

DETERMINANTS OF WORKERS' REMITTANCES:
EVIDENCE FROM TURKEY

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ABSTRACT

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In this thesis, macroeconomic determinants of workers' remittances are analyzed for the case of Turkey, using annual data over the period 1964-2001. Using two different models, in contrast to some previous analyses, we find that macroeconomic variables and variables related with economic and political risk in the country of origin significantly impact on remittance inflows. According to empirical results, remittance flows are highly responsive to the differential between the official and black market exchange rates. In both models, we observe that the difference between the black market and official rate of exchange has a significant negative impact on the inflow of remittances. Domestic rate of inflation also has a significant negative impact on remittances, indicating a negative correlation between economic instability in home country and remittance inflows. Results also reveal that the interest rate differential between the country of origin and host country has a significant positive impact on remittances. Periods of military administration in Turkey also have a significant negative impact on remittance inflows, indicating a negative correlation between political instability in home country and remittance inflows. Hence, contrary to some previous studies, our results, based on the evidence from Turkey, suggest that governments of labor-exporting countries can influence remittance inflows through inflation, exchange rate and interest rate policies.

Key Words: Workers' Remittances, Black Market Premium, Real Overvaluation, Interest Differentials

ÖZET

İŞÇİ DÖVİZLERİNİ BELİRLEYEN ETKENLER:

TÜRKİYE ÖRNEĞİ

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Bu tezde işçi dövizlerini belirleyen makroekonomik etkenler, Türkiye örneği üzerinde, 1964-2001 periyodu yıllık verileri kullanılarak incelenmiştir. İki farklı model kullanılarak, bundan önceki bir kısım çalışmaların aksine makroekonomik değişkenlerin ve işçi gönderen ülkedeki ekonomik ve siyasal riskle ilgili değişkenlerin işçi dövizlerinin ülkeye akışı üzerinde önemli ölçüde etkisi olduğu bulunmuştur. Sonuçlara göre döviz akışları resmi döviz kurları ile kara borsa döviz kurları arasındaki farkdan çok etkilenmektedir. İki modelde de resmi döviz kurları ile kara borsa döviz kurları arasındaki farkın döviz akışı üzerinde önemli ölçüde negatif etkisinin olduğu ortaya çıkmıştır. İşçi gönderen ülkedeki enflasyonun da işçi dövizlerini negatif yönde etkilediği tespit edilmiştir, bu bize ülkedeki ekonomik istikrarsızlıkla işçi dövizleri akışlarının arasındaki ters orantıya işaret etmektedir. Sonuçlar ayrıca işçi gönderen ülke ile işçi alan ülke arasındaki faiz farklarının işçi dövizleri üzerinde önemli ölçüde bir pozitif etkisinin olduğunu ortaya çıkarmıştır. Türkiye'deki askeri yönetim dönemlerinin de işçi dövizleri üzerinde önemli ölçüde negatif etkisinin olduğu bulunmuştur, bu bize ülkedeki siyasi istikrarsızlıkla işçi dövizleri akışlarının arasındaki ters orantıya işaret etmektedir. Dolayısıyla, bu çalışmadaki sonuçlarla, bundan önceki bir kısım çalışmaların aksine, işçi ihraç eden ülkelerin hükümetlerinin enflasyon, döviz kuru ve faiz oranları politikalarıyla işçi dövizleri akışlarını etkileyebileceği Türkiye örneğini kullanılarak gösterilmiştir.

Anahtar Kelimeler: İşçi Dövizleri, Kara Borsa Primi, Reel Aşırı Değerlenme, Faiz Farkları

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CHAPTER 1: INTRODUCTION

The volume of international migration has been increasing since the end of the Second World War. International Labor Organization (ILO) estimates the worldwide population of migrant workers to be between 36 and 42 million in year 1999 (see, ILO Bulletin of International Migration, 2000). One important aspect of migration has been the remittances of migrant workers. Remittances are the part of the payment of the worker that goes back to the country of origin. World Bank definition of remittances includes three streams of money flowing into countries: workers' remittances (value of money transfers sent home from workers who reside abroad for more than a year); compensation of workers (gross earnings of workers residing abroad for less than a year, including the value in-kind benefits, such as housing and payroll taxes) and; migrant transfers (net worth of migrants who move from one country to another) (Neyaptı, 2001). According to Murinde (1993), remittances are a major source of foreign exchange for many developing countries, where its limited availability could therefore act as a major constraint on economic development programs and stabilization policy.

Since workers' remittances are a major source of foreign exchange for labor-exporting countries, the determinants of workers' remittances are of central concern for those economies. In order to attract these foreign exchange flows, appropriate macroeconomic policies must be developed and special laws must be formed to give incentives to workers abroad who want to remit their earnings. Another important factor in this context is the existence of unofficial channels for international capital flows. El Sakka and McNabb (1999) indicate that: "Since many labor exporting countries have well-established informal mechanisms through which remittance earnings can be channeled, it is important to establish the factors that influence the amount of migrants' savings that go through official channels as opposed to those that find their way into unofficial channels, most notably the black market." Developing appropriate macroeconomic policies and laws that will attract remittances and preventing the flow of remittances to the unofficial market, all require that key determinants of workers' remittances are well-understood.

The determinants of workers' remittances are mainly grouped into two in the literature (see, for example, Russell, 1986). The determinants of workers' remittances in the first group mostly includes variables regarding the sociodemographic characteristics of migrants and their families, such as the marital status of migrant, number of children of the family of migrant; years of education of migrant and the family and the employment status of other

family members, occupational level of migrant, etc. The second approach, however mainly considers macroeconomic and political variables as well as variables related with the institutional environment. Much of the literature, however, has concentrated on the determinants of workers' remittances in the first group rather than on the macroeconomic variables that may influence the flow of migrants' savings to their countries of origin. In addition, the evidence in the literature regarding the impact of macroeconomic variables, such as interest rate differentials, black market premium and domestic rate of inflation, on remittances is not conclusive.

According to Swamy (1981), the number of migrants abroad and their wages explain over 90% of the variation in remittance inflows. Swamy (1981) also include that, the level of, and cyclical fluctuations in, economic activity in the host countries explained 70 to 90% of the variation in the remittances. On the other hand, Swamy (1981) argues that "incentive" interest rates in the country of origin relative to the interest rate in the host countries, the difference between the black market exchange rate and the official exchange rate, that is the black market premium, in the home country do not affect total remittance flows significantly. Since governments of labor-exporting countries introduced special incentive schemes to increase the flow of workers' remittances through official channels, Swamy's results question the use of such policies. On the other hand, Elbadawi and Rocha (1992) explain Swamy (1981)'s failure to find a significant impact of interest differentials on remittances by a potential correlation with interest differentials and other variables included in the model.

Straubhaar (1986), develops a simple model to examine the remittances of Turkish workers in Germany. In support of Swamy (1981), Straubhaar (1986) argues that: "Contrary to the conventional belief, the incentives to attract emigrants' remittances have not been very successful. Neither variation in exchange rates, reflecting the governmental intention to attract remittances by premium exchange rates, nor changes in the real return of investments (reflecting the governmental intention to attract remittances by foreign exchange deposits with higher returns) affect the flows of remittances towards Turkey."

In contrast with the conclusions of Swamy (1981) and Straubhaar (1986), Chandavarkar (1980), Katselli and Glytsos (1989) and Wahba (1991), all argue that a macro economic policy framework developed on competitive interest and exchange rates would enable governments of labor exporting countries to attract remittances through official channels. Elbadawi and Rocha (1992) and El-Sakka and McNabb (1999) agree on the significance of the

impact of macroeconomic policy on remittances, but they contrast on the direction and significance of the impact of some variables. For example, they agree on the negative effect of the black market premium, but they disagree on the effect of differential interest rate and domestic inflation. According to Elbadawi and Rocha (1992), differential between domestic and foreign interest rates has no significant effect on remittances, while El-Sakka and McNabb (1999) argue that it negatively affects the remittances. Also, Elbadawi and Rocha (1992) argue that domestic inflation negatively affect the remittance flow, while El-Sakka and McNabb (1999) argue that it positively affect the remittances. So, the evidence in the literature regarding the impact of macroeconomic variables on remittance inflows has not reached to a consensus.

As also indicated in El-Sakka and McNabb (1999), the contradictory findings reported in the literature may reflect the fact that the focus of some studies is often limited to only a few macroeconomic variables often ignoring key determinants such as the black market exchange rate. In addition, because of the lack of data in labor exporting countries estimation periods of most studies are really short. Also, the estimations in previous studies (see, for example, Elbadawi and Rocha [1992], El-Sakka and McNabb [1999]) are generally based on modeling remittances with the levels of potential determinant variables, while these variables are generally non-stationary. All these factors lead us to question the reliability of the general conclusions in the previous literature.

In this study, further evidence regarding the impact of macroeconomic variables on remittance inflows is presented using Turkish data. Turkish workers' migration abroad started in the early 1960s with mainly to Western Europe and especially to the Federal Republic of Germany. Since the early 1960s, over 2 million Turkish workers have migrated for employment to about 30 countries. The inflow of Turkish workers' remittances started to grow slowly after 1964, and after then the amount of remittances reached considerable amounts and became an important source of external financing for Turkey. In 1970, remittances reached 20 %, in 1976 reached the highest level with 90 % and beginning from 1990, it remained to be around 20 % of total exports. The Turkish Government has developed a number of policies to encourage migrants' remittances, such as special exchange rates for remittances, special interest rates for the foreign currency accounts maintained by the Turks abroad with the Turkish Central Bank and special import privileges for consumer goods and machinery.

This study examines the significance and the direction of the impact of macroeconomic variables on workers' remittances for the case of Turkey. We question the role of key macroeconomic variables, such as, interest differentials, black market premium, per capita income in domestic and host countries, and variables related with the economic and political risk in the home country, such as, military administration dummy, rate of growth and inflation, in explaining variations in remittance flows. The empirical analysis is based on annual data for 1964-2001 period, which is lengthier than the previous studies. We develop models that are based on the first differences of variables. The estimation results are also tested with relevant diagnostic tests.

The rest of the thesis is organized as follows. In Chapter 2, the historical background regarding the significance of migration and remittances in the world is reviewed with a specific emphasis on Turkey. Also, past four decades of Turkish experience with migration; economic and political context in Turkey in the initial periods of migration; the magnitude and development of Turkish workers' remittances; and the official attitude of Turkish government towards migrants and remittances are discussed. In Chapter 3, previous literature related with determinants of workers' remittances is presented. In Chapter 4, theoretical considerations regarding the potential determinants of workers' remittances are discussed and based on this discussion equations that are used to model remittances are presented. In Chapter 5, econometric theory used in this study is given. Chapter 6 presents the data used in the estimations. In addition, data constructions and correlations between variables are described. Chapter 7 reviews the results of regressions that based on models presented in Chapter 4. Finally in Chapter 8, the concluding remarks that can be drawn from the empirical results are discussed. Related tables and graphs are included in the Appendix.

CHAPTER 2: HISTORICAL BACKGROUND

In this chapter we will firstly review the significance of migration and remittances in the world. Secondly, past four decades of Turkish experience with migration will be presented. Thirdly, the economic and political context in Turkey will be analyzed. Fourthly, the magnitude and development of Turkish workers' remittances will be given. Finally, official attitude of Turkish government towards migrants and remittances will be discussed.

2.1. Migration and Remittances

Since the end of the Second World War international migration has been increasing. The worldwide population of migrant workers, who are defined as people who are economically active in a country of which they are not nationals but excluding asylum seekers and refugees, is estimated by the ILO to be between 36 and 42 million in the world. If dependants are added to this estimate, the total population of migrants stands at between 80 to 97 million. Europe is the region with the highest concentration of non-nationals in the world, with between 26 and 30 million people who are non-national residents. (ILO, Bulletin of International Migration, 2000)

According to Murinde (1993), remittances are the main reason for workers who choose to be employed abroad. From the migrants perspective, remittances from migration help them and their families to consume and invest more. Murinde (1993) also argue that from the perspective of the country of origin remittances are a major source of foreign exchange and its limited availability acts as a major constraint on economic development programs and stabilization policy.

Because of these reasons, in 1975, there were 13.8 million immigrant workers in the world living temporarily away from their home countries; 10.3 million were working in the developed countries of Europe and North America; 2 million in the oil exporting countries of the Middle East and North Africa; and the remaining 1.5 million mainly in South and West Africa. (Ecevit and Zachariah, 1978) They remitted close to \$8.1 billion through official channels alone. Since then, both labor flows and remittances have increased considerably.

2.2. Turkish Experience with Migration

Turks have been migrating abroad for employment for the past four decades. Exporting workers abroad started in the early 60s with mainly to Western Europe and especially to the Federal Republic of Germany. Since the early 1960s, over 2 million Turkish workers have migrated for employment to about 30 countries. Turkish experience with migration can be better understood by Graph 2.1, showing the yearly figures of recruited workers for the period 1961-2001.

2.2.1. Bilateral Recruitment Agreements and Social Security Agreements

Turkish migration for employment was handled through bilateral agreements with recruiting countries. After bilateral recruitment agreements, social security agreements were signed between the host countries and Turkey in order to protect and improve the social security rights of workers. Up to 2001, Turkey signed social security agreements with England, Germany, Netherlands, Belgium, Austria, Switzerland, France, Libya, Denmark, Sweden, Norway and Turkish Republic of Northern Cyprus. Bilateral recruitment agreements and social security agreements that were signed by Turkey within 1961-2000 period are given in Table 2.1.

2.2.2. Migration to Western Europe

Throughout the 1950s and 1960s, the rapidly growing economies of France, Germany and England attracted large numbers of migrant workers from the countries in southern Europe. Organized labor migration from Turkey to Federal Republic of Germany was initiated with a bilateral recruitment agreement of October 1961. Turkish constitution was revised to make entering to and leaving Turkey a fundamental right and freedom, followed by a bilateral labor recruitment agreement was signed between Turkey and the Federal Republic of Germany in October 1961. (Abadan-Ünat, 1986)

Keyder (1988) reports that only 1700 Turks were employed in the Federal Republic of Germany in 1960. Before the period of recruitment, Turks had not participated in post-war European labor migration, which in the late 1950s primarily involved Italians migrating to France, Switzerland and the Federal Republic of Germany. Initial Turkish labor flows to the Federal Republic were small, but official emigration of workers soon jumped to 66 thousand in 1964 and 130 thousand in 1970, and then reached the highest level at 136 thousand in 1973. Between 1961 and 1975 about 805 thousand Turks were sent to work abroad through the Turkish Employment Service (TES), and according to Gitmez (1989), another 120

thousand to 150 thousand emigrated illegally. Most of these first Turkish migrants were graduates of Turkish technical schools who went to the Federal Republic of Germany for additional training (see, Martin, 1992). The volume of yearly recruitment of Turkish workers to Federal Republic of Germany is shown in Graph 2.2.

Turkish labor migration to Western Europe occurred in three phases:

- (i) European employers recruited Turkish workers during the 1960s and early 1970s. Just the brief economic crises of 1966/1967 disturbed the development of the labor migration. In West Germany the number of employed Turks decreased by about a fourth, from 161 thousand to 123 thousand, between September 1966 and January 1968, while in Netherlands the number of Turks decreased as well from 14,5 thousand to 12,3 thousand (Penninx, 1982). After 1968, Turkish labor migration to Western Europe grew rapidly. In this first stage of migration migrant workers were warmly welcomed, since they took up employment in areas that the native populations found unattractive because of low pay or poor working conditions. However, the sudden rise in domestic unemployment levels as a result of the oil crisis of the early 1970s changed people's attitudes to migrants.
- (ii) The massive flow of labor migrants over the period 1968-1972 suddenly stopped in 1973. The oil crisis forced West Germany and the Netherlands to announce the end of the recruitment of migrant workers, and this, in fact, marked the end of large labor migration from Turkey to Western Europe. When labor recruitment was stopped in 1973, there were one million Turks on the waiting list ready to work abroad. However, the sudden finish of the flow of labor migrants did not mean the end of the migration flow as a whole. The migration flow, which was a result of the family reunification of Turks in West European countries and which had already begun before, continued and from 1974-1980 onwards, it was characterized by: an increasing migration of non-actives, at least of migrants who had not been recruited as workers in Turkey; a decrease of return migration from Western Europe to Turkey; and a continually increasing growth of the Turkish population in West European countries as a result of the increasing birth rate among Turkish migrants. (Penninx, 1982)
- (iii) Today about 3.5 million Turks have apparently settled in Western Europe. A small migration flow continues between Turkey and EC countries, but this migration mostly involves family reunification in the EC countries and retirees coming back to Turkey, rather than migration from Turkey for employment in the EC countries.

2.2.3. Migration to Middle East

In the second half of the 1970s, when migration to Western Europe suddenly stopped, the flow of labor migrants from Turkey was directed to the oil exporting Arab countries. The greatest demand was formed by Libya and Saudi Arabia. Initially Libya started to recruit a large volume of Turkish workers. In 1980, Libya recruited 15 thousand workers and in 1981 recruitment reached the highest level with 30 thousand workers. Total number of workers sent to Libya from 1975 till 2001 reached to 228 thousand. Migration to Saudi Arabia also started in the second half of the 1970s but accelerated after 1983 and reached its highest level at 1992 with 46 thousand workers. Iraq also recruited Turkish workers between 1981 till 1990, which is the starting year of the Gulf War. Total number of workers sent to Iraq in this period reached 42 thousand. Labor migration to this country came to an end after the start of the war. The patterns of migration to Saudi Arabia and Libya are demonstrated in Graphs 2.3 and 2.4.

2.2.4. Migration to the Former Soviet Republics

When the USSR disintegrated in the beginning of the 1990s, another important phase for Turkish migration started. Former Republics of USSR became a major direction for Turkish workers searching for job abroad. The development of Turkish workers migration to Former Republics of USSR is shown in Graph 2.5.

Turkey's four decades of experience on migration is given in Table 2.2 in a more detailed way. Also the recent (1999-2001) directions of migration for Turkish workers are given in Table 2.3. Table 2.4, on the other hand, present numbers of Turkish Nationals, workers and unemployed, by country as of October 2001. However, we have to indicate that labor emigration data are generally misleading because Turkish migrants went abroad both through official channels and as tourists who later regularized their status or worked as illegal aliens. Martin (1992) argues that, the data given in Table 2.2 regarding the Turkish workers sent abroad through the Turkish Employment Service underestimates actual emigration by 20 to 40 per cent.

2.3. The Economic and Political Context in Turkey (1960-1980)

The economic and political context in Turkey within the period of 1960-1980 accelerated the migration of Turkish workers abroad. Here, we will give a brief review of this context. When Turkey started the planned development in 1963, it was a dominantly agricultural country. Agriculture was producing about 41% of the national income and over 80% of exports were

agricultural. Also, agriculture was employing over three quarters of the civilian active population, which then amounted to almost 12 million. (Paine, 1974)

Rapid industrialization and economic growth were the main concepts for the three period of the development planning (covering 1963-1977) in Turkey by the State Planning Organization (SPO). Although the first two five year development plans were reasonably successful in achieving their aggregate targets (in particular, an average annual growth rate of 7%), they were less successful in bringing about basic structural transformation in the economy, or in distributing the gains from development to those most in need. Also, price stability and improvement in the employment situation was not achieved. The employment steadily decreased. The official total unemployment index rose from 100 in 1962 to 162 in 1972, and non-agricultural unemployment index from 100 to 319 during the same period. In 1973, the official total unemployment estimate approached two million, out of an economically active population of nearly 16 million. Because of these facts, exporting workers became an increasingly attractive policy to the government, especially when it discovered the inflow of savings and remittances. The outflow of migrant workers was primarily determined by host country demand and so was subject to large fluctuations. But as Paine (1974) indicated: “Despite the high risk attached to the adoption of a mass labor export policy, the achievement of Turkey’s development plans was made increasingly dependent on labor export.” (p.36)

The outcome of the planned economy period as indicated earlier was actually a growth of the industrial output and the GNP, but at the same time there were important negative effects: the industrialization in Turkey was mainly in the branches that are of large scale, capital-intensive industries with high quality technological equipment and this had two consequences which were important for emigration:

1. This form of industrialization created relatively little employment. In addition to that, population growth and the decrease of labor from the agriculture sector continued. As a result, the pressure to emigrate increased (official unemployment rose, in spite of massive emigration, from 1.4 to 2.2 million in the period 1962-1977).
2. Although industrialization expected to have made Turkey independent of other countries, the opposite effect was produced. Turkey was made strongly dependent on other countries for the import of raw materials, semi-manufactured articles and technology, while the lack of foreign currency and the deficit on the balance of payments formed a big problem. (Penninx, 1982)

In the second and third five-year plans the emigration of workers and the expected flow of money resulting from remittances took an important place at the service of the Turkish development planning. As Adler (1981:82) noted: “The emphasis was on maximizing the outflow of individuals and the consequent inflow of hard currency little else had such high priority.”

Between the overthrow of the Menderes-government (May 27, 1960) and the takeover by the military (September 12, 1980) ten changes in government had taken place. These changes in government also caused an unstable economic environment in Turkey and this situation deteriorated both the flow of migration and remittances. In order to give some insight to the Turkish economy, the developments on GDP and annual inflation rates within the 1964-2001 period are given in Graphs 2.6 and 2.7.

2.4. Turkish Workers’ Remittances

Before 1963, the remittances of Turkish emigrants towards their home country were so small that they were not recorded in the Turkish balance of payments. The flow of remittances started to grow slowly only after 1964, the beginning of the emigration towards Germany. After then the amount of remittances reached considerable amounts and became an important source of external financing for Turkey. According to Paine (1974), in the case of Turkish workers abroad, it was estimated that mean savings amounted to about 36%, mean remittances to about 11% of mean income abroad, and that non-basic expenditure totaled about 10% of earnings abroad. Graph 2.8 presents the development of Turkish workers’ remittances for 1964-2000 period.

As observed from Graph 2.8, remittances to Turkey declined dramatically first during the late 1970s and started to recover in mid-1979, as the government started to devalue the Turkish Lira. It was the first attempt to correct a large exchange rate misalignment. However, the political turmoil and the failure to effectively correct the misalignment brought remittances back to very low levels in the last months of 1979. Yearly figures show a recovery of remittances in 1979, but such recovery actually started only after the 1980 program (Elbadawi and Rocha, 1992). We also see that remittance flows declined in the early 1980’s, then stabilized in the second half of the 1980s, rose substantially in the second half of the 1990’s, but fell again in 1999.

Remittances have come to play a major role in the economies of the labor-sending countries. According to Russell (1986), the significance of that role is frequently underscored by calculation of remittances as a percentage of the macroeconomic indicators such as gross national product (GNP), or government expenditures. In addition, Russell (1986) argues that: “The most frequent and probably most meaningful comparison is with exports and imports, a comparison which stresses the relative contribution of remittances to foreign exchange earnings, the importance of the “labor export industry” and the role of remittances in a countries ability to pay the import bill.” Table 2.5 presents the data and ratios of workers’ remittances, GDP, exports and imports. According to Chandavarkar (1980), the magnitude of foreign remittances is understated in these figures. He indicates that the figures cover only cash remittances through official channels. Graphs 2.9, 2.10 and 2.11 present the magnitude of workers’ remittances as percentage of exports, imports and GDP.

