

**THE RELATIONSHIP BETWEEN UNEMPLOYMENT
AND GROWTH : AN ECONOMETRIC ANALYSIS IN
THE CASE OF TURKEY**

**M.Sc. Thesis by
Alper TÜMBAL**

Department : Management Engineering

Programme: Management Engineering

Supervisor : Assoc. Prof. Dr. Özlem ONARAN

MAY 2005

**İŞSİZLİK VE BÜYÜME ARASINDAKİ İLİŞKİ:
TÜRKİYE İÇİN EKONOMETRİK BİR ANALİZ
DENEMESİ**

**YÜKSEK LİSANS TEZİ
Alper TÜMBAL
(507021011)**

**Tezin Enstitüye Verildiği Tarih : 9 Mayıs 2005
Tezin Savunulduğu Tarih : 30 Mayıs 2005**

**Tez Danışmanı : Doç.Dr. Özlem ONARAN
Diğer Jüri Üyeleri Yrd. Doç. İpek İLKKARACAN (İ.T.Ü.)
Yrd. Doç. Cem BAŞLEVENT (B.Ü.)**

MAYIS 2005

PREFACE

The urban split in Turkey has been sharpened since the liberalization and privatization policies of the 1980s as Turkish society entered a process of social fragmentation and differentiation. The high unemployment rates and inequality between diverse fragments of society has increased the focus on the performance of the labor markets. Whatever the role of labor markets in achieving the macroeconomic objectives of liberalization and structural adjustment policies, how the labor markets respond to these instruments will certainly affect the distribution of income in the economy, generally against the poor. One of the most momentous influence of economics on society is the effect of production of real output on employment and unemployment of labor. This relation is expressed by the Okun's Law, which implies an inverse relation between output and unemployment rate. The basic aim of this research is to analyze, whether there is a short-term correlation a la Okun between output and unemployment in Turkey and to investigate the significance of this relation. It is also necessary to distinguish the effects of the sources of growth, in particular investments on employment and unemployment. This study also estimates an extension of the Okun's Law for Turkey in order to analyze the role of investments in creating employment.

I would like to express my gratefulness to my dissertation supervisor Assoc. Prof. Dr. Özlem Onaran not only for her precious guidance and supervision, but also for her patience and gracious working conditions, which she has offered without any hesitation, at every step of this study. Without her being, it would be impossible to complete this thesis. I also owe special thanks to Prof. Ümit Şenesen, Prof. Dr. Burç Ülengin, Assist. Prof. Saime Suna Kayam and research assistant Nursel Aydın and Cenk Özbay for their helpful suggestions and assistance.

I would also like to thank the Institute of Science and Technology for making it possible for me to complete this study and my family for their lifetime support and tenderness.

May 2005

Alper Tümbal

LIST OF CONTENTS

ABBREVIATIONS	iv
LIST OF TABLES	v
LIST OF FIGURES	vi
ÖZET	vii
SUMMARY	ix
1. INTRODUCTION	1
2. THE STURCTURE OF THE LABOR MARKET IN TURKEY	5
2.1. Labor Force Participation	5
2.2. Unemployment	8
2.2.1. Unemployment Vs. Growth in Turkey	13
2.3. Employment	20
3. THE RELATION BETWEEN UNEMPLOYMENT AND GROWTH: OKUN'S LAW	23
4. SPECIFICATION OF OKUN'S LAW AND ESTIMATION RESULTS	26
4.1. Estimations of Labor Force Participation	28
4.2. Estimations of Employment	31
4.3. Estimations of Unemployment	44
5. CONCLUSION	60
REFERENCES	64
APPENDIX	67
CURRICULUM VITAE	82

ABBREVIATIONS

OECD	: Organization of Economic Corporation and Development
GNP	: Gross National Product
GDP	: Gross Domestic Product
HLSF	: Household Labor Force Surveys
SIS	: State Institute of Statistics
ILO	: International Labor Office
OLSR	: Ordinary Least Square Regression
RNAGDP	: Real Non-Agricultural Gross Domestic Product

LIST OF TABLES

	Page Number
Table 2.1. Urban Unemployment Rates	10
Table 4.1. Estimation Results for Labor Force Participation Rates of Male	28
Table 4.2. Estimation Results for Labor Force Participation Rates of Male Aged Between 20-24	29
Table 4.3. Estimation Results for Labor Force Participation Rates of Female	31
Table 4.4. Estimation Results of Total Employment	32
Table 4.5. Estimation Results of Total Employment (Investment Added)	33
Table 4.6. Estimation Results of Male Employment	34
Table 4.7. Estimation Results of Male Employment (Investment Added)	35
Table 4.8. Estimation Results of Female Employment	36
Table 4.9. Estimation Results of Female Employment (Investment Added)	37
Table 4.10. Estimation Results of Male Employment in Public Sector	38
Table 4.11. Estimation Results of Male Employment in Private Sector	39
Table 4.12. Estimation Results of Male Employment in Other Sector	40
Table 4.13. Estimation Results of Female Employment in Public Sector	41
Table 4.14. Estimation Results of Female Employment in Private Sector	42
Table 4.15. Estimation Results of Female Employment in Other Sector	43
Table 4.16. Estimation Results of Change in the Total Unemployment Rate	44
Table 4.17. Estimation Results of Change in the Total Unemployment Rate (Investment Added)	46
Table 4.18. Estimation Results of Change in the Total Unemployment Rate (including dummy1994)	47
Table 4.19. Estimation Results of Change in the Total Unemployment Rate (including dummy2001)	49
Table 4.20. Estimation Results of Change in the Male Unemployment Rate	51
Table 4.21. Estimation Results of Change in the Male Unemployment Rate (including dummy1994)	52
Table 4.22. Estimation Results of Change in the Male Unemployment Rate (including dummy2001)	54
Table 4.23. Estimation Results of Change in the Female Unemployment Rate	55
Table 4.24. Estimation Results of Change in the Female Unemployment Rate (including dummy1994)	57
Table 4.25. Estimation Results of Change in the Female Unemployment Rate (including dummy2001)	59

LIST OF FIGURES

	Page Number
Figure 2.1. : Labor Force Participation Rates of Urban Female (%, 1988-2003)	6
Figure 2.2. : Labor Force Participation Rates of Urban Male (%, 1988-2003)	8
Figure 2.3. : Urban Unemployment Rates (%, 1988-2003)	11
Figure 2.4. : Unemployment Rates of Urban Male with respect to Age (%, 1988-2003)	12
Figure 2.5. : Unemployment Rates of Urban Female with respect to Age (%, 1988-2003)	13
Figure 2.6. : Urban Unemployment Rates versus GDP Growth in Non-Agricultural Sector (%, 1988-2003)	17
Figure 2.7. : Changes in Urban Unemployment Rate versus RNAGDP Growth (%, 1988-2003)	18
Figure 2.8. : Investment / RNAGDP Growth (%, 1988-2003)	19
Figure 2.9. : Distribution of Employment in Terms of Economic Activity for Male (%, 1988-2003)	21
Figure 2.10. : Distribution of Employment in Terms of Economic Activity for Female (%, 1988-2003)	21

İŞSİZLİK VE BÜYÜME ARASINDAKİ İLİŞKİ: TÜRKİYE İÇİN EKONOMETRİK BİR ANALİZ DENEMESİ

ÖZET

Gelişmekte olan ülkelerde emek piyasalarının yapısal uyum programları ve istikrar uygulamaları boyunca üstlendikleri en temel rol, bu süreçlerin daha başarılı olabilmesi adına yapılan fedakarlıklardan ibarettir. Yapısal uyum politikaları ilk etapta dar anlamda bir istikrar sürecini ve ardından piyasalarda serbestleşmeyi ve kurumsal reformları içerir. İstikrar uygulamalarının ilk aşamada istihdam ve gelir dağılımı üzerinde yaratacağı olumsuz etki kabul edilmekle beraber, uzun vadede istihdamın artacağı ve gelir dağılımının olumlu yönde gelişeceği öngörülmektedir. Bu süreç boyunca kabul edilen en temel varsayım, ekonomik büyümenin işsizliği azaltacağıdır.

Ne yazık ki, gelişmekte olan ülkelerdeki yüksek ve kalıcı işsizlik oranları gözönüne alındığında, uygulanan ekonomik politikaların ve yapısal uyum programlarının çok da başarılı olduğu söylenemez.

Ekonominin en temel yasalarından birisi olarak kabul edilen Okun Kanunu, büyüme ile işsizlik arasında negatif ve ters yönlü bir ilişkinin varlığını savunur. Bu çalışma, Okun Yasası'nın Türkiye için kısa vadede ne derece geçerli olduğunu incelenmektedir. Bu analiz, Türkiye için özellikle önemlidir. 1980 sonrası uygulanan yapısal uyum programları, işsizlik oranlarında bir azalmaya neden olmamıştır.

İlk bölümde, çalışmanın geri kalan kısmına temel oluşturması amacıyla Türkiye emek piyasalarının yapısı üzerinde durulmaktadır. Bu noktada, işgücüne katılım oranları, istihdam ve işsizlik verileri irdelenerek bazı temel göstergeler verilmektedir.

İkinci olarak, tahmin edilecek denklemin temelini oluşturmak amacıyla Okun Yasası basit bir modelleme ile tanımlanacaktır. Bu noktada yatırımlarının işsizlik ve istihdam üzerindeki olası etkilerinin incelenmesi adına denklemin özelleştirilmesi öngörülmektedir.

Üçüncü bölümde, büyüme ve yatırım oranlarının etkilerinin analiz edilebilmesi için işgücüne katılım, istihdam ve işsizlik değerleri tahmin edilmektedir. Yapılan bu tahminlerin gücünün sınanması adına, farklı yaş ve cinsiyet grupları için yapılan sınamalar tekrarlanmaktadır.

Bu araştırmanın sonuçları, Okun Yasası olarak bilinen ve işsizlik ve büyüme arasındaki negatif ve anlamlı ilişkiyi savunan ekonomik savın Türkiye özelinde kısa vadeli olarak geçerli olmadığını, aksine, temel emek piyasası göstergelerinin, büyümeden ziyade yatırım oranlarına karşı daha duyarlı olduğunu göstermektedir.

Bu noktada, büyümenin kaynağı da işsizliğin önlenmesi adına önem kazanmaktadır. Yeni iş alanlarının yaratılması ve işgücünün niteliğinin iyileştirilmesi yerine kapasite kullanım oranlarının artırılmasına ve emek piyasalarının düzensizleştirilmesine dayalı bir büyüme rejiminin sürdürülebilir olmadığı, son 20 senedir uygulanan yapısal uyum politikalarının geldiği noktanın başarısızlığı ile ortadadır. Yapılan çalışma, bu görüşü destekler niteliktedir. Fiziki yatırımların yanı sıra, yeni yatırımlara dayalı bir büyümeyi destekleyen sistematik bir devlet sanayi politikasının işsizlikle savaşmakta temel oluşturacağı ortadadır.

THE RELATIONSHIP BETWEEN UNEMPLOYMENT AND GROWTH: AN ECONOMETRIC ANALYSIS IN THE CASE OF TURKEY

SUMMARY

The most basic role that the labor markets of developing countries perform throughout structural adjustment programs and stabilization applications is limited with the sacrifices done in the name of success of these programs. Structural adjustment policies consist of a stabilization process –in a rather narrow sense of the term- and institutional reforms. Although it is endured that at the beginning stabilizing interventions badly affect employment patterns and income distribution, an eventual increase in employment and parity in income distribution are predicted for quite long periods. Throughout this process, one of the significant policy assumptions has been that economic growth would reduce unemployment.

However, it is not easy to claim that existing economic policies and structural adjustment programs are successful, given the persistent and high unemployment rates in developing countries.

Okun Law, which is the one of the most indispensable and constitutive theories of economics, defends a negative and significant relation between economic growth and unemployment. This thesis is concerned with examining the relevancy of Okun Law in Turkey in short term. This analysis is especially important for Turkey. The structural adjustment policies after the 1980s have not resulted in lower unemployment rates.

Chapter 1 presents the stylized facts of the Turkish labor markets as a general basis for the rest of the study. Hence through analyzing the ratios of labor force participation rate, employment, and unemployment, some basic signifiers are introduced.

Secondly, Okun Law will be defined through a simple model, to specify the equation that will be econometrically predicted. At this point, the equation will be extended in order to scrutinize the possible effects of investment on employment and unemployment patterns.

In the third chapter, labor force participation rates, employment and unemployment equations are estimated to analyze the effects of growth and investment. With the aim of checking the robustness of those predictions, the analysis is repeated for different age and gender groups.

The results of this study demonstrate that Okun Law, which maintains the negative and meaningful relation between unemployment and growth, is not valid in the case of Turkey for short term. On the contrary, analyses show that labor market outcomes are quite sensitive to investment rates rather than growth.

Here it is easy to notice that the source of growth has also significance in order to reduce unemployment. Considering the evident failure of the structural adjustment policies that were applied in the last 20 years; a growth regime that depends on the increase of capacity utilization rate and destabilization of labor markets, instead of engendering novel job fields and improvement of the workforce qualities, is not sustainable anymore. The results of this thesis support these views. It is obvious that, in addition to physical investments, a systematic state industrial policy to foster growth based on new investments can provide a strong basis for the struggle against unemployment.

1 INTRODUCTION

Labor markets play an essential role in shaping the macroeconomic outcomes of stabilization and adjustment policies and in mediating the effects of these policies on population's standards of living, especially for the poor. A number of monetary and fiscal policy tools are available to realize these goals about inflation, balance of payments and growth. The links between instruments and targets, however, almost always interact with labor markets and their operations (Horton et al., 1994:2). In the mainstream literature, the possible unfavorable outcomes of this interaction were regarded as temporary, and the structural reforms were, celebrated as the painful medicine of the market necessary for recovery- "The market theology's correlative of an Old Testament God whose punishments expiate sin," (McMurtry, 2002:5).

Nevertheless, how the labor market responds to these instruments will certainly affect the distribution of income in the economy. Unfortunately, as Keynes mentioned, "The outstanding faults of the economic society in which we live are its failure to provide for full employment and its arbitrary and inequitable distribution of wealth and incomes via its connections," (Keynes, 1936, p.372). Seventy years after Keynes wrote these words, there are close to 40 million unemployed in the OECD countries, and income inequality is still rising in many developed and developing countries. Moreover, not only have fewer jobs been created per percentage point increases in income growth, but also the jobs created are increasingly ones that pay poorly, which reveals the corruption of these so-called economic connections (Clark and Kavanagh, 1996).

One of the most significant impacts of economic activity on society is the effect of production on employment. This relation is expressed by the Okun's Law, which implies an inverse relation between output and unemployment rate. As originally formulated for the US by Arthur Okun in 1962, it states "In the postwar period, on the average, each extra percentage point increase in the unemployment rate above four percent has been associated with about a three percent decrement in real GNP," (Okun, 1983, p. 148). Since Okun's original publication, the existence of a trade-off between unemployment and output in developed economies has been extensively studied and largely confirmed.¹

According to Okun's Law, growth potential of an economy is widely connected with the unemployment level of the economy itself. The number of the people unemployed is assumed to be minimized as long as the economy is not off its growth potential. The significance of output, and mostly domestic demand in encouraging equally labor demand and investments propose considerable policy implications in order to increase the employment creation capacity and growth potential of the economy.

This debate is remarkably crucial for Turkey. The average annual growth rate of urban employment, which is approximately 2.25 %, is much below what is needed to combat unemployment. The 3.48 % average annual growth rate of non-agricultural GDP in 1980-2003 period is indeed modest given the required performance to catch-up with advanced economies. Furthermore growth in Turkey is generating lesser jobs through time. While the average growth of 1965-79 period is 6.09%, and the employment increase is 4.84%, the average growth of 1980-2003 period is 4.55% and the employment increase is 2.63%. Although part of this could be explained by increased productivity, the lack of a dynamic growth process that generates more jobs is remarkable. Furthermore, the abdication of government responsibility and the sacrifice of workers' living standards to the goal of lower prices and increased business returns do not seem to make the

¹ See Gordon (2003), Lee (2000), and Mankiw (2000)

situation better for creating more jobs. This non-employment-creating-growth performance becomes socially less and less sustainable.

The basic aim of this research is to analyze, whether there is a short-term relation a la Okun between output and unemployment in Turkey and to investigate the significance of this relation.

