

Labour Markets In Developing Countries

Ayse Arzu Yavuz
PhD in Economics
University of Exeter

September 2009

Labour Markets In Developing Countries

1 Volume

Submitted by Ayse Arzu Yavuz to the University of Exeter as thesis for the degree of Doctor of Philosophy in Economics, September 2009.

This thesis is available for Library use on understanding that it is copyright material and that no quotation from the thesis may be published without proper acknowledgement.

I certify that all material in this thesis which is not my own work has been identified and that no material has previously been submitted and approved for the award of a degree by this or any other University.

.....(signature)

Abstract

This thesis basic aim is to have a better understanding of how labour markets work and to explore different transmission mechanisms that might be responsible for making these markets different from their counterparts in the developed world. I analyzed problems created by large public sector employment by using two different frameworks and I made an empirical study about the social factors related to gender issues. In the second chapter, the government's excess employment in the economy is placed under the efficiency wage framework. It is aimed to find out how the wage and effort differentials between public and private sectors actually affect the labour market or more specifically equilibrium levels of employment, wages and productivity. The chapter investigates how the total welfare responds to changes in these differentials in terms of two different models. The results show that an effort of raising employment by the government eventually leads to a reduction in the total welfare by curbing private employment. This chapter contributes to the existing literature by providing a different approach by defining an explicit outside option, namely the government sector, to the efficiency wage theory. Another aspect analyzed is the relation between public sector employment and output growth. In chapter three, I try to establish a link between the government employment and economic growth rate underlying several mechanisms; distortionary taxes, productive government expenditure and productivity link resulting from the interaction of government and private labour markets inspiring from the efficiency wage theory. I endogenize the growth rate by introducing a public sector capital term in government expenditures. The production function in the growth model is constructed such that productivity of private worker decreases when size of public employment increases. I concluded that the abundant government employment force private sector either to pay higher wages or to have lower productivity of labour as outside option for the workers are now plenty. While higher wage leads more unemployment, productivity decline causes output to reduce. Developing countries social dynamics have unforeseen consequences on the labour markets. Thus, in order to understand the social and traditional values explaining the employment decisions taken by the labour force in the developing countries, in the fourth chapter of this thesis an empirical study is carried out to investigate the existence of and the potential behavioral change in son preference in Turkey, by using different statistical techniques. The main contribution of this part is that, it provides a broad analysis of son preference behavior in Turkey by using the latest econometric techniques. In particular, it investigates whether the process of urbanization and modernization in Turkey had an effect on son preference behavior over time. The results imply that there is clear and strong son preference in Turkey and the difference between progression ratios of families with and without sons is larger in 1993 compared to 1998. It is also found that the regional effects are more dominant on childbearing decision and urbanization had a diminishing effect on son preference behavior in Turkey.

Contents

1	Introduction	1
1.1	An Overview of Labour Markets in DC	2
1.1.1	The Importance of the Labour Markets in DC	2
1.1.2	Features of DC Labour Markets	3
1.1.3	An example of a DC Labour Market: The Turkish Case	8
1.2	Labour Markets in the context of Efficiency Wages, Growth and Social Factors	22
1.2.1	Shirking Model Including Government Sector	23
1.2.2	A Growth Model with Public Employment and Efficiency Wages	27
1.2.3	A Social Factor Related to Gender Preference	29
2	Labour market interactions	32
2.1	Introduction	32
2.2	Literature Review	34
2.3	Model	40
2.3.1	General Framework	40
2.3.2	Model Specifics and Solution	44
2.4	Tax and Welfare Analysis	50
2.5	Endogenizing Government Wage and Effort	57
2.6	Conclusion	65
3	Government employment and growth	68
3.1	Introduction	68
3.2	Model	72
3.3	Model with government employment affecting the productivity of the private sector	78
3.4	Endogenous Model	83
3.4.1	Outline of the main endogenous growth model	84
3.4.2	Endogenous model with government employment affecting the productivity of the private sector	88
3.5	Conclusion	91
4	Son Preference in Turkey	94
4.1	Introduction	94

4.2	Data, Methodology and Empirical Results	99
4.2.1	Data	100
4.2.2	Models and Empirical Results	104
4.2.3	Further comparisons between the years 1993 and 1998	113
4.3	Conclusion	115
5	Conclusion	118
5.1	Policy Recommendations	119
5.1.1	Importance of Social Security System for Employment Creation in the Private Sector: The Turkish Case	123
5.2	Further Research	131
A	Labour market interactions	133
A.1	Simple Model (\bar{w} increases and decreases)	134
A.2	Simple Model (\bar{e} increases and decreases)	135
A.3	Simple Model (U_b increases and decreases)	137
A.4	Tax on Private Sector (Main Model)	139
A.5	Tax on Private Sector (\bar{w} increase)	141
A.6	Tax on Private Sector (\bar{e} increase)	145
A.7	Tax on Private Sector (U_b increase)	149
A.8	The Effects of Tax Financed Increase in \bar{w}	153
A.9	Endogenizing Public Sector Wage and Effort	154
B	Government employment and growth	156
B.1	Exogenous Main Model Steady State Values	156
B.2	Steady states values for the exogenous model in which government em- ployment affecting the productivity of the private sector with $\lambda = 0.6$.	158
B.3	Steady states values for the exogenous model in which government em- ployment endogenized to see its effect on the productivity of the private sector	159
B.4	Steady state values and growth rates of endogenous models	160
B.5	Graphs for Levels of the Main Endogenous Growth Model	161
B.6	Graphs for Steady State Growth Rates of the Main Endogenous Growth Model	162
C	Son preference in Turkey	163
C.1	Parity Progression Logistic Regression (1998)	164
C.2	Parity Progression	165
C.3	Parity Progression Logistic Regression	166
C.4	Effects of Changes in Son Preference Variables	167

C.5 Cox Proportional Hazards Model	168
C.6 Hazards Model with Last Boy Dummy	169
C.7 Simple Cox Proportional Hazards Model	171
C.8 PP Logistic Regression (year and regional dummy)	172
C.9 Pooled regressions	173

List of Tables

1.1.1 Labour Force Participation Rates (percent)	4
1.1.2 Summary of Turkish Labour Force (15+Age, Thousand, Average) . . .	9
1.1.3 Share of Employment by Employment Status in Turkey, percentage . .	11
1.1.4 Distribution of employed persons in agricultural, informal and formal sector in Turkey (percentage)	15
1.1.5 Government Employment in Turkey	17
2.3.1 Effects of the changes on labour markets	47
2.4.1 Effects of the changes on labour markets including tax	57
2.5.1 Effects of the changes on government monitoring on labour market variables, $t=0.1$	61
4.2.1 Parity Progression	107
4.2.2 Parity Progression Logistic Regression	108
4.2.3 Effects of Changes in Son Preference Variables	109
4.2.4 Cox Proportional Hazards Model	112
4.2.5 PP Logistic Regression with Year Dummy Interaction	114

List of Figures

1.1.1 ILO unemployment rates for males and females, 2006	5
1.1.2 Employment in the informal economy as a % of total employment . . .	6
1.1.3 Share of Public Employment in Selected Countries	7
1.1.4 Employment Shares By Economic Activity and Sex in Years 1960 and 2005 in Turkey	11
1.1.5 The Distribution of Employment by Employment Status, Geographical Location and Gender, Turkey, 2000 (%)	12
1.1.6 Labour Force Participation Rates by Gender and Geographic Location in Turkey	19
1.1.7 Productivity, Production and Working Hour in Public Manufacturing Sector in Turkey	20
1.1.8 Productivity, Production and Working Hour in Private Manufacturing Sector in Turkey	21
1.1.9 Quarterly Real Wages Index (1997=100)	22
2.3.1 The Effects of Increase in \bar{w} on Labour Market Variables in the Simple Model	49
2.4.1 Government Labour Demand, Total Employment and Tax	53
2.4.2 The Effects of Tax Change on Labour Market Variables	54
2.4.3 Welfare Structures	55
2.4.4 The effects of tax financed increase in \bar{w}	56
2.5.1 Government Labour, Total Employment and Tax with Endogenized Public Wage and Effort	62
2.5.2 Welfare Structures with Endogenized Public Wage and Effort	63
2.5.3 Government Labour and Per Capita Labour Payoffs	64
3.2.1 Steady states values when government employment changes in the main exogenous model	77
3.2.2 Private Employment and Tax rate when government employment changes in the main exogenous model	78
3.3.1 Steady states values of the exogenous model in which government em- ployment affecting the productivity of the private sector $\lambda = 0.6$	80

3.3.2 Steady states values of wage, rent, saving and capital in the exogenous model in which government employment affecting the productivity of the private sector ($\lambda(L_g) = \frac{1}{1+L_g^{\frac{1}{4}}}$)	82
3.3.3 Steady states values of production, consumption, government expenditure and private employment in the exogenous model in which government employment affecting the productivity of the private sector ($\lambda(L_g) = \frac{1}{1+L_g^{\frac{1}{4}}}$)	82
3.4.1 The endogenous model steady states growth and tax rates with different levels of government employment	89
3.4.2 Endogenous model in which government employment affecting the productivity of the private sector	90
3.4.3 Comparison of growth rates when lambda is constant and endogenized	90

Acknowledgements

I would like to express my deepest appreciation to my supervisor Professor Gareth Myles being to me an invaluable mentor as well as an excellent teacher. I am deeply indebted to him for his guidance and help through my PhD studies. In numerous occasions Professor Gareth Myles showed his most encouraging support.

My gratitude goes also to Professor Nigar Hashimzade for her support and help in the son preference paper. I would like to thank Professor John Fender and Professor Tatiana Kirsanova for the valuable discussion and their comments during the viva.

The support and friendship of many staff members and my fellow research students at the University of Exeter were certainly unforgettable. The completion of the work described in this thesis would not have been possible without the scholarship offered by the Central Bank of the Republic of Turkey. Many thanks also go to my friends Jack Rogers and John Hawkins who helped me to correct my English.

My parents, Mr Ahmet Cetinkaya and Mrs Hatice Handan Cetinkaya, my in-laws Mr Fevzi Yavuz and Mrs Ayten Yavuz, my sister, Canan Gedik and her family supported my dreams and efforts during many difficult moments. Mr Abdullah Kuzu, Mrs Ayse Kuzu and Miss Lale Kuzu are like a second family for me now and they helped me on numerous occasions. I also would like to thank to Mrs Sevil Fertinger and Miss Cosku Fertinger for their support and friendship.

Finally, I would like to thank my husband, Devrim Yavuz, for his unconditional support for everything. Without his support, I would not have finished this thesis.

Chapter 1

Introduction

This thesis analyses certain features of the labour market in developing countries (DC). The basic aim is to have a better understanding of how labour markets work and to explore different transmission mechanisms that might be responsible for making these markets different from their counterparts in the developed world. My main motivation comes from my observations as a researcher of the Central Bank of Turkey. During my experience, I discovered that when designing economic policy in a country like Turkey, one should be extremely careful because any policy action may lead to completely unexpected results due to the different structural features of the economy. Therefore, it is critical to understand this structure as thoroughly as possible before proposing any policy advice. It is my personal opinion that understanding labour market dynamics in DC may contribute significantly to macroeconomic policy recommendations in these countries.

As my observations about Turkey provided the main motivation for this study, I think it would be appropriate to start with a brief history and outline of the Turkish labour market. In Turkey, similar to other developing countries, government is the main employer in the economy, the growth rate of government employment is high and there is a trend of overemployment in the public sector (Bulutay 1995, chap.7). The overemployment in the government sector in Turkey is mainly because there is no unemployment benefit system and the employment in government sector is used as an insurance mechanism. Like many other structural problems, the condition of the labour market today in Turkey has its roots in the recent economic history.

In the early years of the new Turkish Republic, due to the lack of a well operating private sector and domestic entrepreneurs, public investment was seen as the major locomotive for growth and development. This led to an expanding public sector in time which invested in several sectors and big public enterprises were formed. The rise of public employment in Turkey mainly took place after a considerable rural population migrated to big cities. Before the 1950s, the main employment was in the agricultural sector in Turkey and most of the population was in the rural areas. However, after the 1950s, because of technological progress in the agricultural sector, productivity increases caused excess labour. Therefore, surplus labour in the rural areas started to

migrate to big cities. This was the beginning of employment problems of Turkey as cities were not able to absorb this extreme surplus labour. The creation of jobs was not successful as the industrial developments were lacking. This huge unemployment in the cities created another problem which can be named as the informal employment sector in the cities. Besides, to cope with this huge unemployment, government started to employ people and in time overemployment in the government sector created low production and productivity problems. Another important point is that, the financing of these workers was done by public revenues (Philpott 1997) and the public sector rarely laid off workers. This high public employment feature of the DC labour markets can clearly be observed in Turkey and it is studied in detail in this thesis.

Next, a brief overview of DC labour markets is given. A more detailed analysis of the Turkish case follows. Then the introduction proceeds by concentrating on the main research interests in this thesis.

1.1 An Overview of Labour Markets in DC

1.1.1 The Importance of the Labour Markets in DC

High inflation rates, unstable growth rates, fragile banking system, low labour productivity, high income inequality, huge public sector, wage flexibility and poor functioning labour markets are among the characteristics of the developing countries where various markets fail to function well because of several economic inefficiencies or poor government interventions. In order to overcome these problems and maintain macroeconomic steadiness, developing countries often adopt stabilization programs and structural reforms related to fiscal, financial or real sector. Conventional fiscal or monetary policy alone cannot achieve the required objectives because of the structural factors and that is why these stabilization programs are often supported by a package of structural reforms. A good example can be found in the ‘letter of intent’ submitted to the International Monetary Fund (IMF) by the Turkish government in 1999:

"Our structural reform program aims at making sustainable over the medium term the fiscal adjustment implemented in 2000, lowering the burden of interest payments on public sector debt, improving transparency and economic efficiency, and reducing the contingent liabilities of the public sector. All these are essential to create an environment where high growth rates could be sustained in a low inflation environment... "

Among all the other structural factors, ill functioning labour markets are particularly critical in the sense that, the response of the economy to the stabilization policies may be restrained through complex and diverse channels of the labour markets.

First of all, labour market conditions are critical in determining how the economy reacts to any policy aiming to change aggregate demand. Different results obtained in response to different policies in macroeconomic literature often depend on different

assumptions in the labour market. The impact of monetary and fiscal policy on different macroeconomic variables depends on how they affect the consumption and investment behavior of the people. This behavior is closely related to what happens in the labour market side of the economy as labour income is the major source of income. When the recent history of mainstream macroeconomic literature is considered, it is obvious that assumptions about the labour market play a critical role in determining the policy implications of many problems. This significance may be more critical for the developing countries, because designing economic policy is harder in these countries due to many structural problems. All in all, understanding the structure of labour markets is critical for foreseeing possible achievements or drawbacks of stabilization programs.

Secondly, the wage determination process is critical in controlling inflation which is one of the major policy objectives in stabilization programs. An 'Incomes policy' is usually a vital component of these programs. Controlling aggregate demand is only possible by controlling certain expenditures and this often cannot be done only by controlling the interest rates in developing countries. Fiscal dominance or the structure of the financial system may prove interest policy ineffective and more heterodox measures such as price or income controls may be necessary. The way of labour markets operating will then be important to predict the true effects of these policies on the economic variables.

Finally, labour markets play a significant role in determining the costs of the stabilization efforts. These programs often incur short-run costs and in return they offer longer-run benefits. The extent of these costs and how they will be shared by different social groups are closely related to the functioning of labour markets. Besides, it should not be forgotten that employment generates income, labour income is the main source of income for the poor population and poverty reduction is possible with creating productive jobs. Economic programs can only be sustainable and successful at the end if they can attain public support. Therefore, prediction of the social cost of a given policy is critical for its success and this cost is often connected strongly to the conditions in the labour market.

Consequently, for all these reasons, understanding the behavior of the labour markets of the developing countries is crucial to comprehend the effects of economic policy. Different structure of developing economies brings about different obstacles when conducting economic policy. Coping with these obstacles requires a deep understanding of the operation of labour markets since this operation affects various policy objectives such as growth, inflation or income distribution.

1.1.2 Features of DC Labour Markets

One of the most important features of labour markets in general is the labour force participation rate. The labour participation rates for different groups of countries around the world are given in Table 1.1.1. If the rates associated with the developed

economies and European Union are taken as a benchmark, North African, Central and South Eastern European and Middle Eastern countries have relatively lower rates of labour participation, while Latin American and East Asian countries have higher participation rates in general. The figures do not imply a certain relation between being a developing country and having particularly low or high rates of labour participation. However, when looked at closer, it is realized that the groups with low rates are mostly formed by Muslim countries. The second part of the table displays what the reason might be for this difference. South Asian, North African and Middle Eastern countries have considerably lower participation rates for women, which is believed mainly due to the cultural and religious beliefs. This feature does not seem common for all developing countries, but it is a distinctive one for a group of them including Turkey. The fourth chapter of this thesis aims to contribute to the understanding of this feature by analysing son preference behavior in Turkey.

Table 1.1.1: Labour Force Participation Rates (percent)

Both sexes	1996	2002	2003	2004	2005
WORLD	66.7	66.0	65.8	65.8	65.7
Developed Economies & European Union	60.7	60.4	60.3	60.4	60.4
Central & South-Eastern Europe	60.6	58.9	58.4	58.9	58.9
East Asia	78.0	76.0	75.4	75.2	74.9
South East Asia & the Pacific	70.1	70.4	70.3	70.5	70.6
South Asia	61.2	60.3	60.3	60	59.9
Latin America & the Caribbean	63.4	65.1	65.4	65.4	65.5
North Africa	49.8	49.6	49.9	50.3	50.5
Sub-Saharan Africa	75.6	74.6	74.4	74.4	74.3
Middle East	52.6	54.7	55.1	55.6	56.0
Women					
WORLD	53.0	52.6	52.5	52.5	52.5
Developed Economies & European Union	51.0	51.8	51.9	52.3	52.4
Central & South-Eastern Europe	51.0	50.1	49.5	49.5	49.5
East Asia	71.1	68.9	68.4	68.1	67.7
South East Asia & the Pacific	57.6	58.1	58.0	58.4	58.6
South Asia	36.9	36.5	36.7	36.1	36.1
Latin America & the Caribbean	46.1	50.0	50.7	51.3	51.8
North Africa	23.9	24.5	25.1	25.3	25.5
Sub-Saharan Africa	64.3	63.0	62.7	62.8	62.7
Middle East	24.9	29.1	29.8	30.9	31.7

Source: ILO, KILM1

Unemployment can be listed as another issue in developing countries. The general picture for the unemployment rates for a number of developing countries for the year

2006 is given in Figure 1.1.1. Some Latin American, Central European countries as well as Turkey have quite high unemployment rates. Note that unemployment is not a problem for only the developing world. Industrialized countries such as France and Germany also tend to have high rates of unemployment. But in the developing countries, unemployment is usually a chronic, structural problem.

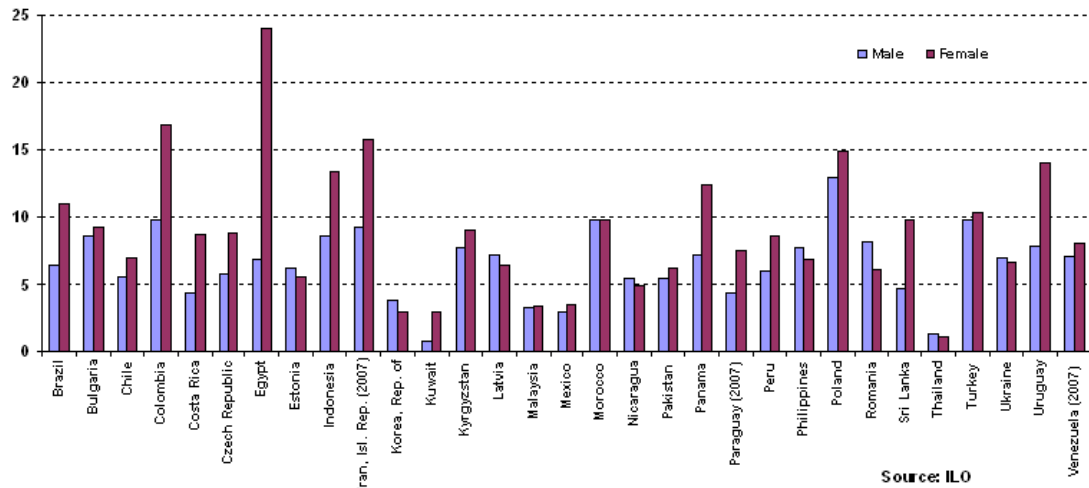


Figure 1.1.1: ILO unemployment rates for males and females, 2006

For developing countries, one of the main observation is that economic growth is often extremely volatile. The economy can achieve higher than satisfactory growth rates for one to two years but then a significant recession or a year of low growth follows. It is very unlikely for the economy to grow with an average rate for five years in a row. The unsustainable growth performance also brings about job insecurity especially in the private sector. This also strengthens the importance of public sector employment in these countries.

A second issue about unemployment in DC is the weak relation between economic growth and unemployment reduction. For example in Turkey, high economic growth and a lower unemployment rate do not go hand in hand necessarily. The growth often occurs due to a favorable condition such as cheap foreign currency which will lower the price of imported intermediate goods and hence rises production. Since the economic environment is not very stable, it usually does not result from an increase in the investment expenditures. Therefore, the effects of economic growth on unemployment are limited.

Most of the developing countries also have a huge agricultural sector which consists of unpaid family workers and self employed people (Agenor 2005). It is one of the features that distinguish them from the industrialized countries. However, more interestingly the urban side of the labour market has characteristics such as segmentation, presence of an informal sector and huge public employment.

Labour market segmentation¹ (LMS) theories rely on the fact that the labour

¹Dual labour market theory (Doeringer & Piore 1971) has two labour markets: the primary

market consists of various subgroups in which mobility is low, wage is not determined according to the marginal productivity of workers and differs from group to group. These factors cause inefficient allocation of resources, generates rent and besides, low income for some groups which deepens income inequality. Therefore, segmentation in labour markets may have important implications through economic policy.

The definition of informal sector varies in the literature and the boundaries between formal and informal sectors are not very clear especially for the developing countries. However, the informal sector can briefly be summarized by the following conditions: legal obligations associated with labour contracts are almost non-existing; there are no defined working hours or holidays, there is no social security and there is no registration of these commonly small enterprises. For many developing countries, the informal labour market is the only source of income for the poor population. The insufficient economic growth leads to limited creation of new jobs. Given fast urbanization together with migration from rural areas, enough employment cannot be provided.

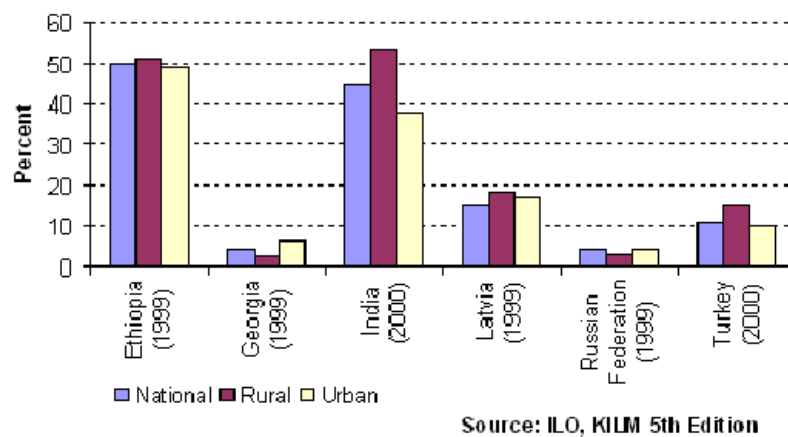


Figure 1.1.2: Employment in the informal economy as a % of total employment

Figure 1.1.2 shows the percentage of employment in the informal sector to total employment for selected countries. The informal sector in rural India exceeds 50 percent in 2000 according to International Labour Organization (ILO). Again according to ILO data, there are African countries where private formal employment consists of less than 10 percent of the total employment during the 1990s. Bulutay & Tasti (2002) also provide some data for Latin American countries:

"The share of the informal sector in non-agricultural labour force in Latin America has a minimum value of 37.1% (for Uruguay (Montevideo only)) in Latin America for 1997. It can reach 59.6% in the same year for Brazil, Mexico and Paraguay. The share for Latin

labour market and the secondary labour market. The primary labour market is characterized by higher wages, while the other labour market is disadvantageous in all terms. The taste of discrimination idea by Becker (1971) points out that consumers may have preferences for certain groups of workers. Statistical discrimination (Thurow 1975) may have resulted from average characteristics of the specific sample.

America as a whole in 1997 was 57.7%. These show that the informal sector has more weight in Latin America than in Turkey. But the comparatively higher shares of Latin America could be due to the lower share of agricultural employment there "

The informal sector is important in terms of poverty and social policy. In poor countries the income provided by informal employment is seen as one of the reasons preventing social explosion. It is also important for tax evasion and reducing the government's ability to intervene. There exists a vast literature on informal employment in developing countries. Interested readers can refer to Bernabe (2002) for a broad analysis of the issue and a review of the existing literature.

Another important characteristic of developing countries labour markets is the high and unqualified government employment. Figure 1.1.3 shows the share of public employment in selected countries. Jordan in 1996 and Panama in 1997 had more than 30 percent of public employment share. However, the data confirm that public employment comprises a larger proportion of the total population in some industrialized countries than in developing countries. Generally, the huge public sector criticism in developing countries contradicts with the case in developed countries. However, it is certain that the quality of the employment together with the allocation of the employment cannot be comparable. Thus, it is these later arguments that create the difference between developed and developing countries. Asian countries are a good example for explaining why efficient and productive employment is important. The expansion of their productive capacity brought success in international markets and as a result the economy was able to generate sufficient employment opportunities, and the large public sector employment did not create revenue problems. Rather than size, it is the efficiency of the system that matters in the government employment issue. This thesis gives particular importance to the analysis of this problem. Chapters two and three analyse the effects of inefficiently high public employment on social welfare and economic growth.

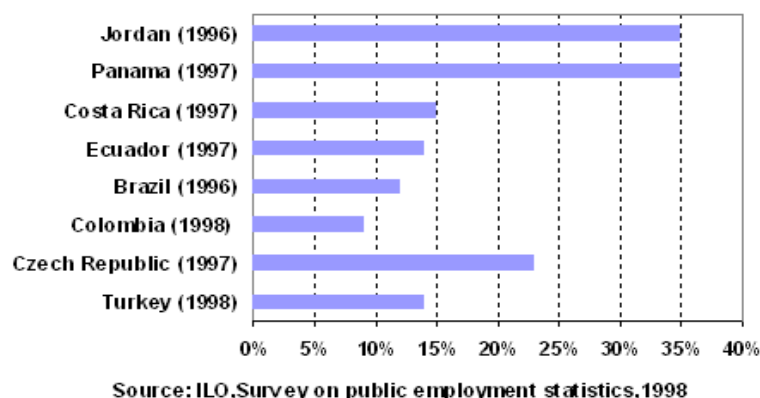


Figure 1.1.3: Share of Public Employment in Selected Countries

Urban employment in developing countries is also associated with underemployment, discouraged workers and discrimination problems. People are underemployed

when they would like to work full time but instead they work in a part time job. Discouraged workers are the ones who are no longer looking for a job as they have lost their hope of finding a job. For a broader explanation of these characteristics see the International Labour Organization website.

1.1.3 An example of a DC Labour Market: The Turkish Case

In the light of the mentioned characteristics of the labour markets of developing countries, in this section I provide a more detailed analysis and present more data for the Turkish labour market both because it may stand for a good example of the developing countries, and it constitutes the basis of the main motivation of this study. Before proceeding further with the analysis and presenting data, it may be essential to point out a couple of problems about the collection of unemployment data for the Turkish economy. Before 1988, there was not a regular labour force survey conducted by a specific institution. The data for this period were gathered from population censuses, labour force surveys and two organizations, namely the State Planning Organization and the Turkish Employment Organization. After 1988, the State Institute of Statistics (DIE) started to collect data on employment and unemployment based on a labour force survey which complies with international standards, twice a year using the last weeks of April and October as reference weeks. It is not before 2000 that DIE (DIE's name changed to the Turkish Statistical Institute, TUIK, in 2005) started to conduct monthly household labour force surveys. However, the data were announced quarterly and starting with January 2005, the survey results are announced every month based on the moving averages of the three months. Bulutay (1995, p. 213), which provides a broad summary of the data for unemployment and employment before 1988, also points out the fact that the data have numerous problems. The numbers collected from population censuses are collected by asking only one question. The definition of unemployment and underemployment is varied between different surveys and each survey has its own sampling procedures. Although the data are not completely comparable for the years before 1988, overall I believe it shows the general trend of Turkish employment and unemployment.

The Turkish labour market has not been able to create sufficient jobs for its highly growing population. According to the United Nations, the annual population growth rate for the years between 2000 and 2005 is 1.42 percent, which has been gradually slowing since 1980, however, still high compared to many other European countries. While before the 1950s, according to the TUIK, the rural population accounted for 75 percent of the population, the rate declined to 35.1 percent in 2000. The migration from rural areas to big cities starting from the 1950s is one of the root causes of the problems of Turkish labour markets, along with the lack of capital accumulation and industrialization problem. The population growth of big cities along with fast urbanization has been faster than the industrialization (Todaro 1969) in developing countries and the employment growth rate in industrial sectors is far behind

the growth rate of the urban population. In that matter, Turkey is not an exception. Istanbul, Ankara and Izmir which are the biggest cities in Turkey are the main destinations of migration in the 1950s, and these cities are still suffering from fast urbanization and population growth.

Table 1.1.2: Summary of Turkish Labour Force (15+Age, Thousand, Average)

	1950-59	1960-69	1970-79	1980-87	1988-98	1999-2007
Population 15+	14,159	17,808	23,191	28,950	38,957	48,052
Labour Force (LF)	10,440	12,493	15,497	17,592	21,369	23,823
LF Part. Rate(%)	73.7	70.2	66.9	61.0	55.0	49.6
Women		65.4	50.3	45.8	31.7	26.9
Men		93.6	79.5	79.8	78.8	72.7
Employment	10,172	11,999	14,289	16,203	19,685	21,642
Employment						
Rate (ER) (%)	71.8	67.5	61.7	56.2	50.7	45.1
Rural					63.3	54.5
Urban					40.6	39.0
Unemployed	269	494	1,208	1,389	1,685	2,181
Unemployment						
Rate (UR) (%)	2.5	3.9	7.7	7.9	7.9	9.1
Rural					4.7	5.3
Urban					11.8	12.3
Young UR (%)					15.7	17.6
Under ER(%)					7.1	5.7
GDP growth (%) ¹	6.4	5.2	4.8	5.8	4.3	3.7

Source: TUIK, Household Labour Force Surveys(HLFS), Central Bank of Turkey and emp. and unemp. figures before 1988 are from Bulutay (1995, p. 214-220).

(1) Until 1986, the GDP data announced annually, after that the original data are quarterly. Until 1947, the data was constructed with 1948 fixed prices, then until 1967 they were announced by fixed prices of 1968, later by 1987 fixed prices and finally by 1998 fixed prices. For growth rates until 1960, I used the archives of the Central Bank of Turkey but it must be noted that there are some inconsistencies in the data.

Table 1.1.2 aims to give a general picture of the Turkish labour markets from 1950 to 2007. The most striking figures in this table are the declining rates of labour participation both for women and in total, and the extremely high young unemployment rate in the 2000s. Declining participation rates are the result of transformation of the economy from a rural agrarian economy to an industrialized urban one or from labour intensive to capital intensive technology. Lower participation for the younger population on the other hand, can be attributed to the increased years of schooling.

The data shows that, the sharp fall in the participation rate mainly resulted from the female population. The high volatility of GDP growth together with productivity increase may have negative effects on job creation, contributing to the increased number of women who are discouraged to look for a job. But in Turkey this low rate is basically driven by low education. During the transformation, the women who used to work in the agricultural sector which does not need any human capital, later started to seek an urban job, which mostly requires skilled labour. In addition to economic explanations, the low participation of women in urban areas can also be attributed to sociological and cultural factors as married women are expected to devote themselves to their families.

Table 1.1.2 displays a more than adequate performance in GDP growth over the years. However, basically because of the volatility of the growth, the rise in national income could not be reflected to employment increases in Turkey. According to the Worldbank, there are three main reasons for this: First, there was a rapid structural change from a low productive agricultural sector to an urban based industrial society. Second, the relationship between productivity and employment within sectors is still changing and the third reason was labour market regulations and institutions. Bulutay (1995, p. 63) summarizes the problems of the Turkish labour market with the following words:

"The scarce employment opportunities in the cities have made the State and Public Enterprises the last employment resort with the result of considerable disguised unemployment there. The second and the main area of disguised unemployment is the sector of agriculture with its low productivity level. That is, there is a large amount of people seemingly employed but with little contribution to production. It means that, taking the informal sector also into consideration, there is an employment problem alongside of the unemployment problem in Turkey. The former is at least as serious as the latter. A related important fact is the great weight of "unpaid family workers" in the rural areas and in the global economy. "

The population growth, migration and industrialization in developing countries also caused big shifts in sectorial allocation of the labour force. After the 1950s in Turkey as a result of people migrating from rural areas, the share of the agricultural sector in total employment obviously started to decline. Besides, industrialization raised the share of labour force in industrialized sectors but the most important change was observed in the services sector. Figure 1.1.4 displays how sectorial distribution of employment changed in Turkey in general between the years 1960 and 2005. While in 1960, the agricultural sector was the leading employment sector by 74.8 percent, in 2005 it was the service sector by 51.1 percent. The change in the composition of employment through out the years between 1960 and 2005 exhibits a similar trend for male employment. While male employment was highly concentrated in the agricultural sector in 1960, the services sector became much more dominant in 2005. However, for female employment, the agricultural sector kept being the lead-

ing sector in 2005 as well, although its share went considerably down and the shares of the services and industry sectors went significantly up. This suggests that, the unpaid family workers problem is still effective especially for female employment in 2005. In rural areas, women being the family labour is a natural consequence of an agricultural way of life, while women being a wage labourer is still thought to be inappropriate according to the social norms. Only men could be the main breadwinner of the household.

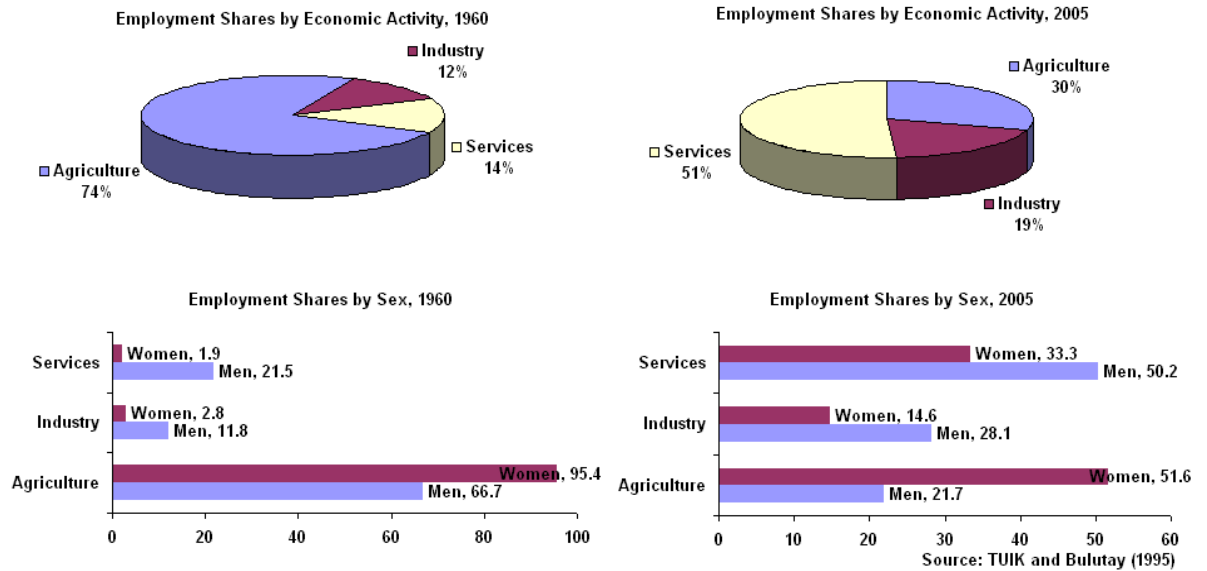


Figure 1.1.4: Employment Shares By Economic Activity and Sex in Years 1960 and 2005 in Turkey

Table 1.1.3 describes the Turkish labour market by considering the shares of employment status. In 1988, the share of unpaid family workers (UFW) and regular employees constituted the two largest shares among all categories. Later, in 2007, there was a considerable decline in the share of unpaid family workers while the rate increased substantially for the regular employees category. This change is weaker but still notable within the agricultural sector. Therefore, we can talk about a shift from UFW status to the status of regular employee in general.

Table 1.1.3: Share of Employment by Employment Status in Turkey, percentage

	1988	1998	2007
Unpaid Family Worker (UFW)	30.2	25.0	14.1
UFW within agricultural sector	59.9	56.3	45.4
Employer	3.5	6.1	5.5
Self employed	25.9	23.7	22.3
Regular Employee	33.1	36.7	51.0
Casual Employee	7.2	8.5	7.2

Source: TUIK, HLFS

Next, Figure 1.1.5 displays the employment status in the year 2000 by gender and geographical location. The composition is significantly different between men and women. In rural areas, for women, the unpaid family workers among other employment status still leads with a big difference and 77.1 percent of women in the agricultural sector are unpaid family workers. For men, a more even distribution between different status is observed and the leading share belongs to the status of being self employed. We observe that the share of regular employees cannot dominate the labour market in rural areas in 2000, neither for the men nor the women. However, in urban areas, for both the men and the women, this category has the largest share. Together with the changes in the shares of urban and rural employment over time, we observe the mentioned shift in employment status by the second half of the 2000s.

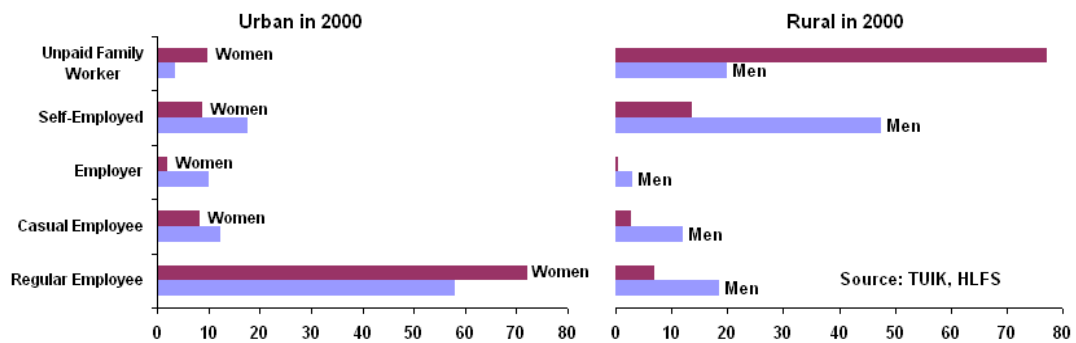


Figure 1.1.5: The Distribution of Employment by Employment Status, Geographical Location and Gender, Turkey, 2000 (%)

Capital accumulation and investment together with increasing labour and capital productivity are very important for developing countries, particularly for the purposes of promoting economic growth and creating employment. Both physical and human capital accumulation are often considered as the engines of economic growth, employment and welfare increase. Shortly after the foundation of the Republic of Turkey, in the 1930s, the new nation adopted a development strategy which was relying on government intervention and statism. The main reason behind this is the fact that, the dynamics that can provide private capital accumulation were almost non-existing and the private sector could not afford large investments. Public investment by establishing state-owned enterprises were the solution to the private sector inadequacy for investment. The perception was that, the state would be the initiating power and in time the private sector would develop with the help and support of the government. Although at first government acceleration might be advantageous as a contribution to the productive capacity of Turkey, later inefficient and populist government policies prevented this public infrastructure from producing favorable results. Besides, the private sector has been supported by expanding credits because there was no sufficient amount of savings and the financial system was not functioning efficiently. At the end, statism had more long lasting effects than expected on employment in Turkey,

as public enterprises have become large providers of employment in time.

In the 1950s the engine of growth was the agricultural production. After the 1950s, mechanization of agricultural production took place in Turkey, by the introduction of new technologies such as the tractor, modern irrigation and fertilizer usage and this caused excess labour. Therefore, a new capitalized way of agriculture started replacing traditional family production. The small farmers especially whose production totally depended on unpaid family workers, had difficulty in adjusting to the technological changes as they had limited access to credit markets and mostly were not able to buy these costly technologically advanced products. Besides, in the event of a crop failure there were no insurance mechanisms for these small farmers. This process led to the beginning of internal migration to big cities and external migration especially to Germany from the Turkish economy in the 1960s. Internal migrants to big cities were looking for employment opportunities that involve permanent work with social security benefits. Another consequence of internal migration to big cities in Turkey is the formation of squatter settlements where most of the migrants settled until they could find a job. These illegal living areas called *gecekondu* (most appropriate translation may be "constructed within a night") was also a security for the migrants. The effects of fast and unplanned urbanization in big cities in the 1960s created many structural problems which cannot be solved completely even today. The problems in the structure of the labour market also have their roots in the social and economic environment created by the internal migration at that time. The migrant's need for finding a secure job in cities also increased the demand for government jobs where they would like to work as civil servants or school teachers which provide permanent income with social security. All in all, the migration to big cities created an employment problem and the state-owned enterprises (SEEs) offered employment opportunities to the growing urban population. In the 1960s, the State Planning Agency started to implement five year development plans and SEE's were used to achieve the targets for import substitution policies. These enterprises were the main source of relatively lower cost intermediate goods to the private manufacturing sector. Thus, until the petroleum shock at the end of the 1970s, the number of SEEs were increased. The turmoil in the 1970s led to destabilization in the Turkish economy with high inflation rates. The import substitution policies came to an end as a foreign currency shortage caused a decline in imported goods. The import substitution policies were implemented to support industrialization for the Turkish economy until 1980. These policies lead the manufacturing sector to expand in urban areas causing urban employment to increase. Later, "The Structural Adjustment and Stabilization Programme" of January 24, 1980 questioned the role of SEEs and the public investment in the manufacturing sector considerably declined and privatization efforts started for the unprofitable SEEs.

So far, I have tried to give the general picture of the Turkish labour market. Next, the employment, unemployment, underemployment and the productivity structure of

the Turkish labour markets are summarized under four headings: informal sector, government employment, low participation rates of Turkish women and productivity, wage and employment relationship of Turkish manufacturing sector.

Informal Sector in Turkey

It is not only the unemployment rates in the Turkish Labour Market that display the crucial setbacks but the data for underemployment, low productivity, discouraged workers as well as the unrecorded employment, also show how problematic Turkish Labour market is. The migration to big cities created segmented labour markets, formal and informal sectors of employment, as a result of the lack of sufficient job creation.

The formation of the informal sector in Turkey is also a consequence of internal labour migration from low productive agricultural based rural areas to industrial urban areas. The population that did not have enough education was not able to find jobs in the industrial urban sector especially after the 1980s in which the SEEs were no longer a safe place for the crowd who have less human capital accumulation. Mainly, in Turkey, people pushed to work in the low productivity and low paid informal sector because there was no unemployment insurance scheme.

The informal sector in Turkey is affected by the growth performance of the economy, the ability of the economy to create new jobs such as employment opportunities in the public sector or private manufacturing sector and increase in labour force as a result of the migration from rural to urban areas. While the first two variables are related to the size of the informal sector negatively, the last one causes it to expand. GDP growth is expected to increase the formal and government employment rather than the informal sector. Obviously more job opportunities in the formal sector means lower demand for informal employment which pays poorly and lacks social security. On the other hand, a rapid rise in the urban labour force due to migration causes excess supply of labour and gives people no choice but to work in the informal sector.

Bulutay & Tasti (2002) revealed that the employment in the informal sector is negatively correlated with the employment in the agricultural sector. The explained trend for the agricultural and informal sector can be seen in Table 1.1.4. Besides, it is necessary to point out that the difference between figures change remarkably after the year 1999 in the Table 1.1.4. There are two reasons for this as they also explained in their paper. First of all, their time series data is based on two different data sets: Data Set I estimated informal sector from Bulutay (2000) and Data Set II estimated the figures from the survey of Household Labour Force which is conducted by Turkish Statistical Institute. These two data sets have differences in their definition of informal sector. Data Set I do not take into account the unincorporated and tax related characteristics of informal sector, while Data Set II the definition of informal sector is more similar to International Labour Organization's concept. Secondly, Turkish Statistical Institute changed the classification scheme for the Survey of Household

Labour Force several times and in 2000, the institution started to conduct the survey with new weights.

When the gender composition of informal employment is considered, it is seen that female participation is low. According to Bulutay & Tasti (2002) the share of women in the informal sector is 11 percent in 2000 and they stated that this rate is lower than the informal sector in Latin America due to the low education level of Turkish women together with the low participation rate especially in urban areas. They summarized the low women participation in the informal sector into three headlines: i) the religious effect, ii) for poor households, the hard housework done by the women is more valuable, iii) in Turkey, the second breadwinner after the father is not usually the mother but the young sons among less educated households.

Table 1.1.4: Distribution of employed persons in agricultural, informal and formal sector in Turkey (percentage)

	Agricultural Employment	Informal Sector ⁽⁵⁾ Employment	Formal Sector ⁽⁶⁾ Employment
1995 ⁽¹⁾	47.8	10.8	29.0
1996 ⁽²⁾	45.8	10.9	30.0
1997 ⁽²⁾	42.4	11.4	32.9
1998 ⁽²⁾	43.0	10.6	33.0
1999 ⁽³⁾	45.8	11.3	30.0
2000 ⁽⁴⁾	35.6	12.7	37.8

Source: Bulutay & Tasti (2002), TUIK, HLFSSs
and TUIK's other sources

(1) October 1995

(2) Average of two six months values

(3) April 1999

(4) HLFSS of 2000 with new weights

(5) The definition that depends on the status in employment.

It covers the self-employed and unpaid family workers.

(6) Residuals of the definition of informal sector definition
in note (5)

Importance of Public Sector and Public Employment

Similar to other developing countries government is still one of the biggest employers in Turkey. After the establishment of the Turkish Republic in 1923, SEEs emerged as a result of a lack of private capital accumulation in order to initiate economic development. As they had large scale investment, they became a major policy tool for the government to create industrial infrastructure, to decrease unemployment and to improve income distribution. At the beginning, SEEs were successful in stimu-

lating the private sector for the development of Turkish industry. All these enterprises operated in different sectors such as manufacturing, mining, energy, agriculture, transportation, communication etc. Moreover, until the mid 1990s the markets for coal, copper ores, cigarette and tobacco products, petrochemical products, locomotives and wagons, communication services and railway were totally controlled by government monopolies without any private sector activity. SEEs accounted for nearly 17 % of GNP and they employed more than 700 thousand people in 1989 (Cebi 2000).

Although SEEs were successful in stimulating economic growth first, in time they became one of the tools for the populist policies creating large scale employment opportunities and redistributing income. Besides, their board members and managers were chosen from those who had similar views with the political party in power. Thus, they suffered from poor management, overstaffing, weak financial position, inadequate pricing policy and inferior production technology and hence low productivity. Towards the end of 1970s, SEEs had considerable financial losses and became a heavy burden for the government budget. In 1978, their overall losses amounted to 49 percent of the budget deficit. All these circumstances gave rise to privatization efforts in the Turkish economy starting from 1985².

Although due to privatization efforts, the share of the public sector in the manufacturing industry and the share of public employment in total employment have been diminished, the public sector continues to be an important component of the Turkish industry and labour market today. Nearly 20 percent of the total manufacturing production is still produced by SEEs. Almost 61 percent of total public manufacturing production consists of petroleum, petroleum products and chemicals. The sectors where the SEEs are dominant are as follows:

Manufacturing Industry: MKE (machinery and chemical industry), Sumerhali (carpeting)

Mining Industry: TKI, TTK (coal mining)

Energy: TEAS, TUAS, TEDAS (electricity production and distribution)

Petroleum and Natural Gas: BOTAS (pipe transfer enterprise), TPAO (Turkish petroleum international company), PETKIM (petrochemicals), TUPRAS (petroleum refining)

Agriculture: TMO (agricultural products), CAYKUR (tea production), TS-FAS (sugar), TEKEL (tobacco and alcoholic beverages)

Transportation: TCDD (railway transportation), THY (airway transportation), TDI (sea transportation)

Communication: PTT (mail and communication services)

Banking: Ziraat Bank, Halk Bank, Exim Bank, Kalkinma Bank

Some of these companies are public monopolies in their markets. However, recently some of these markets opened to private competition although the public enterprises are still in operation.

²The numbers given in this section are collected from the following websites: www.tuik.gov.tr, www.hazine.gov.tr and www.ydk.gov.tr.

As mentioned before over employment is a problem in SEEs. The public share in total employment is quite significant in Turkey. The share of the public sector in total wage and salary employment has been estimated at around 33 percent in 1990, 28 percent in 1996 while the share of total public employment in total employment is around 12 percent in 1998. The diminishing trend is due to privatization efforts but this does not undermine the importance of public sector employment in Turkey. Data from the top 500 industrial establishments in Turkey reveals that in 2001, while the ten establishments in the private sector (in terms of personnel size) on average employed a total of 42,779 workers, ten largest state enterprises combined had 1,137,509 workers. More recent data about the share of public sector employment is around 14 % in 2006 (Table 1.1.5). Note that total employment fell significantly after the crisis in 2001 and the crisis mainly affected the private sector which may have caused a rise in the share of public sector.

Table 1.1.5: Government Employment in Turkey

	Non- agricultural (NA) Employment	Number of public employees	Share of public emp. in NA emp.(%)	Share of public emp. in total emp.(%)
1923	519,254	86,375	16.6	1.6
1930	763,788	115,262	15.1	1.8
1940	1,040,694	112,454	10.8	1.5
1950	1,417,234	203,670	14.4	2.2
1960	2,989,602	317,362	10.6	2.7
1970	4,908,295	493,191	10.0	3.6
1980	7,523,431	1,381,431	18.4	8.4
1988	9,710,436	1,667,141	17.2	9.0
1998	12,412,683	2,036,138	16.4	9.7
2006	15,994,711	2,995,498	18.7	13.6

Source: Bulutay (1995) for figures until 1988, other figures are computed by the author using TUIK and HLFSSs. Last column figures until 1998 are from Tansel (1998).

Wage and salary expenses of public workers constitute a significant portion in budget expenses. The staff expenses in the consolidated government budget were around 8.2 % of GNP in 2000 and 8.5 % of GNP in 2005. However, this figure does not reflect the total staff expenditure of the public sector. With SEEs, local municipalities and social security organizations the figure rises to 16 % in 1993 and 13 % in 2000.

As a result, it is observed that the privatization efforts may lead to a decline in both public sector production and employment shares. However, the public sector is still an important part of the economy. Although recently its domination is slightly

diminished, the recent history of the Turkish economy is very much influenced by the public sector and the economic structure created by it. This structure is analyzed to be one of the major causes of economic instability in Turkey. Especially low productivity and economic losses are the main characteristics of the SEEs. However, the data reveals that the privatization did not always lead to an increase in productivity and profits.

Women Labour Force Participation in Turkey

Among the OECD countries Turkey has one of the lowest women labour force participation rates with 26.9 between the years 1999 and 2007 on average. The female participation difference is considerable between rural and urban areas, 17.2 percent in rural areas versus 38.6 percent in urban areas for the year 2000. In Turkey family, religion and patriarchal pressures have a strong influence on labour force participation of women. Education level significantly affects the Turkish women labour force participation in urban areas (Tansel 2001). The participation rates increase with the education level in urban areas whereas in rural areas, the effect is almost nonexistent as most of the women work as unpaid family workers. Before the 1950s most women were employed by the agricultural sector which did not need human capital accumulation. Later, migration from rural areas to big cities led to less employment opportunities for Turkish women as most of the urban employment sectors, industry or services require human capital. Thus, most women can find jobs in the informal sector like domestic work or home based jobs.

Other than human capital, financial motivations also play an important role in women participation rates (Kasnakoglu & Dayioglu (1997) and Citci (1982)). Single and divorced women with greater financial needs and lower family responsibilities are more likely than married women to be in the labour force. Divorced women who have the responsibility of the family by themselves have the highest participation rates (See Figure 1.1.6). The married women have the second lowest participation rates among other women. The labour force participation rate of married men in 2000 was 80.6 which was the highest among other categories where single men, divorced men and widowed men had participation rates of 58.5, 71.9 and 28.4 percent, respectively. The numbers above illustrate that the main breadwinner of the household is still regarded as men and the participation of women to the labour force is under financial need. Baslevant & Onaran (2003) investigated whether the added and discouraged worker effects are dominant in urban households in Turkey during economic fluctuations. They asked how the employment status of the husband affects the participation decision of women and found that it is statistically significant and negatively correlated in the 1994 crisis. They concluded that the added worker effect dominates the discouraged worker effect.

Figure 1.1.4 which shows Turkish women employment shares according to economic activity illustrates that industry's share were 2.8 percent of women's employ-

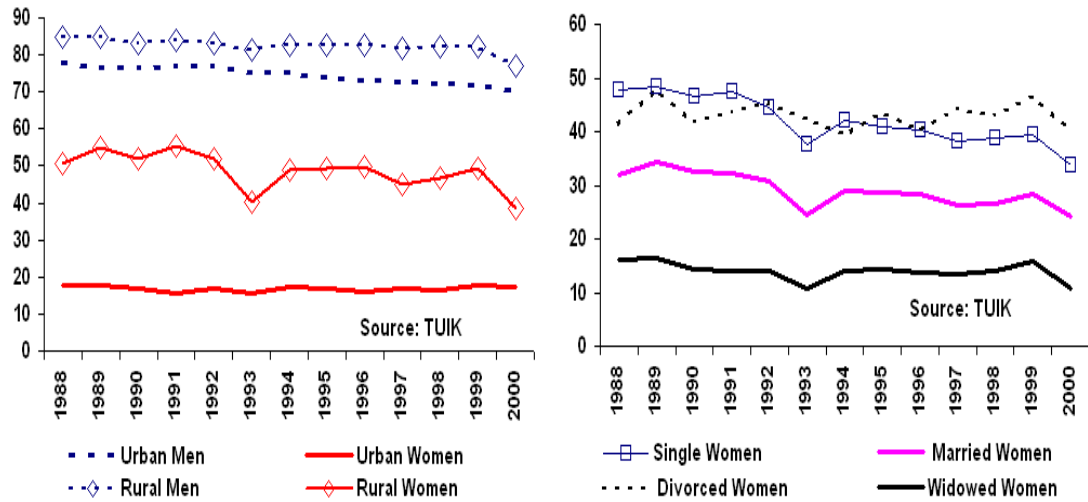


Figure 1.1.6: Labour Force Participation Rates by Gender and Geographic Location in Turkey

ment in 1960 while it increased to 14.6 percent in 2000. The import substitution policies and SEEs before the 1980s contributed to the increase in employment in manufacturing but also the export promoting policies after 1980 gave rise to labour productivity in manufacturing and this led female employment to increase in light manufacturing (Tansel (2001) and Baslevant & Onaran (2004)).

