THE EFFECT OF REAL EXCHANGE RATE
ON UNEMPLOYMENT IN TURKEY

A Master's Thesis

by
NİLAY KILIÇASLAN

Department of Economics
Bilkent University
Ankara
July 2007

To My Family and Prof. Erinç Yeldan

THE EFFECT OF REAL EXCHANGE RATE
ON UNEMPLOYMENT IN TURKEY

The Institute of Economics and Social Sciences
of
Bilkent University

by

NİLAY KILIÇASLAN

In Partial Fulfilment of the Requirements for the Degree of
MASTER OF ARTS

in

THE DEPARTMENT OFECONOMİCS
BİLKENT UNIVERSITY
ANKARA

July 2007

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Arts in Economics.

Assc. Prof. Kıvılcım Metin Özcan
Supervisor

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Arts in Economics.

Assc. Prof. Syed F. Mahmud
Examining Committee Member

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Arts in Economics.

Asst. Prof. Nazmi Demir
Examining Committee Member

Approval of the Institute of Economics and Social Sciences

Prof. Erdal Erel
Director

ABSTRACT

THE EFFECT OF REAL EXCHANGE RATE

ON UNEMPLOYMENT IN TURKEY

Kılıçaslan, Nilay

Master of Economics

Supervisor: Assc. Prof. Kıvılcım Metin Özcan

July 2007

This thesis is intended to analyze the influence of real exchange rate on total and urban unemployment in Turkish economy over 1988 – 2006 periods by using the original work of Frenkel (2004) for Turkey. In addition to this analysis, an alternative model is suggested to overcome some limitations of Frenkel (2004). In this thesis, three channels of influence, namely macroeconomic channel, development channel and labor intensity channel, are taken into account in the search of unemployment's response to changes in real exchange rate. The results for both analysis show that real exchange rate influences unemployment positively through labor intensity channel for both total and urban unemployment in Turkey. Moreover, suggested alternative model achieves to

quantify the seperate effects of the influence channels which was not achieved in Frenkel (2004) due to the limitations of the model.

ÖZET

TÜRKİYE'DE REEL DÖVİZ KURUNUN

İŞSİZLİK ÜZERİNE ETKİLERİ

Kılıçaslan, Nilay

Yüksek Lisans, İktisat Bölümü

Tez Yöneticisi: Doç. Dr. Kıvılcım Metin Özcan

Temmuz 2007

Bu çalışma Türkiye'de döviz kurunun 1988 – 2006 yılları arasında toplam ve kentsel işsizliği ne yönde etkilediğini incelemiştir. Çalışmada Frenkel (2004) tarafından geliştirilen üç etki kanalı olan makro iktisadi kanal, kalkınma kanalı ve emek yoğunluğu kanalı göz önünde bulundurulmuştur. Frenkel (2004)'te sunulan modelin etki kanallarını açıklamadaki kısıtlılığından dolayı, alternatif bir mıodel önerilmiştir. Her iki model için de çalışmanın bulguları reel döviz kurunun işsizliği pozitif yönde etkilediği sonuçunu çıkarmıştır. Alternatif modelin ek olarak katkısı bahsi geçen üç etki kanalının sonuçlarını ayrı ayrı ölçmeyi başarmış olmasıdır.

Anahtar Kelimeler: Reel Döviz Kuru, İşsizlik, Etki Kanalları

ACKNOWLEDGEMENTS

I would like to thank to Prof. Kıvılcım Metin Özcan for her supervision, guidance and motivation through the development of this thesis.

I am indebted to Prof. Erinç Yeldan who has a great influence on my decision of my career path, who endeared me my profession so much.

I would like to thank to Prof.Syed Mahmud, Prof. Serdar Sayan and Prof. Tarık Kara for their support and motivation.

I owe special thanks to my beloved fiancé, my future husband, who carried me this way and supported me in every stage of this process.

Finally, I especially would like to express my deepest gratitude to my mother, my father and my grandmother who brought me up to the person I am today.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Turkey entered a period of financial reform in 1980 with the 24 January Stabilization Package, designed to deal with the balance of payment problems in the economy created in the 1970s and the disequilibrium in the markets. From the 1980s onwards, unemployment remained one of the most important and chronic problems in Turkish economy, stabilizing at around 8-9 percent. After the 1994 crisis, the unemployment rate decreased from 8-9 percent to 6.5 percent in 2000. The 2000 crisis caused a jump in the unemployment rate from 6.5 percent in 2000 to 8.4 percent in 2001. Considered the worst crisis in the Turkish Republic's history, the 2001 crisis raised the unemployment rate to 10.3 percent. According to growth rates, in the post 2001 period the economy performed well. In the period 2002 to 2006 the growth rate of the Turkish economy ranged from 5.8 to 9 percent. However, this performance is not reflected in the unemployment rates, which are nearly constant during the same period. Pamukçu and Yeldan (2005) evaluated the slow performance of unemployment in the post 2001 crisis era. They argue that this picture of the economy is an example of what may be called "jobless growth" which they claim to be a key characteristic of the post- 2001

growth in Turkey. Apart from the fact that unemployment decreases national income and creates inequalities in income distribution in society, more and more people suffer a loss of skills and capacities when they are unemployed for a long time. In this sense, examination of the sources of unemployment is gaining importance in the literature. A large number of studies have focused on the effect of the real exchange rate on the growth rate of economy or inflation; however, the labor market has received less attention in terms of the real exchange rate in the Turkish economy.

The aim of this study is to analyze the effects of the real exchange rate on total unemployment and urban unemployment in Turkey over the 1988-2006 periods. We used Frenkel's (2004) three methodological classifications given in his article for the Turkish economy. The influence of the real exchange rate on employment (unemployment in our case) is based on three different channels, namely the macroeconomic channel, development channel and labor intensity channel. Due to the insufficiency of Frenkel's (2004) to distinguish the separate effect of these three channels, we additionally suggested an alternative model. Therefore, this study considers these three channels in the determination of the response of unemployment in Turkish to changes in the real exchange rate.

The rest of this study is organized as follows. In chapter 2, a literature survey on the effects of the real exchange rate on the labor force is presented. In chapter 3, the channels of influence of the real exchange rate on unemployment are summarized. In chapter 4, some stylized facts and a short history of the Turkish economy are given. Chapter 5 presents the empirical modeling, i.e., the

background of the data, estimation and the results. Finally, in chapter 6, the conclusion of this study is provided

.

CHAPTER 2

LITERATURE SURVEY ON THE EFFECTS OF EXCHANGE RATES ON THE LABOR MARKET

In this section, we discuss the effects of the exchange rate on the labor market. Earlier research dealing with the relationship between the exchange rate and employment was published by Branson and Love (1988) and Revenga (1992). Branson and Love (1988) analyzed the influence of the real exchange rate on manufacturing employment over the period 1970-1986 in the U.S. and Japan. They conclude that both appreciation and depreciations in the exchange rate significantly affect employment and output in these countries, in the durable goods sector. Revenga (1992) studies the effect of competitiveness on U.S. manufacturing employment over the period 1977-1981. Her results indicate that over-appreciation of the exchange rate between 1980 and 1985 led to a decreased in employment, especially in industries in the more competitive import sectors.[1]

Burgess and Knetter (1998) analyze the reaction of manufacturing industry employment to changes in the real exchange rate at industry level across G-7

---

[1] See Galindo, Izquierdo, Montero (2006) and Filiztekin (2004)

4

countries[2]. According to them, there are two important trends that marked the developments in the labor markets of industrialized countries in the 1980s and early 1990s: the share of jobs in the manufacturing sector decreased and wage inequalities among workers with different skills increased. They set out two main reasons explaining those trends: technological change biased towards skills and increasing integration in the manufactured goods market. However, there is no consensus on the relative contributions of technology and trade to the labor market in the industrialized economies. Their most favorable finding is that an appreciation in the real exchange rate decreases employment because it reduces aggregate demand, and hence domestic output, by decreasing the relative prices of foreign goods. However, Burgess and Knetter (1998) go further to examine the effects of the real exchange rate on manufacturing industry employment. Their argument is that both the market structure and the regulation of international trade and the labor market determine the real exchange rate elasticity of employment and the speed of adjustments to exchange rate shocks. The more market power an industry has, the more insulated the real exchange rate on employment in that industry will be. This could be due to product differentiation since domestic goods may not have foreign substitutes. Similarly, tighter regulations on trade and the labor market would provide more protection for the industry against exchange rate shocks. In addition to the effect of the real exchange rate on employment, Burgess and Knetter (1998) further show that U.K. employment is more sensitive to exchange rate shocks than U.S. employment, which is much more sensitive than German or Japanese industry employment in country comparisons. This is explained by the trade regulatory policies of the countries.

---

[2] U.S., U.K., Germany, Japan, Italy, France, and Canada

Gourinchas (1998) studied the effect of exchange rates on employment using a VAR model in which the endogeneity of exchange rates is considered. However, that study did not include the trade structures as a channel.

Campa and Goldberg (2001) considered openness[3] and imported intermediate goods to analyze the relationship between the real exchange rate and employment, wages and overtime activity in the U.S. manufacturing industry over the period 1972-1995. Their results indicate a significant effect of the exchange rate on the number of jobs and employment although it is very weak. They also present two important characteristics of industry that are connected to the relative importance of exchange rates: the response of low-markup industries is more significant than that of high-markup industries and industries where there are more high skilled workers have a lower exchange rate elasticity of employment. They claim that the effect of the exchange rate depends on industry structure because a sector with a weak ability to react to exchange rate changes is affected more.[4] In addition, export orientation[5] increases the sensitivity of labor demand and more intensive use of imported inputs has an ambiguous response depending on the structure of production activity. In addition, they show that trade structure is also a very important factor in the determination of the effect of the real exchange rate on employment. Their model also takes into consideration three channels through which the real exchange rate affects employment: export

---

[3] By openness, we mean the sum of the export orientation ratio and import penetration ratio.
[4] Industry response to the exchange rate across international markets are more sensitive in low price-over-cost markup industries. Campa and Golberg (1995) verify investment responses across countries.
[5] Export orientation in our terminology is the proportion of gross output that is exported.

orientation, import penetration[6] and imported inputs. Due to the high correlation between imported inputs and import penetration, their estimation contains only export orientation and imported inputs. Their study did not take the endogeneity of exchange rates into account. They argue that changes in exchange rates influence overtime work hours instead of employment or job creation in high-markup industries and industries with higher proportion of skilled workers in their labor force.

Faria and Leon-Ledesma (2004) scrutinized the long-run impact of real wages, real interest rates and real exchange rate on employment in the U.K. and U.S. using Turnovsky's (1995) open economy version of the standard intertemporal labor supply model. The main idea is that workers adjust their labor supply comparing actual and expected future real wages. They claim that a depreciation in the real exchange rate increases the present value of financial wealth that is accumulated in foreign bonds. This means a positive income effect which creates an ambiguous effect on employment because the workers either decrease labor supply since they can keep the same level of utility by working fewer hours or increase labor supply to take advantage of the higher income to increase future consumption. They prove that the real exchange rate has a negative and significant effect on employment, which means that an appreciation in the real exchange rate decreases the employment rate in the U.S.

---

[6] What we mean by import penetration is the relative share of imports in the supply of goods available for domestic consumption. Import penetration expresses imports as a percentage of domestic supply, which is shipments minus exports plus imports.

Kim and Kinal (2004) analyzed the relationship between the real exchange rate and employment using a panel of 28 industries in Korea, Malaysia and the Philippines from 1970 to the 1990s. They employed a panel VAR based on the model described by Campa and Goldberg (2001), in which the adjustment costs are involved in changing the level of domestic labor. They also scrutinized three channels: export orientation, imports penetration and imported inputs taking the endogeneity of exchange rates into consideration. Their results shows that Korean and Malaysian employment responded positively to real exchange rate shocks and in the Philippines employment responded positively only after 1985. The main conclusion of their paper is that exchange rates are very important in explaining the change in employment, especially in the long run for those three countries.

Filiztekin (2004) analyzed the effect of the exchange rate on manufacturing employment in Turkey over the period 1981-1999 and the channels through which the exchange rate affects employment. He used a model that decomposes the effect of exchange rates on the labor market into revenue and cost channels similar to the one used by Campa and Goldberg (2001). Similar to Campa and Goldberg (2001), Filiztekin was unable to identify the import penetration channel and imported inputs channel independently because of the high correlation between them. Contrary to previous results, he found that although a depreciation in the domestic currency increases the competitiveness in international markets, the net effect of a devaluation on employment is negative in given periods in the respective country. His point is that a depreciation in the exchange rate increases domestic demand and hence employment assuming that aggregate demand is a function of the export orientation of firms and the import

penetration ratio of the industry in which the firm is. However, his reasoning behind the net result is the high dependency of Turkish manufacturing industries on foreign inputs. Higher dependency on imported inputs causes sensitivity to exchange rate shocks in Turkey. Filiztekin (2004) stated that after 1980 the trade volume of Turkish manufacturing rapidly increased. In addition, exchange rates increased dramatically. Although there was a huge increase in the openness of the manufacturing sector, its import structure did not undergo a significant change: Turkey is highly dependent on foreign inputs since the imported capital and intermediate goods comprise a significant portion of imports.

Hatemi and Manuchehr (2006) investigated the relationship between the real exchange rate and employment at industry level in France in the long-run over the periods 1975-1999. They found that the industry in France is quite sensitive to changes in the real exchange rate according to panel unit roots and panel cointegration analysis. In their paper, they draw on the conjectures by Burgess and Dolado (1989) and Burgess and Knetter (1998). The results reveal that the real exchange rate influenced employment in an expected manner, i.e. a depreciation in real exchange rates increases employment and stimulates manufacturing for all industries in their sample. To examine the response of employment to the real exchange rate they applied the asymptotic theory of panel cointegration. Their study was the first attempt in this field to test the real exchange rate elasticity of employment using panel unit root and panel cointegration techniques.

Galindo, Izquierdo and Montero (2006) analyzed whether the real exchange rate has a significant effect on industrial employment and whether the effect changes with trade openness and liability dollarization. They used a panel of 9 Latin American countries[7] whose liability dollarization data are available. Their results show that real exchange rate depreciation can affect the growth of employment positively especially in industries with a higher export orientation; however, the situation is reversed if liability dollarization increases in the economy, and the effect may even be negative. Their study is based on the theoretical model derived by Campa and Goldberg (2001) where Galindo, Izquierdo and Montero (2006) extended the context by including the additional channel of balance sheet effects. They argue that equilibrium employment is affected by a shock, i.e. the effect of the real exchange rate on employment is increasing in export orientation industries and home market import penetration, however, it is unclear in industries, using mostly imported inputs. According to their explanation, in the balance sheet channel, a real exchange rate shock to debt service may result in a collapse in industries with high foreign currency denominated liability, and hence harm their solvency. As a result those industries would decrease employment.