Nevertheless, in many other developing countries, there is major evidence demonstrating that the economic growth does not necessarily reduce either inequality or unemployment. The weak link between unemployment and change in growth is mostly discussed in regards to reasons, which could generate a lower rate of unemployment during times of recession (Izyumov and Vahaly, 2002). They include, among other factors, the political fear of mass unemployment, the preservation of soft budget constraints in many state-owned and newly privatized enterprises, labor hoarding by firms accustomed to labor shortages, and labor's low geographic mobility. Furthermore, the inadequacy of unemployment protection and the existence of enterprise specific non-wage benefits, such as subsidized housing and childcare, force workers to keep their jobs during recessions, accepting even nominal wage cuts. However, the low response of employment to recession does not necessarily explain why fewer jobs are generated during recovery. There is need to explain the cases when unemployment increased during a recession and did not recover during growth years. An analysis of the cases where high growth fails to decrease unemployment is particularly important for Turkey. After 2001 economic crises, although real GDP increased by 23.8 % in cumulative terms through the recovery phase during 2000-2003 period, the total number of unemployed people raised from 2.830 thousands to 3.608 thousands, by 27.5 %.

It is also necessary to distinguish the effects of the sources of growth, in particular investments on employment and unemployment. Growth based on new investments can create a macroeconomic environment more favorable to job

creation. This study estimates an extension of the Okun's Law for Turkey in order to analyze the role of investments in creating employment.

Since unemployment is a joint outcome of employment and the labor force participation decision, these variables will be discussed separately as well. The analysis covers the period of 1988 and 2003. The main source of data regarding labor force, employment, and unemployment figures in Turkey is the Household Labor Force Surveys (HLFS), published semi-annually by the SIS since 1988 in ILO standards, and quarterly since 2000. However since quarterly data does not supply enough length for a time series analysis, we use the semi-annual data. The analysis is restricted to the urban areas, since the nature of employment in agriculture in the rural areas include a lot of self-employed, as well as non-market work done by unpaid family workers. Also since the gender-based division of labor in the household creates different work and participation patterns for men and women, the analysis is made in a disaggregated fashion for the male and female labor force.

This thesis consists of six sections, including this introduction part. Section II presents the stylized facts of the labor market in Turkey; based on the interaction between labor demand, labor supply both in the formal and informal sectors. Section III outlines the conceptual framework of Okun's law, defining the relation between unemployment rate and the real growth of output. Based on the theoretical background, Section IV presents an empirical analysis of Okun's relation to evaluate the response of unemployment to growth, in order to shed light on the characteristics of employment pattern in Turkey. Finally Section V concludes, and discusses the policy implications for growth and unemployment.

2 THE STRUCTURE OF THE LABOR MARKET IN TURKEY

The high unemployment rates and the inequality in income distribution as a consequence of structural adjustment programs have increased the focus on the functioning of labor markets in the world as well as in Turkey. The mainstream debate in Turkey is mostly centered on the rigidities in the labor market, and the suggestion is deregulation of the labor market in order to increase the international competitiveness of firms. However the critiques of this approach suggest that the integration to global markets is managed via deterioration in the living and working standards of employees (Boratav and Yeldan, 2002; Onaran and Yenturk, 2001; Onaran 2002.).

This section will steer the general features of the Turkish labor market and present the stylized facts regarding labor force participation, employment and unemployment based on the Household Labor Force Surveys published by the State Institute of Statistics. Also, all figures were drawn founded on the data of Household Labor Force Surveys published by SIS. Although the significance of the informal labor market in Turkey is beyond the scope of this study, the consequences of the presence of this sector is worth to explore in order to understand structure of labor markets.

2.1 Labor Force Participation

In Turkey, although the working age population is increasing faster than the overall population, this increase in working age population is not reflected to the labor force. The labor force participation rate has been continuously declining,

compared to 1960s (Tunali, 1997). This decline is particularly visible for the female participation rates, as an outcome of urbanization. While the proportion of females is nearly the 52.6% of whole population at working age, their share in labor force is at approximately 27.5% as of 2003 in urban areas.

Figure 2.1 shows the labor force participation rates of the urban women. This ratio analyzed by a gender perspective brings out remarkable disparities between female and male population; especially disaggregation with respect to age makes the results more meaningful. The participation rates for urban women are more or less stable except the decrease in the participation rate in the age group of 15-19, and the increase in the age group of 20-24, which is a positive development. The increase in the enrollment to high school can explain the decline in the participation rate of age group 15-19 through the years 1988 to 2003. Meanwhile, the labor force participation rate of urban women aged between 20-24 has increased nearly 2.3 point from 25.60% to 27.90%. This increase reached its peak at October 2002 with a participation rate of 29.75%.

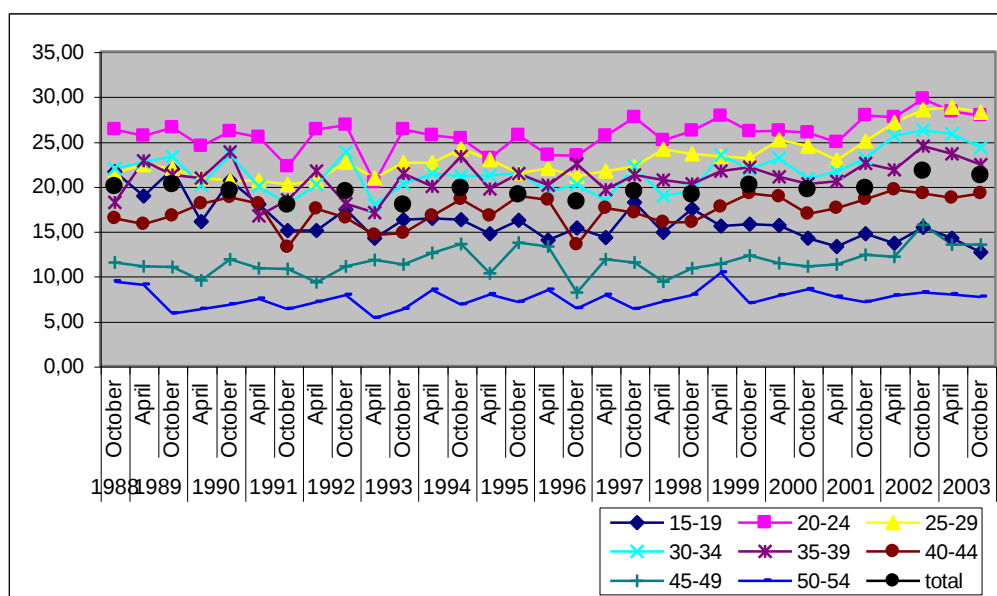


Figure 2.1 Labor Force Participation Rates of Urban Female (% , 1988-2003)

The female labor force participation rates increases especially during the 1994 and 2001 economic crises. This added worker effect during a crisis, top compensate the decline in the household income is very visible during the crisis years in Turkey. Onaran and Başlevent (2003) also find evidence on the domination of added worker effect to discouraged worker effect for female labor and cite the necessity of improvements in the demand side of the market, as well as providing women with the right kinds of labor market skills in order to achieve a permanent increase in women's participation.

Figure 2.2 demonstrates the labor force participation rates of urban male in the period of 1988 and 2003. The steadiness of the labor participation rate is similar for the male participation rates for the age groups of 25-29, 30-34, 35-39 and 40-44, however at remarkably higher rates. This steadiness of the high participation rates of urban male can be interpreted as an endeavor of these age groups to carry on their individual responsibilities due to the social division of labor in the household, since its commonly admitted that men are the main breadwinner of the household.²

On the other hand, for the age groups of 15-19 and 20-24, the participation rates have been reduced dramatically, from %84.90 to %62.50 and %56.10 to %29.65 respectively. While the former could be due to increased school enrollment, the latter is also related to discouragement of the youth through high unemployment rates³. The most steady groups in terms of labor force participation seem to be the men between the ages of 30-34, 35-39 and 40-44 at almost %100 percent participation levels whereas participation for the age groups of 45-49 and 50-54

² The hegemonic construction of masculinity in Turkish society mostly depends on self-dependency and bread-winning commitment. Being jobless for women aged between 15-24 is more tolerable than men at the same age group through familial connections and social networks. (Ozbay and Balic, 2004) For more, see "Toplum ve Bilim" Special Edition, Winter 2004.

³ The young male/female labor participation rates must also be dealt within their familial connections. The military duty obligation for men and living with family until getting married for women also influence the low rates of participation rates.

are lower, and decreasing through time due to early retirement possibilities for these groups.

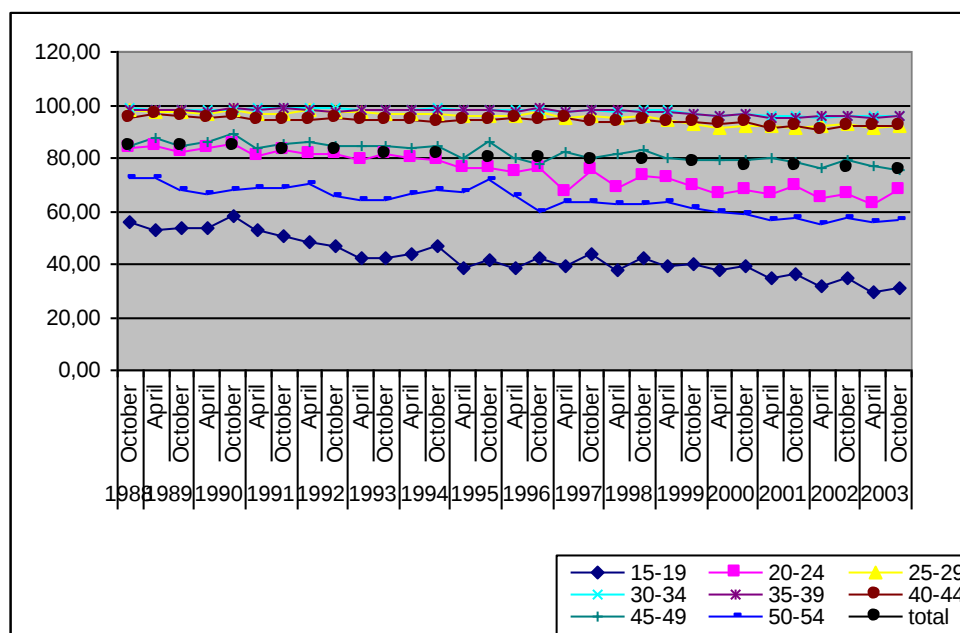


Figure 2.2 Labor Force Participation Rates of Urban Male (% , 1988-2003)

2.2 Unemployment

İlkkaracan and Selim (2003) indicate that the orthodox thinking of economics points the neoclassical supply and demand model for the explanation of unemployment phenomena. On the other hand, against orthodox point of view, Keynesian approach considers unemployment as a matter of effective demand and ponders any wage-setting mechanism inadequate to alter this demand.

Employment creation and unemployment have been a serious problem for Turkey for years. According to SIS (in line with ILO definitions), unemployment is defined as the state of being jobless during the period of the survey, for people above the age of 15, who are presently available for work and in search of job. Table 2.1 below shows the unemployment rates (%) and percentage changes of

them for both urban male and female between 1988 and 2003. All values are the shares in the non-institutional civilian population at the age of 15 years and over.

The problem of unemployment is more outstanding in the urban areas both for men and women. The unemployment rate for the urban male has been continuously increasing except for the modest declines in 1995 and 1999. Moreover, thanks to flexible wages, unemployment rates do not rise as much as it could. It is commonly admitted that people are ready to work with low wages especially during the era of economic crises rather than losing their current jobs. This is mainly widespread among males aged between 24-44, who are supposed to be household heads. Since they cannot afford to be unemployed for long periods, they choose to be employed with low wages thanks to downward flexibility of wages.

Meanwhile, a decline in the female unemployment rate from 28.70% to 17.80% through the years 1988 to 2003 does not mean an elevated win too, given the latest increases after the 2001 crisis. Also the unemployment rate is still very high compared to the men. Female unemployment is nearly two times of the male unemployment in urban areas, which is certainly generating a discouraging effect for the labor force participation rates of women in Turkey.

Table 2.1 Urban Unemployment Rates (% , 1988 –2003)

Years		Unemployment Rate Male (u)	Change in u (male) (1)	Unemployment Rate Female (u)	Change in u (female) (1)
1988	October	9,539		28,87	
1989	April	9,952		25,64	
	October	9,706	0,018	27,65	-0,042
1990	April	10,689	0,074	26,94	0,051
	October	8,345	-0,14	21,11	-0,237
1991	April	10,981	0,027	22,011	-0,183
	October	10,574	0,267	23,92	0,133
1992	April	11,234	0,023	21,17	-0,038
	October	10,566	-0,001	21,61	-0,097
1993	April	10,721	-0,046	22	0,039
	October	10,627	0,006	24,27	0,123
1994	April	11,97	0,117	20,88	-0,051
	October	9,555	-0,101	20,97	-0,136
1995	April	10,011	-0,164	17,19	-0,177
	October	8,146	-0,147	20,33	-0,031
1996	April	8,927	-0,108	15,05	-0,124
	October	8,947	0,098	16,47	-0,19
1997	April	8,796	-0,015	15,35	0,02
	October	7,955	-0,111	20,05	0,217
1998	April	8,908	0,013	16,32	0,063
	October	9,387	0,18	17,24	-0,14
1999	April	11,468	0,287	17,75	0,088
	October	8,916	-0,05	18,05	0,047
2000	April	8,698	-0,242	14,46	-0,185
	October	7,32	-0,179	12,32	-0,317
2001	April	9,547	0,098	16,11	0,114
	October	11,355	0,551	17,76	0,442
2002	April	13,301	0,393	17,91	0,112
	October	13,109	0,154	19,97	0,124
2003	April	13,157	-0,011	19,17	0,07
	October	11,961	-0,088	17,84	-0,107

(1) Average annual percentage change for the period

Figure 2.3 below shows the unemployment rates both for urban male and female between the years 1988 and 2003. Although the unemployment rates seem to be decreasing for women and stable for men until 1999, they happen to increase drastically without diminishing in the next four years. After 2001 crisis, the unemployment rates unfortunately have stabilized at very high points. The unemployment rate for women is nearly %19.70 while this rate is practically

%13.10 for men. These unemployment rates are quite high and need to be investigated carefully.

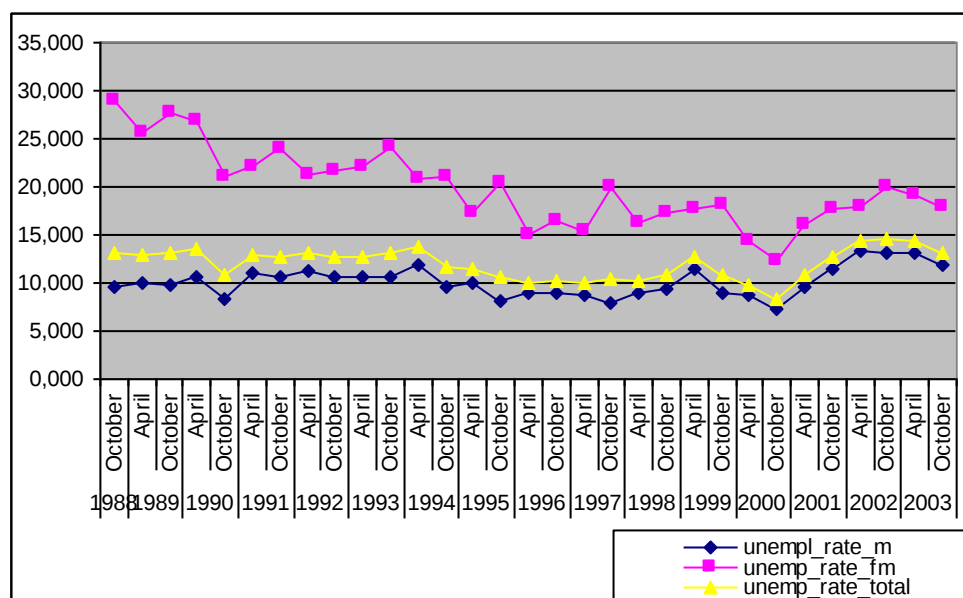


Figure 2.3 Urban Unemployment Rates (% , 1988-2003)

Another interesting point, which must be considered precisely, is the high unemployment rates of men between the age groups of 25-34 and 35-54, where the labor force participation rates are quite stable. The poor linkage between the labor force participation rate and the number of people employed can prove that the unemployment phenomena is not just about the labor supply but about the labor demand and the capacity of the economy to create new working areas. Figure 2.4 and 2.5 shows the unemployment rates of urban male and female between the years of 1988 to 2003 according to the age groups, respectively.

Unemployment is eve more dramatic for the urban youth. The highest unemployment rate is among the 20-24 year-old young people, for both female and male. However, youth unemployment is more prominent for the male. As shown in Figure 2.4, the unemployment rate of men aged between 20-24 is fluctuating between %16.01 and %25.27. The share of workers who contribute to

labor force and who are employed within total working-age population both increase progressively as age increase to 25-44, and gradually declines then after. The topmost level for the share of unemployed within total working-age population is at the age of 20-24. The reason for the unemployment rate being highest for the 20-24 age group may result from low opportunities of employment for the inexperienced labor force, skill mismatches and longer- job seeking periods for the new entrants (Onaran and Yentürk, 2001).