Productivity, Employment and Wage in the Turkish Manufacturing Sector

In the above section, the reason for the considerable share of the public sector in the manufacturing industry is attributed to import substitution policies that depended largely on SEEs. Besides, it is also mentioned that after the 1980s, the privatization policies led to a decline in public employment. Figure 1.1.7 illustrates the general trends for productivity, production and employment for the public manufacturing sector between the years 1998 and 2006. The series used to illustrate these relationships are all quarterly, for the manufacturing sector and the base year of index is 1997. Moreover, a four period moving average method is used for all series to have a clearer picture corrected for the seasonal effects. The three indexes used are: index of production hours worked, production index and index of partial productivity per production hour worked in sector.

The figure clearly displays the downward trend in public employment in terms of production hours starting with the second half of 1980s when import substitution policies were abandoned. On the other hand, we can observe an upward trend in public manufacturing production if we ignore the break in 1999. This is mostly due to the two large earthquakes that hit Turkey in 1999. One of the regions that was affected seriously is an important center for industrial production which deepened the effects of the disaster on output. Parallel to these trends we also observe an upward trend in labour productivity as the output is increasing when employment is decreasing. The

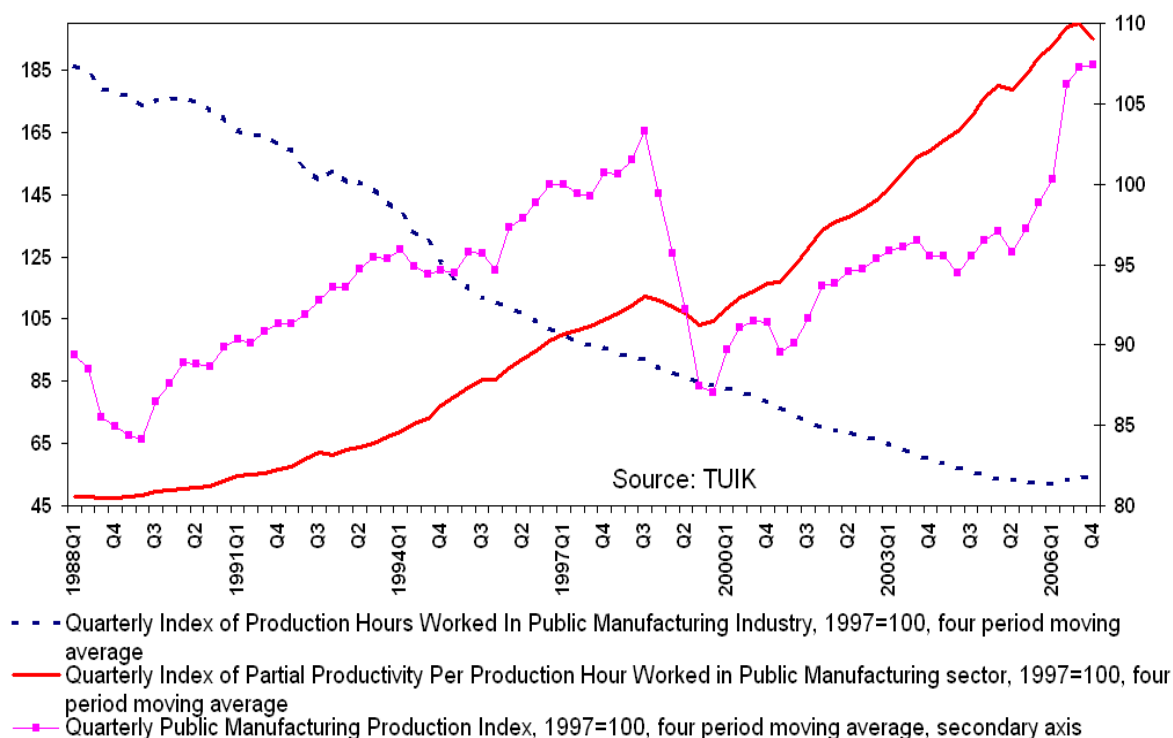


Figure 1.1.7: Productivity, Production and Working Hour in Public Manufacturing Sector in Turkey

inverse relation between employment and productivity gives us the clues about how low public labour productivity was in the 1980s.

Figure 1.1.8 shows the same indexes for the private sector. The negative relationship is not observed in the private sector. While working hours are fairly stable, productivity and production increases. Assuming the factors that affects production are similar for the two sectors, the difference between the two figures highlights the overemployment and low labour productivity created by it in the public sector.

Figure 1.1.9 illustrates that real wages in the public manufacturing sector after 1997 grew faster than those in the private manufacturing sector. This is mainly a result of the public sector consisting of larger firms than the private firms. Higher wages is usually a result of firms' large size with higher capital/labour ratios. However, Bulutay (1995, p. 280) finds no consistent difference between wages in the public and private sectors in large manufacturing firms however, he also draws attention to the fact that the wages in firms employing more than 1000 workers are 2.56-3.02 times higher than the wages in firms employing 10-24 workers. The similar relationship is also valid for the productivity and the firm size. Large firms have more physical and human capital leading to higher productivity. Besides, wages are higher in firms with higher productivity. However, Bulutay (1995, p. 282) points out that it is not possible to conclude with the available data that the private sector is always efficient. In the 1970s, the protection of Turkish enterprises or SEEs by import substitution policies created big public firms which had considerable power in oligopolist markets. Exclusion of competition because of protection policies together with the market power

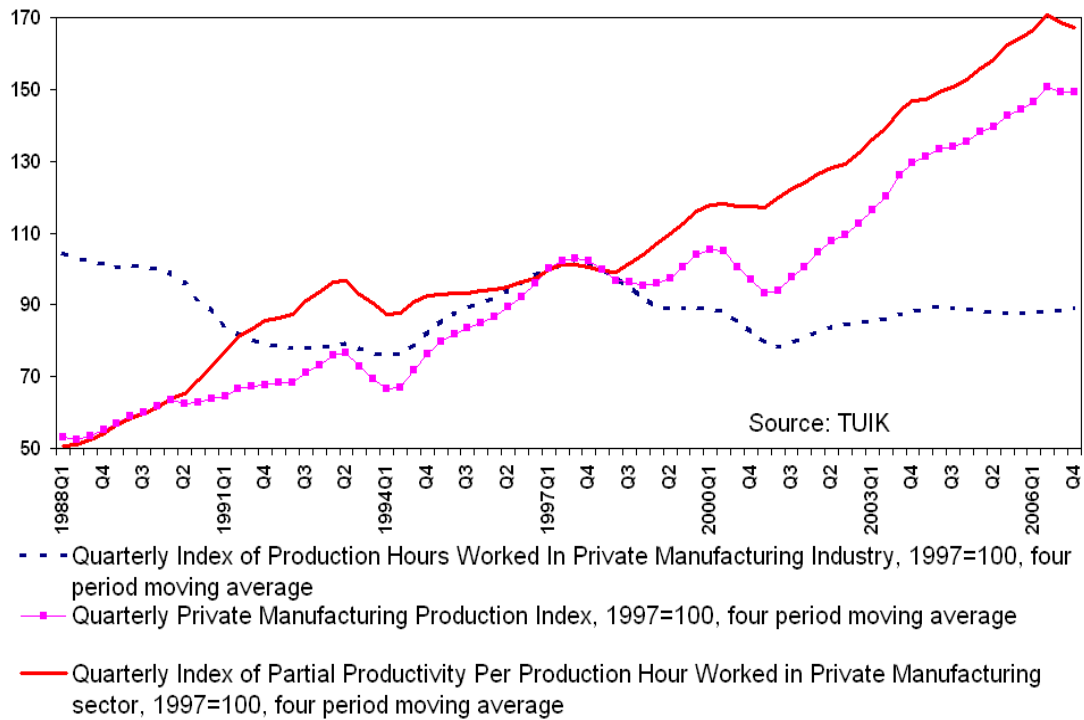


Figure 1.1.8: Productivity, Production and Working Hour in Private Manufacturing Sector in Turkey

might be among the reasons for higher wages in the public sector in Turkey. A persistent high rate of inflation is another important factor for the continuous nominal wage increase in Turkey. Unionization is also effective on wages in Turkey. Bulutay (1995, p. 284) mentions that under military coups in 1971 and 1980 which were anti-labour in nature, the wages declined considerably.

All the historical background provided in this section together with the data presented suggest a major transformation in the Turkish labour market in the last six decades. This transformation compounded with the economic objectives and strategies played a critical role in the emergence of structural problems we observe in the labour market today. Unfortunately, Turkey failed to produce a successful social policy during these years that can help restoring or increasing the welfare of the society. Short-sighted policies that were aimed at political success rather than poverty reduction did more harm than good in the long run. Of course all of the developing countries may not have a similar background. However, the data suggests at least some of the characteristics of the labour markets display resemblance among these countries.

In the context of this study, it is not possible to analyze or even address all these structural problems about DC labour markets. Therefore, in this thesis I concentrated on some of these problems. More specifically, I analyzed problems created by large public sector employment by using two different frameworks and I made an empirical study about the social factors related to gender issues. The main aim is to understand the dynamics that have become structural problems over the years. So far, the general

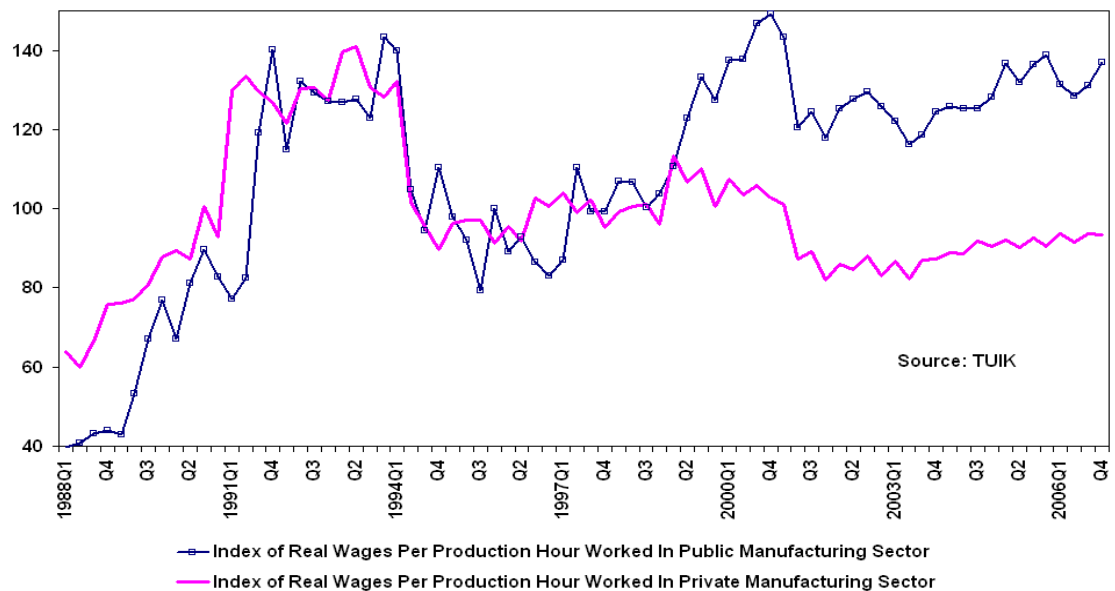


Figure 1.1.9: Quarterly Real Wages Index (1997=100)

picture of the developing countries' labour market has been given, for the rest of this chapter, the problems addressed in this thesis are explained more broadly.

1.2 Labour Markets in the context of Efficiency Wages, Growth and Social Factors

In terms of economic policy objectives, such as lowering inflation or avoiding financial fragility, the dominance of the public sector becomes quite important. First of all, a great deal of public debt is often a common characteristic of developing countries. Being able to finance this debt is crucial and this has important consequences for the financial sector. Secondly, the existence of a vast number of state owned enterprises makes the public sector critical for controlling inflation or promoting economic growth. Thirdly and finally, the state is often an important actor in the labour market. Therefore, decisions about tax rates, government controlled prices or public wages have substantial influence on the economy.

A huge public sector in the labour markets of developing countries can be considered as a response to adverse conditions in the private labour market. The driving force of government employment in developing countries is usually unrelated to production necessities or economic incentives. The main aim is often political support. For example, for Turkey, according to Tansel (2000), providing employment is considered one of the duties of the government and according to Bulutay (1995), this function is abused by political patronage. In other words, government jobs are distributed unnecessarily, inefficiently and without considering qualifications in order to redistribute income in favor of certain groups. While doing that the governments try

to attract friendly votes and create rent (Rodrik (2000); Nelson (1994)). The lack of transparency in public accounts makes this kind of action even easier to take. Given these conditions, this study tries to answer the following questions: ‘How does the interaction between public and private sector labour markets work?’ and ‘What is the influence of this interaction on labour market conditions, economic growth and social welfare?’

One way of considering the interaction between two sectors is to look at the relationship between public and private wages. A good example can again be found in the ‘letter of intent’ submitted to IMF by the Turkish government in the year 1999:

"Incomes policy will be essential to support disinflation and our exchange rate policy, and in particular to guide the private sector to set wage and price increases in line with the inflation target. To this end, salary increases for civil servants will be set in line with targeted CPI inflation... the government will endeavor to ensure that the minimum wage increase in 2000 will be in line with targeted inflation..."

There are mainly two points worth mentioning on this commitment by the government. First, the existence of such a commitment and the underlined importance of it for the sake of the stabilization targets is an indicator that normally public wage setting is not being done responsibly. Secondly, in the statement, it is believed that public wage increases in line with the inflation target will guide the private sector to behave the same way. In other words, incomes policy aims to make use of the relation between public and private wages by using the public wages as an anchor to meet the inflation target.

1.2.1 Shirking Model Including Government Sector

To establish a relationship on a theoretical basis, the efficiency wages theory introduced by Shapiro & Stiglitz (1984) becomes useful. The classical economists’ market clearing (full employment) approach to labour markets failed long ago, as did the Keynesian sticky wage and Monetarists’ real wage unemployment and the natural rate of unemployment concepts. Thus, the new-Keynesian theories came up with new ideas about the question of why there is unemployment at all. The efficiency wage hypothesis argues that wages are set higher than the market clearing wage so that firms can attract more productive workers (Malcolmson (1981); Stiglitz (1976); Weiss (1980)), decrease turn over cost (Salop (1979); Stiglitz (1974)) and make sure the workers are putting effort in (Shapiro & Stiglitz 1984). When it was introduced, the efficiency wage theory was critical to support the findings of the new-Keynesian models such as menu cost models. The main conclusions of these models are based on an assumption of an elastic labour supply, however this assumption was not supported empirically. The no shirking condition imposed by efficiency wage theory provided a

labour market environment where the prevailing wage is over the equilibrium wage and hence supported new-Keynesian theories at that time.

The Shapiro & Stiglitz (1984) no shirking model is based on the assumption that the cost of monitoring a shirking worker is high. With high monitoring costs, giving higher wages lead workers incentives to shirk to decrease because if they are caught while shirking, they will lose a well-paying job. When the difference between the utility of having a job and being unemployed is high, workers tend to shirk less. This means shirking in the private sector depends on the outside option of the private worker and that is where the employment policy of the government comes into the picture. When the worker thinks that the employment in the government sector is abundant, the non-shirking wage should be higher. When the unemployment rate is high, the negative consequences of losing a job are also high, thus workers will put more effort in since the outside option is not favorable. Thus, the high unemployment rate may lower the wage rate. However, when there is an increase in the possibility of finding a job in the government sector, the outside option is favorable leading to an increase in wages.

The analysis in chapter two is a version of Shapiro-Stiglitz's shirking model, thus, I am going to present an extensive summary of this seminal paper. In the model, there are M identical firms indexed by i that hire within the pool of N identical risk neutral workers who decide to shirk or not. If caught shirking, firms fire workers with no exceptions and hire new workers from the unemployed pool. The cost of losing a job is to be unemployed until finding a new one.

The utility function of the worker is $U(w, e) = w - e$, where w is the wage rate and e is the effort. Workers dislike putting in effort while enjoying consumption. Effort can only take two values, that is 0 when the worker shirks and $e > 0$ when the worker does not shirk and respective utilities for the worker are w and $w - e$. During unemployment, the workers get an unemployment benefit equal to \bar{w} . In equilibrium, the firm has to make sure that the workers have no incentive to shirk as shirking workers produce zero output. This can be done by constant monitoring which is costly. Thus, there is imperfect periodical monitoring in which the probability of being caught while shirking is q , which is exogenously determined. In addition to fired workers, workers may leave for other reasons. Separation probability, b , which will be taken exogenously, is the ratio of workers who quit due to relocation to total number of workers. Each worker maximizes present discounted utility, V , with a discount rate, r , in continuous time to select an effort level. This requires comparison of present value of the utility from shirking, V_E^S , with the utility from not shirking V_E^N of an employed worker. Besides, the expected present value of the unemployed utility, V_U needs to be taken into account while deriving the relation:

$$rV_E^S = w + (b + q)(V_U - V_E^S) \quad (1.2.1)$$

$$rV_E^N = w - e + b(V_U - V_E^N) \quad (1.2.2)$$

Equation (1.2.1) describes a shirker worker who gets w in the first period and then becomes unemployed with probability $b + q$ or remains employed with a probability of $1 - (b + q)$. Similarly, in Equation (1.2.2), the non-shirker worker gets $w - e$ and with a probability of b the worker quits the job or keeps on working with a probability of $(1 - b)$. The wage at which the worker will choose not to shirk will be when $V_E^N \geq V_E^S$. Shapiro-Stiglitz called this the "no-shirking condition" (NSC). Alternatively, solving for the wage gives:

$$w \geq rV_U + (r + b + q)\frac{e}{q} \equiv \hat{w} \quad (1.2.3)$$

Equation (1.2.3) implies that the higher the discount rate, r , the required effort level, e , the utility gained from being unemployed, V_U , and the exogenous quitting rate, b , the higher the wage needed for workers not to shirk. Besides, the higher the probability of being caught, q , the lower the wage needed to induce no shirking.

On the firm side, where each firm has production function $F(L_i)$. L_i is the number of non-shirking workers. Given NSC, there is no reason for the firm to pay more than necessary for workers not to shirk, thus, Equation (1.2.3) holds with equality and no one has an incentive to shirk. As the firm i has to pay \hat{w} and the firm i 's labour demand will be $L_i = L_i(\hat{w})$ and the firm chooses employment such that $F'(L_i) = \hat{w}$.

The general equilibrium is reached when flow out of unemployment is equal to the flow into unemployment, see Equation (1.2.4):

$$bL = (N - L)a \quad (1.2.4)$$

where accession rate, a , is the ratio of new hires to the number of unemployed, and L is aggregate employment. The key market variable is V_U for the determination of firm behavior and it can be calculated in a similar way to the utilities V_E^N and V_E^S .

$$rV_U = \bar{w} + a(V_E - V_U) \quad (1.2.5)$$

Notice that in Equation (1.2.5) V_E is V_E^N , not V_E^S , because in equilibrium no one shirks. a is endogenous from Equation (1.2.4) and equal to $\frac{bL}{N-L}$ and NSC becomes:

$$w \geq \bar{w} + e + \frac{e}{q}\left(r + \frac{bN}{N-L}\right) = \bar{w} + e + \frac{e}{q}\left(\frac{b}{u} + r\right) \equiv \hat{w} \quad (1.2.6)$$

where $u = \frac{N-L}{N}$ is the unemployment rate. Equation (1.2.6) is the aggregate NSC and it highlights the relationship that the higher the unemployment benefit, the higher the critical no shirking wage. Besides, the higher the level of employment, the less time spent as an unemployed if fired and the less costly for the worker and the more it is possible to shirk. To prevent this, firms must pay higher wages. Equation

(1.2.6) is the labour supply function where as the unemployment rate approaches zero, the NS wage tends toward infinity. The equilibrium is at the intersection of the labour demand curve and NSC which is $F'(L_i) = \hat{w} = w^*$. This is actually a nash equilibrium as firms have no incentive to pay more as all workers are putting an effort e and besides lowering wages may ended up shirking. Besides, from the workers' point of view under involuntary unemployment, they are willing to work at w^* and prefer working to unemployment.

Shapiro & Stiglitz (1984) also did welfare analysis of the outcome of their involuntary unemployment model. They concluded that the outcome of the model is never Pareto optimal because the burden of employment is above the social cost, $w^* > e$, the firms employ less and by decreasing unemployment as a result of hiring a new worker, each firm is increasing V_U for other workers. They showed that unless $F(L)$ has constant returns to scale, market equilibrium will not be Pareto optimal and firms will employ few workers. A social planner would have to tax profits and subsidize wages until $w^* = \frac{F(L)}{L}$ to get a Pareto efficient outcome however, taxation creates redistribution which will make firms worse off and workers better off and would not generate a Pareto improvement. Shapiro-Stiglitz concluded that efficiency and distribution are not separable problems for this model.

The Shapiro & Stiglitz (1984) shirking model has been influential to numerous papers and created an enormous literature. They explained why wages do not fall during recessions and involuntary unemployment from the point of view of the shirking idea. Maintaining the previous employment level means that wages should fall, however that increases the probability of shirking. Thus, unemployment rises during recessions. Besides, the firms cannot cut wages until unemployment rises sufficiently and that is why wages are adjusting slowly or rigid. Costly monitoring is an inefficiency and the assumption that workers will cheat anyway is strict, nevertheless the shirking model tries to explain aggregate demand effects, although it has limitations like homogenous workers, two discrete values of effort, and a small decrease in effort as a result of possible wage decrease may not be that costly to firms.

In the second chapter of this thesis, the government's excess employment in the economy is taken as given and placed under the efficiency wage framework. As mentioned earlier, economists who have been trying to explain involuntary unemployment emphasize the efficiency wage theory and try to answer the question why labour markets are not clearing. In the next chapter, I analyse the consequences of government employment using an efficiency wage framework. In a theoretical model, the aim is to find out how the wage and effort (productivity) differentials between public and private sectors actually affect the labour market or more specifically equilibrium levels of employment, wages and productivity. These differentials are firstly modelled exogenously but after they are relaxed and endogenized. The chapter investigates how the total welfare responds to changes in these differentials in terms of two different models. The results show that an effort of raising employment by the government

eventually leads to a reduction in total welfare by curbing private employment. This chapter of my thesis contributes to the existing work by providing a different approach by defining an explicit outside option, namely the government sector, to the efficiency wage theory.

1.2.2 A Growth Model with Public Employment and Efficiency Wages

Another aspect that analyzed in this study is the relation between the public sector employment strategy and output growth. Unlike the developed countries, there is a weak relationship between output growth and unemployment in DC. While output grows, unemployment may tend to increase against the economic theories. There are probably a lot of explanations for this result, but Gelb et al. (1991) claims that one of the reasons for this conclusion is that the overemployment in the government sector crushes all other theory based mechanisms and this complex relationship between variables leads to unexpected results. In order to understand these complex channels better and to see how growth and employment interact, I analyse growth and employment in an environment where government is present as a third party beside the consumers and private firms. While doing this, I construct several growth models under different assumptions and try to find out what are the effects of excessive government employment on the economy.

In chapter three, I try to establish a link between the government employment and economic growth rate underlying several mechanisms; distortionary taxes, productive government expenditure and a productivity link resulting from the interaction of government and private labour markets. After the introduction of endogenous growth models, governments' intervention into the markets are being analyzed more thoroughly, especially after the seminal paper of Barro (1990). Barro (1990) assumes a production function in the form of:

$$Y_i = AL_i^{1-\alpha} K_i^\alpha G^{1-\alpha} \quad (1.2.7)$$

where $0 < \alpha < 1$, $A > 0$ is the technology, labour, L and capital, K are private constant returns to scale inputs and G is the total government purchases from the private sector which is transformed into productive public goods where G is non-rival and non-excludable. Notice that capital no longer faces diminishing returns to scale as G rises along with K and constitutes constant returns to scale in fixed L leading to endogenous growth. Besides, the usage of G for one firm does not affect the benefits of other firms.

$$G = \tau Y \quad (1.2.8)$$

Government purchases are financed by levying a proportional tax rate on gross output and the government runs a balanced budget and τ , thus G/Y , are constant

over time. The profit maximizing firm equates the wage rate to the after tax marginal product of labour and the rental rate to after tax marginal product of capital.

$$r + \delta = (1 - \tau) \left(\frac{\partial Y_i}{\partial K_i} \right) = (1 - \tau) \alpha A k^{-(1-\alpha)} G^{1-\alpha} \quad (1.2.9)$$

In Equation (1.2.9) as all firms have identical production functions and are subject to the same rental rate which includes r , the interest rate and δ depreciation rate, then $k = \frac{K_i}{L_i}$ is the same for all firms. G can be written from Equations (1.2.7) and (1.2.8) as follows assuming the labour force L is constant:

$$G = (\tau AL)^{1/\alpha} k \quad (1.2.10)$$

Inserting Equation (1.2.10) into Equation (1.2.9) leads to Equation (1.2.11), which is the after tax marginal product of capital, and is independent of the level of k , with τ and L constant.

$$r + \delta = (1 - \tau) \left(\frac{\partial Y_i}{\partial K_i} \right) = \alpha A (L\tau)^{(1-\alpha)/\alpha} (1 - \tau) \quad (1.2.11)$$

The household side of the Barro (1990) model is determined by the standard Ramsey model. The representative, infinite-lived households maximize utility given τ and G , where c is consumption, $u(c)$ is the concave utility function in the form of $u(c) = \frac{c^{1-\sigma}-1}{1-\sigma}$, $\sigma > 0$ and G is given in Equation (1.2.10).

$$\begin{aligned} & \max_{\{c\}} \int_0^{\infty} u(c) e^{-\rho t} dt \quad (1.2.12) \\ & \text{s.t. } \dot{k} = (1 - \tau) A k^\alpha G^{1-\alpha} - \delta k - c \\ & \text{where } k(0) = k, \quad L = \bar{L} \end{aligned}$$

First order conditions derived from the setup (1.2.12) give the growth rates for c , k and y all equal to the same constant that is γ given in the Equation (1.2.13). Since the marginal product of capital is not dependant on k , there is a constant growth rate with no transition dynamics. The effects of government on the growth rate is negative through the taxation $(1 - \tau)$ that comes from after tax marginal product of capital and positive through G , or $\tau^{(1-\alpha)/\alpha}$.

$$\frac{\dot{y}}{y} = \frac{\dot{k}}{k} = \frac{\dot{c}}{c} = \gamma = \frac{1}{\sigma} (\alpha A^{1/\alpha} (L\tau)^{(1-\alpha)/\alpha} (1 - \tau) - \delta - \rho) \quad (1.2.13)$$

It is also possible to derive an optimal τ which maximizes the growth rate by simply taking the derivative of Equation (1.2.13) with respect to τ and equating it to zero reaching the result in Equation (1.2.14). The result also satisfies the second order condition for a maximum. At low values of τ the positive effect of $\frac{G}{Y}$ dominates hence the growth rate increases, however later the distortionary effect of tax offsets the

positive effect and the growth rate starts to decrease. Besides, the marginal product of public services is the derivative of Equation (1.2.13) with respect to G , which gives $\frac{(1-\alpha)}{\tau}$ with the addition of the result of Equation (1.2.14) the natural efficiency condition for the size of the government is $\frac{\partial Y}{\partial G} = 1$.

$$\tau = \frac{G}{Y} = 1 - \alpha \quad (1.2.14)$$

In chapter three, I use both exogenous and endogenous growth models to investigate government employment and an efficiency framework. I introduce a productive government expenditure term in the production function which in fact consists of labour expenses of the government. I assume these expenditures are financed by levying a tax on the private sector. For the next step, I endogenize the growth rate by introducing a public sector capital term in government expenditures and hence in the production function. However, the main contribution of this section of my research is again about the interaction between public and private labour markets. Inspired from the efficiency wage theory, I establish a link between the size of public employment and the productivity of the private sector. To consider the relationship between private effort level and public employment imposed by the no shirking condition of chapter two, the production function in the growth model is constructed such that the productivity of the private worker decreases when the size of public employment increases. Therefore, the analysis made in chapter three, in a way, combines the efficiency wage framework with the growth framework.

It has been underlined so far that sustainable growth is the key factor that will create new employment opportunities. However, it has also been pointed out that because of the government's over involvement in the labour market, although growth has been experienced, the mechanisms that are theoretically expected may not function properly and this growth may not be as productive in terms of employment. In general, the analysis that is carried out in chapters two and three explores the trade-off between the positive production and employment effects of excessive government employment and the negative effects of the distortions created by this strategy. At the bottom line, the results show that when the links above are considered, the long-run growth and the capital accumulation can be increased up to a certain government employment level. However, beyond that point, a rise in government employment slows down growth and capital accumulation.

1.2.3 A Social Factor Related to Gender Preference

Developing countries' social dynamics directly or implicitly have unforeseen consequences on the labour markets. One example can be a lower labour force participation rate of women compared to developed countries. The social reasons behind the low participation rates of women affect economic factors like underemployment, forgone output etc. These low levels of participation rate are often attributed to

cultural and religious beliefs together with the human capital endowments. Thus, understanding the social and traditional values is an important part of explaining the employment decisions taken by the labour force in the developing countries.

In more traditional developing countries, women's main responsibility is taking care of the children while men are the main breadwinner of the household. The fact that the family income can only be provided by men also creates other social consequences among families, one of which is son preference. It is a well known fact that in many developing countries, sons are preferred over daughters among many parents due to the social status of women. From this point of view the women's improvement in status through education and employment is important in the sense that this may loosen the traditionally assigned role of women and men in society. This improvement of the woman's social status is believed to decrease son preference (Chung and Das Gupta, 2007, Clark, 2000).

While the literature presents both subjective and objective methods to indicate son preference, it is the actual fertility preferences that really show the real behavior. Haughton and Haughton (1998) showed that some simple numerical tests, not all of them, have accurate results for measuring son preference compared to the complex regressions or methods using data from Vietnam. They estimated a benchmark parity progression model for the completed families in order to compare its results with the seven simpler tests. Parity progression ratio is the proportion of women of a specific parity (number of children) who progress to the next level and they estimated four parity progression models to explain the progression for families with two, three, four and five children. The dependent variable is one if the family has another child and zero, otherwise. In addition to the dummies that show the number of son or sons the family already has, they included control variables related to the mother, household variables and geographic effects. The seven simpler tests they performed to compare are as follows: the parity progression model without any control variables, the parity progression table, the last boy test, the unisex sibship test, the male proportion tests, the sibling differential tests and the birth order test. For the incomplete families, Haughton and Haughton (1998) estimated a benchmark hazards model which estimates the risk of having another child at any point in time. The dependent variable is the time between one birth to the next and the control variables and the dummies for the existing sons are the same as the parity progression model. They estimated a simple hazards model without the control variables to compare the results for the benchmark hazards model. After performing these different types of models, Haughton and Haughton (1998) concluded that the simple models for the completed households gave an accurate measure of son preference, however most of the simpler tests for incomplete households gave second best results. Completed household data sets have the information about the past, not the present, however, picking the gender preference for the current state needs incomplete households in which the simpler tests for this kind of data set is not advantageous.

In the fourth chapter of this thesis an empirical study is carried out to investigate the existence of and the potential behavioral change in son preference in Turkey, by using different statistical techniques. The data for this chapter is obtained from the Turkish Demographic and Health Survey (TDHS) for the years 1998 and 1993. The main contribution of this part is that, it provides a broad analysis of son preference behavior in Turkey by using the latest econometric techniques. Another novel feature is that it tries to find out how son preference is evolved over time by exploiting data sets collected in different years. In particular, it investigates whether the process of urbanization and modernization in Turkey had an effect on son preference behavior over time. The results imply that there is a clear and strong son preference in Turkey and the difference between progression ratios of families with and without sons is larger in 1993 compared to 1998. It is also found that the regional effects are more dominant on childbearing decision and urbanization had a diminishing effect on son preference behavior in Turkey.

The next three chapters following this introduction contain the main analysis done in this thesis. The last chapter concludes, tries to summarize policy recommendations, and talks about potential future research.

Chapter 2

Labour market interactions

2.1 Introduction

The labour market structure of developing countries significantly differs from industrial countries. The huge public sector, the importance of self-employment, segmentation in the labour markets (Rosenzweig, 1988) and irregular work activities are among the key differences.

The agricultural sector is the dominant employment area in the developing countries where seasonal factors determine the labour demanded. Besides, this sector mainly consists of people who are self employed or unpaid family workers who have relatively low productivity. Limited employment opportunities in the rural agricultural sector causes migration to urban areas causing excess labour. Many work in the informal urban sector, which are basically low-skilled jobs, low wages, few non-wage benefits, job insecurity and are not well covered by the social insurance mechanism. Others, who are more qualified, are employed in the formal urban sector where wages are higher in addition to other benefits and there is relative job security.

The economic fragility of the developing countries causes instability in the employment opportunities and duration. The inadequacy of new job creation in the private sector due to economic fluctuations in developing countries introduces another channel to raise employment; that is an increase in public employment. There is indeed some evidence suggesting that countries that are greatly exposed to external risk have higher levels of public employment (Rodrik, 2000).

In many developing countries, public sector employment accounts for a larger percentage of wage employment. For example, Tansel (2001) reports that the share of the public sector in total wage and salary employment has been estimated at around 33 percent in 1990, 28 percent in 1996, and 12 percent in 1998 in Turkey. Besides, according to the International Labour Organization (ILO), the public sector wage bill in Morocco stands at 12.2 percent of GDP in 2001. The ultimate motivation for constructing public enterprises and creating public employment is to initiate economic development as a result of a lack of private capital accumulation, to decrease unemployment and to improve income distribution. However, in time they become one of

the tools for the populist policies by creating large-scale employment opportunities and redistributing income. Government wage and employment decisions are often determined more by political considerations than conventional economic considerations (Nelson, 1994).

Employment in the public sector tends to increase partly in response to adverse conditions in private labour markets. Especially before the elections, increases in employment or higher wages may be observed due to the efforts of the government to attract followers or to retain them. When faced with budgetary pressures, it is easier politically for governments to cut investment outlays or maintenance expenditure than to fire public sector workers, which brings relative job security for public sector employees. Therefore, overemployment and hence, low labour productivity becomes another characteristic of the public sector. Furthermore, the wage increases in the public sector tend to exert a leading effect on wage setting in the private sector. For example, in countries like Morocco and Turkey, wage increases in the regulated manufacturing sector appear to be highly correlated with wage movements in the public sector (Agénor and El Aynaoui, 2003). Thus, the dynamics of public sector employment decisions play a very important role in determining labour market outcomes and this employment structure becomes one of the major causes of economic instability.

In developing countries, the public sector employs workers with formal contracts, the jobs are relatively secure and the non-wage benefits such as pension and health insurance are plenty. On the other hand, the wages are relatively high and the choice of employees is not always rational, i.e. lower-skilled workers are employed although there exist higher skilled ones willing to work at the same wage rate, the effort level is lower and shirking is a common behavior as there is job security.

The explained structure of the public sector in developing economies is likely to affect private sector wage and employment decisions and hence, have an influence on the aggregate labour market. This study aims to find out how these wage and effort (productivity) differentials between public and private sectors actually affect the labour market or more specifically equilibrium levels of employment, wages and productivity.

In order to do that, I construct a model with efficiency wages, which is first suggested by Shapiro and Stiglitz (1984). Efficiency wage models are usually used to examine effort and wage realizations in the labour market where the supply side is competitive, and therefore, they provide the suitable tools to analyze the wage and effort differentials between public and private sector. My model is inspired from Bulkley and Myles (1996), where they examine the effects of unionization on wages and effort. However, it includes another economic agent, the government, instead of the labour union, which has a different objective and constraint compared to the private sector. The main characteristic of the model is that the wage and effort differentials between public and private sectors are defined exogenously, that is, it is assumed the wage is higher and the effort is lower in the public sector than they are in the pri-

vate sector by a fixed amount and public sector workers willingly exert positive effort. This approach has two advantages. First, it prevents the model from becoming too complicated by reducing the number of endogenous variables, and second it makes it possible to measure the effect of these differentials by running simple simulations. This assumption is very plausible in the context of this study because the question of interest here is the effects not the causes of differences between public and private sectors. However, these assumptions are going to be relaxed later in this chapter and public wage and effort are endogenized to find out more about the labour market interaction consequences.

2.2 Literature Review

Before explaining the details of the shirking model, I would like to give a brief outline of the efficiency wage theories and their importance in the existing literature. It is worth mentioning the previous ideas concerning the labour market variables before pointing out the contribution of the efficiency wage framework. In the Classical model, the labour demand and supply determines the real wage rate in a perfectly competitive market. The market clearing real wage rate causes unemployment to be voluntary, meaning when supply/demand exceeds the demand/supply of labour, real wage rate acts accordingly and excess or shortage of labour is diminished. The claims that there is always full employment and there is no involuntary unemployment are extremely insufficient as unemployment is still observed in the real world. As a result, new explanations are searched for to explain the unemployment rates.

Later, Keynes (1937) puts the idea that the wages are inflexible in the short run and this results in involuntary unemployment. However, the inadequacy of the market to clear because of the wage rigidity has also its own lack of explanations. Firstly, there is no valid argument about why wages are rigid and besides even if wages are flexible in the long run, there is no equilibrium when continuous full employment is observed. Afterwards, Monetarists' ideas of the Phillips curve which claims that there is a trade off between the inflation and unemployment and natural rate of unemployment try to explain observed unemployment (Friedman, 1968). They claim that in the short run the expected and the actual inflation rate differs leading to fluctuations in the employment level. On the other hand, in the long run because of rational expectations the Phillips curve is vertical and there is no change in the unemployment rate. However, the stagflation as a result of oil crises also puts some doubts about the Phillips curve story of unemployment. This is when the implicit contract and the efficiency wage models come into the picture to explain what Keynesians can not: Why are wages rigid?¹ While implicit contract theory explains wage rigidity as

¹There is a huge literature that tries to explain why wages are rigid. It is beyond the scope of this thesis. However, other than the mentioned models above, menu costs model (Ball, Mankiw and Romer, 1988) and insiders-outsiders and trade union approaches (Lindbeck and Snower, 1986) also provide different explanations for the unemployment phenomena.

a consequence of an insurance mechanism for risk averse workers against uncertain output markets, the efficiency wage theory claims that the productivity of the worker increases with the wage.

In implicit contract models, wages are not flexible for some period as employees and employers have agreed on a mutual contract deciding that the wages will be fixed within that period no matter what the labour market conditions are. The explanations for why there are labour contracts are underlining the fact that hiring and firing workers is costly so firms would like to have a long term relationship with the worker so that they believe he has the necessary qualifications. Likewise, it is also hard for the worker to search for jobs and thus, he/she prefers to have a stable job. Azariadis (1975) focuses the advantage that each party, employee and employer, possesses information that outsiders do not. Besides, workers are risk averse and do not have access to capital markets easily. Newbery and Stiglitz (1987) focuses that risk neutral firms provide insurance to risk averse workers. More clearly, depending on the market conditions workers may have higher/lower wages than their marginal product. Rosen (1985) also points out that fixed wages by contracts are the insurance premiums of workers during good times and compensation against bad times.

Similar to the implicit contract model, efficiency wage theory also treats wages other than the price of labour. It simply says that there is a positive relationship between the wage and productivity, that is productivity is a function of the wage. Thus, increasing productivity by paying higher than the market clearing wage may increase the profitability of the firm while in the mean time it creates involuntary unemployment. In addition to that, the theory also sheds light on why there are segmented labour markets, why there are wage differentials between industries and firms with similar characteristics, why there are dual labour markets and why wages cannot be lowered during recession periods. The answers to those questions are all based on the fact that the linkages between effort and wages are different across firms and industries, for some the wage productivity relationship is more important than others. Efficiency wage theories can be categorized into six different titles all of which have different arguments about why high wages push up the productivity of the workers. These are nutritional benefits, sociological (gift giving) models, turnover models, adverse selection models, union threat models and the shirking models.

Nutritional benefit of higher wages is among the topics of development economics. It is based on the idea that the workers who are paid lower wages, do not have the opportunity to take good nutrition and that affects their productivity negatively. However, by efficiency wages, workers will have higher income to buy healthy food that will have a positive effect on their productivity (Stiglitz, 1976 and Dasgupta and Ray, 1986). Other than economic factors, there are other reasons that will affect the productivity of the workers. Sociological models based their ideas on non-economical issues: altruism or not individualistic maximization. Akerlof (1982 and 1984) indicates that the higher wages paid are seen as a gift from firms to workers and workers return

the favour by putting in more effort.

Turnover models (Stiglitz, 1974 and Salop, 1979) claim that the cost of a quitting worker is high. Thus, by giving higher wages, the intention of the firms is to decrease the turnover rate and increase the average labour productivity. The important phenomena in these models is the outside options of the workers. If wages are lower than the current job, the workers' turnover rates will be lower, productivity will be higher and vice versa. One of the main critiques about the turnover models are that they do not have an argument for the unemployment rate in the first place as the turnover rate can also be decreased in the environments where there is no unemployment. Adverse selection models emphasize the fact that the productivity of the workers can not be always observable (Weiss, 1980). As a result, for firms to attract more productive workers from the sample pool, they use the relationship that higher productive workers ask for higher wages. By offering higher wages, firms can attract more productive workers. Union threat models aim to decrease the power of worker unions or keep the unions out of the loop by giving higher wages than the market clearing wages (Dickens, 1986).

The most famous shirking efficiency wage model is Shapiro and Stiglitz (1984). The shirking of the worker is not easy to monitor and shirking is easier than putting effort in. Thus, firms claim to decrease the probability of shirking by paying higher wages than the market clearing wages as the worker will lose a higher paid job. In this model, there are homogenous workers whose expected lifetime expectancy is independent of the workers' age and homogenous firms which live forever and all pay the same wage. Effort is costly and outside opportunity of the worker is a very crucial element in this model. If all firms set the same wage and there is no unemployment, the worker simply puts no effort in at all, as if he/she is caught when shirking, the worker will get the same wage in another job and there is no risk of unemployment. However, when the wage exceeds the market clearing wage, there will be unemployment and the wages offered by firms will be different. Thus, losing a job may end the worker in an unemployment status or in a lower wage job. Both the high unemployment rates, the higher wage in the current job and low unemployment benefit decrease the outside opportunity of the worker and shirking will be less.

The shirking model also has an input for dual labour market theories. The dual labour market theories have a primary labour market which has high wages with internal markets and a low paid secondary labour market which is disadvantageous in all terms (Doeringer and Piore, 1971). The main criticism to dual labour market theory is that with the same productive characteristics, the wages of the primary labour market should be decreased to market clearing wage. The shirking model explains that in the primary labour market detection of shirking is more difficult to spot than the secondary labour market causing the wage differences to be persistent.

Carmichael (1990) summarizes the criticisms against the Shapiro-Stiglitz efficiency wage model. He emphasizes the fact that other conditions than the unemployment

threat or wage rigidity may also result in a no shirking environment. He points out that the two parties, workers and employees, continue their agreements truthfully as long as both have a surplus at the end. A surplus can be generated not only as a result of higher wages to workers and productivity gains to firms but also through direct costs involved in changing the job or replacing the worker, specific training of workers for the unique firms or not hiring the workers that have been fired from other firms or vice versa. Besides, bonding mechanisms can also eliminate the worker discipline mechanism of unemployment. Even if the firms pay efficiency wages, they still can ask for an entrance fee to reduce the shirking of the workers (Becker and Stigler, 1974) or offer post performing bonds that would be off the table when the workers were caught shirking. Additionally, the bonding mechanisms have already existed in the labour markets. Promotions, retirement pensions or upward trend earnings are some examples of bonding mechanisms.

However, it has been argued that bonding mechanisms have their own problems. It is difficult to finance the bonding for a newly started worker who has no accumulation of wealth or no access to capital markets. Besides, in the case of false accusations of firms, it is hard to prove otherwise and may result in losing the workers pensions. Lazear (1979 and 1981) overcomes this problem by pointing out the fact that firms' value their reputation and by threatening fairly to their old workers, they are actually improving the effort levels of new workers.

In the analysis of this chapter, the government also becomes part of the efficiency wage framework. In the Shapiro-Stiglitz shirking model, there is unemployment benefit and employment subsidies, however, government is not one of the employers. The government in this chapter decides on the tax rate, unemployment benefit, government wage and employment. The effect of unemployment benefit under the efficiency framework is related to the outside option of the worker and modelled exogenously within this chapter. As unemployment benefit increases, the outside option of the worker increases so firms should pay more to force them not to shirk.

The influence of tax rates on employment and real wages under efficiency wages have reached different conclusions. Pisauro (1991) summarizes three important papers related to employment and real wages responding to tax changes. First one is the Yellen (1984) which concludes that ad valorem tax on labour has no effect on the after tax wage and decreases employment, while a specific tax raises the after tax wage (Pisauro (1988) reaches the same conclusion). The second one is the Johnson and Layard (1986) which shows that ad valorem tax reduces the after tax wage and leaves employment unaffected, while a specific tax lowers the employment level. The last one is the Shapiro-Stiglitz (1984) which implies that the effect of specific and ad valorem tax will be the same and they both decrease employment.

The public sector wage premium is assumed to exist and the facts for why there is a public wage premium are not discussed within this chapter. In general, the literature about public sector wages supports the idea that except for the highly skilled

workers, average public sector wages are higher than the private sector wages, besides public sector jobs have more fringe benefits and job security while less demanding in terms of both hours and competition compared to the private sector. For developed countries Mueller (1997) summarizes the reasons for public and private wage differentials under three headings: profit maximization, union power, and characteristics of final product. Firstly, most private firms try to minimize the costs by offering the lowest wage possible to workers under the profit maximization incentive. Secondly, it is mostly observed that unions are more powerful in the public sector which may cause higher wages. And lastly, government services are considered to be inelastic, thus the wage increase can be passed onto the consumers. Ehrenberg and Schwarz (1986) and Gregory and Borland (1999) have conducted a survey for public sector wage premium for the United States of America; Blanchflower (1996) and Panizza and Qiang (1999) show that there is public wage premium for the fifteen member countries of the Organization for Economic Cooperation and Development and several Latin American countries, respectively. For developing countries, Terrell (1993), Assaad (1996) and Tansel (1999) give examples for excess government employment and public wage premium for Haiti, Egypt and Turkey respectively.

Tansel (1999) points out the public wages in Turkey increase annually according to seniority. The promotions also raise the salary but performance is not a determination factor. Public administrator workers work 40 hours per week, have life time contracts; laying off is extremely rare and covered by Retirement Fund which includes retirement and health benefits. She also states that state economic enterprise workers wages are determined by collective bargaining. They have almost one hundred percent unionization rate, works 45 hours per week and are covered by the Social Security Institution in terms of retirement and health benefits. She concludes that state economic enterprises wages are higher than the private sector except at the university level, while public administrator wages are higher than the private sector for both men and women in Turkey.

Panizza (1998) summarizes that in an efficiency wage setting, higher firing costs and job security lead no shirking condition to be ended with higher wages and this is not motivated to attract more productive workers to the public sector but it is a result of governments which are not able to solve the principal agent problem. Besides, he also points out that the public wage premium is an indicator of the inefficiency of the public sector against the literature that higher public wages decrease corruption² and increase the efficiency of the public sector.

Other than the observed wage premium, the other common characteristics of public employment is that the less competitive work environment, rarely observed laying off which contributes to less competitiveness, abundant fringe benefits (Bellante and Long, 1981), less supervision and monitoring. As a result of higher wages and the

²I am not going to write about the corruption literature basically because in this chapter, I am just trying to show the welfare results of public wage premium and the lower productivity and not the reasons underneath them.

more fringe benefits in the public sector, it is expected that the productivity and the quality of the work in the public sector are higher than the private sector although these are not observed in most of the developing countries. Under efficiency framework, the higher wages may be a result of the lower monitoring as wage is a function of monitoring. If monitoring increases, the wage is expected to decrease while the efficiency goes up. Higher wages may be necessary but not a sufficient condition to improve efficiency in the public sector. Panizza et. al. (2001) discuss the relationship between wage differential between public and private sector and the efficiency of the public sector for Latin American countries. They found no significant relationship between the public wage premium and the productivity of the public sector, however they found a positive correlation between efficiency and the differential between the relative wages of workers with low education and workers with high education. Di Tella and Schargrotsky (2000) claim that the auditing should be accompanied by the higher wages so that the quality of the public sector will increase. Besides, Rauch and Evans (2000) state that as long as the allocation of jobs is done according to the abilities, skills and qualities actually needed, the productivity increases, however if the decisions are based on the political choices or other noneconomic reasons, the ineffectiveness cannot be decreased. Van Rijckeghem and Weder (1997) found a negative correlation between public-private wage differentiation and the effectiveness of public sector. All mentioned studies point out that the empirical work to conduct research on the linkage between the public wages and the efficiency in the public sector for different countries have data comparability problems as indexation of the quality variable is subjective. Besides, they all reached the same conclusion that increasing the public wages may not increase the quality of the public sector.

Later in this chapter, the effect of the increase in the government employment on the private employment is examined. In the literature, the crowding out of private expenditure as a result of a rise in the government expenditure is a more popular topic than the crowding out of the private employment by government employment. The conclusion of the studies which focus on private employment crowding out vary with respect to the labour supply elasticity. While a perfectly elastic labour supply may lead to no crowding out, the perfectly inelastic one may cause complete crowding out. Malley and Mautos (1996) argued that government employment curbs the private employment by increasing real wages for the Swedish labour market data between the years 1964-90. Additionally, they claimed that higher taxes to finance government employment also lead the total employment to decrease. Boeri et al. (2000) calculated the crowding out effect of government employment and estimated that every public job crowds out 0.3 private job for 19 industrialized OECD countries between the years 1982-95. Similarly, Algan et al. (2002) found the crowding out effect of public employment for OECD countries in the 1960-2000 period and Holmund (1997) a rise in public wage or employment lead the increase in the reservation utility of private sector workers and their bargaining power caused, private sector wage to increase and

private sector employment to decrease.

2.3 Model

2.3.1 General Framework

This section summarizes the general set-up of the model. I consider a labour market which is occupied by three kinds of agents; private firms, workers and the government. The firms are profit maximizers who choose a private wage, a level of private effort to impose and their demand for labour to maximize profits. The government, on the other hand, aims to maximize public employment. Finally, the workers maximize utility by deciding to shirk or not to shirk. Then the equilibrium in the labour market is determined as a common result of the behavior of all agents.

Private Firm

Although, the firm chooses the level of private wage, private effort and private employment to maximize profits, its choice of wage and effort is not independent from each other in the context of the efficiency wage theory. In order to make the workers exert effort, first the firm needs a monitoring mechanism, which punishes workers who are caught shirking. Moreover, assuming perfect monitoring is not possible or extremely costly, the firm still needs to choose a high enough wage rate to prevent workers from shirking. In other words, with imperfect monitoring, a worker can still shirk without being caught. Therefore, the firm should choose the wage rate such that workers' utility maximization problem would lead them to exert effort and not to take their chances with shirking and hoping not to be caught.

Following Bulkley and Myles (1996), I assume spot-check monitoring³ to ensure no shirking condition (NSC) in the private sector. In this set up, there exists a cut off effort level, s , which is imposed by the private firm. That is the minimum level of effort a worker is asked to exert. As a result of random monitoring, if any worker is caught exerting an effort level below s , he is treated as shirking and fired. A worker with an effort level higher than or equal to s , on the other hand, is entitled to get the private wage rate w^p . The parameter q shows the fraction of workforce being monitored in the context of spot-check monitoring which is also the probability of being caught while shirking. The equations (2.3.1) and (2.3.2) below correspond to the expected utility of a private sector worker when he shirks and when he does not shirk, respectively.

$$V(s, w^p, e^p) = (1 - q)U(w^p) + q(h_g U(U_g) + h_b U(U_b)) \text{ if } e^p < s \quad (2.3.1)$$

$$V(s, w^p, e^p) = U(w^p - C^p(e^p)) \text{ if } e^p \geq s \quad (2.3.2)$$

where $U(\cdot)$ is the utility function of the worker which shows the amount of utility he

³See Bulkley and Myles (1996) for the details of spot-check monitoring.

gets resulting from the payoff he receives; h_g and h_b are the probabilities of finding a job in the government sector and being unemployed respectively; U_b and U_g are the payoffs from being unemployed and being employed in the government sector, $C^p(\cdot)$ is the cost of exerting effort in the private sector which satisfies $C^p(0) = 0$. It will become clearer later in this section that the probabilities h_g and h_b depend on labour market conditions and the payoffs U_b and U_g are determined by unemployment benefits and public wage and effort.