Klein, Scott and Triest (2000) tried to identify labor adjustment costs due to trade by estimating the effects of the real exchange rate on labor reallocation. They used a new model of industry level employment dynamics characterized by job creation and job destruction at firms for U.S. manufacturing industries over the period 1973-1993. According to them, the real exchange rate affects

---

[7] Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, and Uruguay

employment either by altering relative prices of internationally traded goods or by generating a wide range of responses within the industries due to difference in trade patterns across industries. They decompose the real exchange rate into trend and cyclical parts and their results show that the trend of the real exchange rate influences both job creation and job destruction in the same direction by similar magnitudes hence the net effect on employment is zero. Appreciation in the cyclical real exchange rate decreases employment only by increasing job destruction. They underline the fact that the impact of an increase in job destruction on welfare is most probably greater than that of a decrease in job creation.

Finally, in Frenkel (2004) the relationship between the real exchange rate and employment in four Latin American countries, Argentina, Brazil, Chile and Mexico, was analyzed. Frenkel argues that the real exchange rate affects employment via three channels: the macroeconomic channel which means the role of the real exchange rate on the determination of output activity level; the development channel, which is the effect of the real exchange rate on economic growth rate in the long run and the labor intensity channel which is similar to the imported inputs channel in the literature, i.e. the effect of the real exchange rate by changing the proportions of factors in the production of output. A model was estimated relating the unemployment rate with output and the real exchange rate level. The results of the paper do not reject the hypothesis of the influence of the real exchange rate on unemployment and Frenkel argues that for these four Latin American countries in the event of a depreciation in the real exchange rate the net effect of the macroeconomic and development channel is positive, meaning that

11

the real exchange rate increases the level and growth rate of output, and hence unemployment decreases. In addition, via the labor intensity channel, a depreciation means the switching of capital to labor in the production of output.

In the next section, the channels by which the real exchange rate influences unemployment rates are discussed.

CHAPTER 3

THE CHANNELS OF INFLUENCE OF THE REAL

EXCHANGE RATE ON UNEMPLOYMENT

In the previous chapter, we summarized the channels by which the real exchange rate influences employment in the literature as export orientation, import penetration and imported inputs. However, in our search for an alternative way of linking the real exchange rate with unemployment, we follow the systematic classification given by Frenkel (2004) which separates real exchange rate influence mechanisms on unemployment into three channels; the macroeconomic channel, the development channel and the labor intensity channel. The macroeconomic channel is the short run influence of the real exchange rate on unemployment through the determination of output level. The development channel is the effect of the real exchange rate on the growth rate of output in the long run which also engenders the creation of new work areas. The labor intensity channel focuses on the influence of the real exchange rate on the intensity of labor in the production process of given level of output by affecting the relative use of capital and labor through their production costs. To the best of our knowledge, although there have been some previous studies involving empirical examination

of macroeconomic and development channels, these channels have never been investigated empirically in the context of the Turkish economy.

3.1 The Macroeconomic Channel

Before the Great Depression, economic theory assumed that the market mechanism worked perfectly and it kept the market in a continuous equilibrium. Hence, it assumed a-priori full employment. However, the macroeconomic theory, which was born out of the insufficiency of the ongoing theory's explanationof the Great Depression and its consequences, recognized the relationship between the real exchange rate and employment. Keynesian thought asserted that the free market mechanism cannot achieve full employment and equilibrium unless it is by coincidence. Therefore, Keynesians claimed that undesirable unemployment always exists. Referring to this system, a ceteris paribus depreciation in the real exchange rate increases the competitiveness of the country in the international market, because the comparative price of a good in the domestic market is cheaper than it is in the international market. Therefore, foreigners demand domestic goods more and the country's citizens demand foreign goods less. This means that exports increase and imports decrease, and thus aggregate demand increases in the country. Higher aggregate demand creates excess demand in the market, which causes firms to run out of stock. To increase profits, firms expand their production. More production requires more labor. Consequently, unemployment decreases. Similarly, in the case of an appreciation, exports decrease and imports increase, which decreases output and hence employment.

Frenkel (2004) claims that the macroeconomic channel involve a ceteris paribus change in the real exchange rate in a comparative static analysis. Although this effect generally can be found, in a developing country, with many political, sociological and economic problems, like in the case of Turkey, a change in the real exchange rate may have many complicated and confusing results. The final outcome will be determined by the real and the financial structure of Turkey and the particular conjuncture of the economy during that period of interest when the change in the real exchange rate occurred or was implemented. Nevertheless, for the major expected effects to take place other simultaneous counter effects should not be predominant.

Frenkel (2004) argues that idle capacity is taken as given in the first analyses of devaluation. However, when devaluation was included in IMF programs the focus turned to the balance of payment. A balance of payments deficit was attributed to excess demand, which means that full employment was achieved. This is certainly not true for Turkey given the fact that, one of the serious problems of the Turkish economy is unemployment. Indeed, during the period 1980-2006, the unemployment rate ranged from 6.5 to 10.3 percent, which implies that the amount of idle capacity in Turkey is quite high.

The macroeconomic mechanism concerning the contractive effects of devaluation is recognized by Diaz (1963) and Krugman and Taylor (1979): Firstly, since exports increase and imports decrease in response to a devaluation, net exports will increase as well. All other things constant, this raises price

through the increase in aggregate demand and hence engenders a fall in the value of real balances, which will again decrease equilibrium output. Secondly, income will be redistributed towards higher saving propensity sectors, which will decrease investment and consumption and hence aggregate demand. In addition, it may create a negative welfare effect on debtors in international currency greater than the positive effect on international currency asset holders. However, as Frenkel (2004) denotes, the potential contractive effects of devaluation do not contradict the negative relation between the real exchange rate and unemployment. As one can observe, there are two effects beyond devaluation: contractive effects and expenditure-switching effects. Both effects overlap with each other. In addition, the duration of the two effects differ too. Various influences of contractions, like those on investment in Turkey, may last longer.

3.2   The Development Channel

As mentioned in the section of stylized facts, one of the important facts about unemployment in Turkey is that the creation of new jobs is more crucial than the destruction of jobs. Frenkel (2004) and Frenkel and Rapetti (2007) define the development channel as "the influence of real exchange rate on economic growth and consequently on the speed of new jobs creation".

To give a detailed explanation for this channel, we will follow the methodology set out by Frenkel (2004), which takes Woo (2004), who scrutinized industrial policies, as a reference. Woo (2004) analyzed "import substitution

industrialization" and "export promotion industrialization" strategies and free trade. Woo denotes the relative price of exports and imports as follows:

$$EQ\text{ - }1: \qquad \frac{P_M}{P_E} = \frac{P_M^{\,W}}{P_E^{\,W}} \frac{(1+t)}{(1+s)}$$

where P_M is the home country price of imports, P_E is the home country price of exports, $P_M^{\,W}$ is the world price of imports, $P_E^{\,W}$ is the world price of exports, t is the effective tariff rate and s is the effective subsidy rate.

Before we examine Woo's analysis, it is important to define import substitution industrialization and export promotion industrialization strategies. Import substitution is substituting the imported goods with goods produced in the home country in order to meet the domestic demand[8]. Contrary to the import substitution industrialization strategy, the export promotion industrialization strategy promotes only the industries that have the potential to develop and compete in international markets[9].

According to the classification given by Woo, for an economy to implement import substitution industrialization, it must set an effective tariff rate that is positive and greater than the effective subsidy rate, i.e. t>s and t>0. Hence, $\frac{P_M}{P_E} \rangle \frac{P_M^{\,W}}{P_E^{\,W}}$, which means that import substitution industrialization strategies

---

[8] Bruton, 1998
[9] Balassa, 1989

encourage import substitution by distorting prices towards the production of importables against imported goods.

Woo defines export promotion industrialization strategies by setting an effective subsidy rate that is positive and equal to the effective tariff rate, i.e. t=s>0. In this case, $\frac{P_M}{P_E} = \frac{P_M{}^W}{P_E{}^W}$ which means that the result of the export promotion industrialization strategy appears to be similar to that in a free trade setting, i.e. t=s=0. However, Woo rejects this argument. According to Woo's analysis, when export promotion industrialization strategies are implemented although relative price distortion is not the case between exports and imports, the relative prices distorts towards the production of tradable goods against production of non-tradable goods. He supports his argument as follows: $P_T = \varepsilon P_E + (1-\varepsilon)P_M$, which is the price of tradable goods where e is the weight of exports in total trade. $P_T{}^W = \varepsilon P_E{}^W + (1-\varepsilon)P_M{}^W$, which is the world price of tradable goods. PN is the price of non-tradable goods. Woo argues that in an export promotion industrialization strategy $P_T{}^{EPI} = (1+s)P_T{}^W = (1+t)P_T{}^W$. Hence, when an export promotion industrialization strategy is implemented $\frac{P_T{}^{EPI}}{P_N} = \frac{(1+t)P_T{}^W}{P_N}$, whereas in a free trade setting $\frac{P_T{}^{FT}}{P_N} = \frac{P_T{}^W}{P_N}$.

Hence, $P_T{}^{EPI} \rangle P_T{}^{FT}$, where the relative price is distorted towards tradables.

For import substitution strategies, the domestic price of tradables is as follows: $P_T{}^{ISI} = \varepsilon(1+s)P_E{}^W + (1-\varepsilon)(1+t)P_M{}^W$. As for the free trade setting the

price of tradables are smaller than this value:

$$\frac{P_T^{ISI}}{P_N} = \frac{\varepsilon(1+s)P_E^{W} + (1-\varepsilon)(1+t)P_M^{W}}{P_N} \text{ which is greater than } \frac{P_T^{FT}}{P_N} = \frac{P_T^{W}}{P_N}.$$

Frenkel (2004) claims that Woo's characterization of export promotion industrialization strategies is similar to a real exchange rate depreciation in terms of the results. The effect of the depreciation of the Turkish Lira, for instance, is equivalent to the effect of an export promotion industrialization strategy, which means a uniform tariff on imports and uniform subsidy on exports of the same amount. A depreciation in the real exchange rate distorts the relative prices towards production of tradables against non-tradable activities; this creates an effect equivalent to that of an export promotion industrialization strategy where both protection to local activities from imports and support to competitiveness of exports are provided. Although it is not mentioned in the literature, theoretically import substitution industrialization strategy's results also show similarities to export promotion industrialization result. Mathematically, the relative price of tradables versus non tradables distorts in favor of tradables. However, there is no argument in theory that links the effects of imports substitution strategies to the changes in real exchange rates.

3.3 The Labor Intensity Channel

Following Frenkel's (2004) explanation, the labor intensity channel is the real exchange rate's channel of effect on unemployment by changing the

intensities of the production factors of the output. The real exchange rate determines the relative prices of capital and labor. In the first two channels, the real exchange rate affects unemployment by changing the output level. However, in this channel the real exchange rate only affects the labor intensity in the output.

As Frenkel (2004) argues, the real exchange rate is an important determinant of the relative price of labor/capital goods in developing countries including Turkey, because a significant part of imported components are capital goods and intermediate goods used in the production of output. This can be seen from the trade figures for Turkey. Intermediate goods comprise the major part of imports. The proportion of intermediate goods to total imports was around 70-79 percent at the beginning of the 1990s. It decreased to 65-70 percent in the first half of the 1990s, was rather stable at around 64-66 percent in the second half of the 1990s, and then increased to 70-73 percent at the beginning of the 2000s which are very high values (See Table 1, Column 8). In addition, the real exchange rate also affects the relative price of imported capital goods/labor ratio and the wages in international currency. We can see that the portion of imported goods to total imports varied between 16and 25 percent during the period 1989-2006, which is smaller than that of intermediate goods but still significantly high (See Table 1 Column 6). As a whole, a real change in exchange rates changes the employment/output rate because of the changes in the relative prices mentioned above.

TABLE 1: Turkish Imports Regarding the Types of Goods[10]

Years	Imports	Capital Goods (Ca.G)	Consump-tion Goods (Co.G.)	Interme-diate Goods (I.G.)	Ratio of Ca.G. in Imports	Ratio of Co.G. in Imports	Ratio of I.G. in Imports
1989	15,792.1	2,548	737.6	12,499.7	16.135	4.671	79.151
1990	22,302.1	4,040.72	2,075.58	16,154	18.118	9.307	72.433
1991	21,047	4,295.53	1,575.04	15,053.4	20.409	7.483	71.523
1992	22,871.1	4,825.5	1,772.17	16,184.6	21.099	7.749	70.765
1993	29,428.4	7,357.69	2,525.72	19,402.8	25.002	8.583	65.932
1994	23,270	5,220.36	1,381.3	16,565.4	22.434	5.936	71.188
1995	35,709	8,119.48	2,416.49	25,077.7	22.738	6.767	70.228
1996	43,626.6	10,336.2	4,424.29	28,736.7	23.692	10.141	65.870
1997	48,558.7	11,108.9	5,051.94	32,118.9	22.877	10.404	66.144
1998	45,921.4	10,624.1	5,363.56	29,562.2	23.135	11.68	64.376
1999	40,671.3	8,727.01	4,820.41	26,854.2	21.457	11.852	66.027
2000	54,502.8	11,365.3	6,928.48	36,009.6	20.853	12.712	66.069
2001	41,399.1	6,940.43	3,813.41	30,300.8	16.765	9.211	73.192
2002	51,553.8	8,399.57	4,898.33	37,655.8	16.293	9.501	73.042
2003	69,339.7	11,325.9	7,813.33	49,734.8	16.334	11.268	71.726
2004	97,539.8	17,397.4	12,100.3	67,549.4	17.836	12.405	69.253
2005	116,774	20,363.2	13,975.3	81,868.3	17.438	11.968	70.108
2006	138,295	23,147.7	16,018.5	98,623.4	16.738	11.583	71.314

---

[10] Foreign Trade by Categories – The Central Bank of Turkey - Million $

Frenkel (2004) argues that any change in the real exchange rate affects relative prices. Firms will restructure the organization of production, change their production basket and/or change the structure of their output to adapt to this new set of prices. Certainly, this is not a short run effect since the whole economy adapts to the new set of prices via structural change. Following the development channel, a depreciation in the real exchange rate stimulates tradable sectors that were not competitive before. In addition, it increases the relative price of imported capitals and intermediate goods used in production, which increases substitution to labor in the production of output. An appreciation of real exchange rate may lead to some firms going out of business but surviving firms decreases the amount of labor (since its relative price increased) involved in production to achieve competitiveness. Moreover, a real exchange rate change affects the non-tradable sector as well. Although international competition is not a concern in non-tradable sectors, if the non-tradable sector uses capital goods that have a high import portion, imported capital goods and intermediate goods used in capital goods affect non-tradables as well. Hence, depreciation causes a shift in prices in favor of capital goods, which cause non-tradable sectors to increase labor, i.e. decrease the unemployment rate, to achieve competitiveness in the local market. Similarly, an appreciation of real exchange rate increases the relative price of labor against capital goods, which causes firms to decrease the amount of labor, thus increasing the unemployment rate.

