of capital and therefore accelerating economic growth.

## 4. EMPIRICAL ANALYSIS

### 4.1. Variables, data and the model

In this section we estimate the impact of remittances on macroeconomic growth. We employed a modified version of the model developed by Chami et al. (2003), which posits that because remittances transfer takes place under asymmetric information and uncertainty, remittances are burdened with a moral hazard problem that limits their ability to contribute to positive business and human capital investment in developing economies, thus leading to negative economic growth. After briefly outlining their model we obtain our own estimates, using the same general empirical methodology but making slight modifications and adding some different variables.

Using panel data on workers' remittances, per capita GDP, gross capital formation (gross domestic investment), and net private capital flows Chami et al. (2003) estimate the model below,

$$\Delta y_i = \beta_0 + \beta_1 y_{0i} + \beta_2 wr_i + \beta_3 gcf_i + \beta_4 npcf_i + \varepsilon_i$$

Where  $y$  is the log of real GDP per capita,  $y_0$  is the initial value of  $y$ ,  $wr$  is the log of worker remittances to GDP ratio,  $gcf$  is the log of gross capital formation to GDP ratio, and  $npcf$  is the log of net private capital flows to GDP ratio. They also use an alternative specification using change in the log of workers' remittances to GDP ratio as an independent variable:

$$\Delta y_i = \beta_0 + \beta_1 y_{0i} + \beta_2 \Delta wr_i + \beta_3 gcf_i + \beta_4 npcf_i + \varepsilon_i$$

Mansoor (2007) finds this specification problematic, because a country would need to increase remittances year after year to promote growth, which would end up with a 100% share of remittances on GDP in the limit. This criticism seems us reasonable therefore, unlike Chami et al. (2003), we look at the level, rather than growth, of remittances to GDP.

Also, unlike abovementioned paper, we included the export and foreign direct investment variables in the model. By doing so, we have adopted to consider the impact of remittances on growth via the route of foreign exchange sources. This is important especially for developing countries which are rushed by fiscal deficits, external debts, trade imbalances and few foreign direct investments one of which is Turkey. To this end, we consider in the model relationship between GDP (per capita), investments (private plus public sector's) and other sources of foreign exchange such as remittances, foreign direct investments, and exports.

Thus the model to be estimated is like:

$$GDPPC_t = \beta_0 + \beta_1 GDPPC_{t-1} + \beta_2 RREM_t + \beta_3 REXPO_t + \beta_4 RINV_t + \beta_5 RFDI_t + \varepsilon_t$$

where  $GDPPC_t$  is per capita GDP,  $GDPPC_{t-1}$  is one period lagged per capita GDP,  $RREM_t$  is ratio of workers' remittances to GDP,  $REXPO_t$  is ratio of exports to GDP,  $RINV_t$  is ratio of gross domestic investments (include both private and public sectors fixed capital investments) to GDP, and  $RFDI_t$  is ratio of foreign direct investment inflow to GDP.  $\varepsilon_t$  is usual white noise error term which includes the effects of omitted factors. All variables are used in their logarithmic values and in USD figures. The remittance data was obtained from Central Bank of Turkey –EDDS (Electronic Data Distribution System), while others from TURKSTAT (Turkish Statistical Institution) database. Sample period covers the time period of 1970 to 2005. After 2003 the expenditures of migrant workers that they made in Turkey along their visitation are excluded from remittance figures and included to tourism revenues. But we integrated this two item so that to have a larger and actual sample.

When dealing with time series data, it is necessary to assess whether the series are stationary or not. The reason being that regression of a non-stationary series on another non-stationary series lead to what is known as spurious regression. Furthermore, statistical tests of the parameters resulting from such regression may be biased and inconsistent. The standard approach to investigate the stationarity of a time series is through unit root tests. Several tests are available but the most commonly used is the augmented Dickey-Fuller (ADF) test. If two series are non-stationary but their linear combination is, the two series are said to be cointegrated. Series that are cointegrated move together in the long run at same rate; in other words, they obey an equilibrium relationship in the long run. The implication being that if

economic growth and remittances are cointegrated then they should move together in the long run at the same rate. That is, economic growth is remittance-oriented. Same things can be said for other variables.

## 4.2. Empirical results

The results of the ADF unit root test are shown in appendix Table-2. These results suggest that none of the variables under analysis are stationary in their levels. That is, they should be differenced. After first differencing all variables turned to stationary.

Table-3 presents the results of Johansen cointegration test procedure. This table shows whether there is any long run co-movement between the variables under investigation. These results suggest that there is at least one long run meaningful relationship between the variables. Therefore a regression equation can be set up between economic growth and explanatory variables in levels.