Next, the utility maximization decision of the worker comes into the picture. Note that, given (2.3.1) and (2.3.2), the decision of worker's effort is a binary one between shirking and not shirking. In other words, since effort is costly, a rational worker never exerts any positive effort other than s , he will either chooses the critical level or does not exert any effort at all. The worker first observes s and w^p determined by the firm, then he simply chooses $e^p = 0$ if he is going to shirk and $e^p = s$ if he is not going to shirk, whichever provides a higher utility. Therefore, to eliminate incentives for shirking and to impose any level of effort e^p the private firm should satisfy the condition,

$$U(w^p - C^p(e^p)) \geq (1 - q)U(w^p) + q(h_g U(U_g) + h_b U(U_b)) \quad (2.3.3)$$

The NSC given in equation (2.3.3) can be considered as an incentive compatibility constraint for the firm's optimization problem which ensures that the worker behaves. Furthermore, this constraint will be binding since no rational firm pays a wage higher than necessary to induce the required effort. Given that $U(\cdot)$ is a monotonically increasing function of worker's payoff, w^p affects both sides of equation (2.3.3) positively. However, with $(1 - q) < 1$, when the w^p is raised, the rise in the left hand side of the equation will be larger compared to the rise in the right hand side⁴. In other words, for any given level of effort raising w^p increases the relative utility of not shirking compared to shirking. Since raising w^p is costly for the firm, it raises just enough to make (2.3.3) to bind. This implies that the NSC takes the form

$$w^p = w^p(q, h_g, U_g, h_b, U_b, C^p(e^p)) \quad (2.3.4)$$

This condition actually defines the pairs of effort and wage the private firm can choose simultaneously and therefore, it defines the interdependence between the firm's choice of wage and effort. To induce any effort e^p the firm should give the corresponding w^p defined by this relation. Note that the partial derivatives of (2.3.4) are in line with the efficiency wage theory. A higher rate of monitoring q , ceteris paribus, reduces the efficiency wage as it raises the probability to be caught and diminishes the expected utility of shirking. On the other hand, a higher h_g , h_b , U_b or U_g would mean a better outside option for the worker and requires a higher wage rate to prevent

⁴This is obvious if the utility function is linear i.e $U'(\cdot)$ is constant. But it is also true when utility function is concave i.e $U'(\cdot)$ is diminishing. The cost for exerting effort ensures $U'(w^p - C^p(e^p)) > U'(w^p)$.

shirking. Finally, a higher wage rate would be required to impose a higher effort level. Thus, the NSC given in (2.3.4) defines a positive relationship between the private wage and effort.

Having introduced the NSC, I can now write the private firm's optimization problem. The private firm chooses the required effort, wage rate and employment to maximize profits.

$$\text{Max}_{\{w^p, L^p, e^p\}} \pi^p = R^p(e^p, L^p) - w^p L^p \quad (2.3.5)$$

$$\text{subject to } w^p = w^p(q, h_g, U_g, h_b, U_b, C^p(e^p)) \quad (2.2.4)$$

where total profits are equal to the revenues from production minus total labour cost. $R^p(\cdot)$ is the revenue function which defines total revenues as a function of effort e^p and the number of workers employed L^p . As a firm's choice of the wage and the required effort level are interdependent, the maximization problem is subject to the NSC which is explained in detail above.

Public Sector

Having set the optimization conditions for the private sector, I outline the problem of the public sector next. The public sector is assumed to create employment for reasons that are not based on economic grounds. Therefore its sole aim is to maximize employment. This is one of the key elements in the model. The public sector distorts the labour market with an objective that is completely different from that of the private firms. To abstract from other drawbacks such as budget deficits caused by populist government policies, I assumed that the public sector is bounded by a break-even constraint and hence, operates with a balanced budget. The maximization problem is

$$\text{Max}_{\{L^g\}} L^g \quad (2.3.6)$$

$$\text{subject to } \pi^g = R^g(e^g L^g) - w^g L^g - (H - nL_p - L^g)U_b = 0 \quad (2.3.7)$$

$$\text{where } w^g = w^p + \bar{w} \quad (2.3.8)$$

$$\text{and } e^g = e^p - \bar{e} \text{ such that } \bar{w} > 0, \bar{e} > 0 \quad (2.3.9)$$

Equation (2.3.7) is the break-even constraint that ensures the government budget is balanced. Government budget equals the total revenues minus total expenditures where $R^g(\cdot)$ is the revenue function, which is similar to the revenue function of the private firm. At this stage, I assume government only drives revenue from production. On the expenditure side, there are two types of costs. First, there is the labour cost resulting from public employment and second, there is the cost of benefits that are

paid to the unemployed. Note that H denotes the total number of workers, n is the number of firms and hence $(H - nL^p - L^g)$ shows the total number of people who are unemployed. Then unemployment benefit U_b times the size of unemployment gives the cost of unemployment benefits. Equations (2.3.8) and (2.3.9) show the critical assumptions about the public sector. It is assumed that wage and effort differentials between the public and the private sectors are exogenously given. Therefore public wage rate w^g is given once the private wage is determined. The positive parameter \bar{w} implies that public wage is always higher than the private wage by a fixed amount. Similarly public effort is also given once the private effort is determined. It is assumed that there are no efficiency wages in public sector and the public sector worker willingly exerts positive effort, which is by a fixed amount lower than the private effort level. This assumption is a little tricky. Without efficiency wages and unless there is perfect monitoring, there is no guarantee that government can induce this effort level. In fact, given his utility maximization problem, without any monitoring, the worker simply exerts no effort as the probability of being caught will be zero. For the first part of my analysis, I retain this assumption because my aim is to analyze the effect of these differentials on the labour market; and to do that \bar{e} and \bar{w} should be exogenous. This assumption is not totally unreasonable in the sense that as $w^g > w^p$ and $e^g < e^p$, a worker who exerts e^p for w^p will be more willing to exert e^g for w^g . Therefore it can be assumed that the government can induce e^g for w^g by using some sort of a monitoring mechanism which is not explicitly outlined. Note that in the later stages of the analysis this assumption is going to be relaxed.

Labour Market Equilibrium

The equations below together with the optimization conditions of the public and private sectors characterize the labour market equilibrium where L^g and L^p are the amount of labour employed in the public and the private sectors respectively, H is the total number of workers and n is the number of private firms. The probabilities h_g and h_b are determined by the labour market conditions.

$$h_g = L^g / (H - nL^p) \quad (2.3.10)$$

$$h_b = 1 - (L^g / (H - nL^p)) \quad (2.3.11)$$

$$U_g = w^g - C(e^g) \quad (2.3.12)$$

Equation (2.3.10) states that the probability of finding a job in government sector after being fired from the private sector is equal to the size of public employment over the number of people who are not employed in the private sector. Therefore, the probability of being unemployed after being fired given in equation (2.3.11) is $1 - h_g$. Finally the payoff from being employed in the public sector is simply the public wage rate minus the cost of public effort level.

2.3.2 Model Specifics and Solution

In order to run some numerical simulations and drive conclusions, in this section, I make assumptions about the functional forms for utility and revenues functions outlined above. When choosing these functions, one of the concerns is to ensure that a plausible equilibrium can be found. A second issue is to get internal solutions for public effort and employment. And finally, the selected functional forms are checked to be consistent with the efficiency wage theory.

Private Firm

First, I assume a linear utility function to exploit the Jensen's inequality which states $E(U(.)) = U(E(.))$ when $U(.)$ is linear. This leads Equation (2.3.3) to become:

$$U[w^p - C^p(e^p)] = U[(1 - q)w^p + q(h_g U_g + h_b U_b)] \quad (2.3.13)$$

Then, with linear utility, NSC yields that firm should choose wage and effort such that the payoff received from not shirking will be equal to the expected payoff received from shirking.

$$w^p - C^p(e^p) = (1 - q)w^p + q(h_g U_g + h_b U_b) \quad (2.3.14)$$

One of the reasons for choosing a linear utility function is for the sake of simplicity. As it can be seen from (2.3.14), now NSC can easily be derived without considering the functional form of the utility function. Note that linear utility also means the worker is risk neutral while choosing between shirking and not shirking. The payoff received from not shirking is a certain payoff but the payoff from shirking is an expected one. With linear utility, the firm has to equate the guaranteed payoff of not shirking to the risky payoff of shirking because the worker's risk premium is zero. On the other hand, if the utility function were concave and hence the worker were risk averse, due to the positive risk premium the firm would be able to satisfy the NSC by offering a lower guaranteed payoff for not shirking. In other words, if everything else is held constant, a concave utility function would lead to a lower efficiency wage since the worker would be less willing to take the risk of shirking. However a linear utility function which is increasing in income is enough to establish the positive relationship between wage and effort which is critical for our analysis in the context of the efficiency wage theory.

Next, to ensure an interior solution, I also assume the private firm's cost and revenue functions are in the following forms:

$$C^p = c(e^p)^2 \text{ and,} \\ R^p = (e^p)^{1/2}(L^p)^{1/2}$$

Note that the cost function is convex in e^p and hence marginal cost of effort is higher for higher levels of the private effort. This assumption is also reasonable because, as the worker works more and more, it would become harder to exert additional effort. I assume a Cobb-Douglas type revenue function which exhibits constant returns to scale in e^p and L^p . The choice of this type of revenue (or production) function is

fairly common because it leads to closed form solutions. All these choices are made to make the model as simple as possible while preserving the general idea of the efficiency wages framework and avoiding corner solutions for the endogenous variables.

Substituting the cost function into Equation (2.3.14) and solving for w^p yields to the NSC below

$$w^p - c(e^p)^2 = (1 - q)w^p + q(h_g U_g + h_b U_b) \quad (2.3.15)$$

$$w^p = \frac{c(e^p)^2}{q} + h_g U_g + h_b U_b \quad (2.2.4a)$$

The first term on the right hand side of the NSC states the efficiency wage w^p is increasing in the cost parameter c and decreasing in the monitoring parameter q which is completely consistent with the idea of efficiency wages. The level of effort that is desired to be induced also pushes the wage rate upwards i.e $\frac{\partial w^p}{\partial e^p} > 0$. Moreover, because of the convex cost function, the required wage increase to induce a fixed amount of extra effort rises when the effort level goes up, or in other words $\frac{\partial(w^p)^2}{\partial^2 e^p} > 0$. The sum of second and third terms on the right hand side is the outside opportunity of the private sector worker. In line with the efficiency wages theory, an improvement in the outside opportunity would lead the wage rate to go up in order to maintain the level of effort.

Then, the private firm's problem becomes

$$Max_{\{w^p, L^p, e^p\}} \pi^p = (e^p)^{1/2} (L^p)^{1/2} - w^p L^p \quad (2.2.5a)$$

$$\text{subject to } w^p = \frac{c(e^p)^2}{q} + h_g U_g + h_b U_b \quad (2.2.4a)$$

Substituting w^p from the NSC into the profit function yields an unconstrained maximization problem in e^p and L^p . The first order conditions for maximization are

$$\frac{\partial \pi^p}{\partial L^p} = \frac{1}{2} \left(\frac{e^p}{L^p} \right)^{1/2} - \frac{c(e^p)^2}{q} - h_g U_g - h_b U_b = 0 \quad (2.3.16)$$

$$\frac{\partial \pi^p}{\partial e^p} = \frac{1}{2} \left(\frac{L^p}{e^p} \right)^{1/2} - \frac{2cL^p e^p}{q} = 0 \quad (2.3.17)$$

The first choice for the firm is to decide on the amount of labour that will be employed. To do that the firm simply equates the marginal revenue of labour to the marginal cost of labour which is the private wage rate. However, the wage rate is a function of the effort level that is desired to be induced via NSC. Therefore, firm chooses effort level e^p optimally as well by equating the marginal revenue of additional effort to the marginal cost of inducing it. Note that, the higher the cost parameter c and the lower the monitoring parameter q , the higher the marginal cost of inducing effort will be for the firm. Solving these first order conditions together with the NSC

in (2.2.4a) yields

$$e^p = \left(\frac{q}{c}(h_g U_g + h_b U_b)\right)^{1/2} \quad (2.3.18)$$

$$L^p = \frac{1}{16} \left(\frac{q}{c}\right)^{1/2} (h_g U_g + h_b U_b)^{-3/2} \quad (2.3.19)$$

$$w^p = 2(h_g U_g + h_b U_b) \quad (2.3.20)$$

Equations (2.3.18), (2.3.19) and (2.3.20) show the profit maximizing levels of the private wage, effort and employment. The equilibrium levels are such that, an improvement in the outside opportunity of the worker raises the private wage and private effort and leads to a fall in private employment.

Public Sector

For the public sector, I assume the form of the revenue function is similar to the one assumed for private sector.

$$R^g = (e^g)^{1/2} (L^g)^{1/2} \quad (2.3.21)$$

It is a well-known fact that, in developing countries, although effort level is low and wages are high, governments are usually able to employ many workers. Besides, note that, we do not allow budget deficits in the model but in reality governments can run budget deficits to achieve their goals. As mentioned earlier, in the context of this model, government tries to employ as many people as possible given its budget constraint.

The government's budget constraint which equates total revenues to total cost, will then be in the following form:

$$(e^g)^{1/2} (L^g)^{1/2} = w^g L^g + (H - nL_p - L^g) U_b \quad (2.3.22)$$

Note that, once the private levels of wage and effort are given, public effort and wage are determined by equations (2.3.8) and (2.3.9). Therefore, the government raises L^g until the budget constraint binds; i.e the government breaks even. Solving for L^g from the budget equation using the quadratic formula leads to:

$$L^g = - \frac{1/2 \frac{e^{g1/2}(e^{g1/2} + (e^g - 4w^g U_b H + 4w^g U_b n L_p + 4U_b^2 H - 4U_b^2 n L_p)^{1/2}}{-w^g + U_b}}{w^g - U_b} + U_b H - U_b n L_p}{w^g - U_b} \quad (2.3.23)$$

The level of government employment given in (2.3.23) is the maximum level that can possibly be achieved given the conditions in the labour market.

Labour Market Equilibrium

Labour market equilibrium is determined by simultaneous choices made by public and private sectors as well as the resulting conditions in the labour market. Therefore,

together with (2.3.10), (2.3.11), (2.3.18), (2.3.19), (2.3.20) and (2.3.23), the equation below becomes part of the labour market equilibrium

$$U_g = w^p + \bar{w} - c(e^p - \bar{e})^2 \quad (2.3.24)$$

There exist two links between public and private labour markets. First of all, public wage and effort are functions of private wage and effort defined by equations (2.3.8) and (2.3.9). Secondly, the conditions in the public labour market affect the outside opportunity of the private sector worker and hence the profit maximization problem of the private firm.

Simulations and Results

The model that has been outlined in the above section has a government whose sole aim is to increase employment as high as the break even (budget) constraint allows, given \bar{e} , \bar{w} and U_b . The parameters \bar{e} and \bar{w} determine how low/high government productivity/wage will be compared to private sector, and U_b is the payoff of unemployment benefit where it has an important role in determining the outside option for the private sector worker. I run simulations to see what will be the effect of a change in \bar{e} , \bar{w} and U_b on the endogenous variables of the model such as private effort, wages and employment and public employment. In other words, in this set up I do not deal with why governments tend to give higher wages for a lower effort, I just assume this is the case and investigate how does the labour market react to a change in these differentials as well as a change in unemployment benefit. While running simulations, I calibrate certain parameter values. I choose these values to be $q = 0.9, \bar{e} = 0.1, \bar{w} = 0.2, c = 1, U_b = 0.5, H = 100, n = 350$. The choices are made to ensure that the simulations can be run without any problems and lead to results for the endogenous variables that are consistent with the assumptions of the model. The results are given in Table 2.3.1.

The table is constructed by considering changes in \bar{e} , \bar{w} and U_b under four alternative scenarios as opposed to the baseline scenario given above. Each sign shows the direction of the change in the endogenous variable as a result of a ceteris paribus increase in \bar{e} , \bar{w} or U_b .

Table 2.3.1: Effects of the changes on labour markets

	\bar{e}	\bar{w}	U_b
e^p	-	-	-
w^p	-	-	-
L^p	+	+	+
L^g	-	-	-
e^g	-	-	-
w^g	-	+	-

This basic set up is important to see how the model works. However, it has a significant limitation. The public sector's only source of revenue is the production revenue that comes in return of the hired labour force. Given the private levels of wage, effort and employment and the budget constraint, an increase in \bar{e} , \bar{w} or U_b would mean a rise in costs and therefore can only be attained by a reduction in public employment. The results show that, even after the private sector reacts to the change, in the new equilibrium, any attempt of raising the wage and effort differentials causes a fall in public labour. The government is able to increase these differentials only at the expense of a deterioration in its objective, public employment. In other words, the government can only offer better conditions by reducing the amount of workers it hires. This can be considered as the main finding of this simplest form of the model.

From the table, it is not even clear if the government is actually able to offer better conditions for a representative public worker. We can see a clear increase in the well-being of the public worker for only the case when \bar{w} is increased. We observe the government wage is higher and the effort level is lower. For two other cases when \bar{e} and U_b are increased we see a lower wage with a lower effort so the information on the table is not enough to tell what happens to the utility of the public worker. The same result applies for the private worker for all three cases where he receives a lower wage and exerts lower effort. A proper welfare analysis is carried out later in this chapter by using an extended version of this basic set up.

In the context of the model, the main transmission channel between public and private labour markets works through the outside opportunity of the private worker. Therefore, the resulting effects of different scenarios for the private sector depends on the outside opportunity of the private sector worker, which is $(h_g U_g + h_b U_b)$. NSC will work accordingly and the profit maximization will determine the private wage, effort and employment. The outside opportunity which is nothing but the expected utility of a worker when caught shirking and has been fired, mainly depends on two things. First, the possible payoffs for being employed by the public sector or being unemployed (U_g and U_b) and second, the corresponding probabilities for these outcomes (h_g and h_b). The resulting change in outside opportunity is therefore determined by the changes both in payoffs and probabilities. The second mechanism is about the reaction of the private sector. The behavior of the private sector concerning wage and effort affects the levels of public wage and effort and hence the amount of labour that the government would be able to hire.

After all these interactions, the simulation results point out that an increase in \bar{e} , \bar{w} and U_b all have a similar effect on private sector variables qualitatively, i.e. a rise in private employment and a fall in private wage and effort level. The private sector simply reacts by lowering the wage and effort and increasing its level of employment. From the point of view of a representative private firm, with an increase in \bar{e} , \bar{w} or U_b , the outside opportunity changes and hence the former levels of wage, effort and employment no longer maximise profit. After the private and the public sector made

all the adjustment and the new equilibrium is reached we observe that the situation is actually improved for the private firm. The Figure 2.3.1 displays that private profits tend to rise as \bar{w} is increased. That is probably because government, while increasing the wage differential, is lowering the probability of getting a job in public sector at the same time. Therefore in this set up, an increase in the wage differential fails to increase the incentives to shirk in private sector. The results also show that, after all adjustments, U_g increases consistently, h_g falls consistently but the resulting change in the outside opportunity is ambiguous. The changes in \bar{e} and U_b also have similar effects (See Appendix A2 and A3).

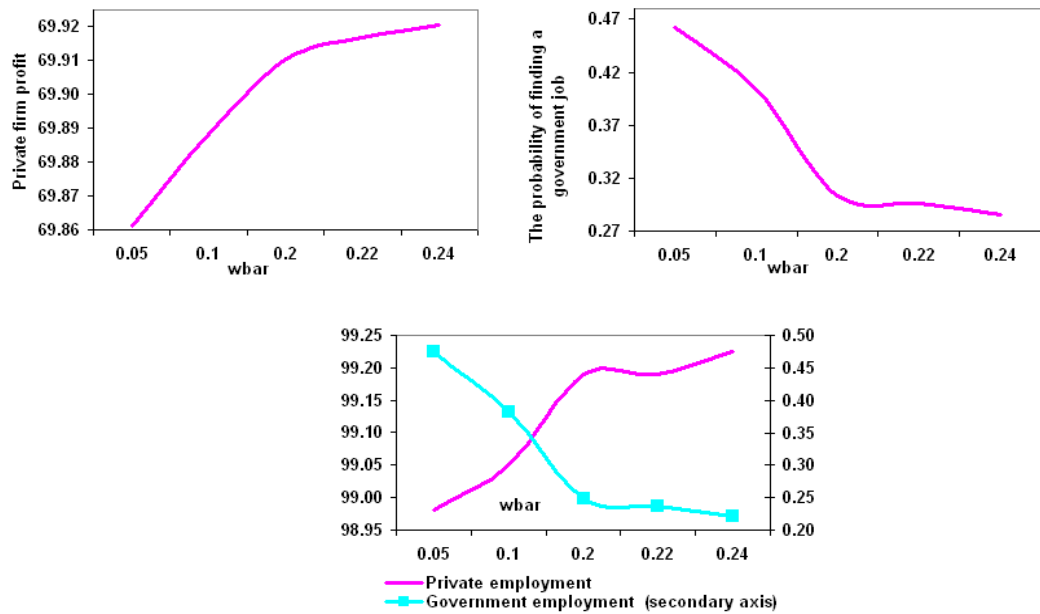


Figure 2.3.1: The Effects of Increase in \bar{w} on Labour Market Variables in the Simple Model

From the Figure 2.3.1, we observe public employment is falling while private employment is rising and the change in total employment is ambiguous when the wage differential \bar{w} becomes larger (See also the graphs for \bar{e} and U_b in the Appendix A2 and A3, respectively). Another puzzling point about these results might be about lowering \bar{e} , \bar{w} and U_b . This is because it seems public employment can be raised by lowering these variables. Where this study is concerned there may be two explanations to this. First, as mentioned earlier for the first two parts of this chapter, we assume these differentials are there and they are not determined by any kind of optimization. This is mainly what is observed in developing countries. Secondly, we can think these variables are some kind of policy tools for the government. However, the government has not got the full control of them. Once they are given they cannot be lowered (they are sticky downwards) but from time to time the government may want to increase them in an attempt to offer better conditions (Although not modeled, this may be another way of attracting political support by improving the public worker's conditions).

All in all, the government in this simple model faces an ultimate trade-off between offering better conditions and employing more people both of which may be desirable for an increased political support. This is not really suitable for the purpose of my analysis and it is not really realistic as well. We know governments can raise income from other resources or run budget deficits and they are often able to increase the employment without worsening the conditions or improve the conditions without lowering the employment. Through out this study we do not let for budget deficits but in the next section we allow the government to raise some extra revenue to finance an increase in employment or an improvement in the conditions of a public worker.

2.4 Tax and Welfare Analysis

In the previous section, the results confirmed that with the simple set up government has to sacrifice some employment to improve the public worker's conditions. The break even constraint is the key factor for this result. Therefore, to avoid this and to give the government a wider space to maneuver, I now assume it can find a way to increase revenues more specifically: to levy an income tax for the employers in the private sector. A flat tax rate out of the earnings of total private workers is imposed on the private firms, which will increase the marginal cost of the worker to the employer, while enabling government to finance the employment in the government sector by using the raised tax revenues. I choose the flat tax rate as the model does not have different income levels for the workers. Besides, I also prefer not to levy an income tax to the workers as that will definitely complicate the no-shirking condition, which may be an extension of the model for future research. With the newly introduced tax rate the set up of the model changes as follows.

Private Firm

The private firm's optimization problem is changed to be:

$$\text{Max}_{\{w^p, L^p, e^p\}} \pi^{pt} = R^p(e^p L^p) - (1+t)w^p L^p \quad (2.4.1)$$

$$\text{subject to } w^p = w^p(q, h_g, U_g, h_b, U_b, C^p(e^p)) \quad (2.2.4)$$

where t denotes the tax rate. The representative firm pays a proportion t of its total labour cost as tax to the government and the increased labour costs are reflected in the new profit function.

The revenue and cost of effort functions are assumed to remain the same

$$C^p = c(e^p)^2 \text{ and,}$$

$$R^p = (e^p)^{1/2}(L^p)^{1/2}$$

After the functional forms are imposed, the optimization problem becomes:

$$\text{Max}_{\{w^p, L^p, e^p\}} \pi^{pt} = (e^p L^p)^{1/2} - (1+t)w^p L^p \quad (2.4.2)$$

$$\text{subject to } w^p = \frac{c(e^p)^2}{q} + h_g U_g + h_b U_b \quad (2.2.4a)$$

Substituting NSC in the objective function leads to :

$$\pi^{pt} = (e^p L^p)^{1/2} - (1+t) \left(\frac{c(e^p)^2}{q} + h_g U_g + h_b U_b \right) L^p \quad (2.4.3)$$

Then the first order conditions for a maximum are :

$$\frac{\partial \pi^{pt}}{\partial L^p} = \frac{1}{2} \left(\frac{e^p}{L^p} \right)^{1/2} - (1+t) \left(\frac{c(e^p)^2}{q} - h_g U_g - h_b U_b \right) = 0 \quad (2.4.4)$$

$$\frac{\partial \pi^{pt}}{\partial e^p} = \frac{1}{2} \left(\frac{L^p}{e^p} \right)^{1/2} - (1+t) \frac{2cL^p e^p}{q} = 0 \quad (2.4.5)$$

The private firm will choose effort, wage rate and employment to maximize profits. The optimal values of e^p and L^p can be solved from the first order conditions. Then w^p is determined by the NSC

$$e^p = \left(\frac{q}{c} (h_g U_g + h_b U_b) \right)^{1/2} \quad (2.4.6)$$

$$L^p = \frac{1}{16(1+t)^2} \left(\frac{q}{c} \right)^{1/2} (h_g U_g + h_b U_b)^{-3/2} \quad (2.4.7)$$

$$w^p = 2(h_g U_g + h_b U_b) \quad (2.4.8)$$

First of all, note that the simple model in the previous section is a special case of this new model where the tax rate t is simply zero. Second, it is observed that the income tax paid over the wage bill by the private firm does not affect the optimal effort and wage. Note that, this is of course when all the parameters are the same and the public sector variables are given. Therefore, even if the parameters are chosen to be the same, with the altered public sector optimization problem, optimum levels of private wage and effort are likely to be different compared to the simple model without the tax. Finally, we observe that the optimal level of private employment is negatively related to the tax rate. Once again, private labour demand is increasing in the monitoring variable q and decreasing in the tax rate, cost of effort and outside opportunity.

Public Sector

The government budget constraint now contains both the revenue from the tax collected from the private employers and production. The budget constraint that the government is facing is as such that the revenues must be equal to the expenditures (government workers wage and unemployment benefit).

$$ntw^p L^p + R^g(e^g L^g) = w^g L^g + (H - nL^p - L^g)U_b \quad (2.4.9)$$

where the first term on the left hand side is the total tax revenue collected from n firms. The rest of the budget constraint is as before. I assume the revenue function to be in the same form with the new model as it is concave both in labour and effort and it exhibits constant returns to scale.

$$R^g = (e^g)^{1/2}(L^g)^{1/2} \quad (2.4.10)$$

Thus, with the functional form, the government's budget constraint becomes:

$$ntw^pL^p + (e^g)^{1/2}(L^g)^{1/2} \geq w^gL^g + (H - nL^p - L^g)U_b \quad (2.4.11)$$

Note that, the government's aim is once again to maximize public employment given the wage effort differentials, other parameters and private sector variables. Therefore, the government simply raises L^g until the budget constraint binds and all available income is used to hire workers. The binding budget constraint then solves for optimal L^g :

$$\begin{aligned} L^g = \frac{1}{-w^g + U_b} & \left(\frac{1}{2} \frac{1}{-w^g + U_b} (e^{g^{1/2}}(e^{g^{1/2}} + (e^g - 4w^gU_bH + 4w^gU_bnL^p \right. \\ & \left. + 4w^gnL^ptw^p + 4U_b^2H - 4U_b^2nL^p - 4U_bnL^ptw^p)^{1/2}) \right. \\ & \left. + U_bH - U_bnL^p - nL^ptw^p \right) \end{aligned} \quad (2.4.12)$$

Results and Welfare Analysis

The labour market equilibrium is composed of equations (2.4.6), (2.4.7), (2.4.8), (2.3.10), (2.3.11), (2.3.24) and (2.4.12). Under the new set up I basically considered two different scenarios. In the first one the government simply increases public employment and the additional cost of public workers is financed by an increase in the tax rate. In other words, I raise the tax rate and see what happens to the endogenous variables in the new equilibrium. In this scenario the wage and effort differentials are constant and the government's aim is to attract public support simply by offering more jobs. In the second one, I assume the government makes a one time increase in the public wage differential \bar{w} in an attempt to provide better conditions for its employees. However, different from the previous section, this time the government supports this improvement in conditions by a subsequent rise in the tax rate to restore the former level of public employment or in other words to compensate for the increased labour cost. This section is mostly about the welfare effects of these policies implemented by the government. In the previous section, I briefly mention how the well-being of an average worker is affected as a result of the raised differentials, yet in this part I conduct a detailed welfare analysis to show how the welfare in public and private sectors and in total as well, is influenced.

After the introduction of the tax, it is expected that the government can afford to hire a larger number of public workers and as a result increase its demand for labour.

In order to see whether this is the case, I solve the model for different tax rates and get the simulation results. I choose the values for $q = 0.9$, $\bar{e} = 0.1$, $\bar{w} = 0.2$, $c = 1$, $U_b = 0.5$, $H = 100$, $n = 350$. The baseline scenario remains as it is in the previous section. I consider ten different tax rates ranging from 0.01 to 0.8. I prefer a wide range of tax rates to invigilate the general trend of other variables.

As expected, with a rise in the tax rate, the government manages to hire more workers as a result of an improvement on the income side of its budget constraint (Figure 2.4.1). However, parallel to the rise in public employment, total employment declines along with the increasing tax rate, indicating a decline in the private employment which suppresses the improvement on the public side. In this scenario, the policy by the government affects the private sector in two ways. First, it imposes an additional cost item and second, it improves the outside opportunity given that everything else is constant. With the new conditions we observe, the private sector reacts by lowering the private employment. This also has two effects. First, it lowers the tax bill and second, with increasing unemployment, the private firm can ease the pressure on the NSC by reversing the effects of rising public employment. At this point, recall that the probability of finding a job in the public sector, h^g , is a function of both private and public employment. While, the growth in L^g raises this probability, the fall in L^p reduces it by increasing the number of workers who are potentially seeking a job in the public sector. The results also show that, after the adjustments are made, the outside opportunity and the probability of finding a job in the public sector are both decreasing in the new equilibrium with a higher tax rate (See Figure 2.4.2 and Appendix A4).

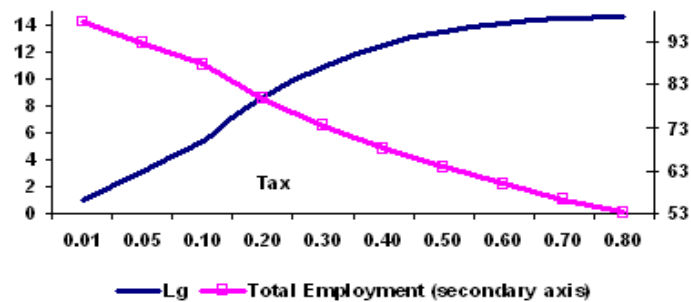


Figure 2.4.1: Government Labour Demand, Total Employment and Tax

Another implication of the tax financed increase in public employment can be seen in the shape of the L^g curve in Figure 2.4.1. If we ignore the first two scenarios where the change in the tax rate is not even; for the rest of the analysis where the tax rate is raised ten percentage points in each step, we observe L^g increases with a decreasing rate. In other words, additional increases in the tax rate result in less and less improvement in the public employment. This is probably because the private sector employs less people each time the tax rate is raised, and therefore the

government's ability to raise more revenues goes down with the increasing tax rate. The private sector's reaction to the newly levied tax also includes a fall in private wage and effort. Given that the differentials are unchanged public wage and effort also fall accordingly (Figure 2.4.2).

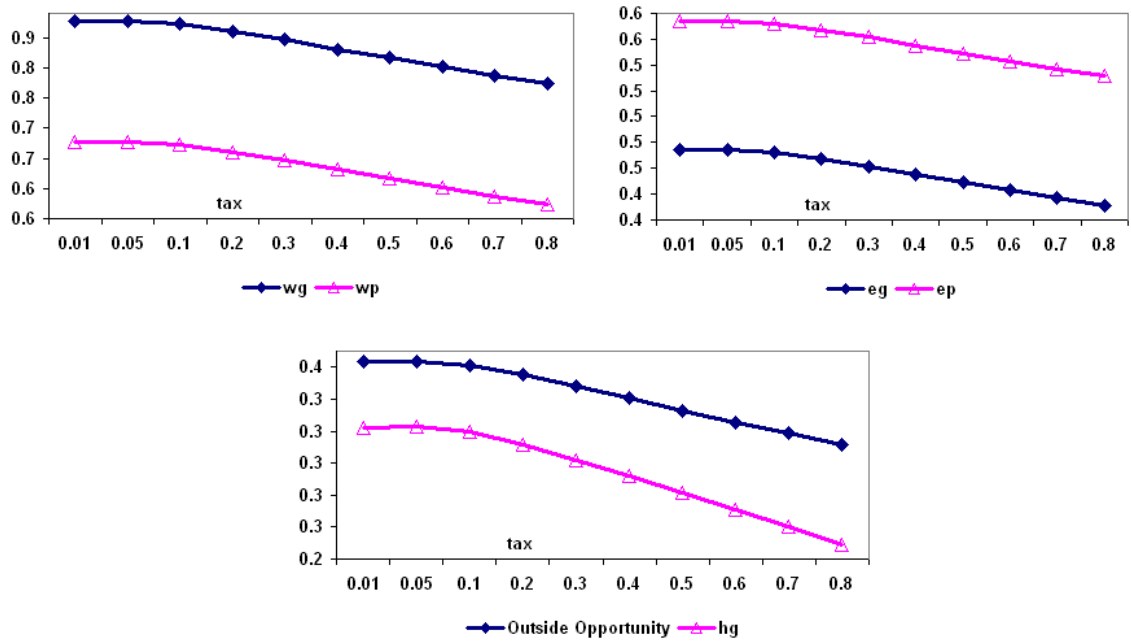


Figure 2.4.2: The Effects of Tax Change on Labour Market Variables

Having established that, with the modification of the simple model now the government is able to raise L^g without lowering the differentials, it is interesting to look into what happens to the agents welfare and the overall welfare in society as the tax rate is changing. In terms of the welfare structure, we can consider the worker's welfare and the private firm's welfare. A representative worker can be in any of the three states. He can be employed by the private sector, by the public sector or can be unemployed. Therefore, we have to consider the well-being of four different groups. The four components of total welfare are: private firm profit (π^{pt} , Equation 2.4.2), private labour payoff ($V_p = nL^p(w^p - c(e^p)^2)$), government labour payoff ($V_g = L^g U_g$) and the payoff from unemployment benefit ($((100 - nL^p - L^g)U_b)$). The simulation results show that the total welfare of the public workers increases along with the tax rate. On the other hand, the total private firm profit and the total private labour payoff both display a downward trend leading the total welfare to fall. Therefore, we conclude the tax policy is not welfare enhancing (Figure 2.4.3). When examined in detail, we see that the payoff of a representative public worker is decreased as a result of the falling wage, however we can say the government can increase the total welfare in the public sector simply by offering jobs for a greater number of people. However, as a result of the distortion created in private labour market, the welfare of the society is decreased and unemployment is increased.

The tax increase also leads to redistribution of income. On the gainers side, there

is a fraction of the unemployed who benefit from tax policy and who get a job in the public sector. However, the firms lose profits. A fraction of the people who were employed in the private sector manage to keep their jobs but work in worse conditions. Another fraction of the private workers lose their jobs. Even the existing public workers get less utility with the higher tax rate.

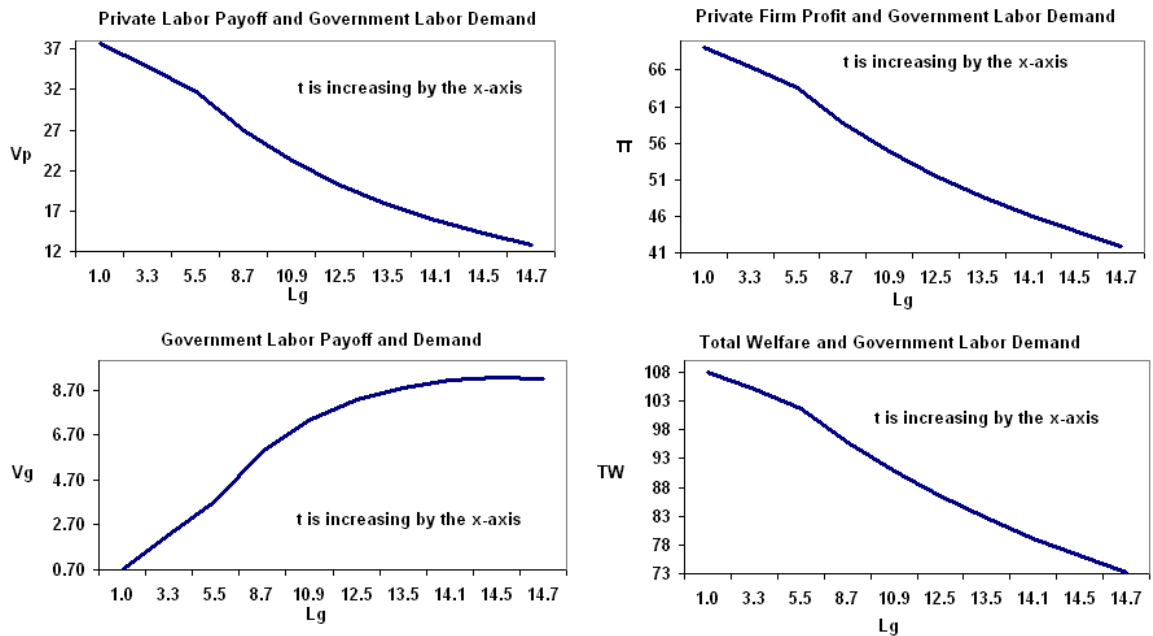


Figure 2.4.3: Welfare Structures

The second main scenario I consider is a one time rise in \bar{w} where the government also supports this increase with a matching rise in the tax rate to keep public employment at the level it was before the increase in the wage differential. More specifically, I start with the values of the baseline scenario. Next, I raise \bar{w} by 0.5 and then increase the tax rate until the previous level of public employment is nearly restored. Then I observe the changes in various endogenous variables of the model. The results are presented in Figure 2.4.4 (Also see Appendix A8).

The first part of the figure summarizes how the policy operates. Initially, the rise in the public wage differential \bar{w} results in a drastic fall in public employment. Then, when the tax revenues raised by an increase in the tax rate, public employment recovers again. Note that, it requires a 1.4 percentage points increase in the tax rate to make sure public employment is roughly restored at its pre-policy level. The same part of the figure also displays how private employment reacts to the policy scenario. We see a notable fall in private employment particularly after the tax change takes place.

In the second part, we see how the utility of a public worker and the probability of finding a job in the public sector changes as a result of the proposed policy scenario. The initial increase in \bar{w} raises U_g but as a result of the falling public employment a

decline in h^g is observed. After the tax increase, both U_g and h^g stay fairly stable. The interesting result here is that despite the increase in L^g the probability of finding a job in the public sector is not affected. In other words, although public employment recovers and reaches to its initial level as a result of the tax policy, getting a job in the public sector gets harder compared to the baseline scenario. Similar to the tax policy considered previously in this section, the private sector reacts by lowering employment to compensate for the pressure on outside opportunity and to bring tax expenditures down which eventually offset the positive effect of the increase public employment on h^g .

The last part of the figure shows how welfare structure is affected by the new policy. We see that, thanks to the tax policy, the government manages to increase the utility of a representative public worker while holding the level of public employment fairly stable. Therefore, the aim is achieved and total welfare in public sector, $V_g = L^g U_g$, is increased. However, similar to the previous policy, private profits decline. All in all, once again, the deterioration in the other components of the total welfare surpasses the improvement in public sector and a loss in overall well-being of the society is observed.

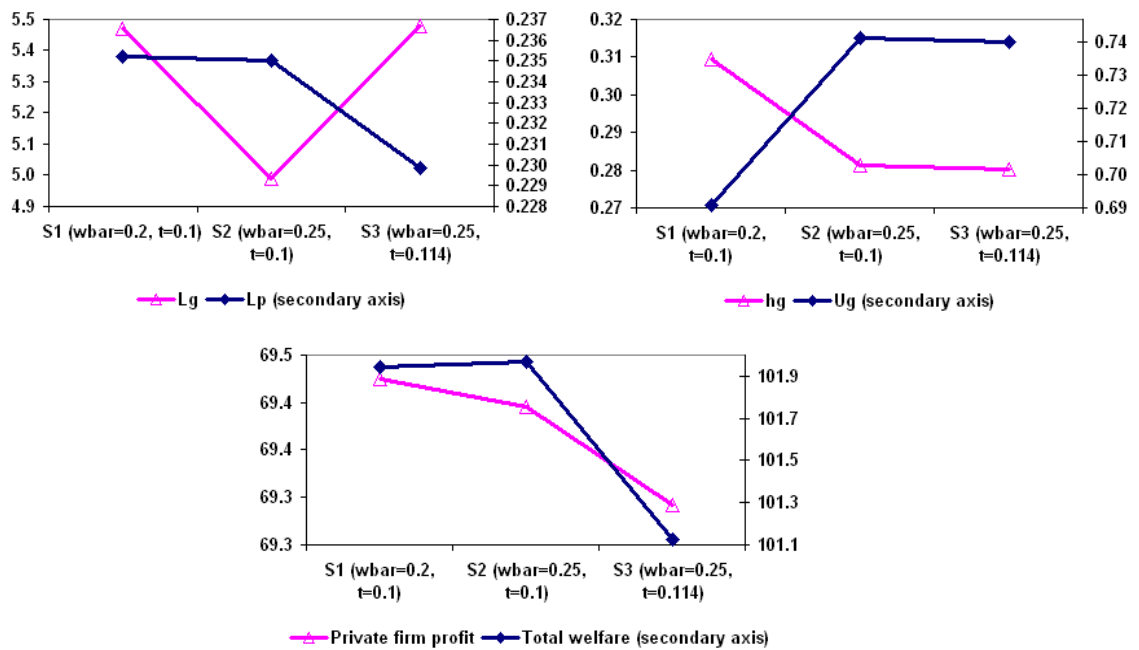


Figure 2.4.4: The effects of tax financed increase in \bar{w}

This chapter focuses on the welfare and distributional effects of public employment and the effects of it on production and growth are studied in detail in the next chapter. However, there is another point that may be worth mentioning about the results of the considered policy. A lower private effort is also observed in the new equilibrium and hence the effort differential is not changed as this also means a fall in public effort. Therefore, we observe an overall productivity loss as a result of the new policy. Moreover, in the new equilibrium private employment is lower and public employment

is nearly stable compared to the baseline scenario. Given the lower effort levels, this means total production in both public and private sectors drop as a result of the policy.

Next, I check if the results of the tax financed increase in the public employment is robust to different values for wage and effort differentials and unemployment benefit. While checking for robustness, I also construct a table similar to the one in the previous section. Table 2.4.1 displays the effects of a *ceteris paribus* increase in \bar{e} , \bar{w} or U_b on the endogenous variables (See Appendix A5, A6 and A7).

Table 2.4.1: Effects of the changes on labour markets including tax

	\bar{e}	\bar{w}	U_b
e^p	+	+	?
w^p	+	+	+
L^p	-	-	-
L^g	-	-	-
e^g	-	+	?
w^g	+	+	+

First of all, the effects of increasing tax rate seem robust to the changes in initial values of the exogenous variables. In other words, the general results about the welfare effects of the tax policy hold for different values of \bar{e} , \bar{w} or U_b . Secondly, the signs in the table which are assigned relative to the baseline scenario, exhibit a slightly different picture compared to the simple model without any tax. The main similarity is the effect on public employment. As long as the tax rate is constant, we observe an increase in \bar{e} , \bar{w} or U_b can only be sustained with a fall in L^g (although this feature is the same, the new set up of the model makes it possible to analyze tax financed increases in public employment or public wage differential). The main difference, on the other hand, is observed in the reaction of the private sector. In the simple model, private employment rises and private wage and effort fall. However, this time we see the private sector adjusts by doing just the opposite. This is due to the newly introduced tax on private labour expenditure. Although it is constant, existence of the tax rate changes relative costs and leads to a different reaction in the private sector. These results are displayed just to see that the existence of tax rate actually matters in terms of the equilibrium behavior, but the main purpose of introducing the tax rate is to analyze tax financed employment policy. Therefore, the main focus of this section is the welfare analysis conducted under different policy objectives.

2.5 Endogenizing Government Wage and Effort

The analysis made in this chapter is based on the fact that motivation and dynamics in the public sector part of the labour market in developing countries are

dissimilar to the incentives in the private part. I try to exploit efficiency wage framework to display how the two segments of the domestic labour market can interact with each other. Up to this point, I used a simple assumption that links public and private levels of wage and effort which simply states that public levels of these variables are different from their private counterparts by an exogenously given fixed amount. Therefore, while private wage and effort are determined as a result of profit maximization, public wage and effort can simply be derived from them. This has two main disadvantages. First, as mentioned earlier, it is not really clear how the public sector commits on a level of effort under this set up and second, this feature also leads public wage and effort to follow private levels directly without any underlying mechanism such as efficiency wages.

The simple assumption maintained for the first two sections is a reasonable one since it proposes a higher wage and lower level of effort in the public sector. Any worker who is willing to work in the private sector, will be willing to work in the public sector as well. However, we know that the worker exerts the determined level of effort thanks to the monitoring mechanism. Without any monitoring, even if the wage rate is higher, it is not optimal for the worker to exert any positive level of effort. The exogenously given wage and effort differentials introduced in the previous sections therefore, leave the wage mechanism in the public sector uncertain.

The second problem associated with the exogenous differentials assumption may be the relation between public and private variables. When the government changes something the private sector reacts by changing wage and effort levels, but as the differentials are given the public levels change accordingly. In other words, when setting wage and effort the private sector knows that the public sector will follow. This set up fails to provide any explanation why the wage and effort levels are as they are observed empirically.

To tackle these problems and retest the welfare effects of the government's employment policy on a more realistic model, in this section I also introduce efficiency wages in the public sector. Similar to the private sector, the government should pay enough wages to implement a certain level of effort in line with the worker's no shirking condition. There are three main differences between public and private sectors. First of all, the public sector has a different objective as before. Secondly, monitoring is assumed to be relatively loose in the public sector. This assumption covers the relative job security in the public sector which may be a good factor that can explain productivity differences between two sectors. Finally, the outside opportunity of the public worker is modified for simplicity. I simply assume the public worker's outside opportunity consists of unemployment benefit only and no public worker has a chance to find a job in private sector after getting fired. The modified version of the model is outlined below.

Private Sector

The private sector maximizes profits as before. The modifications made in this

section do not affect the private firm's optimization problem.

Public Sector

I introduce no shirking condition in the public sector. The expected utility of the government worker when he exerts the required effort level s or more and when he shirks are given as

$$V_g(s, w^g, e_g) = (1 - \beta q)U_g(w^g) + \beta q U_b \quad (2.5.1)$$

$$\text{if } e_g < s \text{ and } \beta < 1 \quad (2.5.2)$$

$$V_g(s, w^g, e_g) = U(w^g - C^g(e_g)) \text{ if } e_g \geq s \quad (2.5.3)$$

There exist a couple of dissimilarities compared to the utility of private sector worker. The first one is the lower monitoring density. When the public worker shirks, he has a lower chance of getting caught. This is captured by multiplying monitoring density q by $\beta < 1$. With the introduction of the parameter β , the monitoring density in public sector is βq . The second difference is the outside opportunity of the public worker. For the sake of simplicity, I assume the private sector never employs anyone caught shirking and fired from public sector. Consequently, a public worker who gets fired stays unemployed and gets the utility of unemployment benefit. This can be seen on the right hand side of equation (2.5.1). Then, to guarantee the implementation of the optimal effort level, NSC of the public worker requires

$$U(w^g - C^g(e_g)) \geq (1 - \beta q)U_g(w^g) + \beta q U_b \quad (2.5.4)$$

Then once again, the NSC defines a relationship between the wage and effort level in the form of

$$w^g = w^g(\beta q, U_b, C^g(e_g)) \quad (2.5.5)$$

The government maximizes employment as before, but this time the maximization problem is subject to budget constraint and NSC.

$$\begin{aligned} & \text{Max}_{\{L^g, e_g\}} L^g \quad (2.5.6) \\ & \text{subject to } w^g = w^g(\beta q, U_b, C^g(e_g)) \\ & nt w^p L^p + R^g(e_g L^g) - w^g L^g - (H - n L_p - L^g) U_b \geq 0 \end{aligned}$$

Public Sector Model Specifics

We assume the public sector pays the minimum possible wage to implement optimal effort level which means NSC is binding

$$U(w^g - C^g(e_g)) = (1 - \beta q)U(w^g) + \beta q U(U_b) \quad (2.5.7)$$

By assuming linear utility similar to the private sector we have

$$U[w^g - C^g(e_g)] = U[(1 - \beta q)w^g + \beta q U_b] \quad (2.5.8)$$

and therefore

$$w^g - C^g(e_g) = (1 - \beta q)w^g + \beta q U_b \quad (2.5.9)$$

Next, I assume cost and revenue functions to be the same as before.

$$C^g = c(e^g)^2 \text{ and,}$$

$$R^g = (e^g)^{1/2}(L^g)^{1/2}$$

Substituting these functions in the general form of NSC we get

$$w^g - ce_g^2 = (1 - \beta q)w^g + \beta q U_b \quad (2.5.10)$$

which implies

$$w^g = \frac{ce_g^2}{\beta q} + U_b \quad (2.5.11)$$

Then the maximization problem of the public sector becomes

$$\begin{aligned} & \text{Max}_{\{L^g, e_g\}} L^g \quad (2.5.12) \\ & \text{subject to } w^g = \frac{ce_g^2}{\beta q} + U_b \\ & ntw^p L^p + e_g^{1/2} L^{g^{1/2}} - w^g L^g - (H - nL_p - L^g)U_b \geq 0 \end{aligned}$$

To find the optimal levels of public wage, effort and employment, I first substitute the NSC in the budget constraint and then write the Lagrangian of the optimization problem

$$\Phi = L^g + \lambda(ntw^p L^p - (H - nL^p)U_b + e_g^{1/2} L^{g^{1/2}} - \frac{ce_g^2}{\beta q} L^g) \quad (2.5.13)$$

The budget constraint binds and the first order conditions imply

$$\frac{\partial \Phi}{\partial e_g} = \lambda \left(\frac{1}{2} e_g^{-1/2} L^{g^{1/2}} - 2 \frac{ce_g}{\beta q} L^g \right) = 0 \quad (2.5.14)$$

$$\frac{\partial \Phi}{\partial L^g} = 1 + \lambda \left(\frac{1}{2} e_g^{1/2} L^{g^{-1/2}} - \frac{ce_g^2}{\beta q} \right) = 0 \quad (2.5.15)$$

$$\frac{\partial \Phi}{\partial \lambda} = ntw^p L^p - (H - nL^p)U_b + e_g^{1/2} L^{g^{1/2}} - \frac{ce_g^2}{\beta q} L^g = 0 \quad (2.5.16)$$

Solving the first order conditions simultaneously yields to the optimal values of public effort and employment

$$e_g = \frac{3}{16} \frac{\beta q}{c(-ntw^p L^p + U_b H - nL^p U_b)} \quad (2.5.17)$$

$$L^g = \frac{256}{27} \frac{(-ntw^p L^p + U_b H - nL^p U_b)^3 c}{\beta q} \quad (2.5.18)$$

The public wage can then be solved using the NSC.

Simulations and Results

I choose the values for $q = 0.9$, $c = 1$, $U_b = 0.35$, $H = 100$, $n = 350$ and $\beta = 0.8$. These values are chosen to ensure that the simulations can be run without any problems. The choice of the values is consistent with the baseline scenario used previously. I only change the unemployment benefit and of course the values that are assumed for wage and effort differentials are disappeared as public wage and employment is now endogenous. There is also an additional parameter β in the modified version of the model which defines how weak the monitoring is in public sector relative to private sector. According to the chosen values public workers are monitored only 80 percent of the time private workers are monitored. Table 2.5.1 summarizes the effects of a change in the public sector monitoring parameter β .

Table 2.5.1: Effects of the changes on government monitoring on labour market variables, $t=0.1$

	$\beta = 0.75$	$\beta = 0.8$	$\beta = 0.9$
e^p	0.565	0.564	0.562
w^p	0.710	0.707	0.703
L^p	0.232	0.233	0.235
L^g	8.410	3.420	0.757
h_g	0.446	0.187	0.043
h_b	0.554	0.813	0.957
U_g	0.361	0.367	0.384
e_g	0.150	0.212	0.378
w^g	0.383	0.412	0.527

The results display a lower level of effort in the public sector compared to the private sector. Therefore, our results are consistent with the idea that, weaker monitoring or relative job security may be one of the reasons for lower productivity in the public sector. The government's objective is to maximize employment. The results show that it can achieve this goal by setting a lower effort level than that is observed in the private labour market. To induce this effort level, in line with the no shirking condition, it needs a lower wage rate. In other words, even though monitoring is less intense in public sector, as the equilibrium public effort is sufficiently lower

relative to the private effort; public wage rate is found to be lower than the private wage rate. Besides, the simplifying assumption that has been made about the private sector never employs laid off public workers and hence the outside opportunity of a typical public worker is only determined by the unemployment benefit, leads to less strict public sector no shirking condition and contributes to lower public wages in the equilibrium.

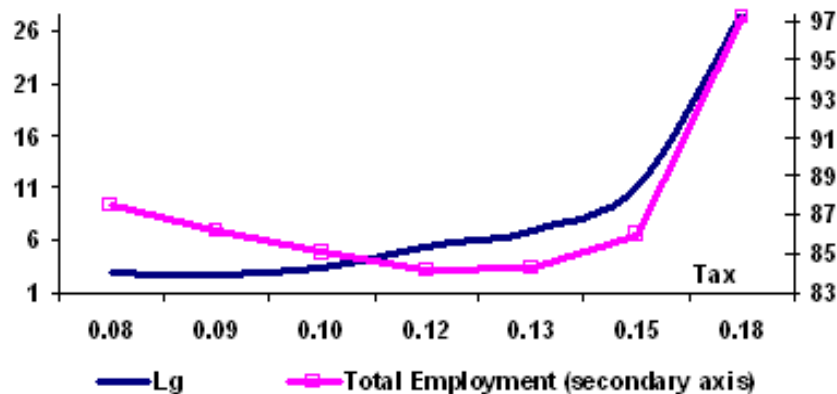


Figure 2.5.1: Government Labour, Total Employment and Tax with Endogenized Public Wage and Effort

For a welfare analysis similar to previous sections, I consider seven different tax rates ranging from 0.08 to 0.18. With higher tax rates I failed to reach an equilibrium. The results display similarity with the previous sections. The government is once again able to increase public employment by raising the tax rate. One difference is that, this time total employment also rises along with the public employment. This is due to a drawback of the model. In the previous sections, when we have exogenous differentials, apart from its objective function we can control how the government changes the working conditions of an average public worker by changing these differentials. In this model though, while the government aims to maximize public employment, it is not concerned with about the public wage and effort. Therefore, we observe as tax rate goes up, the government pushes effort and wage down and is able to increase public employment at an increasing rate. As a result, the increase in public employment suppresses the fall in private employment causing total employment to increase.