CHAPTER 4

STYLIZED FACTS CONCERNING THE TURKISH ECONOMY

Turkey experienced many structural reforms in the social, political and economic arena after the proclamation of the republic in 1923. The Turkish economy overcame many bottlenecks and dealt with many crises afterwards, such as 1980, 1994, and 2000-2001 crises. Inflation, high interest rates and changes in the money standards became the main concerns in the world after the 1960s and in the search for solutions to the crises that occurred, the 1970s brought the "New World Order", and the 1980s brought "solutions in the liberal economic system", namely globalization. In accordance to these changes, many countries experienced periods of financial liberalization and large speculative capital movements took place. As a way out of crises, financial liberalization did not perform well in economic stagnation but engendered worldwide depressions like those in the Middle East, Russia, Mexico, and Argentina in the last decade. An examination of Turkey during the liberalization period (like any other countries that experienced liberalization) reveals that the economy became fragile to external shocks. This fragility is due to the short-term entrance of speculative capital into the economy.

The financial change in Turkey started with 1980 Stabilization Package to deal with the balance of payment difficulties in the economy created in the 1970's and the disequilibrium in the markets. The package's aims were to clear the disequilibrium in the foreign and domestic markets and to build up the institutional basis for the liberalization process. The main measures were taken to increase foreign currency income, liberalize imports, provide an environment for equilibrium in the markets, increase foreign investment, etc.

With those measures taken, in 1980 the government devalued the Turkish Lira against the dollar at about 33 percent increasing the exchange rate. After July 1981[11], it was decided to set the exchange rate on a daily basis (and the Turkish Lira was continuously devalued in real terms until 1989). The permitted limit on foreign exchange held by exporters increased. The government established a fund to support exports and gave credits to exporters. As a result of these measures, exports tripled and brought in a large amount of foreign currency. One of the important measures of the 24 January Package concerned the goods market: the equilibrium price was left to be set by the market mechanism. In addition, to increase foreign investments the Law on Encouraging Foreign Investments was passed. The permission limit on foreign investment was increased.

The first steps taken in the liberalization process were the abandonment of the restrictions on the interest rates of the banks and afterwards on all interest rates in 1981. After that, entrance to the banking sector was eased. This stimulated competition in the sector and decreased the share of individual banks since the

---

11 ÖZÇAM, Mustafa. (2004)

share of the sector was constant. In 1982, Turkey experienced a major crisis, namely the Banker Crises. The foundation of this crisis was laid at the end of the 1970s with a law that brought some restrictions on the interest rates of credits to the banks. This drove banks to collaborate with people who worked with interest rates outside the market interest rates called "bankers". Bankers were intermediary between the banks and the capital market instead of being intermediary between demand and supply of the bonds. The interest rate war between bankers turned into "Ponzi Finance" (to finance the interest rate of borrowings by borrowing with higher interest rates). This turned out to be a disaster for the system and led to the "Banker Crises", which undermined the financial position of the banks.

The foreign exchange rate policies were relaxed in 1984: banks were allowed to set their own exchange rates providing that it would not be 6 percent less or more than the Central Bank's exchange rates, and 8 percent less or more than the Central Bank's effective exchange rates. In addition, the maximum difference allowed between the exchange buying rate and exchange selling rate was 2 percent.

In 1985 the exchange rate was allowed to float freely. However, at the beginning of 1986 the Central Bank declared that banks could not set their rates 1 percent less or more than the Central Bank's exchange rates. At the end of 1986, the exchange rate regime was revised once more: banks were allowed to determine their selling rate freely, provided that it was not higher than the Central Banks exchange rate.

The 1980 stabilization program was implemented successfully and during the period 1980- 1987 the Turkish economy showed improvement: the growth rate of GNP was -2.3 percent in 1980, +3.1 percent in 1982, +7.1 percent in 1984 and +4.3 percent in 1985[12]

Yeldan (2001) argues that the primary descriptive reasons for the expansion and recession in the Turkish economy between 1970s and 2001 were the current account balance and the resources to finance the volume of imports. The liberalization policies in the 1980s increased Turkey's trade volume immediately. Exports were 2.9 billion dollars in 1980 and increased to 10.2 billion dollars in 1987. The export import ratio increased from 30 percent in 1980 to 72 percent in 1987. Imports, meanwhile, increased continuously during the 1980-1987 period except for 1982 and 1986. They decreased due to the fall in oil prices in 1986. Imports increased from 7.9 billion dollars in 1982 to 14.2 billion dollars in 1987. As Selçuk (1997) argues, there are many reasons for the deterioration/amelioration of the current account: political stability, a change in the economic conditions of trade collaborating countries, world interest rates, export subsidies, import quotas, etc. However, for small economies, the most significant indicator for the current account balance and the volume of imports is the real exchange rate. Yeldan (2001) claims that there is a close synchronization between changes in the real exchange rate and the growth rate of national income. After the large devaluation in 1980, a small period of stabilization with positive growth rates was observed, during which the government continuously devaluated

---

12 Central Bank of Turkey, Electronic Data Delivery System, 2007

the exchange rate. This favorable economic environment with a positive growth rate, real devaluation, lasted for 4 years.

The growth rate of GNP was above the target with 6.8 percent in 1986 due to the increase in domestic aggregate demand and the decrease in oil prices. This enhancement continued in 1987 and the economy grew by 9.8 percent.

To eliminate the instabilities in the economy and to provide equilibrium in the markets some precautionary measures were taken. The aim was to encourage savings in terms of the Turkish Lira, to increase demand on the Turkish Lira, to put a brake on imports, to vitalize exports, and to decrease government expenditures. With the decrease in government expenditures, public investments fell too. This affected private investments and production negatively. As a result of those events, the growth rate of real GDP was 2.1 percent in 1988. The main reason for this deterioration compared with 1987 was the decrease in the growth rates of the industrial and service sectors' income.

As a result, after 1983, many steps were taken with regard to the exchange rate system in Turkey and most of the restrictions and prohibitions were abrogated. The first step was taken in July 1989 with Law on the Protection of the Value of the Turkish Currency. The second step was the 32nd decree, published in the Official Gazette. The resulting changes were as follows: the Turkish Lira became convertible, the domestic economy became open to international markets and the finding of financial resources from international markets was liberalized

and investors began to switch from the Turkish Lira to foreign currency, and, as a result, currency substitution became commonly used.

The seemingly successful policy implementation between 1980 and 1987 did not perform well in terms of enhancing the existing capacity and vitalization of capital stock so the Turkish economy experienced unstable growth. However, the Treasury and Central Bank of Turkey were not fast enough to carry out the necessary regulations in time and the banks approached foreign currency denominated resources without taking the rules of liquidity management into account. Hence, this made the results of 1990 Gulf Crises more severe. After the military intervention by the United Nations in Iraq, the crisis worsened and the financial sector suffered a liquidity shortage. The increase in the price of oil caused more inflation. The Central Bank was forced to bring in a large amount of foreign currency in order to meet the public demand.

In addition, the unemployment maintained its high level. In this environment, the growth rate of real GDP in 1989 was 0.2 percent. Çelik (2003) assessed these results. He argues that the negative results of the financial liberalization in the 1980s were as follows:

    a. Liberalization did not increase domestic savings, but high interest rates decreased investments hence affected growth negatively.

    b. The instability in exchange rates and interest rates increased the volatility of capital movements and the sensitivity of the Turkish economy to external shocks.

c. Most importantly, although financial liberalization achieved its aims, financial profundity was not achieved.

The 1990s saw financial crises all over the world. The most remarkable ones were in the European Monetary Zone in 1992-93, in Turkey and Mexico in 1994-1995, in Southeast Asia in 1997, in Russia in 1998, and Brazil in 1998-1999.

Although growth performance was weak in 1989, as a result of the increase in the agricultural sector's output and some precautionary measures, the real GNP growth rate was 9.3 percent in 1990. With the effect of the Gulf Crisis in October 1990, imports increased as a result of the tremendous increase in oil prices. At the end of 1990, exports reached 12.9 billion dollars and imports were 22.3 billion dollars. The current account deficit rose drastically.

The 1991 Gulf War had a negative effect on the growth rate of the Turkish economy and the economy grew by 0.9 percent which was a large difference compared to 1990's growth performance which was 9.3 percent. Tourism was one of the sectors influenced by the war. Most of the income coming from tourism declined in 1991 and the sector went into stagnation. Although Turkey received 745 million dollars in 1990 and 1785 billion dollars in 1991[13] in the form of an international grant due to the Gulf Crisis, the Central Bank of Turkey lost most of its reserves in the mean time. In 1991 exports increased by 4.9 percent to 13.6

---

13 Haber Anadolu 28.12.2001
(http://www.byegm.gov.tr/YAYINLARIMIZ/HABERANADOLU/HABER-ANA/2001/12/HA28X12X01.htm), 2007

29

billion dollars and imports decreased by 5.6 percent to 21 billion dollars. A current account surplus occurred. After these positive events the public expectations for economic performance in 1992 improved and real GDP increased by 6 percent in 1992 (See Table 2). GNP per capita increased significantly from 2708 dollars in 1992 to 3004 dollars in 1993. In addition, real GDP grew by 8 percent in 1993 (See Table 2). Yeldan (2001) mentions that the Turkish economy showed positive growth rates with a 5 - 10 percent overvalued Turkish Lira in 1983-1987. After the small stagnation in 1988, the Turkish Lira was continuously overvalued in the first half of the 1990s until the financial crash in 1994.

From the beginning of the 1990s until 1994, the ratio of domestic debt to GNP showed a rising trend. After 1990, the Central Bank of Turkey announced monetary programs and tried to hit its monetary targets.[14] Moreover, the government changed the way it financed its deficits in order to decrease interest rates on domestic debts and to obtain a delay in debt payments in 1993. In addition, the debts of the Treasury were cancelled and its borrowing limit was doubled. The expectation of devaluation increased because the government preferred to use the Central Bank instead of taking on a domestic debt to finance the public deficit. Özçam (2004) argues that with the effects of the 1991 Gulf War and the financing of the public debt by the Central Banks resources monetary expansion increased and it became hard to cope with liquidity and the balance sheet of the Central Bank. Hence, the demand for foreign currency increased and created a large gap between the official exchange rate and market exchange rates. As a result, these events increased the imbalances and created pessimistic

---

14 ÖZÇAM, Mustafa, 2004

expectations.[15] As Özatay (2000), implies the 1994 crisis is a very clear political mistake. The reduction in interest rates decreased the demand for domestic government bonds and harmed the bond market seriously. The liquidity in the market was directed to foreign currency and this increased the demand for it, which put pressure on the foreign exchange market.

In the first quarter of 1994, the Turkish Lira was devalued by 70 percent and overnight interest rates skyrocketed to 700 percent. The economy suffered a liquidity crisis and the market went into imbalance. Therefore, the April 5 Stabilization Package was announced to ensure balance and stability in the exchange and financial markets and to decrease inflation in the short run. In the medium run, the package aimed to find a permanent solution to budget and current account deficits, which were the primary cause of the instability, and in the long run to engender sustainable growth. After April 5 Package the Treasury increased domestic borrowing interest rates and shortened their maturity. Consequently, the difficulties with domestic borrowing continued until the end of May 1994.[16]

Turkey was far from successful in crisis management at the end of 1993 and beginning of 1994. The government announced that the short-run target and started to inject liquidity to the market; however, the demand for foreign currency, which was expected to decrease, increased swiftly. In addition, the high current account deficit also stimulated the expectations for devaluation, and hence the demand for foreign currency. The government planned to supply the foreign

---

15 Central Bank of Turkey, Annual Report, 1994
16 Central Bank of Turkey, Annual Report, 1994

currency demand of the market and direct it towards the Stock Market. Unfortunately, the largest banks were making their decisions according to the information that there would be a large devaluation. Hence, all the foreign currency supplied was sold with higher exchange rates and did not satisfy the market demand. In addition, the transaction volume of the Stock Exchange Market (IMKB) was 52 million dollars, which was not sufficient to absorb the speculative capital in the market. As a result, the Turkish Lira was devalued by 70 percent from January 1994 to April 1994 and the Central Bank's international reserves decreased from 7 billion dollars to 3 billion dollars in 3 months.[17] GDP decreased by 5.5 percent.

The effect of the large devaluation in 1994 can be also seen in the trade figures. Exports increased to 18.1 billion dollars and imports decreased to 22.2 billion dollars. The trade balance ameliorated by approximately 70 percent, decreasing to 4.2 billion dollars. However, this situation did not last long, due to the revival in the Turkish economy, the decline in the devaluation rate in the Turkish lira and the deterioration in the economies of OECD countries that had significant weights in trade with Turkey. The rate of increase in exports decreased in 1995 and there was a huge increase in imports. The trade balance deteriorated by nearly 215 percent. (See Table 2)

Özçam (2004) claims that, as of 1995, the Central Bank increased its control on exchange rates by targeting stability depending on the Turkish Lira's real value although the flexible exchange rate regime was in effect. According to

---

17 Central Bank of Turkey, Electronic Data Delivery System, 2007

this strategy, namely "devaluation as much as inflation" monthly rate targets were declared and then the nominal rate was controlled considering target inflation. Meanwhile, the Central Bank asserted control over its assets and strengthened its foreign currency reserves. Tight monetary policy resulted in high interest rates.