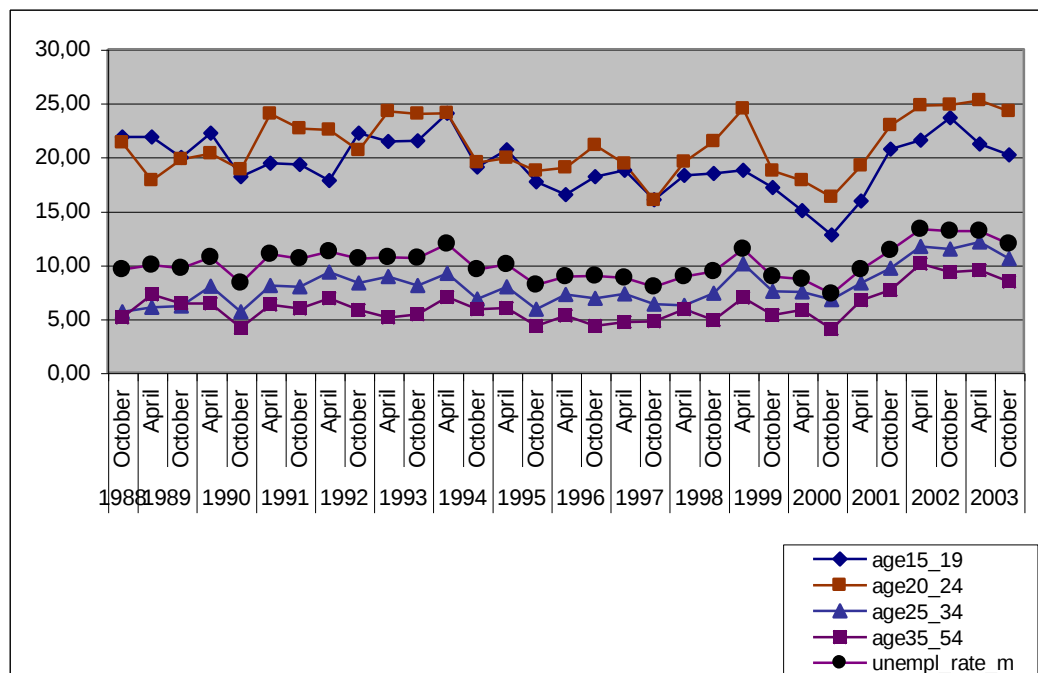


Figure 2.4 The Unemployment Rates Of Urban Male with respect to Age (% , 1988-2003)

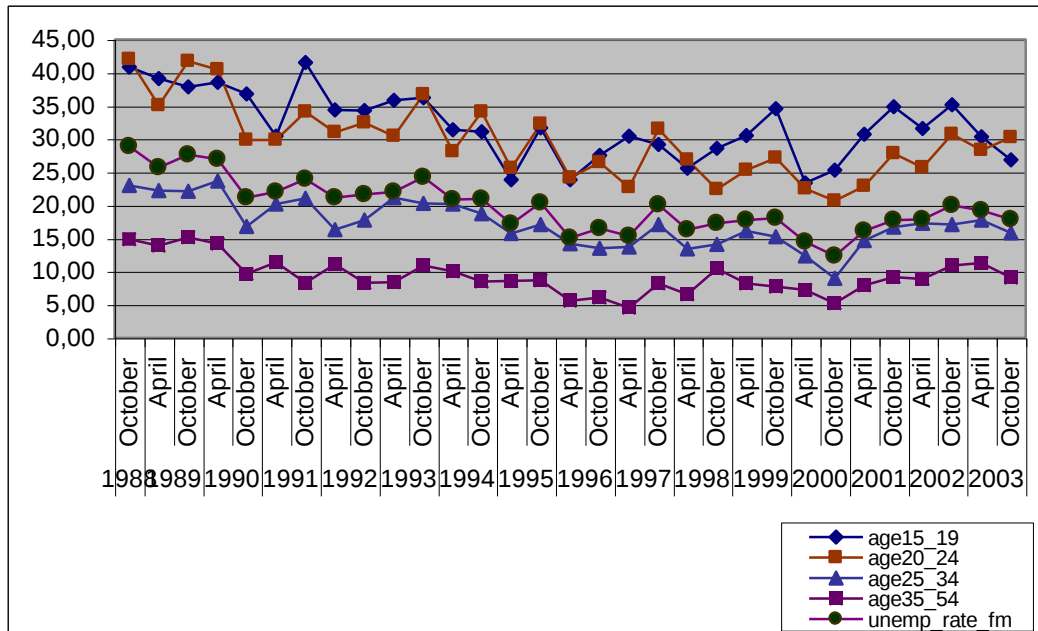


Figure 2.5 The Unemployment Rates Of Urban Female with respect to Age (% , 1988-2003)

2.2.1 Unemployment Vs. Growth in Turkey

The urban split in Turkey has been sharpened since the liberalization and privatization policies of the 1980s as Turkish society entered a process of social fragmentation and differentiation (Gürbilek, 1992; Gürbilek, 2001; Işık and Pınarcıoğlu, 2001; Kandiyoti, 2002). New squatter districts continued to join the older ones as more and more peasants come to the cities meaning more unskilled labor force, while income and consumption gaps between different segments of society became more visible. Even though it has existed before, spatial segregation engendered a feeling of a divided city with opaque and impermeable borders not only geographically but also culturally.

Turkish modernization has always deemed problematical because it was controlled and governed by the surveillance and direct intervention of the nation

state since its inception, and worse, many liberating aspects of modernization was pruned and oppressed in the very name of modernity (Bozdoğan and Kasaba, 1997). Since the introduction of multi-party system in 1946, both central and local governments have rewarded their constituents by using their power to hire new employees (Tunali et al, 2003). The situation in Turkey may be illuminated through further reconsideration of worldwide decline of national developmentalist and import-substitution policies, the process of globalization with all its contradictory features, especially the revolution in communication and transportation technologies, and the great match between liberal Turkey's novel values with capitalism and their unpreventable alliance. Keyder's (1997) interpretation is even more challenging that people in Turkey equalized the state and the modernization project. When it became clear (and despite some obvious benefits they received) that the project reached its end the same people have tended to think the state is also ended. Inescapably, they have shifted their acts according to this fact of stateless moment. The easiest way to adapt their lives to new conditions was migration, informal employment practices, kleptocracy, corruption, and legal ambiguity.

Göle (2000) defines this process after 1980s in Turkey as a breaking point in the perception of time and entering into the real modern times. It could be explained with the use of the metaphor of speed: Introducing speed into people's lives after 1980s with a real fast social leader, Turgut Özal, and transmogrification of hopes, attempts, expectations, unknown futures into guaranteed tomorrows, or better "now"s, with many modes of becoming rich (*köşeyi dönmek*), and unavoidable political expressions of the whole course of imagination and action: From future to tomorrow, from the state to the individual, from the ideology to the service...

Özyeğin (2001; 2002) investigates the shifting notions, experiences, and limitations of modernity through critical encounters between tenants, doorkeepers, and domestic workers in the name of informal sector. The dominating idea of the modern cannot be considered as solid as apartment walls in which the new upper-middle classes hide themselves, enables one to see spatial encounters of different

social classes; and therefore consequent interactions and interferences. The basic understanding on “outsider within”s that Özyeğin makes is all the intermeshing notions such as tradition, modern, urbanity, parenthood, etc. are all open to negotiation and an active process of navigation and change. Norms and exceptions are constantly reproduced by intercommunication and challenge.

Keyder (1999) turns his multifaceted focus and hails us to reevaluate the 1980 military coup. For him, the coup did not occur spontaneously, on the contrary it was an intervention to stop the already terminated nationally developmentalist strategies and to constitute liberal economic values and policies leaded by Özal. Keyder highlights that the “successful” application of liberal policies and attempts to integrate the economy to international trade by Özalist governments is a key point in comprehending the unique transformation Turkey has experienced in the last twenty years. The most visible signs of this success are towers, shopping malls, business centers, international hotels, entry of multinationals, and restructuring of Turkish banking and service sectors. Nevertheless, all those period of change and endeavors have not succeed to make Turkey a real first-class country. Keyder, instead, chooses to define what has been living as “informal globalization” while he signifies transnational trade routes, money transfers, informal and illegal flows of goods, capital, and people in the search of permanent jobs. An indicator of the declining ability of the Turkish economy to provide employment may be the startling growth of the informal sector. The number of the people working outside the formal economy is nearly the 26% of urban employment (Bulutay, 1995), and may involve more than one-quarter of the economically active population in the next 20 years. Considering all economic aspects, people opt to participate in informal sector rather than being unemployed. Yavan (1997) opt to label “informalization” of labor as a political preference in the name of flexibility of wage determination and labor markets.

There has been a rise in the rate of unemployment since the 1960s, except for marginal declines at the beginning of the 1980s and 1990s. Today, there are more

than 2.5 million unemployed people in Turkey.⁴ Unfortunately, the high average growth potential of Turkish economy does not necessarily connote the high potential of job creation (Ansal et al, 2000, p.21). Tunali et al. (2003) also cites that the employment creation capacity of the Turkish economy did not recover after the adoption of structural adjustment policies in the post-1980s, due to macroeconomic volatility, such as high inflation, exchange rate ambiguity, and the short term capital flows, which could not provide an appropriate environment for investment. Furthermore, according to the results of HLFS by SIS, there has also been a steady decline in participation rates and an increasing number of discouraged people have stopped seeking jobs. The change in the institutional structure of the labor market and the erosion of the power of trade unions over the past two decades⁵ have also marked the labor market structure of Turkey.

Unemployment in Turkey is due mainly to the lack of capacity to produce sufficient amounts of new, permanent, and high productivity jobs. The fast growth rate of population and labor supply can not be seen as the major cause of unemployment, given the poor employment creation capacity of the country. Figure 2.6 and Figure 2.7 shows the fluctuations of countrywide rate of unemployment rate and non-agricultural GDP growth and changes in urban unemployment rate versus growth between 1988 and 2003, respectively.

In the era after 1989, the expansionary macroeconomic policies of the period led to a slight decline in unemployment rate, which supplied to the favorable conditions for growth. The only exception to this declining trend in unemployment rate is the increase in 1992-93. Overall, in the 1990s, it is hard to talk about a clear inverse relationship between unemployment and growth.

⁴ SIS, 2005

⁵ The structural adjustment policies, shift from an import substituting industrialization strategy to an export-led growth regime, in order to supervise the assimilation of Turkish economy to the international markets, and the regulations about trade unions and collective bargaining during the military regime, which were retained by later parliamentary regimes are the key economic transformations in order to understand the structure of Turkish labor market. See Onaran 2002, for a more detailed discussion.

The crisis of 1994 is an interesting example with a great decline in GDP accompanied by a small deterioration in unemployment rate thanks to the flexible real wages. With real wages playing the role of macroeconomic shock absorber, unemployment was less responsive to the changes in output. Although it is supposed to increase, the unemployment rate decreased because of the downward flexibility of real wages.

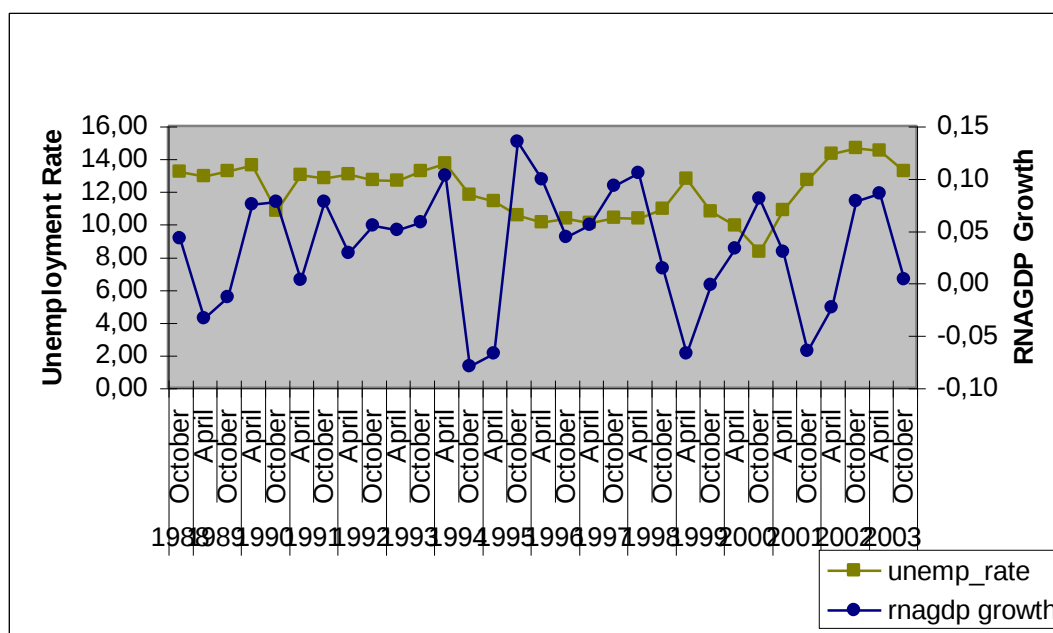


Figure 2.6 Urban Unemployment Rate versus real GDP Growth in non-agricultural sector (% , 1988-2003)

1998-2001 periods seem to prove the applicability of Okun's Law in Turkey with inverse relations between growth and unemployment rate. The decline of GDP at the beginning of 1998 and 1999 is associated with an increase in the unemployment rate.

The 2001 economic crisis is an important turn point for the relation where the unemployment rate reached one of the highest levels in the Turkish economic history. Furthermore, after the economic recovery period, although GDP began to rise, the unemployment rates stabilized at the very high levels. The reason could

be that the post 2001 period of growth was sustained by the increase of productivity, without creating employment. The striking fact is that employment did not increase in spite of the fall in real wages.

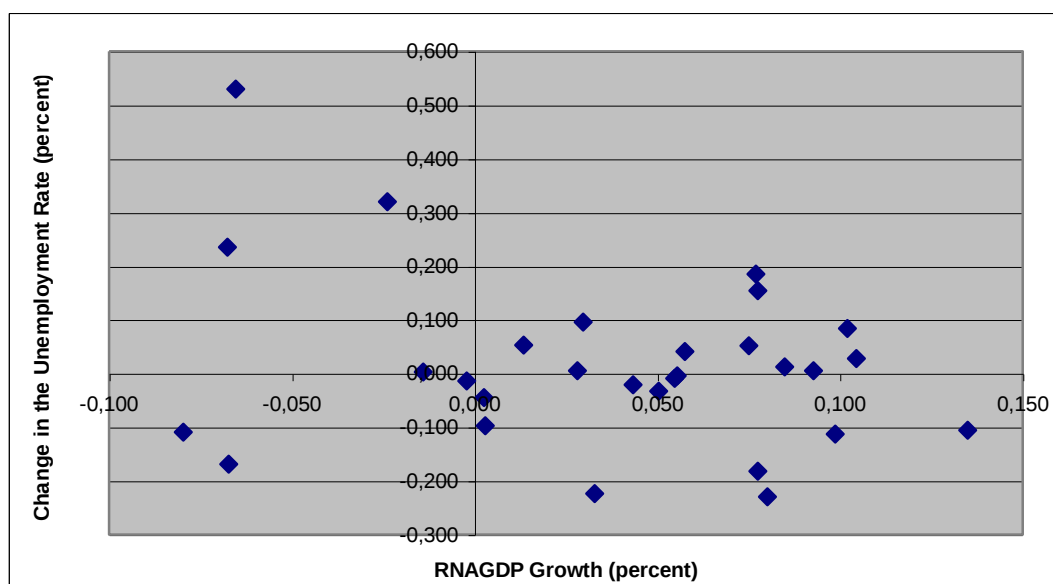


Figure 2.7 Changes in Urban Unemployment Rate versus RNAGDP Growth (1988-2003)

Figure 2.8 demonstrates the change in the investment/real non-agricultural GDP growth ratio in the period of 1988 and 2003. In order to shed light on the future discussions about the effects of investment rates on unemployment, the urban unemployment rate was also included in the graph.

In spite of the decrease in the public investment rate from the late 80s to early 90s, the private investment rate has increased until 1992. The effect of investment on unemployment rate is not so clear during that period, but the slight decline in 1990 can be considered as connected to investments. In the following term, the investment rates have decreased because of the nationwide economic crisis occurred in 1994. However, the response of unemployment rate to these declines is not so robust as a result of flexible real wages.