Because of this drawback, we should be careful when we state the effect of job security on low effort levels in public sector. But this feature of the model can be interpreted as the relative importance of employment as opposed to working conditions and in that sense, it is not very unrealistic. Another, issue about the working conditions is about the wage rate that is chosen by the government. In the model, just because of the drawback I mentioned above, the public wage stays lower than the private wage, although empirically we observe the opposite. Note that, this is also a result of the binding no shirking condition. In the private firm's case it is obvious the

firm will choose the minimum wage that can induce the required effort level. However, no shirking condition only provides a lower limit for the wage that can induce the required level. Governments, if they are concerned about the wages as well as the employment, can pay a wage even higher than the efficiency wage as long as they can raise the necessary funds. Therefore, higher public wages rather than the private wages does not necessarily contradict with the efficiency wages theory.

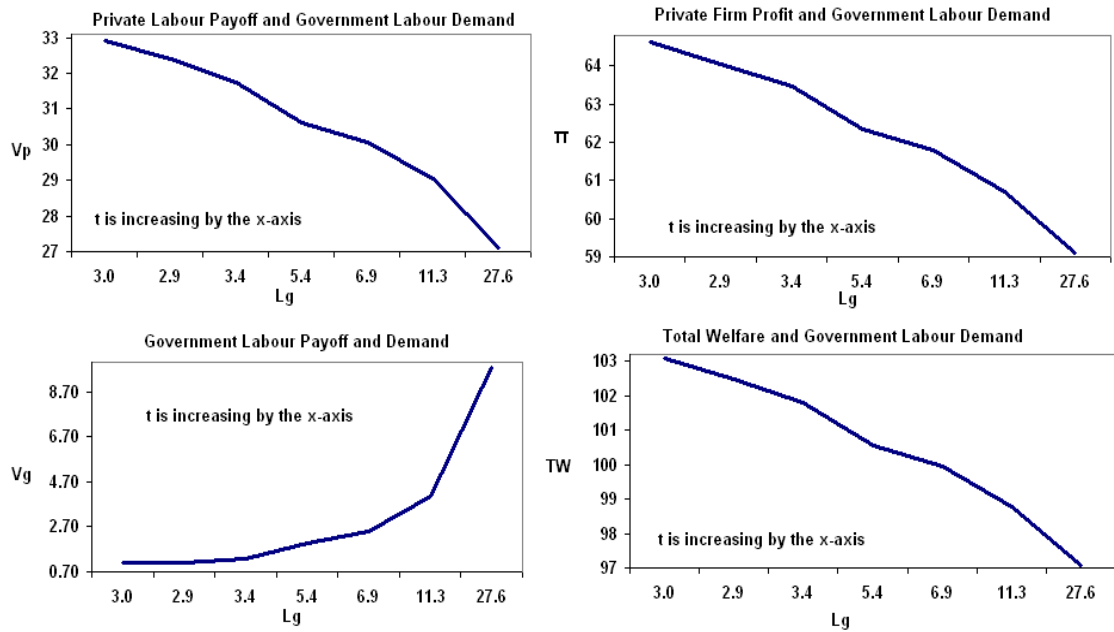


Figure 2.5.2: Welfare Structures with Endogenized Public Wage and Effort

The welfare structures are very similar to what we get in the previous models. It is observed that, while the total welfare in public sector increases along with the tax rate, the total welfare of private workers, private profits and hence the total welfare in private sector falls. Once again the loss of welfare in the private sector dominates the gain in the public sector and total welfare goes down. Per capita welfare in public sector also shows the effects of the declining wage rate. As mentioned before the government sacrifices from the well-being of an average public worker in order to employ more people (See Appendix A9).

The government we consider in this study is a self-centred one and as its aim is to boost political patronage, it is also short-sighted. In other words it often does not care about the longer run consequences of its actions even if they can deteriorate the well-being of the society as a whole. It only aims to get support by raising wages or increasing employment in the short-run to win the elections and remain in power. The negative effects of these actions usually take some time to show up with all the labour market adjustments. When they do, together with many things happening in the economy in the process, these negative consequences usually cannot be linked to the government's previous actions regarding public wages and employment by the society. Given the difficulty of their lives, people become short-sighted too and they can often be fooled by the short-term improvement in their well-being.

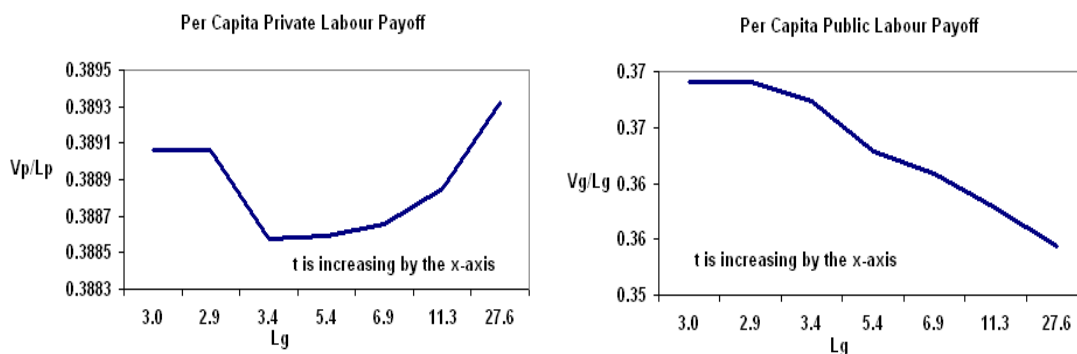


Figure 2.5.3: Government Labour and Per Capita Labour Payoffs

A benevolent government on the other hand, would have made a difference. If the government's objective was to maximize social welfare where it produces a public good that enters into agents' utility function, then the trade off for the government would be between the rise in the social welfare due to increased public employment, public good output and the fall in the welfare due to the effects on the private labour market such as higher taxes. Then the government would probably choose a lower level of public employment and would not raise the taxes in the expense of social welfare in the long run.

This can be seen as an externality in the real life. The private cost and benefit (to the government) of the public employment policy considered in this study are different than the social cost and benefit (to the society) of it. Public goods can increase the welfare of the society as a whole in the long run. However, especially when people have more imminent financial problems, better health services, nicer roads or public parks in the longer run may not be as tempting as a rise in their wages or finding a new job when unemployed. As long as people can be "fooled" with these short-run effects, politicians will be willing to implement these policies. For instance, it became common recently in Turkey that, a political party gives out food and coal supplies in the poorer parts of the country before the elections. When basic needs are at stake, people cannot think of the longer term consequences of the policies even if they may suffer from them in the future.

I also look at the social welfare assuming public revenues has a social value and hence affect the well being of the society. I consider three different cases where public revenues enter the social welfare function (i) as they are, (ii) after multiplied by a coefficient smaller than one (iii) after multiplied by a coefficient bigger than one. Regardless of how public revenues enter social welfare, the general results regarding the welfare effects of the public employment policy remain unchanged.

2.6 Conclusion

When the governments increase the public sector share of the economy, it is expected that they will both increase the efficiency and the productivity of the economy until the private sector catches up, invests and creates job opportunities. However, in many developing countries, the governments are suffering from severe budget deficits caused from excessive amount of expenditures for inefficient investments, unproductive workers and projects. It is now a very-well known fact that governments use the power they possess in a severely uneconomical way because of populist intentions that resulted in strict destructions in the economic channels and which an extensive amount of time and revenue is needed for them to function properly again.

In this chapter, I tried to show how such efforts affect the private labour market and social welfare particularly when the populist policy is financed by a tax levied on the private sector. Assuming efficiency wages, I provide public employment as an explicit outside option for the private worker and investigate the results of an increase in tax rates in an attempt to raise more public employment or increase public wages. The common result is that, such a policy has severe effects on the private sector and leads to a fall in social welfare.

The aim of the analysis in this chapter is not to prove public employment is a bad thing. However, it aims to show the way it is performed in developing countries has serious effects on the economy. Excessive employment by public sector can be seen as a compensation for the lack of unemployment insurance in these countries. Therefore, it is often used as a way of distributing funds to people who are not employed in the private sector. When the topic of introducing an insurance system for the unemployed is brought for discussion, people who are against it usually argue about the funding issues and its effects on the labour market. If we think in the context of the models discussed in this chapter, unemployment benefits have effects similar to those of public wages or public employment, i.e they affect the outside opportunity of the private worker similarly.

One may argue that, employing public workers may require lesser funds as at least it will generate some revenue. This may be true when we consider a simple model where all workers are the same. But it should not be forgotten that, public workers have lower productivity and usually they are over-paid. Therefore, this advantage is weakened in the case of public workers. When we consider different types of skilled and unskilled labour in the various sectors of production, the excess public employment may cause other structural problems that would otherwise not be observed under an unemployment insurance system. The first difference between providing employment and unemployment benefit is the inefficiency. Public sector often hires unskilled labour by providing a wage level which is higher than their productivity and the unemployment benefit. When this is extreme, even without the structural problems this method can be more costly in providing a certain level of additional welfare compared to unemployment benefit system. With more costs budget problems will be more

severe which will lead to higher taxes. As it is shown in this chapter, higher taxes will have stronger distortionary effects on the private labour market.

Secondly, as a structural problem, how these new employment opportunities are distributed among people is usually not fair. People who get government jobs are often decided upon their political status rather than their skills. On the other hand, a well established unemployment benefit system can provide necessary compensation for all the people in need of it in a much more fair and equal way.

Thirdly, public sector's employment policy is in line with the establishment of huge public enterprises which are mentioned several times throughout this study. The accounts of these enterprises are far from being transparent and in time they become the centres of corruption and bribery. One problem created by this situation goes back to the inefficiency problem mentioned earlier. With all the corruption going on what these public firms spend often exceeds any good they do which leads to unnecessary growing of budget deficits. The second problem is about these public firms harming competition in the market and possibly curbing private investment in many cases. For example, when jobs are delegated to private firms, certain firms are favoured and therefore it also affects efficiency of the private production in the economy negatively.

Another thing that may worth mentioning is the environment created by the public employment system. If the government provides unemployment insurance, that would lead to a more transparent support system. On the other hand, when you have several government agencies with lots of workers and property, it becomes easier to implement inefficient policies for political support and even corruption can take place. It is common in Turkey that, governments give jobs to their supporters or unproductive workers or allocate the investment projects to the firms that are not efficient but friendly, and the repercussion effects are often overlooked. Eventually the findings of this chapter at least support the idea that unemployment support systems may not be that impossible to implement after all in developing countries by showing that, with the alternative, lots of funds are already being used inefficiently and in a way that leads to loss of social welfare.

A further issue that was addressed several times in this chapter is public wages. The wage differentials between sectors, firms or industries are not commonly seen only in developing countries but also in developed countries. There are numerous factors that explain the wage differentiation: individual, social or economical factors. Besides, the productivity of a worker is one of the determinants of the wage. It is expected that higher paying jobs come with the higher capital-labour ratios and higher productivity. However, most of the developing countries' public sectors show no consistent relationship outlined in the economic theory as mentioned before. Non-wage compensations, political choices or trade unions are important in this outcome for the developing countries.

According to Bulutay (1995, p. 213), the larger firm size in the public sector is the main determinant for the higher wages in the Turkish public manufacturing sector

as a result of the import substitution policies in 1970s. This larger firm size in the public sector also created monopoly profits which caused the public sector to have more profits to distribute to its workers not only in the form of wage but also as fringe benefits. Besides, the high inflation environment also helped the SEEs to shift the cost of high wages to consumers. He also shows that the political environment in Turkey has significant effects on wages. In the 1950s, 60s and 70s the wages were higher, however, especially 80s wages declined considerably under the military regime. Besides, unionization among public workers is better than the private workers in Turkey leading higher wages.

Political patronage seems like the primary motive for this kind of policies. One may ask the question that, if these policies worsen the social welfare, how do the governments manage to gain political support by these. There may be several factors that can explain this, but two of them are particularly worth mentioning. First, the losers of such policies are often the private workers as we observed in the simulations above. People who lose their jobs may not be aware of the government's role on this outcome. Therefore the government can gain the support of the ones who now have jobs in the public sector without losing the support of all of the losers on the other side. The second factor is timing. The model we have considered is a static one so everything happens simultaneously. However, in reality these kind of policies usually take place before political elections and while benefits can be seen much quicker, the realization of the costs may take some time or they can be postponed to a great extent. For example, the government can run budget deficits for some time after a public wage increase and the harmful effects of the deficit, such as higher taxes in the future, higher interest rates or higher public prices cannot be recognized by the factor for a considerable time. In other words, people are usually short-sighted therefore, while the politicians can collect the benefits of their actions in the short-run, they may avoid taking the responsibility of the longer-run costs. The effects of these kind of policies, once implemented, are very hard to take back. In time they may turn into structural problems and no one remembers who are supposed to be blamed for them.

Chapter 3

Government employment and growth

3.1 Introduction

Economic growth has always been one of the most important policy objectives for governments. They often try to improve investment, capital accumulation, employment or productivity with the aim of promoting economic growth. In the early years of the Turkish Republic involvement of the state in the economic activities has been considered as the main engine for growth as private investment was extremely inadequate. However, in time, the public sector's involvement took such an inefficient form that might even undermine the growth performance of the economy. One of the main arguments of this thesis is this inefficiency in the public sector and its motivation and the possible consequences. Therefore, it is also mentioned that the problem is not the public sector employment itself but the way it is being put into operation. In Turkey, the structure of the public sector became suitable for the use of public employment as an income transfer mechanism for enhancing political power. This leads to excess employment over time and hence a surge in labour use in the public sector. Government's involvement in the labour market also affects the private sector wage and employment decisions and private labour productivity. Moreover, the low productivity and overemployment in the public part of the labour market make it necessary to finance this employment by using external sources from the budget. As a result, via higher taxes, government employment strategy creates another distortion over the economy. All in all, we observe the government takes over some of the available resources in the economy and uses them in an inefficient way while paying their prices from the governments budget. This chapter aims to analyse the impact of such behavior on economic growth, or in other words, it investigates if, under certain assumptions, higher public employment contributes to the relatively lower rates of growth in developing countries. Gelb et. al. (1991) stated that the different growth rates of developing countries which have similar endowments and saving rates could be due to the surplus labour in the public sector.

The relative size of the public sector employment was averaged at 44 percent of total non-agricultural employment in 23 developing countries (Heller and Tait, 1983). Specifically, this rate is 7 percent in Haiti (Terrell, 1993) and 17.2 percent in Turkey (Bulutay, 1995). Also, in Egypt, 35 percent of total employment was in the public sector in 1995 (Assaad, 1997). Government is the employer of last resort in many of these countries; for example in Egypt, university graduates are guaranteed to have a job in the public sector. In Latin America, despite the fact that budget cuts should be placed, the expansion of government employment had been continued (Gelb et. al., 1991). Although, recently several attempts for different countries to downsize the public employment have been taken the very crude calculation of total public employment rates from the International Labour Organization database show that many countries, Turkey, Egypt, Mauritius, Sudan etc. still have high rates of government employment.

Growth can be considered as a structural issue in the Turkish economy and public employment strategy and the transmission mechanisms affected by it is an important part of the structure. Naturally, growth performance of an economy is influenced by many factors, so public employment can only be one of the many inter-related parts of the whole structure. The motivation of public employment may also sever the relationship between growth and employment. More specifically economic growth may not always result in employment increase; or during times of recession the fall in employment may be not as severe. It is known that, during times of low growth or recession, the public sector may choose to raise employment to compensate the fall in private employment. Similarly, sometimes, when the conditions are favorable, the growth in the national income may not be equally reflected in employment because at least part of the output growth can be attributed to more efficient use of resources or increased labour productivity. In other words, although total employment remains the same, a more efficient allocation may lead to better growth performance.

My basic aim in this paper is to study the outcome of excess public sector employment on capital accumulation and growth. Government employment decisions have an impact on various economic variables through different economic channels, and broadly, through government related mechanisms and private labour market. All in all, the changes in the government employment policy definitely have repercussion effects on labour market tightness, the private labour wage, productivity and demand; all which are critical to decide the necessary labour input for the private sector output. Ardagna (2004) presented the effect of fiscal policy on growth through the labour costs of private firms and claimed that a decrease in government employment increases the probability of being unemployed and makes the labour market less tight, lowers the pressure on the wages and, thus, positively affects the growth rate. Similarly, in line with efficiency wage framework (Shapiro and Stiglitz, 1984), the increase in government employment has repercussion effects on private productivity and results in a decline in growth rate. When government employment increases, the outside

opportunity of the worker increases, without the wage increase; the no shirking condition implies that effort in the private sector will decrease and shirking will be more. Thus, the increase in the size of the government employment affects the productivity in the private sector negatively and the output loss brings the growth rate down. Hansson and Henrekson (1993) tested the effect of various government expenditure on productivity growth in the private sector and concluded that the private productivity growth is affected negatively from government transfers, consumption and total outlays, which are affected positively by educational expenses and government investment has no effect on it.

Besides, especially for developing countries, governments create employment with the aim of decreasing unemployment and initiating economic activity as a reaction to adverse conditions in the private labour market and insufficient increase in employment.¹ However, in time, other than economic considerations, government employment creation becomes a populist tool to distribute income and to attract friendly votes and results in wage pressure, decrease in overall employment and increases labour taxes. Demekas and Kontolemis (2000) studied the empirical evidence on the interaction of government employment with other labour market indicators for Greece. They concluded that an increase in public wage or employment increases private wage and does not have a significant effect on unemployment.

The government related mechanisms consist of tax, budget and output issues. Government employment creation is generally financed by tax and thus, has redistributing effect. The literature about the effects of taxation on employment agrees that the over-all result is negative on the economy (See Prescott, 2003 and Cardia et. al., 2003). Choulet (2006) points out that the labour taxes to finance government employment are the stimulator of the destruction in private employment and implicitly, private consumption. When government jobs are financed by lump sum or proportional taxes, creation of one public job destroys one private job; otherwise, it is 1.5 with distortive taxation. While the increase in government employment stimulates the economy, as it is an expenditure both in the sense of consumption and government spending, it is limited by the tax rise and the balancing of the government budget. The question of how high a tax rate should be to create jobs and to induce economic growth is essential.

Furthermore, government basically employs to provide infrastructure, public goods and services for the private sector which uses these inputs to start new job creating and economically developing investment projects to help to build capital accumulation of the economy (productive government expenditure, Barro, 1991). However, if the governments employ unproductively and unqualifiedly, the infrastructure will be poor and the whole economy's potential for growth will be lower. The rise in government employment also reduces the capital/labour ratio of the economy as a result of wage pressures created on the private labour market. Thus, the increase in wages leads

¹See Rodrik (2000) and Nelson (1994) for more information about driving force of government employment.

firms to use less labour and their capital intensity goes up. This lowers the marginal productivity of capital, causing firms and households to decrease investment and savings, respectively. Overall, frankly, short sighted governments have missed the very basic point of this excess employment; that is, this process changes the labour market conditions totally, and results in structural fluctuations. At the end governments are backfired by their own populist tool, ending up with a severely vicious cycle of unemployment.

In this chapter, government employment is considered as an input for private production in a classical setting but at the same time, in line with the literature I focus on the involvement of government in the labour markets (Chapter Two discusses the government involvement and its expected results on the labour markets) a negative effect of excess government employment which is low productivity is analysed. The effects of government spending where the private sector buys as an input for production and the effect of total government spending or government investment on growth get the most attention in the literature. The results of government spending specifically on government employment or compensation to employees on growth and on other labour market variables² have been studied by Finn (1998), Ardagna (2001), Cavallo (2005), Pappa (2005), Ganelli (2005), Van der Ploeg (2006), Linnemann (2009) and Gomes (2009). Most of these studies disaggregated the government consumption from the government employment compensation and tried to understand the transmission mechanisms of fiscal policy through the labour market.

Finn (1998) makes a distinction between the government spending by goods purchases and employee compensation and investigates the results of this different spending on the business cycle using a real business cycle model for the United States economy. She concluded that an increase in government employment affects private employment and output negatively. Ardagna (2001) resulted that an increase in government employment compared to government spending on private goods affected the ten European Countries economy more badly. Additionally, he pointed out that the output can be increased if public employment affected the productivity of private capital positively. On the contrary, in this chapter, the increase in government employment has a depressing effect on the productivity of the economy. Cavallo (2005) distinguished between the goods and the employment expenditure, wages and salaries, of government consumption to examine the fiscal shocks on the macroeconomy in a neoclassical growth model. Cavallo (2005), similar to Finn (1998), concluded that a fiscal shock to government employment decreases the hours, output, and investment in the private sector. Besides, he found that a shock to government employment which is also a transfer for households, reduces the negative wealth effect on consumption and labour supply.

Pappa (2005) built a New-Keynesian and a standard real business cycle model

²Rotemberg and Woodford (1992), Ramey and Shapiro (1998), Edelberg et al.(1999) Burnside et al. (2004) and Cavallo (2005) focused on the results of the increase in government spending for national defense, military employment and military expenses to economic growth in USA.

using a data set for United States to discuss the results of shocks to government consumption of private goods, government investment, and government employment. Different from the other studies she concluded that the response of output to these shocks is positive in both and public employment increased the productivity in the United States. Linnemann (2009) estimated a trivariate VAR with government and private employment and GDP and reached the same conclusion as Pappa (2005) which is the increase of private employment when there is a government employment shock. However, Ganelli (2005) showed that a reduction in public employment which reduces the tax burden leads to an increase in domestic consumption compared to foreign consumption in an open economy environment. Van der Ploeg (2006) claimed that the downsizing of public employment or the decreasing the labour income tax rate led to a lower wage, a higher interest rate and a higher capital stock using a Ramsey growth model with private and public employment. While Gomes (2009) studied the macroeconomic effects of public sector employment and public sector wages by using a dynamic stochastic general equilibrium model. In his model, wage and employment shocks can be distinguished. He underlined the fact that if the wage premium in the public sector is high, than the private wages raises leading more unemployed people who are looking for a public job and thus lowers the private employment and resulted a welfare loss of the representative consumer. Besides, he concluded that public sector employment is counter-cyclical while public sector wages are acyclical.

In the next section, an exogenous growth model³ is constructed, which contains distortionary taxes and productive government expenditure provided by government employment to explain how changes in government employment affect the long run capital accumulation and growth. Then, in the third section, the model is restructured in a way that the productivity of the economy declined with the government employment as one of the downsizing effects of excess government employment on the private production. In the fourth section, a new variable is introduced: government capital, in order to create an endogenous growth model and the model is again reorganized the same way as in section three. At the end of every model in the sections, simulations are run for different levels of government employment to find out the consequences on the steady state levels of output and capital accumulation for exogenous models and on the steady state growth rates of stock variables for endogenous models. The last section concludes the chapter.

3.2 Model

The model structured in this paper is inspired by Barro (1990), which is a seminal work not only because of introducing the government policy into the endogenous growth theory, but also strengthening the results of the theoretical model with the

³For examples of exogenous models see Harrod (1939), Domar (1946), Solow (1956), Swan (1956) and Barro and Sala-i Martin (1999).

empirical results. At first, I try to construct an exogenous growth model where there is a representative firm, a household and a government in a perfectly competitive market structure. Government employment is productive and financed by levying a tax on the private firm's output. A more detailed description of the model is as follows:

Private firm

The firm maximizes profit by optimally choosing private labour and total capital.

$$\max_{\{K_t, L_{pt}\}} \pi_t = (1 - \tau_t)Y_t - w_t L_{pt} - r_t K_t \quad (3.2.1)$$

$$\text{subject to } Y_t = F(K_t, L_{pt}, G_t) \quad (3.2.2)$$

where t is the time subscript, π_t is profit, Y_t is output, $F(\cdot)$ is the production function, w_t is the wage rate of labour, L_{pt} is the labour employed by the private sector, r_t is the rental rate of capital, τ_t is the tax rate and G_t represents government expenditure. The production function $F(\cdot)$ exhibits the standard neoclassical production function properties. In a competitive labour market structure, taxes imposed on workers or firms do not really matter. A high tax on a private firm is partially shifted to workers and vice versa.

Households

Each representative, infinitely lived household wants to maximize overall utility in a closed economy. The objective of the consumer is then,

$$\max_{\{K_t\}} \sum_{t=1}^{\infty} \beta^{t-1} U(C_t) \quad (3.2.3)$$

$$\text{subject to } C_t = Y_t + \delta K_t - K_{t+1} \quad (3.2.4)$$

where $\beta > 0$ is the discount factor, δ is the depreciation rate and $U(\cdot)$ is the utility function exhibits $U'(\cdot) > 0$ and $U''(\cdot) < 0$, while C_t is the consumption. Equation (3.2.4) is the basic identity for the economy.

Government

In Barro's (1990) model, G is the quantity of public services provided to each firm; it is non-rival and its role of input to private production makes it productive. As the main aim of this paper is to understand how government employment decisions are affecting the growth rate, I define G as a function of L_{gt} ,

$$G = G(L_{gt}) \quad (3.2.5)$$

where the government's sole aim is to maximize public sector employment funded by the tax rate levied on private sector production. For simplicity, I assume the public sector wage rate is the same as the private sector wage rate. Thus, the government's economic activities include taxing and creating employment which constitutes the

total income and the expenditures, respectively. Obviously, the government has a budget constraint which equates its total income to its expenditures.

$$\tau_t Y_t = w_t L_{gt} \quad (3.2.6)$$

The increasing trend of government employment affects the economy through many possible channels. The abundance of government employment is generally associated with rising wages and declining employment in the private sector and, as the outside option of the workers is now better, firms should pay more for them to work hard and not to shirk and thus, the employment growth in the sectors outside of government is affected negatively and so is the growth rate. Besides, more government employment comes with rent-seeking and rent-creating motives which results in ineffective distribution of resources within the economy leading to less productive activities. As the government size increases with the public employment, more taxes are levied to finance which has left less room for the private sector to function efficiently as taxes have distortionary effects. In the light of above discussion, the model I am trying to build is looking for a relationship between the increasing trend of tax financed productive government employment and growth.

Equilibrium

The equilibrium is reached when firms and households optimize, government satisfies the budget constraint and the labour market clears, implying Equations (3.2.7), (3.2.8), (3.2.9), (3.2.10) and (3.2.4) should be satisfied.

$$w_t = (1 - \tau_t) F_{L_{pt}}(K_t, L_{pt}, G(L_{gt})) \quad (3.2.7)$$

$$r_t = (1 - \tau_t) F_{K_t}(K_t, L_{pt}, G(L_{gt})) - \delta \quad (3.2.8)$$

$$L = L_{pt} + L_{gt} \quad (3.2.9)$$

$$U'(C_t) = \beta(1 + r_{t+1})U'(C_{t+1}) \quad (3.2.10)$$

Equations (3.2.7) and (3.2.8) are the necessary conditions for the firm to maximize, which require factor prices should be equal to their respective marginal products. Equation (3.2.9) shows that the labour market clears, and government and private employment is equal to the total employment. Equation (3.2.10) is the Euler Equation ensuring that total utility cannot be increased by switching consumption between periods. Equation (3.2.4) is the economy's resource constraint underlying the fact that income is composed of capital accumulation and consumption.

Model specifics and solution

I assume G_t , the production function, and the utility function are as follows, where A is the productivity coefficient, α and ρ are parameters:

$$G_t = L_{gt}^\rho \quad 0 < \rho < 1 \quad (3.2.11)$$

This covers the inefficiency of public employment

$$F(K_t, L_{pt}, G(L_{gt})) = AL_{pt}^{1-\alpha} K_t^\alpha L_{gt}^{\rho(1-\alpha)} \quad 0 < \alpha < 1, A > 0 \quad (3.2.12)$$

is a Cobb-Douglas type production function and I also assume log utility.

$$U(C_t) = \ln(C_t) \quad (3.2.13)$$

The analysis can be set entirely in terms of capital: To make it simpler, I assume $L_{gt} = L_g$ for all t . Thus, the government fixes the sequence $\{L_{gt}\}$ and $\{G_t\}$.

In line with the profit maximization Equations (3.2.1) and (3.2.2), the wage rate and the rent of capital are determined as:

$$\max_{\{K_t, L_{pt}\}} \pi_t = (1 - \tau_t) AL_{pt}^{1-\alpha} K_t^\alpha L_g^{\rho(1-\alpha)} - w_t L_{pt} - r_t K_t \quad (3.2.14)$$

$$w_t = (1 - \tau_t) (1 - \alpha) A [L - L_g]^{-\alpha} K_t^\alpha L_g^{\rho(1-\alpha)} \quad (3.2.15)$$

$$r_t = (1 - \tau_t) \alpha A [L - L_g]^{1-\alpha} K_t^{\alpha-1} L_g^{\rho(1-\alpha)} \quad (3.2.16)$$

The calculation of the tax rate τ_t follows from Equation (3.2.6) and Equation (3.2.15). Hence,

$$\tau_t A [L - L_g]^{1-\alpha} K_t^\alpha L_g^{\rho(1-\alpha)} = (1 - \tau_t) (1 - \alpha) A [L - L_g]^{-\alpha} K_t^\alpha L_g^{\rho(1-\alpha)} L_g \quad (3.2.17)$$

or

$$\tau_t [L - L_g] = (1 - \tau_t) (1 - \alpha) L_g \quad (3.2.18)$$

This can be solved to give:

$$\tau_t = \frac{(1 - \alpha) L_g}{L - \alpha L_g} \quad (3.2.19)$$

which is constant if L_{gt} is constant.

The objective of the consumer is then:

$$\max_{\{K_t\}} \sum_{t=1}^{\infty} \beta^{t-1} \ln(Y_t + \delta K_t - K_{t+1}) \quad (3.2.20)$$

taking K_1 , L_{gt} , and G_t as given. Note that the tax rate does not figure in this but is implied by the cost of purchasing the labour L_{gt} .

The necessary condition for K_t is:

$$\beta^{t-2} \frac{1}{Y_{t-1} + \delta K_{t-1} - K_t} (-1) + \beta^{t-1} \frac{1}{Y_t + \delta K_t - K_{t+1}} \left(\frac{\partial Y_t}{\partial K_t} + \delta \right) = 0 \quad (3.2.21)$$

This re-arranges to;

$$\beta (Y_{t-1} + \delta K_{t-1} - K_t) \left(\frac{\partial Y_t}{\partial K_t} + \delta \right) - (Y_t + \delta K_t - K_{t+1}) = 0 \quad (3.2.22)$$

where

$$Y_{t-1} = A [L - L_g]^{1-\alpha} K_{t-1}^\alpha L_g^{\rho(1-\alpha)} \quad (3.2.23)$$

$$Y_t = A [L - L_g]^{1-\alpha} K_t^\alpha L_g^{\rho(1-\alpha)} \quad (3.2.24)$$

and

$$\frac{\partial Y_t}{\partial K_t} = \alpha A [L - L_g]^{1-\alpha} K_t^{\alpha-1} L_g^{\rho(1-\alpha)} \quad (3.2.25)$$

Given a choice for L_g the path of K_t can be simulated from the initial condition and the terminal condition. Once K_t is found, w_t , r_t , Y_t and C_t can be calculated from the Equations (3.2.15), (3.2.16), (3.2.24) and (3.2.4), respectively. S_t , on the other hand, is driven by the equation below.

$$S_t = Y_t - C_t = K_{t+1} - \delta K_t \quad (3.2.26)$$

Simulations and results

The exogenous growth model outlined so far has a government whose sole aim is to increase government employment financed by tax levied on private sector production. Although the government employment is productive as it is an input for the private production, it has also negative effects as more resources are taken away from the private sector and used in less efficient ways, basically through tax. In order to observe the optimum government employment (implicitly, tax rate) and its effect on growth, a loop is run to reach steady state values of the variables in question.

For different exogenously given values of L_{gt} , (as when L_{gt} is exogenously determined, L_{pt} , τ_t and G_t are verified), how K_t , w_t , r_t , Y_t , S_t and C_t react and how steady state values of these variables change are examined. In order to do this, the following parameter values are assumed: $L = 1$; $A = 8$; $\rho = 0.5$; $\alpha = 0.5$; $\delta = 0.99$; $\beta = 0.8$; $K_0 = 1$; $K_2 = 1.1$. They are also chosen to ensure that the simulations can be run without any problems. Seven different L_{gt} values are: 0.125; 0.225; 0.334; 0.45; 0.56; 0.69; 0.8 and the respective G_t and τ_t values are determined by the Equations (3.2.11) and (3.2.19). Steady state levels of variables are expected since exogenous models have steady state growth rates equal to zero. All the graphs for the different values of L_{gt} are not reported; however, graphs for $L_{gt} = 0.125$ are given to display

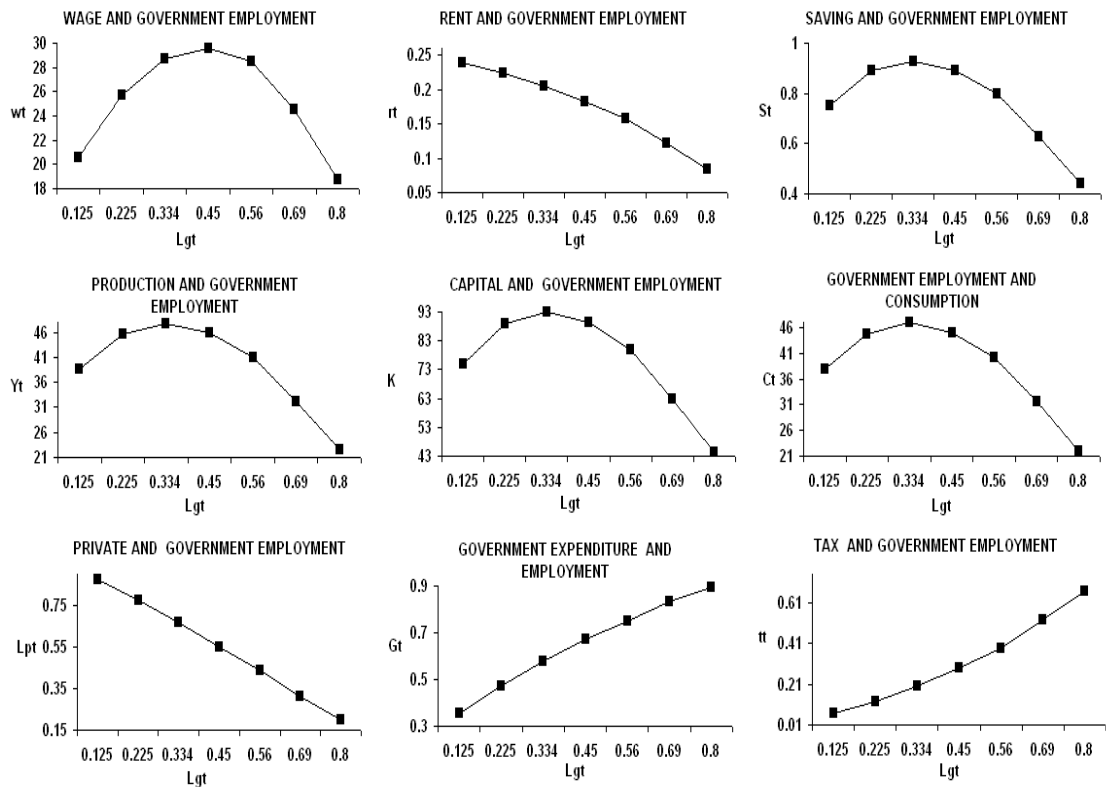


Figure 3.2.1: Steady states values when government employment changes in the main exogenous model

how variables converge to their steady state values (See Appendix B1). In almost all different kind of loops, the variables follow the same convergence path. Besides, the steady state values of all variables are reported in various tables in the Appendix B.

The steady state values are graphed against L_{gt} values to examine how the steady state values change when the government creates new employment by levying a tax rate on a private firm (See Figure 3.2.1). Does increasing the government employment actually help the economy to perform better or the distortion created by the tax rate decrease the private sector's output and the capital accumulation and result in an ill-functioning economy with a lower growth rate? It can easily be seen from Figure 3.2.1 that up to a certain point the government's employment creation stimulates the economy as the private firm's output is positively affected by increasing the input L_{gt} and the tax rate distortion does not offset the effects of output increase. However, as the employment, hence, the tax rate increases, the private firm's output and labour market outcomes lead the growth rate and the capital accumulation to decrease.

There are several forces at work here. When the tax rate increases, its effect is not only in a distortionary way but also it creates productive expenditure as more government employment builds and the G_t can be financed by the taxation, and the tax has a positive effect on the production function; however, at higher tax rates government takes a higher fraction of what is produced. Hence, at low tax rates, it is expected that the net effect will be positive, while the opposite holds for the higher tax rates. The growth maximizing tax rate for my simulation is around 0.2.

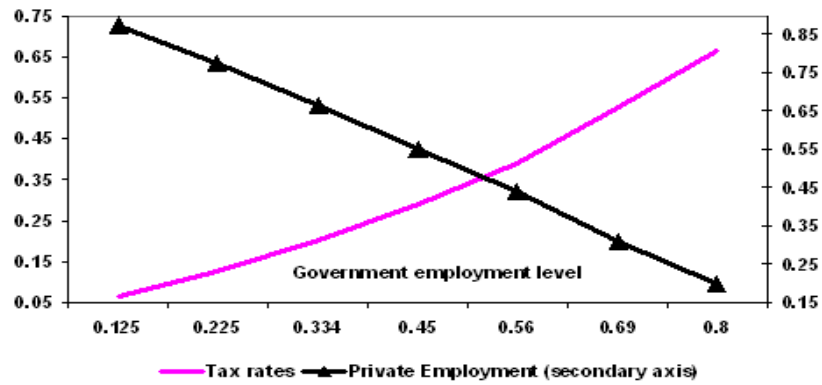


Figure 3.2.2: Private Employment and Tax rate when government employment changes in the main exogenous model

Thus, the excess government employment also creates inefficiencies compared to the previous state of the economy where the level of public employment was lower.

3.3 Model with government employment affecting the productivity of the private sector

In the above model, government employment financed by a tax levied on the private firm affects the economy through the production function of the private firm, specifically through government expenditure, G , and obviously through tax, τ , via marginal costs. While L_g is a productive input for the private sector which determines G , it has also negative direct effects on the private firm's employment and after a certain level on productivity. The government simply takes away resources from the private sector, finances it by a tax and uses them in a less efficient way.

As government employment becomes more of a populist tool for the politicians to attract votes and support, it will become more independent of economical considerations over time. Given that the motivation of hiring workers is just to obtain political support, it is likely that public employment and hence the tax rate can easily be driven over the output maximizing level. Therefore, it is also likely that amount of taxes and public employment in developing countries is higher than the optimal level.

In the previous chapter I presented a framework where more government employment will increase the chance of finding a job in the public sector and create a better outside option. The improved outside option leads to less motivation for the employees to work hard, lowers their productivity for a given wage rate or puts pressure for higher wages and results in lower employment in the private sector. Increased capital-labour ratio comes with lower marginal productivity of capital and reduces private sector investment and output. As most of the government jobs offer more fringe benefits and social security, the abundance of it definitely forces the firms to pay more than the market clearing wage as, otherwise, motivating or retaining of the worker

becomes harder and shirking and lower productivity are the common consequences. However, in this chapter, up to this point, that kind of an interaction between public and private employment has not been considered. The growth model constructed here has a classical setting and the total employment is fixed. I also assumed there is only one wage rate in the economy. On the other hand, one of the main ideas of the efficiency wage framework is the link between the productivity of the worker and his outside opportunity. Next, I try to cover the effect of efficiency wages by constructing a simple productivity link between private and public sectors.

The Shapiro-Stiglitz efficiency wages framework is one of the key elements tried to be inserted as an argument here to the growth model. In their seminal paper, they pointed out a relationship between the outside opportunities of the worker and their productivity in line with a no shirking condition. They claimed that at the same wage if workers probability of finding a job is increased then the workers incentive to shirk will rise. Thus, to force the workers to be as productive as before, the firm has to pay more or their productivity will fall. As I assume the public wage to be equal to the private wage; the productivity of a representative private worker is expected to be lower when public employment is increased. This reduced form of efficiency wages is set as an inverse relationship between the government labour and the productivity of private labour input. An increase in the public labour affects output positively via productive government spending, but it is also affects the private labour market by lowering private labour and also through the no shirking condition by decreasing private labour productivity. This may even deepen the inefficiency created by the overemployment in the public sector.

In this context, as a first step, I consider putting a parameter in the production function, which will decrease the effect of the private labour input, L_{pt} , and hence its productivity by assigning a value less than one. The production function with the the new parameter, λ , becomes:

$$F(K_t, L_{pt}, G) = A(\lambda L_{pt})^{1-\alpha} K_t^\alpha G^{1-\alpha} \quad (3.3.1)$$

The wage rate and rent of capital in Equation (3.2.15) and (3.2.16) change into:

$$w_t = (1 - \tau_t) (1 - \alpha) A \lambda^{1-\alpha} [L - L_g]^{-\alpha} K_t^\alpha L_g^{\rho(1-\alpha)} \quad (3.3.2)$$

$$r_t = (1 - \tau_t) \alpha A \lambda^{1-\alpha} [L - L_g]^{1-\alpha} K_t^{\alpha-1} L_g^{\rho(1-\alpha)} \quad (3.3.3)$$

Equations (3.2.23), (3.2.24) and (3.2.25) change accordingly and determine the K_t , while the tax equation (3.2.19) stays the same:

$$Y_{t-1} = A [\lambda(L - L_g)]^{1-\alpha} K_{t-1}^\alpha L_g^{\rho(1-\alpha)} \quad (3.3.4)$$

$$Y_t = A [\lambda(L - L_g)]^{1-\alpha} K_t^\alpha L_g^{\rho(1-\alpha)} \quad (3.3.5)$$

$$\frac{\partial Y_t}{\partial K_t} = \alpha A [\lambda(L - L_g)]^{1-\alpha} K_t^{\alpha-1} L_g^{\rho(1-\alpha)} \quad (3.3.6)$$

After implementing necessary modifications, I run the simulations again with the new parameter, $\lambda = 0.6$, which is less than one to ensure that output will be affected negatively. It is seen from the Figure 3.3.1 and the Appendix B2 that all variables' steady state values are affected badly. As expected, with the decreasing productivity of the private labour input, level of output falls notably.

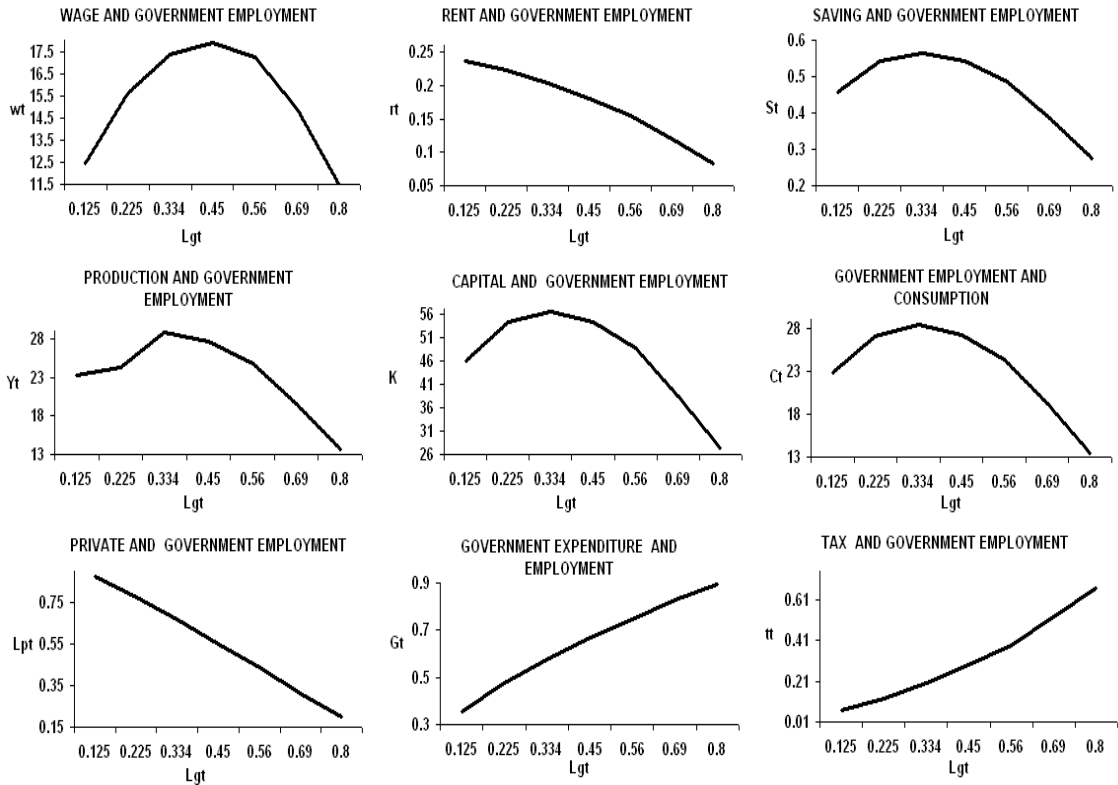


Figure 3.3.1: Steady states values of the exogenous model in which government employment affecting the productivity of the private sector $\lambda = 0.6$

In line with the Shapiro-Stiglitz efficiency wages framework, a relationship between the outside opportunities of the worker and their productivity is tried to be inserted with the Equation (3.3.7). Under the no shirking condition, at the same wage if workers probability of finding a job is increased, which is the increase in probability of finding a job in the public sector, and then the workers incentive to shirk will rise. Thus, the firm faces two options: pay more or otherwise, productivity will fall. This reduced form of efficiency wages affects the private labour market through the no shirking condition by decreasing private labour productivity. To induced this relationship, I endogenize the parameter λ in a such way that the higher L_{gt} , affects the productivity in the private sector harmfully. I choose a function whose first order derivative is negative, while the second order derivative is positive so that as L_{gt} increases, λ diminishes at a decreasing rate (Equation (3.3.7)). Thus, the model described above changes as follows:

Production function alters to:

$$\lambda(L_g) = \frac{1}{1 + L_g^{\frac{1}{4}}} \quad (3.3.7)$$

$$F(K_t, L_{pt}, G) = A\left(\frac{1}{1 + L_g^{\frac{1}{4}}}\right)L_{pt}^{1-\alpha}K_t^\alpha G^{1-\alpha} \quad (3.3.8)$$

The maximization conditions for the private firm in Equation (3.2.15) and (3.2.16) becomes:

$$w_t = (1 - \tau_t)(1 - \alpha)A\left(\frac{1}{1 + L_g^{\frac{1}{4}}}\right)^{1-\alpha}[L - L_g]^{-\alpha}K_t^\alpha L_g^{\rho(1-\alpha)} \quad (3.3.9)$$

$$r_t = (1 - \tau_t)\alpha A\left(\frac{1}{1 + L_g^{\frac{1}{4}}}\right)^{1-\alpha}[L - L_g]^{1-\alpha}K_t^{\alpha-1}L_g^{\rho(1-\alpha)} \quad (3.3.10)$$

Tax equation (3.2.19) stays the same, while the necessary conditions for K_t in Equations (3.2.23), (3.2.24) and (3.2.25) turn out to be:

$$Y_{t-1} = A\left[\frac{1}{1 + L_g^{\frac{1}{4}}}(L - L_g)\right]^{1-\alpha}K_{t-1}^\alpha L_g^{\rho(1-\alpha)} \quad (3.3.11)$$

$$Y_t = A\left[\frac{1}{1 + L_g^{\frac{1}{4}}}(L - L_g)\right]^{1-\alpha}K_t^\alpha L_g^{\rho(1-\alpha)} \quad (3.3.12)$$

$$\frac{\partial Y_t}{\partial K_t} = \alpha A\left[\frac{1}{1 + L_g^{\frac{1}{4}}}(L - L_g)\right]^{1-\alpha}K_t^{\alpha-1}L_g^{\rho(1-\alpha)} \quad (3.3.13)$$

Having set the new model, I run the simulations with the new equations but using the old parameter values. Figure 3.3.3 summarizes the results of the model in which government employment is also affecting the productivity of the private sector (See Appendix B4). As similar to the main model, the capital accumulation and other variables keep on increasing up to a certain tax rate, and begin to decline afterwards. It is also found that in the model where public employment affects private productivity, although the parameters values are chosen to be the same, levels of production is lower, beneficial effects in the first phase are more limited and the decline afterwards is faster compared to the baseline model. As with many other studies, this study also emphasizes the fact that the government's interference to the economy or the size of the government is acceptable as long as the government's aim is to stimulate; however, when the size is too big or the interference becomes a tool for reckless economical politics to attract more votes, the results become unpleasant.

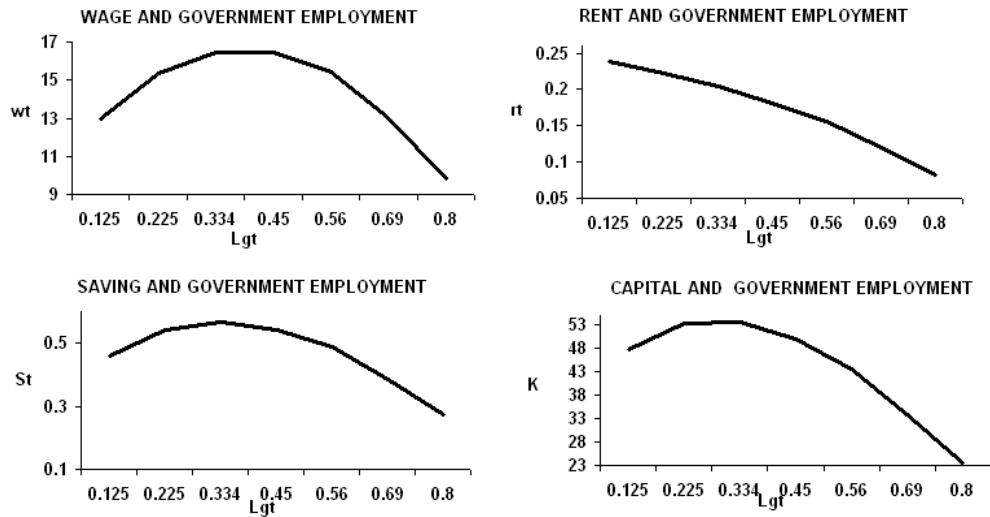


Figure 3.3.2: Steady states values of wage, rent, saving and capital in the exogenous model in which government employment affecting the productivity of the private sector ($\lambda(L_g) = \frac{1}{1+L_g^{\frac{1}{4}}}$)

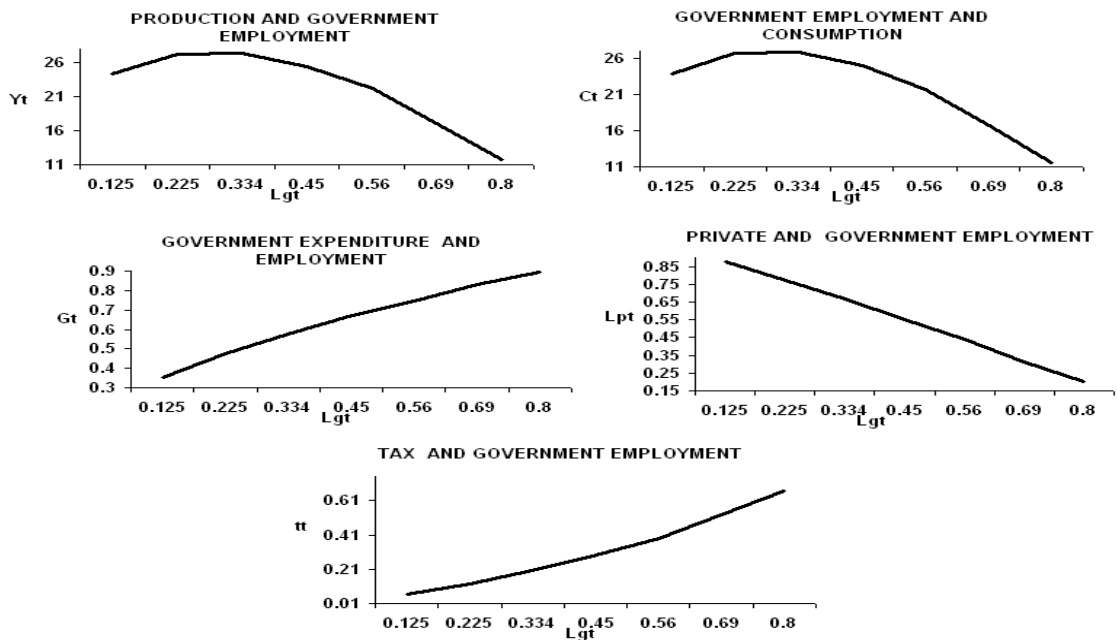


Figure 3.3.3: Steady states values of production, consumption, government expenditure and private employment in the exogenous model in which government employment affecting the productivity of the private sector ($\lambda(L_g) = \frac{1}{1+L_g^{\frac{1}{4}}}$)

3.4 Endogenous Model

So far, I try to outline an exogenous growth model to understand the effects of excess government employment on growth and capital accumulation. However, exogenous growth models have limited explanations about the effects of government's market intervention on growth because in this literature, economic growth comes as a result of factors that are exogenously determined to the model, such as technological progress or population growth.

In most of the neoclassical exogenous growth models, there is a fixed savings rate which determines the capital accumulation and a production function that exhibits constant returns to scale in both inputs: labour and capital. However, in this set up, one factor, namely capital, diminishes when the other, labour, is fixed. Therefore, output can only be increased up to a certain level by capital accumulation. Beyond that level, further growth can only be achieved by changing one of the exogenous factors. This diminishing returns characteristic of the exogenous models makes it hard to analyze the effects of the government's actions on the growth rate. Any policy can affect growth, if and only if it can affect one of the exogenous factors such as technological progress, labour productivity, savings rate or labour supply. Therefore, the model's own dynamics have no effect on the growth rate, which cause the lack of ability to examine the outcomes of the government's actions on the growth rate. As a result, a new generation of models have emerged, which are endogenous growth models, to overcome one of the main shortcomings of the exogenous growth models and leave much more room for policy analysis.

The endogenous growth models⁴ can be categorised into three groups excluding the simple AK model (Von Neumann, 1937), which has only one input, leading the average and marginal productivity of the capital to be constant, not diminishing. The first group of models presented externalities and spillover and scale effects as a result of the capital and knowledge accumulation (Arrow⁵, 1962; Romer⁶, 1986). Productivity and level of knowledge of the whole economy bring constant returns to scale. The next group of models includes human capital (Barro, Mankiw and Sala-i-Martin, 1992; Lucas, 1988; Uzawa, 1965) as a new input in the production function and they are outlined in a way, in which capital can either be in the form of physical or human capital. Education and training increase the productivity and with a constant returns to scale production function, never ending output rise can be reached. Finally in the third group, there are endogenous growth models including research and development (R & D), in which technological progress creates new varieties of products, both qualitatively and quantitatively, preventing capital to diminish while there is profit maximization. These models use a variety of sources for the creation of new products

⁴Endogenous growth literature is vast. See Fine (2000) and Aghion and Howitt (1998) for more information.