2.5. Official Attitude of Turkish Government Towards Migrants and Remittances

As noted earlier, the period between 1960 and 1980 has witnessed substantial political turmoil. In the years of a change in the Turkish government, it was observed that workers remit substantially less (see, Graph 2.8). In addition to this, changes in government also caused repeated changes in the official attitude towards the remittances. How these repeated changes in the government led to just as many repeated changes in the official attitude towards the remittances is described at length in Miller (1976), Etzinger (1978), Werth and Yalçıntaş (1978), Adler (1981), and in Penninx (1982).

The Turkish Government has developed a number of policies to encourage migrants’ remittances, such as special exchange rates for remittances, “special interest rates” for the foreign currency accounts maintained by the Turks abroad with the Turkish Central Bank, and a program which permits Turks residing abroad to shorten their compulsory military service by paying a fee in foreign currency. In addition to these, Turkish migrants also enjoyed special import privileges for consumer goods and machinery. Since the late 1980s, returned migrants have had the right to buy consumer durables with foreign exchange at special “duty free” shops during the first six months after their return. (Martin, 1992)

The special “preferential exchange rates” for emigrants’ remittances had been practiced in the 1960s, became abolished in 1970, and became valid again in April and May 1979.

Turkey adopted a two-tiered exchange rate in May 1979, which did increase remittances for a short time, and then devalued the Turkish Lira in 1980, which once again increased remittances.

Since 1976, Turkey has had a foreign exchange deposit program, which offers premium interest rates on foreign currency accounts (e.g. 11 per cent on one-year US dollar accounts in 1988). These premium-interest foreign currency accounts, mostly in DM, with the Turkish Central Bank attracted US\$ 4 billion in savings by 1988, but according to Martin (1992) this has a cost to Turkey because the interest rate premium represents a subsidy to savers. Today two types of accounts are available for migrants: “Foreign Currency Deposit Accounts with Credit Letter” and “Super FX Accounts”. As of April 2002, foreign currency deposit accounts with credit letter offer 4% premium interest for one-year time deposits of US\$ and Euro, and annually 5% interest rate is offered for two-years time deposits. On the other hand, super foreign exchange accounts offer 8% interest rate for one-year time deposits, 9% annually for two-year time deposits and 10% annually for three-year time deposits.

The Turkish Government in the 1970s also tried to channel remittance savings into employment generating activities in order to maximize economic growth. In Turkey such governmental channeling of remittances included programs, which made Turkish Lira loans for homes, farms and small business contingent on migrants establishing foreign currency savings accounts with one of the designated Turkish banks. Migrants wanting to return with cars, trucks and professional equipment were also required to open foreign currency savings accounts. But, according to Abadan-Ünat (1986), such programs to channel remittances into government approved investments failed to attract many migrant applicants, in part because the private sector offered attractive savings alternatives. One government housing program required that 40 per cent of the housing loan be deposited in a foreign currency account for three years. Housing co-operatives, by contrast, offered low interest 20-year mortgages. These mortgages were backed by the Turkish Government in exchange for relatively small down payments and monthly installment payments during the three to five years of construction. This alternative was a good opportunity for migrants abroad (see, Martin, 1992).

Turkey established two unique development programs linked to migration. One is the Village Development Cooperatives (VDCs), which were initiated in 1962 both to help rural development and to give priority to members who wished to migrate abroad for employment. During the early 1960s, persons joining a VDC had to pay a membership fee, and the 1000 TL down payment was soon accepted as the fee, which had to be paid to emigrate. The

number of VDCs and their membership exploded in the mid-1960s but, according to Abadan-Ünat (1986), this VDC expansion was “solely to assure (VDC) members priority in finding work in Europe” (p.356). Abadan-Ünat (1986)’s evaluation of VDCs suggests that they failed to help rural development because their major purpose was to help members to jump ahead in the emigration queue, not to increase development projects. In addition, some migrants paid only part of their VDC fee before they went abroad and, once abroad, they failed to pay the rest of the fee, so that most VDCs had very limited resources to help development.

The second Turkish institution developed to channel migrant remittances was the Turkish Workers Company (TWC). TWCs are Turkish corporations established by migrant savings. Migrants exchange their savings for stock in TWCs, which tend to be small enterprises (usually fewer than 100 employees), located in the area of origin of the migrant-investors. Although the exact number of TWCs and their employment is not certain, about 360 were “founded” and about 200 were incorporated, but only about 100 actually constructed a facility to produce a good or service. There were 27 of these in 1975; the 10 most established firms had 20 thousand shareholders and one thousand employees. (Swamy, 1981) In the early 1980s just about 80 TWCs with an employment of 11 thousand were operating. (Abadan-Ünat, 1986)

TWCs in the late 1980s tended to fall into one of three groups: those that opened and failed; those that opened, ran into trouble and were “rehabilitated” by a special Turkish bank and provincial authorities; and those that proved successful enough to abandon their migrant shareholder roots. Most TWCs fall in the first group (Abadan-Ünat, 1986).

All of the TWC complained about the Turkish bureaucracy and the declining value of the Turkish lira, which had devalued their savings and investment plans. Until 1981, when Turkey introduced foreign currency accounts in Turkey, migrant workers were required to convert their foreign currency savings into Lira within 30 days of their permanent return. This currency conversion was not a major issue until 1977-1978, when the value of the lira began declining rapidly. A Turkish worker who converted his DM savings at the rate of DM1 = 8 TL in 1977 could have obtained 12 TL for each DM a year later, 17 TL in 1979, and 42 TL in 1980. (Martin, 1992)

When the labor demand in Western Europe suddenly decreased in the beginning of 1970s, in order to promote the departure of migrants, bilateral credit programs and some other

programs were applied. But these programs have failed to attract many participants. An agreement, dating 1972, between the Federal Republic of Germany and Turkey made German funds available to returning Turkish migrants who wished to open a small business in Turkey, provided that the migrant participated in training programs in both the Federal Republic of Germany and Turkey. One analysis of such reintegration programs begun by host nations to promote returns concluded that they were too complicated and too costly for host governments and not attractive enough to encourage migrant participation. (Martin, 1992)

CHAPTER 3: REVIEW OF LITERATURE

In this section we first present methods for modeling international workers' remittances and determinants of remittances according to these methods. Secondly, a simple taxonomy of remittances will be given in order to understand the remitting behavior of workers. Thirdly, determinants of remittances regarding the sociodemographic characteristics of migrants and their families will be briefly presented. Fourthly, macroeconomic determinants of remittances will be discussed in depth. Impacts of economic activity, stock of workers, wage rates, relative rates of returns, exchange rate premium, institutional environment, political instability, inconsistent government policies, domestic inflation and exchange rate misalignment will be analyzed. Finally, the ongoing debate in the literature regarding the macroeconomic determinants of workers' remittances will be summarized.

3.1. Methods for Modeling International Workers' Remittances and Determinants of Remittances According to These Methods:

Methods for modeling international workers' remittances are mainly classified into two categories (Elbadawi and Rocha, 1992). One category treats workers' remittances as an endogenous variable in the process of decision making on migration and remittances within the family (see, e.g. Knowles and Anker [1981], Lucas and Stark [1985], Russell [1986], Taylor [1992], Ilahi and Jafarey [1998]). The other category models it as a transfer of saving from one region to another and in this approach mainly portfolio considerations are emphasized (see, e.g. Chandavarkar [1980], Wahba [1991], El-Sakka and McNabb [1999]).

The determinants of workers' remittances are also grouped into two according to the following two approaches (Russell, 1986). The determinants of workers' remittances under the first tradition mostly includes variables regarding the sociodemographic characteristics of migrants and their families, such as the marital status of migrant, number of children of the family of migrant; years of education of migrant and the family and the employment status of other family members, occupational level of migrant, etc. The second approach, however mainly considers macroeconomic and political variables as well as variables related with the institutional environment.

Determinants of remittances regarding the sociodemographic characteristics of migrants and their families have been the main focus of many of the studies in the literature (see, for

example, Knowles and Anker, 1981; Lucas and Stark, 1985; Hoddinott, 1992). Much of the literature, however, has concentrated on individuals' motives to remit rather than on the macroeconomic variables that may influence the flow of migrants' savings to their countries of origin. While many of the earlier empirical work consistently find significant influence on remittances of the sociodemographic characteristics of migrants and their families, some of them fail to find any significant effects of macroeconomic variables and incentive policies (see, for example, Swamy, 1981; Straubhaar, 1986; Glytsos, 1988). Hence, the question of whether remittance flows are responsive to macroeconomic variables has not been sufficiently explored.

3.2. A Simple Taxonomy of Remittances

In order to achieve a full understanding of the remittance behavior of migrant workers and the determinants of the level of remittances, the following simple taxonomy of remittances given in Wahba (1991) is important: First class of workers' remittances is the "*Potential Remittances*" which are the savings available to the migrant once all his expenses are met in the host economy. These represent the maximum amount a migrant can remit. Second class is the "*Fixed Remittances*" that represent the minimum amount a migrant sends to satisfy his family's basic needs. The third class is the "*Discretionary Remittances*", they are what the worker remits over and above the fixed amount sent either through official or unofficial channels. Finally "*Saved Remittances*", or retained savings, are the amount not remitted. They are represented by the difference between total savings and actual remittances in that period.

3.3. Determinants of Remittances Regarding the Sociodemographic Characteristics of Migrants and Their Families

Now let us give a brief review of the literature on determinants of remittances regarding the sociodemographic characteristics of migrants and their families. According to Russell (1986) the potential determinants of remittances in this approach are ratio of females in population in host country, years since worker has out migrated, household income level, employment of other household members, marital status of the migrant, years of education of the migrant and occupational level of migrants. Ilahi and Jafarey (1998) also add variables like the number of children and their educational position, and pre-migration economic situation.

The literature in this field is also divided into two main approaches. According to the first approach, the ability to remit is directly linked to the wage received in the host country and the migrant saving behavior, among other factors. This suggests a sequential decision process, where an aggregate level of savings is determined before the share to be remitted to the home country. There is a class of models that centers the analysis in the determination of the migrant worker's savings function. In these models, the migrant is seen as the traditional macroeconomic agent maximizing intertemporal utility to generate a savings-consumption path, both at home and abroad (e.g. Djajic [1989]; Djajic and Milbourne [1988]). However, the migrant's program is more complex than the standard savings program, since he needs to account for information on foreign relative prices, wages and interest rate paths, in addition to his length of stay abroad.

The second approach, on the other hand, treats remittances as an intertemporal contractual agreement between the migrant and his family. The exact terms of the contract are defined by the relative bargaining powers of the parties involved. Stark (1980, 1982, 1983, 1984, 1985b, 1987a) is the main contributor to this literature. In order to give some insight into the second approach, let us present three explanations for why migrants remit parts of their incomes to their families at home. According to Lucas and Stark (1985), first, migrants may remit for purely altruistic reasons in order to increase the well being of family members at home by providing additional income and thus, higher consumption levels. Second, migrants may remit part of their savings for motives of self-interest to be used to finance the purchase of durable goods, real and financial assets and/or investment at home. Third, remittances can be seen as part of a mutually beneficial arrangement between the migrant and his family at home.

3.4. Macroeconomic Determinants of Remittances

We now turn to the discussion in the literature on the macroeconomic aspect of determinants of workers' remittances. Russell (1986) lists some potential determinants of remittances in this approach as number of workers, wage rates, economic activity in host and sending countries, exchange rate, relative interest rate between labor sending and receiving countries, political risk factors in sending country and facility of transferring funds.

3.4.1. Impact of Economic Activity, Stock of Workers and Wage Rates

The impact of economic activity, real earnings of workers and total number of workers in the host country were consistently found to be significant and positively affecting the flow of remittances in the literature. (e.g. Swamy [1981], Straubhaar [1986], Elbadawi and Rocha [1992], El-Sakka and McNabb [1999])

According to Swamy (1981), the number of migrants abroad and their wages explain over 90% of the variation in remittance inflows. The author also adds that most of the variation was due to the number of workers abroad. Since, the numbers of workers in the host country and wage rates are both related to the levels of economic activity, both in the host country and in the labor-sending country, Swamy (1981) also examines fluctuations in remittances in relation to the fluctuations in GDP. He finds that the level of, and cyclical fluctuations in, economic activity in the host countries explained 70 to 90% of the variation in the remittances. This result may be due to the fact that changes in these macroeconomic indicators reflect changes in the demand for migrant workers and possible changes in their wage rates.

El-Sakka and McNabb (1999) note that the general finding that the level of economic activity in host countries has an impact on remittance flows is further supported in their analysis. The level of real earnings available to migrants in the host countries where they work is found to have a significant positive effect on the inflow of remittances though it appears that the impact takes some time to work through. The level of real domestic income, in contrast, does appear to influence the flow of remittance earnings irrespective of whether it enters the model in its current or lagged form. Elbadawi and Rocha (1992) also conclude that the flow of remittances to labor-exporting countries in North Africa and Europe is positively correlated with the number of nationals working abroad and income in the host countries.

3.4.2. Impact of Relative Rates of Returns and Exchange Rate Premium

On the other hand, the impact of relative rates of return, exchange rate premium, domestic income and inflation and economic risk factors are rather mixed. Swamy (1981) was one of the most influential studies in this field that focus upon identifying and measuring the determinants of remittances systematically. In this study, Swamy constructs a simple model of remittances that contains major potential determinants as the "incentive" interest rates on

foreign currency deposits in the sending country relative to the interest rate on comparable maturity deposits in the receiving countries, the difference between the preferential exchange rate for remittances and the official exchange rate in the home country, the rate of real return on real estate in the home country relative to comparable rate of real return on bank deposits in the receiving countries and the difference between the black market exchange rate and the official exchange rate (the black market premium) in the home country, in addition to the classical variables of economic activities, wage rates and number of workers. By this model Swamy (1981) also tests the effectiveness of government policies on workers' remittances by using the first two variables, since they represent the special incentive schemes introduced by governments of labor-sending countries to increase the flow of workers' remittances through official channels. Swamy tests the model using data from Greece, Turkey and Yugoslavia and concludes that the "incentive" interest rates in the sending country relative to the interest rate in the receiving countries, the difference between the preferential exchange rate and the official exchange rate in the home country, the rate of real return on real estate in the home country relative to the rate of real return of the receiving countries, the difference between the black market exchange rate and the official exchange rate, the black market premium, in the home country were not found to affect total remittance flows significantly. Since governments of labor-exporting countries introduced such special incentive schemes to increase the flow of workers' remittances through official channels, Swamy's results question the use of such policies.

Straubhaar (1986) develops a simple model to examine the remittances of Turkish workers in Germany. The model is tested through a reduced form equation in which the flow of remittances is a function of the deviation of the official exchange rate from the one defined by a purchasing power parity equilibrium between Turkey and Germany, the difference between expected real rate of returns to investment in the home and the host country, the stock of Turkish workers in Germany, and their wages. Following Swamy (1981)'s conclusions, Straubhaar (1986) argues that: "Contrary to conventional belief, the incentives to attract emigrants' remittances have not been very successful. Neither variation in exchange rates, reflecting the governmental intention to attract remittances by premium exchange rates, nor changes in the real return of investments (reflecting the governmental intention to attract remittances by foreign exchange deposits with higher returns) affect the flows of remittances towards Turkey." He concludes that, the flows of remittances towards Turkey are determined, in order of importance: first, by the economic situation in Germany, the wage levels in Germany and possibility for Turkish emigrants to become active have

determined the potential flow of remittances. What part of this potential flow has been really remitted was determined by the second, the confidence the Turkish emigrants felt in the safety and liquidity of their investments in their country of origin. The workers' propensity to remit might have been determined finally by a third factor, economic incentives making an investment in Turkey more beneficial than investments in other countries.

Following Swamy (1981) and Straubhaar (1986)'s conclusions, Glytsos (1988) argues that the variables related with the socio-demographic and income factors are the long-run determinants of remittances. Regarding the macroeconomic variables and policy, he argues that they only have short-run effect and they only shift remittances around the long-run trend.

In contrast with Glytsos (1988), Elbadawi and Rocha (1992) argue that macroeconomic policies in the labor-exporting country may, however, influence the choice of the channel of transfer i.e. the official versus unofficial channels. Furthermore, it is argued that as average age of the stock of migrants increase, the "required" component of remittances, which is mostly related with the family characteristics, declines and becomes relatively less important. This means that the short-run versus long-run effects between the two sets of influences is not as straightforward as suggested by Glytsos (1988). Since actual remittances data reflect both "required" components and the "desired" components, and since the desired component is mostly related with the portfolio considerations, any empirical model that give meaningful policy implications must account for the determinants of both concepts.

Wahba (1991), in the study of remittances over the period of 1974-1989, examines the Egyptian case against the decline of the growth of remittances to countries in the Middle East. He also develops a theoretical framework for analysis of such flows. Regarding the interest rate differentials, Wahba (1991) states that the flow of discretionary remittances is determined primarily by the difference between the real domestic interest rate and the real foreign interest rate. Furthermore, for these remittances to flow through official channels the exchange rate difference must be greater than the cost of going to the parallel market. As an example he indicates that: "Islamic companies established in Egypt in the early 1980s were offering returns on deposits of approximately 24% in nominal terms compared to 13.25 percent on ten year Egyptian government bonds. It is estimated that by 1987 these companies had accumulated deposits of \$9 billion from workers abroad, tempted by the high domestic interest rates. These remittances, for the most part, went through unofficial channels."

Katseli and Glytsos (1986) find that per capita remittances are positively related to interest rates in the host country. The home interest rate is significant with a negative sign but becomes insignificant when domestic inflation is introduced, suggesting that the home interest rate and domestic inflation are positively correlated.

3.4.3. Impact of Institutional Environment

Regarding the importance of institutional environment Chandavarkar (1980) states that: “Realistic rates of exchange and facilities for holding remittances in foreign currency accounts, with banks in the countries of origin, are useful incentives that have been widely used by governments of labor-sending countries for attracting migrants’ funds.”

According to Wahba (1991) the availability of financial intermediation is one of most important factors affecting the flow of remittances. He indicates that many workers use the parallel market because of absence of a more efficient channel of transfer. He adds that 53% of migrants from rural areas in Egypt used friends, relations, or both, as a means of transferring their remittances to Egypt, because of the absence of official channels. So, absence of official channels is an important factor that reduces the volume of remittances.

3.4.4. Impact of Official versus Unofficial Channels

Another important factor affecting the level of recorded remittances is clearly the channel used to remit. Workers can send their remittances to their country of origin through official or unofficial channels. According to many studies the volume of unofficial remittances is substantial in many labor-exporting countries. For example, in Sudan, only 24 percent of migrants surveyed used official banking channels. (Serageldin et. al. (1981))

The options of workers as unofficial channels are given in Russell (1986) as postal money orders, private money changers or other agents, transfer through foreign corporate employers, and various mechanisms by which funds are hand-carried back to the country of origin- by the migrant during visits, by friends or trusted agents.

Wahba (1991), regarding the workers’ choice of the use of a channel, argues that whether the workers send their fixed remittances through the official or the unofficial market will depend on the difference between the official exchange rate and the parallel (or black market) rate,

and the cost of going through the unofficial market. This cost is related with the search for a means of sending the remittances and the worker's willingness of the risk in using the unofficial channels.

3.4.5. Impact of Political Instability and Inconsistent Government Policies

The effects of political instability and inconsistent government policies on workers' remittances were also analyzed in Wahba(1991)'s study. He argues that political instability in the home country does not appear to affect the flow of fixed remittances, that the migrant has to send in order to satisfy the family's basic needs; but will affect the flow of discretionary remittances, which are more related with the portfolio considerations. Regarding the inconsistent government policies, (e.g. a temporary ban on imported goods), he argues that it can reduce the demand for foreign currency, thus cutting the parallel market premium. Thus he concludes that the greater the variance in the government's policies the less will be the migrant's willingness to use official channels.

After these observations, some policy options for governments were given in Wahba (1991)'s study as follows: firstly, when a parallel market exists and the government wishes to increase the flow of recorded remittances, it could devalue its exchange rate. Devaluation will reduce the difference between the parallel and official rates and will make it attractive for workers to remit through official channels, irrespective of the interest rate structure. Secondly, sufficiently increasing domestic interest rates relative to those in the host country will increase attractiveness of investment in home country. Finally, higher penalties for those caught operating in the black market may prevent some workers from sending their money through unofficial channels.

3.4.6. Impact of Domestic Inflation

In El-Sakka and McNabb (1999) domestic inflation is found to have a positive and significant impact on the inflow of remittances. According to the authors, this may reflect the need to boost family support in times of rising prices. An alternative explanation is that migrants remit more of their earnings during periods of inflation to purchase real assets, such as land and jewellery, the real value of which may be constant or actually rising in times of inflation.

On the other hand, Elbadawi and Rocha (1992) argue that a high inflation should lead to lower official remittances since it reflect increased risk and uncertainty. They also note that since the premium is directly related to the market for remittances, it should have a greater impact on remittances than domestic inflation. Katseli and Glytsos (1986) also argue that remittances are negatively related to inflation rates in the home country.

3.4.7. Impact of Exchange Rate Misalignments

Regarding the impact of exchange rate misalignment Chandavarkar (1980) argue that: “Given a congenial legal and political milieu, clearly the most important macroeconomic requisite for inducing remittances through official channels is a realistic unitary (single) rate of exchange for the currency of the labor exporting country. Remittances are notably sensitive to any indications of currency overvaluation and are prone to slow down in such cases, leading to widespread resort to unofficial channels to transfer funds.”

Following Chandavarkar (1980)’s conclusion, Elbadawi and Rocha (1992) indicate that large exchange rate misalignments can change the direction of a substantial volume of remittances away from official channels and towards parallel markets and they add that the existence of incentives, such as preferential interest rates or exchange rates may not prevent this result.

To summarize, the impact of economic activity; real earnings of workers; and total number of workers in the host country were consistently found to be significant and positive on the flow of remittances. However, the evidence on the impact of relative rates of return, exchange rate premium, domestic income and inflation is rather mixed. Russell (1986) argues that the existence of necessary facilities for transferring funds and economic activity in sending country positively affect the remittance flow. Likewise, political risk factors in sending country negatively affect the remittance flow. But, the effect of exchange rate and relative interest rate between labor-sending and receiving countries is rather mixed according to Russell (1986). On the one hand, Swamy (1981), Straubhaar (1986) and Glytsos (1988) all argue that neither interest rate differentials between the host and home countries nor variation in exchange rates have any effect on remittance flows. In contrast, Katseli and Glytsos (1986) find per capita remittances to be related to the foreign interest rate. Also they found significant negative effect of domestic inflation on the flow of remittances. According to Chandavarkar (1980), both realistic exchange rates and existence of necessary institutional environment significantly affect remittances. Wahba (1991) also indicate that black market

premium of exchange rates, interest rate differentials, political instability and inconsistent government policies and also necessary financial intermediation all significantly affect the flow of remittances. While El-Sakka and McNabb (1999) and Elbadawi and Rocha (1992) agree on the negative effect of the black market premium, they disagree on the effect of differential interest rate and domestic inflation. According to Elbadawi and Rocha (1992), differential between domestic and foreign interest rates has no significant effect on remittances, while El-Sakka and McNabb (1999) argue that it negatively affect the remittances. Also Elbadawi and Rocha (1992) argue that domestic inflation negatively affect the remittance flow, while El-Sakka and McNabb (1999) argue that it positively affect the remittances. Hence, there is still, an ongoing debate on the effect of some potential determinants of remittances.