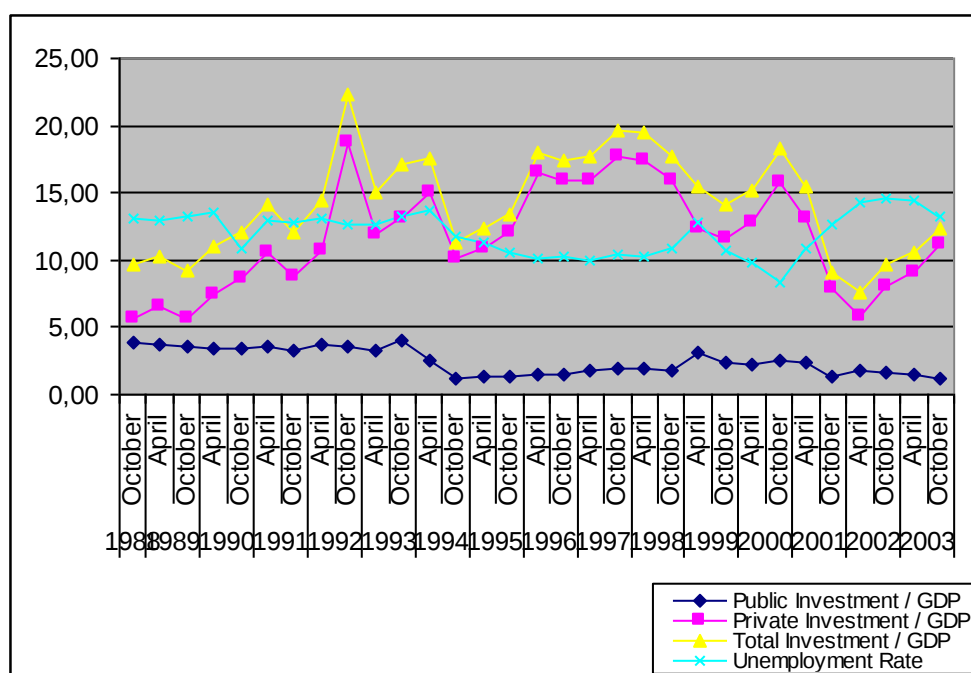


Figure 2.8. Investment/RNAGDP Growth (% , 1988-2003)

After 1995, the private investment rates have been enhanced, whereas the public investment rates have become stagnant at very low ratios. The decline in unemployment rate during this period is again in parallel to the rise in total investment. The negative relation between unemployment and investment rates is more obvious during the 1999-2001 term. Following the 2001 economic crisis, investment rate fell sharply, and the unemployment rate has increased and reached nearly 15% percentages. Even though the private investment rates have begun to retrieve afterwards, the long lasting effects of the crisis, and the decrease in the public investment rates have deteriorated the unemployment rate even in the recovery pace.

2.3 Employment

The allocation of employment with respect to the economic activity is important in evaluating the structure of the labor markets in Turkey. The low shares of industrial sector comparing to agricultural area in Turkish economy even after 1962-1963 period⁶ is an essential apprehension for employment policies. Due to the stagnationist strategies of economy, even in the era of low real wages, the investments decrease precluding the increase in employment (Yentürk, 1997). Figure 2.9 and Figure 2.10 shows the percentages of employment by sectoral division excluding the agricultural activities both for male and female between 1988 and 2003 respectively.⁷

As it is seen in Figure 2.9, the sector of “wholesale and retail trade, restaurants and hotels” is the only area that increases its share in total employment through years. It reached its peak point in 2000 with the share of %32,1 of total employment. All other sectors have slight deteriorations in their employment shares. Although some service sectors like “finance, insurance, real estate and business service” or “transportation, communication and storage” do not seem to be much effected in terms of employment shares, the “manufacturing” sector as one of the production areas lost some aptitude of employment, which is the most important motives of economic growth.

⁶ 1962-1963 is the period of implementation of formal planning, which suggests the industrial growth instead of agricultural development.

⁷ All employment data less than 1000 are assumed to be zero for simplicity.

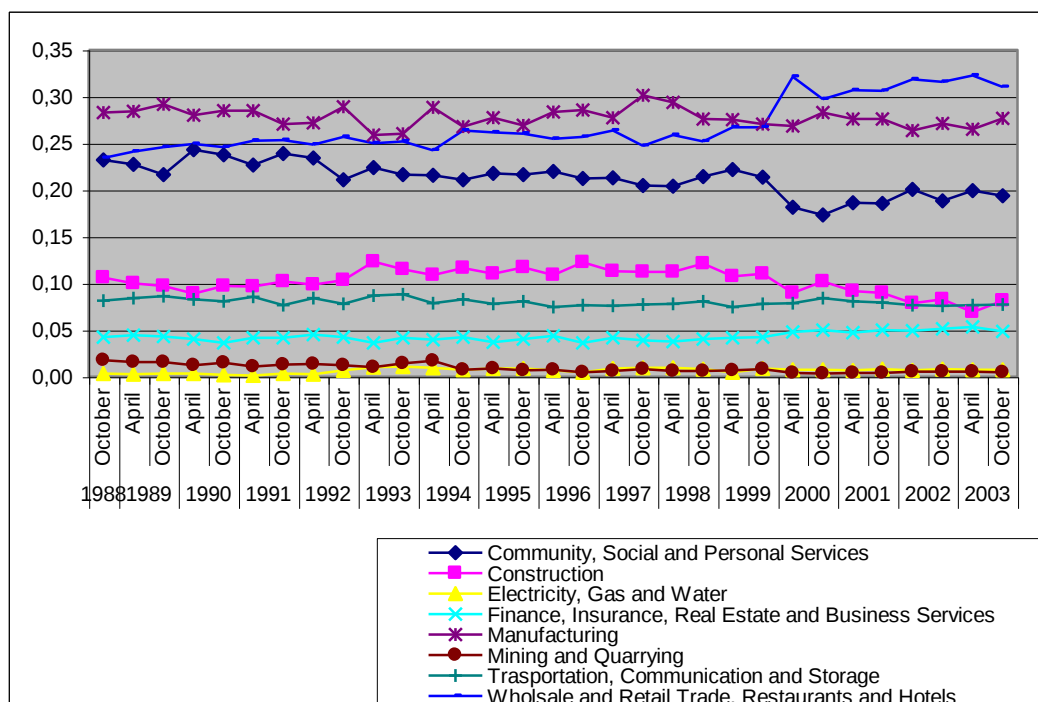


Figure 2.9 Distribution of Employment In Terms Of Economic Activity For Male
(%, 1988-2003)

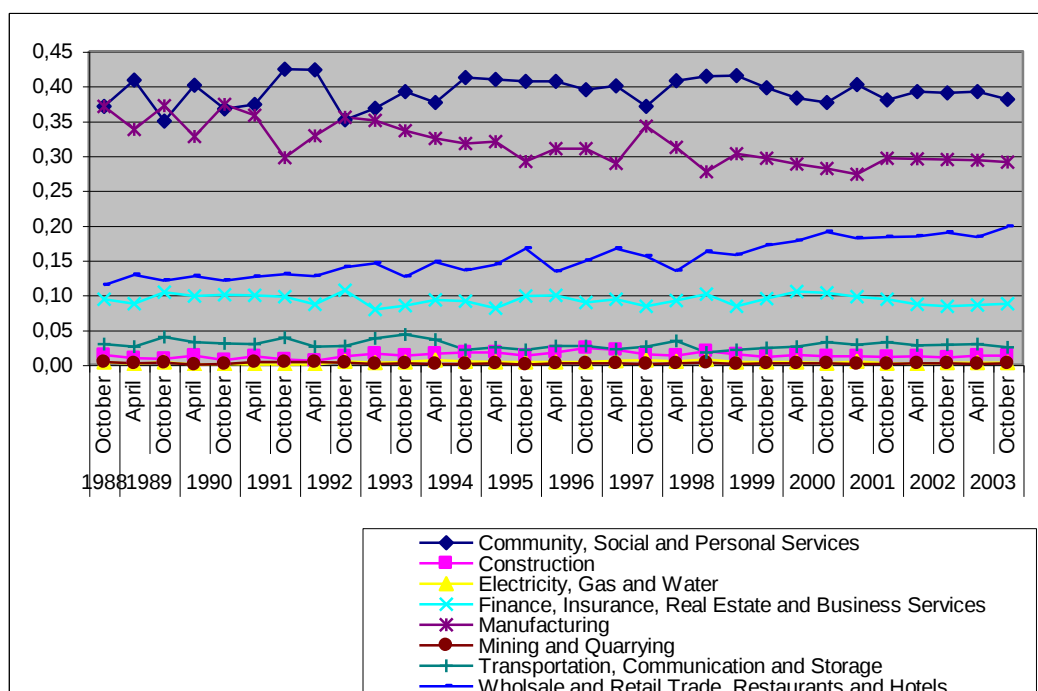


Figure 2.10 Distribution of Employment In Terms Of Economic Activity For
Female (%, 1988-2003)

This deterioration is more obvious in case of female employment, which can be seen in Figure 2.10. The share of “manufacturing” between 1988 and 2003 has declined nearly 8 percentages from %37 to %29, which slides the female employment to the sector of “wholesale and retail trade, restaurants and hotels”. The shift of employment from production to service sectors is important to understand the dynamics of economic growth of Turkish economy for last 15 years. The increased feminization of work may not be realized if export oriented policies do not sufficiently foster growth (Başlevent and Onaran, 2004).

3 THE RELATION BETWEEN UNEMPLOYMENT AND GROWTH: OKUN'S LAW

“Okun’s Law” describes an empirical regularity between unemployment and real output growth. The initial empirical proposition of Okun is that there is a fixed relationship between movements in the unemployment rate and movements in the size of the output gap, specifically, a 3% decrease (increase) of the real growth of output results in a 1% reduction (increase) in the unemployment rate.

Okun’s Law has proved to be one of the more durable relationships in modern macroeconomics, and is now often presented as an element of core beliefs. Durability and simplicity being relatively scarce commodities in macroeconomics, Okun’s Law is appealing as a shorthand guide to policy outcomes.

Many researches and studies have scrutinized Okun’s Law in the United States of America and other advanced market economies for recent periods.⁸ In Lee (2000), Okun coefficients for European countries were found to be generally higher than for the US, and it is argued that the results for Europe are likely a consequence of labor-market rigidities⁹ and other factors associated with relatively high levels of unemployment.

Both for the conceptual and empirical aspects of Okun’s Law, the crucial simplifying assumption is that changes in productivity and the labor force –and hence the potential output- occur at a roughly steady, exogenous trend rate over

⁸ Mankiw, 2000; Lee, 2000; Gordon, 2003

⁹ The Okun approach captures labor-market flexibility, which is far beyond the limits of this thesis, only through the linkages between unemployment and output.

time. Therefore, Okun's law facilitated discussing an employment goal and unemployment shortfalls while using the language of real output and potential output gaps (Friedman and Wachter, 1974).

Assume, for a simple Cobb-Douglas production function,

$$XA = (CAP \times K)^{\alpha} \times (POP \times PART \times (1-U) \times H)^{1-\alpha} \beta e^{\phi t} \quad (3.1)$$

Where XA is actual real output, CAP is the effective utilization rate of capital stock, K is the capital stock itself, POP is population, PART is the labor force participation rate, U is the unemployment rate, H is an index of hours per worker, and t is a linear time trend (Friedman and Wachter, 1974).

The essence of Okun's Law approach is to remove all variables other than U and t from the equation assuming that these variables are solely function of unemployment rate and/or exponential time trend. Using potential output (XP) to represent the influence of the several time trends and solving the resulting expression for U yields Okun-type equation

$$U = f(XA, XP) f_1 < 0, f_2 > 0 \quad (3.2)$$

Where f_1 is the partial derivative of function f with respect to its i^{th} argument.

An alternative way of estimating the unemployment-output trade-off is to use the GDP (or GNP) growth and a first difference measure of unemployment, where there are no reliable estimates for potential GDP or similar macroeconomic benchmarks, and thus, it is not possible to use the gap approach.

$$\Delta U = a - b(\Delta Y / Y) \quad (3.3)$$

ΔU is the change in the unemployment rate;

$\Delta Y / Y$ is the GDP growth.

The relative sensitivity of unemployment to output in the Turkish economy is estimated using this variant of Okun's first-difference law, where the change in the aggregate investment is added in order to distinguish the effect of various sources of growth, i.e. changes in capacity utilization vs. new additions to the capital stock. The lag of the change in unemployment rate is used to determine the hysteresis effect.

$$(\Delta U / U)_t = \beta_0 + \beta_1 \Delta Y_t + \beta_2 \Delta U_{t-1} + \beta_3 \Delta I_t + \varepsilon_t \quad t=1990 \dots 2003 \quad (3.4)$$

To test for the presence of an Okun-type relationship between unemployment and output, Equation (3.4) will be used and the results will be explained in Section IV using urban semiannual data on output and unemployment between 1990 and 2003 for the Turkish Economy. The starting period is due to the lag structure and the availability of data.

4 SPECIFICATION OF OKUN'S LAW AND ESTIMATION RESULTS

This section proceeds with the estimation of Okun's Equation discussed and interpreted in Section IV, in order to provide a quantitative measure of the link between the labor market outcomes and growth. Since unemployment is a combination of the labor force participation and employment outcomes, we will also present estimation for the latter two.

The equations are estimated with OLS regression method by using urban semiannual data of output and labor market variables of the Turkish Economy for the period of 1988-2003, disaggregated for public and private sectors, and with respect to age and sex. The latter points at particularly interesting behavioral differences. Since our analysis is limited to the urban areas, the growth rate of output, which we are using as an explanatory variable, covers also only the non-agricultural output. The other standard explanatory variable for the unemployment and employment estimations could be the wage variable. But unfortunately this variable only exists for manufacturing industry, and furthermore even in manufacturing, the quarterly wage data, which would be suitable for this study exists only for firms that employ more than 25 workers. This coverage would limit the scope of our analysis, and therefore wages are left out of the analysis here. Besides, Okun Law, which is the basis of this study, focuses on the relation between growth and unemployment. Furthermore, it must be noted that the decline in real wages in an era of high and persistent unemployment signals that wages would not have the significant negative effect on employment, as expected by mainstream economics.

The estimation period is limited by the availability of data for detailed and reliable labor market indicators, based on Household Labor Force Surveys (HLFS) by the SIS. In spite of the fact that this casts limits on the degrees of freedom, the results are still indicative. Another advantage of the HLFS data is that it relies on the reports of the people themselves; thus different from firm based survey data for the industrial sector, the HLFS is expected to reflect some of the informal employment as well, even if only to the extent that the people would report it.

The labor market variables are reflecting the survey results from the April and October rounds of the HLFS. Accordingly we calculated the semi-annual GDP data based on the quarterly data, such that the first observation for growth in a year corresponds to growth in the period of October in the previous year-March in the current year with respect to the same period in the previous year, and the second observation covers growth in April-September period. Similarly investment/GDP ratios are also calculated accordingly.

Time series properties of the variables were carefully examined, and the variables, which have a unit root, are used in the form of first difference or logarithmic difference (corresponding to the annual changes with respect to the same quarter of the previous year). The results of the unit root tests are reported in Appendix-A.

This section consists of three parts. All estimations are made by using the semiannual data both for the male and female residing in urban areas for the period of 1990 and 2003 (the observations before 1990 are lost due to the lag structure). In Section I, the labor force participation rate equation is reported. Section II provides the empirical estimations of the employment equation for different sectors, based on gender differences. Finally, Section III estimates the effect of growth on unemployment rate.

4.1 Estimations of Labor Force Participation

Total labor force participation for male is positively associated with the current as well as the lag of the growth rate. In order to capture the longer-term effects of growth, the first and second lag of growth were also added to the estimation. Nevertheless, the second lag is insignificant.¹⁰ Table 4.1 shows the estimations results for labor force participation rates of male. In fact, the growth variables are not able to explain most of the change in labor force participation decision.

Table 4.1 Estimation Results for Labor Force Participation Rates of Male

Dependent Variable:	Change in the LFPR Male Total ($\Delta \log l f p r m$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	28 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	0.007	0.273
Real GDP Growth ($\Delta \log r n a g d p$)	0.158	0.029
$\Delta \log r n a g d p$ (-1)	0.129	0.071
Unemployment Rate Male ($\Delta u n e m p m$)	0.002	0.319
$\Delta u n e m p m$ (-1)	-0.001	0.535
$\Delta \log l f p r m$ (-1)	0.4000	0.029
R-squared:	0.521	
Adjusted R-squared:	0.412	
F-statistic:	4.791	
Probability (F-statistic):	0.004	

¹⁰ See Appendix-D for the estimation results of Breusch-Godfrey Serial Correlation LM Tests.

However, when we disaggregate the labor force participation rates of male with respect to age, the coefficients of GDP becomes insignificant except for the age group of 20-24 and the lagged value for the age groups of 15-19 and 35-54. Table 4.2 demonstrates the estimation results for the labor force participation rates of urban male aged between 20-24.