⁵Learning by doing process adds to knowledge of firms.

⁶Accumulation of knowledge as a result of the scale effect of the people working in the research and development area.

such as ideas (Romer, 1987), vertical innovation⁷ (Aghion and Howitt, 1992; Grossman and Helpman, 1991), horizontal innovation (Romer, 1990; Jones, 1995), heterogeneous and lumpy innovation (Aghion and Howitt, 1998). There are also models that contain both elements of vertical and horizontal innovation (Jones and Williams, 1999). For all the endogenous models discussed so far, the fixed saving problem of the neoclassical growth models is overcome by the help of Ramsey's (1928) analysis of consumer optimization which is first introduced to the growth literature by Cass (1965) and Koopmans (1965).

The introduction of endogenous growth models also triggered a vast new literature about the effects of fiscal policies on the long run growth rate (Barro, 1990; Barro and Sala-i-Martin, 1992; Jones et al., 1993; Easterly and Rebelo, 1993; Stokey and Rebelo, 1995; and Mendoza et al., 1997, Turnovsky, 1996). This topic is one of the most debated and inconclusive subjects in the economics literature. Broadly, taxation and expenditure structures of government budgets are focused on: specifically, distortionary and non-distortionary taxation⁸ and productive and non-productive expenditures are distinguished⁹ (Barro, 1990 and 1991). Barro (1990) assumes that all government spending is productive, while Barro (1991) distinguishes the productive and non-productive government expenditures by defining expenditures which have no direct effect on private sector productivity as non-productive. He concludes that growth is lower when non-productive expenditures increase. Later, Barro and Sala-i-Martin (1992) introduce tax policy while underlying the fact that under different characteristics of public goods (rival or non-rival, non-excludable or excludable and subject to congestion or not), distortionary or non-distortionary tax policy may be superior. In the case of public goods that are subject to congestion (rival but commonly non-excludable) income tax is better, while for public goods that are non-rival and non-excludable lump sum tax is preferable. They also find that distortionary taxes have a negative impact on the growth rate, while productive expenditures increase it. On the other hand, non-distortionary taxes and non-productive expenditures have no effect on growth. In addition to all, Turnovsky (2000) endogenizes the labour supply within the endogenous growth model and thus, enabling to study the effects of fiscal policy, including the labour taxes, on growth and welfare.

3.4.1 Outline of the main endogenous growth model

After summarizing the endogenous growth literature and why these models are important as a means of understanding the results of fiscal policy on long term growth, I rebuild the model by introducing a new variable, K_{gt} , which is the public capital to endogenize the growth model. The total capital, K_t , is now divided into private capital, K_{pt} and K_{gt} in the endogenous model to ensure the constant returns to scale

⁷See also Schumpeter (1934) for the creative destruction concept.

⁸See Myles (2000) for a full discussion of taxation and growth literature.

⁹There is also different point of views about the classifications of distortionary and non-distortionary taxes and productive and non-productive expenditures.

and not diminishing marginal product of capital with fixed labour. The changes in the structure of the main model are as follows:

Private firm

As a matter of fact, the private firm's optimization problem in order to reach optimum private labour and capital is almost the same except that the private firm maximizes not with respect to K_t but K_{pt} ; that is maximizing Equation (3.4.1) subject to Equation (3.4.2) in which everything exhibits the same characteristics of the previous exogenous model except the fact that the production function $F(\cdot)$ displays constant returns to scale in K_{pt} and K_{gt} for fixed L . $F(\cdot)$ differs from the standard neoclassical production function as there is K_{gt} , public capital complementary with the private inputs in the sense that an increase in K_{gt} raises the marginal product of K_{pt} and L_{pt} (Barro, 1990).

$$\max_{\{K_{pt}, L_{pt}\}} \pi_t = (1 - \tau_t)Y_t - w_t L_{pt} - r_t K_{pt} \quad (3.4.1)$$

$$\text{subject to } Y_t = F(K_{pt}, L_{pt}, G_t) \quad (3.4.2)$$

Households

Households utility problem is now maximized with respect to K_{pt} and K_{gt} leaving other things the same.

$$\max_{\{K_{pt}, K_{gt}\}} \sum_{t=1}^{\infty} \beta^{t-1} U(C_t) \quad \text{subject to Equation (3.2.4)} \quad (3.4.3)$$

Government

Barro (1990) introduced government spending into the AK model to investigate the long run growth rate effects of policy changes in an endogenous growth model. Different to the exogenous model, government now also has capital stock other than the public labour. Thus, public capital stock is not only an input for the production of G , but also an expense in the government budget. Thus, government provides public infrastructure to private producers using two kinds of inputs: government labour, L_{gt} and government capital, K_{gt} as defined in Equation (3.4.4).

$$G = G(L_{gt}, K_{gt}) \quad (3.4.4)$$

In this model, government expenditures are consist of spending on public labour and capital, each of these marginal costs are wage rate and rent, respectively. The financing of these expenditures is through the tax rate levied on the private sector output. Thus, the government's balance budget is given in the Equation (3.4.5).

$$\tau_t Y_t = w_t L_{gt} + r_t K_{gt} \quad (3.4.5)$$

Equilibrium

Equations (3.4.6) and (3.4.7) are the results of profit maximization conditions

of the private firm, which include K_{gt} to determine the marginal products. Equation (3.4.8) shows that total capital is now composed of public and private capital. Together with Equation (3.2.4), which is the basic identity of the economy, Equation (3.2.10), which is the Euler equation and Equation (3.2.9) which confirms that the labour market is the total of private and public labour, the equilibrium has been reached.

$$w_t = (1 - \tau_t) F_{L_{pt}}(K_{pt}, L_{pt}, G(L_{gt}, K_{gt})) \quad (3.4.6)$$

$$r_t = (1 - \tau_t) F_{K_{pt}}(K_{pt}, L_{pt}, G(L_{gt}, K_{gt})) - \delta \quad (3.4.7)$$

$$K_t = K_{pt} + K_{gt} \quad (3.4.8)$$

Model specifics and solution

Utility has the same form as Equation (3.2.13). After introducing K_{gt} into the model as a determinant for the government purchases, G_t is assumed as Equation (3.4.9) and the production function of the private firm changes accordingly to Equation (3.4.10). In the previous exogenous model, when $L_{gt} = L_g$ is assumed, it fixes the G_t , thus there is diminishing returns in the accumulation of capital, K_t , as the total labour force is assumed to be equal to L in Equation (3.2.12). However, in Equation (3.4.10), G_t is not fixed anymore although L is constant, K_{gt} changes, thus G_t rises along with K_{pt} , meaning there is no diminishing returns of capital and growth is endogenous. As Barro (1990) points out G_t raises the marginal products of L_{pt} and K_{pt} . The exponent of K_{gt} , which is $(1 - \alpha)$, leads constant returns to scale of the production function under fixed L and plays a very important role in Equation (3.4.10) not implying diminishing returns and endogenous growth of the economy.

$$G_t = K_{gt} L_{gt}^\rho \quad 0 < \rho < 1 \quad (3.4.9)$$

$$F(K_{pt}, L_{pt}, G(L_{gt}, K_{gt})) = A(L_{pt} L_{gt}^\rho)^{1-\alpha} K_{pt}^\alpha K_{gt}^{1-\alpha} \quad 0 < \alpha < 1, A > 0 \quad (3.4.10)$$

As before, I assume $L_{gt} = L_g$ and for all t . Along with the new assumptions, the profit maximization condition for the private firm and the marginal products of L_{pt} and K_{pt} are determined as follows:

$$\max_{\{K_{pt}, L_{pt}\}} \pi_t = (1 - \tau_t) A L_{pt}^{1-\alpha} K_{pt}^\alpha K_{gt}^{1-\alpha} L_g^{\rho(1-\alpha)} - w_t L_{pt} - r_t K_{pt} \quad (3.4.11)$$

$$w_t = (1 - \tau_t) (1 - \alpha) A [L - L_g]^{-\alpha} K_{pt}^\alpha K_{gt}^{1-\alpha} L_g^{\rho(1-\alpha)} \quad (3.4.12)$$

$$r_t = (1 - \tau_t) \alpha A [L - L_g]^{1-\alpha} K_{pt}^{\alpha-1} K_{gt}^{1-\alpha} L_g^{\rho(1-\alpha)} \quad (3.4.13)$$

Inserting Equations (3.4.10), (3.4.12) and (3.4.13) into Equation (3.4.5) is lead to find the optimal tax rate:

$$\tau_t = \frac{L_g K_{pt} (1 - \alpha) + \alpha K_{gt} [L - L_g]}{K_{pt} [L - \alpha L_g] + \alpha K_{gt} [L - L_g]} \quad (3.4.14)$$

which is a function of K_{pt} and K_{gt} .

The consumer's optimization problem changes to:

$$\Phi = \max_{\{K_{pt}, K_{gt}\}} \sum_{t=1}^{\infty} \beta^{t-1} \ln (Y_t + \delta(K_{gt} + K_{pt}) - K_{gt+1} - K_{pt+1}) \quad (3.4.15)$$

The first order necessary conditions are:

$$\begin{aligned} \frac{\partial \Phi}{\partial K_{pt}} &= \beta (Y_{t-1} + \delta(K_{pt-1} + K_{gt-1}) - K_{gt} - K_{pt}) \left(\frac{\partial Y_t}{\partial K_{pt}} + \delta \right) \\ &\quad - (Y_t + \delta(K_{gt} + K_{pt}) - K_{gt+1} - K_{pt+1}) = 0 \end{aligned} \quad (3.4.16)$$

$$\begin{aligned} \frac{\partial \Phi}{\partial K_{gt}} &= \beta (Y_{t-1} + \delta(K_{pt-1} + K_{gt-1}) - K_{gt} - K_{pt}) \left(\frac{\partial Y_t}{\partial K_{gt}} + \delta \right) \\ &\quad - (Y_t + \delta(K_{gt} + K_{pt}) - K_{gt+1} - K_{pt+1}) = 0 \end{aligned} \quad (3.4.17)$$

where

$$Y_{t-1} = A [L - L_g]^{1-\alpha} K_{pt-1}^{\alpha} K_{gt-1}^{1-\alpha} L_g^{\rho(1-\alpha)} \quad (3.4.18)$$

$$Y_t = A [L - L_g]^{1-\alpha} K_{pt}^{\alpha} K_{gt}^{1-\alpha} L_g^{\rho(1-\alpha)} \quad (3.4.19)$$

$$\frac{\partial Y_t}{\partial K_{pt}} = \alpha A [L - L_g]^{1-\alpha} K_{pt}^{\alpha-1} K_{gt}^{1-\alpha} L_g^{\rho(1-\alpha)} \quad (3.4.20)$$

$$\frac{\partial Y_t}{\partial K_{gt}} = (1 - \alpha) A [L - L_g]^{1-\alpha} K_{pt}^{\alpha} K_{gt}^{-\alpha} L_g^{\rho(1-\alpha)} \quad (3.4.21)$$

The paths for K_{gt} and K_{pt} can be generated by assigning initial and terminal values and solving simultaneously the first order conditions; Equations (3.4.16) and (3.4.17). After solving K_{gt} and K_{pt} , w_t , r_t , Y_t , S_t , G_t , τ_t and C_t can be calculated from the Equations (3.4.12), (3.4.13), (3.4.19), (3.2.26), (3.4.9), (3.4.14) and (3.2.4), respectively.

Simulations and results

As for now, the dynamism of the model is driven endogenously by its own vari-

ables, the effects of the change in the government employment on growth and capital accumulation are observed in growth rates of stock variables. Apart from, another difference from the exogenous model, the growth rates for government expenditures and tax rates are no longer constant because G_t is a function of both K_{gt} , L and L_g , while τ_t is determined by K_{gt} , K_{pt} , L and L_g .

In addition to the parameters values assumed in the previous section, for the simulation of the endogenous growth model, $K0$ and $K2$ values are omitted and instead the following values are utilized to determine the path of the K_{gt} and K_{pt} : $KP0 = 1$; $KP2 = 1.1$; $KG0 = 1$; $KG2 = 1.1$; $A = 2$. The seven different values used for the L_{gt} to investigate the effects on other variables are the same as the exogenous model. Steady state growth rates are expected to be positive. Graphs and numeric results for the levels and the steady state growth rates of the endogenous growth model for $L_{gt} = 0.125$ are reported (See Appendix B4, B5 and B6). As expected, the results of the loops show that the levels of the variables do not converge but growth rates of stock variables stabilize.

Before explaining what Figure 3.4.1 is trying to summarize, it is worthwhile to point out the fact that in the endogenous growth models, all the per capita variables grow at the same rate and that is why only one growth rate is reported in the below figure, while there are more than one stock variables. It can also be seen in the Appendix B4 that the growth rates for Y_t , w_t , S_t , C_t , K_t , K_{pt} , K_{gt} , G_t are all the same. This conclusion is also a result of the absence of diminishing returns. In Figure 3.4.1, the answer to the question of how to finance excess government employment is obvious, that is: tax rate should be increased. It can also be observed that the tax rate increase up to a certain point is stimulating the growth rate. However, as the tax rate is being raised more to finance the increasing L_{gt} , the channels negatively affecting the economy dominate. The effect of distortionary tax, the lower marginal productivity of the government expenses, the shirking private sector and the inefficiencies brought by the larger public sector lead steady state growth rates to decline. In the model, the corresponding tax rate that maximizes the growth rate is simulated as 0.33.

3.4.2 Endogenous model with government employment affecting the productivity of the private sector

This section basically reapplies the general idea that the excess government employment also has an impact on private sector labour productivity through private labour market wage and employment decisions, with an endogenous growth model. As same as the previous section, the general form is assumed as Equation (3.3.7). The following changes are made to the endogenous growth model to endogenize the productivity effect of the excess government employment:

Inserting Equation (3.3.7) changes the production function:

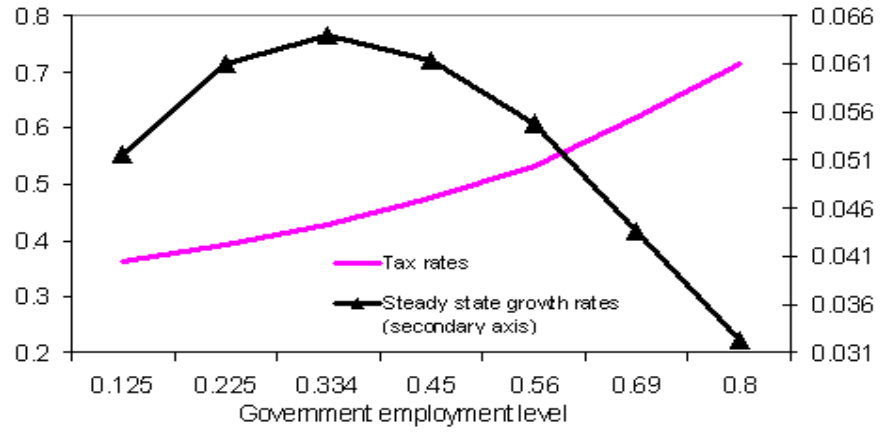


Figure 3.4.1: The endogenous model steady states growth and tax rates with different levels of government employment

$$F(K_{pt}, L_{pt}, G(L_g, K_{gt})) = A \left(\frac{1}{1 + L_g^{\frac{1}{4}}} L_{pt} \right)^{1-\alpha} K_{pt}^{\alpha} K_{gt}^{1-\alpha} L_g^{\rho(1-\alpha)} \quad (3.4.22)$$

The maximization conditions for the private firm in Equation (3.4.12) and (3.4.13) become:

$$w_t = (1 - \tau_t) (1 - \alpha) A \left(\frac{1}{1 + L_g^{\frac{1}{4}}} \right)^{1-\alpha} [L - L_g]^{-\alpha} K_{pt}^{\alpha} K_{gt}^{1-\alpha} L_g^{\rho(1-\alpha)} \quad (3.4.23)$$

$$r_t = (1 - \tau_t) \alpha A \left(\frac{1}{1 + L_g^{\frac{1}{4}}} \right)^{1-\alpha} [L - L_g]^{1-\alpha} K_{pt}^{\alpha-1} K_{gt}^{1-\alpha} L_g^{\rho(1-\alpha)} \quad (3.4.24)$$

Tax equation (3.4.14) stays the same, while the necessary conditions for K_{pt} and K_{gt} in Equations (3.4.18), (3.4.19), (3.4.20) and (3.4.21) turn out to be:

$$Y_{t-1} = A \left[\frac{1}{1 + L_g^{\frac{1}{4}}} (L - L_g) \right]^{1-\alpha} K_{pt-1}^{\alpha} K_{gt-1}^{1-\alpha} L_g^{\rho(1-\alpha)} \quad (3.4.25)$$

$$Y_t = A \left[\frac{1}{1 + L_g^{\frac{1}{4}}} (L - L_g) \right]^{1-\alpha} K_{pt}^{\alpha} K_{gt}^{1-\alpha} L_g^{\rho(1-\alpha)} \quad (3.4.26)$$

$$\frac{\partial Y_t}{\partial K_{pt}} = \alpha A \left[\frac{1}{1 + L_g^{\frac{1}{4}}} (L - L_g) \right]^{1-\alpha} K_{pt}^{\alpha-1} K_{gt}^{1-\alpha} L_g^{\rho(1-\alpha)} \quad (3.4.27)$$

$$\frac{\partial Y_t}{\partial K_{gt}} = (1 - \alpha) A \left[\frac{1}{1 + L_g^{\frac{1}{4}}} (L - L_g) \right]^{1-\alpha} K_{pt}^{\alpha} K_{gt}^{-\alpha} L_g^{\rho(1-\alpha)} \quad (3.4.28)$$

After going over the necessary changes in the equations to examine the productivity effects of the excess government employment, simulations are re-run using values assigned for the main endogenous model. Figure 3.4.2 illustrates that compared to the

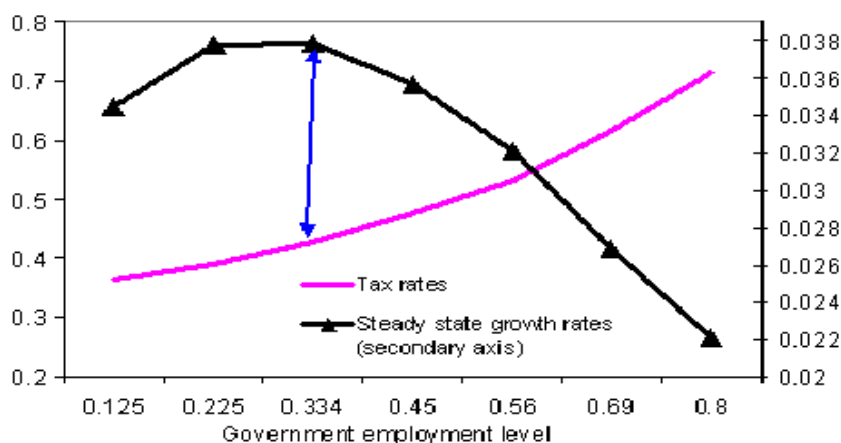


Figure 3.4.2: Endogenous model in which government employment affecting the productivity of the private sector

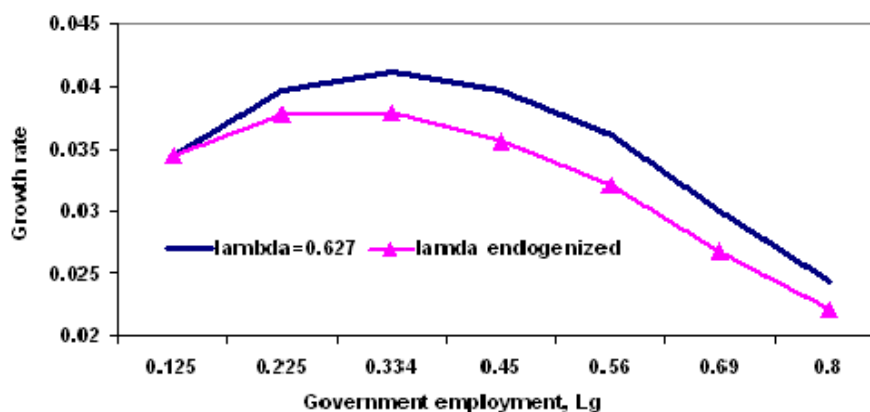


Figure 3.4.3: Comparison of growth rates when lambda is constant and endogenized

main endogenous model, tax rates are higher while steady state growth rates are lower for the same level of government employment. The abundant government employment forces the private sector either to pay higher wages or to have lower productivity of labour as outside options for the workers are now plenty. While higher wage leads more unemployment, productivity decline causes output to reduce. Other than these, the model concludes that the highest steady state growth rate is corresponding to the tax rate of 0.43 (See Appendix B4).

In order to see the effects of the changing private labour productivity with the effect of increasing public employment, I run another simulation by holding the productivity parameter λ constant for the rest of the analysis. The level of λ is held constant at the level associated with the first level of public employment considered during the simulations which is 0.125. Therefore, the growth rates shown on Figure 3.4.3 are the same for the first level of public employment but they follow a different path there after. It can be observed from the figure that the beneficial effects of the rising public employment at the beginning is much more limited when the productivity of private

employment is affected negatively. It is also seen that for the following few data points where more than half of the total employment is still private, the fall in growth rates is steeper when the productivity parameter decreases with the public employment. This effect loses its importance for the final part of the simulations both because the magnitude of private employment becomes smaller and the curvature of the relation assumed between public employment and private labour productivity.

3.5 Conclusion

Most of the developing countries mainly focus on the macroeconomic instability and its effect on growth together with the decisions concerning the reductions in the public and private investment. It is proven by many studies that the macroeconomic instability affected the growth rate and the capital accumulation negatively. While private investment decrease as a result of the uncertainty and not favorable expectations related to main economic indicators like inflation and exchange rates shocks, the public investment is usually seen as an expenditure reduction tool for the unstable economy to balance their budget instead of cutting other populist expenditures. Besides, there is also a positive relationship between the public infrastructure and the increase in the private investment. It is believed that the public investment is a crucial input for the private investment. It is this main idea of Barro's famous paper where public spending is an input in private production. Thus, macroeconomic instability and the precautions taken by the governments are extremely important in capital accumulation both in private and public sector and obviously in the growth rate. The macroeconomic instability and the economic growth never go hand in hand together.

Most of the studies focus on the public spending in the role of the economic growth. Some conclude that the private investment crowds out as a result increase in public investment; some claim that the public infrastructure is an important stimulator for the economic growth, while some other focus on the effects of government spending on the interest rates on both the short run and the long run effects. However, what is also more important in terms of developing countries is that while trying to maintain the economic stability, what kind of policy tools are being used and other ignored and what is the overall effects of these specific policy tools? Moreover, developing countries' governments have lots of things in their agendas, thus, while choosing to fix something by the means of stabilization, what kind of choice variables are chosen and why others are not chosen? Why do most governments choose to reduce public investment to reduce the budget deficit and not to choose other expenditures especially the ones that they believe will bring more votes in the next elections? Is choosing these kinds of expenditures really helping the economic stabilization or while fixing one thing it really destroys the other economical relationships which will definitely create more structural problems in the long run?

As mentioned before, most developing countries have lots of things on their table to focus on. One of them is obviously stable economic growth. Stable economic growth is not only necessary for capital accumulation, but also for employment, welfare, productivity increase and income equality. The interactions of all these economic variables are extremely complex especially in the context of developing country markets. As an example of a developing country, one of the main aims of Turkey is to grow stability hoping that this stabilization in the growth rate will bring one of the most important problems of Turkish economy down: which is the high rate of unemployment into which Turkey since its establishment tried to introduce many stabilization programmes, most of them supported by IMF for macroeconomic stability and the welfare increase. While doing that in different episodes the government has played different roles in different states. Before the 1980s, the Turkish economy was totally inwardly orientated and after that it is outwardly orientated. The government played an important part in 1970s with the import substitution policies and Turkey was a state dominant country where lots of public investment and the public employment took place. However, the import substitution policy did not answer the expectations of stable economic growth and resulted in a severe economic crisis. However, the solution to this economic crisis was found in the exactly opposite economic policies which promoted exports, trade and financial liberalization. The state's role in this new economic term has crucially changed. The private investment is seen as a substitute for public investment and public investment had decreased substantially both causing fewer infrastructures and the capital accumulation.

However, there is one stable status of the state which has never changed since Turkey's establishment. It is that the state is always the main employer in the labour markets. The state sees its role in this manner as really important because by doing that it prevents social tension by creating earnings for low income families, trying to draw the picture of fair state in the minds of poor people by distributing the revenues to the ones that need them and, to be elected again. This role is obviously related to political reasons and as a result of populist intentions with a myopic solution.

As mentioned before while implementing a policy, the other consequences should be elaborated carefully to see the long run outcome. While trying to create short run solutions for many problems, it may lead the main problem to be affected more negatively than before. While the government employs workers and when they are an input for the production process to provide public infrastructure in order for the private sector to produce and invest so that capital accumulation paces up and the new employment opportunities to lower unemployment are created, it misses one important phenomenon. The productivity of these workers is one of the main determinants of the production and also an input for the economic growth. If the productivity of these workers is not good enough, it may lower the production capacity and become another factor that affects the macroeconomic instability.

Many of the studies focused on the government's influence on private investment,

growth and capital accumulation. Another link that has been created by government involvement may be the overemployment in the public sector leading lower productivity. These workers' productivity similar to the quality of other inputs is also a determinant of the capital accumulation and growth rate. While on the one hand the government is distributing income to these workers, on the other hand all members of the society are suffering from its side effects, low and unstable growth rate. This low and unstable growth rate not only lowers the creation of new jobs but it also increases inequality and decreases the overall welfare of the economy. While certain beneficiaries of this populist policy believe that government has actually taken action to offset the effects of low employment in the economy, it is the opposite that has been going on. The income of the next generation and their own children suffers from the low growth rate and as a consequence low employment opportunities.

Economic growth and the productivity relationship is analysed by many different aspects. There is this misperception that the productivity growth brings more unemployment to the economy while growth rate increases. However, it is this productivity growth that brings the welfare to the countries and in the end creates the income. Developing Asian countries are a very good example of the productivity growth which resulted in employment increase at the end. Besides, the developed countries are also another proof for the state to employ productive workers. Like many other developing countries, some of the developed countries also have a very high percentage of public employment. However, the difference between these countries is in terms of the optimum allocation and the productivity in the public sector.

For many countries, the government is still one of the biggest employment providers and its share in the labour market is growing. However, its employment decision mechanism is different than the private sector, definitely not including the profit maximization behavior but political considerations: rent-seeking and rent-creating. Besides, there is strong evidence of counter cyclical government employment. Thus, government labour market decisions have profound impact on the private labour market and growth. This paper tries to establish a link between the government employment and the growth rate underlying several mechanisms: distortionary taxes, productive government expenditure produced as a result of government labour input and productivity link sourced by the interaction of government and private labour market. On the positive side, public sector employment stimulates production as a means of productive government expenditure. However, on the other hand when the negative distortionary effect of the tax and the detrimental productivity effect of excess government labour on private production are considered, the long-run growth and the capital accumulation can only be increased up to a certain level of tax rate and government employment. Any public employment and a higher tax rate beyond that point leads to a decline in economic growth and capital accumulation.

Chapter 4

Son Preference in Turkey

4.1 Introduction

Son preference can be defined as the desire of parents to have at least one or more sons and is widely observed, mostly in less developed countries. There are numerous studies in the literature providing empirical evidence and emphasizing the reasons and the outcomes of such behavior particularly for Southern and Eastern Asian countries, such as Taiwan, Korea, Indonesia, Malaysia and China.¹

The general motivation in investigating son preference is that, it may have significant social, economic and demographic implications. A widely recognized result of son preference is its effect on fertility. If parents have preferences for sons, they tend to continue having children until the desired number of sons is achieved. Clark (2000) pointed out that girls in India belong to larger families on average than do boys.

Son preference can also result in neglect of daughters.² If parents allocate most of their resources to sons (See Clark 2000, Sen and Sengupta 1983, Rose 1999); a female child is disadvantaged from birth in terms of lower quality and quantity of parental care (less food or poorer health care) and lower investment (schooling, etc.).

Moreover, under strong son preference, the spacing of births after a son is expected to be longer when parents can affect birth timing (Rahman and Da Vanzo, 1993). Besides, couples with more sons are more likely to use contraception because they do not want any more children (Aly and Shields 1991, Rahman, Akbar, Phillips and Becker 1992).

Studies employ various ways to measure son preference. One possibility is to ask parents directly if they prefer sons. The problem with this approach is that, although some parents do have preference for boys, this may not necessarily cause them to have more children. In other words, their preference might not be strong enough to

¹See Chang (1994); Larsen, Chung and Das Gupta (1998); Kevane and Levine (2001); Pong (1994) and Poston (2002).

²Note that allocation difference between sons and daughters in a family can also exist when there is no son preference. For example, the time of the daughter may be substituted for that of the mother in household work through reductions in school attendance when wage levels increase for an adult woman. It is also shown that with different market returns by sex, nutrition allocation will favor the one with the higher return (Sen and Sengupta 1983, Rosenzweig and Schultz 1982).

motivate them to bear children until the desired number of boys is reached, and hence, has no effect on fertility. Thus, the data collected this way will not be very useful.

Various indirect statistical measures for son preference are summarized by Haughton and Haughton (1998) and McClelland (1979). A common statistical approach is to estimate parity progression ratio (PPR), which is defined as the transitional probability of a household with n children to progress to having $(n+1)$ children. This method was employed by De Tray (1984) and Ben-Porath and Welch (1976). Many studies (Mannan 1998, Haughton and Haughton 1998, Aly and Shields 1991) employ a logistic model for calculating PPR. In this model, the dependent variable is set equal to one if the household progresses to having another child(ren) and zero otherwise. The use of contraceptive can also be an option for the dependent variable (Rahman and Da Vanzo, 1993).

Another approach to build empirical evidence for son preference is the hazards model analysis. The dependent variable in this case is the time elapsed since the previous birth, and it is regressed on dummy variables for the number of existing sons and a variety of social and geographic control variables. The conjecture is that parents with son preference will have a larger hazard of conceiving another child if they do not have enough sons yet. Rahman and Da Vanzo (1993), Haughton and Haughton (1998) and Pong (1994) used this hazards method to model son preference behavior.

The reasons for the existence of son preference in Turkey stem from socioeconomic conditions, as well as religious norms and cultural traditions. Although Turkey was one of the first countries in the world to give women the right to vote in 1931, an unequal status between men and women within a family persists, especially in rural areas. Women have almost no bargaining power within the family (Ergocmen, 1997).

Generally, traditional Turkish families have a male head of household. He is the main income earner of the household and controls the family assets. When the father is no longer an income provider, a son replaces him and is expected to look after his parents. One of the main reasons for many societies having strong son preference is that parents consider having sons as insurance for an old age (Altun and Ersoy, 1998; Kagitcibasi, 1982). Therefore, the expected return on a son as an investment is much higher than the one on a daughter. The allocation of resources is unequal for boys' and girls' education in Turkey, especially in rural areas, because of the gap between male and female earnings (Baslevant and Tunali, 2002, Tansel, 2002).

Furthermore, because the wife takes the husband's surname after marriage, a son is also seen as a guarantee of the continuation of the family name which is also valued in a traditional Turkish society. If there is no son among the children, the husband can marry another woman, in accordance with the Islamic norms, because not bearing a son is believed to be the wife's fault.³ The wife who bears a son enjoys a higher prestige in the family compared to the other wives.

³Turkey's population is predominantly Muslim, and according to Islam, a man can be married to up to four women at the same time, as long as these marriages are endorsed by a religious ceremony. Officially, polygamy in Turkey is illegal.

Studies of son preference in Turkey concluded that women were willing to stop or delay childbearing after a son's first birth. Ulusoy (1986) investigates the effect of sex preferences on fertility in Turkey using the 1983 Turkish Fertility Survey data. He concluded that sex preference does not have a significant effect on fertility in urban areas; however, rural families still express a desire to have a living son for women who had experienced at least one live birth. Later, Unalan (1993) estimated that in the absence of son preference in Turkey, 3.5 % more women would desire no more children and the usage of contraceptives would increase by 1.8 % employing the data set 1988 Turkish Population and Health Survey. He basically tried to find out the effect of different questions concerning the fertility behaviour on the sex ratio and compared it with the year 1978.

Behar et. al. (1999) tried to explain the puzzlingly high infant mortality rate in Turkey. They also reported that Turkey's infant mortality, compared to the neighbouring countries (Bulgaria, Greece, Cyprus, Syria, Iraq, Iran, Armenia and Georgia) is higher including the periods 1960–1964 and 1990–1994. Besides, they pointed out the fact that one of the underlying reasons for the excess female mortality is the son preference. In the light of this statement, they claimed female disadvantage has increased and given the following numbers:

“...In Turkey, on the other hand, female mortality has always been abnormally high. Paradoxically, when general mortality was high, as it was 30 years ago in 1966–1968, female mortality was in line with Northern European standards. More recently, female disadvantage has increased: an excess female mortality of 15% in the first year of life and of 22 % in the 1–4 year age group. In all, some 10000 young girls died every year from 1983–1993 above the already high male norm. Excess female mortality appears in early life and rises in the post neonatal period, when female probability is 8% above male probability (normally 21 % less according to the standard).”

Kagitcibasi and Ataca (2005) studied the value of children in Turkey in order to compare the results of the previous study which is Kagitcibasi (1982). They asked the responders about why they would like to have a child and then categorized the answers in the following way: pleasure watching children grow, fun to have young children around, to have someone to love and care for, to carry on the family name, bring spouses closer together, children can help when you're old, to have a girl/another girl, more reason to succeed in work, companion for child/children, to have a boy/another boy, child helps around the house and to help your family economically. They concluded that son preference has been replaced by daughter preference as result of changing family dynamics and family roles in Turkey using the data set gathered in 1975 and in 2003. Comparisons with the 1975 mothers, for 2003 mothers "having a son" were less important. In this study a separate questions had been asked about the sex preference for the child. While in 1975, boy preference was around 84 percent

and 16 percent girl preference, in 2003, 41.1 percent preferred a boy and 58.9 percent preferred a girl. They concluded that the old age security value of the child decreased substantially while psychological value of the child increased dramatically. Besides, they pointed out the fact that "the much lower financial expectations from children and weaker economic/utilitarian values of children in 2003, compared with the 1975 findings, it is no wonder that sons are needed less".

On the other hand, Berik and Bilginsoy (2000) used the sex ratio as a signal of girls' relative survival indicator in Turkey. They pointed out the fact that in the 0-9 age group is the most sensitive cohort to gender discriminatory practices in intrahousehold allocation of resources in Turkey and there is a shortfall of girls where son preference is one of the contributing factors for both the neglect and the lower survival rate of girls. They tried to estimate the effects of labour force participation rates of women on the sex ratio in Turkey using the data set for province-level census data for 1985 and 1990. They found a negative relationship between women's labour force participation and the sex ratio, and resulted that not all types of female labour force participation appear to have the same effect on the sex ratio where women work as an unpaid family worker or not is crucial.

The overall sex ratio in Turkey does not reflect a significant deficit of women in the population, especially in comparison with the alarming figures from India and China. However, high infant mortality rate among girls and female disadvantages in nutrition, education etc. speak out and there are number of studies tried to compare female disadvantages with other similar countries. Behar et. al. (1999) compared female disadvantage index for Turkey and the Arab Middle East for infant, girls between the age of 1-4 and age under 5. They concluded that except for Jordan, the Arab Middle East comes out better than Turkey, estimated overall at 6 % against 15 % in Turkey (Arab Middle East includes Syria, Lubnan, Jordan, Palestine (West Bank and Gaza), Saudi Arabia and Gulf Emirates).

Bulatao (1979) compared the Value of Children surveys carried out in various countries. He claimed that Turkey was an exception among compared countries (Philippines, Indonesia, Thailand and Korea) in the sense that although the desired family size and fertility declined, there were still high short or long-term material and economic advantages expected by parents of their children between the 1975-1976 period.

Population Reports M.12 (1994) calculated a very crude index of preference for sons comes from the Demographic and Health Survey responses: "the ratio of the number of parents who say that they prefer their next child to be male to the number who prefer their next child to be female. Among countries surveyed, those with strong preference for sons (indices of 1.6 or above) are Bangladesh, Jordan, Nepal, Pakistan, South Korea, and Syria. Moderate preference for sons (indices of 1.2 to 1.5) has been documented in many other countries, including the Dominican Republic, Egypt, Mexico, Senegal, Sudan, Turkey, Nigeria, Tunisia, and Yemen. Some countries, such as Colombia, Ghana, and Indonesia, show no preference, and two (Jamaica and

Venezuela) show a slight preference for daughters.”

Turkey mainly differs from other countries where son preference is observed in that radical measures, such as sex-selective abortion, are not commonly used in Turkey in order to have a son. In Turkey, the Ministry of Health has restricted clinical application of sex selection methods when there is no medical indication (Kalaca and Akin, 1995). Sex-selective abortions may be considered as a drawback for statistical techniques that are used to measure son preference. For example, the sex ratio that is commonly used to measure son preference is distorted by sex-selective abortion.⁴ Many other techniques, including the ones employed in this study, use the sex composition of existing children as explanatory variables in testing for son preference. However, if female children are being aborted, sex composition will also be distorted. In other words, if households have already chosen the sex of a child, they will be satisfied, so it will be hard to observe behavior related to parity progression or duration. Absence of sex-selective abortions in Turkey, therefore, strengthens the statistical results found in this study.

In relation to other studies which have studied son preference in Turkey, what I have done in this chapter differs as follows: In terms of survey data, similar to this chapter, both Ulusoy (1986) and Unalan (1993) used the Turkish Population and Health Survey. However, the data used by Ulusoy (1986) and Unalan (1993) were belonged to the years 1978, 1983 and 1988, while, in this chapter, the same survey data for the years 1993 and 1998 were employed. In the data section of this chapter, it is outlined that the sampling method changed every survey and thus the number of observations differed in each of the survey. Besides, until 1998, the reproductive women were considered to be between the ages of 12-49, however after 1998 it changed to 15-49. Although the same survey was employed with the Ulusoy (1986) and Unalan (1993), the questions chosen within the survey to analyse the “son preference” in this chapter were totally different. For the analysis of this chapter, the questions that can be observed in reality were selected (observed fertility data), the hypothetical questions like “whether they preferred to have a son or daughter if they give birth” were not chosen. The reason is that as it has been explained before although they answered that they preferred sons, this may not necessarily cause them to have more children.

Although some of the studies mentioned before do not have a primary objective to conclude whether there is son preference or not, they had results about son preference. Kagitcibasi and Ataca (2005) and Kagitcibasi (1982) collected their own survey data for the years 1975 and 2003 where the surveys were called “Value of Children in Turkey”, while Behar et. al. (1999) pointed out the data collecting problems in Turkey and they combined the results of Turkish Population and Health Surveys, other surveys concerning fertility and child, individually done surveys for academic purposes, Population Censuses and data from different government institutions (Ministry of

⁴See Cho and Park (1995) for distortion of sex ratio at birth, between family and within-family levels, caused by sex selective abortion.

Health and State Planning Organization) over the period of 1961 to 1993. Other than that, Berik and Bilginsoy (2000) used the data set for province-level Turkish census data for 1985 and 1990.

In terms of techniques, this chapter differs from Berik and Bilginsoy (2000) and Unalan (1993) as they utilize sex ratio as a determinant of son preference. They look at how various factors affect sex ratio to arrive conclusions about son preference. In this study, on the other hand, the child bearing behaviour is modelled and the effects of sex composition of existing children on the child bearing behaviour are investigated.

In this study, the main aim is to understand how son preference alters the observed fertility behaviour. To do this we modelled this behaviour by using two different techniques and include many variables that can possibly affect child bearing decision. The effect of son preference on each parity (for different family sizes) can be measured. How the effect changes as a new child is born can be seen. Besides, this approach has another advantage. The control variables added help to see the real effect of son preference by discriminating other financial and cultural factors such as education and regional characteristics. Therefore it also provides insight about how these other factors affect the child bearing decision of Turkish households. Additionally, for the parity progression model only completed families are included to avoid any complications about if the household stopped having more children. All the analysis relies on the observed behaviour rather than future wishes or plans of the household.

In terms of results, all of the studies agreed that there is son preference in Turkey. Although Kagitcibasi and Ataca (2005) concluded that in 2003 some mother's preferred daughters than sons. This result also supported by this chapter as families who have only sons or daughters continue to progress which may be an indication of mixed sex preference.

There exists a wide literature on the effects of son preference on fertility or sex composition of the children. These issues are beyond the scope of the present study. The main goal of this paper is to display the existence of son preference behavior in Turkey. A novel feature of this study is that it also tries to analyze how son preference evolved over time by exploiting data sets collected in different years. In particular, I investigate whether the process of urbanization and modernization in Turkey had an effect on son preference behavior over time.

The organization of the rest of the paper is as follows. Section 2 describes the data sets used in this study, outlines the techniques and the variables used, and presents the results obtained within different models of son preference. Section 3 concludes.

4.2 Data, Methodology and Empirical Results

This section consists of three main parts. The first section (Section 4.2.1) is about the data used in this study. Next, in Section 4.2.2, I test for the presence of son preference in Turkey using the data from TDHS-1998 and TDHS-1993. First, I

estimate a parity progression model and conduct a simple “the last boy” test. Next, I estimate a hazards model. For each model, I provide the theoretical background and the variables used. Finally, I compare the results obtained using different techniques for the year 1998.

In the last section (Section 4.2.3), I repeat the analysis for the pooled sample with interaction dummies and compare the results for the two different years. Because the individuals in the two samples are not the same, I could not apply the panel data technique, i.e. estimate fixed or random effect models. Therefore, to evaluate how son preference behavior has evolved over time, I compare separate regressions from two samples and use a year dummy in the pooled regressions to capture the time varying effect.

4.2.1 Data

The data for this study are obtained from Turkish Demographic and Health Survey (TDHS) for the years 1998 and 1993. TDHS is a nationally representative sample survey designed to provide information on fertility levels and trends, infant and child mortality, family planning and maternal and child health in Turkey and the sample included women in the reproductive ages (15-49 for TDHS-98, 12-49 for TDHS-93) and the husbands of currently married eligible women. This survey is conducted by the Institute of Population Studies at the Hacettepe University (HIPS) in collaboration with the Turkish General Directorate of Mother and Child Health/Family Planning and the Ministry of Health. The survey is supported and sponsored by United Nations Population Fund and Macro International Inc. through the MEASURE/DHS+ project. At the end of every survey, usually conducted five year apart, a detailed report has been written by the HIPS. The reports can be found in the following websites: “<http://www.measuredhs.com>” and “<http://www.hips.hacettepe.edu.tr>”.

The objectives of the survey have been summarized by the reports of HIPS under five headings. The first one includes the data collection at the national level which allows the calculation of demographic rates such as fertility and childhood mortality rates. Next one is the gathering information about the causes of fertility and childhood mortality. Third one aims to assess the contraceptive knowledge under different geographical regions such as pointing out the difference between rural and urban areas. Next one, again includes collecting data on mother and child health, including immunizations, breastfeeding etc. Last one contains the nutritional status of children under five and of their mothers.

TDHS-98 included four types of questionnaires: the household and three individual questionnaires which were ever-married women of reproductive ages, never-married women and husbands’ questionnaires. TDHS-93 only included individual questionnaire for ever-married women of reproductive ages and the household questionnaire. DHS Model “A” Questionnaire constituted the baseline of the contents of the questionnaires in Turkey while some modifications might have done for particular

information specific to Turkey. Questionnaires were prepared in English first, and then translated to Turkish.

The main aim of the household questionnaire is to collect information regarding socioeconomic situation about all usual members of and visitors of the selected households. The questions about age, sex, educational attainment, marital status and the relationship to the head of household of each person were asked in the first part of the household questionnaire. The information gathered from the first part of the questionnaire later processed to find out whether women and husbands are eligible for individual questionnaires. Later, the second part of the household questionnaire includes questions about the welfare of the aged people; while the third part asks questions about dwelling unit, for example number of rooms, the flooring material, the source of water, the type of toilet facilities and on the household's ownership of a variety of consumer goods.

The individual questionnaires for women, both ever and never married, try to gather information about the following topics: background characteristics, reproduction, marriage, knowledge and use of family planning, maternal care and breastfeeding, other issues relating to contraception, immunization and health, fertility preferences, husband's background, women's work and status, sexually transmitted diseases and AIDS, maternal and child anthropometry (TDHS (1998), TDHS (1993)). In the ever married women's questionnaires, a monthly calendar exists so that fertility, contraception, marriage and migration data are stored for the periods including the January of the last conducted survey to the beginning month of the new survey. The never-married women's questionnaire only includes migration calendar. The individual questionnaires for husbands includes following information: background characteristics, reproduction, knowledge and use of family planning, marriage, fertility preferences, sexually transmitted diseases and AIDS and attitudes (TDHS (1998)).

The sample for the both surveys, TDHS-98 and TDHS-93, provides fertility and mortality rates for the nation as a whole, for urban and rural areas and for five major regions which are West, South, Central, North, and East. Although in both surveys the overlapping questionnaires used were almost the same and a weighted, multi-stage, stratified cluster sampling approach were used, sampling units of the two surveys were prepared using the results of different Population Censuses. For TDHS-98, a target sample size of 10,000 selected households was projected on the provisional results of the 1997 General Population Count. While for TDHS-93, sampling units were based on the results of the 1990 General Population Count. Three different sampling stages are summarized as follows in TDHS reports:

"The sampling units at the first stage were the settlements stratified by population size. The frame for the selection of the primary sampling units (PSU) was prepared using the provisional results of the related Population Count. The frame was divided into two groups, one including those settlements with population of more than 10,000 and the other including settlements with population

less than 10,000. The selection of the settlement in each group was carried out with probability proportional to size (related Population Count).

The second stage of selection involved the list of quarters (administrative divisions of varying size) for each urban settlement, provided by the State Institute of Statistics (SIS). Every selected quarter was subdivided according to the number of divisions (approximately 100 households) assigned to it. In rural areas, a selected village was taken as a single quarter, and wherever necessary, it was divided into subdivisions of approximately 100 households. In cases where the number of households in a selected village was less than 100 households, the nearest village was selected to complete the 100 households during the listing activity, which is described below.

After the selection of the secondary sampling units (SSUs), a household listing was obtained for each by the TDHS listing teams. From the household lists, a systematic random sample of households was chosen for the TDHS. All ever-married women age 12-49 for TDHS-93 and 15-49 for TDHS-98 who were present in the household on the night before the interview were eligible for the survey.

A more technical and detailed description of the TDHS sample design, selection and implementation is presented in Appendix of the TDHS reports ..."

TDHS-98 the number of household interviewed was 8,059, the number of women at the reproductive ages (15-49) interviewed was 8,576 and the number of husbands of the currently married women interviewed was 1,971. The corresponding numbers for the TDHS-93 was 8,619 for the household interviews and 6,519 ever married women.

In this study, I used the sample for the ever married women from TDHS-98 and TDHS-93. In the website of Measure DHS (Demographic and Health Surveys) the ever-married women's questionnaire is summarized as follows:

“Background characteristics: Questions on age, marital status, education, employment, and place of residence provide information on characteristics likely to influence demographic and health behaviour. Information is also collected about age, sex, relationship to the head of the household, education, and parental survivorship and residence. More specifically: head of household, total income earned by the members of this household, the place that has been lived until 12 years old and now, whether to understand a letter or newspaper: easily, with difficulty, or not at all (asked to both husband and wife), how old the husband is, highest level of school the husband attend, the husband's highest grade completed, highest level of school the woman attended, woman's highest grade completed.

Reproductive behaviour and intentions: Questions cover dates and survival status of all births, pregnancies that did not end in a live

birth, current pregnancy status, fertility preferences, and future child-bearing intentions of each woman. More specifically: number of living children, number of step children, whether any sons or daughters to whom you have given birth who are now living with you, whether you have ever given birth to a boy or a girl who was I born alive but later died, how many of the dead children were girl, how many of the dead children were boy, name given to your first/next baby, sex of the baby, in what month and year the baby was born, how old you were when the child born, whether the baby is still alive, how old was the dead baby when he/she died (note that the same questions are asked for every living and death children), number of miscarriages, number of abortions, number of still births, age at first marriage, whether married more than once, whether would like to have (a/another) child or prefer not to have any (more) children, if yes, how many more children, if you could go back to the time you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be, how many of these children you would like to be boys, how many would you like to be girls and for how many would it not matter?, suppose you get married in the future. If all of your children are girls, would you give more births than you normally desired for the chance of having a boy?, let's suppose just the opposite, if all of your children are boys, would you give more births you normally desired for the chance of having a girl?.

Contraception: Questions cover knowledge and use of specific contraceptive methods, source of contraceptive methods, exposure to family planning messages, informed choice, and unmet needs for family planning. For women not using contraception, questions are included on knowledge of a source of contraception and intentions about future use.

Antenatal, delivery, and postpartum care: The questionnaire collects information on antenatal and postpartum care, place of delivery, who attended the delivery, birth weight, and the nature of complications during pregnancy for recent births.

Breastfeeding and nutrition: Questions cover feeding practices, the length of breastfeeding, and children's consumption of liquids and solid food.

Children's health: Questions examine immunization coverage, vitamin A supplementation, recent occurrences of diarrhea, fever, and cough for young children and treatment of childhood diseases.

Status of women: The questionnaire asks about various aspects of women's empowerment, including decision making and autonomy, and about attitudes towards domestic violence.

AIDS and other sexually transmitted infections: Questions assess women’s knowledge of AIDS and other sexually transmitted infections, the sources of their knowledge about AIDS, knowledge about ways to avoid getting AIDS, and high-risk sexual behavior.

Husband’s background: Currently married women are asked about the age, education, and occupation of their husbands.

Other topics: Questions examine behaviour related to environmental health and the use of tobacco.”

4.2.2 Models and Empirical Results

Parity Progression Model

PPR is the proportion of women of a specific parity (number of children) who progress to the next level. It is assumed that if sex preferences influence fertility behavior, then at any parity a couple with an undesirable sex composition of previous children is more likely to have an additional child than is a couple that already has the desired sex composition. Although there are statistical and logical problems with this method, as it assumes sex preferences and desired family size are homogenous within the population (McClelland, 1979)⁵, these problems can be overcome by using the data from surveys which include more individual-specific information. It is important that PPR is based on completed families; otherwise the sample will be censored (i.e. including a family who may continue to have children after the data was collected results in miscalculations as their progression from one parity to another can not be observed). Thus, in this study the TDHS sample is restricted to the women over the age of 40.

I estimate a parity progression model for four types of families: with two, three, four and five children to test for son preference in Turkey. The model relates the changes in the parity progression ratio to the number of sons the household already has. If the estimated ratio is affected by the sex composition of the existing children, this is interpreted as evidence of the preference for child’s sex. The model is described by the following equation:

$$Y_i = \alpha + \sum \beta_j S_{ij} + \sum \delta_k C_{ik} + \sum \lambda_m R_{im}$$

The dependent variable takes value one if the mother progresses to the next birth and zero otherwise. Variables S_{ij} are the “son preference” dummy variables that take value one if individual i has j sons and zero otherwise. The coefficients on these variables capture the effect of the sex composition of the existing children upon the parity progression decision. C_{ik} are the control variables which are likely to affect the

⁵McClelland (1979) argued that parity progression ratio methods are not accurate as they ignore possible heterogeneity of sex preferences.

parity progression decision for a given sex composition of the existing children (mother characteristics, household characteristics etc.). R_{im} are the regional dummies.

Mother characteristics

It is a well-established result in the existing empirical literature that mothers with higher education levels are less likely to have many children. However, causal relationships through which education operates still deserve further exploration. Kravdal (2001) summarizes the mechanisms that women's education influence fertility preferences as: i) the high opportunity costs of childbearing involved when the better educated women work (Bernhardt 1993, Jones 1982, Chapman et. al. 1999), ii) the reduced need for children as an old age security when a woman is able to accumulate wealth, iii) preferences shifting away from children towards other sources of satisfaction as a result of more knowledge about the modern world, iv) the lower infant and child mortality among the educated women (Chen and Mosley 1984, Caldwell 1979), v) their higher age at marriage (Caldwell, 1981), vi) their increased knowledge about modern contraception and husband-wife communication about family planning (Becker and Lasee, 1997), vii) the erosion of traditional norms (Mason, 1997).

Young women who have opportunities to contribute economically in their parents' household (as one of the consequences of their higher education level) may enter a marriage later in life, have fewer children and weaker son preference because bearing a son, who would be expected to benefit the whole family as a source of income, is no longer that crucial. Kaffle (2005) pointed out that women's education and exposure to media are found to have negative effects on son preference in Nepal. Dreze and Murthi (2001) stated that in a country such as India where there is marked son preference, the education of women may reduce their dependence on sons for social recognition or support in old age.

I use two variables to capture the effect of how educated the mother is, a dummy variable, which takes the value one if the mother is literate and zero otherwise, and the mother's single year of education. The expected signs of effects of these variables are negative.

The length of the period a woman can bear children is limited and hence, variables that affect the length of this period influence the total number of children a woman is going to have. Therefore, women who get married late can be expected to have fewer children. To control for this effect, I include mother's age at first marriage in the regression. The expected sign of its effect is negative.

Mother's age at the time of child's birth is also important for the parity progression decision. The older the mother is when the second child is born, the lower is the probability that she will bear the third child. I use mother's age at the last child birth to capture this effect. As mothers who give birth to their child later, have less time left to bear children, they will be likely to bear fewer children and hence, the expected effect of this variable will be negative.

Household characteristics

TDHS surveys include questions about income, however, the questions are asked to get information on the source and estimate of the total household income. Participants choose from different ranges of income (whether total household income is greater than 100 million, 300 million, 500 million or lower than 50 million), thus the exact income earned by the household is not known. I do not include an income variable in the regression mainly for three reasons. Firstly, technically it is not easy to find a true income measure, because the purchasing power can be very different for the same level of income in different Turkish cities. Besides, income level is closely related to other independent variables: education, place of residence, age at first marriage etc. Lastly, I also do estimations including the income variable by treating the categories as dummy variables where the control group is the lowest income range. I expect a positive sign for the higher income groups as the higher the income, the more incentive there is to bear many children. All the coefficients of income dummies in the estimated equations are positive as expected, however, insignificant. Also, the estimations have severe a multicollinearity problem, probably because regional and education variables capture the effect of income dummies.