Table-4 presents results from the ordinary least squares estimation of the relationship between per capita GDP and remittances and other variables. The  $RFDI_t$  variable is omitted from the final model because it turned to be insignificant. The model is meaningful as a whole (F statistic is 282,0) and have a strong explanatory power (R-square is 0,97). It appears from these results that the per capita GDP variable and workers' remittances ratio to GDP were negatively correlated over the time period of 1970 to 2005. The growth elasticity of remittances in that time period was  $-0,03$ . This result is in accordance with of Chami et al. (2003), which points to moral hazard problem.

On the other hand, ratios of exports and gross domestic investments to GDP have a meaningful and positive effect on the per capita income.

## 5. CONCLUSION

The remittances have become a popular issue in the international financial literature over a decade because of their volume and their potential to reduce poverty. Recent literature

has posited that there exist positive relations between remittance and economic growth, capital accumulation and poverty alleviation of recipient countries. Though the results seem varied, most of them utilized cross country or panel data and therefore there is a need to validate it further into country specific case studies.

In this paper, we aim at to investigate if there is a growth impact of workers' remittances on Turkish economy. Wherefore, Turkey has been one of the prominent remittance receiver countries throughout the last forty years, it is reasonable to think workers' remittances able to have a meaningful impact on growth of Turkish economy. To this end, we employed an econometric procedure which heavily relies on relationship between foreign exchange sources (remittances, exports, foreign direct investments additional to gross domestic investments) and economic growth (namely, GDP per capita).

As Chami et al. (2003) pointed out moral hazard problem created by remittances can be severe enough to reduce economic activity. Our empirical results suggest that remittances have negative affects on economic growth in the example of Turkey. At the very least, we have demonstrated that remittances differ greatly from investment and exports in terms of their motivation and their effects. Remittances, in the case of Turkey, do not appear to be a significant source of capital for economic development, unlike from some of the other developing countries.

It seems quite difficult, in the near future to gain advantage from remittances in the way of growth. Because, the structure of workers' remittances have changed substantially and remittance inflow is far away from it's past high level. Especially third generation in the Western Europe is not so inclined to remit and developed strong entrepreneurial skills. Therefore it is too hard for Turkey to re-gain more remittance income as in the past.

## **REFERENCES**

Akkoyunlu, S. & Kholodilin, K.A. (2006), "What Affects the Remittances of Turkish Workers: Turkish or German Output?", German Institute for Economic Research, DIW, Discussion Papers, No. 622, Berlin.

- Alper, A.M. (2005), “Macroeconomic Determining Factors of Workers’ Remittances: Turkey Example”, Unpublished expertise thesis, CBRT, General Directory of Remittances, Ankara. (in Turkish)
- Ang, A. P. (2006), “Workers’ Remittances and Economic Growth in the Philippines”, [http://www.ifw-kiel.de/VRCent/DEGIT/paper/degit\\_12/C012\\_029.pdf](http://www.ifw-kiel.de/VRCent/DEGIT/paper/degit_12/C012_029.pdf)
- Aydas, O.T., Neyapti, B. & Metin-Ozcan, K. (2004), “Determinants of Workers’ Remittances: The Case of Turkey”, Bilkent University Department of Economics Discussion Paper.
- Buch, C.M. & Kuckulenz, A. (2004), “Worker Remittances and Capital Flows to Developing Countries”, Centre for European Economic Research, ZEW, Discussion Paper, No. 04-31.
- Carrasco, E. & Ro, J. (2007), “Remittances and Development”, <http://www.uiowa.edu/ifdebook/ebook2/contents/part4-II.shtml>
- Chami, R., Fullenkamp, C. & Jahjah, S. (2003), “Are Immigrant Remittances Flows a Source of Capital for Development?”, IMF Working Paper, No. 189.
- Erdem – Yigit, F. P. (2005), “The Relationship Between Workers’ Remittances and Growth Cycles”, Unpublished expertise thesis, CBRT, General Directory of Remittances, Ankara. (in Turkish)
- Faini, R. (2002), “Migration, Remittances and Growth, Paper presented at UNU-WIDER conference on Poverty”, International Migration and Asylum, 27-28 September, Helsinki.
- Giuliano, P. & Ruiz-Arranz, M. (2006), “Remittances Financial Development and Growth”, IZA, Discussion Paper No. 2160.
- Glytsos, N. (2005), “Dynamic Effects of Migrant Remittances on Growth: An Econometric Model with an Application to Mediterranean Countries”, EconWPA, Discussion Paper, No. 74.
- Hagen-Zanker, J. & Siegel, M. (2007), “The Determinants of Remittances: A Review of the Literature”, Maastricht University Working Paper, MGSOG/2007/WP003.
- Icduygu, A., Sirkeci, I. & Muradoglu, G. (2001), “Socio-economic Development and International Migration: A Turkish Study”, International Migration, 39 (4), 39-61.

IMF – International Money Fund (2005), *World Economic Outlook: Globalization and External Imbalances*, Washington, DC.