Table 4.2 Estimation Results for Labor Force Participation Rates of Male Aged Between 20-24

Dependent Variable:	Change in the LFPR Male Aged 20-24 ($\Delta \log l_{fpm}(20_24)$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	28 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	-0.004	0.705
Real GDP Growth ($\Delta \log r_{nagdp}$)	0.412	0.029
$\Delta \log r_{nagdp} (-1)$	0.208	0.275
Unemployment Rate Male ($\Delta \log u_{mpm}$)	0.022	0.003
$\Delta \log u_{mpm} (-1)$	-0.021	0.007
$\Delta \log l_{fpm}(20_24) (-1)$	0.452	0.008
R-squared:	0.652	
Adjusted R-squared:	0.573	
F-statistic:	8.272	
Probability (F-statistic):	0.000	

The insignificance of the effect of growth on the labor force participation rate of male aged over 25 may be reflecting the fact that males, who are the main

breadwinners of the household participate in the labor market independent of the economic conditions.

On the other hand, the unemployment rate is totally insignificant for all age groups except for the age group of 20-24, which is in line with the above explanation for the ineffectiveness of growth. The current value of unemployment rate has a positive and significant effect on the labor force participation rates for the age group of 20-24, whereas the lag of the unemployment rate has a negative and significant effect. Thus, higher unemployment generates an “added worker effect” for the young male workers, whereas the “discouraged worker effect” dominates after a period of six months.

In the case of the urban female, the effect of unemployment rate and growth on labor force participation rate is always insignificant. Two lags of labor force participation rates of female were also used in order to avoid the autocorrelation problem. The results of labor force participation rates of female are illustrated on Table 4.3.

However, the effect of unemployment rate with one period lag on the participation rates of female aged between 35 and 54 is negative and significant demonstrating the “discouraged worker effect” for the age group.¹¹ These results reflect the gender division of labor in the household, and the inability of the economic conditions to pull women to the labor market.

¹¹ See Appendix –B for estimation results of labor force participation rates.

Table 4.3 Estimation Results for Labor Force Participation Rates of Female

Dependent Variable:	Change in the LFPR Female Total ($\Delta \log lfp_{fm}$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	28 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	0.106	0.000
Real GDP Growth ($\Delta \log n_{gdp}$)	-0.102	0.623
$\Delta \log n_{gdp}$ (-1)	-0.311	0.146
Unemployment Rate Female ($\Delta unemp_{fm}$)	-0.001	0.637
$\Delta unemp_{fm}$ (-1)	0.010	0.010
$\Delta \log lfp_{fm}$ (-1)	-0.228	0.134
$\Delta \log lfp_{fm}$ (-2)	-0.2676	0.000
R-squared:	0.602	
Adjusted R-squared:	0.483	
F-statistic:	5.060	
Probability (F-statistic):	0.002	

4.2 Estimations of Employment

The results in Table 4.4 show that growth has a positive but insignificant effect on employment. We have also used the first and second lag of growth in order to portray the effects of growth through time. However, the lags are also insignificant. We have been able to experiment with two lags here since growth is

the only explanatory variables, relaxing the degrees of freedom restraints. Apparently the growth variable is not able to explain most of the change in total employment. In order to understand the effect of previous period's employment status on current period's employment condition, the lags of employment variable were also added to the equation. The hysteresis effect is not present in the case of total employment.

Table 4.4 Estimation Results of Total Employment

Dependent Variable:	Change in the Total Employment ($\Delta \log \text{total}$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	28 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	0.020	0.036
Real GDP Growth ($\Delta \log \text{rnagdp}$)	0.001	0.938
$\Delta \log \text{rnagdp}$ (-1)	-0.023	0.602
$\Delta \log \text{rnagdp}$ (-2)	0.109	0.196
$\Delta \log \text{total}$ (-1)	-0.160	0.120
$\Delta \log \text{total}$ (-2)	0.787	0.202
R-squared:	0.621	
Adjusted R-squared:	0.420	
F-statistic:	3.082	
Probability (F-statistic):	0.028	

In order to understand the effects of investment on employment, the total employment estimation is re-estimated by adding the Investment/GDP ratio (in difference form). The machinery and equipment investment excluding the

construction sector is used to calculate the Investment/GDP ratio for the non-agricultural sector. Table 4.5 demonstrates that the current value of change in investment rate has a positive and significant effect on total employment in the period of 1990 and 2003.

Table 4.5 Estimation Results of Total Employment (Investment Added)

Dependent Variable:	Change in the Total Employment ($\Delta \log \text{total}$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	28 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	0.034	0.029
Real GDP Growth ($\Delta \log \text{rnagdp}$)	-0.086	0.672
$\Delta \log \text{rnagdp}$ (-1)	0.069	0.622
$\Delta \log \text{rnagdp}$ (-2)	-0.055	0.666
$\Delta \log \text{total}$ (-1)	0.274	0.230
$\Delta \log \text{total}$ (-2)	-0.282	0.287
Change in the Total Investment Rate ($\Delta \text{tinvrnagdp}$)	0.002	0.105
$\Delta \text{tinvrnagdp}$ (-1)	0.001	0.632
R-squared:	0.660	
Adjusted R-squared:	0.321	
F-statistic:	1,949	
Probability (F-statistic):	0.141	

The regression model for employment based on gender differences is also estimated in order to comprehend the effects of investment as well as growth on employment of men and women. The results of the OLS estimations are shown for male and female, for each sector respectively. The question that we are

interested in is whether stagnant investment is an explanation of the poor employment performance of the economy for male and female labor.

Table 4.6 shows that growth has a positive but insignificant effect on male employment. On the other hand, the lagged effect of growth on employment of male is significant but negative. To analyze the existence of hysteresis effect on male employment, the lag of employment variable was also added to the equation. Estimation results show that hysteresis effect exists in the case of male employment.

Table 4.6 Estimation Results of Male Employment

Dependent Variable:	Change in the Male Employment ($\Delta \log m$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	28 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	0.011	0.131
Real GDP Growth ($\Delta \log n \Delta gdp$)	0.075	0.433
$\Delta \log n \Delta gdp$ (-1)	-0.144	0.104
$\Delta \log n \Delta gdp$ (-2)	-0.147	0.163
$\Delta \log m$ (-1)	0.476	0.022
R-squared:	0.448	
Adjusted R-squared:	0.348	
F-statistic:	4.480	
Probability (F-statistic):	0.008	

Next, Table 4.7 shows the estimation results of male employment with respect to growth and investment rate. The importance of public and private investment in employment creation reveals itself in male employment. The investment rate has a positive and significant effect on male employment in the period of 1995-2003. Especially, the positive and significant effect of machinery and equipment investment on male employment points the importance of private machinery and equipment investment rather than growth to create employment in Turkish economy. On the other hand, the coefficients of growth are not significant at all.

Table 4.7 Estimation Results of Male Employment (Investment Added)

Dependent Variable:	Change in the Male Employment ($\Delta \log m$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	28 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	0.017	0.143
Real GDP Growth ($\Delta \log n \text{agdp}$)	-0.059	0.721
$\Delta \log n \text{agdp}$ (-1)	0.143	0.188
$\Delta \log n \text{agdp}$ (-2)	-0.119	0.240
Change in the Total Investment Rate ($\Delta \text{tinvr} \text{agdp}$)	0.023	0.052
$\Delta \text{tinvr} \text{agdp}$ (-1)	0.000	0.916
$\Delta \log m$ (-1)	0.617	0.013
$\Delta \log m$ (-2)	-0.225	0.262
R-squared:	0.335	
Adjusted R-squared:	-0.623	
F-statistic:	1.350	
Probability (F-statistic):	0.957	

The female employment estimation results in Table 4.8 demonstrate that growth has insignificant effect on female labor. The effect of investment on female employment is also estimated and reported in Table 4.9. The results show that the effect of investment on female employment is insignificant.

Table 4.8 Estimation Results of Female Employment

Dependent Variable:	Change in the Female Employment ($\Delta \log fm$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	28 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	0.118	0.001
Real GDP Growth ($\Delta \log rnagdp$)	0.026	0.920
$\Delta \log rnagdp$ (-1)	-0.063	0.793
$\Delta \log rnagdp$ (-2)	-0.200	0.448
$\Delta \log fm$ (-1)	-0.345	0.042
$\Delta \log fm$ (-2)	-0.634	0.000
R-squared:	0.480	
Adjusted R-squared:	0.356	
F-statistic:	3.885	
Probability (F-statistic):	0.011	

Table 4.9 Estimation Results of Female Employment (Investment Added)

Dependent Variable:	Change in the Female Employment ($\Delta \log fm$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	28 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	0.123	0.001
Real GDP Growth ($\Delta \log rnagdp$)	-0.134	0.788
$\Delta \log rnagdp$ (-1)	0.016	0.961
$\Delta \log rnagdp$ (-2)	-0.171	0.546
Change in the Total Investment Rate ($\Delta \log tinrnagdp$)	0.041	0.348
$\Delta \log tinrnagdp$ (-1)	-0.004	0.952
$\Delta \log fm$ (-1)	-0.340	0.055
$\Delta \log fm$ (-2)	-0.704	0.000
R-squared:	0.504	
Adjusted R-squared:	0.322	
F-statistic:	2.765	
Probability (F-statistic):	0.036	

Due to the differences in the employment dynamics across public vs. private, as well as irregular employment practices (which include employment at home, market place, irregular place and mobile employment), a disaggregation of the analysis along these lines would be useful. However a consistent disaggregation of data is possible only after 1995, thus the estimations for these employment categories are based on data from 1997 onwards (after controlling for lags). In spite of degrees of freedom problems, we report the results.

When the equation is decomposed in terms of fixed-public, fixed-private and irregular employment practices, the coefficients of growth are again mostly insignificant. In the case of public sector, as can be seen in Table 4.10 below, labor hoardings, as well weakening of public employment as part of the stability programs may posit two opposite explanations of the weakness of relation between public employment and growth in Turkish economy.

Table 4.10 Estimation Results of Male Employment in Public Sector

Dependent Variable:	Change in the Male Public Employment (logpubm)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1997 -2003	
Number of Observations:	14 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	4.026	0.329
Real GDP Growth ($\Delta \log \text{rnagdp}$)	0.083	0.895
$\Delta \log \text{rnagdp}$ (-1)	0.028	0.955
$\Delta \log \text{rnagdp}$ (-2)	-0.190	0.753
logpubm (-1)	0.092	0.808
logpubm (-2)	0.367	0.329
R-squared:	0.230	
Adjusted R-squared:	-0.250	
F-statistic:	0.478	
Probability (F-statistic):	0.783	

Furthermore, growth has no significant effect on employment of male in private sector, although this time the coefficient of current growth is closer to significance

with a probability of 0.107. The estimation results of male employment in private sector are demonstrated in Table 4.11.

Table 4.11 Estimation Results of Male Employment in Private Sector

Dependent Variable:	Change in the Male Private Employment ($\Delta \log \text{privm}$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1997 -2003	
Number of Observations:	14 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	0.005	0.829
Real GDP Growth ($\Delta \log \text{nagdp}$)	0.827	0.107
$\Delta \log \text{nagdp}$ (-1)	-0.063	0.911
$\Delta \log \text{nagdp}$ (-2)	-0.049	0.918
$\Delta \log \text{privm}$ (-1)	0.046	0.893
R-squared:	0.426	
Adjusted R-squared:	0.171	
F-statistic:	1.670	
Probability (F-statistic):	0.239	

Only in irregular employment practices in the period of 1995 and 2003, growth has a positive effect on male employment, which is shown in Table 4.12, signaling the problem that growth is generating more and more irregular jobs in Turkey.

Table 4.12 Estimation Results of Male Employment in Other Sector

Dependent Variable:	Change in the Male Other Employment (Δ logothm)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1997 -2003	
Number of Observations:	14 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	-0.069	0.281
Real GDP Growth (Δ logrnagdp)	1.898	0.099
Δ logrnagdp (-1)	-0.460	0.690
Δ logrnagdp (-2)	0.670	0.536
Δ logothm (-1)	0.308	0.349
R-squared:	0.405	
Adjusted R-squared:	0.140	
F-statistic:	1.531	
Probability (F-statistic):	0.272	

Nevertheless, the female employment estimation results for the total employment, as well as the public, private and other employment are far different from the general pattern of total employment results. Table 4.13 shows the estimation results of female employment in public sector. The effect of current growth on female employment in public sector is positive but insignificant, but the first lag is negative and significant.

Table 4.13 Estimation Results of Female Employment in Public Sector

Dependent Variable:	Change in the Female Public Employment ($\Delta \log \text{pubfm}$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1997 -2003	
Number of Observations:	14 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	-0.008	0.445
Real GDP Growth ($\Delta \log \text{rnagdp}$)	0.904	0.135
$\Delta \log \text{rnagdp}$ (-1)	-0.583	0.078
$\Delta \log \text{rnagdp}$ (-2)	0.432	0.125
$\Delta \log \text{pubfm}$ (-1)	0.370	0.227
R-squared:	0.650	
Adjusted R-squared:	0.495	
F-statistic:	4.187	
Probability (F-statistic):	0.034	

Another interesting point to take into consideration is the significant but negative effect of growth on female employment in private sector, which can be seen on Figure 4.14. Even though the number of observations seems not to be sufficient for further interpretations, the female employment in private sector looks as if it is again negatively correlated with growth. This is a very striking result indicating that growth does not generate employment for the women.

Table 4.14 Estimation Results of Female Employment in Private Sector

Dependent Variable:	Change in the Female Private Employment (logprivfm)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1997 -2003	
Number of Observations:	14 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	2.486	0.168
Real GDP Growth ($\Delta \log \text{nagdp}$)	-0.250	0.072
$\Delta \log \text{nagdp}$ (-1)	-0.017	0.974
$\Delta \log \text{nagdp}$ (-2)	-0.739	0.482
Logprivfm (-1)	0.650	0.104
R-squared:	0.809	
Adjusted R-squared:	0.725	
F-statistic:	9.576	
Probability (F-statistic):	0.002	

The effect of growth on irregular employment of female is demonstrated in Table 4.15, which shows that the effect of growth on female employment in irregular sectors is insignificant.

Table 4.15 Estimation Results of Female Employment in Other Sector

Dependent Variable:	Change in the Female Other Employment (logothfm)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1997 -2003	
Number of Observations:	14 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	4.860	0.055
Real GDP Growth ($\Delta \log \text{rnagdp}$)	-1.911	0.302
$\Delta \log \text{rnagdp}$ (-1)	-0.213	0.901
$\Delta \log \text{rnagdp}$ (-2)	-1.930	0.380
logothfm (-1)	0.156	0.599
logothfm (-2)	-0.054	0.884
R-squared:	0.520	
Adjusted R-squared:	0.220	
F-statistic:	1.735	
Probability (F-statistic):	0.232	

4.3 Estimation of Unemployment

The effect of growth on urban unemployment rate in the period of 1990 and 2003 is insignificant. The lags of growth with the aim of demonstrating the longer-term effects of growth were also used. Nevertheless, the lags are also insignificant. We have been able to experiment with two lags here since growth is the only explanatory variables, relaxing the degrees of freedom restraints. In fact, the growth variables are not able to explain most of the change in unemployment rate. We have also used the first and second lag of unemployment rate in order to avoid the autocorrelation problem. Table 4.16 shows the estimations results of change in the total unemployment rate.

Table 4.16 Estimation Results of Change in the Total Unemployment Rate

Dependent Variable:	Change in the Total Unemployment Rate (Δ unemp_ratetotal)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	27 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	-0.326	0.477
Real GDP Growth (Δ logrnagdp)	4.148	0.495
Δ logrnagdp (-1)	-4.710	0.278
Δ logrnagdp (-2)	10.181	0.198
Δ unemp_ratetotal (-1)	0.748	0.000
Δ unemp_ratetotal (-2)	-0.492	0.013
R-squared:	0.518	
Adjusted R-squared:	0.404	
F-statistic:	4.525	
Probability (F-statistic):	0.005	

Table 4.17 illustrates the estimation results of the change in unemployment rate as a function of real GDP growth and investment. Investment is used to extent the Okun Law, in order to incorporate the different effects of growth based on increased capacity utilization vs. new investments. The lags of growth were also used to reflect the effect of growth through time. Due to the degree of freedom problems, only one lag of the variables was added. In order to determine the hysteresis¹² effect, the lag of unemployment rate, was also used.

The estimation results for the change in the unemployment rate in the urban areas indicate the existence of no significant effect of growth on unemployment, rather than a negative effect. Growth contemporaneously or with a lag of one-period displays no significant effect on total unemployment rate. Growth with a lag of two-periods is also added to the equation, but it also has no significant effect on unemployment rate. The effect of previous period's unemployment rate on unemployment is positive and significant confirming the hysteresis effect. On the other hand, the negative and significant effect of the current investment rate on unemployment rate implies the centrality of investment to fight against unemployment.

¹² The effect of preceding phase's unemployment condition to the subsequent period is defined as the hysteresis effect of unemployment.