As one of the household characteristics, I intend to include a dummy variable which equals one if the head of the household is male. I run models including this variable however, I have encountered several obstacles (See Appendix C1). First of all, the variable ended up not significant in the models. Then, I listed the households who have female head of household and realized that most of these households are either widowed, divorced or not living together, only 42 of the respondents who are currently married and over 39 years old have female head of households. Thus, as a result of this analysis, I concluded that it is not assumed that the head is a male unless he is absent. If this is not the case, then the female-headed households are not likely to be special; certainly they are not less likely to be conceiving. I excluded the possibility of ruling out female headed households from the sample, on the grounds that their special circumstances do not allow one to make inferences about son preference.

The education level of the father can be another determinant. Khan and Sirageldin (1977) found for Pakistan that husband's education has a negative impact for both the husband's and the wife's probability of wanting additional children. If the father has a higher education, the household is likely to have fewer children.

Regional variables

Khan and Sirageldin (1977) found that the more urbanized the woman, the lower the probability of her wanting additional children; the opposite holds for the husband's responses. In Turkey, urban areas tend to have lower fertility rates. Different regions may also have different fertility rates due to cultural differences and birth control programs. I include both the urban dummy and regional dummy variables in the regression.

Results

First, I investigate the difference between progression ratios of families with no sons and those with at least one son. The results are presented in Table 4.2.1⁶ in which families with more than three children are not reported, firstly, because in order to make the table more readable for comparison purposes and secondly, because in the next section when logistic regression results have been estimated, the effect of son preference for families having more than three children are found statistically insignificant (see Appendix C2 for the results including more than three children).

Table 4.2.1: Parity Progression

	No sons	At least one son	No sons	At least one son
	Families with 2 children		Families with 3 children	
	1998			
Stop child bearing	48	227	29	260
Continue	268	720	103	639
PPR	84.8 %	76.0 %	78.0 %	71.1 %
	1993			
Stop child bearing	36	201	15	227
Continue	284	711	128	665
PPR	88.8 %	78.0 %	89.5 %	74.6 %

Source: TDHS-1998 and TDHS-1993

For families with two, three and five children, there is considerable difference between the progression ratios of the families who have at least one son and those who have no sons at all for both years. For the families with two children, where the difference is the highest, the progression ratio is 8.8 percentage points higher than for the ones who have no sons for the year 1998 and it is 10.8 for the year 1993. These results, in general, suggest a son preference behavior for both of the years. Families with no sons are more likely to progress to the next child compared to the ones who already have a son.

⁶See also Haughton and Haughton (1998)

Table 4.2.2: Parity Progression Logistic Regression

	Probability of progression with the next parity			
	Number of children			
	1998		1993	
	2	3	2	3
Number of boys				
One son	-0.8947*** (0.235)	-0.7676*** (0.303)	-1.1286*** (0.252)	-1.6146*** (0.364)
Two sons	-0.6371** (0.270)	-1.0127*** (0.307)	-0.8747*** (0.278)	-1.9681*** (0.368)
Three sons		-0.5357 (0.370)		-1.3703*** (0.418)
Intercept	8.9181*** (0.720)	8.9836*** (0.781)	9.3935*** (0.748)	11.8167*** (0.934)
Control variables				
Mother's single year of education	-0.1659*** (0.036)	-0.1182*** (0.046)	-0.1176*** (0.037)	-0.0965** (0.045)
Mother literacy (Yes=1)	-0.3769 (0.303)	-0.7506*** (0.281)	-1.2206*** (0.337)	-0.7367*** (0.284)
Father's years of education	-0.1129*** (0.027)	-0.1012*** (0.027)	-0.0681** (0.030)	-0.1110*** (0.032)
Mother's age (last child's birth)	-0.3062*** (0.033)	-0.3496*** (0.030)	-0.3247*** (0.032)	-0.3713*** (0.034)
Urban (Yes=1)	-0.2768 (0.200)	-0.1133 (0.190)	-0.0198 (0.215)	-0.3494* (0.205)
Age at first marriage	0.0976*** (0.033)	0.1448*** (0.034)	0.1229*** (0.034)	0.1153*** (0.036)
Regional Controls				
East	3.3132*** (0.562)	1.6261*** (0.320)	2.5390*** (0.607)	0.9938* (0.379)
Central	0.8219*** (0.240)	1.1692*** (0.259)	0.6711*** (0.250)	0.2512 (0.258)
South	0.8464*** (0.247)	1.0031*** (0.261)	0.5166** (0.243)	0.3130 (0.259)
North	0.7572*** (0.269)	1.0592*** (0.273)	0.6807** (0.308)	0.0507 (0.304)
Pseudo R squared	0.3720	0.3416	0.3545	0.3383
Number of obser.	1,263	1,031	1,232	1,035

* significant at 10 % ** significant at 5 % *** significant at 1 %

The numbers are regression coefficients.

The numbers in parenthesis are standard errors.

Source: TDHS-1998 and TDHS-1993

Next, I estimate the logit model as described above. The regression results presented in Table 4.2.2⁷ clearly indicate son preference. All son preference variables have

⁷The results for four and five children families are not reported although they have the expected

the expected negative signs for both years, meaning that probability of progression to the next child falls if the family has a son or sons among the existing children. Son preference is particularly strong for families with two and three children, where both of the variables ‘one son’ and ‘two sons’ are statistically significant. On the other hand, for the families with four children statistical significance shifts to the variables ‘two sons’ and ‘three sons’ (See Appendix C3). This indicates that as the total number of children increases, the desired number of sons also increases. In other words, the probability of progression falls significantly only after the second son is born. For the families with five children, although the effects of son preference variables have the expected negative sign, the estimates are statistically insignificant. A possible reason is that parity progression decisions are influenced by variables other than the child’s sex preferences when family size becomes larger.

The control variables have expected signs, except for the mother’s age at first marriage: the estimated effect is positive and significant. Over 80 % of the women in the sample married for the first time between the ages of 12 and 20. This means that most of the women in the sample have sufficiently long time to bear as many children as they like. Thus, age at first marriage does not play a role of a constraint. It is also likely that women married late in life may pace up child bearing compared to early married ones to compensate for the late start and thus, end up having the same number of children as the early married ones.

Mother’s age at child birth is significant in all four regressions. The dummy variable for mother’s literacy, the number of father’s years of education, and mother’s single year of education also have a significant effect. The coefficients on regional dummies are significant in almost all cases. The reference group is the West, which can be considered as the most urbanized region in Turkey. Whenever significant, all four regional dummies have expected positive signs and the coefficient on the East dummy is the largest, as one would expect, since the eastern region consists mostly of rural areas.

Table 4.2.3: Effects of Changes in Son Preference Variables

	Number of children in the family			
	1998		1993	
	2	3	2	3
Base progression rate	78.2 %	72.0 %	80.8 %	76.6 %
Estimated probability of progression				
One son	59.5 %	54.4 %	57.7 %	39.4 %
Two sons	65.5 %	48.3 %	63.7 %	31.4 %
Three sons		60.1 %		45.4 %

Source: TDHS-1998 and TDHS-1993

signs but mostly not significant (See Appendix C3).

Table 4.2.3⁸ shows the quantitative effects of changes in son preference variables on parity progression ratio. The base progression rate for mother with no sons is calculated directly from the observed data. Then, the estimated probability of progression is derived by using the coefficients from the logit regression from Table 4.2.2. Families with two children are approximately 18.7 percentage points less likely to have a third child if they have a son already for the year 1998 and the corresponding number is 23.1 for the year 1993. Similarly, households with three children are 17.6 and 37.2 percentage points less likely to have the fourth child if they have a son among their existing children for the years 1998 and 1993 respectively. These two effects are found statistically significant at the 1 % level in the logit model. For families with four and five children, it is observed that the effect of having one son is much smaller (See Appendix C4). Having one son decreases the progression ratio by 6.7 percentage points for the families with four children and only by 1.3 percentage points for the families with five children for the year 1998. The same number for the year 1993 who have four children is 6.1 while for five children, surprisingly the percentage is not decreasing but increasing. Probably having so many children may not be driven by the son preference reason. On the other hand, the birth of the second son changes the picture significantly for the year 1998. For the families with four children, the estimated progression ratio is by 19.2 percentage points lower than the base ratio if the family has three sons. All together, these results imply that when the desired number of sons is achieved the probability of progressing to the next parity diminishes.

It is interesting to see that the estimated progression ratio gets slightly higher when all existing children are male (this is shown by the last dummy under the number of boys in each regression in Table 4.2.2 and the corresponding ratios in Table 4.2.3). For families with two children, the ones with one and two sons both have a lower probability of progression compared to the base progression rate, defined for the case of no sons. But the ones who only have sons have a higher progression ratio compared to the ones who have a son and a daughter. This may be an indication of mixed sex preference. A similar pattern is also observed for larger families; however, this effect is statistically significant only in the regression for the families with two children.

The Cox Proportional Hazards Model

The hazards model estimates the risk of progressing to the next child. Lower risk for households who have a son or sons indicates son preference. In this section, I estimate the proportional hazards model proposed by Cox (1972).

Cox proportional hazards model (CPHM) is a technique for investigating the relationship between the survival time and explanatory variables. The CPHM assumes the following basic form when all explanatory variables (co-variates) are time-independent,

⁸See also Haughton and Haughton (1998).

that is, when their values do not change over time, as is the case in my study:

$$h(t) = h_0(t) e^{(b_1 X_1 + b_2 X_2 + \dots + b_k X_k)}$$

where

$h(t)$ is the hazard function at time t ,

$h_0(t)$ is the baseline hazard, or hazard for an individual when the value of all the explanatory variables equal zero,

X_1 to X_k are the co-variates (explanatory variables),

b_1 to b_k are the parameters to be estimated.

The hazard function $h(t)$ of survival time t is the function that has the meaning of the conditional failure rate. It equals the probability of failure per unit of time at time t , given that no failure took place before time t . The event of failure occurs after a length of time called the failure time and can occur at most once for any individual. There may be subjects in the sample for whom the event of failure has not yet occurred, which requires censoring. An important advantage of the hazards model is that the uncompleted families are not excluded from the sample, as it was the case in the parity progression model.

The dependent variable in our model is the time, in months, elapsed from one birth to the next. In the construction of the dependent variable censoring occurs because some mothers may not have completed their childbearing. For example, for the families who have at least two children, the dependent variable is the time between the birth of the second and the third child. But for the families who only have two children, it is the time between the birth of the second child and the date of the interview.

The dependent variable is regressed on son preference dummy variables and social, economic and geographic controls, which are also used in the parity progression model. It is expected that parents have a greater probability of bearing another child if they have not achieved the desired number of sons.

Results

Son preference is quite evident from the regression results (Table 4.2.4⁹). The relative hazard for families decreases significantly if they have one son. For the families with two or more children, if one of them is a son, the hazard is only 65.1 and 67.3 percent of the hazard with no sons, and for families with at least three children, the rate is almost 76.6 and 64.5 percent for the years 1998 and 1993, respectively. For the families with four or more children, the significance shifts to the second dummy variable (two sons) indicating that the hazard falls significantly only after the birth of the second son (see Appendix C5). There is also evidence of mixed gender preference. The hazard is higher for the families who have no daughters at all (the last dummy under the number of boys for each regression in Appendix C5) in the case of two,

⁹The numbers are regression coefficients, hazard ratios are also based on coefficients. See also Haughton and Haughton (1998).

three and five children. The results are very similar to those obtained for the parity progression model. The desired number of sons is positively correlated with the total number of children. Moreover, this model provides stronger evidence for some degree of mixed gender preference.

Table 4.2.4: Cox Proportional Hazards Model

	Hazard of having more children			
	Coefficient if number of children is at least			
	1998		1993	
	2	3	2	3
One son	-0.4291***	-0.2661***	-0.3962***	-0.4387***
Two sons	-0.3619***	-0.5574***	-0.3654***	-0.5822***
Three sons		-0.3094***		-0.5560***
Control variables				
Mother's single year of education	-0.1080***	-0.0791***	-0.1079***	-0.0888***
Mother literacy (Yes=1)	-0.0948	-0.2469***	-0.1269**	-0.2154***
Father's years of education	-0.0403***	-0.0286***	-0.0419***	-0.0483***
Mother's age (last child's birth)	-0.1056***	-0.1208***	-0.0878***	-0.1311***
Urban (Yes=1)	-0.1227***	-0.1680***	-0.1077***	-0.2294***
Age at first marriage	0.0292***	0.0438***	0.0311***	0.0651***
Regional Controls				
East	0.6723***	0.7802***	0.6853***	0.5130***
Central	0.3620***	0.3978***	0.4484***	0.2277***
South	0.4520***	0.4922***	0.4829***	0.3431***
North	0.3555***	0.3490***	0.5220***	0.1632**
Hazard ratio				
One son	65.1***	76.6***	67.3***	64.5***
Two sons	69.6***	57.3***	69.4***	55.9***
Three sons		73.4***		57.3***
Number of observations	4,010	2,534	4,335	2,897
* significant at 10 % ** significant at 5 % ***significant at 1 %				
Source: TDHS-1998 and TDHS-1993				

Other methods

The Last Boy Test

Families who have strong desire for sons are more likely to have a son as their last born child, because when families reach the desired number of sons, they stop childbearing. In that sense, the last boy test is simple: it uses the sex ratio for the lastborn children (total number of sons divided by total number of daughters times 100). This test is applicable to the completed families. Out of 1,535 completed families from TDHS-98 data, in Turkey the sex ratio for all children is 103.6 and for the lastborn children it is 129.8. This notable difference is another piece of evidence for son preference in Turkey.

The Hazards Model with Last Boy Dummy

I also estimate a hazards model which evaluates the effect of the last born child being a male. It is quite evident from the results that the families whose last born child is male have less probability of bearing another child (See Appendix C6). For the families with two or more children, the hazard is only 81.5 percent of the hazard with no sons, and the effect is statistically significant for the year 1998 and it is 83.2 percent for the year 1993. In general, this effect is significant in all regressions: the hazard ratios are considerably lower when the last born child is a boy.

4.2.3 Further comparisons between the years 1993 and 1998

The main aim of this section is to analyze possible change in son preference behavior between the years 1993 and 1998. Strong son preference behavior exists for the families with two, three and four children for the year 1993. Parity progression after five children seems to be driven by factors other than the number of existing sons. The coefficients on control variables have expected signs, except for the age at first marriage variable. These results are similar to the ones obtained using 1998 data set. The effect of son preference variables seems to be higher in 1993, especially for families with two and three children. Larger negative coefficients by absolute value indicate that the difference between progression ratios of families with and without sons is larger in 1993 compared to 1998. That may be an indication of a fall in general tendency of having more children between 1993 and 1998, after controlling for all other factors. The comparison of hazards models between two years reveal ambiguous results for the model that includes control variables. When a simpler model without control variables (See Appendix C7) is estimated, son preference appears to be weaker in 1998 compared to 1993 for the families with two and three children.

Table 4.2.5: PP Logistic Regression with Year Dummy Interaction

Number of boys	Probability of progression with the next parity			
	Number of children			
	2	3	4	5
One son	-1.1761*** (0.255)	-1.5680*** (0.356)	-0.3253 (0.310)	0.2991 (0.443)
Two sons	-0.9180*** (0.281)	-1.8971*** (0.359)	-0.6847** (0.299)	0.2514 (0.432)
Three sons		-1.3895*** (0.411)	-0.3121 (0.317)	-0.0630 (0.424)
Four sons			-0.6064* (0.346)	-0.0596 (0.437)
Five sons				0.4904 (0.591)
Dummy_year_98	-0.4361 (0.295)	-1.0351** (0.416)	-0.1665 (0.361)	0.3361 (0.578)
Dummy_year_98*oneson	0.3220 (0.341)	0.8037* (0.463)	0.0880 (0.461)	-0.3340 (0.673)
Dummy_year_98*twosons	0.2949 (0.385)	0.9173** (0.465)	-0.0882 (0.446)	-0.6283 (0.659)
Dummy_year_98*threesons		0.8250 (0.550)	-0.4056 (0.462)	-0.7425 (0.650)
Dummy_year_98*foursons			0.2543 (0.523)	-0.6158 (0.677)
Dummy_year_98*fivesons				-1.1746 (0.852)
Intercept	9.3122*** (0.540)	10.7345*** (0.649)	9.6846*** (0.675)	8.4043*** (0.821)
Control variables				
Mother's education	-0.1407*** (0.026)	-0.1094*** (0.032)	-0.0609* (0.037)	-0.0001 (0.050)
Is mother literate (Y=1)	-0.7596*** (0.224)	-0.7172*** (0.198)	-0.7938*** (0.197)	-0.7099*** (0.229)
Father's years of education	-0.0925*** (0.020)	-0.0995*** (0.021)	-0.0936*** (0.023)	-0.0758*** (0.027)
Mother's age at child birth	-0.3135*** (0.023)	-0.3547*** (0.022)	-0.3289*** (0.022)	-0.2964*** (0.023)
Urban (Yes=1)	-0.1573 (0.145)	-0.2171 (0.138)	-0.3946*** (0.144)	-0.4481*** (0.162)
Age at first marriage	0.1102*** (0.024)	0.1269*** (0.024)	0.0942*** (0.026)	0.0821*** (0.027)
Regional Controls				
East	2.9297*** (0.407)	1.2979*** (0.243)	1.9240*** (0.271)	1.6058*** (0.254)
Central	0.7412*** (0.172)	0.7027*** (0.181)	0.1419 (0.191)	0.4206* (0.235)
South	0.6785*** (0.172)	0.6486*** (0.182)	0.7142*** (0.200)	0.7460*** (0.228)
North	0.6782*** (0.200)	0.6024*** (0.201)	0.1950 (0.216)	0.4407* (0.256)
Pseudo R squared	0.3609	0.3363	0.3093	0.2512
Number of observations	2,495	2,066	1,593	1,161

Source: TDHS-1998 and TDHS-1993

To test for that, I estimated the model on pooled data with a year dummy for 1998 and the interaction of this year dummy with the son preference variables (Table 4.2.5¹⁰). Control variables and regional dummies have expected signs aside from the mother's age at first marriage. The coefficient on the year dummy variable is negative (the intercept term appears to be higher for 1993 compared to 1998) and statistically significant for the families with three children. Besides, the interaction dummies are positive for the families with two (not significant) and three children (significant) meaning that the coefficient for the year 1998 is less negative than the 1993, thus son preference is fairly decreased for these families. The regressions for four and five children end up insignificant and most of the interacted dummy coefficients are positive. Although the overall results do not confirm strongly that the son preference weakens between the years 1993 and 1998, the regression with three children shows a statistically significant difference.

Next, the year dummy is interacted with the regional control variables to see how the effect of these variables changed between two years (See Appendix C8). A significant effect is observed in the only regression for families with three children. Positive coefficients of the year-region interaction variables indicate that the regional effects are more dominant on childbearing decision in 1998. As the control group of the regional variables is the most urbanized West region, this result provides some evidence of the effect of urbanization being stronger in 1998. Apart from all of these, I also run regressions for the whole pooled data to check whether son preference is significant (See Appendix C9). The pooled regressions also show significant evidence of son preference.

4.3 Conclusion

One of the main differences between the labour markets of developing and developed countries is the female participation rates, where in developed countries it is higher. Not only are the female participation rates low in these countries, but also the wage difference between female and male workers is also a fundamental problem, also commonly seen in developed countries. The wage differentials and the low participation rates can be attributed to several factors, human capital, productivity differences, discrimination etc. however it has been underlined by many other studies that the cultural and the social pressures in the developing countries towards women are the most important determinant of the low participation and wage rates of women and Turkey is one of the countries which has such characteristics.

Firstly, most women are seen as mothers with household responsibilities within the family, which adversely affect female labour market participation rates. Most of the time, the idea of working women instead of men in the family is seen as a weakness of

¹⁰* significant at 10 % ** significant at 5 % *** significant at 1 %. The numbers are regression coefficients. The numbers in parenthesis are standard errors.

manhood. Especially women in the Muslim countries who work outside the house are believed not to comply to the rules of Islam as they are socially in contact with men other than the family members. Thus, as most of the employers know these facts, they treat unequally to women as they are aware of the fact that working women are financially vulnerable otherwise they will not chose to work. Thus, they usually offer less wage than the men doing the same job. Secondly, because the women are expected to bear a child and this results in a raise of responsibilities in the household, and decreased concentration for the job, the employers anticipate interruptions in the working life of women prefer to offer more jobs to men than the women. These interruptions also cause less work experience for the women. Thirdly, daughters are usually neglected upon education. As they are seen as a help to the mother of the household, families think that there is no point in sending their daughters to school. Thus, most of the girls have less formal schooling and obviously have lower qualifications. While human capital accumulation is not a big problem in the rural areas where most of the women work as unpaid family workers, the lack of it limited the job opportunities in big cities for women. Migration to big cities starting from the productivity increase and the capitalization of the agricultural sector creates big unemployment problems among women where the city jobs require human capital accumulation.

Turkey is one of the best examples of this status. Before the 1950s, the women worked as unpaid family workers in the agricultural sector. As women worked in the family job, it was not seen as a violation of the Islamic rules and the responsibilities of the women within the household were not affected by the agricultural job as it has flexible hours compared to big city jobs. However, after the migration started to big cities with the mechanization of the agricultural sector, women became totally dependable on men. The low qualifications of the women both in terms of human capital and the job experience lead women to concentrate on low skilled and low paid jobs in sectors such as textiles, service and food. Fourthly, in most of the developing countries, economies were not able to create a sufficient amount of jobs for those migrated from rural areas. Unemployment increased substantially, leading to most of the men without jobs. With these unfavorable market conditions, the probability of women finding a job was even lower than the men.

Lastly, all these undesirable economic conditions together with the social and the cultural beliefs ended up to another social pressure on women, which is to bear a son or sons. The daughters who have limited chance to financially help the household budget are not treated equally with sons. Sons, on the other hand, are seen as a security for the household future income and favored in terms of education, nutrition and status compared to the daughter. So in this study, I try to underline a social mechanism, son preference that affects the Turkish labour markets badly as the lower participation rates of women in the long run costs the economy in terms of forgone output and under qualified mother who are the ones that educate our children at home.

In this study, I examine son preference behavior in Turkey using the TDHS data for the years 1998 and 1993. First, using the 1998 sample, I test for the presence of son preference employing a parity progression model, last boy test and hazards model. The results confirm that families with no sons (or at least have less sons than desired) are more likely to progress to the next child compared to the ones who already have a son (or have the desired number of sons).

The parity progression analysis of this chapter shows that the TDHS survey data provide strong evidence for son preference in Turkey. It has been estimated that families who already have a son among their first two children are about 18.7 percent less likely to have the third child for the year 1998 and the corresponding number is 23.1 percent for the year 1993. There is also a notable difference between the sex ratio for all children and the lastborn child. The hazards models show a very similar pattern with the parity progression model and last boy test. The relative hazard for families decreases significantly if they have at least one son. The effect of the last boy dummy is negative and significant, meaning that the probability that the family will progress to the next child falls when the last born child is a boy.

Second, I compare separate regressions for the years 1998 and 1993. The effect of son preference variables seems to be higher in 1993, especially for families with two and three children. Finally, I run pooled regressions including a year dummy interacted with regional dummies to capture the time-varying regional effects. The results provide some evidence of the effect of urbanization being stronger and son preference appears to be weaker in 1998 compared to 1993.

Chapter 5

Conclusion

In the previous chapters, the importance and differences of labour market characteristics of developing countries are outlined by paying special attention to Turkish labour market and the historical background that led to the current labour market conditions in Turkey. The effects of higher wages and lower productivity in the public sector are discussed under efficiency wage framework. The influence of overemployment in public sector on economic growth via expenditure, productivity and tax mechanism is also analysed. Finally, in relation with the importance of cultural and religious beliefs on the social status of women, the son preference behavior of Turkish households is examined, because it is considered to be among the social factors that lead to low labour market participation rates for women. The main findings can be summarized briefly under a few bullet points:

(i) Under the assumptions of the models considered, the current involvement of the public sector in the labour market has significant welfare and redistribution effects. More specifically, tax financed increases in public wages or employment lead to a fall in overall social welfare. Moreover, the only gainers from such a policy is the previously unemployed who get to find a job in public sector after the policy. On the other hand, the wellbeing of other parties including the private workers and the workers who already have jobs in the public sector before the policy gets worse.

(ii) Government's excessive involvement in the labour market also worsens the long-run growth performance of the economy under the considered assumptions. Boosting public employment over a certain level is found to lower the steady state level of national income in an exogenous model and the steady state level of growth rate in an endogenous growth model.

(iii) The empirical study using a widespread household survey in Turkey, reveals Turkish households have strong and statistically significant preference for sons over daughters. Moreover, this behavior does not seem to change significantly between the years 1993 and 1998 suggesting the integration of rural families to big city life which can be named as "urbanization" or "modernization" in this period did not affect the preference for sons considerably.

Overall, the main aim of investigating these economic conditions is to come up with

potential solutions for better performing economies and thus, in this chapter, policy suggestions concerning these issues will be discussed. In addition to that, further research prospects will be presented concerning these topics.

5.1 Policy Recommendations

One of the most key defects of labour market in developing countries is the declining labour force participation rates. Early retirement, choosing to stay home and longer education periods contribute to low participation rate. Especially, low women labour force participation rate is mainly a result of the cultural and religious beliefs in some developing countries.

The results of the empirical analysis in Chapter four give clues about possible reasons of low rate of participation for women by emphasizing two different aspects. First, existence of strong son preference implies, women are disadvantageous from the birth. They are not considered as "valuable" socially and economically. Secondly, if we consider the importance of child bearing in a working woman's career, this study also gives clues by identifying the factors that affect the decision of child bearing in a household.

In this context, we can talk about a "virtuous circle". The cultural structure prefers a non-working woman who takes care of the house and the children. This leads to lower tendency for women to go in to the market as wage labourers. Then given the limitations of earning a wage in general, women become less valuable economically and this feeds back in son preference. Therefore, to break this cycle, it is necessary to create the incentives for the women to work as well as help them to acquire the necessary qualifications.

As earning income is seen as a future security and men are much more likely to earn income, it puts pressure on the women to give birth to a son or sons to take care of the family and this creates son preference. The results of this study show that after the effects of other factors are controlled, the decision of a household about having another child significantly depends on the number of sons they have already got. In order to overcome doubts about future income, measures should be introduced about social security system for widows and female headed families.

Another viable solution that comes to the mind is to promote education. It has been shown in Chapter Four that in Turkey within five years of period the preferences did not change significantly. This points out that, although the education level and labour force participation of women are increased, the tight social and cultural traditions are still effective. The migration from rural areas to big cities deepens the problem of insufficient qualifications for the women. The women, who might be working in the agricultural sector previously may not have the required qualifications for the jobs in the urban areas after the migration. However, promoting the education of women may not be easy and even if women have the necessary skills, the role of

them within the family may still prevent them from working. The general attitude towards working women is negative because it is believed culturally that the bread winner of the household must be the male. That is why, one should deal with the difficulties that are imposed by the cultural and religious factors at the same time. Given the head of the household is male, improving women's education level may not have a crucial effect on preferences of the households. To overcome these social and religious customs, the education of men is great essence as the change should start from the source of the pressure on women. Together with easing the social pressure, the increase in human capital of women may, in time, empower them to have a word in the family decisions and combat traditional practices more strongly. The findings of chapter four supports the importance of education by showing that, mother's literacy, mother's single year of education and the father's year of education have negative effects on parity progression which means better educated parents tend to have less children. Generally, we can think that, in families where the parents are well educated, both because they tend to have less children and the mother has better qualifications, the participation of the mother to the labour force becomes more likely. Moreover, if we assume that son preference is, in general, results from the father, this may also mean that once the mother is more educated she may have a greater power in decision of child bearing.

The increase in education will obviously have positive effects on the society. However, it should aim more than improving the potential job skills and help them to deal with the social difficulties as well. Overall, the awareness of finding the solution in their home towns rather than migrating to big cities is extremely essential as excessive immigration contributes significantly to social and economic problems. If we consider different regions of Turkey, West Turkey is the most urbanized region as it may be considered as the base of Turkish manufacturing industry. Therefore, it is possible that, the transformation after immigration might have happened quicker in this part because jobs are relatively more abundant. The results of the empirical analysis done by using regional dummy variables suggest that, being in any other region compared to west significantly raises the probability of having more children. Therefore, women living in west tend to have less children. The participation data also shows that female labour force participation is relatively higher in Western and Northern Turkey in 2000s. These all suggest the economic structure may have done a better job in absorbing the excess female labour that was formed after the migration compared to the other regions. Besides, if we assume the transformation or urbanization after the migration is a continuing process and consider the changes between years 1993 and 1998, the regression results also show that the urbanization lowers the son preference but not as significant as expected. All in all, controlling this tendency of migration is critical and since the regions display different results, special programs should target certain areas.

As a result, we observe social status of women and their economic value for the

household display a two-way interdependence. Therefore, to help women to break this cycle, policies that improve both of these factors simultaneously should put into action. As long as the social pressures are strong well educated women cannot go into the labour force successfully or even if these pressures are eased, women without necessary education cannot fit into the urbanized life easily.

Another issue raised in this thesis is the excess employment by public sector in developing countries. In Chapter Three, it has been shown that the excess employment in government sector caused growth rate to decline and affected the productivity of the private sector badly. In the light of these results, policies that target the reduction of the overemployment should be put into effect. However, downsizing of the government sector also has its own problems (Rama, 1999). The experience of Turkey to decrease employment in State Economic Enterprises (SEE) is an interesting case study. A great effort has been put on privatization of SEEs after late 1980s. However, the general conclusion about privatization in Turkey is that government has no clear cut policy, there are only a few successful cases and it leads large scale redundancies (Auer and Natalia, 2003). The lack of private jobs for those who laid off from SEEs has made downsizing of public sector more difficult in Turkey. In case of no replacement jobs, it is believed that privatization adversely affect the income distribution and worsen the unemployment problem. The solution was found by an early retirement policy, however later it brought pension crisis and the new retirement age increased substantially. While the government employment is a way of providing income to certain groups, it is also an obstacle for the adjusting to economic changes as employment protection makes it impossible to restructure the problematic economic units.

In the context of the results in this thesis, it is shown that the common employment policy that has been prevailing for years has negative effects on the economy. However, the past experience shows that, the solution might not be downsizing public sector at all costs. The results of this study do not suggest government employment is necessarily a bad thing. It only suggests the way it has being done in developing countries affects welfare and growth negatively. It is also underlined several times that the problem is in fact structural, therefore the solution must probably be a set of structural reforms.

Other than the employment effect, it has been pointed out in Chapter Three that there is also a negative efficiency interaction between private and public sector. The downsizing of the government employment have a positive effect on private sector productivity as the private sector employees are now aware of that finding a job in the public sector got harder and the decline in the outside opportunity of the workers makes them work harder in order not to lose their jobs under efficiency wage framework. Therefore to impose a required effort level private sector has to pay less to the workers and that may lead to increased employment in private sector. However, most probably private sector will not be able to absorb all excess employment in the

public sector.

Different countries try to implement various policies to decrease the public employment. To freeze the recruitment is one of the options that was preferred. However, this policies effect cannot be seen in the short run. Other than that, detecting the workers who absolutely put no effort into the job and firing them is another method (this kind of employees are called ATM workers in Turkey as they do not do anything else but just to withdraw money from the ATMs when it is the payment date). Laying off the workers usually cause a lot of social tension thus it is usually not preferred at all. Asking for voluntaries to quit usually ending up losing the most qualified labour as within the group their possibility to find a private job is the highest.

One solution may be creating productive employment in the private sector to absorb the excess employment in the public sector. A good way of this for developing countries may be attracting foreign direct investment (FDI). FDI brings knowledge and technology not only to one sector but also to supportive industries. Developing countries also should make an obligation to firms bringing FDI to make training programs to domestic workers from experienced and qualified experts. The other important thing to focus on about creating employment is the regional development. While attracting FDI, governments should impose restrictions for the facilities whereabouts. The solution to urban unemployment is rural development and for this economic growth should be get out of the big cities. While downsizing the public employment, governments can also introduce new training programs in sectors which have lack of workers. By doing that the overemployment of one sector is transferred to the other sector in which trained workers are needed causing efficient allocating within the economy and increase productivity.

In Chapter Two, the decreasing welfare of the economy as a result of the high wage and the low productivity in the public sector is presented. The system of wage determination according to the productivity of the labour is obviously the best solution to overcome the problems in the public sector. However, same as the downsizing the government employment, it definitely will get strong reactions from the unions. The determination of where the public payrolls should be decreased must be also done extremely careful. While decreasing the cost, the quality of the government services should not be diminished. Increasing the productivity in the public sector may be achieved by bringing job insecurity to the public sector.

The roots of this problem in developing countries can often be found in the lack of an organized social support system. In the context of the models and scenarios considered in this study, even during the phase when government is actually able to increase the growth and welfare by pumping up public employment, there occurs significant income redistribution. If we consider the complexity of the labour markets, the benefiting and losing parties of this redistribution and the fairness of it are certainly open to debate. It is mentioned that, this system acts as a social support system for the poor in developing countries but usually the consequences in the longer

run harms to whole society and mostly to the poor. Then, a well organized social support system can achieve a more efficient and more fair distribution of income. However, the governments usually do not prefer that because the ongoing system can be abused more easily and can be used in discretion in line with their purposes.

The way of finance that is used to pay public wages is also very important in terms of the results of the excess public employment. In this study it is assumed this is done by levying taxes on private sector. This method is chosen because of two reasons. First, it is reasonable as taxation is the main source of income for many governments. Second, distortionary effects of a tax is worth to analyze in an environment where public and private sectors have different objectives. In other words, one of the assumptions of the models constructed in Chapters 2 and 3 is that, thanks to taxes government budget is always balanced. However, it is also known that running budget deficits is a common aspect of developing countries. When that is the case, the governments accumulate debt and public debt is likely to cause other structural problems. These problems are not considered in this thesis because they are not easy to analyses in a theoretical framework. On the other hand, it is worth mentioning that, the effects on private sector labour market would be similar. Excessive budget deficits and public debt often results in an unstable unpredictable economic environment. Monetizations of the debt in many Southern American countries lead to hyperinflation episodes. In many other countries, such as Turkey, financing deficits by domestic or foreign borrowing brought about ill functioning financial markets with extreme interest and exchange rate risks. The common outcome is an unstable economic environment which prevents private investment expenditures and hence affects growth and employment negatively.

All in all, the past experiences showed that, public sector restructuring is not an easy task. Eliminating excess employment, curbing excessive government expenditure or taxation has many effects on welfare and distribution of income. Many of these problems are chronic problems which has roots deep in the economic system. Therefore, it should be done with extreme care and possibly in least costly way for the society.

5.1.1 Importance of Social Security System for Employment Creation in the Private Sector: The Turkish Case

While analysing the effects of excess government employment and considering possible solutions, the taxation of labour and the social security coverage of workers come forward as two very important aspects of the problem. The importance of taxation is apparent as the distortionary effects of a tax on growth and welfare is already discussed in this study. It is also mentioned several times that, the employment in public sector also serves as a substitute for the lack of unemployment insurance. Therefore, cutting public employment without providing a better alternative may have detrimental effects. If we consider abandoning a social support scheme, millions of

people who rely on the income they receive from that scheme will suffer terribly. In order to understand the vital importance of these aspects in designing the policy, in this section, I focus on the social security system and taxation of labour in Turkey, in accordance with other problems of the labour market that may be relevant. In the light of the results of this thesis and some other studies on Turkish labour market, I also discuss the effects of some possible changes.

Turkish social security system consists of two main systems. The first one is financed by voluntary or charitable foundations together with municipal's general budget to support orphan or in need of protection children, widowed, elderly and martyr. The second one is based on a premium system in accordance with the social insurance structure. The person who has paid the premium benefitted later in accordance with the total contribution. There is also private retirement systems offered by the banks under strict regulations of the Treasury. However the private part of the system was launched only a few years ago and before that all system was managed by the state.

The largest component of the system is of course the premium-based part that is governed by the state. This include retirement and health benefits and only covers working people (in private or public sector) who pay a certain amount of premium. Therefore, except the ones covered by the first part of the system, the unemployed are not covered. In other words, some of the poor population or the elderly can be provided by some benefits but there is no security system that covers the unemployed as a whole. Because of the limitations of the employment creation potential of the private sector, public employment acts as a social security system who cannot get a job in private sector. At this point, it is worth mentioning the effects of the high cost of employment to employees through high employment taxation. As our results also display, this curbs private employment and moreover forces unemployed to accept jobs in the private sector without any social security coverage, which leads to the formation of informal employment market which was not considered in our analysis. The high employment taxes for the private sector employees definitely extends the informal sector in Turkey, which is another problematic side of the Turkish labour market.

This notion is also important because it is also an alternative to formal private employment. However, public employment provides much better insurance compared to informal private employment not only because of higher wages but also the fringe benefits. A worker who is employed in informal sector works with a low salary and waives his right to retirement funds and health benefits. On the other hand, public workers enjoy higher wages and social benefits at the same time.

The share of social security expenditures within the gross domestic product was considerably lower than the most OECD countries in Turkey in 1994 (Peker, 1997). On the other hand, Peker (1997) also compared the percentages with some other developing countries like Argentina and Bolivia, and concluded that Turkey had higher expenditure percentage. However, this expenditure percentage in Turkey did not cover

the unemployment and family benefits as the social security system in Turkey does not provide these kinds of compensation. Besides, as different from other countries, the contribution of the government to the social security revenues in Turkey is almost none and they are totally financed by the private sector.

The coverage of the social security system is also quite limited as the high taxes encourage the employers to offer informal employment. Although, the high premium may be expected to cut down the deficit of the system, under-reporting of both the total number of employed people and the number of hours worked result in foregone revenues. Besides, the governments in different occasions offered remission of tax debts for populist purposes. This tax remission created a general belief that postponing the tax payments or employing without registering to the social security system has no severe consequences and sooner or later, another government will again come with a package that will offer exemption or lower taxation for the private sector employees. This tax remissions together with the informal employment and other factors mentioned above resulted imbalanced revenue and expenditure structure in the social security system.

As a result, the social security system in Turkey became no longer sustainable as a result of many bad policies. Therefore, to overcome the problems and to avoid the collapse of the system in 2008, Turkey's social security system was restructured. The problem is just a common one for any social security system. The payments made to the retired people exceed the revenues of the system creating deficits. This kind of problem usually happens when the population gets relatively "older". However, on the contrary Turkey has a much "younger" population compared many developed countries. The reason for the income and expenditure mismatch is due to the factors mentioned above as well as bad management and corruption. Peker (1997) compared the retirement ages for OECD countries, some of the developing countries and Turkey. She concluded that among all, the youngest average retirement age was in Turkey before the Turkish social security reform in 2008. After the reform it was raised, however it should also considered that average life expectancy in Turkey is shorter compared to developed countries. Therefore, the rise of the retirement age is expected to reduce future payments significantly but at the expense of a certain welfare loss. Since, the revenues do not meet the expenses of the system, transfers from the government budget became ordinary in years. The stabilization programmes focusing mainly on the short term recovery through decreasing the government expenditures chose to cut social security expenses as much as possible rather than improving the structure. Thus, together with bad policy choices and the with the help of the labour market structure the system reached to a point where it can no longer provide the necessary payments to those that are covered. Besides, the high inflation periods caused these payments purchasing power to diminish. As a result, the funds have been used extremely inefficiently where neither the system is financially stable nor it can provide good service.

In 2008, some major precautions have been put into effect for preventing a severe financial crisis in the social insurance system. The retirement age has been increased, severe limitations for the health expenditures applied, more auditing for the employment number and the number of hours worked has been exercised, although the coverage is limited, unemployment benefit system is introduced, the penalties for the misreporting and late payment of the premiums of the employees have been substantially increased and the private retirement systems have been introduced under strict regulations of the Treasury.

The conditions in the social security system seem to be major obstacle for the restructuring of labour markets and the informal sector seems to be one of the main reasons of revenue loss in the social security premiums. The informal sector is quite important for other reasons as well. First, informal sector causes loss of revenues for the governments through the employment, profit and income taxes. Besides, it also creates unfair competition among firms. However, it is also known that the informal sector in the developing countries, especially in the urban areas, is the primary source of income for a huge number of people. In Turkey, bad supervision, together with the economic environment led to the increase of informal employment in years. After economic crisis, most of the employers see the informal employment as a cost reducing strategy. People who employed informally, on the other hand, see it as a source of income as an alternative to none. Ironically, the informality of the employment is contributed significantly to the continuation of the firms during crisis times. That may be reason why the government ignored it. Thus, the link between the informal sector and the employment opportunities is complex. While the government tries to formalize the labour market, the incomes of both the wage earners and the small entrepreneurs may be affected badly, causing a loss in social welfare particularly in urban areas. Especially during the crisis periods where formal employment was decreasing fast, the informal employment was the income preserver. However, after the macroeconomic effects of crisis passes, the level of informal unemployment stays the same as less employment cost to the employer means higher profits. The problem, in time becomes a structural one which is reinforced by the high cost of employment. In order to convince small enterprises to employ in accordance with the law and regulations, the cost of the employed should be lowered.

The TUSIAD's (Turkish Industrialists' and Businessmen's Association) report on the structure of the labour markets in Turkey and unemployment is a good summary of the problems and the possible solutions of the Turkish labour market from the point of view of the private sector. The report summarized the possible structural problems under five headings which are high labour cost due to tax and premiums, inefficient wage determination, unproductive job searching process, lack of unemployment benefit system and the inappropriate coping policies with the informal sector.

The cost of employment is categorized under four different components. The wage that the employed takes to home, the income tax, the payments of employed and

the employers to the social security system and severance pay paid by the employer. Labour intensive sectors which have higher labour to capital ratios are the ones that affected the most. Thus, services sector, which is a labour intensive sector, is affected negatively and formal employment would be expected to be higher if labour costs were lower. The income tax is usually considered as a labour supply phenomenon, however, in Turkey the tax reduction is made from the source not as a result of declaration. Therefore, the reduction of income taxes are likely to accelerate the employment increase. However, the reduction in taxes may have an adverse effect on the tax revenues, especially if the tax base cannot be expanded, i.e. employment cannot be formalized. Note that income tax is one of the major revenue items in the government's budget and for the countries which run significant deficits it is important to have a high primary surplus for the sustainability of their debt. Therefore, taking other precautions that prevent informal employment is critical if for raising more tax revenues. Another difficulty that may arise is about the timing, because the employment increase may take some time while the revenue losses as a result of the tax cuts are instant.

The share of the unemployed people who are between the ages 15-24 is the highest among the unemployed in Turkey. It reflects that the period for looking for a job is long. It is suggested in the TUSIAD's report that if certain tax exemptions are applied for people who are employed from this group, it will both help to decrease the unemployment and will not cause more of a revenue loss than otherwise the tax reduction.

Generally, in Turkey wages are sensitive to unemployment numbers. The low wages are among the factors that increase the employment level, however, in the long run because the wages are also a determinant of the income level, the low levels of wages may be not favourable. Thus, wages are both a cost item and the income for the majority of the population that leads to economic growth and employment increase. Therefore, the wage determination process is quite important and it is another issue raised in the TUSIAD's report. The unionization ratio and the ratio of employed who work under the collective bargaining agreement have opposite effects on wages; while the former increases it the later has a negative impact on it.

Wage determination by collective bargaining has several advantages in relation to the labour markets. The wage determination in accordance with the macroeconomic circumstances give flexibility so that during recessions the wage increase cannot be seen causing more pressure on the markets. Besides, the collective bargaining creates continuous employment pattern. In sectors where wages are determined collectively, the elasticity of wages to unemployment is lower. During the crises, the employers negotiate the negative circumstances in the general economy and try to find a reasonable solution, which will at the end affect the employment. Similarly, during the economic booms, the workers put the pressure on the employers and have more bargaining power over the wage increases. Thus, according to TUSIAD instead of seeing

the collective bargaining procedure as a win or the loss of the either on of the sides, it should be seen as a total welfare optimization which takes into account both the employers and the workers. On the other hand, the unions' main aim is to protect their members and they do not have much to do with the unemployment problem. Thus, the unemployed who had a reservation wage below the union wage is obstacle for employment expansion.

Having discussed how the private sector sees the problems of Turkish labour market, next I consider the efforts of the government to increase the efficiency of job searching process. Turkish Employment Organization (ISKUR) is a state agency that deals with the labour markets in Turkey.

ISKUR's main aims are categorized under five headings in its website: 1) establishment of national employment policies to create employment and to decrease unemployment and responsible for the unemployment insurance services, 2) to gather employment and unemployment data both in nationally and locally, interpret and write reports about these data, a committee which is responsible for consulting about labour market dynamics, analysing and pointing out the necessary precautions for labour market demand and supply, 3) consulting about occupation and job opportunities, organizing courses and seminars related to occupational education, 4) try to establish the best coordination between the employees looking for workers and the workers looking for a job, try to match the best qualified workers to the fitting jobs, 5) follow the new decisions taken about the labour markets in the European Union and the other international institutes and apply the rules in line with the international institutes accepted by the Turkish government.

Although ISKUR encourage for the registration of unemployed to the system, the results are not very satisfactory. If unemployed registered with explaining the qualifications clearly, then the matching process for finding the right job will be easier. In Turkey, the job searching process mainly consists of two different channels: himself/herself or through informal networks, family or friends. Thus, these mechanisms lowering the efficiency of the job searching and finding process, increasing the time being unemployed and the inefficient matching in terms of qualifications demanded and supplied. Especially, the university graduates in Turkey are having difficulties in finding a job related to their education. The mismatch among the skilled labour is higher than the unskilled ones. The students can be channelled to the occupations which have higher labour demand. This may reduce the time being unemployed. It is obvious that more resources devoted to education will eventually decrease the unemployment problem, however there is still in need of institutions which will coordinate all parties and try to ease the process of first time job seekers.

Turkish economy has been suffering from various problems since the new Republic has been established in 1923. Some of these has become structural problems in time and solving them requires much more complex policies or reforms. Among these problems, unemployment is one of the most crucial ones and insufficient job creation

can be considered as the main obstacle of Turkish labour market. However, how this has been tried to be solved in time created an inefficient environment. One of the main arguments of this thesis, is that populism based policies like increasing government employment inefficiently has bad repercussions effects such as curbing private employment, being an obstacle for private employment creation and affecting the long run growth rate negatively.

The labour force participation in Turkey is increasing together with the employment decline in the agricultural sector, more educated women entering the labour force and looking for a non-agricultural job. Lack of creation of new jobs simply puts the labour demand stable while as it is explained above the labour supply is rising. The developing countries with young demographic structure like Turkey have only one way out of this problem, which is increasing the growth rate with new production capacities. The stable growth rate requires macroeconomic stability which most of the developing countries suffer from.

The Turkish economy experienced severe economic crises in 1994 and 2001. The adjustment of the Turkish firms to these crises was to choose the technology that demanded the lowest labour input which in return increases labour productivity. The more challenging development after the crises is that although the growth rate substantially increased to offset the negative consequences, it did not bring employment improvement with it. As mentioned earlier, the main problem in Turkey is that the labour supply is more than the labour demand and the creation of new jobs is very limited.

According to TUSIAD's report the employment rise is lower if the certain growth comes with the productivity increase. In the long run, productivity increase is expected to bring growth in employment and besides it is the main engine of the welfare improvements. The real wages rise after the productivity increase, which in return determines and change the structure of the domestic demand. While the total consumption accelerates, the services consumption will also rise. Otherwise, the growth will stop. The productivity rises are higher in industrial sector than the services sector. As long as the share of the services sector within the economy increases, the employment creation will be more. Services sector is the main source of employment rise in the long run. The same growth rate ended up with different amount of employment rise for the developing and developed countries. As most of the developing countries are in the industrialization phase, they experience difficulties in employment rise.

In the second and third chapters of this thesis, the overemployment policies' impact on wages, productivity and growth is analyzed. It is shown that overemployment in public sector curbs private employment, reduces efficiency and as a result of this lowers the growth rate. However, as it is mentioned before, the argument is never that the government employment should be reduced in any cost. It is the skilled and efficient employment should be increased and the unskilled labour employment and inefficient

allocation of government employment must be left as a policy. For the establishment of a welfare state, it is crucial to employ skilled and productive persons in education, health and other government services. It is true that there exists overemployment for ordinary clerk numbers in the government sector in Turkey, however, it is also true that the skilled employment is enormously low. Together with the stabilization programmes with the IMF, the employment in public sector is decreasing however; the qualified employment should be increased.

Wrapping up, in the light of all these discussions about main problems and possible solutions in Turkish labour market, three strategies should be underlined in particular:

(i) The importance of unemployment benefits and social security reform: As mentioned several times public employment serves as a substitute for insufficient job creation in private sector and therefore is the source of income and health and retirement benefits for a significant part of the population. Therefore, in eliminating the inefficiencies and overemployment in public sector. An alternative is absolutely necessary to prevent people from suffering severely during the transition. The results of this study shows, in the context of efficiency wages both unemployment benefits and public employment have similar effects on private sector. In the context of the models constructed the difference will be the extra production by the public workers. However, considering the low effort and high wage in the public sector, these benefits of public employment will be limited. The structural problems caused by huge government enterprises or the differences between skilled or unskilled labour are also not considered in the models. On the other hand, the advantages of an unemployment insurance scheme will be in terms of management. It will become harder to implement populist policies and the funds raised from taxes can be distributed more efficiently, equally and systematically to the people who need them.

The unemployment benefit system may require additional funds in the short run but it actually can be established to take the place of the social function that public employment is doing now and already lots of money has being spent in the current system. The results of this study also supports this idea by showing how inefficient the current system is.

In fact, the unemployment benefit system was put into effect very recently. The coverage and the right to claim to these funds are very limited and although the unemployment insurance fund is increasing ever since it was established, the number of unemployed benefiting from the system is very small. Developing this system is critical to fill the gap that would emerge when the employment strategy of the public sector is renewed.

(ii) Reduction of employment cost: The high cost of labour promotes informal labour market which in return causes a loss in tax revenues and problems in social security system. Although, the analysis in this study does not consider the informal sector, the results suggest raising the tax rate for providing more public employment may result in a loss in social welfare and may affect the growth performance of the

economy negatively.

There seems to be an inefficiency in both the collection and the spending of the revenues by the government. Together with other precautions about supervision, bringing the labour cost down may formalize the economy and may provide a more efficient collection of income taxes. A better social policy, on the other hand, may make it possible to increase the welfare by spending less and hence contribute to the reduction in the labour cost.

(iii) Sustainable growth: In a more general perspective, the ultimate solution is to increase the employment creation capacity of the economy. The best way of this would be economic stability and sustainable growth.

5.2 Further Research

In the second and third chapter of this thesis, theoretical models about public and private labour markets are constructed to analyse wage and productivity differentials. An empirical study to support the findings in these models can be appropriate to see what story does the actual data from developing countries tell. It can also be tested empirically how the economy responds to changes in these differential among countries and over time.

As mentioned earlier, the balanced government budget assumption may be relaxed for further theoretical research. Introduction of a financial market allowing government debt in the model may make it possible to compare short run benefits with the long run costs of public employment policies. This would not be easy to consider in a simple theoretical model because, capital market conditions are affected by many factors besides government employment policies and public sector debt. In addition, figuring how these conditions would affect private labour market and economic variables would require another set of assumptions. On the other hand, if these difficulties can be tackled, such a model can make it possible to analyze the effects of monetary and fiscal policy together in restructuring of the public sector. Therefore, we can analyse the welfare effects of stabilization policies more clearly where tight monetary and fiscal policy are often implemented together.

In the models, I assume tax is paid by the firms. As a different assumption, the effects of an income tax levied directly on workers may also be considered. In that case the expected utility and no shirking condition of the worker will be affected directly and this may lead to other interesting results about income taxation under efficiency wages. If we consider the informal sector in the context of the theoretical model in chapter two, it may influence the results via couple of different channels. First, revenue raising effects of a tax increase might be expected to be more limited as firms will shift from formal to informal employment. On the other hand, distortionary effects of the increase on private sector will be diminished as well, since the firms might be able to avoid some of the tax burden.

Informal sector is another aspect of developing country labour markets that was mentioned several times in this study. The theoretical models can also be extended by considering the informal sector. This would provide a better analysis of welfare effects of taxes as the higher cost of employment will also affect the distribution of private employment among formal and informal markets.

For the analysis in the fourth chapter, the results can be considered as an important first step, establishing the existence and strength of son preference in Turkey. It also explores its evolution over time and talks briefly about possible reasons for the changes observed between two different years. However, the reasons and especially the results of this type of behavior can be a subject of further research projects. In doing this, one can make use of more detailed characteristics of the survey data, such as the employment characteristics of the female headed households.