CHAPTER 4: ECONOMIC MODELLING

We hypothesize that, at the macroeconomic level, conditions in the host country and the home country both affect the flow of remittances. So, the economic modeling of workers' remittances will require that we consider both the conditions in the host country and the country of origin. In view of the literature, the variables we consider in our model are: the level of economic activity in host and home countries, interest rate differentials, black market premium, domestic rate of inflation and growth, real overvaluation and state of government. Due to lack of data, we couldn't use the incentive values of interest rates and exchange rates that are available to the migrant workers. Level of economic activity in the country of origin, domestic rate of inflation and domestic rate of growth are variables that are related, but we will question the significance and direction of their impact. The chapter follows discussing the potential determinants of workers' remittances and their expected impact. Then, according to these arguments equations that are used to model remittances are presented.

4.1. HYPOTHESES REGARDING THE IMPACT OF VARIABLES

(i) Level of economic activity in the host country

Looking initially to the host country, most important variable that influence the level of remittances identified in the earlier studies (see, e.g., Swamy (1981), Straubhaar (1986), Elbadawi and Rocha (1992)) is the level of economic activity in the host country. Level of economic activity in the host country affects the level of remittances through two channels: firstly, level of economic activity directly affects the demand for migrant labor. The countries that import labor generally set quotas that limit the number of migrant workers and the duration that they can remain in the host country and these quotas adjust accordingly with the level of economic activity in the host country. Secondly, the economic activity in the host country will affect the level of wages of the migrant workers. Since the wage level of the migrant workers will determine their consumption and saving patterns, it will also determine the potential amount that the worker can remit. Both two channels indicate that the level of economic activity in the host country positively affect the level of remittances.

(ii) Stock of workers abroad

Total stock of workers abroad is obviously one of the variables that most significantly affect the level of remittances to the country of origin. In the Turkish case, as the number of workers in the host countries increase, the inflow of the remittances also increased historically. Also,

stock of workers is found to have a positive and significant impact on the level of remittances in all the previous studies. (see, e.g., Swamy (1981), Straubhaar (1986), Elbadawi and Rocha (1992))

(iii) Interest differentials

Migrant workers also use their remittances to finance financial or real investments. If domestic rates of return are low compared with those in the host country, migrants will prefer to keep their savings abroad. So, it is expected that the larger the premium of domestic rates over foreign ones, the more will the workers send their savings to home. Because of this reason, most labor exporting countries offered foreign exchange accounts with premium interest rates to their migrant workers abroad.

(iv) Black market premium

Workers' remittances are a major source of foreign exchange for countries that are exporting their labor. In many of these countries, exchange rates are pegged in levels that differ significantly from the market rates. This causes an overvaluation and excess demand of the foreign currency. In the countries where a black market or parallel market of foreign exchange is active, migrant workers have the option to exchange their remittances through official channels or unofficial channels, namely the black market. Black market premium is the percentage difference between the black market rate and the official rate of foreign exchange. The more significant the black market premium, the more will be the amount of remittances channeled to the black market. The remittances may also be channeled to the black market because of a taxation applied to the foreign exchange transferred through the official channels. But, governments may also impose some penalties to the people involved in the black market, which will increase the cost of using unofficial channels.

(v) Level of economic activity in the country of origin

According to one school of thought since family support is an important reason for migration, it is expected that workers will remit more of their earnings to their home country the lower the average level of income in the country of origin. (El-Sakka and McNabb, 1999) But, this explanation is valid for "*Fixed Remittances*" that represent the minimum amount a migrant sends to satisfy his family's basic needs. The "*Discretionary Remittances*", which represent the remittances worker remits over and above the fixed amount, will be mostly related with the portfolio considerations. From this point of view, a low level of real economic activity in

the country of origin may also be an indicator of economic and/or political instability or crises. So, a low level of domestic income may also decrease the amount of remittances.

(vi) Domestic inflation

Domestic inflation can affect remittance flows through its impact on domestic real income and the purchasing power of worker's family in the country of origin. The impact of inflation according to this view will be positive because, in periods of high inflation the workers will remit more in order to maintain family consumption levels at home. (El-Sakka and McNabb, 1999) According to another point of view, a high rate of inflation is a sign of economic, and possibly political, instability. (Elbadawi and Rocha, 1992) So, a high rate of domestic inflation can be a proxy for uncertainty and risk. The impact of inflation in this case will be negative. An alternative view is that migrants remit more in periods of high inflation to purchase real assets, because real value of these assets are constant or rising in these periods. (El-Sakka and McNabb, 1999)

(vii) Domestic growth

From our point of view, rate of growth in the country of origin is a good indicator of the economic situation in the country. A low rate of growth in the country of origin may represent a high level of economic risk, so negatively affecting the level of remittances. The considerations regarding the family support may also be valid for the domestic rate of growth.

(viii) Real overvaluation

Exchange rate misalignments in the home country will divert the remittances from the official market to the black market, if a black market exists. Because of this reason, the impact of real overvaluation is parallel with the impact of the black market premium. If there is no black market in the country of origin, workers may prefer to keep their savings abroad. So, the more the domestic currency is overvalued, the less will the migrant workers' remittances.

(ix) Military administration

Periods of military administration in the country of origin represent a political change in the home country. If military administration period is a period of political and economic instability, the level of remittances will decrease. But, it may affect the level of remittances positively if workers confidence to the administration increases in these periods.

4.2. MODEL SPECIFICATION

When we perform the unit root tests of the variables, it turned out that all the variables were I(1), except for the growth rate and extra government dummy (see, section 6.2 for details on unit root tests). So, we used models with the first differences of I(1) variables. Variables with initial “D” are the first differences of variables.

Model 1: First difference of remittances model

Based on the discussion above, the total flow of cash remittances can be represented by the following equation in log form, where, “Rem” represent the cash remittance inflows, “Worker” is the total stock of Turkish workers abroad, “Yhost” is the host country GDP per capita, “Ydom” is the domestic GDP per capita, “Bmp” is the black market premium, “Rov” is the real overvaluation, “Intdif” is the interest differential between the country of origin and the host country, “Inflation” is the domestic annual CPI inflation, “Growth” is the domestic GDP growth rate and “Exgovdum” is the dummy variable representing the periods of military administration. Data for these variables are available in Table 4.1.

$$\begin{aligned} \mathbf{DLogRem}_t = & C_1 + C_2 * \mathbf{DLogWorker}_t + C_3 * \mathbf{DLogYhost}_t + C_4 * \\ & \mathbf{DLogYdom}_t + C_5 * \mathbf{DBmp}_t + C_6 * \mathbf{DRov}_t + C_7 * \mathbf{DIntdif}_t + C_8 * \mathbf{DInflation}_t + \\ & C_9 * \mathbf{Growth}_t + C_{10} * \mathbf{Exgovdum}_t + \epsilon_{1t} \end{aligned}$$

Model 2: First difference of per worker remittances model

An alternative way of modeling remittances is using per worker instead of level remittances. According to Elbadawi and Rocha (1992) per worker regressions perform better than level regressions of remittances. So, as an alternative model we also used the first difference of per worker remittances as dependent variable.

$$\begin{aligned} \mathbf{DLogRempw}_t = & C_1 + C_2 * \mathbf{DLogYhost}_t + C_3 * \mathbf{DLogYdom}_t + C_4 * \mathbf{DBmp}_t + \\ & C_5 * \mathbf{DRov}_t + C_6 * \mathbf{DIntdif}_t + C_7 * \mathbf{DInflation}_t + C_8 * \mathbf{Growth}_t + C_9 * \\ & \mathbf{Exgovdum}_t + \epsilon_{1t} \end{aligned}$$

where different from the model above, “Rempw” represent remittances per worker. Stock of workers is not included in this equation since it is considered with the per worker remittances.

CHAPTER 5: ECONOMETRIC THEORY

In this chapter we review the econometric theory that is used in this study. Firstly, stationarity and test for unit root issues are discussed. Then, diagnostic tests that are used to evaluate the estimations are presented.

5.1. STATIONARITY and TEST FOR UNIT ROOT

Unit root tests are important in examining the stationarity of a time series. Stationarity is a matter of concern in three important areas. First, a crucial question in the ARIMA modeling of a single time series is the number of times the series needs to be first differenced before an ARMA model is fit. Each unit root requires a first differencing operation. Second, stationarity of regressors is assumed in the derivation of standard inference procedures for regression models. Nonstationary regressors invalidate many standard results and require special treatment. Third, in cointegration analysis, an important question is whether the disturbance term in the cointegrating vector has a unit root.

The ADF (Augmented Dickey-Fuller) test consists in running a regression of the first difference of the series against the series lagged once, lagged difference terms, and optionally, a constant and a time trend. With two lagged difference terms, the regression is:

(1)

$$\Delta y_t = \beta_1 y_{t-1} + \beta_2 \Delta y_{t-1} + \beta_3 \Delta y_{t-2} + \beta_4 + \beta_5 t$$

There are three choices in running the ADF test regression. One is whether to include a constant term in the regression. Another is whether to include a linear time trend. The third is how many lagged differences are to be included in the regression. In each case the test for a unit root is a test on the coefficient of y_{t-1} in the regression. If the coefficient is significantly different from zero then the hypothesis that y contains a unit root is rejected and the hypothesis is accepted that y is stationary rather than integrated.

If the Dickey-Fuller t -statistic is smaller (in absolute value) than the reported critical values, you cannot reject the hypothesis of nonstationarity and the existence of a unit root. You would conclude that your series may not be stationary. You may then wish to test whether the series is $I(1)$ (integrated of order one) or integrated of a higher order. A series is $I(1)$ if its first difference does not contain a unit root. You can repeat the ADF test on the first difference of

your series to test the hypothesis of integration of order 1 against higher orders. You can repeat the test on second differences if you find that the first difference may be non-stationary.

5.2. DIAGNOSTIC TESTING

5.2.1. Chow Tests

The test of parameter constancy has the form of a Chow (1960) test:

$$h = \frac{(RSS_T - RSS_{T_1}) / (T - T_1)}{RSS_{T_1} / (T_1 - k)} \underset{\text{app}}{\sim} F(T - T_1, T_1 - k) \text{ on } H_0 \quad (2)$$

where H_0 is parameter constancy. In (2), RSS_T is the full-sample residual sum of squares, RSS_{T_1} is for the relevant sub-sample, where T represents number of observations and there are k regressors. For fixed regressors, the Chow (1960) test is exactly distributed as an F , but is only approximately (or asymptotically) so in dynamic models.

The (Chow) test of parameter constancy out-of-sample has the form:

$$h = \frac{(RSS_{T+H} - RSS_T) / H}{RSS_T / (T - k)} \underset{\text{app}}{\sim} F(H, T - k) \text{ on } H_0 \quad (3)$$

where H_0 is parameter constancy.

5.2.2. Normality

This is a test for whether the skewness and kurtosis of the residuals correspond to that of a normal distribution (see, Doornik and Hansen [1994]). For a variable x_t , let μ and σ_x^2 denote its mean and variance, and write $\mu_i = E[x_t - \mu]^i$, so that $\sigma_x^2 = \mu_2$. The skewness and kurtosis are defined respectively as:

$$\sqrt{\beta_1} = \frac{\mu_3}{\mu_2^{3/2}} \quad \text{and} \quad \beta_2 = \frac{\mu_4}{\mu_2^2} \quad (4)$$

A normal variate has $\sqrt{\beta_1}=0$ and $\beta_2=3$. Sample estimates of these four parameters are given by

$$\bar{x} = 1/T \sum_{t=1}^T x_t, \quad m_1 = 1/T \sum_{t=1}^T (x_t - \bar{x})^2, \quad \sqrt{b_1} = \frac{m_3}{m_2^{3/2}} \quad \text{and} \quad b_2 = \frac{m_4}{m_2^2}. \quad (5)$$

Bowman and Shenton (1975) consider a $\chi^2(2)$ test based on $\sqrt{b_1}$ and b_2 , but emphasize that it is unsuitable unless the sample size is very large: the statistics $\sqrt{b_1}$ and b_2 are not independently distributed, and the sample kurtosis approaches normality very slowly (see Shenton and Bowman, [1977], and D'Agostino, [1970]). Instead, let z_1 and z_2 denote transformations of skewness and kurtosis, designed to make these statistics closer to the standard normal. The resulting test is (see Doornik and Hansen, [1994]):

$$z_1^2 + z_2^2 \text{ app } \sim \chi^2(2). \quad (6)$$

Applied to residuals, this test gives appropriate rejection frequencies under the null of normality, using $\chi^2(2)$ critical values. (The null hypothesis is normality, which will be rejected at (e.g.) the 5% level if a test statistic of more than 5.99 is observed.)

5.2.3. Error autocorrelation

This is a Lagrange-multiplier (LM) test for r^{th} -order residual autocorrelation, distributed as $\chi^2(r)$ in large samples, under the null hypothesis that there is no autocorrelation (that is, that the errors are white noise):

$$u_t = \sum_{i=p}^r \alpha_i u_{t-i} + \varepsilon_t, \quad \text{where } 0 \leq p \leq r \quad (7)$$

, with $\varepsilon_t \sim \text{IID}(0, s^2)$ and p, r represent lag numbers. The F-test is performed by an *auxiliary regression* of the residuals on the original variables and lagged residuals (missing lagged residuals at the start of the sample are replaced by zero, so no observations are lost). The null hypothesis will be rejected if the test statistic is too high. This LM test is valid for models with lagged dependent variables, whereas neither the DW nor the residual correlogram provide a valid test in that case.

5.2.4. Autoregressive conditional heteroscedasticity (ARCH)

This is the ARCH (autoregressive conditional heteroscedasticity test) which in its present form tests the hypothesis $\gamma=0$ in the model, (The null hypothesis is no ARCH, which would be rejected if the test $E[u_t^2 | u_{t-1}, \dots, u_{t-r}] = c_0 + \sum_{i=1}^r \gamma_i u_{t-i}^2$ (8) statistic is too high):

where $\gamma = (\gamma_1, \dots, \gamma_r)'$. Then TR^2 from the regression of u_t^2 on a constant and $u_{t-1}^2, \dots, u_{t-r}^2$ (called the ARCH test) is asymptotically distributed as $\chi^2(r)$ on $H_0: \gamma=0$: as usual, the F-form is reported. Both first-order and higher-order lag forms are easily calculated. (see, Engle [1982a])

5.2.5. Heteroscedasticity

Tests if the $\{u_t\}$ have constant variance against the alternative that u_t^2 depends on the time- t original and squared regressors. The null hypothesis is no heteroscedasticity, which would be rejected if the test statistic is too high. The reported F-statistic is derived by an *auxiliary regression* of the squared residuals on a constant, the original regressors, and the original regressors squared.

Table 5.1: Test Summary

Test	Alternative	Statistic	Sources
Chow(τ T)	Predictive failure over a subset		Chow (1960, p.594-595),
	of $(1-\tau) T$ obs.	$F((1-\tau) T, \tau T-k)$	Hendry (1979)
normality test	Skewness and excess kurtosis	$\chi^2(2)$	Jarque and Bera (1980),
			Doornik and Hansen (1994)
AR 1-p test	p-th order residual autocorrelation	$F(p, T-k-p)$	Godfrey (1978),
			Harvey (1981, p.173)
ARCH 1-p test	p-th order autoregressive		Engle (1982b),
	conditional heteroskedasticity	$F(p, T-k-p)$	Engle, Hendry and Trumbull (1985)
hetero test	Heteroscedasticity quadratic		White (1980),
	in regressors x_i^2	$F(q, T-k-q-1)$	Nicholls and Pagan (1983)

1. There are T observations and k regressors in the model under the null.

2. The value of q may differ across statistics, as may those of k and T across models.

3. By default, PcGets sets $p=4$, $r=12$, and compute two Chow tests at $\tau_1=[0.5T]/T$ and $\tau_2=[0.9T]/T$.

CHAPTER 6: DATA

This chapter presents the data used in the estimations. Data periods, sources and construction of some variables are also given in this section. Results of unit root tests and the correlation matrix of variables are also analyzed in this chapter. The values of the variables were given in Table 4.1, the graphs of variables are also presented in the Appendix.

6.1. SOURCES and CONSTRUCTION

Workers' Remittances (REM) are cash remittances of Turkish workers abroad that are sent via official channels. Data for remittances were available at the website and the bulletins of the Central Bank of Turkey for 1964-2001 period. Data is given in millions of current \$USs. Graph 2.8 represents the development of cash remittance inflows to Turkey for 1964-2001 period, where Graph 6.1 represents per worker remittances in the same period.

Stock of workers abroad (WORKER) is the total stock of Turkish workers abroad. Data was available in Gökdere (1978) for 1964-1976 period and after 1981 data was available in the yearly reports of Ministry of Labor, Foreign Relations Department. For years 1977-1980 we add the number of recruited workers in that year to the worker stock in the previous year. So data is available for 1964-2001 period and presented Table 6.1. Graph 6.2 represents the yearly figures of Turkish worker stock abroad, calculated by this methodology.

Domestic country per capita income (YDOM) is the per capita GDP of Turkey. We used GDP at constant 1987 prices, in TL. In order to obtain per capita income, we divide this GDP value by the population. Data is available at the website of State Planning Institute (DPT), for 1964-2001 period. Graph 6.5 represents yearly figures for Turkish GDP per capita with 1987 prices.

Host Country Representation: Eleven countries with biggest stock of Turkish workers are selected as host countries. These countries are Australia, Austria, Belgium, England, France, Germany, Libya, Netherlands, Saudi Arabia, Switzerland and Republics of Former USSR. Till the unification of Germany, data represent the Federal Republic. In this study Republics of Former USSR is represented by a weighted average of Russian Federation, Azerbaijan, Kazakhstan, Kyrgyz Republic, Uzbekistan and Turkmenistan. Weights are assigned according to the stock of Turkish population in these countries. Stock of population in these countries is

available in the yearly reports of Ministry of Labor, Foreign Relations Department. The stock of workers in the host countries is again available in the yearly reports of Ministry of Labor, Foreign Relations Department after 1981. For the period 1964-1980 cumulative number of recruited workers is assumed to represent the stock of worker in that country. Weight of each host country is calculated then by dividing the stock of the country to the total stock of eleven countries. It turned out that assigning weights to countries by this method is a good representation of host countries. Weights of host countries are given in Table 6.2.

Host country per capita income (YHOST) is the weighted average of per capita GDP in the host countries in current US\$. Data for per capita GDP in host countries is given in Table 6.3. Weights are calculated as explained above. Per capita income in the host countries were obtained from the website of IMF and missing values were calculated by using GDP and population data from the International Financial Statistics of the IMF. Data is available for 1964-2001 period. Graph 6.4 represents yearly figures.

Black market premium (BMP) is defined as the percentage difference between the average yearly exchange rates of the domestic currency vis-a-vis the foreign currency in the official and parallel (black) markets. Data is obtained from the Global Development Network Growth Database of the World Bank available at the website of the bank. Data period is 1964-1999 and values for years 1994 and 1995 are missing. So we could use this variable for 1964-1993 period. Graph 6.3 represents the yearly figures.

Real Overvaluation (ROV) is an index, which is the indicator of the currency (TL) real overvaluation in Turkey. Data is obtained from the Global Development Network Growth Database of the World Bank available at the website of the bank. Data period is 1964-1999. This variable is highly correlated with the black market premium, so we used them interchangeably. Graph 6.7 represents yearly figures of variable.

Domestic Inflation (INFLATION) is the percentage variation of the yearly average Turkish CPI. Data is obtained from the International Financial Statistics of the IMF for the period 1964-2001. Graph 2.7 represents the yearly figures of variable.

Growth (GROWTH) is the percentage variation of the Turkish annual GDP in constant 1987 prices. Data is available at the website of State Planning Institute (DPT), for 1964-2001 period. Graph 6.6 represents yearly figures of variable.

Interest rate differentials (INTDIF) was calculated as the weighted average of bilateral, depreciation-adjusted interest differentials on the yearly averages of deposit rates, following the methodology given in Elbadawi and Rocha (1992). The shares of stock of workers in each host country were again used as weights. If the deposit rate of a host country is not available for a year the weight of that country is distributed to other host countries for that year, proportional with the original weights of remaining host countries. Each bilateral interest differential, between Turkey (T) and host country (H), is defined as:

$$\text{Intdif}_{TH} = \left\{ \left\{ \frac{(1 + i_t)}{(1 + E_t) * (1 + i_t^*)} \right\} - 1 \right\}$$

where E_t is the depreciation of the nominal bilateral exchange rate between t-1 and t, i_t is the domestic deposit rate at period t, and i_t^* is the foreign deposit rate at t. Depreciation for the Euro Area countries for years 1999-2001 are calculated using Euro rates. Interest rates on deposits are obtained from the International Financial Statistics of the IMF for the period 1978-2001 and are presented in Table 6.4; since, the deposit rate for the Federal Republic of Germany was available after 1978. Bilateral exchange rates were calculated from the national currency per US\$ exchange rates of the countries. Exchange rates were also obtained from the IFS of the IMF and are available in Table 6.5. Depreciation rates are also given in Table 6.5. Graph 6.8 represents yearly figures of the variable.

Military order dummy (EXGOVDUM) is the dummy representing that the military order is in force in Turkey. (1 for years with military order and 0 otherwise) Data for this variable is also available for 1964-2001 period. Finally, Graph 6.9 represents the yearly figures of data used in the estimations.

6.2. CORRELATION MATRICES AND UNIT ROOT TESTS

Firstly, we will look at the correlation matrix of the variables, included in models. Table 6.6 is the correlation matrix of variables included in models. According to this matrix, there is a high positive correlation between the first difference of domestic per capita income and domestic rate of growth, which is expected. Also, black market premium and real overvaluation are positively correlated. Real overvaluation is also negatively correlated with extra government dummy. These correlations are important because they may affect the direction and significance of the impact of variables.

The unit root tests of the variables indicate that variables other than extra government dummy and growth were all integrated order one, namely $I(1)$. The results of the unit root tests are given in Table 6.7. Variables starting with “D” indicate the first difference of the original variable. So, we need to take the first difference of $I(1)$ variables to achieve stationarity, which we need for a meaningful regression.

CHAPTER 7: EMPIRICAL RESULTS

This section reviews the results of regressions that are based on Models 1 and 2, presented in Chapter 4. Descriptive statistics and diagnostic tests of equations are also evaluated in this chapter. Dependent variables that are used in these models are the first difference of the logarithm of remittances and the first difference of the logarithm of remittances per worker, respectively. In these two models we use the first difference of variables, which turned out to be nonstationary in the unit root tests. We also estimated models with levels of variables but the results were not conclusive and economically unmeaningful, so we do not report those results. Using Model 1 and Model 2, we carried out regressions for various periods. The changes in the estimation periods are based on data that are not available for the whole period of study. Diagnostic tests of these equations are also evaluated in this chapter. Equations for Model 1 and Model 2 are given in Table 7.1 and Table 7.2, respectively. Diagnostic test results and descriptive statistics of equations for Model 1 and Model 2 are also given in Table 7.3 and Table 7.4, respectively.