Table 4.17 Estimation Results of Change in the Total Unemployment Rate
(Investment Added)

Dependent Variable:	Change in the Total Unemployment Rate ($\Delta \text{unemp_ratetotal}$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	27 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	-0.287	0.573
Real GDP Growth ($\Delta \text{logrnagdp}$)	6.725	0.392
$\Delta \text{logrnagdp}$ (-1)	1.900	0.818
$\Delta \text{unemp_ratetotal}$ (-1)	0.398	0.072
Change in the Total Investment Rate ($\Delta \text{tinvrnagdp}$)	-0.201	0.083
$\Delta \text{tinvrnagdp}$ (-1)	0.036	0.756
R-squared:	0.337	
Adjusted R-squared:	0.186	
F-statistic:	2.240	
Probability (F-statistic):	0.086	

In order to analyze the effects of 1994 and 2001 economic crises on unemployment and on the effect of growth on unemployment, dummy and slope¹³ variables were also added to the estimations.

The 1994 dummy is 1 for the year 1994 and 0 otherwise. Estimation results are in Table 4.18. The current value as well as the lags of growth is again insignificant for the normal years. The coefficient of the 1994 intercept dummy is insignificant.

¹³ Slope variable is formulated as the year dummy *growth.

The joint significance test for the summation of growth and the slope dummy for the growth in 1994 indicates that the summation is also insignificant; both for the current value as well as lags. The Wald test results are at the end of Table 4.18. On the other hand, the effect of current investment on unemployment rate is still negative and significant.

Table 4.18 Estimation Results of Change in the Total Unemployment Rate
(including dummy1994)

Dependent Variable:	Change in the Total Unemployment Rate (Δ unemp_ratetotal)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	27 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	-0.938	0.774
Real GDP Growth (Δ logrnagdp)	20.849	0.630
Δ logrnagdp (-1)	-17.302	0.502
Δ logrnagdp (-2)	24.664	0.156
Δ unemp_ratetotal (-1)	0.436	0.074
Dummy1994	-0.215	0.950
Slope1994	-4.177	0.924
Slope1994 (-1)	20.414	0.475
Slope1994 (-2)	-11.056	0.525
Change in the Total Investment Rate (Δ tinvrnagdp)	-0.230	0.072
Δ tinvrnagdp (-1)	-0.041	0.796
R-squared:	0.492	
Adjusted R-squared:	0.175	
F-statistic:	1.554	
Probability (F-statistic):	0.208	

P (growth+slope dummy1994=0) = 0.122

P (growth (-1)+slope dummy1994 (-1)=0) = 0.766

P (growth (-2)+slope dummy1994 (-2)=0) = 0.191

Even though the estimation results of unemployment equation with respect to 1994 economic crisis fail to reflect the effects of economic downfall, the effect of 2001 economic crisis points at significant results, which can be seen on Table 4.19.

Initially, the effects of growth on unemployment rate are positive and significant with the exception of the first lag. Thus contrary to expectations, an increase in growth is generating a positive change in unemployment. The intercept dummy, Dummy01, which is 1 during and after 2001, and 0 otherwise, has a positive and significant effect on unemployment rate. This positive coefficient of 2.682 presents the increase in the unemployment rate after the 2001 economic crisis on average, after controlling for other variables.

Additionally, the joint significant tests indicate that the effect of growth in 2001 is significant and negative. On the other hand, the joint test results for the first and second lag of growth indicate that the first lag is negative and significant whereas the second lag is negative but insignificant. The Wald test results are at the end of Table 4.19. In this specification, the lag of investment rate is negatively significant.

While unemployment increases in spite of positive growth during the pre-2001 period, during and after the crisis of 2001, unemployment and contraction have been moving together during and after the crisis. Thus the decline in economic activity has led to an increase in unemployment, and the lagged effect of contraction on the following years is also persistent. The resistance of the unemployment rate at high levels verifies our estimation results in the sense that the recovery in growth at the second half of 2002 and 2003 are not reflected to employment growth.

Table 4.19 Estimation Results of Change in the Total Unemployment Rate
(including dummy2001)

Dependent Variable:	Change in the Total Unemployment Rate (Δ unemp_ratetotal)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	27 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	-1.610	0.003
Real GDP Growth (Δ logrnagdp)	14.130	0.040
Δ logrnagdp (-1)	1.362	0.824
Δ logrnagdp (-2)	17.209	0.003
Δ unemp_ratetotal (-1)	0.270	0.211
Dummy2001	2.682	0.060
Slope2001	-29.643	0.033
Slope2001 (-1)	-8.117	0.459
Slope2001 (-2)	-35.619	0.023
Change in the Total Investment Rate (Δ tinvrnagdp)	-0.097	0.969
Δ tinvrnagdp (-1)	-0.014	0.105
R-squared:	0.762	
Adjusted R-squared:	0.613	
F-statistic:	5.129	
Probability (F-statistic):	0.001	

P (growth+slope dummy2001=0) = 0.105

P (growth (-1)+slope dummy2001 (-1)=0) = 0.108

P (growth (-2)+slope dummy2001 (-2)=0) = 0.209

In order to test for behavioral differences, the equations are re-estimated for different gender and age groups. Table 4.20 consists of estimation results of urban male unemployment with respect to GDP growth, its lags and investment rate. The current value and first lag of growth are insignificant, but the second lag is positive and significant. Similar to the total unemployment estimation results, the effect of investment on unemployment rate is negative and significant.

The robustness of estimation results for the hysteresis effect of unemployment is also evident with the estimation of male unemployment. We have used the first and second lag of unemployment rate in order to avoid the autocorrelation problem. The effect of unemployment rate with one period lag on unemployment is positive and significant at 1 percent level of significance, whereas the effect is reversed in the second lag.

Table 4.20 Estimation Results of Change in the Male Unemployment Rate

Dependent Variable:	Change in the Unemployment Rate of Male ($\Delta unempm$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	27 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	-0.610	0.271
Real GDP Growth ($\Delta logrnagdp$)	6.367	0.689
$\Delta logrnagdp$ (-1)	2.824	0.680
$\Delta logrnagdp$ (-2)	11.479	0.054
$\Delta unempm$ (-1)	0.687	0.003
$\Delta unempm$ (-2)	-0.490	0.079
Change in the Total Investment Rate ($\Delta tinvrnagdp$)	-0.045	0.102
$\Delta tinvrnagdp$ (-1)	0.098	0.604
R-squared:	0.594	
Adjusted R-squared:	0.445	
F-statistic:	3.978	
Probability (F-statistic):	0.007	

The effect of 1994 economic crisis on male unemployment rate is similar to the total unemployment estimation results. The joint significant tests indicate that growth, and its lags in 1994 have an insignificant effect on male unemployment rate. Table 4.21 shows the estimation results of change in the male unemployment rate in the period of 1990 and 2003.

Table 4.21 Estimation Results of Change in the Male Unemployment Rate
(including dummy1994)

Dependent Variable:	Change in the Unemployment Rate of Male ($\Delta unempm$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	27 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	-0.528	0.852
Real GDP Growth ($\Delta logrnagdp$)	18.186	0.622
$\Delta logrnagdp$ (-1)	-13.035	0.560
$\Delta logrnagdp$ (-2)	17.361	0.233
$\Delta unempm$ (-1)	0.698	0.008
$\Delta unempm$ (-2)	-0.515	0.042
Dummy1994	-0.188	0.948
Slope1994	-10.659	0.774
Slope1994 (-1)	17.771	0.468
Slope1994 (-2)	-5.942	0.684
Change in the Total Investment Rate ($\Delta tinvrnagdp$)	-0.056	0.6177
$\Delta tinvrnagdp$ (-1)	-0.012	0.3396
R-squared:	0.616	
Adjusted R-squared:	0.334	
F-statistic:	2.187	
Probability (F-statistic):	0.079	

P (growth+slope dummy1994=0) = 0.646

P (growth (-1)+slope dummy1994 (-1)=0) = 0.559

P (growth (-2)+slope dummy1994 (-2)=0) = 0.237

Table 4.22 illustrates the estimation results of change in the male unemployment rate including the effects of 2001 economic crisis with the help of Dummy01 and Slope01 variables. For normal years, the effect of growth on unemployment rate with a lag of two-periods is again positive and significant. The effect of 2001 economic crisis on unemployment rates of male is positive and significant at 1 percent level of significance. On the other hand, the joint significant tests indicate that growth in 2001 is negative and significant whereas the joint significant tests of summation of first and second lags of growth and slope dummy of growth in 2001 are insignificant.

The estimation results for male unemployment is also robust when the unemployment rate is decomposed into age groups. Although the coefficient is insignificant in some cases, the effect of investment on unemployment rate is negative. Moreover, the hysteresis effect reveals itself at every age group and it is significant at the age groups of 25-34 and 35-54 proving the importance of previous period's unemployment condition on the unemployment status of these age groups.¹⁴

¹⁴ See Appendix-C for estimation tables of unemployment based on age disaggregation.

Table 4.22 Estimation Results of Change in the Male Unemployment Rate
(including dummy2001)

Dependent Variable:	Change in the Unemployment Rate of Male ($\Delta unempm$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	27 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	-1.164	0.017
Real GDP Growth ($\Delta logrnagdp$)	7.504	0.206
$\Delta logrnagdp$ (-1)	2.438	0.654
$\Delta logrnagdp$ (-2)	15.699	0.002
$\Delta unempm$ (-1)	0.455	0.020
$\Delta unempm$ (-2)	-0.359	0.087
Dummy2001	2.273	0.001
Slope2001	-21.647	0.089
Slope2001 (-1)	-5.518	0.596
Slope2001 (-2)	-28.748	0.032
Change in the Total Investment Rate ($\Delta tinvrnagdp$)	0.088	0.911
$\Delta tinvrnagdp$ (-1)	-0.074	0.324
R-squared:	0.816	
Adjusted R-squared:	0.682	
F-statistic:	6.077	
Probability (F-statistic):	0.000	

$P(\text{growth} + \text{slope dummy2001} = 0) = 0.101$

$P(\text{growth} (-1) + \text{slope dummy2001} (-1) = 0) = 0.146$

$P(\text{growth} (-2) + \text{slope dummy2001} (-2) = 0) = 0.37$

Table 4.23 shows the estimation results of female unemployment with respect to growth and investment rate. In order to analyze the effects of previous levels of growth, the lag variables were also included to the equation.

Table 4.23 Estimation Results of Change in the Female Unemployment Rate

Dependent Variable:	Change in the Unemployment Rate of Female ($\Delta unemp_{fm}$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	27 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	-1.377	0.263
Real GDP Growth ($\Delta lognagdp$)	31.428	0.054
$\Delta lognagdp$ (-1)	-13.735	0.411
$\Delta lognagdp$ (-2)	7.7579	0.528
$\Delta unemp_{fm}$ (-1)	0.214	0.348
Change in the Total Investment Rate ($\Delta tinvrnagdp$)	-0.527	0.014
$\Delta tinvrnagdp$ (-1)	0.212	0.370
R-squared:	0.365	
Adjusted R-squared:	0.175	
F-statistic:	1.921	
Probability (F-statistic):	0.126	

The effect of growth on female unemployment is positive and significant at 5 percent level of significance. Contrary to expectations, the positive effect of growth on unemployment rate also contradicts to prospects. On the other hand, the coefficient of growth with one lag is negative but insignificant.

The effect of previous period's unemployment condition on present unemployment state of women is insignificant although the coefficient is positive. Besides, the effect of investment on unemployment rate of female is negative and significant at 1 percent of significance level. It is indeed interesting that investment has a negative effect on female unemployment, while one could expect that women are mostly employed in less capital and skill intensive industries. However, our results indicate that investment is also important for the job creation capacity for the women.

On behalf of incorporating the effects of 1994 and 2001 economic crises, the *dummy94* and *dummy01* variables, and slope dummies were added to the equations of female unemployment estimations, respectively. The results of estimation with respect to 1994 economic crisis are presented on Table 4.24. All the variables are insignificant except the change in investment rate. The investment rate has a negative and significant effect on urban female unemployment rate in the period of 1990 and 2003. The joint significance test for the current value of growth discloses the positive and significant effect of growth on female unemployment rate during the 1994 economic crisis. However, the joint test results for the first and second lag of growth indicate that lags have no significant effects on unemployment rate of urban female. Thus, after controlling for other factors, the economic contraction of 1994 controversially decreased unemployment rate for women, which is a result in line with stylized facts.

Table 4.24 Estimation Results of Change in the Female Unemployment Rate
(including dummy1994)

Dependent Variable:	Change in the Unemployment Rate of Female ($\Delta unemp_{fm}$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	27 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	2.606	0.647
Real GDP Growth (Δlog_{nagdp})	3.738	0.960
Δlog_{nagdp} (-1)	-83.979	0.168
Δlog_{nagdp} (-2)	37.247	0.227
$\Delta unemp_{fm}$ (-1)	0.214	0.303
Dummy1994	-4.407	0.479
Slope1994	38.608	0.621
Slope1994 (-1)	76.208	0.132
Slope1994 (-2)	-28.247	0.374
Change in the Total Investment Rate ($\Delta tin_{vrnagdp}$)	-0.621	0.009
$\Delta tin_{vrnagdp}$ (-1)	0.151	0.619
R-squared:	0.495341	
Adjusted R-squared:	0.179930	
F-statistic:	1.570459	
Probability (F-statistic):	0.202981	

P (growth+slope dummy1994=0) = 0.022

P (growth (-1)+slope dummy1994 (-1)=0) = 0.703

P (growth (-2)+slope dummy1994 (-2)=0) = 0.499

In contrast to dummy94 variable, the dummy01 variable, which was added in order to analyze the effects of 2001 economic crisis on female unemployment, has a positive and significant effect on unemployment rate. The positive effect of dummy01 on female unemployment with the coefficient of 3.334 entails the increase of female unemployment after 2001 economic crisis. On the other hand, the joint significance test for growth shows that growth has no significant effect on unemployment rate after 2001. Table 4.25 shows the estimation results of female unemployment rate with intercept dummy of 2001.

Similar to the previous estimations, the effect of total investment rate on unemployment rate of urban female is negative and significant implying the benefits of new investments on reducing the unemployment rate. On the other hand, the coefficient of growth is also positive and significant like the preceding estimations refuting the expectations.

On all estimation results, the hysteresis effect of unemployment on female unemployment is not significant although the sign of coefficient is positive. The robustness of estimation results of female unemployment is also tested as the variables are disaggregated in terms of age. This effect may be related to the fact that movement to the status of non-participant from the status of unemployment is more common among women, who may end up accepting the status of being a house-wife, and the traditional gender based division of labor, after a period of being unemployed.

Overall, the ineffectiveness of growth and significance of investment on unemployment rates demonstrate that the estimation results of unemployment are parallel with the estimation results of employment.

Table 4.25 Estimation Results of Change in the Female Unemployment Rate
(including dummy2001)

Dependent Variable:	Change in the Unemployment Rate of Female (Δ unempfm)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	27 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	-2.411	0.063
Real GDP Growth (Δ logrnagdp)	35.340	0.030
Δ logrnagdp (-1)	-17.117	0.279
Δ logrnagdp (-2)	16.093	0.189
Δ unempfm (-1)	0.155	0.481
Dummy2001	3.334	0.036
Slope2001	-20.356	0.494
Slope2001 (-1)	11.912	0.633
Slope2001 (-2)	-45.789	0.184
Change in the Total Investment Rate (Δ tinvrnagdp)	-0.444	0.039
Δ tinvrnagdp (-1)	0.229	0.318
R-squared:	0.568	
Adjusted R-squared:	0.298	
F-statistic:	2.105	
Probability (F-statistic):	0.088	

P (growth+slope dummy2001=0) = 0.647

P (growth (-1)+slope dummy2001 (-1)=0) = 0.855

P (growth (-2)+slope dummy2001 (-2)=0) = 0.387

5 CONCLUSION

Turkey is an interesting case to test the effectiveness of mainstream policies of orthodox economy on labor market outcomes. After having strictly followed the conventional structural adjustment recipes of the International Monetary Fund and the World Bank for two decades, the country is stuck with urban unemployment rates reaching to 15%, particularly after the last economic crisis of 2001. On the overall, the structural adjustment experience of Turkey has resulted in a massive redistribution of income in favor of capital, and the costs of adjustment have been mainly born by labor.

The labor market in Turkey has a broad capacity for dynamic and flexible adjustment. The downward flexibility of wages, and the inadequacy of unemployment protection play important roles in the adjustment of labor markets to good markets. The informal sector, which is almost as big as the formal sector strengthens the weakness of the linkage.

The change in the wage setting mechanism, following the shift from an import-substituting industrialization to export-oriented growth phase, clearly shows the evolution of the labor market conditions that have led to a higher degree of wage flexibility, which also decreased the sensibility of unemployment level to growth. In the period of 1996 and 2001, the wage decrease due to the increase in unemployment was with an elasticity of 0,14 whereas the wage expansion in case of value-added per worker was with an elasticity of 0,03. Thus, the gains in wages from growth in value-added is smaller than the loss in wages because of increases in unemployment rate (Gürsel et. al., 2004).