Appendix A

Labour market interactions

A.1 Simple Model (\bar{w} increases and decreases)

Default Model

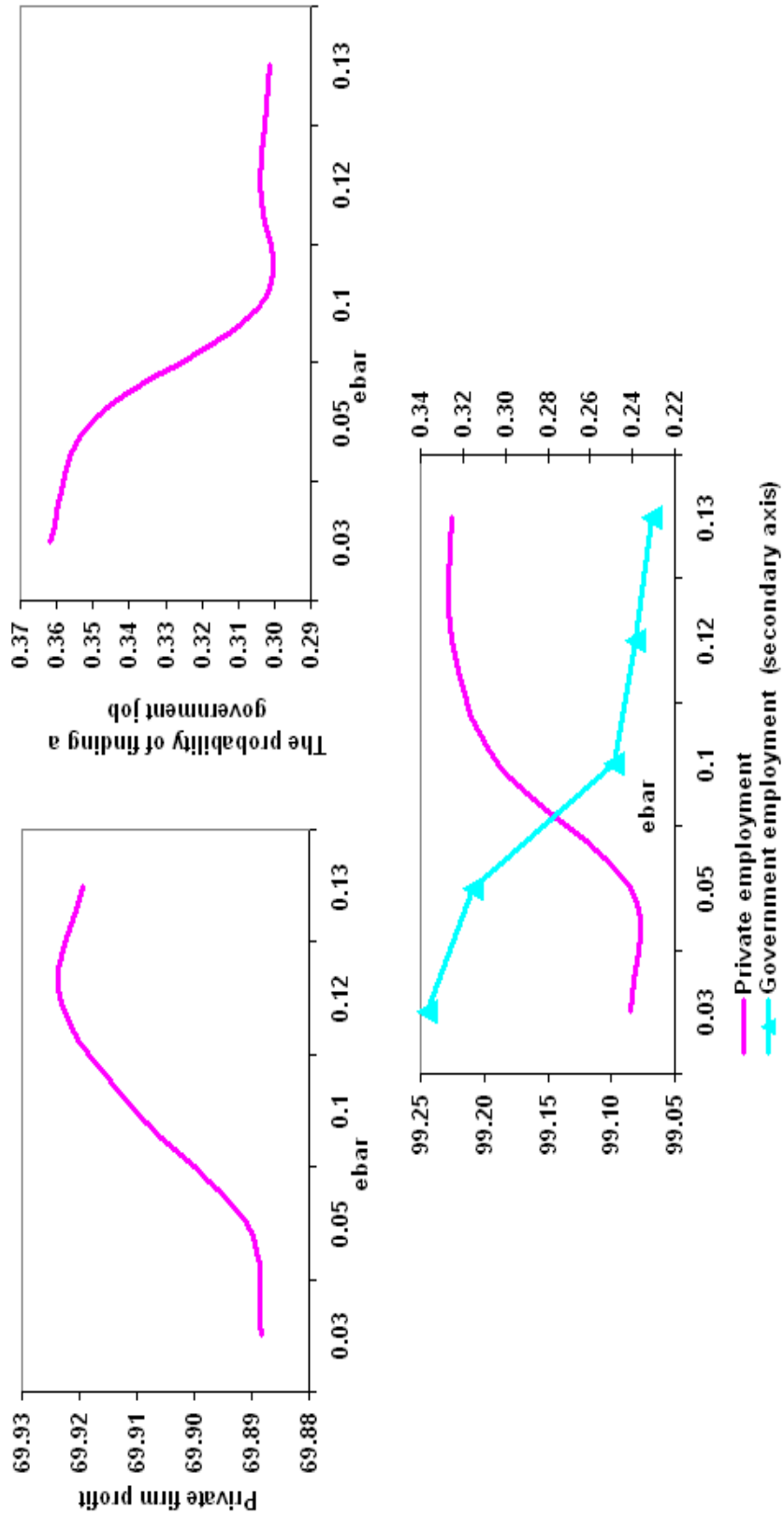
	Fraction of workforce being monitored	Parameter for public production	Parameter for public wage	Cost of exerting effort	Payoff of unemployment benefit	Number of workers	Number of firms
	q	\bar{e}	\bar{w}	c	U_b	H	n
	0.9	0.1	0.2	1	0.2	100	350

Different estimations

Effort in private sector			$\bar{w} = 0.05$	$\bar{w} = 0.1$	$\bar{w} = 0.2$	$\bar{w} = 0.22$	$\bar{w} = 0.24$
Private wage	e^p		0.5636	0.5635	0.5632	0.56317	0.56312
Private employment	w^p		0.7059	0.7055	0.7049	0.7048	0.7047
Government employment	L^p		0.2828	0.2830	0.2834	0.2834	0.2835
Payoff of government employment	L^g		0.4746	0.3825	0.2490	0.2366	0.2220
Effort in public sector	U_g		0.5410	0.5907	0.6903	0.7103	0.7302
Government wage	e^g		0.4636	0.4635	0.4632	0.4632	0.4631
The probability of unemployment	w^g		0.7559	0.8055	0.9049	0.9248	0.9447
The probability of finding a government job	h_b		0.5375	0.5962	0.6965	0.7035	0.7141
Outside opportunity	h_g		0.4625	0.4038	0.3035	0.2965	0.2859
Private firm profit	$h_g U_g + h_b U_b$		0.3577	0.3578	0.3488	0.3513	0.3516
Total employment	$nL^p + L^g$		69.8612	69.8884	69.9106	69.9168	69.9205
			99.4546	99.4325	99.4390	99.4266	99.4470

A.2 Simple Model (\bar{e} increases and decreases)

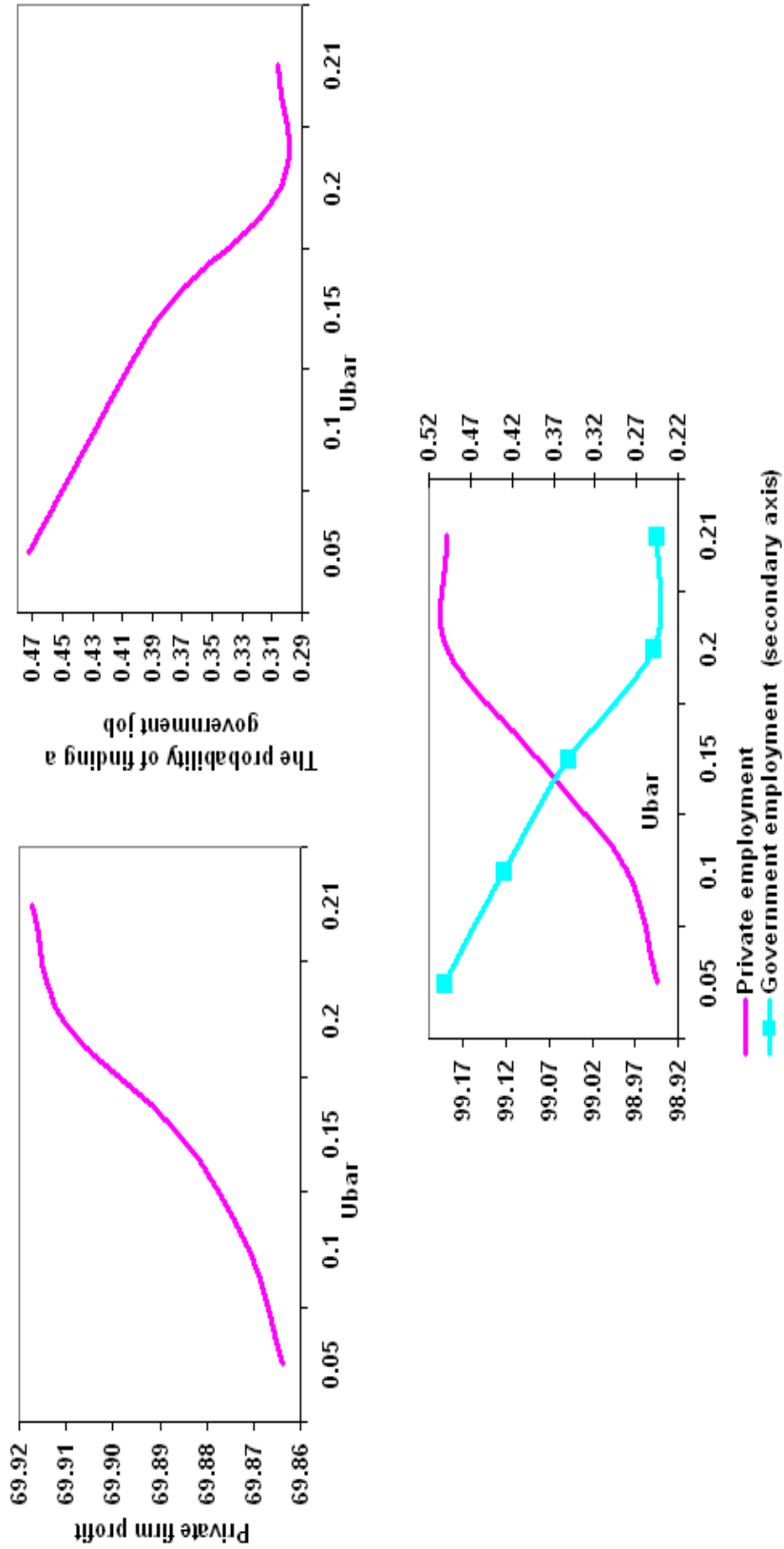
	Fraction of workforce being monitored	Parameter for public production	Parameter for public wage	Cost of exerting effort	Payoff of unemployment benefit	Number of workers	Number of firms
	q	\bar{e}	\bar{w}	c	U_b	H	n
Default Model	0.9	0.1	0.2	1	0.2	100	350
Different estimations							
Effort in private sector			$\bar{e} = 0.03$	$\bar{e} = 0.05$	$\bar{e} = 0.1$	$\bar{e} = 0.12$	$\bar{e} = 0.13$
Private wage		e^p	0.563420	0.56336	0.5632	0.563143	0.56311
Private employment		w^p	0.7054	0.7053	0.7049	0.7047	0.7047
Government employment		L^p	0.2831	0.2831	0.2834	0.2835	0.2835
Payoff of government employment		L^g	0.3368	0.3155	0.2490	0.2387	0.2312
Effort in public sector		U_g	0.6209	0.6417	0.6903	0.7084	0.7171
Government wage		e^g	0.5334	0.5134	0.4632	0.4431	0.4331
The probability of unemployment		w^g	0.9054	0.9053	0.9049	0.9047	0.9047
The probability of finding a government job		h_b	0.6383	0.6494	0.6965	0.6959	0.6988
Outside opportunity		h_g	0.3617	0.3506	0.3035	0.3041	0.3012
Private firm profit		$h_g U_g + h_b U_b$	0.3522	0.3549	0.3488	0.3546	0.3558
Total employment		$nL^p + L^g$	69.8884	69.8908	69.9106	69.9234	69.9193
			99.4218	99.4005	99.4390	99.4637	99.4562



The Effects of increase in \bar{e} in Labour Market Variables in the Simple Model

A.3 Simple Model (U_b increases and decreases)

Default Model		Parameter for public production	Parameter for public wage	Cost of exerting effort	Payoff of unemployment benefit	Number of workers	Number of firms
Fraction of workforce being monitored	Parameter \bar{e}	Parameter \bar{w}	Parameter c	Parameter U_b	Parameter H	Parameter n	
q	0.1	0.2	1	0.2	100	n	350
0.9							
Different estimations							
Effort in private sector		$U_b = 0.05$	$U_b = 0.1$	$U_b = 0.15$	$U_b = 0.2$	$U_b = 0.21$	
Private wage	e^p	0.5637	0.5636	0.5634	0.5632	0.5631	0.5631
Private employment	w^p	0.7060	0.7058	0.7054	0.7049	0.7048	0.7048
Government employment	L^p	0.2827	0.2828	0.2831	0.2834	0.2834	0.2834
Payoff of government employment	L^g	0.5012	0.4291	0.3513	0.2490	0.2449	0.2449
Effort in public sector	U_g	0.6911	0.6909	0.6906	0.6903	0.6903	0.6903
Government wage	e^g	0.4637	0.4636	0.4634	0.4632	0.4631	0.4631
The probability of unemployment	w^g	0.9060	0.9058	0.9054	0.9049	0.9048	0.9048
The probability of finding a government job	h_b	0.5274	0.5720	0.6185	0.6965	0.6944	0.6944
Outside opportunity	h_g	0.4726	0.4280	0.3815	0.3035	0.3056	0.3056
Private firm profit	$h_g U_g + h_b U_b$	0.3530	0.3529	0.3562	0.3488	0.3547	0.3547
Total employment	$nL^p + L^g$	69.8637	69.8711	69.8859	69.9106	69.9173	69.9173
		99.4462	99.4091	99.4363	99.4390	99.4349	99.4349



The Effects of increase in U_b in Labour Market Variables in the Simple Model

A.4 Tax on Private Sector (Main Model)

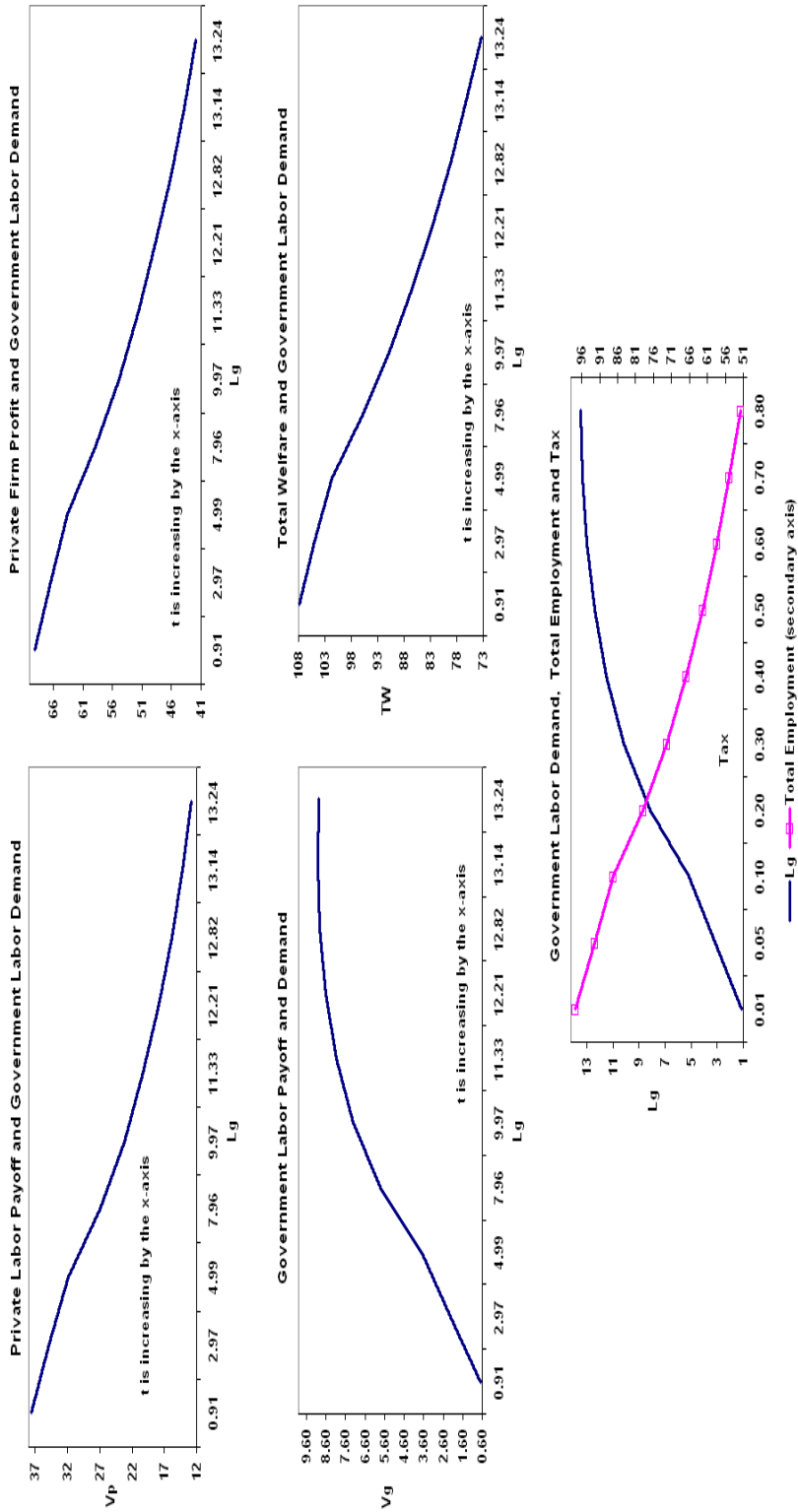
Tax	Frac.workforce monitored	Par. for public production	Par. for public wage	Cost of exerting effort	Payoff of unemp.benefit	Number of workers	Number of firms	Prob. of gov job	Gov.emp
	q	\bar{e}	\bar{w}	c	U_b	H	n	(h_g)	(L^g)
		Effort in public (e^g)	Effort in private (e^p)	Payoff of gov. empl. (U_g)	Government wage (w^g)	Private wage(w^p)	Private empl. (L^p)	Prob. of gov job (h_g)	Gov.emp (L^g)
0.01	0.6880	0.4642	0.5642	0.6918	0.9073	0.7073	0.2764	0.3120	1.0170
0.05	0.6874	0.4641	0.5641	0.6917	0.9070	0.7070	0.2559	0.3126	3.2644
0.1	0.6904	0.4624	0.5624	0.6890	0.9028	0.7028	0.2352	0.3096	5.4688
0.2	0.6984	0.4574	0.5574	0.6811	0.8903	0.6903	0.2031	0.3016	8.7262
0.3	0.7081	0.4515	0.5515	0.6720	0.8759	0.6759	0.1786	0.2919	10.9451
0.4	0.7180	0.4453	0.5453	0.6625	0.8608	0.6608	0.1593	0.2820	12.4761
0.5	0.7286	0.4391	0.5391	0.6530	0.8458	0.6458	0.1436	0.2714	13.4983
0.6	0.7394	0.4330	0.5330	0.6438	0.8313	0.6313	0.1306	0.2606	14.1473
0.7	0.7500	0.4270	0.5270	0.6348	0.8172	0.6172	0.1197	0.2500	14.5268
0.8	0.7611	0.4213	0.5213	0.6264	0.8039	0.6039	0.1103	0.2389	14.6652

Tax	Frac.workforce monitored $q = 0.9$	Par. for public production $\bar{e} = 0.1$		Par. for public wage $\bar{w} = 0.2$		Cost of exerting effort $c = 1$		Payoff of unemp.benefit $U_b = 0.2$		Number of workers $H = 100$		Number of firms $n = 350$	
		Total private firm profit	Total private labour payoff	Total welfare	Total unempl.	Total empl.	Total Private empl.	Total Public labour payoff	Total Private empl.	Total Public labour payoff	Outside opportunity	Total public labour payoff	
0.01	69.12	37.63	107.9	2.2	97.8	96.7	0.35	0.7036					
0.05	66.46	34.82	105.0	7.2	92.8	89.6	0.35	2.2580					
0.1	63.65	31.82	101.7	12.2	87.8	82.3	0.35	3.7680					
0.2	58.88	26.98	95.8	20.2	79.8	71.1	0.35	5.9434					
0.3	54.93	23.24	90.8	26.5	73.5	62.5	0.34	7.3551					
0.4	51.57	20.26	86.5	31.8	68.2	55.8	0.33	8.2654					
0.5	48.69	17.85	82.6	36.2	63.8	50.3	0.32	8.8144					
0.6	46.17	15.87	79.2	40.1	59.9	45.7	0.32	9.1080					
0.7	43.94	14.22	76.1	43.6	56.4	41.9	0.31	9.2216					
0.8	41.97	12.82	73.3	46.7	53.3	38.6	0.30	9.1863					

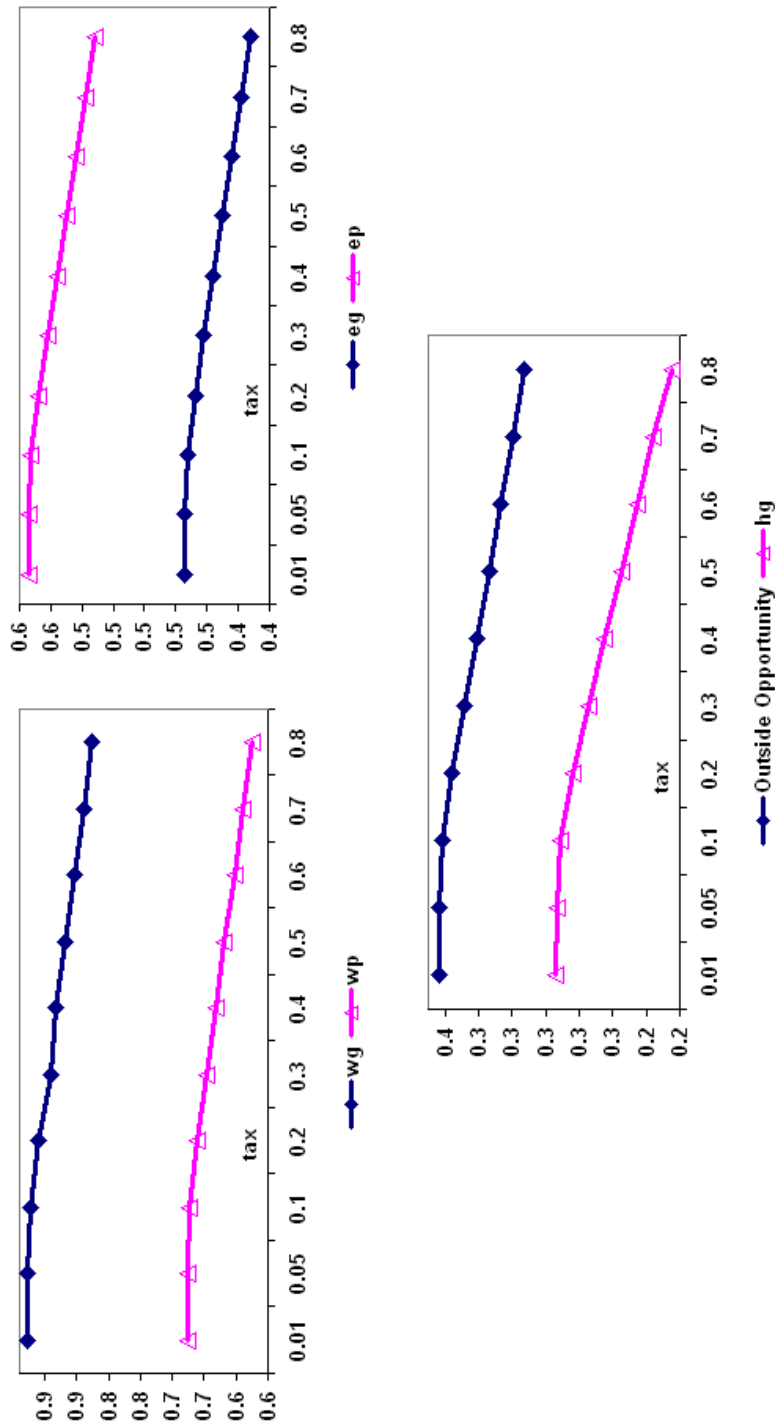
A.5 Tax on Private Sector (\bar{w} increase)

Tax	Frac.workforce monitored $q=0.9$	Par. for public production $\bar{e}=0.1$	Par. for public wage $\bar{w}=0.25$	Cost of exerting effort $c=1$	Payoff of unemp.benefit $U_b=0.2$	Number of workers $H=100$	Number of firms $n=350$	Private Prob. of gov job (h_g)	Gov.emp (L^g)
		Effort in public (e^g)	Effort in private (e^p)	Payoff of gov. empl. (U_g)	Government wage (w^g)	Private wage(w^p)	Private empl. (L^p)		
0.01	0.7161	0.46407	0.56407	0.7417	0.9571	0.7071	0.2765	0.2839	0.9137
0.05	0.7166	0.4641	0.5641	0.7417	0.9571	0.7071	0.2558	0.2834	2.9659
0.1	0.7187	0.46253	0.56253	0.7393	0.9532	0.7032	0.2350	0.2812	4.9873
0.2	0.7260	0.4577	0.5577	0.7317	0.9412	0.6912	0.2027	0.2740	7.9634
0.3	0.7352	0.452	0.552	0.7228	0.9212	0.6771	0.1781	0.2648	9.9745
0.4	0.7451	0.446	0.546	0.7136	0.9125	0.6625	0.1587	0.2549	11.3313
0.5	0.7557	0.44	0.54	0.7044	0.8980	0.6480	0.1429	0.2443	12.2121
0.6	0.7646	0.4337	0.5337	0.6949	0.8830	0.6330	0.1301	0.2354	12.8200
0.7	0.7745	0.4277	0.5277	0.6859	0.8688	0.6188	0.1192	0.2255	13.1402
0.8	0.7849	0.422	0.522	0.6774	0.8555	0.6055	0.1099	0.2151	13.2387

Tax	Frac.workforce monitored $q = 0.9$	Par. for public		Cost of exerting effort $c = 1$	Payoff of unemp.benefit $U_b = 0.2$	Number of		Total public labour payoff
		production $\bar{e} = 0.1$	wage $\bar{w} = 0.25$			workers $H = 100$	firms $n = 350$	
	Total private firm profit	Total private labour payoff	Total welfare	Total unempl.	Total empl.	Total Private empl.	Outside opportunity	
0.01	69.09	37.64	107.9	2.3	97.7	96.8	0.35	0.6777
0.05	66.48	34.82	105.0	7.5	92.5	89.5	0.35	2.1998
0.1	63.63	31.81	101.7	12.8	87.2	82.3	0.35	3.6871
0.2	58.83	26.97	95.8	21.1	78.9	70.9	0.35	5.8268
0.3	54.88	23.21	90.8	27.7	72.3	62.3	0.34	7.2096
0.4	51.54	20.24	86.5	33.1	66.9	55.5	0.33	8.0860
0.5	48.67	17.83	82.7	37.8	62.2	50.0	0.32	8.6022
0.6	46.11	15.85	79.2	41.6	58.4	45.5	0.32	8.9086
0.7	43.88	14.20	76.1	45.1	54.9	41.7	0.31	9.0129
0.8	41.91	12.81	73.3	48.3	51.7	38.5	0.30	8.9679



Government Employment and Welfare Analysis (\bar{w} Increases)

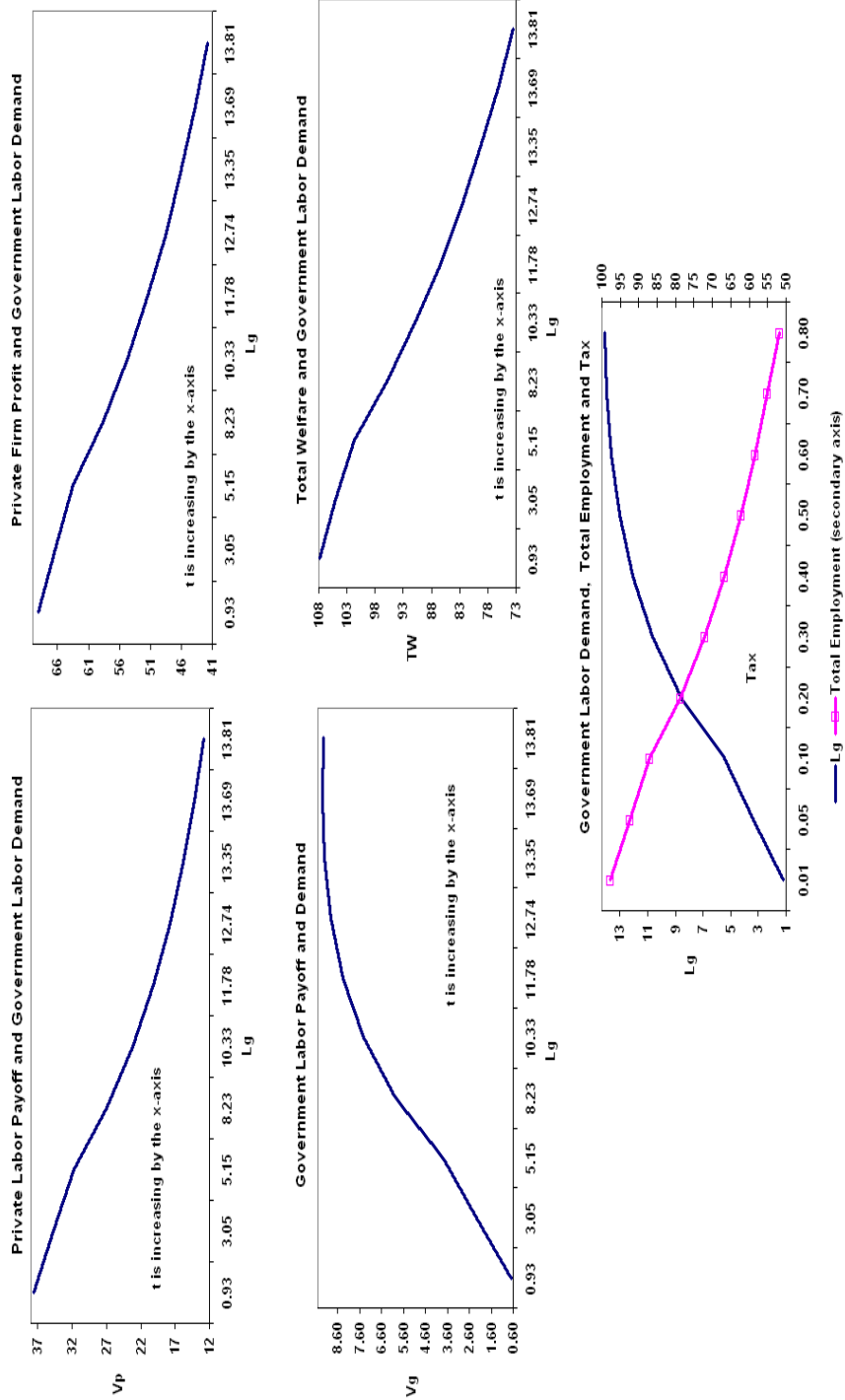


The Effects of Tax Change on Labour Market Variables (\bar{w} Increases)

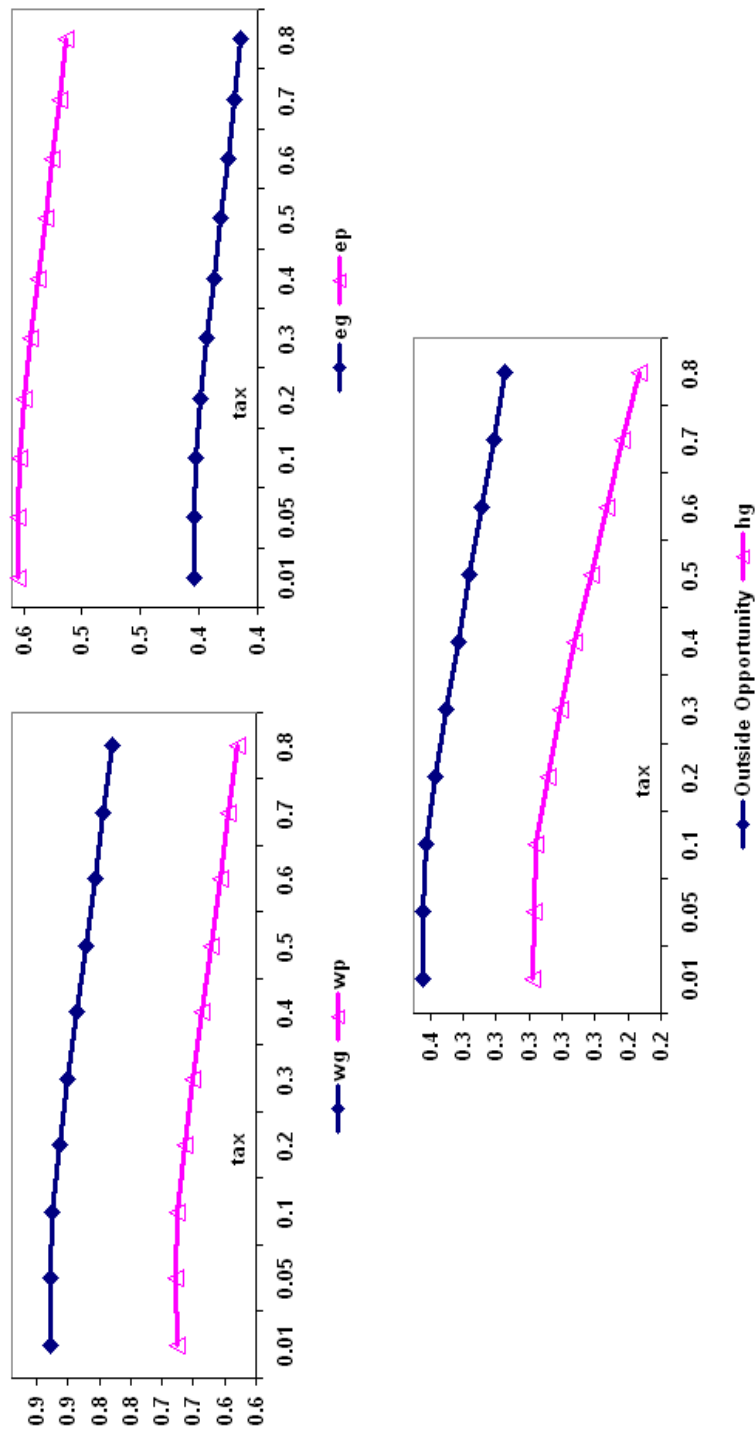
A.6 Tax on Private Sector (\bar{e} increase)

Tax	Frac.workforce monitored		Par. for public production		Par. for public wage		Cost of exerting effort		Payoff of unemp.benefit		Number of workers		Number of firms		Prob. of gov job		Gov.emp (L^g)					
	q	\bar{e}	\bar{e}	\bar{w}	\bar{w}	c	U_b	H	Private	Government	Private	Government	Private	Government	Private	Government						
0.01	0.7121	0.4141	0.5641	0.7357	0.9071	0.2765	0.2879	0.9310	0.7071	0.7080	0.2553	0.2872	3.0537	0.7128	0.4145	0.5645	0.7362	0.9080	0.9049	0.2342	0.2855	5.1487
0.05	0.7145	0.4132	0.563214	0.7342	0.9049	0.2342	0.2855	5.1487	0.7049	0.6942	0.2014	0.2789	8.2343	0.7211	0.4089	0.5589	0.7270	0.8942	0.8808	0.1767	0.2708	10.3348
0.1	0.7292	0.4035	0.5535	0.7180	0.8808	0.1573	0.2621	11.7792	0.6808	0.6664	0.1416	0.2526	12.7379	0.7379	0.3976	0.5476	0.7083	0.8664	0.8519	0.1287	0.2429	13.3468
0.2	0.7474	0.3916	0.5416	0.6985	0.8375	0.1179	0.2330	13.6887	0.6519	0.6375	0.1179	0.2330	13.6887	0.7571	0.3856	0.5356	0.6793	0.8235	0.8235	0.1179	0.2330	13.6887
0.3	0.7670	0.3797	0.5297	0.6793	0.8102	0.1086	0.2228	13.8138	0.6235	0.6102	0.1086	0.2228	13.8138	0.7670	0.3740	0.524	0.6703	0.8102	0.8102	0.1086	0.2228	13.8138
0.4	0.7772	0.3740	0.524	0.6703	0.8102	0.1086	0.2228	13.8138	0.6102	0.6102	0.1086	0.2228	13.8138	0.7772	0.3740	0.524	0.6703	0.8102	0.8102	0.1086	0.2228	13.8138

Tax	Frac.workforce monitored $q = 0.9$	Par. for public production $\bar{e} = 0.15$		Par. for public wage $\bar{w} = 0.2$		Cost of exerting effort $c = 1$		Payoff of unemp.benefit $U_b = 0.2$		Number of workers $H = 100$		Number of firms $n = 350$	
		Total private firm profit	Total private labour payoff	Total welfare	Total unempl.	Total empl.	Total Private empl.	Total Public opportunity labour payoff	Total Private empl.	Total Public opportunity labour payoff			
0.01	69.05	37.63	107.8	2.3	97.7	96.8	0.35	0.6849					
0.05	66.44	34.79	105.0	7.6	92.4	89.4	0.35	2.2481					
0.1	63.55	31.78	101.7	12.9	87.1	82.0	0.35	3.7802					
0.2	58.72	26.92	95.9	21.3	78.7	70.5	0.35	5.9863					
0.3	54.73	23.16	90.9	27.8	72.2	61.8	0.34	7.4204					
0.4	51.36	20.18	86.5	33.2	66.8	55.1	0.33	8.3432					
0.5	48.47	17.77	82.7	37.7	62.3	49.6	0.33	8.8974					
0.6	45.95	15.79	79.3	41.6	58.4	45.0	0.32	9.1933					
0.7	43.73	14.15	76.2	45.0	55.0	41.3	0.31	9.2987					
0.8	41.77	12.76	73.4	48.2	51.8	38.0	0.30	9.2594					



Government Employment and Welfare Analysis (\bar{e} Increases)

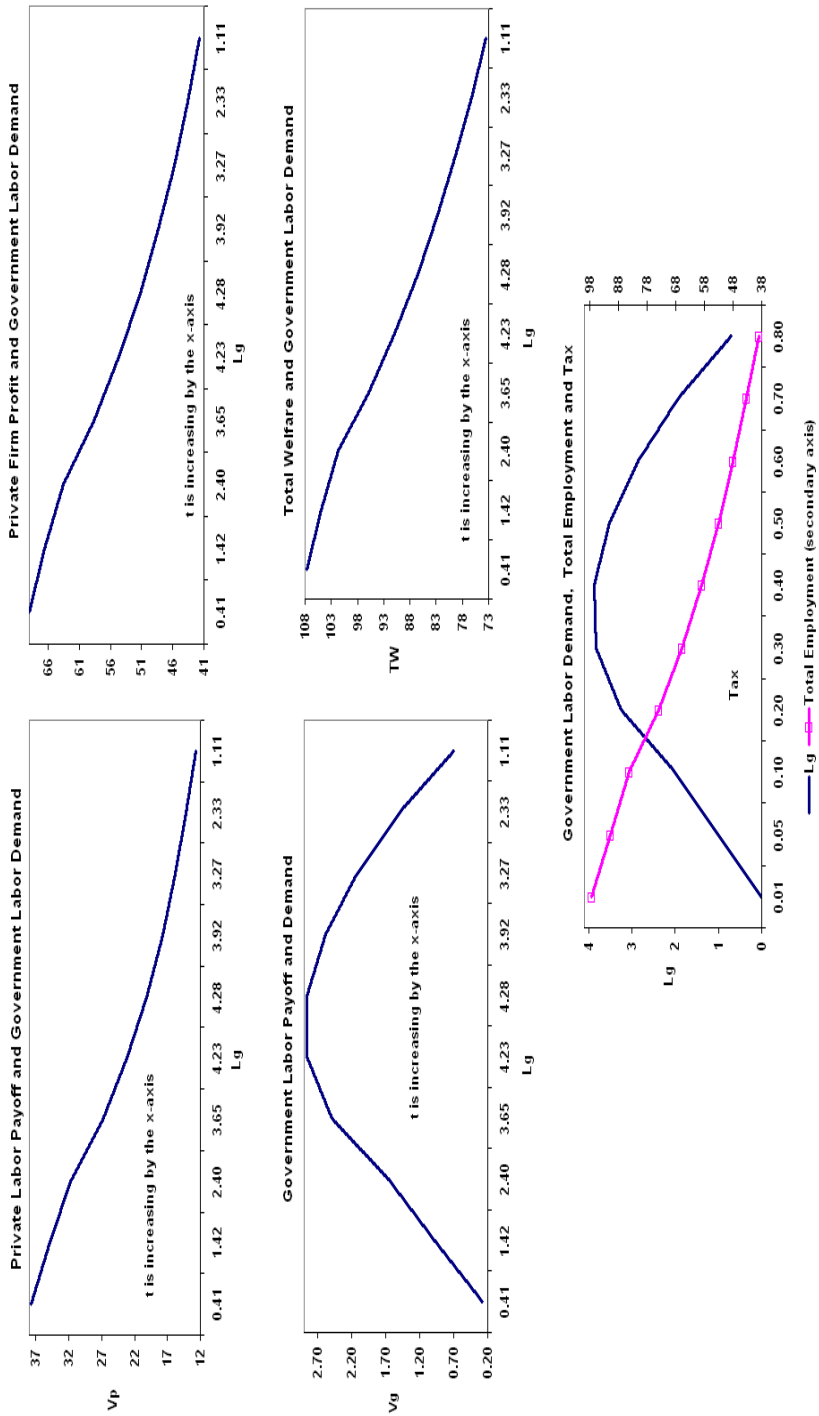


The Effects of Tax Change on Labour Market Variables (\bar{e} Increases)

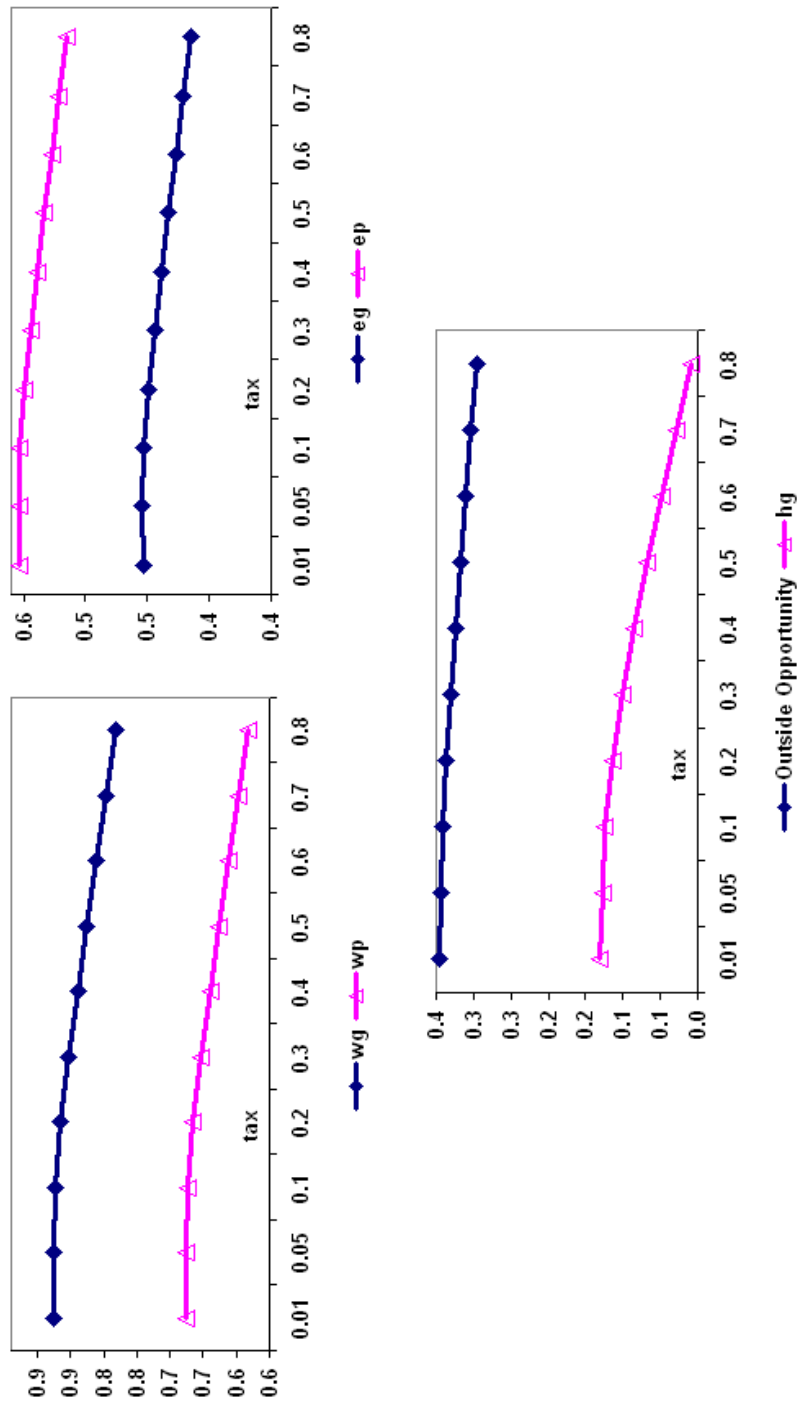
A.7 Tax on Private Sector (U_b increase)

Tax	Frac.workforce monitored	Par. for public production	Par. for public wage	Cost of exerting effort	Payoff of unemp.benefit	Number of workers	Number of firms	Prob. of gov job (h_g)	Gov.emp (L^g)
	$q=0.9$	$\bar{e}=0.1$	$\bar{w}=0.2$	$c=1$	$U_b=0.3$	$H=100$	$n=350$		
	The prob. of unempl. (h_b)	Effort in public (e^g)	Effort in private (e^p)	Payoff of gov. empl. (U_g)	Government wage (w^g)	Private wage (w^p)	Private empl. (L^p)	Prob. of gov job (h_g)	Gov.emp (L^g)
0.01	0.8596	0.46347	0.56347	0.6907	0.9056	0.7056	0.2774	0.1404	0.4086
0.05	0.8635	0.46394	0.56394	0.6915	0.9067	0.7067	0.2560	0.1365	1.4186
0.1	0.8661	0.4630	0.5630	0.6900	0.9044	0.7044	0.2345	0.1339	2.4029
0.2	0.8771	0.4593	0.5593	0.6842	0.8951	0.6951	0.2009	0.1229	3.6479
0.3	0.8900	0.4543	0.5543	0.6764	0.8828	0.6828	0.1759	0.1100	4.2289
0.4	0.9055	0.4488	0.5488	0.6679	0.8693	0.6693	0.1563	0.0945	4.2793
0.5	0.9228	0.44309	0.54309	0.6591	0.8554	0.6554	0.1405	0.0772	3.9223
0.6	0.9410	0.4372	0.5372	0.6502	0.8413	0.6413	0.1276	0.0590	3.2656
0.7	0.9606	0.4312	0.5312	0.6411	0.8271	0.6271	0.1169	0.0394	2.3282
0.8	0.9821	0.42474	0.52474	0.6315	0.8119	0.6119	0.1081	0.0179	1.1142

Tax	Frac.workforce monitored $q = 0.9$	Par. for public production $\bar{e} = 0.1$		Par. for public wage $\bar{w} = 0.2$		Cost of exerting effort $c = 1$		Payoff of unemp.benefit $U_b = 0.3$		Number of workers $H = 100$		Number of firms $n = 350$	
		Total private firm profit	Total private labour payoff	Total welfare	Total unempl.	Total empl.	Total Private empl.	Total Public opportunity labour payoff	Total Private empl.	Total Public opportunity labour payoff			
0.01	68.98	37.68	107.7	2.5	97.5	97.1	0.35	0.2822					
0.05	66.49	34.82	105.0	9.0	91.0	89.6	0.35	0.9810					
0.1	63.58	31.80	101.7	15.5	84.5	82.1	0.35	1.6580					
0.2	58.70	26.88	95.9	26.0	74.0	70.3	0.35	2.4959					
0.3	54.64	23.12	90.9	34.2	65.8	61.6	0.34	2.8604					
0.4	51.24	20.14	86.5	41.0	59.0	54.7	0.33	2.8581					
0.5	48.33	17.73	82.7	46.9	53.1	49.2	0.33	2.5852					
0.6	45.81	15.75	79.3	52.1	47.9	44.7	0.32	2.1233					
0.7	43.61	14.11	76.2	56.8	43.2	40.9	0.31	1.4926					
0.8	41.69	12.73	73.4	61.1	38.9	37.8	0.31	0.7036					



Government Employment and Welfare Analysis (U_b Increases)



The Effects of Tax Change on Labour Market Variables (U_b Increases)

A.8 The Effects of Tax Financed Increase in \bar{w}

	Par. for public production	Par. for public wage	Frac. private workforce monitored	Cost of exerting effort	Payoff of unemp. benefit	Number of workers	Number of firms
	$\bar{c}=0.1$	$\bar{w}=0.2$	$q=0.9$	$c=1$	$U_b=0.2$	$H=100$	$n=350$
	Scenario 1		Scenario 2		Scenario 3		
	$\bar{w}=0.2, t=0.1$	$\bar{w}=0.25, t=0.1$	$\bar{w}=0.25, t=0.1$	$\bar{w}=0.25, t=0.1$	$\bar{w}=0.25, t=0.114$		
Government wage (w^g)	0.9028	0.9532	0.9532	0.9532	0.9518		
The prob. of unempl. (h_b)	0.6904	0.7187	0.7187	0.7187	0.7198		
Effort in public (e^g)	0.4624	0.4625	0.4625	0.4625	0.4620		
Effort in private (e^p)	0.5624	0.5625	0.5625	0.5625	0.5620		
Payoff of gov. empl. (U_g)	0.6890	0.7393	0.7393	0.7393	0.7384		
Gov. emp (L^g)	5.4688	4.9873	4.9873	4.9873	5.4777		
Tax (t)	0.1	0.1	0.1	0.1	0.1140		
Private wage (w^p)	0.7028	0.7032	0.7032	0.7032	0.7018		
Private empl. (L^p)	0.2352	0.2350	0.2350	0.2350	0.2299		
Prob. of gov job (h_g)	0.3096	0.2812	0.2812	0.2812	0.2802		
Outside opportunity	0.3514	0.3516	0.3516	0.3516	0.3509		
Total private lab. payoff	31.8172	31.8110	31.8110	31.8110	31.0533		
Per capita public lab. payoff	0.6890	0.7393	0.7393	0.7393	0.7384		
Private firm profit	69.4399	69.4168	69.4168	69.4168	69.3335		
Total welfare	101.9461	101.9671	101.9671	101.9671	101.1252		
Government lab. payoff	3.7680	3.6871	3.6871	3.6871	4.0446		

A.9 Endogenizing Public Sector Wage and Effort

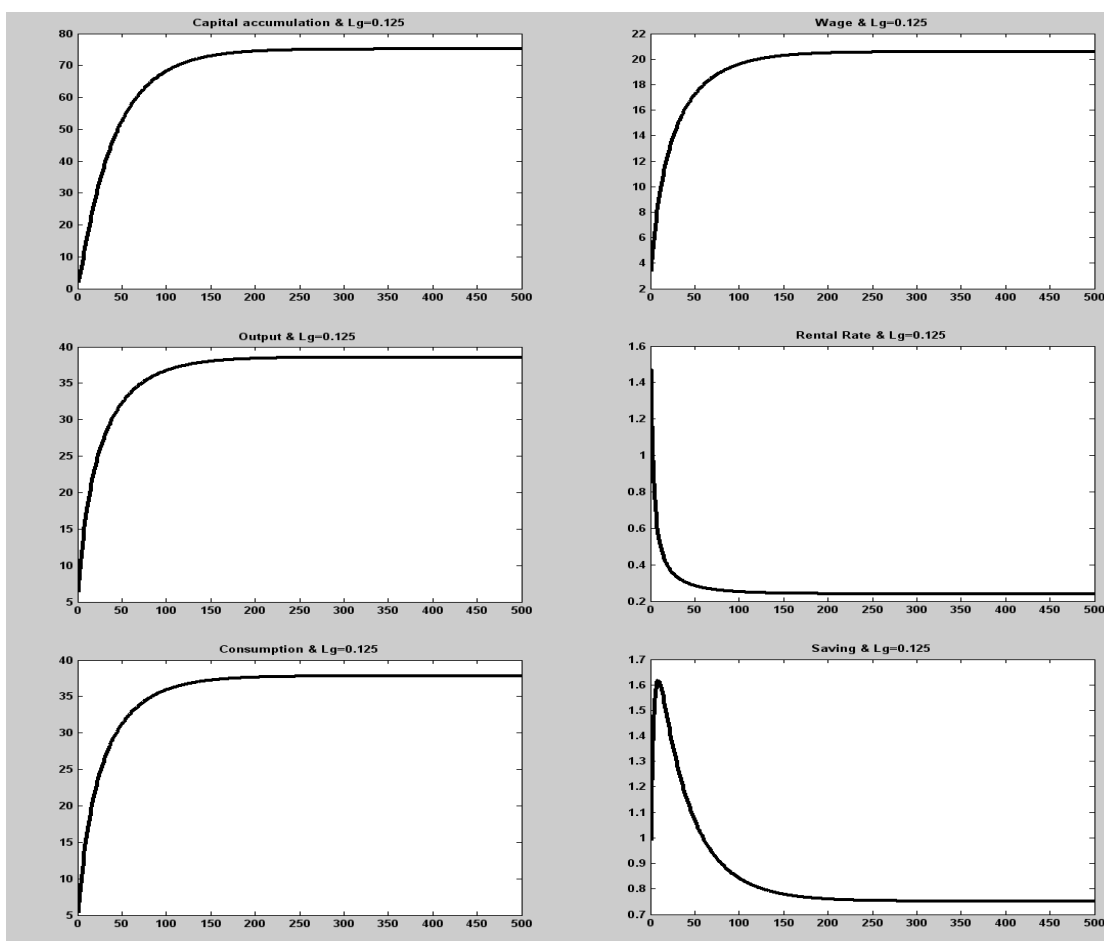
	Frac. public workforce monitored $\beta = 0.8$	Frac. private workforce monitored $q = 0.9$	Cost of exerting effort $c = 1$	Payoff of unemp. benefit $U_b = 0.35$	Number of workers $H = 100$	Number of firms $n = 350$		
	Effort in public (e^g)	Effort in private (e^p)	Payoff of gov. empl. (U_g)	Government wage (w^g)	Private wage (w^p)	Private empl. (L^p)	Prob. of gov job (h_g)	Gov. emp (L^g)
Tax	0.08	0.09	0.1	0.12	0.13	0.15	0.18	0.08
	0.807	0.825	0.813	0.746	0.694	0.552	0.092	0.08
	0.222	0.222	0.212	0.182	0.167	0.142	0.105	0.08
	0.564	0.564	0.564	0.564	0.564	0.564	0.564	0.564
	0.369	0.369	0.367	0.363	0.361	0.358	0.354	0.369
	0.418	0.419	0.412	0.396	0.389	0.378	0.365	0.418
	0.707	0.707	0.707	0.707	0.707	0.707	0.708	0.707
	0.242	0.238	0.233	0.225	0.221	0.213	0.199	0.242
	0.193	0.175	0.187	0.254	0.306	0.448	0.908	0.193
	2.976	2.948	3.420	5.397	6.922	11.345	27.611	2.976

Tax	Frac. public workforce monitored $\beta = 0.8$	Frac. private workforce monitored $q = 0.9$	Cost of exe. effort $c = 1$	Payoff of		Num. of workers $H = 100$	Number of firms $n = 350$	Total private empl.	Outside oppor.	Total public lab. payoff	Per capita	
				unemp.benefit $U_b = 0.35$	unempl.						total public lab. payoff	Total pri. lab. payoff
0.08	64.62	32.91	103.0	12.4	87.6	84.6	0.3537	1.10	0.369	0.3891		
0.09	64.06	32.41	102.4	13.8	86.2	83.3	0.3533	1.09	0.369	0.3891		
0.1	63.48	31.74	101.7	14.9	85.1	81.7	0.3633	1.26	0.367	0.3886		
0.12	62.35	30.62	100.5	15.8	84.2	78.8	0.3533	1.96	0.363	0.3886		
0.13	61.79	30.08	99.9	15.7	84.3	77.4	0.3533	2.50	0.361	0.3887		
0.15	60.70	29.03	98.7	14.0	86.0	74.7	0.3535	4.06	0.358	0.3889		
0.18	59.12	27.10	97.0	2.8	97.2	69.6	0.3539	9.78	0.354	0.3893		