The growth rate of real GDP in 1995-1997 was rather stable at 7-7.5 percent. In 1996, exports increased to 32.1 billion dollars and imports increased to 42.3 billion dollars (see Table 2). Moreover, trade balance values on average were higher in 1995-1997 years than those before the 1994 crisis.

The years 1997 and 1998 witnessed two important crises that affected the whole world: the 1997 Asian Crisis and the 1998 Russian Crisis. The effects of those crises on the Turkish economy were minor. Özçam (2004) claims that this insensitivity was not only because of the sufficiency of the Central Bank's foreign currency reserves but also because the Central Bank fulfilled both foreign and domestic currency demand of the market without any restrictions on amounts.

There was a significant change in the export import scheme in 1997 and 1998. There was a slow down in the increase of exports and imports in 1997 and there was a significant decrease in both accounts. This can be explained by the decline in the increase in world trade volume due to the 1997 Asian Crisis. The trade volume in 1998 was 4 percent, which was less than half of the rate in 1997.[18] In addition, in August 1998, the ongoing global crisis struck the economy of Russia, which is an important trade partner for Turkey.

---

[18] http://www.wto.org/english/res_e/booksp_e/anrep_e/anre98_e.pdf, (2007)

The effects of 1998 were worsened by the devastating earthquake that Turkey suffered in August 1999. GDP decreased by 4.7 percent, and exports and imports decreased to 28.8 and 39 billion dollars respectively (see Table 2).

Following the 1999 elections, several reforms in social security, the economy and the social field were made. Plans were drawn up to establish the Banking Regulation and Supervision Agency to be responsible for regulating the banking sector. The main aim was to minimize political interventions in the economy. In addition to this aim, Turkey set out a new three year economic program under the supervision of the IMF in December 1999. The IMF both designed and supported the program financially with a net $20.6 billion in 1999-2002. The aim of the program was a single digit inflation rate by the end of 2002 (Pamukçu, Yeldan (2005)). The program relied exclusively on a crawling peg exchange rate regime for disinflation. The regime was working on the basis of a currency board. As Özçam (2004) mentions, according to the stand-by agreement, the exchange rate basket was $1+€0.77 whose values were going to be declared in advance by the Central Bank of Turkey. The Central Bank was obliged to declared daily real exchange rate values. The annual increase in the exchange rate was projected to be 20 percent, which was parallel to the projected increase in the wholesale price index for 2000.

The Banking Regulation and Supervision Agency started to scrutinize the banks in the Fund; however, it was not fast enough to intervene in the accumulation of risk in the balance sheet of the banks. Therefore, the overnight

interest rates started to increase and the stock exchange decreased in November 2000. Due to the sensitivity after the Argentina crisis, foreign investments fled and Demirbank, which held most of its assets as domestic government bonds, suffered a liquidity shortage. Demirbank traded them on the market, which caused the interest rates of the domestic government bonds to increase. The other banks in the sector cancelled their buying- selling limits with Demirbank. As a result of this environment of panic, the supply of government bonds increased and the demand for foreign currency boomed. With the anxiety caused by these events, the banks cancelled all buying-selling limits between each other. Foreign investments exited the market. "More than six billion USD of short-term capital fled the country, creating a severe liquidity shortage and sky-rocketing interest rates."[19] The overnight interest rates rose to 250percent. The Central Bank of Turkey declared that it would only fund the market in exchange for foreign currency. However, it was able to keep its promise for only one day.

The November 2000 crisis was a financial banking crisis. According to Özçam (2004), although the main reason for the crisis seemed to be a liquidity shortage due to insufficient foreign currency entering the to economy (after the increase of interest rates), there were reasons behind the crisis that caused this shortage, like the insufficient decrease in inflation, high oil prices, the high fund needs of public banks, privatization and other slowdowns in the structural reforms. Despite the tight policies in effect, the structural measures did not eventuate as fast as expected. This lowered the reliability of the program and increased the rate of interest on domestic borrowing. Hence, the liquidity demand

---

[19] Pamukçu, Yeldan (2005)

of the banks whose assets were composed mostly of government bonds was one of the reasons triggering the November 2000 crisis. (Celasun, 2002)

After the November 2000 crisis, the Banking Regulation and Supervision Agency did not intervene in the risk accumulation of the banks in the fund immediately, and hence overnight interest rates started to rise in November 2000. The Stock Market went down and foreign investor began to withdraw their investments from the market. One of the stranded banks, Demirbank, due to the liquidity shortage tried to dump the domestic government bonds. Therefore, the market interest rates increased and other banks cancelled the interbank limits for market transactions. With the anxiety caused by these events, demand for foreign currency boomed and the Central Bank announced that it had stopped supporting the market and it was only exchanging domestic currency with foreign currency. However, the Central Bank was forced to support the market just one day after this announcement due to the serious liquidity shortage in the market. The systematic crisis in November 2000 aroused suspicion about the current economic program and stimulated the banks to close their open positions by acquiring foreign currency. This in turn created exchange rate risk and engendered the February 2001 Crisis which is popularly known as Black Wednesday. The tight monetary policy used over the previous 14 months was revised and the government switched its exchange rate policy from "currency peg" to "dirty float". The overnight interest rates hit 5000 percent on 21 February 2001. Already fragile due to the November 2000 crisis, the banking sector faced collapse since the interbank payment system broke down. The Turkish Lira swiftly depreciated

by 39 percent from 688,696 TL/$ to 962,499 TL/$ in just one night[20]. The environment of uncertainty resulted in a decrease in the growth rate of GDP. GDP decreased by 7.5 percent from 118,789.1 to 109,885.3 TL. The effects of the crisis were long lasting. Many people lost their jobs and many businesses closed. The total number of unemployed people was 1,409,000 in the fourth quarter of 2000, increased by 32.6 percent to 1,869,000 at the end of the first quarter of 2001 and skyrocketed by 70.6 percent to 2,404,000 at the end of the fourth quarter of 2001.[21]

These two crises were different in nature from 1994 crisis: they resulted in an economic environment where a stability program based on exchange rate was in effect (Özatay and Sak, 2002). After the November 2000 and February 2001 crises, the crawling peg system was abandoned and a flexible exchange rate system was implemented. In the "Transition to a Strong Economy Program" that was announced on 15 May 2001, the government emphasized that it would not intervene in the exchange rate except for in the event of large fluctuations. In addition, the Central Bank was made independent of political authority in October 2001, which increased the credibility of the Turkish government.

In the current economic program, the Central Bank uses interest rates as monetary policy tool under a flexible exchange rate regime to achieve price stability. Since 2001, the Central Bank has implemented implicit inflation targeting.[22]

---

[20] Central Bank of Turkey, Electronic Data Delivery System, 2007
[21] www.tuik.gov.tr, Labor Force Statistics, 2007
[22] Özçam, Mustafa. 2004.

With the 2002 elections, the AKP rose to prominence with a parliamentary majority and continued the adjustment period for the EU membership process with the IMF. In 2002, the growth rate of GDP was 7.9 percent. The growth rate of exports increased from 13 percent in 2001 to 17 percent in 2002. In 2002 exports were 40.1 billion dollars and imports were 47.4 billion dollars. Imports in 2002 were still lower than the value of the post 2000 crisis (See Table 2).

In 2003, real GDP grew by 5.8 percent. This was also an impressive year for trade accounts. Exports increased by 27 percent to 51.2 billion dollars and imports increased by 38 percent to 65.2 billion dollars, which deteriorated the trade balance to 14 billion dollars (See Table 2). Similar movements were recorded in 2004-2006. Growth rates of GDP, exports and imports were positive throughout the post-2001 period. According to Pamukçu and Yeldan (2005), the growth path of Turkey after the 2001 crisis was unstable and inconsistent although rapid. They identify two characteristic of growth in the Turkish economy: it is driven by inflows of speculative money, and it can not accompany a decrease in the unemployment rate which is called jobless growth.

To make an overall comment on real exchange rates, Yeldan and Özlale (2002) proved that from the 1994 crisis to the beginning of 1998 the Turkish Lira remained mostly overvalued. After then to the end of 1999, the Turkish Lira was observed to be undervalued. With the IMF stand-by agreement in December 1999, the currency was targeted for disinflation. Yeldan and Özlale (2002) found

that the Turkish Lira was structurally overvalued until April 2000 and after that it was structurally undervalued.

TABLE 2: Real GDP, GDP Index and Trade Indices

Years	GDP (level) (a)	GDP (index) (a)	Growth Rate of GDP (%) (a)	Exports (b)	Imports (b)	Trade Balance (b)
1987	74,721.8	76.334129	NA	10,190	-13,396	-3,206
1988	76,306.2	77.952717	2.120399	11,662	-13,475	-1,813
1989	76,498.3	78.148962	0.251749	11,625	-15,815	-4,190
1990	83,578.5	85.381937	9.255369	12,959	-22,407	-9,448
1991	84,352.8	86.172945	0.926434	13,593	-20,883	-7,290
1992	89,400.4	91.329461	5.983915	14,715	-22,791	-8,076
1993	96,590.5	98.674707	8.042581	15,345	-29,426	-14,081
1994	91,320.7	93.291197	-5.455816	18,106	-22,273	-4,167
1995	97,887.8	100.000000	7.191250	21,636	-34,788	-13,152
1996	104,745.1	107.005265	7.005265	32,067	-42,331	-10,264
1997	112,631.2	115.061530	7.528849	32,110	-47,158	-15,048
1998	116,113.6	118.619072	3.091861	30,662	-44,714	-14,052
1999	110,646.0	113.033493	-4.708837	28,842	-39,027	-10,185
2000	118,789.1	121.352303	7.359597	30,721	-52,680	-21,959
2001	109,885.3	112.256379	-7.495469	34,373	-38,106	-3,733
2002	118,612.3	121.171688	7.941918	40,124	-47,407	-7,283
2003	125,485.2	128.192890	5.794424	51,206	-65,216	-14,010
2004	136,692.6	139.642121	8.931252	67,047	-90,925	-23,878
2005	146,780.7	149.947900	7.380136	76,950	-110,477	-33,527
2006	155,732.4	118.900108	6.09869	91,689	-131,752	-40,063

(a) At constant 1987 prices, annual data, CB of Turkey
(b) goods, in million dollars, 1987-1991 is annual data and 1992-.. monthly data, CB of Turkey

4.1   Employment, Unemployment and Related Policies

Implemented In Turkey

4.1.1   Employment and Unemployment in Turkey

One of the most important problems common to all countries is unemployment. Unemployment decreases income and creates inequalities in income distribution. People suffer a loss of skills and capacities when they remain unemployed for a long time. Unemployment levels rose tremendously in the 1980s. Since then unemployment became one of the dominant problems of the Turkish economy. For Labor Force Statistics we can analyze 1988-2006 data from TURKSTAT's Labor Force Surveys. Bulutay (1995) collected the unemployment figures for the pre-1988 Labor Force Survey given below. The figures are not quite as reliable as those of the post-1988 Labor Force Survey both because the definitions in the Labor Force Survey changed in 1988 and because the way they were collected was not appropriate; however, they are given here to provide a better understanding of the structure of labor force figures in 1980-1988:

TABLE 3: Labor Force Statistics for the pre-1988 Labor Force Survey[23]

Years	Unemployed	Employed	U (%)
1980	1,375,564	15,702,127	8.1
1981	1,207,745	15,839,014	7.1
1982	1,199,292	16,005,942	7.0
1983	1,343,401	16,169,270	7.7
1984	1,343,234	16,419,342	7.6
1985	1,273,810	16,699,204	7.1
1986	1,452,398	17,009,503	7.9
1987	1,571,930	17,401,735	8.3
1988	1,617,516	17,667,593	8.4

During the 1980- 1988 period, unemployment showed a rather consistent trend in the range of 7-8.4 percent. As can be seen unemployment increased in 1980-1988 except for in 1981, 1982 and 1985. However, the number of employed people continuously increased during this period.

Some stylized facts for the Turkish population and labor force structure can be listed as following:

---

[23] Source of the data: BULUTAY Tuncer, "Employment, Unemployment and Wages in Turkey", Ankara, 1995. (Active Population is 15+)

1. The Turkish population is young: as Bulutay (1995) reported, the proportion of the 0-14 age group to the total population is approximately 40 percent[24]. This is a huge proportion compared to western countries.

2. Both the growth rate of the population and the population itself are high in Turkey. The main results of those facts are the declining labor force participation rate due to insufficient job-creation and more dependent people.

3. Unemployment is higher in urban areas (10.9-13.8 percent) than in rural areas (3.9-5.6 percent)

4. "Unemployment in Turkey is mainly due to the lack of capacity to produce sufficient amounts of new, permanent and high-quality jobs rather than the loss of satisfactory jobs."[25]

5. As Bulutay (1995) mentions one of the features of the labor market in Turkey is that the creation of new jobs is more crucial than the destruction of jobs in unemployment. "The unemployment rate for young people (15-24) is considerably higher in Turkey. It is 2.9 times the rate for all ages in Turkey; whereas the same value is 1.9 on average are some OECD countries in 1989. The proportion of the dismissed in the total unemployment is only 8 percent in Turkey in April 1992. The great majority of the unemployed is composed of:

---

[24] TURKSTAT, "Statistical Indicators", 1923-1990, Ankara, 1992
[25] Bulutay, 1995

a. Those who seek a job for the first time (42.28%)

b. Those who worked temporarily at work that came to and end (23.95%)

c. Those who have quit their jobs (12.19%)"[26]

For the period 1988-2006, the employment and unemployment figures are as follows:

---

[26] TURKSTAT, Labor Force Statistics, April 1994

TABLE 4: Labor Force Statistics for the post-1988 Labor Force Survey[27]

Years	Unemployed	Employed	U (%)
1988	1,638,000	17,755,000	8.4
1989	1,709,000	18,222,000	8.6
1990	1,612,000	18,539,000	8.0
1991	1,723,000	19,288,000	8.2
1992	1,805,000	19,459,000	8.5
1993	1,815,000	18,500,000	9.0
1994	1,871,000	20,006,000	8.6
1995	1,700,000	20,586,000	7.6
1996	1,503,000	21,194,000	6.6
1997	1,552,000	21,204,000	6.8
1998	1,607,000	21,779,000	6.9
1999	1,830,000	22,048,000	7.7
2000	1,497,000	21,581,000	6.5
2001	1,967,000	21,524,000	8.4
2002	2,464,000	21,354,000	10.3
2003	2,493,000	21,147,000	10.5
2004	2,498,000	21,791,000	10,3
2005	2,520,000	22,046,000	10.3
2006	2,446,000	22,330,000	9.9

---

[27] **Note:** Source of Data: TURKSTAT, Labor Force Statistics, 2007

According to statistics for 1988- 2006, there have been slight changes in unemployment rates. Interestingly, after the 1994 crisis, the unemployment rate decreased from 8-9 percent to 6.5 percent in 2000. The effect of the 2000 crisis was a jump in the unemployment rate from 6.5 percent in 2000 to 8.4 percent in 2001. Being the most serious crisis in the Turkish Republics history, the 2001 crisis increased the unemployment rate further to 10.3 percent. If the growth rates of the economy are taken into consideration, the post-2001 period shows that the economy performed well. In the period 2002-2006, the growth rate of the Turkish economy ranges from 5.8 to 9 percent. However, this performance is not reflected in unemployment rates. Unemployment rates in for 2002-2006 years are nearly constant. Pamukçu and Yeldan (2005) evaluated the slow performance of unemployment in the post-2001 crisis era. They argue that this picture of the economy is an example of what may be called "jobless growth" which they claim is a key characteristic of the post-2001 growth in Turkey.