IOM – International Organization for Migration (2005), *World Migration 2005: Cost and Benefits of International Migration*, Geneva.

Koksal, N. E. (2006), “Determinants and Impact on the Turkish Economy of Remittances”, <http://www.luc.edu/orgs/meea/volume8/PDFS/koksal.pdf>

Lopez-Cordova, E. & Olmedo, A. (2006) “International Remittances and Development: Existing Evidence, Policies and Recommendations”, INTAL-ITD, Occasional Paper, No. 41, Buenos Aires.

Luna Martinez, J. de (2005), “Workers’ Remittances to Developing Countries: A Survey with Central Banks on Selected Public Policy Issues”, World Bank Policy Research Working Paper, No. 3638.

Mansoor, A.M. (2007), “Migration and Remittances: Eastern Europe and the former Soviet Union”, (A. Mansoor and B. Quillin eds.) World Bank, Washington, DC.

Rapoport, H. & Docquier, F. (2005), “The Economics of Migrants’ Remittances, The Institute for the Study of Labor”, IZA, Discussion Paper, No. 1531, Bonn.

Ratha, D. (2003), “Workers’ Remittances: An Important and Stable Source of External Development Finance, in the Global Development Finance: Striving for Stability in Development Finance”, Washington, D.C., World Bank, p. 157-175.

Sayan, S. (2004), “Guest Workers’ Remittances and Output Fluctuations in Host and Home Countries: The Case of Remittances from Turkish Workers in Germany”, *Emerging Markets Finance and Trade*, 40 (6), 68-81.

SPO – State Planning Organization (2001), *Labor Market Special Expertise Report*, Sub-commission of Turks-Abroad Report, Ankara. (in Turkish)

Solimano, A. (2003), “Remittances by Emigrants”, UNU-WIDER Discussion Paper, No. 2003/89.

Straubhaar, T. (1986), “The Determinants of Workers’ Remittances: The Case of Turkey”, *Weltwirtschaftliches Archiv*, 122, 728-740.

World Bank (2006), *Global Economic Prospects: Economic Implications of Remittances and Migration*, Washington, DC.



APPENDIX

Table 2: Results of ADF unit-root test.

Variables	Lag	Level		1st differences	
		Intercept	Intercept +trend	Intercept	Intercept +trend
GDPPC	0	-0,497	-2,926	-6,177*	-6,072*
	1	-0,351	-2,859	-3,781*	-3,682**
	2	-0,159	-3,859	-3,122**	-3,010
RREM	0	-1,562	-1,377	-5,083*	-5,691*
	1	-1,598	-1,153	-2,672***	-3,108
	2	-1,494	-1,154	-2,757***	-3,171
RFDI	0	-0,603	-3,795	-9,209*	-9,294*
	1	0,155	-2,774	-5,222*	-5,325*
	2	0,254	-2,219	-4,570*	-4,792*
REXPO	0	-0,611	-2,728	-5,337*	-5,240*
	1	0,856	-1,381	-4,125*	-4,254**
	2	1,156	-0,778	-1,524	-1,734
RINV	0	-1,661	-2,790	-5,617*	-5,550*
	1	-1,512	-2,889	-3,099**	-2,942
	2	-1,094	-3,325	-2,527	-2,259

Note: (\*), (\*\*), and (\*\*\*) denote significance at %1, %5, and %10 level respectively.

**Table 3:** Results of Johansen cointegration test

Variables	Hypotheses		Test Statistics	
	H <sub>0</sub>	H <sub>1</sub>	Eigenvalue	Likelihood ratio
<i>GDPPC</i> , <i>RREM</i> , <i>REXPO</i> , <i>RINV</i>	r = 0	r > 0	0,563	47,232 *
	r ≤ 1	r > 2	0,264	19,089
	r ≤ 2	r > 3	0,145	8,683
	r ≤ 3	r > 4	0,038	1,310

Note: (\*) denotes rejection of the null hypothesis at %1 significance level.

**Table 4:** Results of OLS parameter estimation

Dependent Variable: *GDPPC<sub>t</sub>*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
<i>intercept</i>	3.836827	0.982299	3.905968	0.0005
<i>GDPPC<sub>t-1</sub></i>	0.517648	0.113389	4.565251	0.0001
<i>RREM<sub>t</sub></i>	-0.030925	0.012086	-2.558748	0.0158
<i>REXPO<sub>t</sub></i>	0.057080	0.015472	3.689196	0.0009
<i>RINV<sub>t</sub></i>	0.075925	0.026506	2.864496	0.0076
R-squared	0.974094	Mean dependent var		7.286782
Adj. R-squared	0.970640	S.D. dependent var		0.197502
Log likelihood	71.54710	F-statistic		282.0084
D-W statistic	1.680518	Prob(F-statistic)		0.000000