7.1. RESULTS OF ESTIMATIONS

7.1.1. Results with Model 1

In this section we review the results of the regressions with the ordinary least square estimates of the first difference of logarithm of remittances for various periods.

a. 1979-1993 period:

Table 7.1 represents the ordinary least square estimates of logarithm of remittances for 1978-1993 period, which is the only period that all variables are available. According to these results, a change in stock of workers abroad has no significant impact on remittances in 1978-1993 period (see, Equations 1-2-3-4-6, Table 7.1). Changes in host country per capita income has a positive and significant impact on remittances. It also turned out that the significance of the impact of host country per capita income increase when we drop stock of workers variable from the equation. (see, Equations 7-8, Table 7.1). On the other hand, according to our results, first difference of home country per capita income has no significant impact on changes in remittances. (see, Equations 1-3-4-5-6-7, Table 7.1). Black market premium is the most significant variable in the model. Changes in black market premium have highly significant negative impact on remittances. (see, Equations 1-2-4-5-6-7, Table

7.1) But, we find that real overvaluation has no significant impact on remittances. (see, Equations 1-2-3-4-5, Table 7.1). Since real overvaluation and black market premium are highly correlated variables, we may argue that impact of black market premium dominates the impact of real overvaluation in the equations. The impact of depreciation adjusted interest differential is rather mixed. When worker stock is included in the equations changes in interest differential has no significant impact on remittances, but when we exclude worker stock interest differential significantly and positively affect remittances. (see, Equations 10-12-13, Table 7.1). Domestic rate of inflation also has a negative and significant impact on remittances, reflecting that in periods of high inflation workers remit less, possibly due to increasing economic risk. (see, Equations 1-2-4-5-6-8, Table 7.1). When we drop inflation from the estimation explanatory power of regression significantly decrease and all the variables became insignificant, indicating that domestic rate of inflation is one of the most important factors in home country significantly affecting the inflow of remittances. (see, Equations 3, Table 7.1). On the other hand, domestic rate of growth has no significant impact on remittances. (see, Equations 1-2-3-5-6-7, Table 7.1). Since domestic rate of growth is highly significant with domestic per capita income we also carried out regressions that include these variables interchangeably. We observe that these variables remain insignificant. (see, Equations 2-4, Table 7.1). Extra government dummy, which represent periods of military administration, has a significant negative impact on remittances. This may be due to increasing economic and political risk in the country of origin.

b. 1979-1999 period:

Table 7.1, Equations 12 to 15, represents the ordinary least square estimates of the first difference of the logarithm of remittances for 1979-1999 period. Black market premium is not included in the equations in order to expand the data period, since 1994 and 1995 values of black market premium are not available. Period starts from 1979, since interest differential is available only after that year. According to our results, when we exclude black market premium from the estimations none of the variables significantly impact upon remittances. (see, Equations 12-13-14-15, Table 7.1). Explanatory powers of equations also decrease significantly when we exclude black market premium. So, we can argue that black market premium is an essential variable in our remittance model and equations that do not include black market premium cannot describe fluctuations in remittances.

c. 1965-1993 period:

Table 7.1, Equations 9 to 11, represent the ordinary least square estimates of the first difference of the logarithm of remittances for 1965-1993 period. In this case interest

differential is excluded and black market premium is included in the model. Different from the two cases, changes in stock of workers abroad have a significant positive impact on remittances. (see, Equations 9-11, Table 7.1) In addition, changes in domestic income have significant negative impact on remittances in this period. This may reflect consumption boosting considerations, arguing that workers remit more when domestic income level of family left in home country decrease. This consideration is especially valid at initial stages of migration when migrant workers family is left in the home country. So, our finding is consistent with the theory. When worker stock term is excluded from the equation, significance of domestic income increase and domestic rate of growth also become significant, positively affecting remittances. This positive correlation between growth and remittances may be due to the fact that periods of high growth reflect low economic risk and more opportunities for investment in the home country. So, the inflow of remittances in such periods is expected to increase. The explanatory power of estimation significantly decreases when we exclude worker stock. So, we can conclude that at initial periods of migration total worker stock abroad and economic situation in home country are dominant factors affecting remittances.

7.1.2. Results with Model 2

In this section we review the results of the regressions with the ordinary least square estimates of the first difference of the logarithm of per worker remittances for various periods. Table 7.2 represents the results. Stock of workers abroad is not included in the equations for this model, because we have already used this variable obtaining remittance per worker data.

a. 1979-1993 period:

A change in host country income per capita has significant positive impact on remittances in this period. (see, Equations 1-2-4-5-6, Table 7.2) On the other hand domestic income per capita, rate of real overvaluation and domestic growth have no significant impact on remittances in this period. (see, Equations 1-2-3-4-5-6, Table 7.2) Black market premium is again highly significant negatively affecting the changes in remittances. (see, Equations 1-2-4-5-6, Table 7.2) Depreciation adjusted interest differential also has significant impact on per worker remittances. The direction of impact is positive, higher the differential between domestic and foreign rates of return higher will be per worker remittances. (see, Equations 1-2-4-5-6, Table 7.2) Domestic rate of inflation is also highly significant negatively affecting per worker remittances. (see, Equations 1-2-4-5-6, Table 7.2) As in Model 1, also in this model dropping inflation from the estimation significantly decrease explanatory power of

regression and all the variables become insignificant. (see, Equations 3, Table 7.2). Extra government dummy also has significant negative impact on per worker remittances. (see, Equations 1-2-4-5-6, Table 7.2)

b. 1979-1999 period:

Table 7.2, Equations 7 and 8, represents the ordinary least square estimates of the first difference of the logarithm of remittances per worker for 1979-1999 period. Black market premium is again not included in the equations in order to expand the data period. Again it turned out that, when we exclude black market premium from the estimations none of the variables significantly impact upon remittances per worker. (see, Equations 7-8, Table 7.2) Explanatory powers of equations also decrease significantly when we exclude black market premium.

c. 1965-1993 period:

Table 7.2, Equations 9 to 11, represent the ordinary least square estimates of the first difference of the logarithm of remittances per worker for 1965-1993 period. Again interest differential is excluded and black market premium is included in the model. According to our findings, changes in domestic income and domestic rate of growth have significant impact on remittances when both variables are included in the model. (see, Equation 9, Table 7.2) When we exclude growth from the equation, the impact of domestic income turns insignificant. (see, Equation 11, Table 7.2) Also, when we exclude domestic income from the equation, the impact of growth turns insignificant. (see, Equation 10, Table 7.2) Among other variables only the black market premium has a significant impact on per worker remittances. (see, Equations 10-11, Table 7.2) It is also insignificant when both domestic income and growth variables are included in the model. (see, Equation 9, Table 7.2)

7.2. EVALUATION OF DIAGNOSTIC TESTS AND DESCRIPTIVE STATISTICS

In this section we evaluate the diagnostic tests and descriptive statistics of equations. The tests used in this study are Chow parameter constancy test, “Chow” test; residual heteroscedasticity test, “hetero” test; residual normality test, “normality” test; residual serial correlation test, “AR(1-x)” test; and residual ARCH (Autoregressive conditional heteroscedasticity) test, “ARCH(1-x)” test, where x represent the maximum number of lags included in the test. Some tests were couldn't carry out for all equations because of insufficient number of observations. Detailed information regarding the tests is given in

Chapter 5. The results of diagnostic tests are given in Table 7.3 for equations of Model 1 and Table 7.4 for equations of Model 2.

a. MODEL 1:

For Equations 8 and 11, the null of residual normality is rejected at 5 % significance level against residual non-normality and for Equation 9, the null of residual constant variance is rejected at 10 % significance level against residual serial correlation. Other than these equations, diagnostic tests do not indicate any sign of problems with our equations. When we look at the descriptive statistics, we observe that explanatory power of equations significantly decrease (i.e., R^2 decrease and standard error increase) when we drop black market premium from the equations. Excluding domestic rate of inflation also decrease explanatory power of equations.

b. MODEL 2:

For Equations 6, 10 and 11, the null of residual normality is rejected at 5 % significance level against residual non-normality and for Equation 9, the null of residual homoscedasticity is rejected at 5 % level against residual heteroscedasticity. Diagnostic tests do not indicate any sign of problems with our equations other than these equations. Again explanatory power of regressions significantly decreases when we drop black market premium or interest differential terms from the equations. Dropping domestic inflation rate also decrease explanatory power of regressions.

CHAPTER 8: CONCLUSION

Turkish workers have been migrating abroad for employment for the past four decades. Exporting workers abroad started in the early 1960s with mainly to Western Europe and especially to the Federal Republic of Germany. Since the early 1960s over 2 million Turkish workers have migrated for employment to about 30 countries. Remittances from migrant workers have come to play a major role in the economies of the labor-sending countries. Turkey, like many other developing and labor exporting countries, has attempted to maximize the inflow of these remittances that come through official channels through special exchange rates for remittances, special interest rates for the foreign currency accounts maintained by the Turks abroad with the Turkish Central Bank, a program which permits Turks residing abroad to shorten their compulsory military service by paying a fee in foreign currency, special import privileges for consumer goods and machinery and the right to buy consumer durables with foreign exchange at special “duty free” shops during the first six months after return. These privileges are mainly built on the assumption that macroeconomic factors significantly impact on workers’ remittances. But, whether remittances of Turkish workers are affected from these factors is not well established.

According to Swamy (1981) and Straubhaar (1986), macroeconomic factors other than level of economic activity in host country and total worker stock, have no significant effect on the inflow of remittances. On the other hand, Wahba (1991), Elbadawi and Rocha (1992) and El-Sakka and McNabb (1999) argue that macroeconomic factors have an influential role on the inflow of remittances. But, they contrast on the direction of the impact of various variables. So, there is still ongoing debate on the impact of macroeconomic variables on remittances.

This study mainly focuses on the question of whether macroeconomic variables are really significant in determining remittances for the Turkish case. We also analyze the direction of impact for various variables. We used two models, one using the level of remittances as the dependent variable and the other using remittances per worker as the dependent variable. The potential determinants of workers’ remittances in our models are: the level of economic activity in host countries and in the country of origin, total stock of Turkish workers abroad, black market premium, real overvaluation of TL, domestic rate of inflation and growth, depreciation adjusted interest differential between the country of origin and the host countries, and finally a dummy variable representing the periods of military administration in Turkey.

The general finding of the earlier studies that the level of economic activity in host countries has an impact on remittance flows is further supported in our study. In both the level and per worker remittances models host country income is found to have a significant positive impact on the remittances, in the 1979-1993 period. When we enlarge the data period by dropping black market premium or interest differential from the estimations, host country income loses its significance. But, as observed from the descriptive statistics of these equations (see, R^2 and standard error values for the equations), it is hard to argue that these equations represent a good model of remittances. These equations are reported to demonstrate the significance of some variables in modeling remittances (such as, black market premium and interest differentials). Because, one can observe that dropping these equations from the estimations significantly decrease the explanatory power of the equations.

According to our findings, changes in the stock of workers abroad have significant positive impact on remittance inflows in 1965-1993 period. But, the variable has no significant impact on the changes in remittance inflows in 1979-1993 and 1979-1999 periods. This result may be due to the fact that stock of Turkish workers abroad was on an increasing trend in the 1965-1979 period, and in a sense stabilized after that period. So, a change in the stock of workers was one of the main determinants of remittances at the initial stages of migration, but it lost its significance in the following years.

In the 1979-1993 period, the impact of depreciation adjusted interest differential is rather mixed. When worker stock is included in the equations, changes in the interest differential has no significant impact on remittances. But when we exclude the worker stock, the interest differential significantly and positively affects remittances. Depreciation adjusted interest differential also has significant impact on per worker remittances. The direction of impact is positive, higher the differential between domestic and foreign rates of return higher will be per worker remittances. When we drop black market premium from the estimations, as other variables, interest differential loses its significance. These findings support the findings of Elbadawi and Rocha (1992), and El-Sakka and McNabb (1999) in that the interest differential has a significant impact on remittance inflows. However, our findings contrast with the findings of Swamy (1981) and Straubhaar (1986) in that the interest differential has no significant impact.

The results also reveal that remittance flows are highly responsive to the differential between the official and black market exchange rates. It turns out that, in both models the difference

between the black market and official rate of exchange has a significant negative impact on the inflow of remittances. As emphasized above, when we drop black market premium from the estimations, there is a significant decrease in explanatory power of equations. This supports the conclusions of Wahba (1991), Elbadawi and Rocha (1992) among others, and contrasts with the findings of Swamy (1982) and Straubhaar (1986). According to El-Sakka and McNabb (1999) migrants will prefer the black market when differentials between the black market rate and the official rate increase, because they will get extra return from the black market and a high black market premium is often associated with inconsistent macroeconomic policy. Real overvaluation of TL is positively correlated with the black market premium, but in all regressions it turned to be insignificant.

Turning to the impact of the level of economic activity in the country of origin, the results suggest that the first difference of home country per capita income has no significant impact on changes in remittances in, 1979-1993 period. In 1965-1993 period, when interest rate differential is excluded from the estimations, according to level of remittances model, changes in domestic income have significant negative impact on remittances. This may reflect consumption smoothing considerations, arguing that workers remit more when domestic income level of family left in home country decrease. This consideration is especially valid at initial stages of migration when migrant workers family is left in the home country. When worker stock term is excluded from the equation, significance of domestic income increases. According to per worker remittances model, changes in domestic income have significant impact on remittances when domestic rate of growth is also included in the model. These results contrast with the findings of El-Sakka and McNabb (1999) in that domestic income has a positive impact.

Domestic rate of inflation also has a negative and significant impact on remittances, in both models, for the 1979-1993 period; reflecting that in periods of high inflation workers remit less, possibly due to increasing economic risk. When we drop inflation from the estimation explanatory power of regression significantly decrease and all the variables became insignificant, indicating that domestic rate of inflation is one of the most important factors in home country significantly affecting the inflow of remittances. For the 1965-1993 and 1979-1999 periods, when we drop black market premium or interest rate differential from estimations, domestic rate of inflation loses its significance. These results contrast with the findings of El-Sakka and McNabb (1999) in that inflation has a positive impact on

remittances; and support the findings of Elbadawi and Rocha (1992) and Katseli and Glytsos (1986) in that the direction of impact is negative.

Domestic rate of growth has no significant impact on remittances in both models for 1979-1993 period. Since domestic rate of growth is highly correlated with domestic per capita income we also carried out regressions that include these variables interchangeably. We observe that these variables remain insignificant. In the 1965-1993 period, when worker stock term is excluded from the equations, which take the level of remittances as the dependent variable, significance of domestic income increase and domestic rate of growth also become significant, positively affecting remittances. This positive correlation between growth and remittances may be due to the fact that periods of high growth reflect low economic risk and more opportunities for investment in the home country. So, the inflow of remittances in such periods is expected to increase. In per worker remittances model, changes in domestic income and domestic rate of growth have significant impact on remittances when both variables are included in the model.

The extra government dummy, representing the periods with military administration, significantly affects the inflow of remittances in both models. The direction of the impact of extra government dummy was negative, meaning that periods with military administration negatively affect the changes in inflow of remittances and changes in remittances per worker.

Based on the findings above, we conclude that macroeconomic variables significantly impact on workers' remittances for the Turkish case. So, governments of labor exporting countries can influence the inflow of remittances via developing appropriate macroeconomic policies and forming special laws for the migrant workers. Our results also indicate that, preventing the flow of remittances to the unofficial market is also a main concern for increasing the inflow of remittances, which can be achieved by developing the required financial intermediation and preventing exchange rate misalignments.

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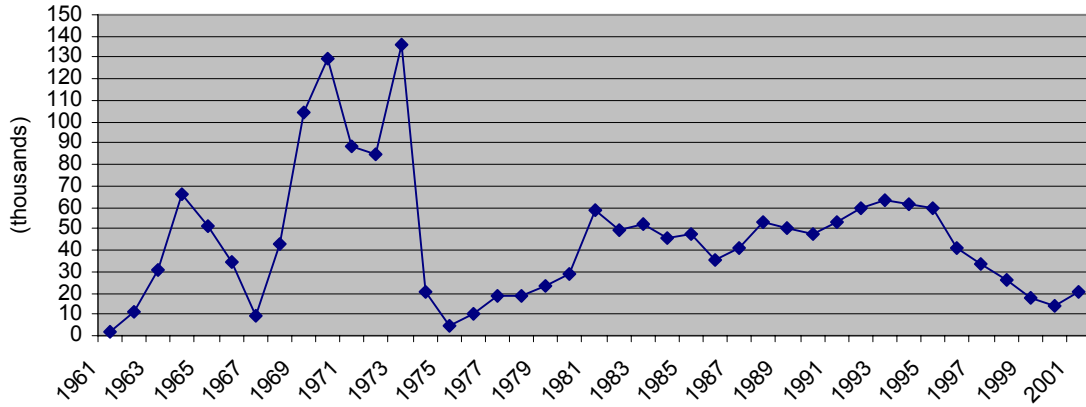
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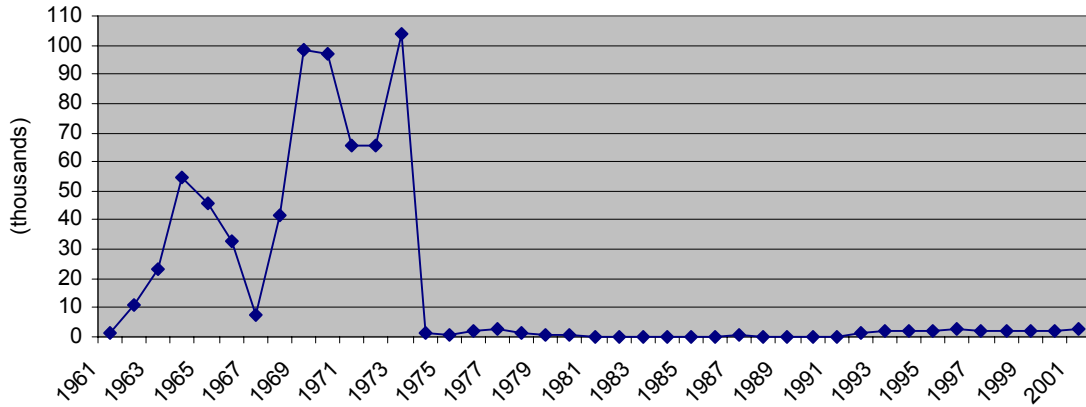
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APPENDIX A: GRAPHS

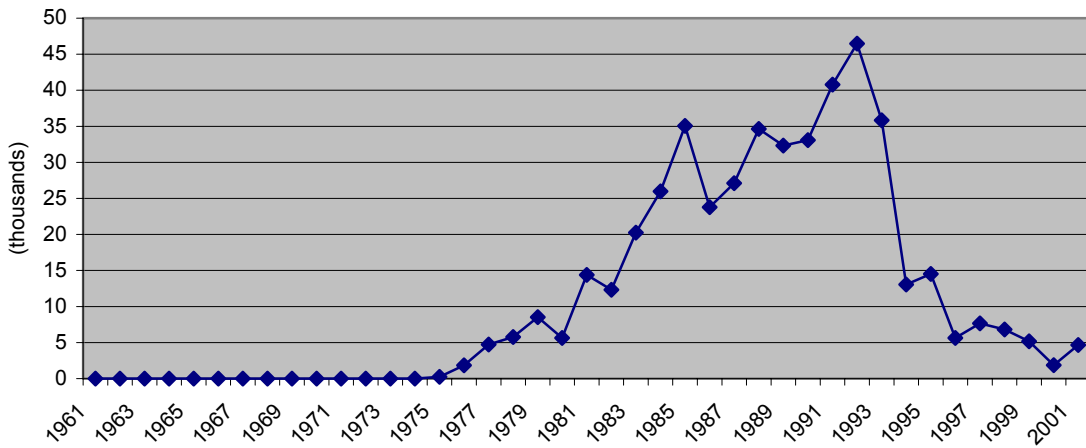
**GRAPH 2.1: Total Number of Recruited Turkish Workers
1961-2001**



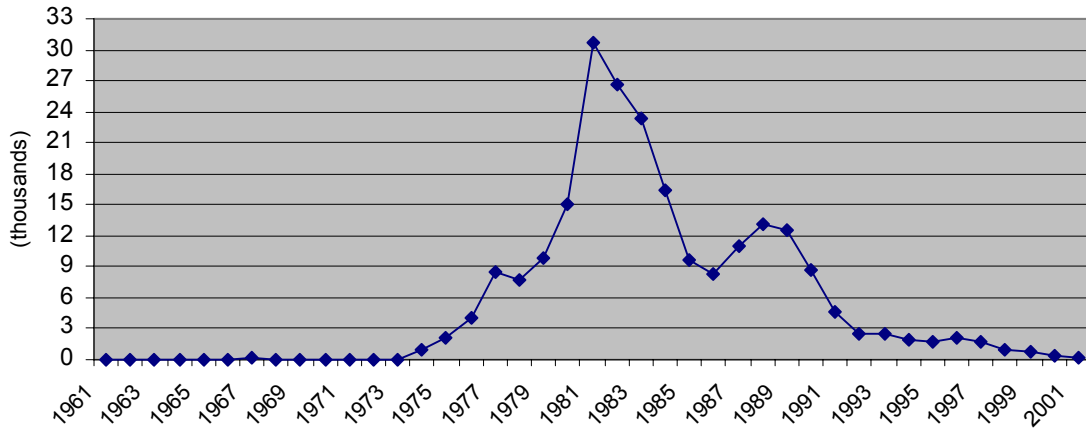
**GRAPH 2.2: Number of Turkish Workers Sent to Germany
1961-2001**



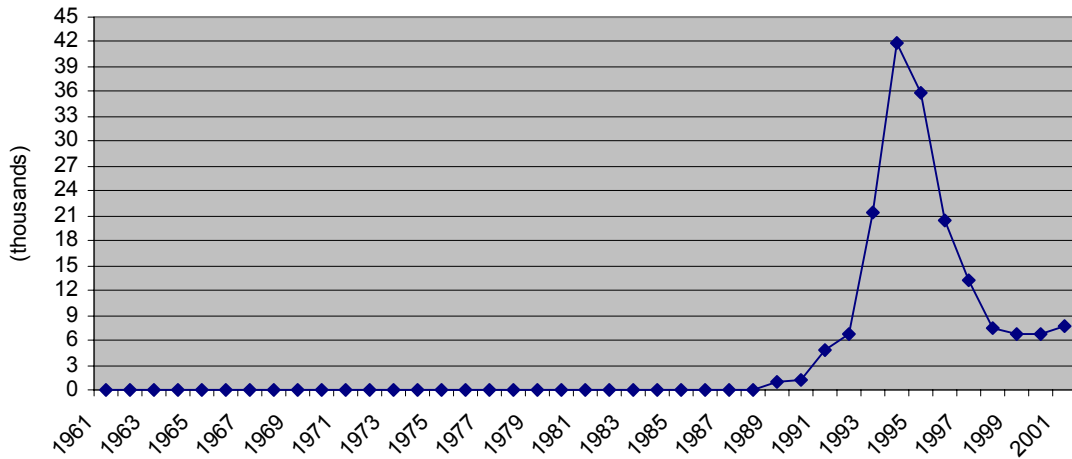
**GRAPH 2.3: Number of Turkish Workers Sent to Saudi Arabia
1961-2001**