4.1.2   Unemployment Policies in Turkey

Gündoğan (2001) argues that each and every country has a different approach to the common economic deadlock: unemployment. These approaches are somewhere between the two extremes:

1. The liberal approach, which leaves the solution to economic growth

2. The approach that regards unemployment as a social problem and gives priority to employment policies.

In Turkey, past governments adopted a liberal approach; however this made the problems worse. The history of unemployment policies in Turkey started with the transition to the planned period; however, no success has been achieved in the struggle against unemployment thus far. If we analyze the planned period for unemployment from the 1980s to 2006, we shall start with the "4th Five-Year Development Plan" which covers 1979-1983.

- **4th Five-Year Development Plan (1979-1983):** The primary concern was to train qualified people for technical fields.

-

- **5th Five-Year Development Plan (1985-1989):** The plan involved basic policies to support small enterprises. The main principle of this policy was to keep up with technological improvements. A high commission (İstihdamı Geliştirme Yüksek Koordinasyon Kurulu) to increase employment was set up and in this context many training programs on technique were organized in 1985. Many industrial zones were established to improve industrialization in a planned way. The Turkish Employment Organization (İŞKUR) was established in 1986 whose aim was to set up businesses or to support Small and Medium size Enterprises (SME).

- **6th Five-Year Development Plan (1990-1994):** The main aim was to ameliorate the income distribution and to decrease unemployment with inter-regional differences in terms of development, in the context of swift, steady and balanced development. In accordance with the main aim, other measures like supporting SME, investments, and entrepreneurial spirit were implemented.

- **7th Five-Year Development Plan (1996-2000):** Formal education was extended to 8 years. With the increase in the quality of the labor supply, a small amount of labor was sent abroad to be employed; however many unemployed people immigrated to Turkey as a cheap work force at this time. A milestone in employment policy is unemployment insurance, which came into effect in 2000.

Gündoğan (2001) claims that preventative measures against unemployment were first taken with the transition to the planned period, however, no policy achieved in this target. Unemployment was a continuous problem between 1960 and 1980 because the solution was left to economic growth and was not the primary concern of the governments. However, the expected growth rate and structural transition in employment were not achieved; thus, unemployment became acute. After 1980, the problem became worse not only because the cure was left to the private sector but also because the government did not take an effective role in the solution. This role seems to change with the development programs put into action. According to the Pre-Accession Economic Program implemented in October 2001, for the near future, the 8th Five Year Development

Plan foresees some of the following solutions to the unemployment problems in the labor market: to trigger productive investments and engender sustainable growth in order to decrease unemployment, based on the needs of the economy and sectors, increasing the skills of the labor force, encouraging non-agricultural employment areas, etc. Due to the aging population the public services are expected to change. In addition, the demand for educational and health services is also expected to increase at all levels.

CHAPTER 5

EMPIRICAL MODELING

In order to test the validity of three channels as to how the real exchange rate may affect unemployment rate, various empirical models have been suggested in the literature. Frenkel (2004) has employed lagged real GDP and lagged real exchange rate to quantify the impact of the real exchange rate on rate of unemployment associated with these channels. Although Frenkel (2004) does not provide a direct linkage of these channels with the empirical model employed, it seems that lagged GDP would account for the macroeconomic and the development channels. In addition, lagged real exchange rate would capture the influence of the labor intensity channel. In the first stage, we adopt Frenkel's (2004) approach to test the impact of the real exchange rate on rate of unemployment, attributed to these channels, for the Turkish economy. However, it seems that this approach has some limitations because it does not allow direct testing of the validity of these three channels separately. In Subsection 5.4, we modify this empirical model to quantify the effects of the real exchange rate on rate of unemployment more explicitly.

Apparently, the variables defined above have limitations in presenting the three channel defined in chapter 3. To overcome this problem, we suggest an alternative model in subsection 5.4 which includes variables to capture the channels of influence by real exchange rate on unemployment. In addition, the following subsection presents the description of the variables.

5.1 Data

5.1.1   Labor Force Statistics

The Turkish Statistics Institute (TURKSTAT) is responsible for the collection, arrangement, classification, and publication of the employment, unemployment, and labor force data. In addition, as Bulutay (1995) argued, in the analysis of unemployment figures for Turkey, two main periods should be clearly distinguished: pre-1988 Labor Force Survey and post 1988 Labor Force Survey periods. For labor force statistics before 1988, there were four data sources: Labor Force Surveys (performed by TURKSTAT), population censuses, the estimations by the State Planning Organization and publications of the Turkish Employment Organization. The unemployment data from population censuses are not generally sufficient. Moreover, since they cover the "persons seeking work", the definitions of the statistics were different from those after the 1988 Labor Force Survey. The statistics of Turkish Employment Organization are not very reliable although they might give an idea about unemployed people seeking work. Before the 1988 Labor Force Survey there were two groups in the surveys: the group including

both active and inactive unemployed people and the group including active unemployed people.

From Turkey's transition to planned development to 1966, the collection of demographic information about the active population was performed by the National Census of Population every five years. After 1966, the informational need was met through the "Household Labor Force Survey." However, the data were not comparable because the geographical area in which it was applied, its definition, the variables it includes and classification varied. Hence, TURKSTAT targets the restructuring of the survey with the aim of accurate quantification of the labor market.

During the period 1988-2000, through contemporary standards on active population, employment, and unemployment (ILO, 1982), the survey was revised and updated accordingly. As of October 1988, the survey was implemented in the last weeks of every April and October. Between October 1988 and April 1994, the survey was applied to a sample of 11160 households using the substitution principle. Beginning from October 1994, the sampling of the survey changed and sample size increased to approximately 1, 500, 028.

Between 2000 and 2003, there were important changes concerning the methodology of the survey, namely the frequency of its implementation, prediction size, questionnaire, etc. The new survey's sample size was enlarged to 23,000 and it was implemented in the October 1999 survey for the first time. The

28 TURKSTAT, www.tuik.gov.tr, Labor Force Statistics

survey began to be implemented monthly in 2000 and predictions have been published quarterly (total and for urban and rural areas), and annually (total and for urban and rural areas, for seven regions and nine cities). Another important change in the new survey is that the 12+ population category used until 2000 was changed to 15+ for 2000 and thereafter.

In 2002, the survey was revised in the line with the European Union adaptation process. New variables were added to meet the norms and standards of the European Union's labor force statistics. In 2004, the number of questions increased and the definitions were clarified further. Based on this change, employment includes the following population groups:

The people in the active population that are in work: people who work at least an hour per week as a wage worker, business owner, employer and/or family worker without payment.

The people in active population that are not in work: the employers and business owners who are still connected with the job, but are not working during the reference week. The wage workers who are not working during the reference week are included in employment data only if they will be back in work in 3 months' time or they are being paid at least the half of their wage during the time they are not working.

Employment rate is defined as the ratio of employment to the active population.

In 2005, the survey was revised again to enable a more comprehensive content. From 2005 onwards the survey predictions have been done monthly taking quarterly survey averages into consideration. The weights of the quarter period are calculated predicating on the projections of the middle month of that period. Hence the quarterly published results after 2005 are still comparable to periodic results published after 2000.

Finally, for the weights of the "Household Labor Force Survey" results, 1985- 1990 National Population Census results are used until 1990, and the 1990 and 1997 National Population Census results are used after 1991. However, it became unavoidable to revise the survey results through retrospective population projections with the base year 1999-2000 because the 2000 National Population Census was very detailed and there was a considerable difference between the 2000 and 1997 census results with regard to age groups and rural-urban discrimination.

Let us now define the terminology used in this study in order to clarify our explication and prevent misunderstanding of the subject:

We have already mentioned the detailed definition of employment, and so there is no need to repeat it.

Non- Institutional Civil Population: the whole population excluding those who reside in a school, dormitory, hotel, kindergarten, home for the aged, prison or army barracks.

Active Population: people in the non-institutional civil population who are older than 15.

Unemployment: people in the active population who are not employed during the reference period and used at least one job-searching channel in the previous three months and ready to work in two weeks time.

Labor Force: the sum of employment and unemployment.

Unemployment Ratio (U): unemployment/ labor force

**Employment Ratio:** employment/active population

Urban Region: residential areas with a population of 20,001 or above.

Rural Region: residential areas, which have a population of 20,000 or below.

Reference Period: The month's first week, which starts with Monday and ends with Sunday.

For our model we use unemployment data, which is yearly over 1988-2006 due to the break in the unemployment data mentioned above (pre-1988 Labor Force Survey and post 1988 Labor Force Survey) (See Figure 1 and Figure 2 for log level and filtered unemployment rates). The conceptual part will contain the terminology above. The following figures provide a closer analysis of unemployment rates between 1988 and 2006:

FIGURE 1: Unemployment Rates
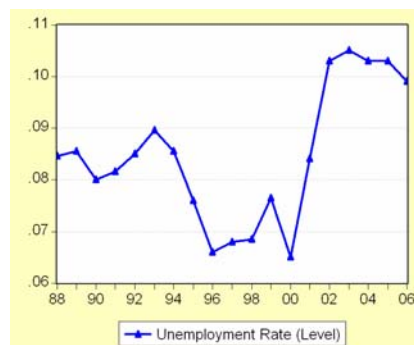
**FIGURE 2: Hodrick-Prescott Filtered Unemployment Rates**
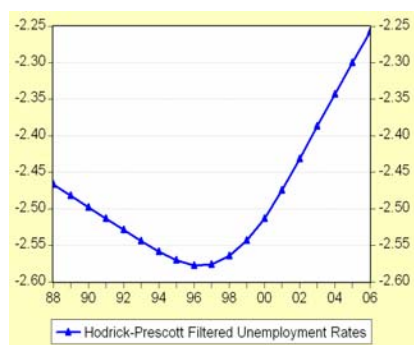
5.1.2   Real GDP

Real gross domestic product for a period is the total value of all final goods and services produced within a country, and it is calculated by the base-year price level. Before Turkey's planned development period there was not a continuous collection of national income statistics. After that time, the State Planning Institute started to calculate the national income statistics for 1961-71. After 1971, those series were corrected with TURKSTAT's participation. Only after 1990 did quarterly data calculations on national income statistics start. This series has been back calculated until 1987. Now TURKSTAT is responsible for the calculation and publication of quarterly GDP series (national income statistics as well). We use GDP in constant prices with the base year 1987 (1987=100) (See Figure 3 and Figure 4 for log level and filtered real GDP series). The series is in New Turkish Lira (YTL) and is yearly, which we obtained from the Electronic Data Delivery System (EDDS) of Central Bank. To be consistent with the unemployment rate series, the data for 1988-2006 are used, although reliable series for 1968- 2006 are available in the TURKSTAT database. The specified real GDP data are presented below:

FIGURE 3: Real GDP

Real GDP (Logarithm)
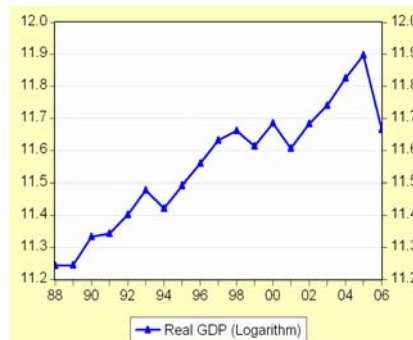
FIGURE 4: Hodrick-Prescott Filtered Real GDP
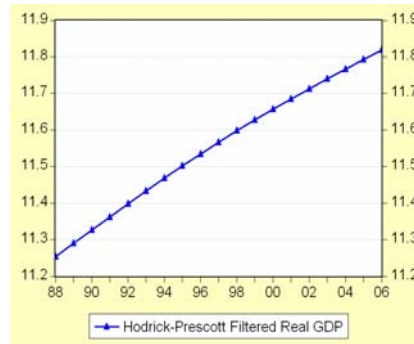
5.1.3   Real Exchange Rate

The real exchange rate between two currencies is the value of one currency in terms of the other by taking the inflation differentials among the countries of those currencies into account. After 1980, Turkey implemented three different exchange rate regimes. Between 1980 and 2000, a dirty float was implemented, after 2000 until the February 2001 crises a crawling peg regime was implemented and since then a free floating exchange regime has been implemented. YTL indices for the real exchange rate are prepared by the Central Bank of Turkey, the State Planning Institute, Reuters and J. P. Morgan. We use the Central Bank of Turkey's annual effective exchange rate indices for 1988-2006, which are calculated (according to the IMF definition), with 19 countries and 29 exchange rates and deflected by consumer prices (1995=100) (See Figure 5 and Figure 6). An increase in the index means an appreciation of YTL. The data source is the Electronic Data Delivery System (EDDS) of Central Bank.
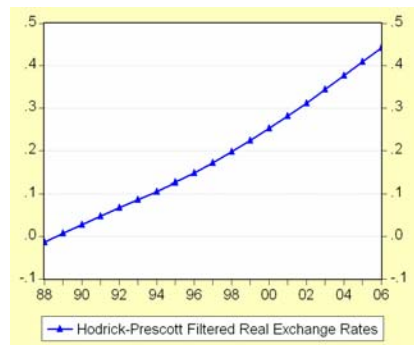
---

[29] Belgium, Germany, Spain, France, Switzerland, Nederland, Italy, Japan, U.K., U.S.A., Sweden, Austria, Canada, Korea, Taiwan, Iran, Brazil, China, Greece