The results of the unemployment estimations show that the response of unemployment to investment is much stronger and significant than its response to growth contradicting the orthodox expectations. Even disaggregating unemployment variables for different gender and age groups, the estimation results are robust implying that high GDP growth does not necessarily imply a decrease in the unemployment rates, and in some specifications growth goes hand in hand with increasing unemployment. Contrary to growth, for almost all age and gender groups, the effect of investment, both in the sense of public and private investments, on unemployment rate is negative and significant. The evidence about the unresponsiveness of unemployment rate to growth points to a weak Okun relation in Turkey.

On the other hand, the negative effect of unemployment on wages creates a flexible wage-setting rule for the industry, where workers accept the erosion of their real wages in order to protect their current jobs. However, growth with the help of increase in the productivity in the name of low real wages does not bring extra labor demand as expected in that period, and wage flexibility does not reduce unemployment as expected by the orthodox economists, either. Furthermore it proves that the source of growth is the significant variable. Growth based on increased capacity utilization does not decrease unemployment, while new investments generates the possibility of dynamic growth with employment increases.

Since Turkey is trapped in a pattern of growth, which is based on increasing the rate of capacity utilization, rather than increasing the ratio of investments, the improvements in productivity are not supported by high investment rates and they are not long lasting. This in turn prevents a high and stable growth rate in employment, as well as a productivity-led growth in real wages. (Onaran and Yentürk, 2001)

The effect of public and private investment on unemployment rate and employment shows the sensitivity of labor market to investments. As an economic

system becomes more productive and interconnected, public investment in all forms of capital becomes more, not less required. Growth without jobs is not only socially unsustainable but also unsuccessful in overcoming high inequalities. A dynamic accumulation process that reallocates resources efficiently towards high-productivity investments is the key to increase the labor demand on behalf of social welfare.

The analysis of labor force participation points out at a striking result regarding the role of growth on the participation decision of male and female workers. It is found that growth has a positive effect on the labor supply of men. However, the sensitivity of female labor to growth in terms of participation is limited, verifying the gender-based division of labor in Turkey. Furthermore, the male participation is insensitive to unemployment, except the age group of 20-24, making the participation of male breadwinners to labor force independent of market conditions.

Alternatively, the implicit assumption that total employment is receptive to growth seems to be valid except for the public sector. The employment policies of public are far beyond the scope of growth given the political labor hoardings, or in the opposite direction forced retirement schemes and the termination of new hirings in parallel with the stabilization programs. While the wage determination process in the public sector is subject to a centrally determined bureaucracy and under more strict surveillance by labor regulations, the private sector entails unregulated market dynamics. (İlkkaracan and Selim, 2001)

Although the equations do not fit much to explain the female employment, male estimations are quite reliable in the sense that private and irregular practices of employment of male give strong response to growth. Only in irregular employment practices in the period of 1995 and 2003, growth has a positive effect on male employment, signaling the problem that growth is generating more and more irregular jobs in Turkey. The importance of output, and particularly domestic demand suggest significant policy implications in order to enhance the

employment creation capacity of economy on which the state has an precious responsibility to participate in order to realize these goals without leaving the equity aspect behind.

The effect of 1994 economic crisis on the unemployment rates is a kind of illustration of real wage flexibility demonstrating that workers accepted the erosion in their real wages rather than losing their jobs. Within this context, by the help of power relations based on private ownership of capital, the costs of economic downfall have been paid mostly by labor. In contrast, the economic crisis of 2001 has stimulated the deterioration of unemployment rates given the positive and significant effect of 2001 economic crisis on unemployment rates. During the 2001 crisis, although the decline in wages was again massive, this did not prevent dramatic increases in unemployment. Even in the recovery phase, the high unemployment rates accompanied by the increase of growth points out the insufficiency of Turkish economy to create employment via real GDP growth as expected by Okun.

On the overall, the results are in contradiction with the expectation of Okun's Law due to the unresponsiveness of unemployment to growth. In that sense, the models, which focus on the role of demand, and particularly investments, as is defined in the Keynesian economics can provide a more powerful theoretical tool. These results suggest that the growth pattern of the Turkish economy has failed to enhance the employment capacity for more than 20 years, and there is need for more active policies targeting investments.

The role of a responsible government is to ensure that new investment works for the economy and not against it. Yentürk (1997) also points the necessity of growth based on the increase in productivity and investments in order to achieve a permanent increase in employment. Apart from the field of physical investments, the role of the state is also critical in the field of labor market policies targeting to enhance the skill level of the labor force, which would strengthen the complementarity between investment and labor furthermore.

REFERENCES

- Ansal, H., Küçükçiftçi, S., Onaran, Ö. And Orbay, B.Z.,** 2000. Türkiye Emek Piyasasının Yapısı ve İşsizlik (In Turkish), Türkiye Ekonomik ve Toplumsal Tarih Vakfı, İstanbul.
- Başlevent, C. and Onaran, Ö.,** 2003. Are Married Women in Turkey More Likely to Become Added or Discouraged Workers?, *Labour*, Vol.17, 439-458
- Boratav, K. and Yeldan, E. A.,** 2002. Turkey, 1980-2000: Financial Liberalization, Macroeconomic (In)-Stability, and Patterns of Distribution, CEPA and The New School for Social Research, London.
- Bozdoğan, S. and Kasaba, R.,** 1997. Rethinking Modernity and National Identity in Turkey, University of Washington Press, Seattle.
- Bulutay, T.,** 1995. Employment, Unemployment and Wages in Turkey, State Institute of Statistics and International Labor Office, Ankara.
- Chang, Ha-Joon,** 2003. Kalkınma Reçetelerinin Gerçek Yüzü (In Turkish), İletişim, İstanbul.
- Clark M. A. C. and Kavanagh C.,** 1996. Basic Income, Inequality, and Unemployment: Rethinking the Linkage Between Work and Welfare, *Journal of Economic Issues*, Vol.: XXX, No: 2.
- Doğruel, A. S. and Doğruel, F.,** 2003. Türkiye’de Büyüme ve Makroekonomik İstikrar” in *İktisadi Kalkınma, Kriz ve İstikrar*, edited by Kose, A. H., Şenses, F. and Yeldan, E., İletişim, İstanbul.
- Friedman, B.M. and Wachter, M.L.,** 1974. Unemployment: Okun’s Law, Labor Force, And Productivity, *The Review of Economics and Statistics*, Vol: LVI, Number 2.
- Greene, W.,** 1993. Econometric Analysis, Prentice Hall, London.
- Gordon, R.J.,** 2003. Macroeconomics, 9th edition, MA, Addison Wesley.
- Göle, N.,** 2000. Melez Desenler: İslam ve Modernlik Üzerine (In Turkish), Metis, İstanbul.
- Gürbilek, N.,** 1999. Vitrinde Yaşamak: 1980’lerin Kültürel İklimi (In Turkish), Metis, İstanbul.
- Gürsel, S., Levent, H., İlkaracan, İ., Ulus, M., Taştı, E., Sezer, D., Eratak, A.Y., Ezberci, H. and Orhan, K.,** 2004. Türkiye’de İşgücü Piyasasının Kurumsal Yapısı ve İşsizlik (In Turkish), TÜSİAD, T/2004-11, 381.

- Gürbilek, N.**, 2001. *Kötü Çocuk Türk* (In Turkish), Metis, İstanbul.
- Horton, S., Kanbur, R. and Mazumdar, D.**, 1994. Labor Markets in an Era of Adjustment, Volume 1, Washington, D.C.: The World Bank.
- Işık, O. and Pinarcioğlu, M.**, 2001. Nöbetleşe Yoksulluk: Gecekondulaşma ve Kent Yoksulları, Sultanbeyli Örneği, İletişim, İstanbul.
- Izyumov, A. and Vahaly, J.**, 2002. The Unemployment-Output Tradeoff in Transition Economies: Does Okun's Law Apply?, *Economics Of Planning*, **35**, 317-331.
- İlkkaracan, İ. and Selim, R.**, 2003. The Role of Unemployment in Wage Determination: Further Evidence on the Wage Curve from Turkey, *Applied Economics*, Volume: **35(14)**, 1589-1598.
- Kandiyoti, D.**, 2002. Reading the Fragments, in *Fragments of Culture: The Everyday of Modern Turkey*, edited by Kandiyoti, D. and Saktanber, A., IB Tauris, London.
- Keyder, Ç.**, 1997. Whither the Project of Modernity? Turkey in 1990s, in *Rethinking Modernity and National Identity in Turkey*, edited by Bozdoğan, S. and Kasaba, R., University of Washington Press, Seattle.
- Keyder, Ç.**, 1999. İstanbul: Between the Local and the Global, Rowman & Littlefield, New York.
- Keyder, Ç.**, 1998. Halk Yığınlarının Bugünkü Durumu (In Turkish) in *Osmanlı'dan Cumhuriyet Türkiye'sine İsciler*, edited by Quataert, D. and Zürcher, E. J., İletişim, İstanbul.
- Keynes, J. M.**, 1936. The General Theory of Employment Interest and Money, Harcourt, Brace & World, Inc., New York.
- Lee, J.**, 2000. The Robustness of Okun's Law: Evidence from OECD Countries, *Journal Of Macroeconomics*, **22(2)**, 331-356.
- Mankiw, G.**, 2000. Macroeconomics, 4th Edition, Worth, New York.
- McMurtry, J.**, 2002. Value Wars: The Global Market Versus the Life Economy, Pluto Press, London.
- Okun, A M.**, 1983. Potential GNP: Its measurement and significance, in *Selected Essays of Arthur M. Okun*, edited by Pechman, J. A., MIT Press, Cambridge, MA.
- Onaran, Ö.**, 2002. Measuring Wage Flexibility: The Case of Turkey before and after Structural Adjustment, *Applied Economics* **34**, 767-781.
- Onaran, Ö. and Yentürk, N.**, 2001. Do Low Wages Stimulate Investments? :An Analysis of the Relationship between Wages and Investments in Turkish Private Manufacturing Industry, *International Journal of Applied Economics*, **15(4)**.
- Onaran, Ö. and Başlevent, C.**, 2004. The Effect of Export-Oriented Growth on Female Labor Market Outcomes in Turkey, *World Development*, Vol. **32**, No:8, 1375-1398.
- Özar, Ş. and Ercan, F.**, 2003. Emek Piyasaları: Uyumsuzluk mu, Bütünleşme mi? ; (In Turkish), in *Neoliberalizmin Tahribatı*, edited by Balkan, N. and Savran, S., Metis, İstanbul.

- Özbay, C. and Balic, İ.**, 2004. Erkekliğin Ev Halleri! (In Turkish), *Toplum & Bilim*, Güz 2004, No: **101**, İstanbul.
- Özyeğin, G.**, 2001. Untidy Gender: Domestic Service in Turkey, Temple University Press, Philadelphia.
- Özyeğin, G.**, 2002. The Doorkeeper, The Maid, and the Tenant: Troubling Encounters in the Turkish Urban Landscape, in *Fragments of Culture: The Everyday of Modern Turkey*, edited by Kandiyoti, D., and Saktanber, A., IB Tauris, London.
- Tunali, İ.**, 1997. To Work or not to Work: An Examination of Female Labor Force Participation Rates in Urban Turkey”, *Annual Conference of the Economic Research Forum*, Beirut.
- Tunali E., Ercan, E., Başlevent, C. and Öztürk, O.D.**, 2003. Background Study on Labor Market and Employment in Turkey, Turkish Employment Organization (ISKUR), Ankara.
- Yavan, Z.A.**, 1997. Türkiye’de İşsizlik: Yapısal ve Yapısal Olmayan Özellikleri (In Turkish), TÜSİAD Report-1, İstanbul.
- Yeldan, E.**, 2001. Küreselleşme Sürecinde Türkiye Ekonomisi: Bölüşüm, Birikim ve Büyüme (In Turkish), İletişim, İstanbul.
- Yentürk, N.**, 1997. Türk İmalat Sanayiinde Ücretler, İstihdam ve Birikim (In Turkish), Friedrich Ebert Report, İstanbul.
- Yükseker, H. D.**, 2003. Laleli-Moskova Mekiği: Kayıtdışı Ticaret ve Cinsiyet İlişkileri, İletişim, İstanbul.

APPENDIX

Appendix –A

Table A.1 Time Series Unit Root Tests

Variable	t_{β}	Constant	Trend	Number of lags
loglfprm(15_19)	-2.078	3.880*	-0.006*	2
Δ loglfprm(15_19)	-4.809*	0.028	-0.002*	1
loglfprm(20_24)	-2.673	2.466*	0.002	2
Δ loglfprm(20_24)	-4.963*	0.094*	-0.003*	1
loglfprm(25_34)	-2,610	3,466*	0.007*	2
Δ loglfprm(25_34)	-3.384*	0.034*	-	1
loglfprm(35_54)	-1.005	3.121	0.006	2
Δ loglfprm(35_54)	-4.852*	0.048*	-	1
loglfprm	-1.908	2.525*	0.003	1
Δ loglfprm	-5.263*	0.057*	-0.001*	1
loglfprfm(15_19)	-2.537	4.108*	-0.000	1
Δ loglfprfm(15_19)	-5.277*	-	-	1
loglfprfm(20_24)	-3.316	5.191*	0.018	2
Δ loglfprfm(20_24)	-5.563*	0.072*	-	1
loglfprfm 25_34)	-1.876	3.404*	0.016*	2
Δ loglfprfm 25_34)	-5.377*	0.083*	-	1
loglfprfm(35_54)	-4.090	6.000*	0.027*	2
Δ loglfprfm(35_54)	-6.486*	0.084*	0.027**	1
loglfprfm	-4.795	9.947	0.030*	2

$\Delta \log l f p r f m$	-7.366*	0.081*	-	1
$\log t o t a l$	-2.125	0.613**	-	1
$\Delta \log t o t a l$	-4.352*	0.033*	-	1
$\log m$	-2.314	0.695	-	2
$\Delta \log m$	-4.043*	0.021*	-	1
$\log f m$	-1.072	0.466	-	2
$\Delta \log f m$	-8.300*	0.109*	-	1
$\log p r i v m$	-2.349	113258*	0.016**	3
$\Delta \log p r i v m$	-2.836**	0.024	-	1
$\log p u b m$	-3.961*	8.456*	0.008*	1
$\log o t h m$	-1.781	4.698	-0.007	2
$\Delta \log o t h m$	-2.923*	-	-	1
$\log t o t a l m$	0.818	-	-	1
$\Delta \log t o t a l m$	-3.887*	0.023	-	1
$\log p r i v f m$	-3.904*	7.348*	0.035*	1
$\log p u b f m$	-2.138	4.171*	0.002	2
$\Delta \log p u b f m$	-2.811*	-	-	2
$\log o t h f m$	-3.991*	6.292*	0.041*	1
$\log t o t a l f m$	-3.487	9.380*	0.031**	1
$\Delta \log t o t a l f m$	-5.693*	0.079*	-	1
$u n e m p_r a t e t o t a l$	-1.484	4.474	0.009	3
$\Delta u n e m p_r a t e t o t a l$	-4.541*	-	-	1
$u n e m p m(15_19)$	-2.589	12.424*	-0.048	2
$\Delta u n e m p m(15_19)$	-5.146*	-	-	3
$u n e m p m(20_24)$	-2.802	13.933*	0.014	2
$\Delta u n e m p m(20_24)$	-5.361*	-	-	1
$u n e m p m(25-34)$	-2.431	3.459*	0.047	2
$\Delta u n e m p m(25-34)$	-4.605*	-	-	1

unempm(35-54)	-1.632	1.124	0.047**	1
Δ unempm(35-54)	-6.211*	-0.658	0.053*	1
unempm	-2.872	5.438*	0.012	2
Δ unempm	-4.805*	-	-	1
unempfm(15_19)	1.577	16.143	-0.046	3
Δ unempfm(15_19)	-5.616*	-	-	1
unempfm(20_24)	-1.302	12.601	0.029	3
Δ unempfm(20_24)	-7.472*	-6.368*	0.296*	1
unempfm(25-34)	-1.725	8.900	-0.069	2
Δ unempfm(25-34)	-5.317*	-	-	1
unempfm(35-54)	-2.141	3.486	0.007	2
Δ unempfm(35-54)	-4.193*	-2.527*	0.126*	1
unempfm	-1.561	9.557	-0.049	3
Δ unempfm	-5.909*	-3.602*	0.160*	1
logrnagdp	-1.297	1.375	-	2
Δ logrnagdp	-5.683*	0.042*	-	1
tinvrnagdp	-2.458	0.058*	-	2
Δ tinvrnagdp	-5.672*	-	-	1
tinvcrnagdp	-3.256	0.052	-0.259	1
Δ tinvcrnagdp	-3.258*	-0.004*	-	1

Notes: * and ** stand for 5% and 10% significance levels respectively, such that t ratios which are significant denotes that the null hypothesis of a unit root can be rejected.