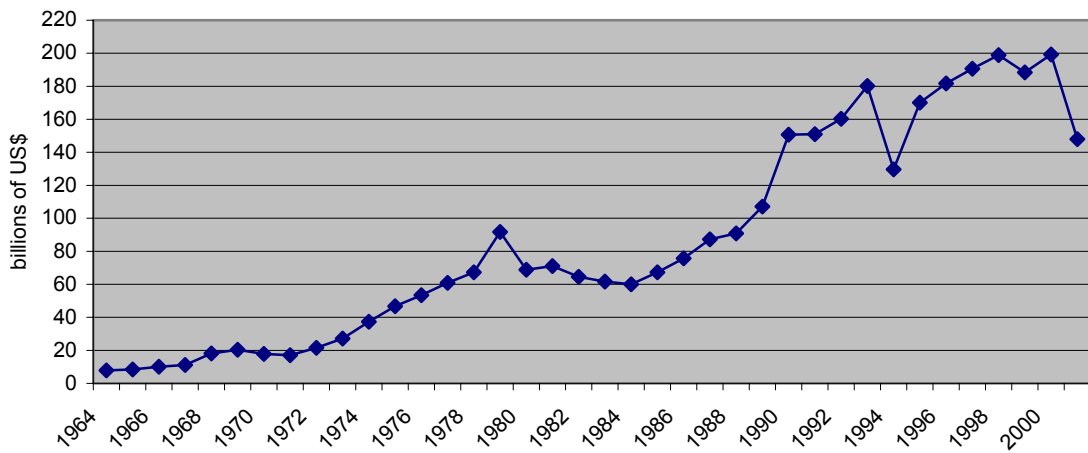
**GRAPH 2.4: Number of Turkish Workers Sent to Libya
1961-2001**



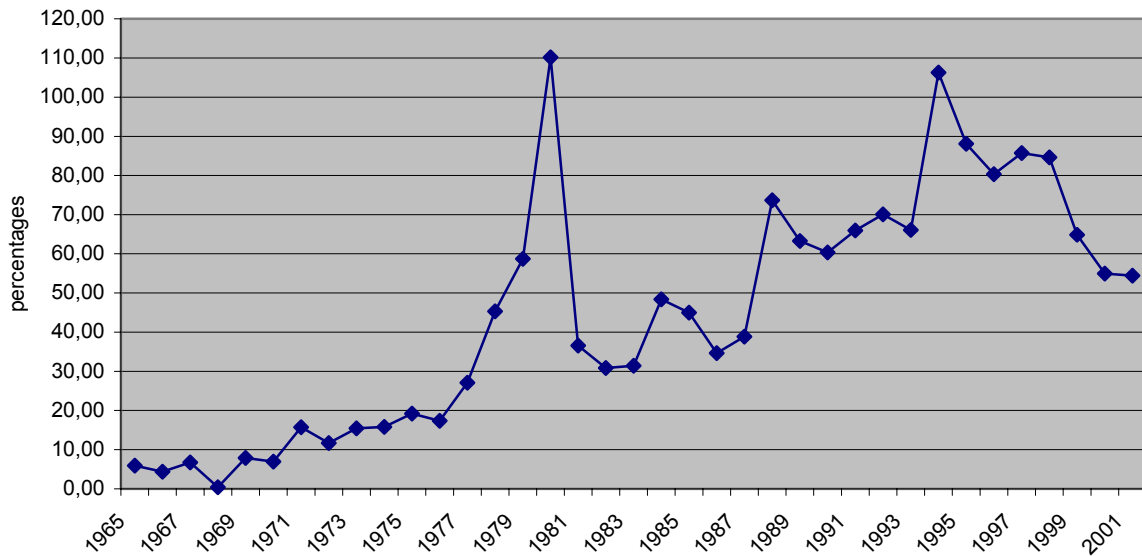
**GRAPH 2.5: Number of Turkish Workers Sent to Rep. Of Former USSR
1961-2001**



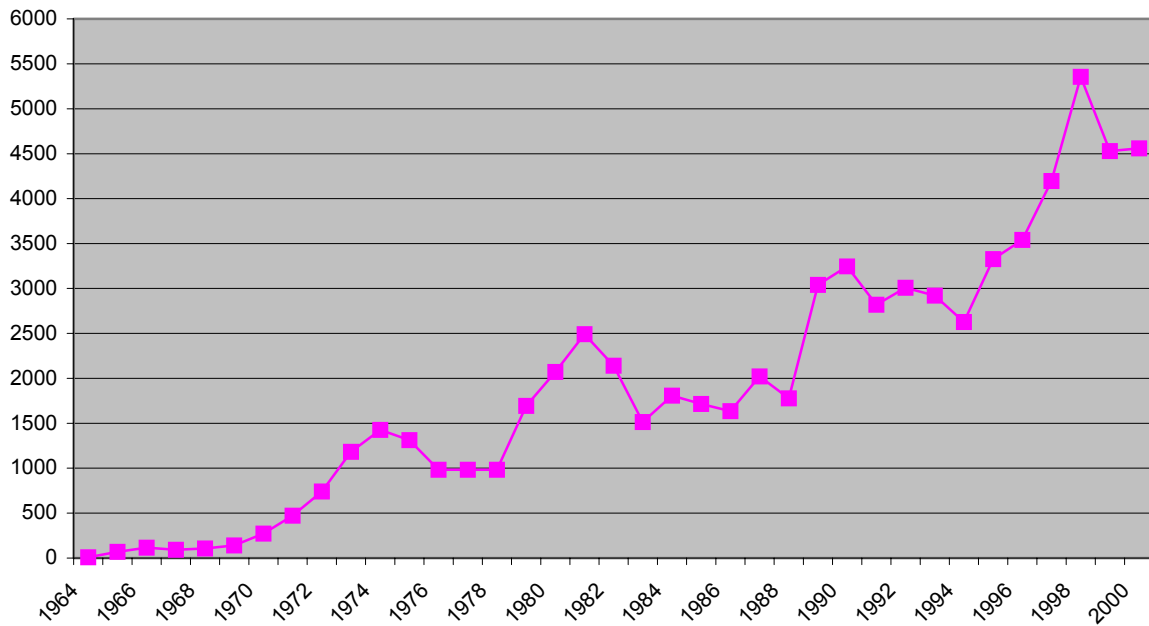
GRAPH 2.6: Gross Domestic Product of Turkey 1964-2001



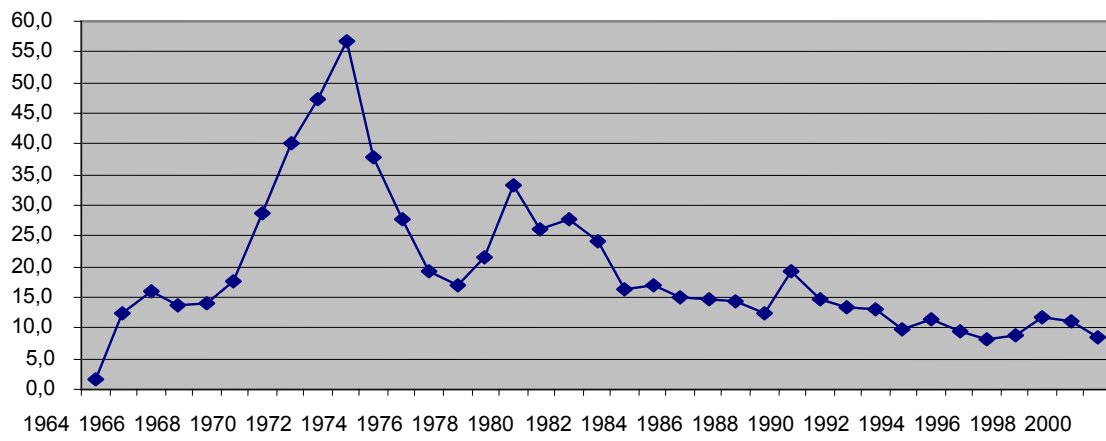
**GRAPH 2.7: Annual Inflation Rates, Turkey
1965-2001**



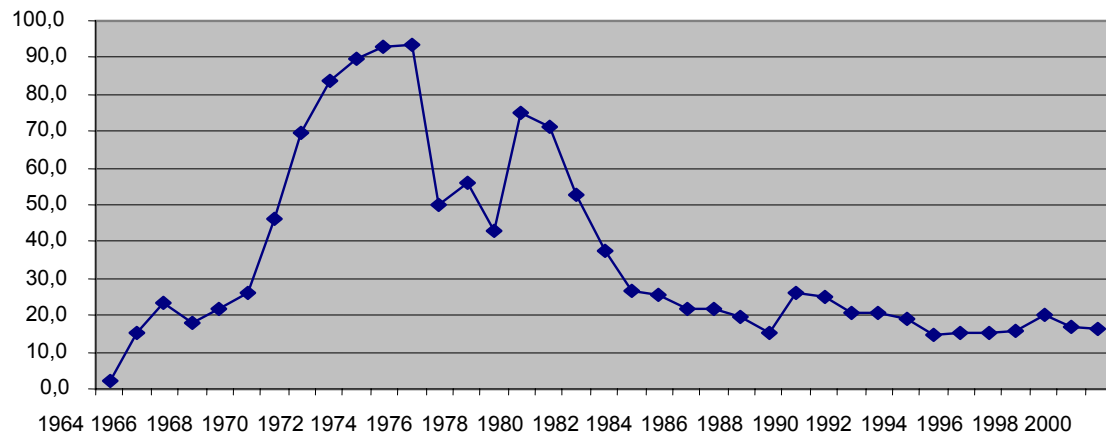
**GRAPH 2.8: Turkish Workers' Remittances 1964-2000
(in millions of US\$)**



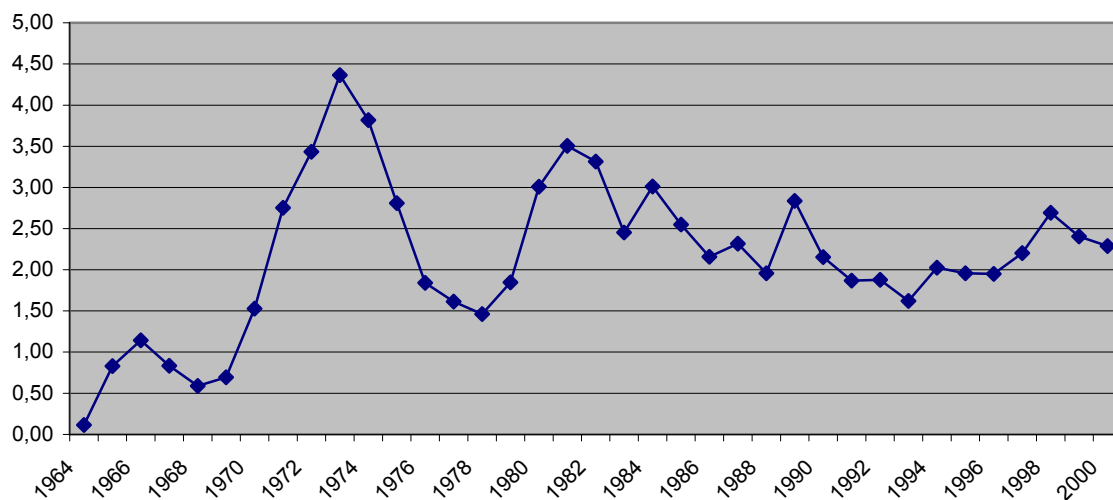
GRAPH 2.9: Workers' Remittances as Percentage of Imports (1964-2000)



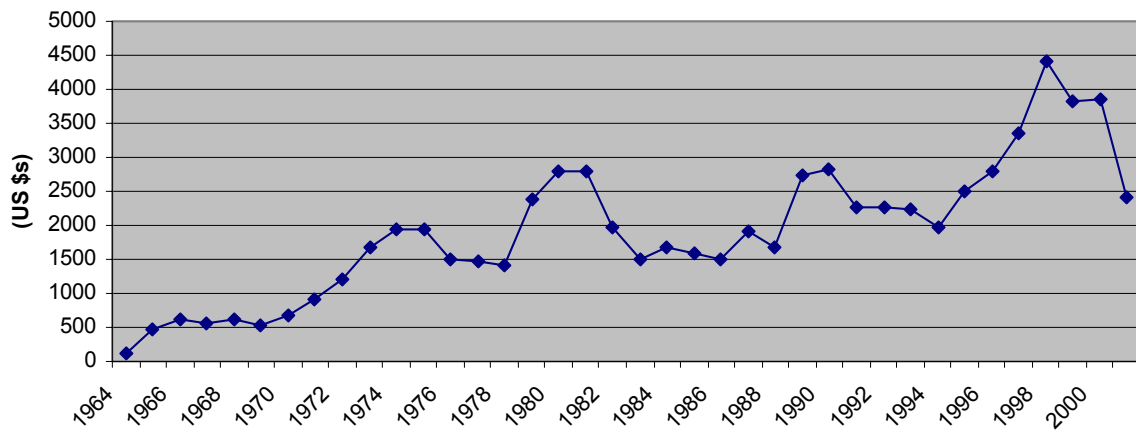
GRAPH 2.10: Workers' Remittances as Percentage of Exports (1964-2000)



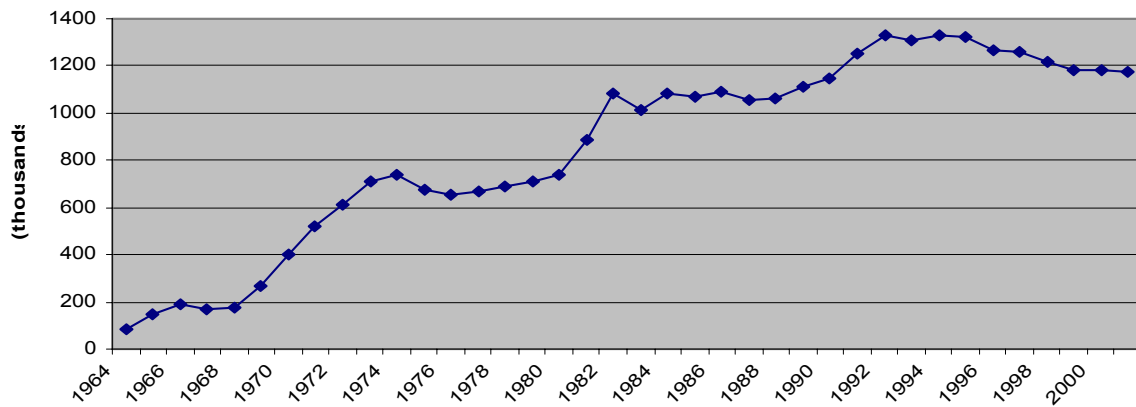
GRAPH 2.11: Workers' Remittances as Percentage of GDP



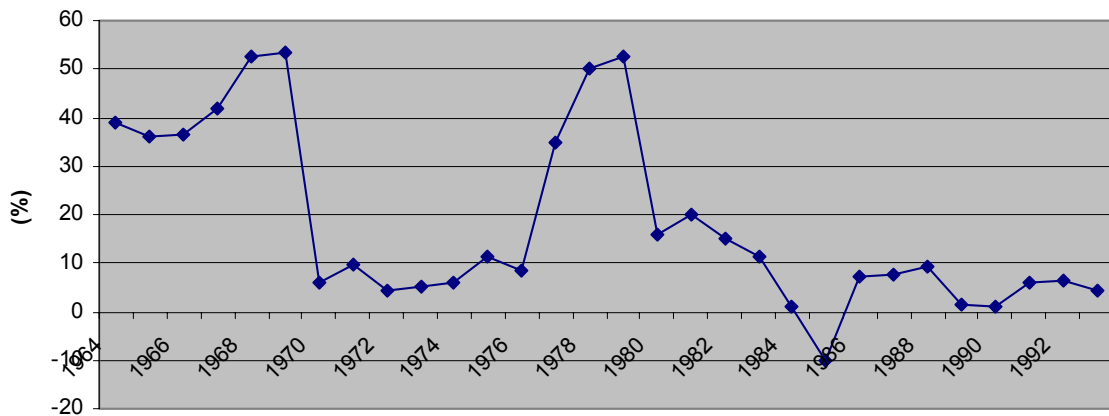
Graph 6.1: Remittances per Worker (1964-2001)



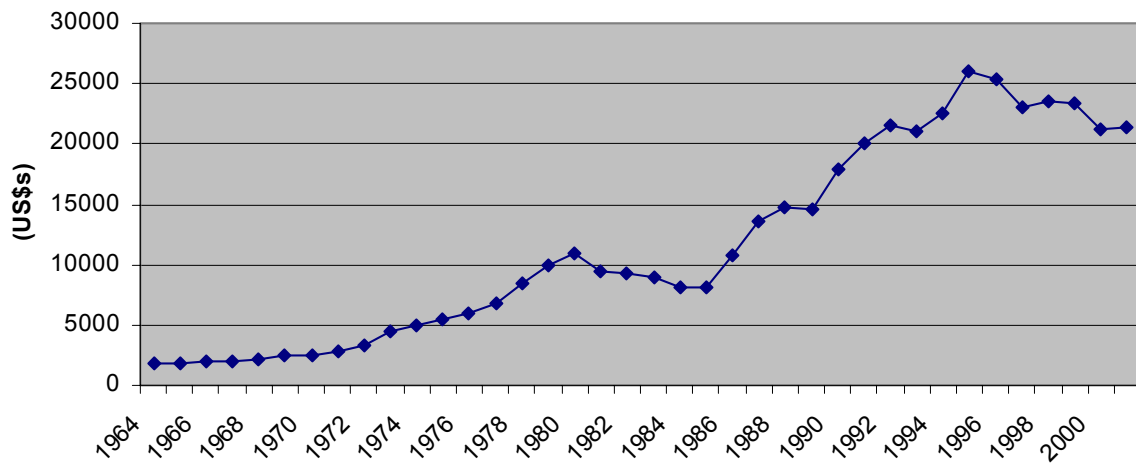
Total Stock of Turkish Workers Abroad (1964-2001)



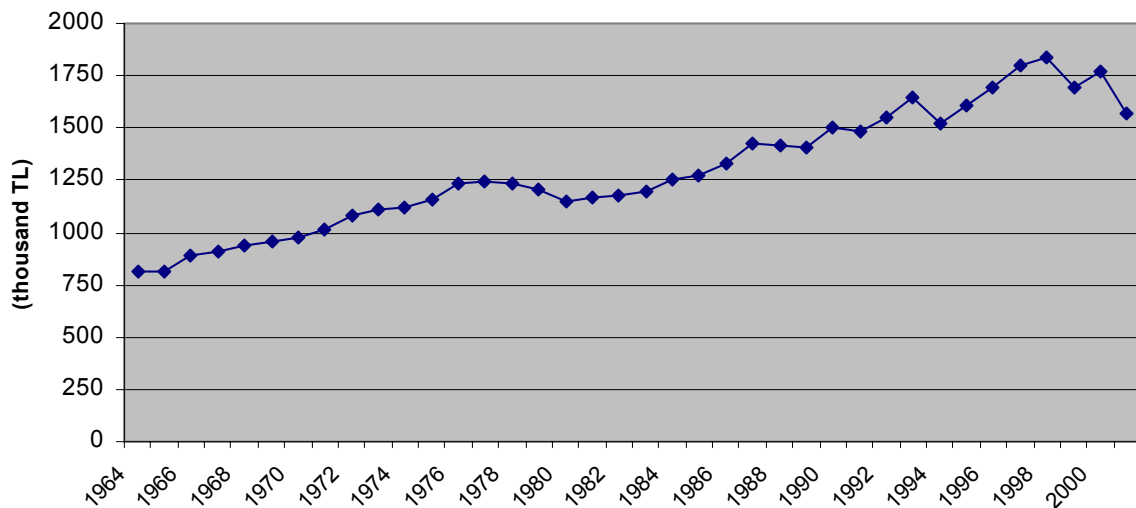
Graph 6.3: Black Market Premium in Turkey (1964-1993)



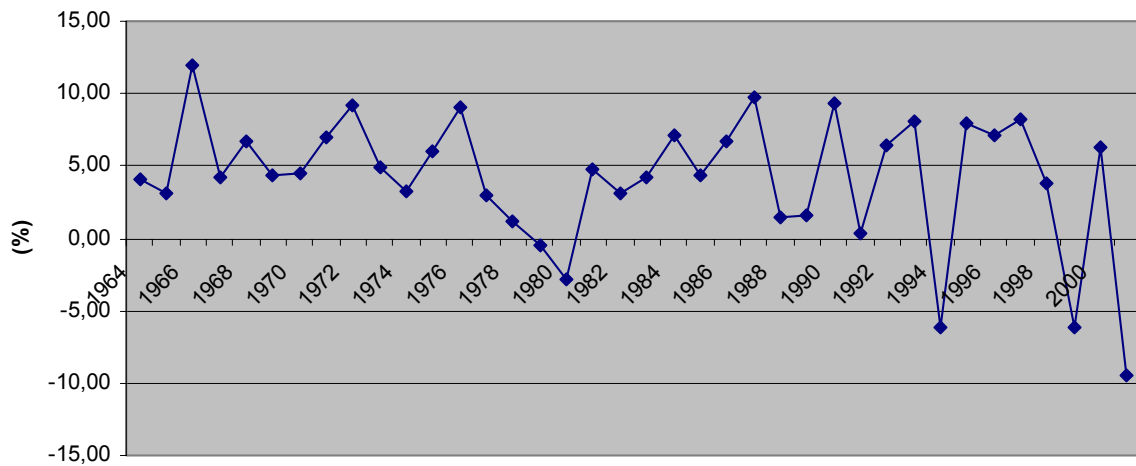
GRAPH 6.4: HOST COUNTRY INCOME PER CAPITA (1964-2001)



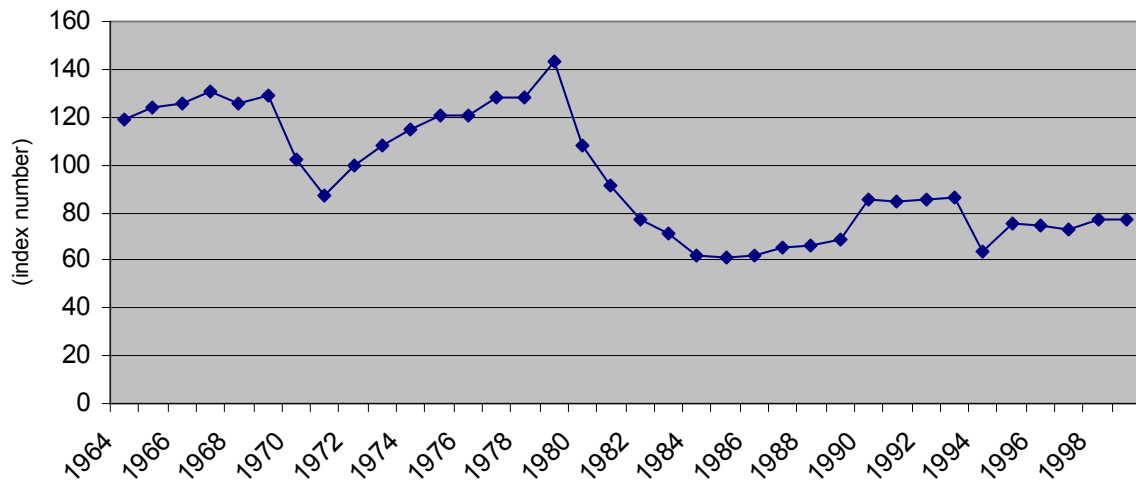
GRAPH 6.5: TURKISH GDP per CAPITA in 1987 PRICES (1964-2001)