FIGURE 5: Real Exchange

Real Exchange Rate (Logarithm)

FIGURE 6: Hodrick-Prescott Filtered Real Exchange Rates

Hodrick-Prescott Filtered Real Exchange Rates

5.2   Testing For Unit Root

In this part, we will present the unit root test results for the data sets. The following figures (1-8) show the levels and growth rates of total unemployment rate, urban unemployment rate, and real GDP and real exchange rate (RER) correspondingly. It can be seen from figures 7, 9, 11, 13 that the unemployment rates, real GDP and RER are at least I (1). In the plots in Figures 8, 10, 12 and 14, the growth rates seem to be I (0). The Augmented Dickey Fuller test results in Table 5 verify the claims based upon the figures.
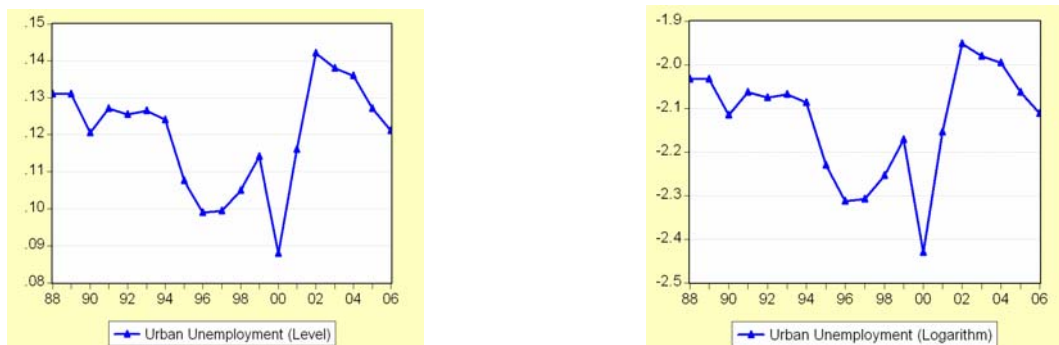
FIGURE 7: Level and Log Level of Unemployment Rate

Unemployment Rate (Level)
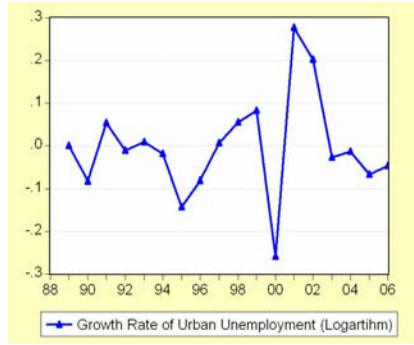

Unemployment Rate (Logarithm)
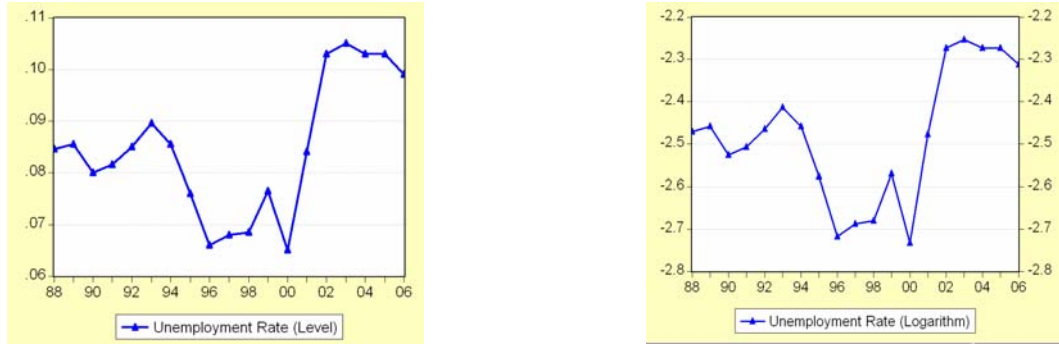
FIGURE 8: Growth Rate of Unemployment

Growth Rate of Unemployment (Logarithm)
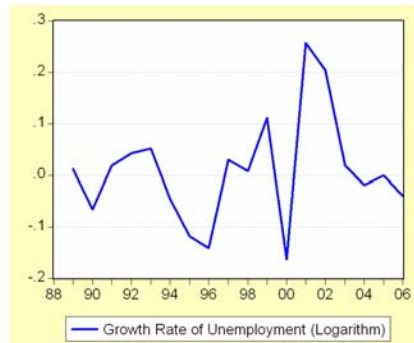
FIGURE 9: Level and Log Level of Urban Unemployment Rate

Urban Unemployment (Level)

Urban Unemployment (Logarithm)

FIGURE 10: Growth Rate of Urban Unemployment

Growth Rate of Urban Unemployment (Logartihm)

FIGURE 11: Level and Log Level of Real GDP

Real GDP (Level)

Real GDP (Logarithm)
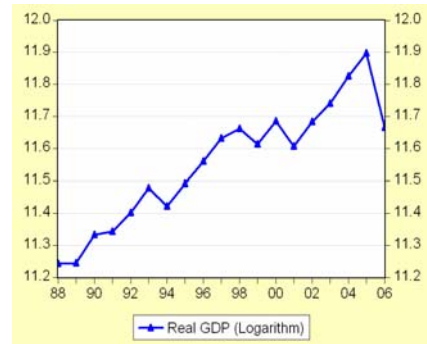
FIGURE 12: Growth Rate of Real GDP

Growth Rate of GDP (logarithm)
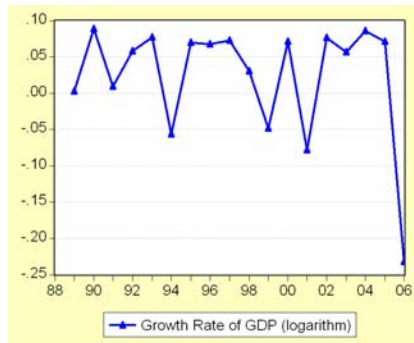
FIGURE 13: Level and Log Level of Real Exchange Rate
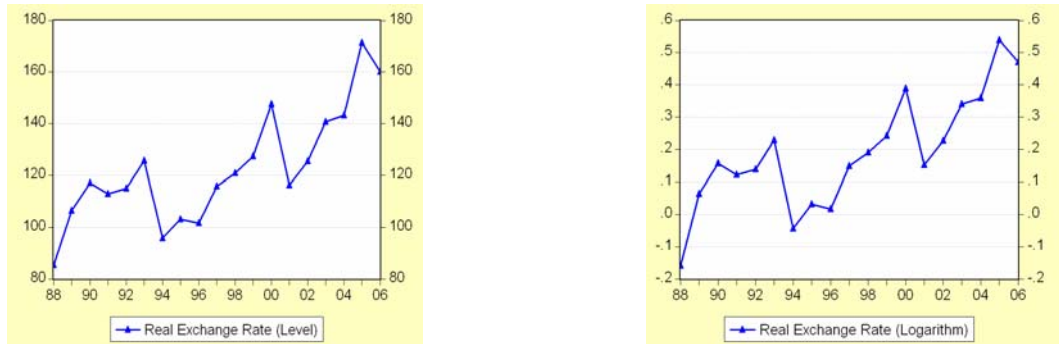
FIGURE 14: Growth Rate of Real Exchange Rate

TABLE 5: Augmented Dickey-Fuller Test Statistic[30]

	Variables			
Null Orders	LU	LUKENT	LGDP	RER
I (0)	-1.555126	-2.062348	-2.904800	-3.129863
I (1)	-3.617579 (**)	-4.277717(*)	-3.972487(*)	-5.595251(*)
I (2)	-6.015977 (*)	-6.101479(*)	-5.407643(*)	-7.579927(*)

---

[30] For the given variables ADF test statistics are reported. All regressions include an intercept term. Only I (0) null order includes trend. For all regressions, zero lagged differences are allowed. Asteriks indicate the significance levels (*) 1%, (**) 5%, (***) 10%.

5.3   Empirical Model and Estimation

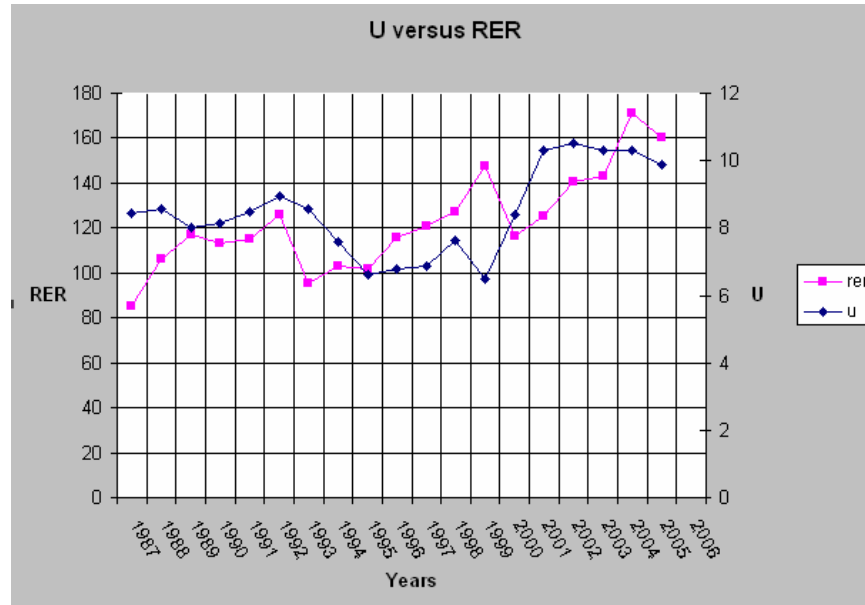
FIGURE 15: Unemployment Rate vs. Real Exchange Rate

Figure 15 shows two series together namely RER and unemployment in Turkey between 1988and 2006. It is necessary to mention that, according to the data collected by the Central Bank of Turkey, an increase in the real exchange rate index means an appreciation of the Turkish Lira. Therefore, movements of RER and unemployment in the same directions can be observed in figure 15, i.e. 1996-1999. An increase in RER index, which means an appreciation of the domestic currency, is associated with a higher unemployment rate and vice versa. To explain the relationship between unemployment and RER, we formulated the following empirical model through some regression analysis. The model we determine to estimate is:

$$\log U_t = \alpha + \beta_i \log GDP_{t-i} + \theta_i \log RER_{t-i} + \gamma_i Trend + \varepsilon_t \quad \text{Eq 5.1}$$

where GDP and RER are real gross domestic product (constant prices, 1987=100) and real exchange rate index (real exchange rate deflected by CPI 1995=100) respectively. The variable trend has been considered in the regression model in order for it to find any autonomous trend in unemployment. β_1 is the intercept coefficient and ε_t is the disturbance term which is white noise ($\varepsilon_t \sim N(0,\delta^2)$). Annual data are used from 1988 to 2006. The model starts with lag number i=3. We decided to use the longest lag length as i=3 by looking at Akaike and Schward's criteria. Then we applied a sequential reduction process, which is basically the elimination of statistically insignificant variables one by one starting from the longest lag. The reduced form of the model we obtained is the following:

Model 1:

$$\log U_t = \beta_1 + \beta_2 \log GDP_{t-2} + \beta_3 \log GDP_{t-3} + \beta_4 \log RER_{t-2} + \beta_5 Trend + \varepsilon_t$$

TABLE 6: The Main Results of Least Squares Estimation for Total

Unemployment in Turkey[31]

	Coefficients	t-stat
β_2	-2.156703	-3.654933*
β_3	-0.738575	-1.740147***
β_4	1.109601	5.589398*
β_5	0.095392	4.801711*
R^2	0.872855	
S.E. of Regression	0.070968	
F – Stat	18.87889	
Durbin – Watson Stat	1.833717	
Normality $\chi^2(2)$	1.043531	
AR_{1-3}, F_{df}	0.050937 (4.033058)	
$ARCH_1$, F_{df}	0.820654 (0.305855)	
RESET, F_{df}	0.428024 (1.033903)	

In terms of diagnostic test statistics, the estimated model shows serial autocorrelation. (See AR_{1-3} F= 0.05), and the normality of the residuals is accepted according to the Jarque-Bera statistic (See χ^2 (2) =1.0435). $ARCH_1$F (1, 16)

---

[31] The Jarque-Bera statistic has a distribution χ2 with 2 degrees of freedom under the null hypothesis of normally distributed errors. F_{ARi-j} is a test for ith or jth order autocorrelation suggested by Breusch-Godfrey Lagrange Multiplier test. F_{ARCHi} is the ARCH test (AutoRegressive Conditional Heteroscedasticity) due to Engle (1982) (The meaning of the asterisks: The coefficients with (*) are significant at 1% significance level, with (**) are significant at 5% significance level, and with (***) are significant at 10% significance level. The coefficients without an asterisk are not significant.)

=0.8207 do not reject the homoscedasticity of the residuals. Moreover, according to the RESET test, we accepted the null hypothesis of the correct specification of our original model (1). The standard error of the estimation is 0.070968. Our prediction appears to be accurate for Turkish unemployment. For the existence of structural breaks in the data, we tested the null hypothesis of 'no structural change in any parameter between the two sample periods' against 'structural change in any parameter between periods'. For the unavailability due to the sample size, we choose 1998 for the break date. Forecast χ^2 (7) = 0.931842 and the Chow test result 0.607930 showed no misprediction of the model.

For the autocorrelation problem, we decided to use the generalized least squares method. As the model has an AR (1) process, we first estimated $\varepsilon_t = \rho\varepsilon_{t-1} + u_t$ where u_t is white noise ($u_t \sim N (0, \delta^2)$) to find the correlation coefficient of the regression. According to the results, ρ came out as 0.090425. After that we estimated the generalized model below:

Model – 2

$$(\log U_t - \log U_{t-1}) = (1-\rho)\beta_1 + \beta_2(\log GDP_{t-2} - \rho \log GDP_{t-3}) +$$
$$\beta_3(\log GDP_{t-3} - \rho \log GDP_{t-4}) + \beta_4(\log RER_{t-2} - \rho \log RER_{t-3}) + \beta_5(1-\rho)Trend + u_t$$

TABLE 7: The Results for Generalized Least Square Estimation for Total Unemployment in Turkey[1]

	Coefficients	t-stat
β_2	-2.277952	-3.443187*
β_3	-0.710943	-1.603790
β_4	1.118593	5.040240*
β_5	0.088374	4.174691*
R^2		0.859410
S.E. of Regression		0.073008
F – Stat		15.28225
Durbin – Watson Stat		1.883644
Normality $\chi^2(2)$		0.891064
AR_{1-3}, F_{df}		0.072951 (0.3623213)
$ARCH_1$, F_{df}		0.922362 (0.156805)
RESET, F_{df}		0.398069 (1.136459)

To comment on the diagnostic test statistics of equation (2), $AR_{1-3}F= 0.072951$ which implies that autocorrelation is not accepted at 1% and 5% significance levels. Hence, by generalized least squares estimation we overcome the autocorrelation problem.