Appendix-B

Estimation Results Of Labor Force Participation Rates (Urban, 1990-2003)

Table B.1 Estimation Results of Labor Force Participation Rates of Male Aged Between 15-19

Dependent Variable:	Change in the LFPR Male Age 15-19 ($\Delta \log l_{fpm}(15_19)$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	28 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	-0.040382	0.0403
Real GDP Growth ($\Delta \log r_{nagdp}$)	0.100018	0.7108
$\Delta \log r_{nagdp} (-1)$	0.570733	0.0283
Unemployment Rate Male (Δu_{nempm})	-0.007659	0.4396
$\Delta u_{nempm} (-1)$	0.016567	0.1144
$\Delta \log l_{fpm}(15_19) (-1)$	0.421218	0.0504
R-squared:	0.330928	
Adjusted R-squared:	0.178866	
F-statistic:	2.176268	
Probability (F-statistic):	0.093833	

Table B.2 Estimation Results of Labor Force Participation Rates of Male Aged Between 25-34

Dependent Variable:	Change in the LFPR Male Age 25-34 ($\Delta \log l_{fpm}(25_34)$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	28 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	0.026681	0.0235
Real GDP Growth ($\Delta \log r_{nagdp}$)	0.123855	0.3093
$\Delta \log r_{nagdp} (-1)$	0.059652	0.6285
Unemployment Rate Male (Δu_{nempm})	0.006649	0.1523
$\Delta u_{nempm} (-1)$	-0.007329	0.1380
$\Delta \log l_{fpm}(25_34) (-1)$	0.214549	0.2801
R-squared:	0.264389	
Adjusted R-squared:	0.097205	
F-statistic:	1.582421	
Probability (F-statistic):	0.206709	

Table B.3 Estimation Results of Labor Force Participation Rates of Male Aged Between 35-54

Dependent Variable:	Change in the LFPR Male Age 35-54 ($\Delta \log lfp_m(35_54)$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	28 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	0.032424	0.0012
Real GDP Growth ($\Delta \log n_{agdp}$)	0.070177	0.2891
$\Delta \log n_{agdp} (-1)$	0.115256	0.0759
Unemployment Rate Male ($\Delta unemp_m$)	-0.004187	0.1805
$\Delta unemp_m (-1)$	0.002349	0.2793
$\Delta \log lfp_m(35_54) (-1)$	-0.179746	0.3986
R-squared:	0.317213	
Adjusted R-squared:	0.162034	
F-statistic:	2.044179	
Probability (F-statistic):	0.111702	

Table B.4 Estimation Results of LFPR of Female Aged Between 15-19

Dependent Variable:	Change in the LFPR Female Age 15-19 ($\Delta \log lfp_f(15_19)$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	28 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	-0.018144	0.5871
Real GDP Growth ($\Delta \log n_{agdp}$)	0.167111	0.7159
$\Delta \log n_{agdp} (-1)$	0.027327	0.9530
Unemployment Rate Female ($\Delta unemp_f$)	0.000807	0.9287
$\Delta unemp_f (-1)$	0.008426	0.3414
$\Delta \log lfp_f(15_19) (-1)$	-0.057009	0.7973
R-squared:	0.052896	
Adjusted R-squared:	-0.162355	
F-statistic:	0.245742	
Probability (F-statistic):	0.937508	

Table B.5 Estimation Results of LFPR of Female Aged Between 20-24

Dependent Variable:	Change in the LFPR Female Age 20-24 ($\Delta \log lfp_{fm}(20-24)$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	28 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	0.036581	0.2133
Real GDP Growth ($\Delta \log r_{nagdp}$)	0.454603	0.2414
$\Delta \log r_{nagdp} (-1)$	-0.023785	0.9525
Unemployment Rate Female ($\Delta unemp_{fm}$)	0.003923	0.6008
$\Delta unemp_{fm} (-1)$	0.001728	0.8135
$\Delta \log lfp_{fm}(20-24) (-1)$	-0.113903	0.6036
R-squared:	0.087597	
Adjusted R-squared:	-0.119767	
F-statistic:	0.422431	
Probability (F-statistic):	0.828044	

Table B.6 Estimation Results of LFPR of Female Aged Between 25-34

Dependent Variable:	Change in the LFPR Female Age 25-34 ($\Delta \log lfp_{fm}(25_34)$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	28 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	0.080548	0.0041
Real GDP Growth ($\Delta \log r_{nagdp}$)	-0.165095	0.5626
$\Delta \log r_{nagdp} (-1)$	-0.302190	0.3049
Unemployment Rate Female ($\Delta unemp_{fm}$)	-0.001502	0.7868
$\Delta unemp_{fm} (-1)$	0.008858	0.1136
$\Delta \log lfp_{fm}(25_34) (-1)$	-0.057981	0.7780
R-squared:	0.171867	
Adjusted R-squared:	-0.016346	
F-statistic:	0.913154	
Probability (F-statistic):	0.490633	

Table B.7 Estimation Results of LFPR of Female Aged Between 35-54

Dependent Variable:	Change in the LFPR Female Age 35-54 ($\Delta \log lfp_{fm}(35_54)$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	28 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	0.078192	0.0122
Real GDP Growth ($\Delta \log r_{nagdp}$)	-0.250849	0.4734
$\Delta \log r_{nagdp}$ (-1)	-0.113192	0.7457
Unemployment Rate Female ($\Delta unemp_{fm}$)	-0.004489	0.5206
$\Delta unemp_{fm}$ (-1)	-0.019160	0.0070
$\Delta \log lfp_{fm}(35_54)$ (-1)	-0.118598	0.5531
R-squared:	0.303500	
Adjusted R-squared:	0.145204	
F-statistic:	1.917296	
Probability (F-statistic):	0.132172	

Appendix-C

Estimation Results Of Unemployment (Urban, 1990-2003)

Table C.1 Estimation Results of the Change in Male Unemployment Rate Aged Between 15-19

Dependent Variable:	Change in the Unemployment Rate of Male Age 15-19 ($\Delta unemp(15_19)$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	27 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	0.178571	0.8551
Real GDP Growth ($\Delta lognagdp$)	6.170650	0.6782
$\Delta lognagdp$ (-1)	-11.33266	0.4733
$\Delta unemp(15_19)$ (-1)	0.353557	0.1360
Change in the Total Investment Rate ($\Delta tinvrnagdp$)	-0.174106	0.4426
$\Delta tinvrnagdp$ (-1)	0.202364	0.3402
R-squared:	0.212409	
Adjusted R-squared:	0.033411	
F-statistic:	1.186656	
Probability (F-statistic):	0.347617	

Table C.2 Estimation Results of the Change in Male Unemployment Rate Aged Between 20-24

Dependent Variable:	Change in the Unemployment Rate of Male Age 20-24 ($\Delta unemp(20_24)$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	27 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	-0.211868	0.8347
Real GDP Growth ($\Delta lognagdp$)	15.05960	0.3361
$\Delta lognagdp$ (-1)	-0.953523	0.9543
$\Delta unemp(20_24)$ (-1)	0.372638	0.0775
Change in the Total Investment Rate ($\Delta tinvrnagdp$)	-0.362246	0.1161
$\Delta tinvrnagdp$ (-1)	0.269937	0.2365
R-squared:	0.288702	
Adjusted R-squared:	0.127043	
F-statistic:	1.785871	
Probability (F-statistic):	0.157429	

Table C.3 Estimation Results of the Change in Male Unemployment Rate Aged Between 25-34

Dependent Variable:	Change in the Unemployment Rate of Male Age 25-34 ($\Delta \text{unempm}(25_34)$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	27 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	0.216124	0.6646
Real GDP Growth ($\Delta \log \text{nagdp}$)	-1.485014	0.8404
$\Delta \log \text{nagdp}$ (-1)	1.933042	0.8005
$\Delta \text{unempm}(25_34)$ (-1)	0.357557	0.0932
Change in the Total Investment Rate ($\Delta \text{tinvrnagdp}$)	-0.086098	0.4077
$\Delta \text{tinvrnagdp}$ (-1)	-0.008664	0.9320
R-squared:	0.232656	
Adjusted R-squared:	0.058260	
F-statistic:	1.334068	
Probability (F-statistic):	0.286811	

Table C.4 Estimation Results of the Change in Male Unemployment Rate Aged Between 35-54

Dependent Variable:	Change in the Unemployment Rate of Male Age 25-34 ($\Delta \text{unempm}(35_54)$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	27 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	-0.367934	0.3661
Real GDP Growth ($\Delta \log \text{nagdp}$)	1.101726	0.8580
$\Delta \log \text{nagdp}$ (-1)	11.72901	0.0727
$\Delta \text{unempm}(35_54)$ (-1)	0.271707	0.1830
Change in the Total Investment Rate ($\Delta \text{tinvrnagdp}$)	-0.154939	0.0806
$\Delta \text{tinvrnagdp}$ (-1)	-0.135884	0.1323
R-squared:	0.414038	
Adjusted R-squared:	0.280864	
F-statistic:	3.109013	
Probability (F-statistic):	0.028483	

Table C.5 Estimation Results of the Change in Female Unemployment Rate Aged Between 15-19

Dependent Variable:	Change in the Unemployment Rate of Male Age 25-34 ($\Delta unempm(35_54)$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	27 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	-0.367934	0.3661
Real GDP Growth ($\Delta logrnagdp$)	1.101726	0.8580
$\Delta logrnagdp$ (-1)	11.72901	0.0727
$\Delta unempm(35_54)$ (-1)	0.271707	0.1830
Change in the Total Investment Rate ($\Delta tinvrnagdp$)	-0.154939	0.0806
$\Delta tinvrnagdp$ (-1)	-0.135884	0.1323
R-squared:	0.414038	
Adjusted R-squared:	0.280864	
F-statistic:	3.109013	
Probability (F-statistic):	0.028483	

Table C.6 Estimation Results of the Change in Female Unemployment Rate Aged Between 20-24

Dependent Variable:	Change in the Unemployment Rate of Female Age 20-24 ($\Delta unempfm(20_24)$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	27 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	-1.009217	0.5345
Real GDP Growth ($\Delta logrnagdp$)	35.83365	0.1361
$\Delta logrnagdp$ (-1)	-23.10444	0.3725
$\Delta unempfm(20_24)$ (-1)	0.090267	0.6746
Change in the Total Investment Rate ($\Delta tinvrnagdp$)	-0.677283	0.0485
$\Delta tinvrnagdp$ (-1)	0.211360	0.5577
R-squared:	0.244049	
Adjusted R-squared:	0.072242	
F-statistic:	1.420483	
Probability (F-statistic):	0.255927	

Table C.7 Estimation Results of the Change in Female Unemployment Rate Aged Between 25-34

Dependent Variable:	Change in the Unemployment Rate of Female Age 25-34 ($\Delta unemp_{fm}(25_34)$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	27 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	-0.751222	0.4921
Real GDP Growth (Δlog_{nagdp})	24.76166	0.1160
Δlog_{nagdp} (-1)	-13.14796	0.4411
$\Delta unemp_{fm}(25_34)$ (-1)	0.014336	0.9517
Change in the Total Investment Rate ($\Delta tin_{vrnagdp}$)	-0.6452433	0.0128
$\Delta tin_{vrnagdp}$ (-1)	0.3754726	0.1270
R-squared:	0.388348	
Adjusted R-squared:	0.249336	
F-statistic:	2.793634	
Probability (F-statistic):	0.042254	

Table C.8 Estimation Results of the Change in Female Unemployment Rate Aged Between 35-54

Dependent Variable:	Change in the Unemployment Rate of Female Age 25-34 ($\Delta unemp_{fm}(35_54)$)	
Estimation Method:	Least Squares	
Estimation Period (Adjusted):	1990 -2003	
Number of Observations:	27 after adjusting endpoints	
Variable	Coefficient	Probability
Constant	-1.227411	0.0896
Real GDP Growth (Δlog_{nagdp})	15.08848	0.1650
Δlog_{nagdp} (-1)	11.37471	0.3277
$\Delta unemp_{fm}(35_54)$ (-1)	0.160502	0.4419
Change in the Total Investment Rate ($\Delta tin_{vrnagdp}$)	-0.3033579	0.0503
$\Delta tin_{vrnagdp}$ (-1)	-0.1762723	0.2695
R-squared:	0.284427	
Adjusted R-squared:	0.121797	
F-statistic:	1.748918	
Probability (F-statistic):	0.165373	

Appendix-D

Breusch-Godfrey Serial Correlation LM Test Results

D.1 Estimation Results for Labor Force Participation Rates of Male

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	1,79	Probability	0,32
Obs*R-squared	2,95	Probability	0,22

D.2 Estimation Results for Labor Force Participation Rates of Male Aged Between 20-24

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	1,76	Probability	0,19
Obs*R-squared	4,19	Probability	0,12

D.3 Estimation Results for Labor Force Participation Rates of Female

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	1,38	Probability	0,27
Obs*R-squared	3,59	Probability	0,16

D.4 Estimation Results of Total Employment

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	1,94	Probability	0,18
Obs*R-squared	5,52	Probability	0,06

D.5 Estimation Results of Total Employment (Investment Added)

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	0,89	Probability	0,44
Obs*R-squared	3,83	Probability	0,14

D.6 Estimation Results of Male Employment

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	2,51	Probability	0,11
Obs*R-squared	5,42	Probability	0,06

D.7 Estimation Results of Male Employment (Investment Added)

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	2,27	Probability	0,15
Obs*R-squared	7,72	Probability	0,02

D.8 Estimation Results of Female Employment

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	1,64	Probability	0,21
Obs*R-squared	3,97	Probability	0,13

D.9 Estimation Results of Female Employment (Investment Added)

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	1,88	Probability	0,18
Obs*R-squared	4,90	Probability	0,08

D.10 Estimation Results of Male Employment in Public Sector

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	0,54	Probability	0,60
Obs*R-squared	2,14	Probability	0,34

D.11 Estimation Results of Male Employment in Private Sector

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	0,95	Probability	0,42
Obs*R-squared	3,00	Probability	0,22

D.12 Estimation Results of Male Employment in Other Sector

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	0,82	Probability	0,47
Obs*R-squared	2,67	Probability	0,26

D.13 Estimation Results of Female Employment in Public Sector

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	2,11	Probability	0,19
Obs*R-squared	5,27	Probability	0,07

D.14 Estimation Results of Female Employment in Private Sector

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	2,40	Probability	0,15
Obs*R-squared	5,70	Probability	0,05

D.15 Estimation Results of Female Employment in Other Sector

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	3,03	Probability	0,12
Obs*R-squared	7,04	Probability	0,02

D.16 Estimation Results of Change in the Total Unemployment Rate

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	0,34	Probability	0,71
Obs*R-squared	0,94	Probability	0,62

D.17 Estimation Results of Change in the Total Unemployment Rate (Investment Added)

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	0,89	Probability	0,42
Obs*R-squared	2,30	Probability	0,31

D.18 Estimation Results of Change in the Total Unemployment Rate (including dummy1994)

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	2,10	Probability	0,15
Obs*R-squared	6,23	Probability	0,04

D.19 Estimation Results of Change in the Total Unemployment Rate (including dummy2001)

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	1,92	Probability	0,18
Obs*R-squared	5,82	Probability	0,05

D.20 Estimation Results of Change in the Male Unemployment Rate

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	0,97	Probability	0,39
Obs*R-squared	2,78	Probability	0,24

D.21 Estimation Results of Change in the Male Unemployment Rate (including dummy1994)

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	0,70	Probability	0,51
Obs*R-squared	2,62	Probability	0,26

D.22 Estimation Results of Change in the Male Unemployment Rate (including dummy2001)

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	1,43	Probability	0,27
Obs*R-squared	4,87	Probability	0,08

D.23 Estimation Results of Change in the Female Unemployment Rate

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	0,95	Probability	0,40
Obs*R-squared	2,59	Probability	0,27

D.24 Estimation Results of Change in the Female Unemployment Rate (including dummy1994)

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	1,96	Probability	0,17
Obs*R-squared	5,92	Probability	0,05

D.25 Estimation Results of Change in the Female Unemployment Rate (including dummy2001)

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	1,72	Probability	0,21
Obs*R-squared	5,33	Probability	0,06

CURRICULUM VITAE

Alper Tümbal was born in Denizli in 1980. He attended to Denizli Anatolian High School and graduated from Yıldız Technical University, Department of Industrial Engineering with an Honor Degree. His graduation thesis is “The Effects of 2000 November and 2001 February Crises on the SMEs and Recovery Process.” He is still having his M.Sc. degree at İstanbul Technical University, the Department of Management Engineering.