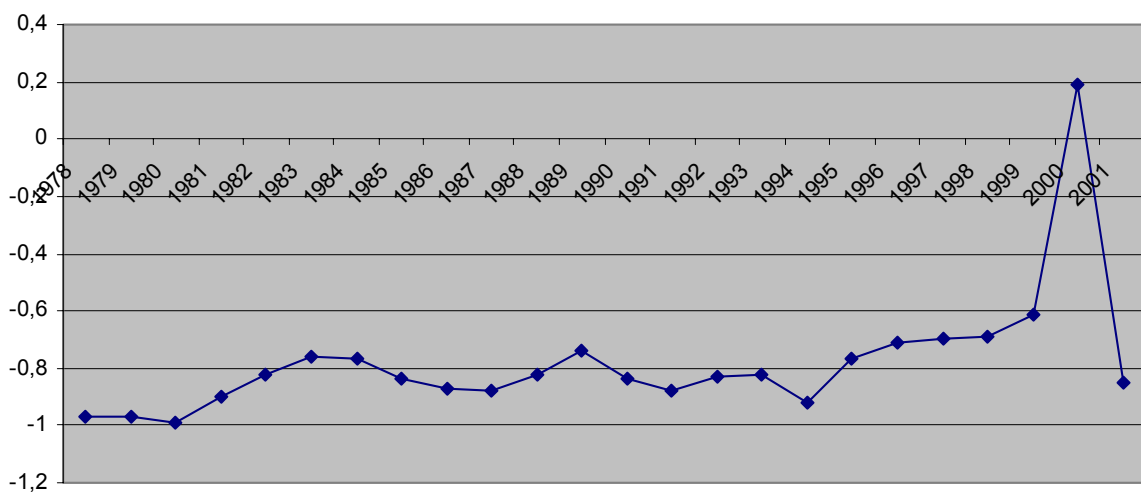
GRAPH 6.6: DOMESTIC RATE OF GROWTH FOR TURKEY (1964-2001)



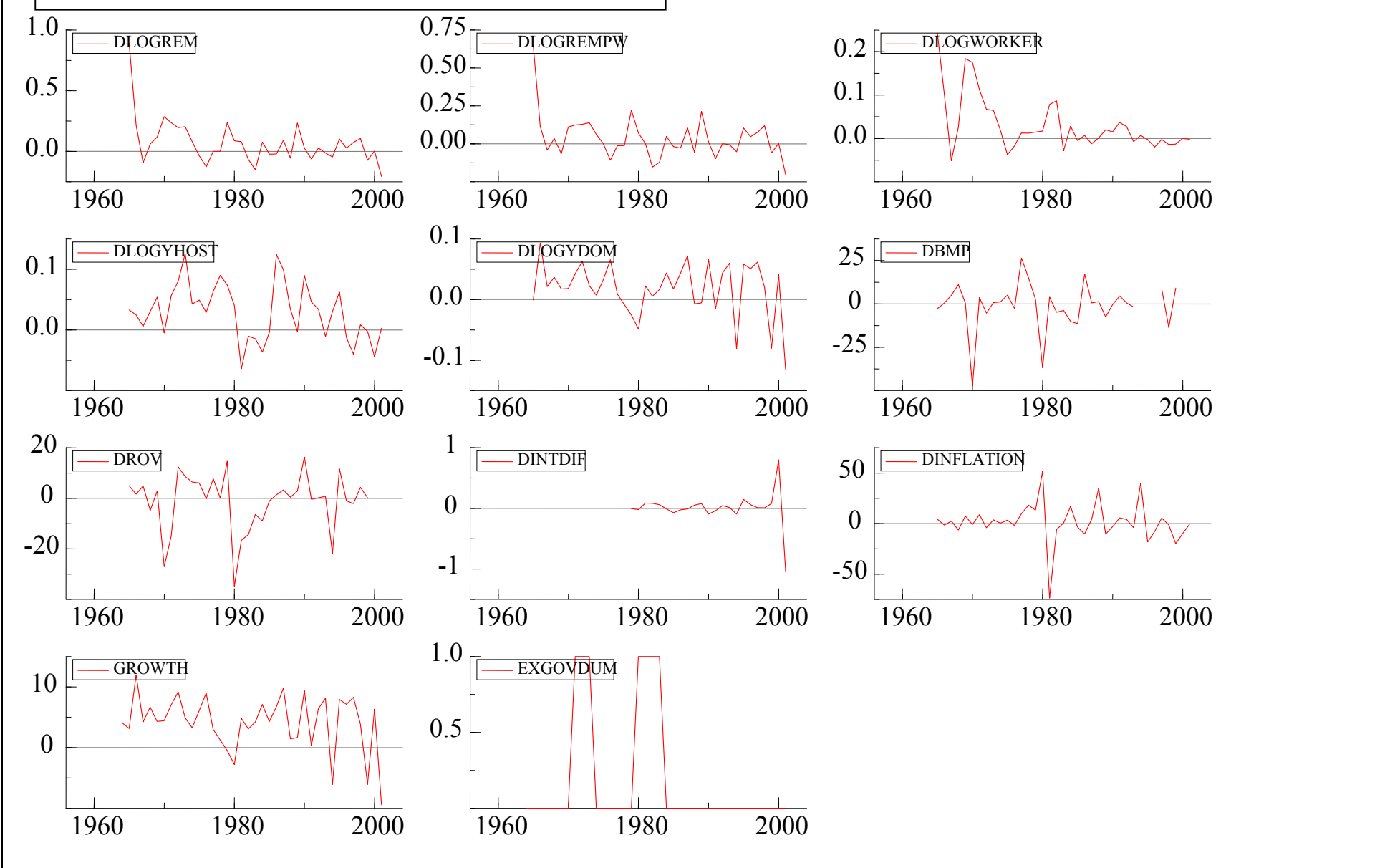
GRAPH 6.7: REAL OVERVALUATION IN TURKEY (1964-1999)



GRAPH 6.8: DEPRECIATION ADJUSTED INTEREST DIFFERENTIAL (1978-2001)



GRAPH 6.9: GRAPH OF VARIABLES USED IN REGRESSIONS



APPENDIX B: TABLES

Table 2.1: Turkey's recruitment and social security agreements, 1961-2000.

Country Name	Recruitment Agreements	Social Security Agreements
England	---	09 September 1961
Federal Rep. of Germany	30 October 1961*	30 April 1964
Austria	15 May 1964	1. 12 October 1966 2. 28 October 1999
Belgium	16 July 1964	4 July 1966
Netherlands	19 August 1964	5 April 1966
Switzerland	---	1 May 1969
France	8 April 1965	20 January 1972
Sweden	10 March 1967	2 September 1977
Norway	---	20 July 1978
Australia	5 October 1967	---
Macedonia	---	06 July 1998
Turkish Rep. of Northern Cyprus	---	09 March 1987
Denmark	---	1.13 November 1970 2.22 October 1976
Libya	5 January 1975	1. 20 March 1976 2. 13 September 1984

(*): Agreement was revised at 30 September 1964.

Source: (Gökdere, 1978) and Ministry of Labor, Turkey.

TABLE 2.2: Workers sent abroad through the Turkish Employment Service, 1961-2000

Years	Germany	France	Austria	Netherlands	Belgium	Switzerland	Australia	Libyan A.J.	Saudi Arabia	Iraq	Rep.of former	Others	Total
											USSR		
1961	1476	0	0	0	0	0	0	0	0	0	0	0	1476
1962	11025	0	160	0	0	0	0	0	0	0	0	0	11185
1963	23436	63	937	251	5605	36	0	0	0	0	0	0	30328
1964	54902	25	1434	2958	6651	193	0	0	0	0	0	13	66176
1965	45572	0	1973	2181	1661	122	0	0	0	0	0	11	51520
1966	32580	0	469	1208	0	153	0	0	0	0	0	0	34410
1967	7199	0	1043	48	0	215	0	215	0	0	0	135	8855
1968	41409	0	673	875	0	97	107	0	0	0	0	43	43204
1969	98142	191	973	3404	0	183	970	0	0	0	0	112	103975
1970	96936	9036	10622	4843	431	1598	1186	0	0	0	0	4923	129575
1971	65684	7897	4620	4853	583	1342	879	0	0	0	0	2584	88442
1972	65875	10610	4472	744	113	1312	640	0	0	0	0	1463	85229
1973	103793	17544	7083	1994	265	1109	886	0	0	0	0	3146	135820
1974	1228	10577	2501	1503	555	770	1138	1015	0	0	0	924	20211
1975	640	25	226	32	59	229	401	2121	251	0	0	435	4419
1976	2101	6	672	98	72	281	339	4098	1832	0	0	1059	10558
1977	2413	15	583	83	45	246	542	8582	4722	0	0	1853	19084
1978	1333	13	54	48	41	326	549	7726	5769	0	0	2993	18852
1979	933	11	23	40	27	406	407	9825	8522	0	0	3436	23630
1980	764	21	944	32	35	549	409	15090	5643	0	0	5016	28503
1981	274	6	184	31	13	379	321	30667	14379	10467	0	2032	58753
1982	75	9	12	2	2	163	125	26686	12325	8906	0	1083	49388
1983	43	4	7	4	2	209	181	23292	20238	7367	0	1123	52470
1984	17	0	2	5	3	69	145	16410	25985	2430	0	749	45815
1985	23	4	16	5	7	110	250	9680	35067	1612	0	579	47353
1986	17	3	52	12	0	137	391	8381	23771	2160	0	684	35608
1987	422	4	18	18	2	83	422	10986	27109	1725	0	18	40807
1988	85	0	34	0	0	96	372	13194	34645	3717	0	878	53021
1989	51	0	142	0	0	38	271	12608	32319	2549	932	1018	49928
1990	62	0	423	0	0	64	255	8606	33077	1274	1243	2703	47707
1991	49	0	315	0	0	66	308	4728	40782	6	4695	2071	53020
1992	1685	0	239	0	0	52	208	2432	46467	0	6708	2209	60000
1993	1999	0	82	0	0	32	166	2549	35826	0	21436	1154	63244
1994	2032	0	10	0	0	13	139	1869	13050	0	41837	2195	61145
1995	2246	0	16	0	0	18	248	1753	14529	0	35792	4881	59483
1996	2443	0	5	0	0	31	97	2063	5635	0	20460	9963	40697
1997	1800	0	0	0	0	0	21	1833	7657	0	13195	8815	33321
1998	1734	0	1	0	0	10	4	1032	6821	0	7426	8879	25907
1999	2350	25	1	2	1	5	11	698	5178	0	6786	2412	17475
2000	2135	87	1	1	1	1	4	385	1862	0	6740	2428	13645
2001	2437	202	5	2	1	1	5	238	4657	0	7600	5087	20235
Total:	679420	56378	41027	25277	16175	10744	12397	228762	468118	42213	174850	89107	1844474

1. This table presents data on Turkish workers sent abroad through the TES; such data may underestimate emigration by 20-40 percent.

2. Data on Germany represent the Federal Republic till 1991 and Germany after then.

3. Sources: Ministry of Labor, Turkey; State Statistics Institute, Turkey.

Table 2.3: Number of Recruited Turkish Workers by Host Country (1999-2001)

COUNTRIES	1999	2000	2001
USA	131	46	104
Germany	2.350	2.135	2.437
Portugal	0	2	0
Australia	11	4	5
Austria	1	1	5
Belgium	1	1	1
Denmark	14	3	5
France	25	87	202
Holland	2	1	2
England	23	29	19
Sweden	1	3	5
Switzerland	5	1	1
Italy	2	2	2
Canada	2	1	7
Turkish Republic of Northern Cyprus	254	159	22
Libya	698	385	238
S. Arabia	5.178	1.862	4.657
Russian Federation	2.215	2.199	4.190
Romania	196	0	13
Japan	65	9	0
Pakistan	91	63	11
Azerbaijan	152	214	267
Bulgaria	107	37	4
Kyrgyzstan	88	177	34
Turkmenistan	1.576	2.191	1.327
Uzbekistan	872	176	455
Kazakhstan	1.524	1.790	1.290
Georgia	150	157	65
Israel	1.485	1.322	3.917
Bermuda	0	1	3
Bahrain	0	73	0
Jordan	20	166	203
Malta	3	2	6
United Arab Emirates	0	21	0
Ukraine	93	222	90
Greece	0	7	3
Panama	0	1	0
Luxembourg	0	2	37
Moldavia	119	20	2
Ethiopia	16	0	0
Croatia	2	72	86
Guernsey	2	0	0
Barbuda	1	0	0
Belarus	0	0	299
Albania	0	0	201
Kuwait	0	0	11
Syria	0	0	9
Total	17.475	13.645	20235
Source: İşkur (Turkish Employment Service), 2001.			

TABLE 2.4: Numbers of Turkish Nationals, Workers and Unemployed Persons by Country (October, 2001)

COUNTRY	No. of Citizens	No. of Workers	No. of Unemployed Persons	Unemployment Rate of Turkish Workers (%)	General Unemployment Rate (%)
A) WEST EUROPE					
Germany	2.053.600	727.780	147.922	20,08	9,00
France	311.356	76.122	32.623	30,00	8,70
Holland*	308.890	54.000	11.000	20,00	3,00
Austria	134.229	57.098	4.836	9,76	5,05
Belgium	69.183	25.021	9.083	34,26	8,33
Sweden	35.844	5.800	1.700	22,50	4,30
England	79.000	44.000	-	11,50	5,30
Denmark	35.232	15.596	3.449	22,40	5,20
Italy	10.000				10,50
Finland	3.325				15,90
Spain	1.000				23,30
Luxemburg	210	60			2,30
Switzerland	79.501	33.888	2.427	6,60	1,70
Norway	10.000	6000			4,50
Liechtenstein	809	339	49	7,80	4,00
TOTAL	3.132.179	1.045.704	213.089		
TURKISH REPUBLICS					
Azerbaijan	5000	2000			
Turkmenistan	5.000	-			
Uzbekistan	3.700	1.881			
Kazakhstan	7.000				
Kyrgyzstan	2.050	1.500			
Tajikistan	300				
TOTAL	23.050	5.381			
MIDDLE EAST & NORTH AFRICA					
S.Arabia	100.000	95.000			
Libya	2.400	1.934			
Kuwait	3.000	2.750			
Jordan	1.130	200			
Qatar	400	400			
TOTAL	106.930	100.284			
OTHER COUNTRIES					
Russian Federation	30.000	10.514			
Belarus	70	4			
Georgia	1.200	500			
Ukraine	800	350			
Moldova	200				
Israel	15.000				
Japan	1.729	1.729			
ABD	130.000				5,3
Canada	35.000				6,7
Australia	52.620	13.500	2.278	16,87	6,60
South Africa	500	250			
TOTAL	267.119	26.847	2.278		
GENERAL TOTAL	3.487.112	1.174.781	219.527		

Note : The number of unemployed persons is included in the number of workers.

: (*) Those holding the double nationality status are included in the number of citizens.

Source: General Directorate of External Relations and Services for Workers Abroad, Ministry of Labor and Social Security.

TABLE 2.5: WR and selected indicators of Turkey, 1964-2000

Years	(All in millions of US\$)				WR as	WR as	WR as
	WR*	Imports	Exports	GDP	%Imports	%Exports	%GDP
1964	9	538	411	7841	1,7	2,2	0,11
1965	70	572	463	8442	12,2	15,1	0,83
1966	115	718	491	10058	16,0	23,4	1,14
1967	93	685	522	11168	13,6	17,8	0,83
1968	107	764	496	18168	14,0	21,6	0,59
1969	141	801	537	20307	17,6	26,3	0,69
1970	273	948	588	17875	28,8	46,4	1,53
1971	471	1171	677	17099	40,2	69,6	2,75
1972	740	1563	885	21545	47,3	83,6	3,43
1973	1183	2086	1317	27100	56,7	89,8	4,37
1974	1426	3778	1532	37338	37,7	93,1	3,82
1975	1312	4739	1401	46678	27,7	93,6	2,81
1976	982	5129	1960	53383	19,1	50,1	1,84
1977	982	5796	1753	60909	16,9	56,0	1,61
1978	983	4599	2288	67226	21,4	43,0	1,46
1979	1694	5069	2261	91727	33,4	74,9	1,85
1980	2071	7909	2910	68790	26,2	71,2	3,01
1981	2490	8933	4703	71040	27,9	52,9	3,51
1982	2140	8843	5746	64546	24,2	37,2	3,32
1983	1513	9235	5728	61678	16,4	26,4	2,45
1984	1807	10757	7134	59990	16,8	25,3	3,01
1985	1714	11343	7958	67235	15,1	21,5	2,55
1986	1634	11105	7457	75728	14,7	21,9	2,16
1987	2021	14158	10190	87261	14,3	19,8	2,32
1988	1776	14335	11662	90764	12,4	15,2	1,96
1989	3040	15792	11625	107120	19,3	26,2	2,84
1990	3246	22302	12959	150720	14,6	25,0	2,15
1991	2819	21047	13593	150980	13,4	20,7	1,87
1992	3008	22871	14715	160260	13,2	20,4	1,88
1993	2919	29428	15345	180210	9,9	19,0	1,62
1994	2627	23270	18106	129700	11,3	14,5	2,03
1995	3327	35709	21637	170050	9,3	15,4	1,96
1996	3542	43627	23224	181680	8,1	15,3	1,95
1997	4197	48559	26261	190660	8,6	16,0	2,20
1998	5356	45921	26974	198840	11,7	19,9	2,69
1999	4529	40671	26587	188370	11,1	17,0	2,40
2000	4560	54503	27775	199300	8,4	16,4	2,29

*: WR represent workers' remittances.

Source: State Statistics Institute, (DİE), Turkey.

TABLE 4.1: DATA USED IN THE MODELS

											EXGOV
	REM	REMPW	WORKER	BMP	INFLATION	GROWTH	ROV	YDOM	YHOST	INTDIF	DUM
1964	9	106	85	38,89	1,69	4,08	119,28	811	1762	N.A.	0
1965	70	471	148	36,11	5,92	3,14	124,28	810	1901	N.A.	0
1966	115	614	187	36,67	4,36	11,99	125,93	889	2012	N.A.	0
1967	93	559	166	41,67	6,75	4,21	130,8	908	2039	N.A.	0
1968	107	606	177	52,78	0,4	6,67	126,01	942	2189	N.A.	0
1969	141	523	270	53,33	7,87	4,32	128,95	958	2479	N.A.	0
1970	273	676	404	6	6,93	4,44	101,9	976	2450	N.A.	0
1971	471	900	523	9,64	15,74	7,05	86,96	1019	2789	N.A.	1
1972	740	1211	611	4,29	11,67	9,17	99,38	1085	3354	N.A.	1
1973	1183	1670	708	5	15,44	4,91	108,01	1110	4482	N.A.	1
1974	1426	1928	740	6,15	15,82	3,26	114,46	1118	4945	N.A.	0
1975	1312	1934	678	11,22	19,2	6,06	120,56	1155	5536	N.A.	0
1976	982	1508	651	8,58	17,36	9,00	120,39	1233	5917	N.A.	0
1977	982	1465	670	35,03	27,08	2,99	128,12	1244	6848	N.A.	0
1978	983	1426	689	50,1	45,29	1,23	128,19	1233	8427	-0,97	0
1979	1694	2377	713	52,76	58,69	-0,49	142,85	1202	9986	-0,97	0
1980	2071	2794	741	15,97	110,17	-2,78	108,11	1145	10960	-0,99	1
1981	2490	2803	888	19,89	36,58	4,81	91,5	1171	9458	-0,9	1
1982	2140	1973	1084	15,13	30,84	3,09	77,16	1177	9232	-0,82	1
1983	1513	1490	1016	11,39	31,4	4,21	70,83	1197	8925	-0,76	1
1984	1807	1668	1083	1,18	48,38	7,11	61,94	1250	8204	-0,77	0
1985	1714	1600	1071	-10,15	44,96	4,30	60,91	1272	8131	-0,84	0
1986	1634	1501	1089	7,15	34,62	6,76	62,29	1328	10826	-0,87	0
1987	2021	1910	1058	7,75	38,85	9,81	65,6	1427	13599	-0,88	0
1988	1776	1675	1060	9,1	73,67	1,45	66,02	1417	14712	-0,82	0
1989	3040	2739	1110	1,57	63,27	1,63	68,93	1409	14628	-0,74	0
1990	3246	2824	1149	1,22	60,31	9,37	85,28	1505	17981	-0,84	0
1991	2819	2253	1251	5,8	65,97	0,35	84,91	1483	19998	-0,88	0
1992	3008	2258	1332	6,3	70,07	6,40	85,08	1549	21625	-0,83	0
1993	2919	2228	1310	4,43	66,1	8,14	85,88	1645	21084	-0,82	0
1994	2627	1974	1331	NA	106,26	-6,08	64,05	1517	22606	-0,92	0
1995	3327	2514	1323	NA	88,11	7,95	75,68	1609	26093	-0,77	0
1996	3542	2803	1264	NA	80,35	7,12	74,68	1693	25338	-0,71	0
1997	4197	3339	1257	NA	85,73	8,29	72,65	1800	23113	-0,7	0
1998	5356	4402	1217	NA	84,64	3,86	76,95	1837	23557	-0,69	0
1999	4529	3837	1180	NA	64,87	-6,08	77,3	1695	23426	-0,61	0
2000	4560	3863	1180	NA	54,92	6,34	NA	1766	21167	0,19	0
2001	2837	2415	1175	NA	54,4	-9,43	NA	1573	21305	-0,85	0
SYMBOL	DESCRIPTION										
REM:	Total cash remittances of Turkish workers (in millions of US\$s)										
REMPW:	Cash remittances of Turkish workers per worker (in US\$s)										
WORKER:	Stock of Turkish workers abroad (in thousands)										
BMP:	Black market premium (%)										
INFLATION:	Domestic CPI inflation rate (%)										
GROWTH:	Domestic growth rate of GDP at 1987 prices (%)										
ROV:	Real overvaluation (index number)										
YDOM:	Domestic GDP per capita at 1987 prices (in thousands of TL)										
YHOST:	Host country GDP per capita (in US\$s)										
INTDIF:	Exchange rate depreciation adjusted interest differential										
EXGOVDUM:	Extra government dummy										