---

[1] Notes: The Jarque-Bera statistic has a distribution χ2 with 2 degrees of freedom under the null hypothesis of normally distributed errors. F_{ARi-j} is a test for ith or jth order autocorrelation suggested by Breusch-Godfrey Lagrange Multiplier test. F_{ARCHi} is the ARCH test (AutoRegressive Conditional Heteroscedasticity) due to Engle (1982) (The meaning of the asterisks: The coefficients with (*) are significant at 1% significance level, with (**) are significant at 5% significance level, and with (***) are significant at 10% significance level. The coefficients without an asterisk are not significant.)

The main conclusion for the generalized least squares estimation result is that all of the coefficients, except β_3 (the coefficient of the 3rd lag of GDP), are highly significant at 1% significance. β_3, contrary to the least squares estimation, is insignificant. All of the coefficients have the expected signs:

Firstly, real GDP has negative coefficients for both of its lags, β_2 =-2.277952 and although insignificant β_3 =-0.710943. The coefficients' signs confirm the inverse relationship between unemployment and real GDP, which is also suggested by the theory (see Frenkel (2005) for similar findings for other countries namely Argentina, Brazil, Chile and Mexico). The values indicate that a one percent increase in real GDP will cause a 2.27 percent decrease in unemployment two years later. In addition the coefficient of real GDP with 3 year lags is significant at 10 percent significance level and is negatively related to the unemployment rate. A one percent increase in real GDP engenders a 0.711percent decrease in unemployment three years later.

Secondly, RER has a positive coefficient, β_4 = 1.18593. We observed that the similar movement of RER and unemployment in figure 15 is indeed confirmed by our econometric results. In fact, a one percent increase in the RER index, which means a percent appreciation of the Turkish Lira, results a 1.19 percent increase in the unemployment rate after two years.

Finally, the trend has a positive coefficient, β_5 = 0.088734. The autonomous trend that cannot be explained by RER and real GDP has been

captured by the coefficient β₅. The sign shows that unemployment has an increasing trend of 8.87 percent per year.

After analyzing total employments behavior, we repeated the same estimation for urban unemployment in Turkey. Following Akaike and Schward's criteria, we started the model with 3 lags.

$$\log \text{UURBAN}_t = \lambda + \theta_i \log \text{GDP}_{t-i} + \chi_i \log \text{RER}_{t-i} + \phi_i \text{Trend} + \eta_t$$

After sequential reduction, we came up with the following reduced form model:

$$\text{Model} - 3: \log \text{UURBAN}_t = \theta_1 + \theta_2 \log \text{GDP}_{t-2} + \theta_3 \log \text{RER}_{t-2} + \theta_4 \text{Trend} + \eta_t$$

The UURBAN here is the unemployment rates in urban areas, which we defined above. The following table shows the regression results for urban unemployment:

TABLE 8: The Results of Least Squares Estimation for Urban Unemployment in Turkey[1]

	Coefficients	t-stat
θ_2	-2.049357	-3.067231*
θ_3	0.734753	2.733385**
θ_4	0.057961	2.800560**
R^2	0.566250	
S.E. of Regression	0.095186	
F – Stat	5.657070	
Durbin – Watson Stat	1.791592	
Normality $\chi^2(2)$	0.597435	
AR_{1-3}, F_{df}	0.503459 (0.837758)	
$ARCH_1$, F_{df}	0.756086 (0.399995)	
RESET, F_{df}	0.434077 (0.995705)	

All of the coefficients are statistically significant here. Meanwhile, we have similar results to those for total unemployment presented above:

First of all, real GDP has a negative coefficient, θ_2 = -2.049357. The coefficient's sign shows the inverse relationship between the dependent variable and real GDP. The value indicates that a one percent increase in real GDP will yment:

cause a 2.05 percent decrease in unemployment two years later. It can be concluded that the magnitude of the 2nd lag of real GDP is quite similar to the one shown above.

Secondly, RER has a positive coefficient, $\theta_3 = 0.734753$. As with total unemployment analysis urban unemployment has a positive relation with RER. As the RER appreciates by one percent urban unemployment increases nearly by 0.73 percent two years later. Therefore, the direct effect of RER on unemployment in urban areas is approximately 0.4 percent less than it is on total unemployment.

In addition, the trend variable also has a positive coefficient, $\theta_4 = 0.057961$. Different from above the autonomous upward increase in the unemployment rate is slower than the one mentioned for total unemployment. The trend coefficient's value shows an upward trend of unemployment with a yearly 0.057 percent increase.

Diagnostic test statistics shows that the estimated model does not show serial autocorrelation. (See AR_{1-3} F= 0.503), and the normality of the residuals is accepted according to the Jarque-Bera statistic (see χ^2 (2) = 0.597435). $ARCH_1F$ (1, 16) = 0.756086 does not reject the homoscedasticity of the residuals. Moreover, according to the RESET test, we accepted the null hypothesis of the correct specification of our original model (3). The standard error of the estimation is 0.095186. For the existence of structural breaks in urban unemployment data, we tested the null hypothesis of 'no structural change in any parameter between the two sample periods' against 'structural change in any

parameter between periods'. Similar to the total unemployment data analysis, we choose 1998 for the break date due to the size constraint of the data set. The Chow test result 1.292204 showed no misprediction of the model.

5.4   An Alternative Model

As mentioned at the beginning of Section five, Frenkel's (2004) model has some limitations in explicitly capturing the influence of the real exchange rate on unemployment through various channels. One important limitation is that the empirical specification in Equation 5.1 fails to distinguish between development and macroeconomic channels. Moreover, labor intensity channel is presented with the real exchange rate although it does not have a direct effect on unemployment.

In order to catch the effect of the three channels more explicitly, an alternative specification is being proposed:

$$\log U_t = \alpha + \beta_i \log GDP_{t-i} + \theta_i (\frac{K_m}{L_{man}})_{t-i} + \gamma_i Trend + \varepsilon_t$$

where U is unemployment rate, GDP is real GDP, K_m is the amount of imported capital and L_{man} is the employment level in manufacturing sector.

As mentioned in Chapter 3, in the macroeconomic channel, the real exchange rate influences unemployment through the activity level, by changing the level of exports. Turkish data shows that there is a negative correlation (- 0.53) between the real exchange rate and real exports (See Table 9), which means an

appreciation in the real exchange rate decreases real exports. The high positive correlation between real exports and real GDP shows that a decrease in real exports decreases real GDP (See Table 9). A decrease in real GDP increases unemployment. Therefore, an appreciation in the real exchange rate decreases unemployment via the macroeconomic channel.

TABLE 9: Correlation Matrix of the Real Exchange Rate, Real Exports and Real GDP

	Real Exchange Rate	Real Exports	Real GDP
Real Exchange Rate	1.000000	**-0.534371**	0.831637
Real Exports	**-0.534371**	1.000000	0.844458
Real GDP	0.831637	0.844458	1.000000

Secondly, in the development channel, the real exchange rate influences unemployment by changing the growth rate of GDP. For this channel, we searched the lagged variables of the real GDP as a proxy to the development channel.

Finally, in the labor intensity channel, the real exchange rate affects unemployment by changing the relative price of capital and labor. A depreciation in the real exchange rate increases the price of imported capitals compared to the price of labor. If technology would allow substitution of labor for imported capital, firms would tend to substitute labor for capital and this would result in reducing unemployment. It is proposed to employ the ratio of imported capital to

labor in manufacturing as a more direct proxy to measure the impact of real exchange rate on unemployment. According to Turkish data both the real exchange rate and unemployment is positively correlated to the ratio of the imported capital to the manufacturing sector employment (See Table 10).

TABLE 10: Correlation Matrix of the Real Exchange Rate, Unemployment and the Ratio of Imported Capital to the Manufacturing Sector Employment

	Real Exchange Rate	U	K_m/L_{man}
Real Exchange Rate	1.000000	0.411464	0.645484
U	0.411464	1.000000	0.504750
K_m/L_{man}	0.645484	0.504750	1.000000

The reduced form of the model after sequential reduction is as follows:

$$\log U_t = \alpha_1 + \alpha_2 \log GDP_t + \alpha_3 \log GDP_{t-1} + \alpha_4 (\frac{K_m}{L_{man}})_t + \alpha_5 Trend + \varepsilon_t$$

TABLE 11: The Results for Least Square Estimation for Total

Unemployment in Turkey with the Alternative Model[1]

	Coefficients	t-stat
α_2	-1.360366	-1.958544***
α_3	-0.974911	-1.972937***
α_4	0.090843	2.053178***
α_5	0.074062	2.886203**
R^2		0.519938
S.E. of Regression		0.127784
F – Stat		3.249187
Durbin – Watson Stat		1.003055
Normality $\chi^2(2)$		0.397851
AR_{1-3}, F_{df}		0.136094 (2.392023)
$ARCH_1$, F_{df}		0.942428 (0.126194)
RESET, F_{df}		0.490012 (0.873552)

In terms of diagnostic test statistics, AR_{1-3} F= 0.136094 implies that serial autocorrelation is rejected at 10 percent significance level. According to Jarque-Bera statistic (See χ^2 (2) = 0.397851)), the normality of the residuals is accepted. $ARCH_1$, F (1, 16) = 0.942428 do not reject the homoscedasticity of the residuals.

---

[1] Notes: The Jarque-Bera statistic has a distribution χ2 with 2 degrees of freedom under the null hypothesis of normally distributed errors. F_{ARi-j} is a test for ith or jth order autocorrelation suggested by Breusch-Godfrey Lagrange Multiplier test. F_{ARCHi} is the ARCH test (AutoRegressive Conditional Heteroscedasticity) due to Engle (1982) (The meaning of the asterisks: The coefficients with (*) are significant at 1% significance level, with (**) are significant at 5% significance level, and with (***) are significant at 10% significance level. The coefficients without an asterisk are not significant.)

In addition, according to RESET test we accept the correct specification of the given model. The standard error of the model is 0.127784.

The main conclusion for the estimation results is all of the coefficients are significant at 10 percent significance level. Moreover, all coefficients have the expected signs according to the methodology given in this subsection:

Firstly, real GDP has a negative sign, α_2 = -1.360366. The coefficient's sign confirms the effect of the real exchange rate through the macroeconomic channel: a one percent increase in real GDP will cause 1.36 percent decrease in unemployment by increasing exports.

Secondly, the one period lagged GDP variable also has a negative sign, α_3 = -0.974911. This suggests that a one percent increase in real GDP will decrease unemployment by 0.97 percent with one period lag through creating new jobs. This result is consistent with the development channel argument.

Moreover, the proportion of imported capital to labor in manufacture has a positive sign as expected, α_4 = 0.090843. This result shows that a one percent increase in the the ratio of imported capital to the manufacturing sector employment level increases unemployment by 0.09 percent due to the change in relative price of imported capital and labor. This is also in accordance with the effect of the real exchange rate via labor intensity channel.

Finally, Trend has a positive coefficient, $\alpha_5 = 0.074062$. The autonomous trend that can not be explained by the independent variables in the model has been captured by this which shows that unemployment has an increasing trend of 0.07 percent.

By the alternative model, we achieved to distinguish the channel effect of the real exchange rate which was ambiguous in Frenkel (2004). Our choice of variables is supported by the correlation coefficients presented in this subsection. In addition, the alternative model we suggest overcomes the limitations of Frenkel's (2004) model. The results show that the effect of the real exchange rate through three channels which is summarized in the theoretical literature, is confirmed by the Turkish data.

5.5   Results

The estimation results, which are the extension of Frenkel (2004) for Turkey, show that depreciation in the real exchange rate decreases unemployment, which in turn increases employment in Turkey. The variables of GDP reflect the indirect effects of the real exchange rate on unemployment via the level and growth rate of output, namely the macroeconomic and development channels. Therefore, the variable RER shows the remaining effect attributed to the labor intensity channel. Firstly, the total effect of the real exchange rate on unemployment via the macroeconomic and development channel is also positive because a depreciation in the real exchange rate increases the level and growth rate of GDP, which in turn decrease unemployment. Secondly, as the theory suggests, the real exchange rate affects unemployment positively through the

labor intensity channel, which means an appreciation in the real exchange rate increases both total unemployment and urban unemployment in Turkey.

By the alternative approach we presented in subsection 5.4, we achieved to distinguish the separate effects of the three channels. According to the estimation results through the macroeconomic channel an appreciation in the real exchange rate increases unemployment by decreasing exports and hence real GDP. Through development channel, an appreciation of the real exchange rate increases unemployment by destroying current job areas. Finally, via labor intensity channel, an appreciation causes a decrease in relative price of imported capital against the price of labor which causes firms to switch to imported capitals and hence increases unemployment. The estimation results are in accordance with the channels of influence of the real exchange rate on unemployment as methodology suggests.

Branson and Love (1988) detected a relationship between the real exchange rate and unemployment. Revenga (1992) concludes that a real exchange rate appreciation decreases employment especially in industries that are in more competitive import sectors. Klein, Scott and Triest (2000) focused on openness as an influence channel of the real exchange rate on employment. According to them, the real exchange rate affects employment through either changing relative prices of internationally traded goods or generating a wide range of responses within the industries due to difference in trade patterns across industries. Campa and Goldberg (2001) considered three channels, export orientation, import penetration and imported inputs but they did not consider the endogeneity of exchange rates in their study. Gourinchas (1998) considered the endogeneity of

exchange rates, but did not take into account the channels of influence mentioned in Campa and Goldberg (2001). In our study, we consider macroeconomic channel, development channel and labor intensity channel in determining how the real exchange rate influences unemployment. In contrast to the literature above, which used manufacturing sector employment in their analyses, we use total unemployment figures in our estimation.

Both of our findings are consistent with the literature given in chapter 2 except for Filiztekin (2004). Contrary to our argument, he suggests that the net effect of a depreciation is negative for employment. The reason behind this may be the difference between the periods of interest: we analyzed the 1988-2006 period whereas Filiztekin (2004) investigated the 1981-1999 period. As mentioned in subsection 5.1.1 the definition of the labor force statistics before the 1988 Labor Force Surveys were different from those after. The data before 1988 and after 1988 need special attention due to this structural break. In addition, we used total unemployment figures for Turkey and urban regions in our estimation while Filiztekin (2004) used the employment figures in the manufacturing sector, which is highly dependent on imported capital goods and imported intermediate goods. As Campa and Goldberg (2001) argue the real exchange rate can affect employment ambiguously with the more intensive use of imported inputs depending on the assumed structure of production. For the entire economy, we find that depreciation in the real exchange rate decreases unemployment since our data includes total unemployment and urban unemployment rates for Turkey.

CHAPTER 6

CONCLUSION

The Turkish economy experienced a massive liberalization period in the 1980s. However, the transformation was not supported by institutional developments. As a result, the Turkish economy faced many bottlenecks and experienced many crises afterwards, such as 1980, 1994, 2000-2001 crises. Throughout these periods, one of the serious long-term problems of the Turkish economy was unemployment. A high and consistent unemployment rate is an indication of a serious amount of idle capacity in Turkey. Moreover, unemployment decreases income and creates income inequalities. People experience loss of skills and capacities when they remain unemployed for a long time. Especially in the last five years, this is more apparent. Despite the high rate of output growth (more than 35 percent in the post 2001 crisis period), the unemployment level has stayed consistently above 10percent due to the failure of the Turkish economy to create adequate jobs[2].

---

[2] http://turkisheconomy-watch.blogspot.com/2006/09/jobless-growth-in-turkey.html

The aim of this thesis is to analyze the influence of the real exchange rate on total and urban unemployment in the Turkish economy over the 1988- 2006 period using the original work by Frenkel (2004) for Turkey. According to the author's classification the real exchange rate influences employment (unemployment in our case) through three different channels: macroeconomic channel, development channel and labor intensity channel. In this thesis, these channels of influence are taken into account in the determination of unemployment's response to changes in the real exchange rate. The estimation results show that the real exchange rate influences unemployment positively through the labor intensity channel for both total and urban unemployment in Turkey. The net effect of the real exchange rate through the macroeconomic and development channels is also positive for both unemployment values, which means that depreciation in the real exchange rate decreases both total unemployment and urban unemployment in Turkey.

Due to the limitations of Frenkel's (2004) to distinguish the separate effect of the three channels; the macroeconomic channel, the labor intensity channel and the development channel, we suggested an alternative model. According to the estimation results of our model through the macroeconomic channel a depreciation in the real exchange rate decreases unemployment by increasing exports and hence real GDP. Through development channel, a depreciation of the real exchange rate decreases unemployment by creating new jobs. Finally, via labor intensity channel, a depreciation causes an increase in relative price of imported capital against the price of labor which causes firms to switch from imported capitals and hence increases unemployment. The estimation

results are in accordance with the channels of influence of the real exchange rate on unemployment as methodology suggests.

Both of our estimation results are consistent with most of the literature presented: Revenga (1992), Gourinchas (1998), Faria and Leon-Ledesma (2004), Kim and Kinal (2004), Galindo, Izquierdo and Montero (2006), Burgess and Knetter (1998), Campa and Goldberg (2001), Frenkel (2004), etc. Branson and Love (1988) detected a relationship between the real exchange rate and unemployment. Revenga (1992) concludes a real exchange rate appreciation decreases employment especially in industries that are in more competitive import sectors. Klein, Scott and Triest (2000) focused on openness as an influence channel of real exchange rate on employment. According to them, the real exchange rate affects employment through either changing relative prices of internationally traded goods or generating a wide range of responses within the industries due to differences in trade patterns across industries. Campa and Goldberg (2001) considered three channels, export orientation, import penetration and imported inputs but they did not consider the endogeneity of exchange rates in their study. Gourinchas (1998) considered endogeneity of exchange rates, but did not take into account the channels of influence mentioned in Campa and Goldberg (2001). In our study, we consider the macroeconomic channel, development channel and labor intensity channel in determining the influence of the real exchange rate on unemployment. Contrary to the literature above which used manufacturing sector employment in the analyses, we use total unemployment figures in our estimation. Our results are in accordance with the literature given in chapter 2 except for one: Filiztekin (2004). We attribute this contradiction to some reasons: the difference in the periods taken into account, the

choice of dependent variables and the methodology. First of all, Filiztekin (2004) evaluated the effect of the real exchange rate on manufacturing sector employment over the 1981- 1999 period. This is an important difference because there is a huge structural break in labor force statistics in 1988 resulting from the change in the definitions. Before 1988, the unemployment data from population censuses are not generally sufficient. Moreover, since they cover "persons seeking work", the definitions of the statistics were different from those after the 1988 Labor Force Survey. Therefore, the results reported by Filiztekin containing this structural break are inevitably different from ours. Secondly, Filiztekin (2004) used the employment figures in the manufacturing sector in Turkey, which is, as he underlines, highly dependent on imported capital goods and imported intermediate goods. However, as Campa and Goldberg (2001) argue, the more intensive use of imported inputs can make the effect of the real exchange rate ambiguous depending on the assumed structure of production. For the entire economy, we find that depreciation in the real exchange rate decreases unemployment since our data include total unemployment and urban unemployment rates in Turkey. Therefore, the difference between Filiztekin's (2004) results and ours should not be surprising.

In the 2002- 2006 period the growth rate of the Turkish economy was between 5.8 and 9 percent. Yet this performance did not affect unemployment rates, which were nearly constant during this period. Pamukçu and Yeldan (2005) evaluated this situation in the post-2001 crisis era. They called this performance "jobless growth", which they claim to be a key characteristic of the post- 2001 Turkish growth. This situation is the result of an increase in labor productivity.

For the near future, Turkey needs to create stability in the political, social and economic arenas as recent historical experiences suggest. Our policy recommendation would follow Calvo and Mishkin (2003). Besides the development of good fiscal, financial and monetary institutions, the choice of exchange rate regime is likely to be of second importance. Especially for an emerging market country Turkey, which experienced a rapid liberalization period without necessary institutional infrastructure, this is crucial. Bearing this in mind, Frenkel's (2004) suggestion also points out an important measure for the Turkish economy. One effective policy to increase job creation in the economy is to preserve a stable and competitive real exchange rate. This would be the most effective contribution to economic and employment performance.

SELECTED BIBLIOGRAPHY

Gündoğan, Naci. 2001, *Genç İşsizliği*. Eskişehir Anadolu Üniversitesi Yayınları, No: 1320.

Başol, Koray. 2001.*Türkiye Ekonomisi*). Anadolu Matbaası.

Çelik, Asım. 2003. *Ekonomik Krizler ve Türkiye*. Erciyes Üniversitesi.

Özçam, Mustafa. 2004. *Döviz Kuru Politikaları ve Türkiye'de Döviz Kuru Oynaklığının Etkileşimleri*. Capital Markets Board of Turkey Research Report.

Selçuk, Faruk. 1997. *Con Ahmet'in Devridaim Makinası*. İmge Kitabevi.

Özatay, Fatih. 2000. "The 1994 Currency Crisis in Turkey," *Journal of Policy Reform* Vol. 3, 327-352.

Pamukçu, Teoman and Erinç Yeldan. 2005. "Country Profile: Turkey, Macroeconomic Policy and Recent Economic Performance", March 2005.

Celasun, Merih. 2002. "2001 Krizi, Öncesi ve Sonrası: Makroekonomik ve Mali Bir Değerlendirme".

Özatay, Fatih and Güven Sak. 2002. "Financial Liberalization in Turkey: Why was the Impact on Growth Limited?," *Emerging Markets Finance and Trade*. 38(5): 6-22, (SSCI).

TURKSTAT. 1992. "Statistical Indicators, 1923 - 1990".

TURKSTAT. 1994. "Labor Force Statistics, 1988 - 2006".

Özlale, Ümit and Erinç Yeldan. 2002. "Measuring Exchange Rate Misalignment in Turkey".

Frenkel, Roberto and Martin Rapetti. 2007. Argentina's Monetary and Exchange Rate Policies after the Convertibility Regime Collapse".

Bruton, Henry J. 1998. "A Reconsideration of Import Substitution," *Journal of Economic Literature* XXXVI: 903-936.

Diaz, Alejandro. 1963. "A Note on the Impact of Devaluation and the Redistributive Effects," *Journal of Political Economy* Vol. 71.
Krugman, P. and L. Taylor. 1978. "Contractionary Effects of Devaluation," *Journal of International Economies* Vol 8.

Frenkel, Roberto. 2004. "Real Exchange Rate and Employment in Argentina, Brazil, Chile and Mexico," *İşletme ve Finans*, Sept. 2004.

Burgess, Simon M. and Michael M. Knetter. 1998. "An International Comparison of Employment Adjustment to Exchange Rate Fluctuations," *Review of International Economics*, *Blackwell Publishing*, Vol. 6(1), pg. 151-63, February.

Filiztekin, Alpay. 2004. "Exchange Rates and Employment in Turkish Manufacturing," *International Finance* 0501004, *EconWPA*.

Galindo, A., A. Izquierdo and J. M. Montero. 2006. "Real Exchange Rates, Dollarization and Industrial Employment in Latin America," *Banco de Espana Working Papers* 0601.

Goldberg, Linda and Joseph Tracy. 1999. "Exchange Rates and Local Labor Markets," *Federal Reserve Bank of New York*, Staff Reports 63.

Haltiwanger, John et al. "Effects of Tariffs and Real Exchange Rates on Job Reallocation: Evidence from Latin America," *Discussion Paper Series In Economics And Econometrics 0410*.

Klein, Michael W., Scott Schuh and Robert K. Triest. 2002. "Job Creation, Job Destruction, and the Real Exchange Rate," *NBER Working Papers 7466*.

Campa, Jose Manuel and Linda S. Goldberg. 2001. "Employment versus Wage Adjustment and the US Dollar," *NBER Working Papers 6749*.

Revenga, Ana L. 1992. "Exporting Jobs? The Impact of Import Competition on Employment and Wages in US Manufacturing," *Quarterly Journal of Economics*, 107 (1), pp. 255-284.

Branson, W., and J. Love. 1988. "United States Manufacturing and the Real Exchange Rate" in Richard Marston (ed.), *Misalignment of Exchange Rates: Effects on Trade and Industry,* University of Chicago Press.

http://ekutup.dpt.gov.tr/ab/kep/pep2001.pdf

http://www.byegm.gov.tr/YAYINLARIMIZ/HABERANADOLU/HABER-ANA/2001/12/HA28X12X01.htm

http://turkisheconomy-watch.blogspot.com/2006/09/jobless-growth-in-turkey.html

http://evds.tcmb.gov.tr/

http://www.tuik.gov.tr/VeriBilgi.do

www.statcan.ca/english/freepub/15-515-XIE/2004001/glossary.htm

www.statcan.ca/english/freepub/15-515-XIE/2004001/glossary.htm

http://www.wto.org/english/res_e/booksp_e/anrep_e/anre98_e.pdf

http://www.msxlabs.org/forum/ekonomi/9609-turkiye-ekonomi-tarihi.html

TABLE 12: The Macroeconomic Indicators for Turkey

Years	GDP (level) (a)	GDP (index) (a)	GDP (%Δ) (a)	Infltn. (b)	Real Exc. Rate©	U. Rate (d)	Emp. Rate (e)	X (f)	M (f)	Trade Balance (f)
1987	74721.8	76.334	NA	NA	93.3	NA	NA	10190	-13396	-3206
1988	76306.2	77.953	2.120	75.2	85.3	8.45	52.61	11662	-13475	-1813
1989	76498.3	78.149	0.252	64.3	106.5	8.55	53.10	11625	-15815	-4190
1990	83578.5	85.382	9.255	60.4	117.0	8.00	52.07	12959	-22407	-9448
1991	84352.8	86.173	0.926	71.1	112.9	8.15	52.32	13593	-20883	-7290
1992	89400.4	91.329	5.984	66.0	114.9	8.50	51.23	14715	-22791	-8076
1993	96590.5	98.675	8.043	71.1	125.7	8.95	47.49	15345	-29426	-14081
1994	91320.7	93.291	-5.456	125.5	95.7	8.55	49.97	18106	-22273	-4167
1995	97887.8	100.000	7.191	78.9	103.1	7.60	49.99	21636	-34788	-13152
1996	104745	107.005	7.005	76.5	101.7	6.60	50.17	32067	-42331	-10264
1997	112631	115.062	7.529	99.2	115.9	6.80	48.98	32110	-47158	-15048
1998	116114	118.619	3.092	68.4	120.9	6.85	49.16	30662	-44714	-14052

TABLE 12 (cont'd)

1999	110646	113.033	-4.709	67.0	127.3	7.65	48.67	28842	-39027	-10185
2000	118789	121.352	7.360	39.3	147.6	6.50	46.70	30721	-52680	-21959
2001	109885	112.256	-7.495	67.9	116.3	8.40	45.64	34373	-38106	-3733
2002	118612	121.172	7.942	29.5	125.4	10.30	44.45	40124	-47407	-7283
2003	125485	128.193	5.794	18.3	140.6	10.50	43.23	51206	-65216	-14010
2004	136693	139.642	8.931	8.7	143.2	10.30	43.70	67047	-90925	-23878
2005	146781	149.948	7.380	11.5	171.4	10.30	43.40	76950	-110477	-33527
2006	116389	118.900	-20.706	9.7	160.1	9.90	43.20	91689	-131752	-40063

(a) At constant 1987 prices, Central Bank of Turkey

(b) Consumer Price Index, Source: TURKSTAT, 1987=100

(c) Effective Real Exchange Rate Index calculated (according to IMF definiton) with nineteen countries rates(**) deflected by Consumer Prices (1995=100), Central Bank of Turkey

(**) Belgium, Germany, Spain, France, Switzerland, Nederlands,Italy, Japan, England, USA, Sweden, Austria, Canada, Korea, Taiwan, Iran, Brazil, China, Greece) An increase in the index is the real appreciation of TL.

(d) TUİK, annual, unemployment/labor force (labor force is the sum of employement and unemployment level)

(e)TUİK, annual, employment(defined in the data section)/active population

(f) Exports (X), Imports (M) and Trade Balance, Goods, in million dollars, 1987-1991 is annual data and 1992-.. monthly data, Central Bank of Turkey