Table 6.1: Stock of workers in host countries

Years												Former			Real
	Germany	France	Austria	Netherlands	Belgium	Switzerland	Australia	England	Libya	S. Arabia	USSR	Others	Total Stock	Stock	
1964	90839	88	2531	3209	12256	229	0	0	0	0	0	13	109165	84785	
1965	136411	88	4504	5390	13917	351	0	0	0	0	0	24	160685	148485	
1966	168991	88	4973	6598	13917	504	0	0	0	0	0	24	195095	187385	
1967	176190	88	6016	6646	13917	719	0	0	215	0	0	159	203950	166413	
1968	217599	88	6689	7521	13917	816	107	0	215	0	0	202	247154	176540	
1969	315741	279	7662	10925	13917	999	1077	0	215	0	0	314	351129	269710	
1970	412677	9315	18284	15768	14348	2597	2263	575	215	0	0	4662	480704	403850	
1971	478361	17212	22904	20621	14931	3939	3142	1864	215	0	0	4286	569146	523161	
1972	544236	27822	27376	21365	15044	5251	3782	1946	215	0	0	4551	654375	610847	
1973	648029	45366	34459	23359	15309	6360	4668	2062	215	0	0	5307	790195	708384	
1974	649257	55943	36960	24862	15864	7130	5806	2175	1230	0	0	6118	810406	739500	
1975	649897	55968	37186	24894	15923	7359	6207	2273	3351	251	0	6455	814825	678424	
1976	651998	55974	37858	24992	15995	7640	6546	2300	7449	2083	0	7487	825383	651236	
1977	654411	55989	38441	25075	16040	7886	7088	2330	16031	6805	0	9310	844467	670320	
1978	655744	56002	38495	25123	16081	8212	7637	2402	23757	12574	0	12231	863319	689172	
1979	656677	56013	38518	25163	16108	8618	8044	2467	33582	21096	0	15602	886949	712802	
1980	657441	56034	39462	25195	16143	9167	8453	2518	48672	26739	0	20567	915452	741305	
1981	590623	38000	30130	47326	23000	20119	16000	3000	38000	45000	0	37092	888290	888290	
1982	652751	63839	30219	68743	25000	24001	12277	3000	80000	80000	0	44595	1084425	1084425	
1983	542512	64070	27733	55000	25000	24751	20000	11648	75500	120000	0	49330	1015544	1015544	
1984	595568	65832	29166	77675	31100	25254	29000	11648	38000	140000	0	39980	1083223	1083223	
1985	585596	65832	29165	77675	31100	25254	29000	11648	27000	150000	0	39043	1071313	1071313	
1986	597092	76580	33437	77700	32500	25254	29000	5000	23000	150000	0	39090	1088653	1088653	
1987	609515	78000	33438	78000	32500	27074	29000	5000	22000	105000	0	38487	1058014	1058014	
1988	626019	82000	35043	80000	35100	28134	29000	5000	27000	75000	0	38154	1060450	1060450	
1989	654219	91520	42423	82000	35100	30698	29000	5000	25000	75000	0	40005	1109965	1109965	
1990	661385	98000	59128	89000	23488	33394	29000	5000	18205	95000	0	37866	1149466	1149466	
1991	694502	111890	58055	89000	23715	36027	29000	30000	10221	130000	0	38554	1250964	1250964	
1992	762775	99000	55749	83400	24000	36815	29000	30000	9000	150000	20000	32278	1332017	1332017	
1993	766648	104432	56279	85498	23488	37371	29000	14274	7742	130000	22000	33361	1310093	1310093	
1994	763697	102900	54058	84500	23488	37640	31000	15746	5802	120000	40000	52188	1331019	1331019	
1995	742566	102900	51297	84500	26764	35828	31000	15746	5802	120000	40000	67083	1323486	1323486	
1996	740277	72544	51327	65000	37500	34825	21085	33000	5810	120000	40000	42134	1263502	1263502	
1997	748814	94224	53715	57000	27118	40883	21609	36280	5570	115000	24731	31969	1256913	1256913	
1998	739446	78965	61096	48000	26855	32944	16484	37880	2600	115000	24731	32786	1216787	1216787	
1999	743148	76122	55555	51000	15938	33262	9130	40450	2400	110000	24731	18684	1180420	1180420	
2000	743148	76122	55555	51000	15938	33262	9130	40450	2400	110000	24731	18684	1180420	1180420	
2001	727780	76122	57098	54000	25021	33888	13500	44000	1934	95000	16749	29689	1174781	1174781	

1. 1964-1980 cumulative number of workers sent abroad up to that year; Source: TES

2. 1981-2001 stock of workers in each country; Source: Ministry of Labor, Turkey.

3. For 1981-2001 data, unemployed citizens are also included.

4. For the real stock column, 1964-1976 from Gokdere 1978 p.43, 1977-1980 recruited workers are added to previous stock.

TABLE 6.2: WEIGHTS FOR HOST COUNTRIES, 1964-2001

Country	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	
Australia	0	0	0	0	0	0	0	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,02	0,01
Austria	0,02	0,03	0,03	0,03	0,03	0,02	0,04	0,04	0,04	0,04	0,05	0,05	0,05	0,05	0,05	0,04	0,04	0,04	0,04	0,03
Belgium	0,11	0,09	0,07	0,07	0,06	0,04	0,03	0,03	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,03	0,02
France	0	0	0	0	0	0	0,02	0,03	0,04	0,06	0,07	0,07	0,07	0,07	0,07	0,06	0,06	0,04	0,06	0,06
Germany	0,84	0,85	0,87	0,87	0,88	0,91	0,87	0,84	0,85	0,83	0,81	0,81	0,8	0,78	0,77	0,77	0,75	0,7	0,63	0,63
Libya	0	0	0	0	0	0	0	0	0	0	0	0	0,01	0,02	0,03	0,04	0,05	0,04	0,08	0,08
Netherlands	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,04	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,06	0,07
Saudi Arabia	0	0	0	0	0	0	0	0	0	0	0	0	0	0,01	0,01	0,02	0,03	0,05	0,08	0,08
Switzerland	0	0	0	0	0	0	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,02	0,02
Former USSR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
England	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Country	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Australia	0,02	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,01	0,01	0,01	0,01
Austria	0,03	0,03	0,03	0,03	0,03	0,03	0,04	0,05	0,05	0,04	0,04	0,04	0,04	0,04	0,04	0,05	0,05	0,05	0,05
Belgium	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,02	0,02	0,02	0,02	0,02	0,02	0,03	0,02	0,02	0,01	0,01	0,02
France	0,07	0,06	0,06	0,07	0,08	0,08	0,09	0,09	0,09	0,08	0,08	0,08	0,08	0,06	0,08	0,07	0,07	0,07	0,07
Germany	0,55	0,58	0,56	0,59	0,6	0,62	0,61	0,59	0,58	0,58	0,6	0,61	0,6	0,61	0,62	0,63	0,65	0,65	0,64
Libya	0,08	0,04	0,03	0,02	0,02	0,03	0,02	0,02	0,01	0,01	0,01	0	0	0	0	0	0	0	0
Netherlands	0,06	0,07	0,08	0,07	0,08	0,08	0,08	0,08	0,07	0,06	0,07	0,07	0,07	0,05	0,05	0,04	0,04	0,04	0,05
Saudi Arabia	0,12	0,13	0,15	0,14	0,1	0,07	0,07	0,09	0,11	0,12	0,1	0,09	0,1	0,1	0,09	0,1	0,09	0,09	0,08
Switzerland	0,03	0,02	0,02	0,02	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03
Former USSR	0	0	0	0	0	0	0	0	0	0,02	0,02	0,03	0,03	0,03	0,02	0,02	0,02	0,02	0,01
England	0,01	0,01	0,01	0	0	0	0	0	0,02	0,02	0,01	0,01	0,01	0,03	0,03	0,03	0,03	0,03	0,04

TABLE 6.3: HOST COUNTRY GDP PER CAPITA (in US\$s), 1964-2001

Country	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Australia	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	3098	3397	3907	5459	6417	6885	7507	7447	8388	9340	10629	12022	11697
Austria	1237	1339	1451	1536	1642	1785	2014	2354	2894	3877	4597	5203	5581	6699	8061	9572	10625	9188	9176
Belgium	1628	1760	1876	2000	2129	2355	2649	2958	3672	4714	5505	6448	6953	8089	9887	11381	12297	10201	8976
France	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	2899	3207	3900	5028	5312	6681	6887	7561	9323	11185	12701	11082	10426
Germany	1802	1945	2051	2064	2215	2504	2437	2797	3353	4475	4915	5419	5798	6722	8363	9897	10553	8853	8514
Libya	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	3318	2919	3313	3839	4910	5347	6564	7283	6886	9107	12091	9985	9507
Netherlands	1490	1641	1764	1912	2100	2351	2585	2971	3651	5027	5871	6762	7341	8585	10427	11867	12675	10539	10172
Saudi Arabia	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1071	1248	1578	2393	3386	4434	6365	7727	7727	10468	15319	16117	12561
Switzerland	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	3448	4117	4923	6580	7571	8721	9208	9866	13775	15436	16819	15319	15501
Former USSR	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
England	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	2215	2493	2860	3212	3459	4149	3994	4499	5709	7416	9481	9077	8576
HOST GDP	1762	1901	2012	2039	2189	2479	2450	2789	3354	4482	4945	5536	5917	6848	8427	9986	10960	9458	9232

Country	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Australia	11084	12115	10569	10815	12579	15701	17445	17963	18027	17432	16770	18882	19956	22153	21929	19390	20567	19869	18424
Austria	9324	8794	9000	12758	15933	16922	16864	21001	21648	24166	23254	24876	29251	28723	25520	26171	25924	23333	23212
Belgium	8485	8106	8428	11681	14536	15817	16075	20122	20610	23013	21840	23565	27826	27058	24556	25067	25009	22789	22554
France	9881	9330	9714	13407	16197	17515	17496	21560	21548	23555	22198	23397	26810	26694	24062	24754	24414	21977	21988
Germany	8541	8082	8194	11679	14546	15588	15289	19062	22213	25123	24120	25746	30130	29112	25759	26179	25656	22773	22427
Libya	8694	7804	7719	6053	5395	5377	5457	6549	7059	6882	6440	6410	6211	6635	7148	5911	5618	6289	5029
Netherlands	9860	9157	9281	12821	15475	16369	16052	19802	20122	22122	21331	22896	26857	26532	24174	25084	25210	23266	23703
Saudi Arabia	9713	8647	7222	5856	5253	5076	5389	6864	7515	7616	7113	7002	7230	7762	7809	6652	7180	8415	7821
Switzerland	15590	14807	14920	21251	26330	27938	26669	33610	33854	35066	33872	37141	43411	41657	35974	36749	36105	33228	34112
Former USSR	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	404	912	1251	1495	1913	1988	1447	1087	1362	1608
England	8117	7647	8098	9812	12025	14528	14622	17277	17938	18590	16577	17868	19368	20242	22507	24042	24511	23988	23765
HOST GDP	8925	8204	8131	10826	13599	14712	14628	17981	19998	21625	21084	22606	26093	25338	23113	23557	23426	21167	21305

TABLE 6.2.1: GDP PER CAPITA FOR REPUBLICS OF FORMER USSR (in US\$s)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Russian Fed.	6685.4	5412.4	575	1236	1817	2273	2825	2902	1920	1322	1777	2134
Azerbaijan	3459.5	2097.2	163	179	160	322	419	517	575	588	670	719
Kazakhstan	1767.6	1083.6	168	304	735	1063	1341	1457	1475	1138	1236	1501
Kyrgyz Rep.	3280.7	2364.6	203	147	244	325	389	374	342	258	264	283
Uzbekistan	2726.7	1725.5	166	255	296	454	609	629	624	700	557	461
Turkmenistan	n.a.	n.a.	246	1383	912	65	566	623	649	n.a.	n.a.	n.a.

TABLE 6.2.2: Weights for Form Republics of USSR according to number of Turkish citizens in 2001

Russian Fed.	0,56
Azerbaijan	0,1
Kazakhstan	0,13
Kyrgyz Rep.	0,04
Uzbekistan	0,07
Turkmenistan	0,1

TABLE 6.4: DEPOSIT RATES FOR TURKEY AND HOST COUNTRIES, 1964-2001																					
COUNTRY NAME	DESCRIPTOR	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	
AUSTRALIA	DEPOSIT RATE	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	5,00	5,25	5,00	5,50	8,00	9,00	8,63	9,00	8,52	8,25	8,58	10,38	12,33	
AUSTRIA	DEPOSIT RATE	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	5,00	5,00	5,00	5,00	5,00	
BELGIUM	DEPOSIT RATE	3,35	3,50	3,65	3,67	3,10	4,56	5,92	4,65	2,90	4,27	6,75	5,41	5,62	5,46	4,50	5,50	7,69	7,50	7,46	
FRANCE	DEPOSIT RATE	n.a.	n.a.	3,00	3,00	3,00	3,79	4,13	4,25	4,25	4,25	6,25	7,50	6,50	6,50	6,50	6,50	7,25	7,75	8,50	
GERMANY	3 MONTH DEPOSITS	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	3,06	5,14	7,95	9,74	7,54	
LIBYA	TIME DEPOSIT	n.a.	n.a.	n.a.	n.a.	3,50	3,50	4,00	4,00	4,00	4,00	4,00	4,00	4,00	4,00	4,00	4,00	4,00	5,13	5,50	5,50
NETHERLANDS	DEPOSIT RATE	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	5,04	5,54	5,96	6,06	5,88	
RUSSIA	DEPOSIT RATE	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
SAUDI ARABIA	DEPOSIT RATE	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
SWITZERLAND	DEPOSIT RATE	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	8,75	4,40
ENGLAND	DEPOSIT RATE	3,25	4,42	4,50	4,21	5,42	5,92	5,21	3,83	4,15	8,02	9,50	7,08	7,54	4,90	6,08	11,71	14,13	10,67	12,42	
TURKEY	3 MONTHS' TIME DEPOSITS	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	4,00	6,00	6,00	6,00	6,00	6,00	7,33	8,00	26,50	45,00	
COUNTRY NAME	DESCRIPTOR	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	
AUSTRALIA	DEPOSIT RATE	10,81	9,75	10,46	13,96	13,77	11,92	15,29	13,70	10,44	6,32	4,76	5,05	7,33	6,86	5,12	4,67	3,53	4,12	3,25	
AUSTRIA	DEPOSIT RATE	4,21	4,00	3,94	3,63	3,03	2,73	2,98	3,41	3,75	3,69	2,98	2,31	2,19	1,71	1,50	2,65	2,21	n.a.	n.a.	
BELGIUM	DEPOSIT RATE	6,67	7,44	6,69	5,33	5,00	4,54	5,13	6,13	6,25	6,25	7,11	4,86	4,04	2,66	2,88	3,01	2,42	3,58	3,40	
FRANCE	DEPOSIT RATE	8,08	7,08	6,25	5,00	4,50	4,50	4,50	4,50	4,50	4,50	4,50	4,50	4,50	3,67	3,50	3,21	2,69	2,63	3,00	
GERMANY	3 MONTH DEPOSITS	4,56	4,86	4,44	3,71	3,20	3,29	5,50	7,07	7,62	8,01	6,27	4,47	3,85	2,83	2,69	2,88	2,43	3,40	3,56	
LIBYA	TIME DEPOSIT	5,50	5,50	5,50	5,50	5,50	5,50	5,50	5,50	5,50	5,50	5,50	n.a.	n.a.	n.a.	n.a.	n.a.	3,21	3,00	3,00	
NETHERLANDS	DEPOSIT RATE	4,03	4,10	4,10	3,93	3,55	3,48	3,49	3,31	3,18	3,20	3,11	4,70	4,40	3,54	3,18	3,10	2,74	2,89	3,08	
RUSSIA	DEPOSIT RATE	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	101,96	55,05	16,77	17,05	13,68	6,51	4,85	
SAUDI ARABIA	DEPOSIT RATE	n.a.	n.a.	n.a.	n.a.	6,68	8,03	9,04	8,01	5,83	3,65	3,52	5,10	6,18	5,47	5,79	6,21	6,14	6,67	3,92	
SWITZERLAND	DEPOSIT RATE	3,31	3,77	4,36	3,51	3,08	4,50	8,08	8,28	7,63	5,50	3,50	3,63	1,28	1,34	1,00	0,69	1,24	3,00	1,68	
ENGLAND	DEPOSIT RATE	11,19	7,27	11,79	9,85	8,57	8,55	11,51	12,54	10,28	7,46	3,97	3,66	4,11	3,05	3,63	4,48	n.a.	n.a.	n.a.	
TURKEY	3 MONTHS' TIME DEPOSITS	45,33	51,42	49,25	40,58	35,00	49,08	53,45	47,50	62,67	68,74	64,58	87,79	76,02	80,74	79,49	80,11	78,43	47,16	74,70	

TABLE 6.5 (1): EXCHANGE RATES (NATIONAL CURRENCY PER TURKISH LIRA)

COUNTRY NAME	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
AUSTRALIA	10,07	10,11	10,07	10,13	10,03	10,11	16,64	16,85	18,04	21,06	18,56	19,05	18,10	22,19	29,05	39,08	106,43	150,71	183,13
AUSTRIA	0,35	0,35	0,35	0,35	0,35	0,35	0,58	0,60	0,61	0,71	0,82	0,82	0,99	1,28	1,89	2,84	6,53	8,41	11,19
BELGIUM	0,18	0,18	0,18	0,18	0,18	0,18	0,30	0,32	0,32	0,34	0,39	0,38	0,46	0,59	0,88	1,26	2,86	3,47	3,98
FRANCE	1,83	1,83	1,83	1,83	1,83	1,63	2,69	2,77	2,77	3,01	3,15	3,38	3,35	4,13	6,04	8,79	19,96	23,25	27,77
GERMANY	2,27	2,26	2,27	2,26	2,26	2,45	4,09	4,33	4,42	5,23	5,81	5,78	7,05	9,24	13,81	20,42	46,02	59,26	78,58
LIBYA	25,31	25,31	25,31	25,31	25,31	25,31	41,79	43,02	43,02	47,80	47,26	51,17	56,29	65,67	85,29	119,41	304,49	451,35	630,80
NETHERLANDS	2,52	2,50	2,50	2,51	2,51	2,49	4,15	4,34	4,39	5,01	5,58	5,64	6,78	8,53	12,82	18,55	42,33	54,13	71,16
SAUDI ARABIA	2,01	2,01	2,01	2,01	2,01	2,01	3,32	3,41	3,41	3,99	3,94	4,29	4,72	5,55	7,62	10,51	27,11	39,13	54,37
SWITZERLAND	2,10	2,09	2,09	2,09	2,10	2,09	3,46	3,61	3,75	4,36	5,51	5,78	6,80	9,72	15,59	22,37	51,12	74,30	93,63
UNITED KINGDOM	25,22	25,34	25,22	21,75	21,55	21,70	35,73	36,12	33,23	32,87	32,86	30,66	28,37	37,06	51,37	78,62	215,00	254,95	301,51
RUSSIA	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

COUNTRY NAME	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
AUSTRALIA	255,09	368,15	392,78	503,78	737,60	1552,59	1834,06	2265,82	3860	5897	9799	30082	44439	85843	134198	193049	353967	373056	740436
AUSTRIA	14,62	20,17	33,38	55,27	90,75	144,44	195,83	274,43	475	754	1192	3530	5913	9839	16275	26770	575957	617784	1294759
BELGIUM	5,08	7,05	11,45	18,75	30,79	48,60	64,70	94,57	162	258	401	1216	2028	3367	5569	9095	575957	617784	1294759
FRANCE	33,88	46,37	76,29	117,40	191,18	299,53	399,74	571,28	981	1555	2455	7244	12173	20580	34336	55934	575957	617784	1294759
GERMANY	103,83	141,28	234,37	390,45	645,53	1019,40	1362,76	1961,22	3351	5306	8384	25004	41611	69318	114729	187964	575957	617784	1294759
LIBYA	955,24	1502,22	1948,50	2414,32	3772,32	6361,19	7919,53	10857,38	18927	28425	44529	107684	168894	295192	528405	830845	1001969	1246234	2223048
NETHERLANDS	92,28	125,30	208,10	345,71	574,35	907,65	1207,88	1733,77	2970	4721	7457	22319	37179	61812	101926	166489	575957	617784	1294759
SAUDI ARABIA	80,92	124,40	158,26	202,35	272,60	484,60	617,81	782,40	1356	2287	3864	10341	15928	28778	54901	83969	144566	179809	387218
SWITZERLAND	129,75	172,04	277,80	466,76	798,83	1206,68	1496,08	2261,73	3748	5882	9782	29528	51847	80047	141280	228452	338460	411479	864562
UNITED KINGDOM	410,23	514,34	833,27	1117,36	1910,61	3283,95	3714,63	5649,18	9503	12949	21437	60509	92458	183002	340030	523111	875119	1004826	2103268
RUSSIA	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	20637	11606	10909	12856	19384	34497	15228	20052	23913	48113

TABLE 6.5 (2): DEPRECIATION RATES FOR TURKISH LIRA

COUNTRY NAME	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
AUSTRALIA	n.a.	0,40	-0,40	0,63	-0,98	0,72	64,66	1,27	7,05	16,71	-11,83	2,59	-4,94	22,58	30,90	34,52	172,35	41,60	21,51
AUSTRIA	0,00	-0,08	-0,08	0,12	0,00	0,00	65,10	3,48	2,46	16,57	14,57	0,22	21,43	29,25	47,04	50,55	129,56	28,86	33,04
BELGIUM	0,00	-0,02	-0,82	0,86	-1,02	0,95	65,07	5,23	1,57	6,64	13,10	-1,04	20,84	27,45	48,54	43,75	126,90	21,49	14,56
FRANCE	n.a.	0,00	0,00	0,00	0,00	-11,11	65,10	2,93	0,00	8,65	4,74	7,30	-0,72	23,23	46,18	45,57	127,00	16,46	19,45
GERMANY	0,00	-0,71	0,71	-0,54	-0,01	8,39	67,00	5,82	2,09	18,44	10,91	-0,50	22,10	30,94	49,55	47,80	125,39	28,79	32,60
LIBYA	n.a.	0,00	0,00	0,00	0,00	0,00	65,10	2,93	0,00	11,11	-1,13	8,29	10,00	16,67	29,87	40,00	155,01	48,23	39,76
NETHERLANDS	0,00	-0,53	-0,08	0,50	-0,28	-0,50	66,34	4,67	0,98	14,23	11,41	0,96	20,36	25,73	50,38	44,67	128,18	27,87	31,45
SAUDI ARABIA	n.a.	0,00	0,00	0,00	0,00	0,00	65,10	2,80	0,00	16,90	-1,13	8,91	10,00	17,50	37,31	37,92	158,07	44,32	38,95
SWITZERLAND	n.a.	-0,07	-0,21	0,05	0,53	-0,37	65,18	4,52	3,74	16,34	26,27	4,99	17,66	42,89	60,33	43,54	128,47	45,35	26,02
UNITED KINGDOM	n.a.	0,46	-0,45	-13,76	-0,91	0,68	64,62	1,10	-8,01	-1,06	-0,05	-6,69	-7,46	30,62	38,62	53,04	173,47	18,58	18,26
RUSSIA	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

COUNTRY NAME	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
AUSTRALIA	39,29	44,33	6,69	28,26	46,41	110,49	18,13	23,54	70,34	52,80	66,16	206,99	47,73	93,17	56,33	43,85	83,36	5,39	98,48
AUSTRIA	30,65	37,94	65,51	65,57	64,18	59,16	35,58	40,14	73,18	58,72	58,00	196,22	67,48	66,39	65,42	64,48	54,43	7,26	109,58
BELGIUM	27,70	38,71	62,47	63,71	64,21	57,81	33,14	46,17	71,78	58,89	55,27	203,49	66,72	66,06	65,38	63,32	54,43	7,26	109,58
FRANCE	22,00	36,86	64,55	53,87	62,85	56,67	33,46	42,91	71,67	58,60	57,83	195,09	68,05	69,05	66,84	62,90	54,43	7,26	109,58
GERMANY	32,12	36,07	65,90	66,60	65,33	57,92	33,68	43,92	70,86	58,36	57,99	198,25	66,42	66,58	65,51	63,83	54,43	7,26	109,58
LIBYA	51,43	57,26	29,71	23,91	56,25	68,63	24,50	37,10	74,32	50,19	56,65	141,83	56,84	74,78	79,00	57,24	20,60	24,38	78,38
NETHERLANDS	29,69	35,77	66,09	66,12	66,14	58,03	33,08	43,54	71,30	58,96	57,94	199,32	66,58	66,25	64,90	63,34	54,43	7,26	109,58
SAUDI ARABIA	48,83	53,74	27,22	27,86	34,72	77,77	27,49	26,64	73,37	68,59	68,98	167,58	54,03	80,68	90,77	52,95	72,17	24,38	115,35
SWITZERLAND	38,58	32,59	61,47	68,02	71,14	51,06	23,98	51,18	65,70	56,96	66,30	201,86	75,59	54,39	76,50	61,70	48,15	21,57	110,11
UNITED KINGDOM	36,06	25,38	62,01	34,09	70,99	71,88	13,11	52,08	68,22	36,27	65,54	182,27	52,80	97,93	85,81	53,84	67,29	14,82	109,32
RUSSIA	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-43,76	-6,01	17,85	50,78	77,97	-55,86	31,68	19,25	101,20

1. For the countries of Euro Area the depreciation is calculated using Euro rates for 1999-2001.

TABLE 6.6: CORRELATION MATRIX OF VARIABLES USED IN MODELS

	DLOGWORKER	DLOGYHOST	DLOGYDOM	DBMP	DROV	DINTDIF	DINFLATION	GROWTH	EXGOVDUM
DLOGWORKER	1	-0,035	0,106	-0,107	-0,414	0,402	-0,343	0,296	0,561
DLOGYHOST	-0,035	1	0,321	0,145	0,301	-0,396	0,343	0,413	-0,108
DLOGYDOM	0,106	0,321	1	0,251	0,242	-0,086	-0,295	0,934	-0,015
DBMP	-0,107	0,145	0,251	1	0,666	0,024	-0,502	0,069	-0,459
DROV	-0,414	0,301	0,242	0,666	1	-0,344	-0,105	0,076	-0,749
DINTDIF	0,402	-0,396	-0,086	0,024	-0,344	1	-0,297	0,007	0,488
DINFLATION	-0,343	0,343	-0,295	-0,502	-0,105	-0,297	1	-0,202	-0,136
GROWTH	0,296	0,413	0,934	0,069	0,076	0,007	-0,202	1	0,215
EXGOVDUM	0,561	-0,108	-0,015	-0,459	-0,749	0,488	-0,136	0,215	1

TABLE 6.7: AUGMENTED DICKEY-FULLER TEST RESULTS FOR VARIABLES

	VARIABLE	ADF	CRITICAL VALUES		
		TEST STATISTICS	1%	5%	10%
1	BMP	-2,1722	-3,6661	-2,9627	-2,6200
2	DBMP	-4,0160	-3,6852	-2,9705	-2,6242
3	LOGYHOST	-1,6111	-3,6228	-2,9446	-2,6105
4	DLOGYHOST	-3,6530	-3,6289	-2,9472	-2,6118
5	LOGYDOM	-2,2027	-3,6228	-2,9446	-2,6105
6	DLOGYDOM	-3,4574	-3,6289	-2,9472	-2,6118
7	LOGWORKER	-2,2503	-3,6228	-2,9446	-2,6105
8	DLOGWORKER	-4,2067	-3,6289	-2,9472	-2,6118
9	LOGREM	-2,2510	-3,6228	-2,9446	-2,6105
10	DLOGREM	-4,1731	-3,6289	-2,9472	-2,6118
11	LOGREMPW	-1,9645	-3,6228	-2,9446	-2,6105
12	DLOGREMPW	-4,3490	-3,6289	-2,9472	-2,6118
13	INTDIF	0,0146	-3,7667	-3,0038	-2,6417
14	DINTDIF	-3,4238	-3,7856	-3,0114	-2,6457
15	GROWTH	-3,3915	-3,6228	-2,9446	-2,6105
16	INFLATION	-1,8100	-3,6228	-2,9446	-2,6105
17	DINFLATION	-5,3237	-3,6289	-2,9472	-2,6118
18	ROV	-1,6740	-3,6353	-2,9499	-2,6133
19	DROV	-3,4000	-3,6422	-2,9527	-2,6148
20	EXGOVDUM	-3,0114	-3,6228	-2,9446	-2,6105

TABLE 7.1. Modelling DLOGREM by OLS

1) Modelling DLOGREM by OLS, 1979-1993 period

	CONSTANT	DLOGWORKER	DLOGYHOST	DLOGYDOM	DBMP	DROV	DINTDIF	DINFLATION	GROWTH	EXGOVDUM	R ²	S.E.
EQ(1)	-0,153	0,667	*1,597	-8,822	** -0,012	0,002	1,282	* -0,004	0,075	-0,226	0,706	0,097
EQ(2)	0,026	0,727	*1,515	n.i.	** -0,013	0,003	1,151	* -0,004	-0,008	* -0,189	0,685	0,092
EQ(3)	-0,163	1,510	0,730	-7,893	-0,007	0,004	0,990	n.i.	0,073	-0,135	0,457	0,121
EQ(4)	0,011	0,709	*1,522	-0,860	** -0,012	0,003	1,159	* -0,004	n.i.	* -0,193	0,689	0,091
EQ(5)	-0,149	n.i.	*1,602	-9,609	** -0,012	0,002	*1,308	** -0,004	0,081	* -0,234	0,685	0,092
EQ(6)	-0,188	0,485	*1,665	-10,961	** -0,011	n.i.	*1,299	** -0,004	0,095	** -0,267	0,689	0,091
EQ(7)	-0,176	n.i.	**1,652	-11,022	** -0,011	n.i.	*1,316	-0,004	0,094	-0,262	0,676	0,086
EQ(8)	0,002	n.i.	**1,592	n.i.	** -0,012	n.i.	**1,299	** -0,004	n.i.	** -0,210	0,569	0,088

2) Modelling DLOGREM by OLS, 1965-1993 period

EQ(9)	-0,339	**1,871	0,244	* -17,069	-0,003	0,005	n.i.	0,000	0,156	-0,036	0,713	0,124
EQ(10)	** -0,763	n.i.	0,820	** -39,268	-0,005	0,003	n.i.	-0,001	**0,365	-0,076	0,443	0,168
EQ(11)	0,020	**2,249	0,180	n.i.	-0,003	*0,006	n.i.	0,000	-0,006	-0,008	0,671	0,129

3) Modelling DLOGREM by OLS, 1979-1999 period

EQ(12)	0,114	1,021	0,080	4,369	n.i.	0,001	0,000	-0,041	-0,052	0,216	0,159	0,115
EQ(13)	0,093	n.i.	0,140	3,033	n.i.	0,000	0,200	0,000	-0,028	-0,038	0,096	0,115
EQ(14)	0,023	0,980	0,085	n.i.	n.i.	0,001	0,304	0,000	0,002	-0,069	0,151	0,111
EQ(15)	0,026	0,982	0,085	0,183	n.i.	0,001	0,301	0,000	n.i.	-0,069	0,152	0,111

1. (**) Indicate significance at 5% level
2. (*) Indicate significance at 10% level
3. (n.i) indicate that variable is not included in the estimation

TABLE 7.2: Modelling DLOGREMPW by OLS

1) Modelling DLOGREMPW by OLS, 1979-1993 period

	CONSTANT	DLOGYHOST	DLOGYDOM	DBMP	DROV	DINTDIF	DINFLATION	GROWTH	EXGOVDUM	R ²	S.E.
EQ(1)	-0,155	*1,594	-8,428	** -0,012	0,003	*1,268	*-0,004	0,072	*-0,223	0,705	0,090
EQ(2)	0,018	*1,516	n.i.	** -0,012	0,003	*1,145	** -0,004	-0,007	*-0,187	0,686	0,086
EQ(3)	-0,160	0,652	-8,501	-0,006	0,003	0,986	n.i.	0,078	-0,132	0,450	0,113
EQ(4)	0,003	*1,522	-0,781	** -0,012	0,003	*1,152	** -0,004	n.i.	*-0,191	0,689	0,085
EQ(5)	-0,201	**1,680	-10,895	** -0,011	n.i.	*1,282	** -0,004	0,096	** -0,272	0,679	0,086
EQ(6)	-0,013	**1,615	n.i.	** -0,012	n.i.	*1,226	** -0,003	n.i.	** -0,225	0,607	0,084

2) Modelling DLOGREMPW by OLS, 1979-1999 period

EQ(7)	0,114	0,082	4,341	n.i.	0,001	0,216	0,000	-0,040	-0,051	0,187	0,111
EQ(8)	0,023	0,084	n.i.	n.i.	0,001	0,305	0,000	0,002	-0,069	0,179	0,107

3) Modelling DLOGREMPW by OLS, 1965-1993 period

EQ(9)	** -0,537	0,512	** -27,402	-0,004	0,004	n.i.	-0,001	**0,254	-0,055	0,409	0,133
EQ(10)	0,060	0,627	n.i.	*-0,005	0,005	n.i.	-0,001	-0,007	-0,012	0,159	0,155
EQ(11)	0,050	0,651	-0,934	*-0,005	0,005	n.i.	-0,001	n.i.	-0,015	0,173	0,153

1. (**) Indicate significance at 5% level
2. (*) Indicate significance at 10% level
3. (n.i) indicate that variable is not included in the equation

TABLE 7.3: DESCRIPTIVE STATISTICS AND DIAGNOSTIC TESTS FOR EQUATIONS WITH DLOGREM

EQ1							
RSS	0.04716	sigma	0,09712	R ²	0,70633	Radj ²	0,17772
LogLik	43.21710	AIC	-4,42895	HQ	-4,43397	SC	-3,95691
T	15	p	10	FpNull	0,38617	FpConst	0,39265

	value	prob
Chow(1992:1)	0,1361	0,7309
normality test	1,7234	0,4225
AR 1-4 test	0,3198	0,8483

EQ2							
RSS	0.05062	sigma	0,09185	R ²	0,68477	Radj ²	0,26447
LogLik	42.68585	AIC	-4,49145	HQ	-4,49597	SC	-4,06662
T	15	p	9	FpNull	0,28049	FpConst	0,28438

	value	prob
Chow(1992:1)	0,0089	0,9286
normality test	3,6281	0,163
AR 1-4 test	0,1327	0,956

EQ3							
RSS	0.08724	sigma	0,12058	R ²	0,45673	Radj ²	-0,26762
LogLik	38.60358	AIC	-3,94714	HQ	-3,95167	SC	-3,52231
T	15	p	9	FpNull	0,71456	FpConst	0,73349

	value	prob
Chow(1992:1)	0,0433	0,8434
normality test	0,2112	0,8998
AR 1-4 test	0,2389	0,8955

EQ4							
RSS	0.04999	sigma	0,09128	R ²	0,68869	Radj ²	0,27361
LogLik	42.77969	AIC	-4,50396	HQ	-4,50848	SC	-4,07913
T	15	p	9	FpNull	0,27322	FpConst	0,27691

	value	prob
Chow(1992:1)	0,0025	0,9623
normality test	3,3547	0,1869
AR 1-4 test	0,1312	0,9568

EQ5							
RSS	0.05060	sigma	0,09183	R ²	0,68491	Radj ²	0,26479
LogLik	42.68912	AIC	-4,49188	HQ	-4,49641	SC	-4,06705
T	15	p	9	FpNull	0,28023	FpConst	0,28412

	value	prob
Chow(1992:1)	0,0619	0,8135
normality test	2,4055	0,3004
AR 1-4 test	0,2773	0,8727

EQ6							
RSS	0.04998	sigma	0,09127	R ²	0,68878	Radj ²	0,27382
LogLik	42.78182	AIC	-4,50424	HQ	-4,50877	SC	-4,07941
T	15	p	9	FpNull	0,27306	FpConst	0,27674

	value	prob
Chow(1992:1)	0,2198	0,6589
normality test	3,7812	0,151
AR 1-4 test	0,1157	0,9647

EQ7							
RSS	0.05198	sigma	0,08617	R ²	0,6763	Radj ²	0,3526
LogLik	42.48697	AIC	-4,59826	HQ	-4,60228	SC	-4,22064
T	15	p	8	FpNull	0,17537	FpConst	0,176

	value	prob
Chow(1992:1)	0,1191	0,7418
normality test	3,7241	0,1554
AR 1-4 test	0,2939	0,8662

EQ8							
RSS	0.06922	sigma	0,0877	R ²	0,56892	Radj ²	0,32943
LogLik	40.33842	AIC	-4,57846	HQ	-4,58147	SC	-4,29524
T	15	p	6	FpNull	0,12567	FpConst	0,12264

	value	prob
Chow(1986:1)	1,1097	0,5515
Chow(1992:1)	0,3564	0,567
normality test	10,3934	0,0055
AR 1-4 test	0,3578	0,8295
ARCH 1-4 test	0,0912	0,9704

EQ9							
RSS	0.30630	sigma	0,12375	R ²	0,71291	Radj ²	0,59807
LogLik	65.98185	AIC	-3,92978	HQ	-3,79689	SC	-3,50545
T	29	p	9	FpNull	0,00014	FpConst	0,00044

	value	prob
Chow(1979:1)	0,6392	0,7708
Chow(1991:1)	0,5838	0,568
normality test	4,125	0,1271
AR 1-4 test	2,5941	0,076
ARCH 1-4 test	0,3617	0,8312
hetero test	20,1256	0,1672

EQ10							
RSS	0.59473	sigma	0,16829	R ²	0,44257	Radj ²	0,25676
LogLik	56.36071	AIC	-3,33522	HQ	-3,21709	SC	-2,95804
T	29	p	8	FpNull	0,01943	FpConst	0,05844

	value	prob
Chow(1979:1)	0,9082	0,5862
Chow(1991:1)	1,1236	0,3458
normality test	3,7463	0,1536
AR 1-4 test	1,0911	0,3923
ARCH 1-4 test	0,563	0,6938
hetero test	1,5796	0,2784

EQ11							
RSS	0.35110	sigma	0,1293	R ²	0,67092	Radj ²	0,56123
LogLik	64.00281	AIC	-3,86226	HQ	-3,74413	SC	-3,48508
T	29	p	8	FpNull	0,00017	FpConst	0,00055

	value	prob
Chow(1979:1)	0,4675	0,893
Chow(1991:1)	0,0277	0,9727
normality test	10,6084	0,005
AR 1-4 test	2,0851	0,1276
ARCH 1-4 test	1,0844	0,4041
hetero test	2,2739	0,1399

EQ12							
RSS	0.15959	sigma	0,11532	R ²	0,15932	Radj ²	-0,40114
LogLik	51.23677	AIC	-4,02255	HQ	-3,9254	SC	-3,5749
T	21	p	9	FpNull	0,89548	FpConst	0,95857

	value	prob
Chow(1989:1)	0,6934	0,7183
Chow(1997:1)	0,7597	0,493
normality test	1,6479	0,4387
AR 1-4 test	0,5762	0,6882
ARCH 1-4 test	0,1573	0,9496

EQ13							
RSS	0.17159	sigma	0,11489	R ²	0,09608	Radj ²	-0,39064
LogLik	50.47529	AIC	-4,04527	HQ	-3,95891	SC	-3,64735
T	21	p	8	FpNull	0,91778	FpConst	0,98048

	value	prob
Chow(1989:1)	0,4271	0,8652
Chow(1997:1)	1,1455	0,3533
normality test	1,9091	0,385
AR 1-4 test	0,9799	0,4649
ARCH 1-4 test	0,0118	0,9996

EQ14							
RSS	0.16116	sigma	0,11134	R ²	0,15102	Radj ²	-0,30612
LogLik	51.13368	AIC	-4,10797	HQ	-4,02161	SC	-3,71006
T	21	p	8	FpNull	0,83533	FpConst	0,92618

	value	prob
Chow(1989:1)	0,3007	0,9351
Chow(1997:1)	0,8592	0,4501
normality test	1,9868	0,3703
AR 1-4 test	0,7329	0,592
ARCH 1-4 test	0,1517	0,9542

EQ15							
RSS	0.16104	sigma	0,1113	R ²	0,15168	Radj ²	-0,3051
LogLik	51.14184	AIC	-4,10875	HQ	-4,02239	SC	-3,71083
T	21	p	8	FpNull	0,83417	FpConst	0,92528

	value	prob
Chow(1989:1)	0,2955	0,9377
Chow(1997:1)	0,8628	0,4487
normality test	2,0162	0,3649
AR 1-4 test	0,7224	0,5981
ARCH 1-4 test	0,1475	0,9563

TABLE 7.4: DESCRIPTIVE STATISTICS AND DIAGNOSTIC TESTS FOR EQUATIONS WITH DLOGREMPW

EQ1							
RSS	0.04802	sigma	0,08946	R ²	0,70525	Radj ²	0,31224
LogLik	43.08154	AIC	-4,54421	HQ	-4,54873	SC	-4,11938
T	15	p	9	FpNull	0,28421	FpConst	0,24603

	value	prob
Chow(1992:1)	0,2209	0,6581
normality test	1,0386	0,5949
AR 1-4 test	0,0585	0,989

EQ2							
RSS	0.05120	sigma	0,08553	R ²	0,6857	Radj ²	0,37139
LogLik	42.59988	AIC	-4,61332	HQ	-4,61734	SC	-4,23569
T	15	p	8	FpNull	0,19676	FpConst	0,16253

	value	prob
Chow(1992:1)	0,0016	0,9698
normality test	2,3944	0,302
AR 1-4 test	0,0972	0,9763

EQ3							
RSS	0.08957	sigma	0,11312	R ²	0,45019	Radj ²	-0,09962
LogLik	38.40577	AIC	-4,0541	HQ	-4,05812	SC	-3,67648
T	15	p	8	FpNull	0,66036	FpConst	0,60064

	value	prob
Chow(1992:1)	0,0122	0,9158
normality test	0,2792	0,8697
AR 1-4 test	0,4932	0,7474

EQ4							
RSS	0.05065	sigma	0,08506	R ²	0,68909	Radj ²	0,37817
LogLik	42.68121	AIC	-4,62416	HQ	-4,62818	SC	-4,24653
T	15	p	8	FpNull	0,1913	FpConst	0,1578

	value	prob
Chow(1992:1)	0,0001	0,9934
normality test	2,1922	0,3342
AR 1-4 test	0,0951	0,9771

EQ5							
RSS	0.05223	sigma	0,08638	R ²	0,6794	Radj ²	0,35879
LogLik	42.45103	AIC	-4,59347	HQ	-4,59749	SC	-4,21584
T	15	p	8	FpNull	0,2071	FpConst	0,17151

	value	prob
Chow(1992:1)	0,4003	0,5502
normality test	3,1442	0,2076
AR 1-4 test	0,1013	0,9745

EQ6							
RSS	0.06396	sigma	0,0843	R ²	0,60741	Radj ²	0,38931
LogLik	40.93187	AIC	-4,65758	HQ	-4,6606	SC	-4,37436
T	15	p	6	FpNull	0,11696	FpConst	0,08638

	value	prob
Chow(1986:1)	0,3535	0,8742
Chow(1992:1)	0,0916	0,7699
normality test	8,0004	0,0183
AR 1-4 test	0,0512	0,9935
ARCH 1-4 test	0,0121	0,9992

EQ7							
RSS	0.15959	sigma	0,1108	R ²	0,18741	Radj ²	-0,25014
LogLik	51.23644	AIC	-4,11776	HQ	-4,0314	SC	-3,71984
T	21	p	8	FpNull	0,86019	FpConst	0,86763

	value	prob
Chow(1989:1)	0,5895	0,7696
Chow(1997:1)	0,7702	0,4863
normality test	1,7005	0,4273
AR 1-4 test	0,6008	0,6717
ARCH 1-4 test	0,1872	0,9352

EQ8							
RSS	0.16117	sigma	0,10729	R ²	0,1794	Radj ²	-0,17229
LogLik	51.13337	AIC	-4,20318	HQ	-4,12762	SC	-3,855
T	21	p	7	FpNull	0,78606	FpConst	0,79104

	value	prob
Chow(1989:1)	0,3964	0,8927
Chow(1997:1)	0,8801	0,4399
normality test	1,9443	0,3783
AR 1-4 test	0,7409	0,5854
ARCH 1-4 test	0,1912	0,9344
hetero test	17,0056	0,1077

EQ9							
RSS	0.36880	sigma	0,13252	R ²	0,40937	Radj ²	0,21249
LogLik	63.28972	AIC	-3,81308	HQ	-3,69495	SC	-3,4359
T	29	p	8	FpNull	0,06548	FpConst	0,09188

	value	prob
Chow(1979:1)	0,8663	0,6137
Chow(1991:1)	0,9939	0,3886
normality test	2,3001	0,3166
AR 1-4 test	1,9092	0,1552
ARCH 1-4 test	1,0109	0,4372
hetero test	22,5938	0,0468

EQ10							
RSS	0.52537	sigma	0,15453	R ²	0,15861	Radj ²	-0,07086
LogLik	58.15868	AIC	-3,52819	HQ	-3,42482	SC	-3,19815
T	29	p	7	FpNull	0,48789	FpConst	0,65907

	value	prob
Chow(1979:1)	0,2754	0,983
Chow(1991:1)	0,0345	0,9661
normality test	20,5136	0
AR 1-4 test	0,6266	0,6496
ARCH 1-4 test	0,3159	0,8626
hetero test	3,4472	0,9834

EQ11							
RSS	0.51624	sigma	0,15318	R ²	0,17324	Radj ²	-0,05224
LogLik	58.41300	AIC	-3,54572	HQ	-3,44236	SC	-3,21569
T	29	p	7	FpNull	0,44149	FpConst	0,6028

	value	prob
Chow(1979:1)	0,3137	0,972
Chow(1991:1)	0,0158	0,9844
normality test	19,0952	0,0001
AR 1-4 test	0,7092	0,5961
ARCH 1-4 test	0,2678	0,8938
hetero test	3,6457	0,9792