Appendix B

Government employment and growth

B.1 Exogenous Main Model Steady State Values



Graphs for Converging of Variables in Exogenous Main Model

Main Exogenous Model's Simulation Numbers

L_{gt}	0.125	0.225	0.334	0.45	0.56	0.69	0.8
w_t	20.568	25.766	28.729	29.613	28.483	24.567	18.756
Y_t	38.565	45.735	47.862	45.899	41.015	32.183	22.507
r_t	0.23958	0.22461	0.20575	0.18255	0.15699	0.12118	0.084779
τ_t	0.066667	0.12676	0.20048	0.29032	0.38889	0.52672	0.66667
L_{pt}	0.875	0.775	0.666	0.55	0.44	0.31	0.2
S_t	0.7512	0.88907	0.92997	0.89223	0.79831	0.62849	0.44247
C_t	37.814	44.846	46.932	45.007	40.217	31.555	22.064
K_t	75.118	88.905	92.995	89.221	79.829	62.848	44.247
G_t	0.35355	0.47434	0.57793	0.67082	0.74833	0.83066	0.89443

B.2 Steady states values for the exogenous model in which government employment affecting the productivity of the private sector with $\lambda = 0.6$

The exogenous model with $\lambda = 0.6$

L_{gt}	0.125	0.225	0.334	0.45	0.56	0.69	0.8
w_t	12.445	15.57	17.355	17.894	17.226	14.89	11.417
Y_t	23.335	24.347	28.914	27.736	24.805	19.506	13.7
r_t	0.23757	0.22301	0.20435	0.18125	0.15575	0.11996	0.083564
τ_t	0.066667	0.12676	0.20048	0.29032	0.38889	0.52672	0.66667
L_{pt}	0.875	0.775	0.666	0.55	0.44	0.31	0.2
S_t	0.4584	0.54109	0.56563	0.54299	0.48665	0.3848	0.27326
C_t	22.877	27.096	28.348	27.193	24.319	19.121	13.427
K_t	45.839	54.108	56.562	54.298	48.664	38.479	27.325
G_t	0.35355	0.47434	0.57793	0.67082	0.74833	0.83066	0.89443

B.3 Steady states values for the exogenous model in which government employment endogenized to see its effect on the productivity of the private sector

Steady states values for the exogenous model with $\lambda = \frac{1}{1+L_{gt}^{\frac{1}{4}}}$

L_{gt}	0.125	0.225	0.334	0.45	0.56	0.69	0.8
w_t	12.996	15.37	16.448	16.422	15.43	13.032	9.8382
Y_t	24.368	27.283	27.403	25.454	22.219	17.071	11.806
r_t	0.23779	0.22296	0.20416	0.18096	0.15538	0.11952	0.083066
τ_t	0.066667	0.12676	0.20048	0.29032	0.38889	0.52672	0.66667
L_{pt}	0.875	0.775	0.666	0.55	0.44	0.31	0.2
S_t	0.47824	0.53428	0.53659	0.49912	0.43694	0.33801	0.23688
C_t	23.889	26.748	26.866	24.955	21.782	16.733	11.569
K_t	47.823	53.427	53.658	49.911	43.693	33.8	23.688
G_t	0.35355	0.47434	0.57793	0.67082	0.74833	0.83066	0.89443

B.4 Steady state values and growth rates of endogenous models

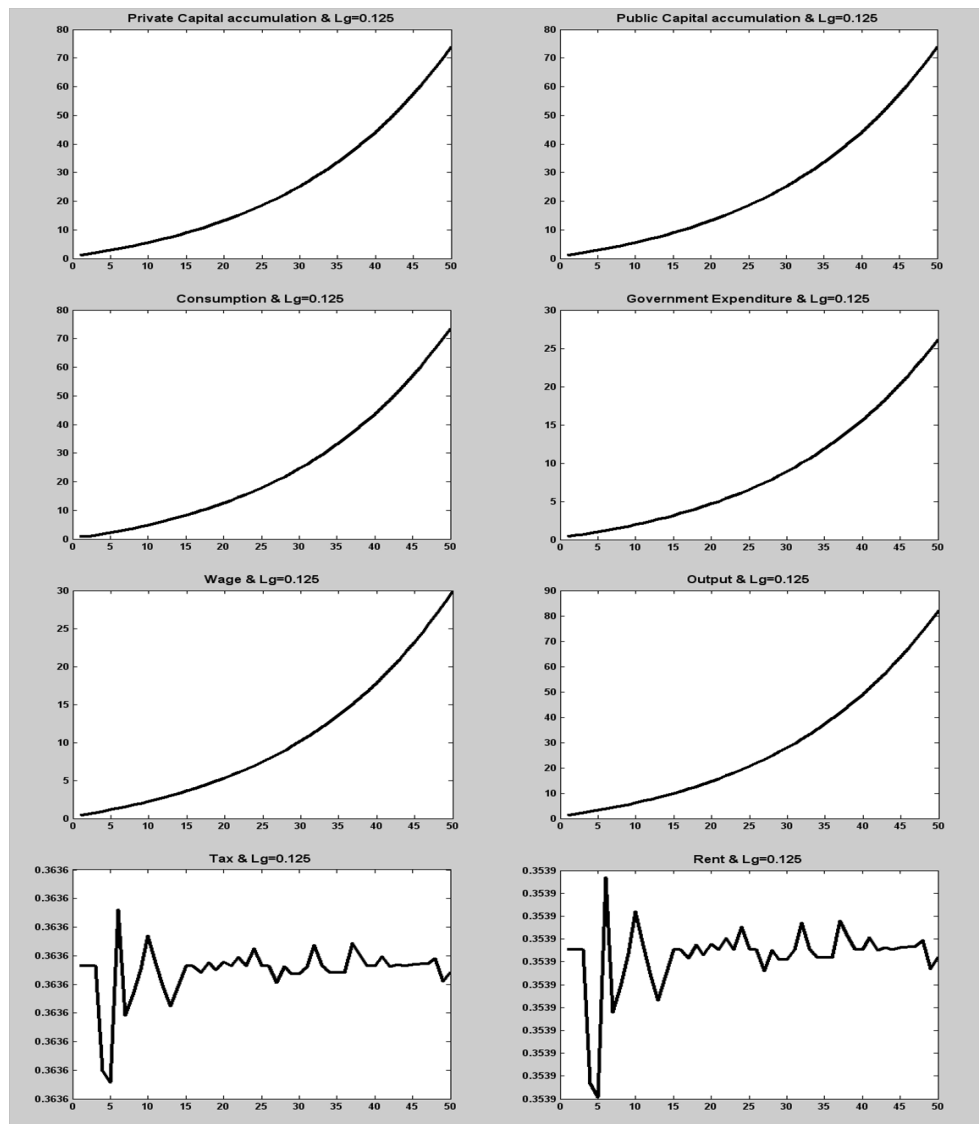
Steady states levels and growth rates for the main endogenous model

L_{gt} (level)	0.125	0.225	0.334	0.45	0.56	0.69	0.8
L_{pt} (level)	0.875	0.775	0.666	0.55	0.44	0.31	0.2
r_t (level)	0.35395	0.36854	0.35436	0.31817	0.2686	0.19421	0.12084
τ_t (level)	0.36364	0.39216	0.42882	0.47619	0.51191	0.61728	0.71429
$\frac{Growthrate}{(Y_{t+1}-Y_t)/Y_t}$	0.051612	0.061029	0.063877	0.061249	0.054793	0.043574	0.032371

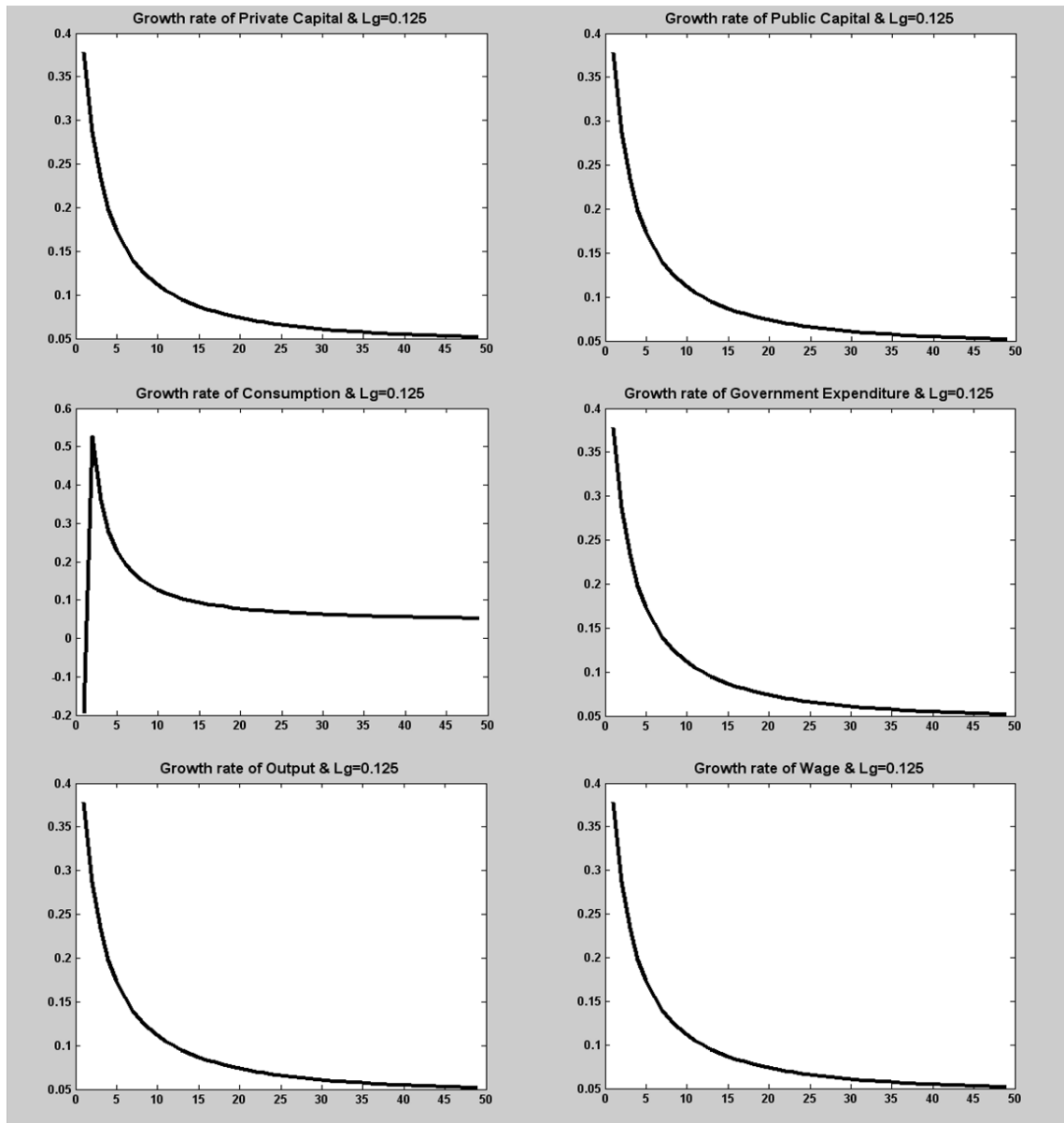
Steady states levels and growth rates of the endogenous model in which government employment affecting the productivity of the private sector

L_{gt} (level)	0.125	0.225	0.334	0.45	0.56	0.69	0.8
L_{pt} (level)	0.875	0.775	0.666	0.55	0.44	0.31	0.2
r_t (level)	0.28029	0.2836	0.2671	0.23591	0.19668	0.14047	0.086632
τ_t (level)	0.36364	0.39216	0.42882	0.47619	0.51191	0.61728	0.71429
$\frac{Growthrate}{(Y_{t+1}-Y_t)/Y_t}$	0.034409	0.037722	0.037862	0.035627	0.032061	0.026817	0.022129

B.5 Graphs for Levels of the Main Endogenous Growth Model



B.6 Graphs for Steady State Growth Rates of the Main Endogenous Growth Model



Appendix C

Son preference in Turkey

C.1 Parity Progression Logistic Regression (1998)

	Probability of progression with the next parity			
	Number of children ¹			
Number of boys	2	3	4	5
One son	-0.8906*** (0.235)	-0.7812*** (0.304)	-0.2927 (0.349)	-0.0598 (0.522)
Two sons	-0.6459** (0.269)	-1.0109*** (0.308)	-0.8047** (0.341)	-0.4284 (0.515)
Three sons		-0.5838 (0.371)	-0.7652** (0.348)	-0.9040 (0.508)
Four sons			-0.4797 (0.401)	-0.791 (0.536)
Five sons				-0.7280 (0.634)
Intercept	8.6399*** (0.760)	8.4001*** (0.814)	9.5570*** (1.005)	9.7899*** (1.260)
Control variables				
Mother's single year of education	-0.1650*** (0.036)	-0.1221*** (0.046)	-0.0001 (0.054)	-0.0656 (0.071)
Mother literacy (Yes=1)	-0.3832 (0.303)	-0.7564*** (0.282)	-1.3583*** (0.294)	-0.9725*** (0.342)
Father's years of education	-0.1123*** (0.027)	-0.1020*** (0.027)	-0.0715** (0.030)	-0.0578 (0.0371)
Mother's age (last child's birth)	-0.3040*** (0.033)	-0.3516*** (0.029)	-0.3551*** (0.034)	-0.3157*** (0.036)
Urban (Yes=1)	-0.2680 (0.200)	-0.0851 (0.191)	-0.6475*** (0.211)	-0.4374* (0.237)
Age at first marriage	0.0956*** (0.033)	0.1446*** (0.033)	0.1308*** (0.037)	0.1122*** (0.0404)
Male head of household (Yes=1)	0.2976 (0.273)	0.6993* (0.310)	0.4731 (0.386)	-0.6865 (0.496)
Regional Controls				
East	3.2838*** (0.564)	1.6060*** (0.321)	1.7674*** (0.378)	1.5244*** (0.367)
Central	0.8008*** (0.240)	1.1460*** (0.259)	-0.0728 (0.300)	0.4123 (0.376)
South	0.8348*** (0.246)	1.0122*** (0.274)	0.7412*** (0.307)	0.4457 (0.350)
North	0.7446*** (0.269)	1.0672*** (0.262)	-0.0127 (0.309)	0.2239 (0.377)
Pseudo R squared	0.3729	0.3457	0.3431	0.2906
Number of obser.	1,263	1,031	764	559

Source: TDHS-1998

¹* significant at 10 % ** significant at 5 % *** significant at 1 %, the numbers are regression coefficients, the numbers in parenthesis are standard errors.

C.2 Parity Progression

	No sons	At least one son	No sons	At least one son
	Families with 4 children		Families with 5 children	
	1998			
Stop child bearing	29	214	9	167
Continue	70	451	29	354
PPR	70.7 %	67.8 %	76.3 %	67.9 %
	1993			
Stop child bearing	39	199	17	166
Continue	93	498	30	389
PPR	70.5 %	71.4 %	63.8 %	70.1 %

Source: TDHS-1998 and TDHS-1993

C.3 Parity Progression Logistic Regression

	Probability of progression with the next parity			
	Number of children			
	1998		1993	
	4	5	4	5
Number of boys				
One son	-0.2631 (0.348)	-0.0656 (0.518)	-0.2835 (0.311)	0.2897 (0.436)
Two sons	-0.7823** (0.342)	-0.4234 (0.511)	-0.6475** (0.300)	0.2649 (0.425)
Three sons	-0.7481** (0.348)	-0.9011 (0.505)	-0.3207 (0.318)	-0.0622 (0.417)
Four sons	-0.4391 (0.401)	-0.7904 (0.531)	-0.6102* (0.345)	-0.0666 (0.429)
Five sons		-0.7358 (0.629)		0.4491 (0.576)
Intercept	9.9063*** (0.972)	9.1983*** (1.167)	9.4893*** (0.914)	8.0613*** (1.081)
Control variables				
Mother's single year of education	0.0045* (0.054)	0.0750 (0.071)	-0.1109** (0.052)	0.0891 (0.073)
Mother literacy (Yes=1)	-1.3666*** (0.295)	-0.9243*** (0.339)	-0.3334 (0.052)	-0.5977* (0.318)
Father's years of education	-0.0697** (0.031)	-0.0575 (0.036)	-0.1224*** (0.034)	-0.1034*** (0.039)
Mother's age (last child's birth)	-0.3539*** (0.034)	-0.3189*** (0.036)	-0.3152*** (0.031)	-0.2801*** (0.031)
Urban (Yes=1)	-0.6571*** (0.210)	-0.4261* (0.236)	-0.1193 (0.202)	-0.4559** (0.227)
Age at first marriage	0.1324*** (0.038)	0.1126*** (0.040)	0.0661* (0.036)	0.0629* (0.038)
Regional Controls				
East	1.7757*** (0.377)	1.5293*** (0.366)	2.1549*** (0.410)	1.6903*** (0.368)
Central	-0.0715 (0.300)	0.4463 (0.375)	0.3346 (0.252)	0.4847 (0.305)
South	0.7156* (0.306)	0.4825 (0.348)	0.7408*** (0.270)	0.9620 (0.308)
North	0.0320 (0.308)	0.2620 (0.375)	0.4559 (0.316)	0.6502 (0.366)
Pseudo R squared	0.3416	0.2876	0.2910	0.2319
Number of obser.	764	559	829	602

* significant at 10 % ** significant at 5 % *** significant at 1 %

The numbers are regression coefficients.

The numbers in parenthesis are standard errors.

Source: TDHS-1998 and TDHS-1993

C.4 Effects of Changes in Son Preference Variables

	Number of children in the family			
	1998		1993	
	4	5	4	5
Base progression rate	68.2 %	68.5 %	71.3 %	69.6 %
Estimated probability of progression				
One son	62.2 %	67.1 %	65.2 %	75.4 %
Two sons	49.5 %	58.7 %	56.5 %	74.9 %
Three sons	50.7 %	46.9 %	64.3 %	68.3 %
Four sons	58.4 %	49.7 %	57.4 %	68.2 %
Five sons		51.0 %		78.2 %

Source: TDHS-1998 and TDHS-1993

C.5 Cox Proportional Hazards Model

	Hazard of having more children			
	Coefficient if number of children is at least			
	1998		1993	
	3	4	3	4
One son	-0.0530	-0.2452	-0.1159	-0.2026
Two sons	-0.3271***	-0.3764**	-0.1345	-0.0417
Three sons	-0.1796	-0.4855***	-0.2516***	-0.0708
Four sons	-0.3305**	-0.5734***	-0.2482**	-0.4154**
Five sons		-0.5121**		-0.1230
Control variables				
Mother's single year of education	-0.0435*	-0.0095	-0.0641***	0.0362
Mother literacy (Yes=1)	-0.4581***	-0.5073***	-0.1977**	-0.3072**
Father's years of education	-0.0440***	-0.0558***	-0.0445***	-0.0736***
Mother's age (last child's birth)	-0.1215***	-0.1214***	-0.1281***	-0.1084***
Urban (Yes=1)	-0.2667***	-0.1230	-0.1672***	-0.1510*
Age at first marriage	0.0522***	0.0694***	0.0536***	0.0532***
Regional Controls				
East	0.6379***	0.7791***	0.7574***	0.7671***
Central	-0.0358	0.2895*	0.2713***	0.2253
South	0.5193***	0.2772*	0.4325***	0.3337**
North	0.2072	0.1963	0.2892**	0.2568*
Hazard ratio				
One son	94.8	78.3	89.0	81.6
Two sons	72.1***	68.6**	87.4	95.9
Three sons	83.6	61.5***	77.8	93.1
Four sons	71.8**	56.4***	78.0	66.0
Five sons		59.9**		88.4
Number of observations	1,562	977	1,826	1,137

* significant at 10 % ** significant at 5 % ***significant at 1 %

Source: TDHS-1998 and TDHS-1993

C.6 Hazards Model with Last Boy Dummy

For the year 1998

Hazard of having more children					
Coefficient if number of children is at least					
	1	2	3	4	5
Last boy	-0.1530***	-0.2048***	-0.3386***	-0.3556***	-0.2762***
Control variables					
Mother's single years of education	-0.0771***	-0.1077***	-0.0767***	-0.0405*	-0.0092
Is mother literate (Yes=1)	-0.0234	-0.1014	-0.2697***	-0.4727***	-0.4651***
Father's years of education	-0.0145***	-0.0387***	-0.0270***	-0.0416***	-0.0575***
Mother's age at child birth	-0.0299***	-0.1046***	-0.1199***	-0.1198***	-0.1232***
Urban (Yes=1)	-0.0992***	-0.1259***	-0.1721***	-0.2691***	-0.1285
Age at first marriage	-0.0064	0.0284***	0.0447***	0.0532***	0.0738***
Regional Control					
East	0.7000***	0.6795***	0.7556***	0.6158***	0.7854***
Central	0.2911***	0.3571***	0.3778***	-0.0765	0.2932*
South	0.4108***	0.4489***	0.4829***	0.5154***	0.2759*
North	0.3637***	0.3481***	0.3445***	0.1657	0.1894
Hazard ratio					
Last boy	85.8***	81.5***	71.3***	70.1***	75.9***
Number of observations	5,067	4,010	2,534	1,562	977

* significant at 10 % **significant at 5 % ***significant at 1 %

Source: TDHS-1998

Hazards Model with Last Boy Dummy (1993)

	Hazard of having more children				
	Coefficient if number of children is at least				
	1	2	3	4	5
Last boy	-0.0783**	-0.1842***	-0.3256***	-0.1570***	-0.1696**
Control variables					
Mother's single years of education	-0.0748***	-0.1053***	-0.0882***	-0.0627***	0.0404
Is mother literate (Yes=1)	0.1104**	-0.1466**	-0.2218***	-0.2014**	-0.3414***
Father's years of education	-0.0239***	-0.0423***	-0.0496***	-0.0453***	-0.0737***
Mother's age at child birth	-0.0308***	-0.0886***	-0.1318***	-0.1269***	-0.1060***
Urban (Yes=1)	-0.0742**	-0.1131***	-0.2277***	-0.1595**	-0.1682**
Age at first marriage	0.0015	0.0321***	0.0654***	0.0550***	0.0504***
Regional Control					
East	0.6382***	0.6952***	0.5026***	0.7604***	0.7651***
Central	0.3250***	0.4550***	0.2115***	0.2587**	0.2111
South	0.4654***	0.4931***	0.3216***	0.4315***	0.3467**
North	0.4551***	0.5071***	0.1427*	0.2822**	0.2551*
Hazard ratio					
Last boy	92.4**	83.2***	72.2***	85.5***	84.4**
Number of observations	5,374	4,335	2,897	1,826	1,137
* significant at 10 % **significant at 5 % ***significant at 1 %					
Source: TDHS-1993					

C.7 Simple Cox Proportional Hazards Model

Simple model ²	Hazard of having more children			
	Coefficient if number of children is at least			
	2	3	4	5
	1998			
One son	-0.3397***	-0.2238***	-0.0185	-0.1881
Two sons	-0.2518***	-0.4044***	-0.1869*	-0.1609
Three sons		-0.2345***	-0.1107	-0.3536**
Four sons			-0.2076*	-0.3502**
Five sons				-0.4187**
Hazard ratio				
One son	71.2***	79.9***	98.1	82.9
Two sons	77.7***	66.7***	82.9*	85.1
Three sons		79.1***	89.5	70.2**
Four sons			81.2*	70.4**
Five sons				65.8**
Number of observations	4,457	2,791	1,752	1,099
	1993			
One son	-0.3737***	-0.3612***	-0.0640	-0.550
Two sons	-0.3034***	-0.4990***	0.0376	0.1178
Three sons		-0.4662***	-0.0533	0.0782
Four sons			-0.1619	-0.1746
Hazard ratio				
Five sons				-0.0221
One son	68.8***	69.7***	93.8	94.6
Two sons	73.8***	60.7***	103.8	112.5
Three sons		62.7***	94.8	108.1
Four sons			85.1	84.0
Five sons				97.8
Number of observations	4,824	3,235	2,055	1,332
Source: TDHS-1998 and TDHS-1993				

²* significant at 10 % ** significant at 5 % ***significant at 1 %

C.8 PP Logistic Regression (year and regional dummy)

	Probability of progression with the next parity			
	Number of children ³			
	2	3	4	5
Number of boys				
One son	-0.9977** (0.171)	-1.1466*** (0.229)	-0.2666 (0.231)	0.1853 (0.331)
Two sons	-0.7611*** (0.192)	-1.4298*** (0.233)	-0.7145*** (0.225)	-0.0186 (0.324)
Three sons		-0.912*** (0.273)	-0.5194** (0.232)	-0.3772 (0.319)
Four sons			-0.4936** (0.260)	-0.3095 (0.330)
Five sons				-0.0481 (0.420)
Dummy_year_1998	-0.2446 (0.194)	-0.8445*** (0.223)	-0.0777 (0.269)	-0.1100 (0.334)
Intercept	9.2261*** (0.529)	10.7250*** (0.619)	9.6484*** (0.672)	8.5843*** (0.798)
Control variables				
Mother's single year of education	-0.1401*** (0.026)	-0.1082*** (0.032)	-0.0609 (0.037)	0.0032 (0.050)
Mother literacy (Yes=1)	-0.7671*** (0.224)	-0.7368*** (0.199)	-0.7903*** (0.197)	-0.7221*** (0.231)
Father's years of education	-0.0927*** (0.020)	-0.1036*** (0.021)	-0.0906*** (0.023)	-0.0768*** (0.027)
Mother's age (last child's birth)	-0.3143*** (0.023)	-0.3587*** (0.022)	-0.3296*** (0.023)	-0.2959*** (0.023)
Urban (Yes=1)	-0.1643 (0.146)	-0.2227 (0.139)	-0.3920*** (0.144)	-0.4457*** (0.162)
Age at first marriage	0.111*** (0.024)	0.1275*** (0.024)	0.0941*** (0.026)	0.0823*** (0.027)
Regional Controls				
East	2.6385*** (0.597)	0.9362*** (0.366)	2.0565*** (0.399)	1.5689*** (0.365)
Central	0.7340*** (0.252)	0.2571 (0.252)	0.2739 (0.251)	0.4240 (0.307)
South	0.5538** (0.243)	0.3038 (0.253)	0.6921** (0.269)	0.8996*** (0.311)
North	0.7102** (0.310)	0.0570 (0.295)	0.3474 (0.313)	0.5362 (0.362)
Dummy_year98*East	0.4909 (0.794)	0.7458 (0.479)	-0.2396 (0.534)	-0.0019 (0.501)
Dummy_year98*Central	0.0184 (0.342)	0.9287* (0.361)	-0.3060 (0.384)	-0.0379 (0.470)
Dummy_year98*South	0.2409 (0.341)	0.7575** (0.363)	0.0063 (0.400)	-0.3756 (0.456)
Dummy_year98*North	-0.0321 (0.403)	1.0635*** (0.399)	-0.3093 (0.428)	-0.2411 (0.508)
Pseudo R squared	0.3609	0.3392	0.3086	0.2500
Number of observations	2,495	2,066	1,593	1,161

Source: TDHS-1998 and TDHS-1993

³* significant at 10 % ** significant at 5 % *** significant at 1 %

C.9 Pooled regressions

Parity Progression Logistic Regression for Pooled Data

	Probability of progression with the next parity			
	Number of children			
	2	3	4	5
Number of boys				
One son	-1.0056*** (0.171)	-1.1266*** (0.228)	-0.309 (0.230)	0.1681 (0.332)
Two sons	-0.7587*** (0.192)	-1.3870*** (0.231)	-0.7372*** (0.224)	-0.0413 (0.325)
Three sons		-0.9337*** (0.271)	-0.5463** (0.231)	-0.4010 (0.320)
Four sons			-0.5200** (0.261)	-0.3251 (0.332)
Five sons				-0.0668 (0.422)
Intercept	8.9354*** (0.545)	9.9380 (0.621)	9.3539*** (0.686)	8.9909*** (0.832)
Control variables				
Mother's single year of education	-0.1412*** (0.026)	-0.1140*** (0.032)	-0.0675* (0.037)	2.73E-05 (0.049)
Mother literacy (Yes=1)	-0.7633*** (0.224)	-0.7139*** (0.198)	-0.7892*** (0.197)	-0.6970*** (0.229)
Father's years of education	-0.0930*** (0.020)	-0.0994*** (0.021)	-0.0928*** (0.023)	-0.0782*** (0.026)
Mother's age (last child's birth)	-0.3115*** (0.023)	-0.3537*** (0.022)	-0.3317*** (0.023)	-0.2932*** (0.023)
Urban (Yes=1)	-0.1474 (0.145)	-0.1995 (0.138)	-0.3957*** (0.144)	-0.4498*** (0.160)
Age at first marriage	0.1080*** (0.024)	0.1262*** (0.024)	0.0928*** (0.026)	0.0833*** (0.027)
Regional Controls				
East	2.8822*** (0.406)	1.2455*** (0.241)	1.8944*** (0.270)	1.5642*** (0.253)
Central	0.7200*** (0.173)	0.6676*** (0.179)	0.1304 (0.190)	0.4056* (0.235)
South	0.6656*** (0.172)	0.6376*** (0.182)	0.6962*** (0.200)	0.7018*** (0.228)
North	0.6587*** (0.199)	0.5631*** (0.199)	0.1541 (0.214)	0.3957 (0.255)
Pseudo R squared	0.3600	0.3333	0.3080	0.2497
Number of obser.	2,495	2,066	1,593	1,161

* significant at 10 % ** significant at 5 % *** significant at 1 %

The numbers are regression coefficients.

The numbers in parenthesis are standard errors.

Source: TDHS-1998 and TDHS-1993

Cox Proportional Hazards Model for Pooled Data

A. Benchmark Model	Hazard of having more children ⁴			
	Coefficient if number of children is at least			
	2	3	4	5
One son	-0.44096***	-0.3656***	-0.0959	-0.2136*
Two sons	-0.3620***	-0.5694***	-0.2317***	-0.1857
Three sons		-0.4487***	-0.2182***	-0.2357**
Four sons			-0.2941***	-0.4661***
Five sons				-0.3001**
Mother's educ.	-0.1095***	-0.0843***	-0.0588***	0.0129
Mother lit. (Y=1)	-0.1080**	-0.2387***	-0.3016***	-0.3882***
Father's educ.	-0.0414***	-0.0370***	-0.0445***	-0.0635***
Mother's age	-0.0969***	-0.1243***	-0.1238***	-0.1148***
Urban (Yes=1)	-0.1231***	-0.2013***	-0.2231***	-0.1423**
Age at first marriage	0.0300***	0.0522***	0.0503***	0.0617***
East	0.6655***	0.6267***	0.6752***	0.7576***
Central	0.4069***	0.3007***	0.1538**	0.2288**
South	0.4647***	0.4047***	0.4664***	0.2959*
North	0.4388***	0.2477***	0.2475***	0.2053***
<i>Hazard ratio</i> One son	66.4***	69.4***	90.9	80.8*
Two sons	69.6***	56.6***	79.3***	83.1
Three sons		63.8***	80.4***	79.0**
Four sons			74.5***	62.7***
Five sons				74.1**
Number of obser.	8,345	5,341	3,388	2,114
B. Simple model				
One son	-0.3561***	-0.2984***	-0.0405	-0.0975
Two sons	-0.2761***	-0.4553***	-0.0639	0.0036
Three sons		-0.3611***	-0.0776	-0.0988
Four sons			-0.1820**	-0.2413**
Five sons				-0.1929
<i>Hazard ratio</i> One son	70.0***	74.2***	96.0	90.7
Two sons	75.9***	63.4***	93.8	100.4
Three sons		69.7***	92.5	90.6
Four sons			83.4**	78.6**
Five sons				82.5
Number of obser.	9,281	6,026	3,807	2,431

⁴* significant at 10 % ** significant at 5 % *** significant at 1 %, Source: TDHS-1998 and TDHS-1993.

Hazards Model with Last Boy Dummy for Pooled Data

	Hazard of having more children				
	Coefficient if number of children is at least				
	1	2	3	4	5
Last boy	-0.1161***	-0.1932***	-0.3299***	-0.2398***	-0.2159***
Control variables					
Mother's single years of education	-0.0765***	-0.1078***	-0.0838***	-0.0558***	0.0151
Is mother literate (Yes=1)	0.0505	-0.1225***	-0.2445***	-0.3021***	-0.3901***
Father's years of education	-0.0188***	-0.0408***	-0.0368***	-0.0441***	-0.0650***
Mother's age at child birth	-0.0302***	-0.0969***	-0.1243***	-0.1227***	-0.1149***
Urban (Yes=1)	-0.0890***	-0.1271***	-0.2016***	-0.2171***	-0.1439**
Age at first marriage	-0.0038	0.0299***	0.0532***	0.0525***	0.0622***
Regional Control					
East	0.6670***	0.6749***	0.6160***	0.6806***	0.7579***
Central	0.3063***	0.4095***	0.2904***	0.1310	0.2198**
South	0.4368***	0.4697***	0.3957***	0.4586***	0.2984*
North	0.4064***	0.4271***	0.2370***	0.2388***	0.2095***
Hazard ratio					
Last boy	89.0***	82.4***	71.9***	78.7***	80.6***
Number of observations	10,441	8,345	5,431	3,388	2,114

* significant at 10 % **significant at 5 % ***significant at 1 %

Source: TDHS-1993

Bibliography

- Agenor, P. (2005), 'The analytics of segmented labour markets'. unpublished working paper.
- Agenor, P. & Karim, J. P. E. A. (2003), 'Labour market policies and unemployment in morocco: A quantitative analysis'. Policy Research Working Paper No 3091.
- Aghion, P. & Howitt, P. (1992), 'A model of growth through creative destruction', *Econometrica* **60**(2), 323–351.
- Aghion, P. & Howitt, P. W. (1998), *Endogenous Growth Theory*, MIT Press.
- Akerlof, G. (1982), 'Labour contracts as partial gift exchange', *The Quarterly Journal of Economics* pp. 543–569.
- Akerlof, G. (1984), 'Gift exchange and efficiency-wage theory: Four views', *The American Economic Review* pp. 79–83.
- Algan, Y., Cahuc, P., Zylberberg, A., Pischke, J. & Verdier, T. (2002), 'Public employment and labour market performance', *Economic Policy* pp. 9–65.
- Altun, I. & Ersoy, N. (1998), 'Perspectives on old age in turkey', *Journal of Asian and International Bioethics* **8**, 143–145.
- Aly, H. & Shields, M. (1991), 'Son preference and contraception in egypt', *Economic Development and Cultural Change* **39**(2), 353–370.
- Angrist, J., Lavy, V. & Schlosser, A. (2005), 'New evidence on the causal link between the quantity and quality of children'. MIT, NBER and Hebrew University working paper.
- Ardagna, S. (2001), 'Fiscal policy composition, public debt, and economic activity', *Public Choice* **109**(3), 301–325.
- Ardagna, S. (2004), 'Fiscal stabilizations: When do they work and why', *European Economic Review* **48**(5), 1047 – 1074.
- Arrow, K. J. (1962), 'The economic implications of learning by doing', *The Review of Economic Studies* **29**(3), 155–173.

- Assaad, R. (1997), 'The effects of public sector hiring and compensation policies on the Egyptian labor market', *The World Bank Economic Review* **11**(1), 85–118.
- Auer, P. & Popova, N. (2003), 'Labour market policy for restructuring in Turkey: The need for more active policies', *Employment Paper* **51**.
- Azariadis, C. (1975), 'Implicit contracts and underemployment equilibria', *The Journal of Political Economy* pp. 1183–1202.
- Ball, L., Mankiw, N. & Romer, D. (1988), 'The New Keynesian Economics and the Output-Inflation Trade-off', *Brookings Papers on Economic Activity* **1**, 1–65.
- Barro, R. (1990), 'Government spending in a simple model of endogenous growth'. *Journal of Political Economy*, 98, S103-S125.
- Barro, R. (1991), 'Economic Growth in a Cross Section of Countries', *The Quarterly Journal of Economics* **106**(2), 407–443.
- Barro, R. J., Mankiw, N. G. & Sala-i-Martin, F. X. (1992), 'Capital Mobility in Neoclassical Models of Growth', *National Bureau of Economic Research* .
- Barro, R. & Sala-i Martin, X. (1992), 'Public finance in models of economic growth', *Review of Economic Studies* **59**(4), 645–661.
- Barro, R. & Sala-i Martin, X. (1999), *Economic Growth*, MIT Press. Cambridge, Ma.
- Baslevant, C. & Onaran, O. (2003), 'Are Married Women in Turkey More Likely to Become Added or Discouraged Workers?', *Labour* **17**, 439–458.
- Baslevant, C. & Onaran, O. (2004), 'The effect of export-oriented growth on female Labour market outcomes in Turkey', *World Development* **32**(8), 1375–1393.
- Baslevant, C. & Tunali, I. (2002), 'Married women's participation choices and productivity differentials: Evidence from urban turkey'. Koc University working paper.
- Becker, G. (1971), *The economics of discrimination*, University of Chicago Press.
- Becker, G. S. & Tomes, N. (1976), 'Child endowments and quantity and quality of children', *Journal of Political Economy* **84**, 143–162.
- Becker, G. & Stigler, G. (1974), 'Law enforcement, malfeasance, and compensation of enforcers', *The Journal of Legal Studies* pp. 1–18.
- Becker, S. & Lasee, A. (1997), 'Husband-wife communication about family planning and contraceptive use in kenya', *International Family Planning Perspectives* **23**(1), 15–20.

Behar, C., Courbage, Y. & G

"ursoy, A. (1999), 'Economic growth or survival? the problematic case of child mortality in Turkey', *European Journal of Population/Revue européenne de Démographie* **15**(3), 241–278.

Bellante, D. & Long, J. (1981), 'The political economy of the rent-seeking society: The case of public employees and their unions', *Journal of Labour Research* **2**(1), 1–14.

Ben-Porath, Y. & Welch, F. (1976), 'Do sex preferences really matter?', *Quarterly Journal of Economics* **90**, 285–307.

Berik, G. & Bilginsoy, C. (2000), 'Type of work matters: Women's labor force participation and the child sex ratio in Turkey', *World Development* **28**(5), 861–878.

Bernabe, S. (2002), 'Informal employment in countries in transition: a conceptual framework'. Centre for Analysis of Social Exclusion, London School of Economics and Political Science.

Bernhardt, E. (1993), 'Fertility and employment', *European Sociological Review* **9**(1), 25–42.

Blanchflower, D. (1996), *The role and influence of trade unions in the OECD*, Centre for Economic Performance, London School of Economics and Political Science.

Boeri, T. & Nicoletti, G. (n.d.), S. Scarpetta (2000), Regulation and Labour Market Performance, Technical report, CEPR Discussion Paper 2420.

Bratti, M. (2002), 'Parents' current income, long-term characteristics and children's education:evidence from the 1970 british cohort study'. Warwick Economic Research Papers, No: 658.

Bulatao, R. (1979), *On the Nature of the Transition in the Value of Children*, [East-West Population Institute, East-West Center], [Honolulu].

Bulkley, G. & Myles, G. D. (1996), 'Trade unions, efficiency wages, and shirking', *Oxford Economic Papers* **48**, 75–88.

Bulutay, T. (1995), *Employment, Unemployment and Wages in Turkey*, International Labour Organization.

Bulutay, T. (2000), 'The Unrecorded Economy as Related to the Labour Market', *Dimensions of the Unrecorded Economy in Turkey* pp. 1–81.

Bulutay, T. & Tasti, E. (2002), Informal sector in the Turkish Labour market, Turkish Economic Association, Technical report, Discussion paper 2004/22. http://www.tek.org.tr/dosyalar/informal_in_turkey.pdf.

- Burnside, A., Eichenbaum, M. & Fisher, J. (2003), 'Fiscal shocks and their consequences', *NBER working paper* .
- Caldwell, J. C. (1979), 'Education as a factor in mortality decline: an examination of nigerian data', *Population Studies* **33**(3), 395–414.
- Caldwell, J. C. (1981), 'Mass education as a determinant of the timing of fertility decline', *Population and Development Review* **6**(2), 225–255.
- Cardia, E., Kozhaya, N. & Ruge-Murcia, F. (2003), 'Distortionary Taxation and Labour Supply', *Journal of Money, Credit & Banking* **35**(3), 351–374.
- Carmichael, H. (1990), 'Efficiency wage models of unemployment-one view', *Economic Inquiry* **28**(2), 269–295.
- Cass, D. (1965), 'Optimum growth in an aggregative model of capital accumulation: A turnpike theorem', *Econometrica* **34**(4), 833–850.
- Cavallo, M. (2005), 'Government employment expenditure and the effects of fiscal policy shocks', *Federal Reserve Bank of San Francisco Working Paper* **16**, 2005.
- Cebi, C. (2000), 'A Short Note on Turkish Public Sector Employment and Personnel Expenses'. Research Department, Central Bank of Turkey.
- Central Bank of Turkey, T. (2009), 'Website', <http://www.tcmb.gov.tr> .
- Chang, M. (1994), 'Sex preference and sex ratio at birth: The case of taiwan'. Paper Presented at the UNFPA/KIHASA International Symposium on Issues Related to Sex Preference for Children in the Rapidly Changing Demographic Dynamics in Asia, 21-24 November, Seoul, Republic of Korea.
- Chapman, B., Dunlop, Y., Gray, M., Liu, A. & Mitchell, D. (1999), 'The forgone earnings from child rearing revisited'. Centre for Economic Policy Research Discussion Paper No 407.
- Chen, L. & Mosley, W. H. (1984), 'An analytic framework for the study of child survival in developing countries', *Population and Development Review* **10**, 25–48.
- Cho, N. & Park, C. (1995), 'Consequences of a son preference in a low-fertility society: Imbalance of the sex ratio at birth in korea', *Population and Development Review* **21**(1), 59–84.
- Choulet, C. (2006), 'Public job creation and unemployment dynamics'. EUREQua-CNRS-Université Paris 1, Preliminary draft.
- Citci, O. (1982), 'Women's issues and female public sector employees in Turkey'.

- Clark, S. (2000), 'Son preference and sex composition of children: Evidence from india', *Demography* **37**(1), 95–108.
- Cox, D. (1972), 'Regression models and life tables', *Journal of the Royal Statistical Society Series B (Statistical Methodology)* **34**, 187–202.
- Dasgupta, P. & Ray, D. (1986), 'Inequality as a determinant of malnutrition and unemployment: Theory', *The Economic Journal* pp. 1011–1034.
- De Tray, D. (1984), 'Son preference in pakistan: An analysis of intentions vs. behavior', *Research in Population Economics* **5**, 185–200.
- Demekas, D. G. & Kontolemis, Z. G. (2000), 'Government employment and wages and labour market performance', *Oxford Bulletin of Economics and Statistics* **62**(3), 391–415. Blackwell Publishers Ltd 2000, International Monetary Fund, Washington D.C.
- Demographic Health Survey, D. (2009), 'Website', <http://www.measuredhs.com> .
- Dhont, T. & Heylen, F. (2005), 'Fiscal policy, employment and growth : Why is the euro area lagging behind'. Paper presented at the 20th Annual Congress of the European Economic Association, Amsterdam.
- Di Tella, R. & Schargrotsky, E. (2003), 'The Role of Wages and Auditing during a Crackdown on Corruption in the City of Buenos Aires*', *The Journal of Law and Economics* **46**(1), 269–292.
- Dickens, W. & Studies, E. (1986), 'Wages, employment and the threat of collective action by workers', *NBER Working Paper* .
- Doeringer, P. & Piore, M. (1971), *Internal labor markets and manpower analysis*, Heath Lexington Books.
- Domar, E. (1946), 'Capital Expansion, Rate of Growth, and Employment', *Econometrica* **14**(2), 137–47.
- Dreze, J. & Murthi, M. (2001), 'Fertility, education, and development: Evidence from india', *Population and Development Review* **27**, 33–63.
- Easterly, W. & Rebelo, S. (1993), 'Fiscal Policy and Economic Growth', *Journal of Monetary Economics* **32**, 417–58.
- Edelberg, W., Eichenbaum, M. & Fisher, J. (1998), 'Understanding the effects of a shock to government purchases'.
- Ehrenberg, R. & Schwarz, J. (1986), 'Public-Sector Labour Markets' in: Ashenfelter, O. and Leyard, R.(eds.), *Handbook of Labour Economics*, Vol. II'.

- Ergocmen, B. (1997), Women's status and fertility in turkey, Technical report, Hacettepe University Institute of Population Studies and Macro International Inc., Calverton, Maryland. in *Fertility Trends, Women's Status, and Reproductive Expectations in Turkey: Results of Further Analysis of the 1993 Turkish Demographic and Health Survey*.
- Fine, B. (2000), 'Critical survey. endogenous growth theory: a critical assessment', *Cambridge Journal of Economics* **24**(2), 245–265.
- Finn, M. (1998), 'Cyclical effects of government's employment and goods purchases'. *International Economic Review*, 39, 3, 635-657.
- Friedman, M. (1968), 'The role of monetary policy', *The American Economic Review* pp. 1–17.
- Ganelli, G. (2005), 'The International Effects of Government Spending Composition', *IMF Working Papers* .
- Gelb, A., Knight, J. B. & Sabot, R. H. (1991), 'Public sector employment, rent seeking and economic growth', *Economic Journal* **101**(408), 1186–99.
- Gomes, P. (2009), 'Fiscal policy and the labour market: the effects of public sector employment and wages', *London School of Economics Working Paper* .
- Gregory, R. & Borland, J. (1999), 'Recent developments in public sector labor markets', *Handbooks in Economics* **5**(3 Part C), 3573–3630.
- Grossman, G. & Helpman, E. (1991), *Innovation and Growth in the Global Economy*, MIT Press, Cambridge, MA.
- Hacettepe Nufus Etutleri Enstitusu, H. (2009), 'Website', <http://www.hips.hacettepe.edu.tr> .
- Hansson, P. & Henrekson, M. (1994), 'A new framework for testing the effect of government spending on growth and productivity', *Public Choice* **81**(3), 381–401.
- Harrod, R. (1939), 'An Essay in Dynamic Theory', *Economic Journal* **49**(193), 14–33.
- Haughton, J. & Haughton, D. (1998), 'Are simple tests of son preference useful? an evaluation using data from vietnam', *Journal of Population Economics* **11**(4), 495–516.
- Heller, P. & Tait, A. (1983), 'Government Employment and Pay: Some International Comparisons', *IMF occasional paper* (24). Washington D.C.: International Monetary Fund.

- Holmlund, B. (1997), 'Macroeconomic implications of cash limits in the public sector', *Economica* pp. 49–62.
- HUIPS (1994), '1993 turkey demographic and health survey'. Hacettepe University Institute of Population Studies (HUIPS), Ankara, Ministry of Health, and Macro Int.
- HUIPS (1999), '1998 turkey demographic and health survey'. Hacettepe University Institute of Population Studies (HUIPS), Ankara, Ministry of Health, and Macro Int.
- International Labour Organization, I. (2009), 'Website', <http://www.ilo.org>.
- Jones, C. I. (1995), 'R&d-based models of economic growth', *Journal of Political Economy* **103**(4), 759–84.
- Jones, E. F. (1982), 'Ways in which childbearing affects women's employment: Evidence from the u.s. 1975 national fertility study', *Population Studies* **36**(1), 5–14.
- Jones, L., Manuelli, R. & Rossi, P. (1993), 'Optimal taxation in models of endogenous growth', *Journal of Political Economy* **101**(3), 485.
- Kafle, R. (2005), 'Sex Preference in Nepal: Study from Demographic and Health Survey, 2001'. Website: <http://www.iipsindia.org>.
- Kagitcibasi, C. (1982a), 'Old-age security value of children: Cross-national socioeconomic evidence', *Journal of Cross-Cultural Psychology* **13**(1), 29.
- Kagitcibasi, C. (1982b), *The changing value of children in Turkey*, East-West Population Institute.
- Kagitcibasi, C. & Ataca, B. (2005), 'Value of children and family change: A three-decade portrait from Turkey', *Applied Psychology* **54**, 317–337.
- Kalaca, C. & Akin, A. (1995), 'Sex selection continued: The issue of sex selection in Turkey', *Human Reproduction* **10**(7), 1631.
- Kasnakoglu, Z. & Dayioglu, M. (1997), 'Female Labour Force Participation and Earnings Differentials between Genders in Turkey', *Economic Dimensions of Gender Inequality: A Global Perspective* p. 95.
- Kevane, M. & Levine, D. I. (2001), *The changing status of daughters in indonesia*, Mimeo, University of California, Berkeley.
- Keynes, J. (1937), 'The general theory of employment', *The Quarterly Journal of Economics* pp. 209–223.
- Khan, M. A. & Sirageldin, I. (1977), 'Son preference and the demand for additional children in pakistan', *Demography* **14**(4), 481–495.

- Koopmans, T. C. (1965), *On the Concept of Optimal Economic Growth*, Amsterdam, North Holland. in *The Econometric Approach to Development Planning*.
- Kravdal, O. (2001), 'Main and interaction effects of women's education and status on fertility: The case of tanzania', *European Journal of Population* **17**, 107–136.
- Larsen, U., Chung, W. & Das Gupta, M. (1998), 'Fertility and son preference in korea', *Population Studies* **52**(3), 317–325.
- Layard, R. & Johnson, G. (1986), 'The natural rate of unemployment: Explanation and policy. 1986. Handbook of Labor Economics, Volume II, O. Ashenfelter and R. Layard eds'.
- Lazear, E. (1979), 'Why is there mandatory retirement?', *The Journal of Political Economy* pp. 1261–1284.
- Lazear, E. (1981), 'Agency, earnings profiles, productivity, and hours restrictions', *The American Economic Review* pp. 606–620.
- Lindbeck, A. & Snower, D. (1986), 'Wage setting, unemployment, and insider-outsider relations', *The American Economic Review* pp. 235–239.
- Linnemann, L. (2009), 'Macroeconomic effects of shocks to public employment', *Journal of Macroeconomics* **31**(2), 252–267.
- Lucas, R. (1988), 'On the mechanics of development planning', *Journal of Monetary Economics* **22**(1), 3–42.
- Lundberg, S. (2005), 'Sons, daughters, and parental behaviour', *Oxford Review of Economic Policy* **21**(3), 340–356.
- Malcolmson, J. (1981), 'Unemployment and efficiency wage hypothesis', *Economic Journal* pp. 848–66.
- Malley, J. & Moutos, T. (1996), 'Does Government Employment "Crowd-Out" Private Employment? Evidence from Sweden', *The Scandinavian Journal of Economics* pp. 289–302.
- Mannan, M. (1988), 'Preference for son, desire for additional children and contraceptive use in bangladesh', *Bangladesh Development Studies* **16**(3), 31–57.
- Mason, K. (1997), 'How family position influences marital women's autonomy and power in five asian countries'. unpublished working paper.
- McClelland, G. (1979), 'Determining the impact of sex preferences on fertility: A consideration of parity progression ratio, dominance, and stopping rule measures', *Demography* **16**, 377–388.

- Mendoza, E., Milesi-Ferretti, G. & Asea, P. (1997), 'On the ineffectiveness of tax policy in altering long-run growth: Harberger's superneutrality conjecture', *Journal of Public Economics* **66**(1), 99–126.
- Mueller, R. (1998), 'Public–private sector wage differentials in Canada: evidence from quantile regressions', *Economics Letters* **60**(2), 229–235.
- Myles, G. D. (2000), 'Taxation and economic growth', *Fiscal Studies* **21**, 141–168.
- Nelson, J. (1994), *Organized Labour, Politics, and Labour Market Flexibility in Developing Countries*, World Bank, Washington, DC. in *Labour Markets in an Era of Adjustment*, Vol. I, ed. by Susan Horton, Ravi Kanbur, and Dipak Mazumdar.
- Neumann, J. V. (1945), 'A model of general economic equilibrium', *The Review of Economic Studies* **13**(1), 1–9.
- Newbery, D. & Stiglitz, J. (1987), 'Wage rigidity, implicit contracts, unemployment and economic efficiency', *The Economic Journal* pp. 416–430.
- Panizza, U. (1998), 'Why Do Lazy People Make More Money?', *Washington: Inter-American Development Bank (IDB). Mimeographed* .
- Panizza, U., di Tella, R. & Van Rijckeghem, C. (2001), 'Public Sector Wages and Bureaucratic Quality: Evidence from Latin America [with Comments]', *Economia* pp. 97–151.
- Panizza, U. & Qiang, Z. (1999), 'Spoiled Bureaucrats and Exploited Women: Public Sector Premium and Gender Gap in Latin America', *Washington: Inter-American Development Bank (IDB). Mimeographed* .
- Pappa, P. E. (2005), 'New Keynesian or RBC transmission? The Effects of Fiscal Policy in Labor Markets', *SSRN eLibrary* .
- Peker, A. (1997), 'Sosyal guvenlik sisteminin yeniden yapilandirilmesi tartismalari ve cozum onerileri', Discussion papers, Research and Monetary Policy Department, Central Bank of the Republic of Turkey. <http://ideas.repec.org/p/tcb/dpaper/9703.html>.
- Philpott, J. (1997), *Working for full employment*, Routledge.
- Pisauro, G. (1991), 'The effect of taxes on labour in efficiency wage models', *Journal of Public Economics* **46**(3), 329–345.
- Pong, S. (1994), 'Sex preference and fertility in peninsular malaysia', *Studies in Family Planning* **25**(3), 137–148.
- Population Reports, M. (1994), *Opportunities for Women Through Reproductive Choice*, Technical report, Johns Hopkins University, Baltimore.

- Poston, D. (2002), 'Son preference and fertility in china', *Journal of Biosocial Science* **34**(3), 333–347.
- Prescott, E. (2004), 'Why Do Americans Work So Much More Than Europeans?', *Federal Reserve Bank of Minneapolis Quarterly Review* **28**(1), 2–13.
- Rahman, M., Akbar, J., Phillips, J. & Becker, S. (1992), 'Contraceptive use in Matlab, Bangladesh: the role of gender preference', *Studies in family planning* **23**(4), 229–242.
- Rahman, M. & Da Vanzo, J. (1993), 'Gender preference and birth spacing in matlab, bangladesh', *Demography* **30**, 315–332.
- Rama, M. (1999), 'Public sector downsizing: an introduction', *The World Bank Economic Review* **13**(1), 1–22.
- Ramey, V. & Shapiro, M. (1998), 'Costly capital reallocation and the effects of government spending', *Carnegie-Rochester Confer. Series on Public Policy* **48**, 145–194.
- Ramsey, F. P. (1928), 'A mathematical theory of saving', *The Economic Journal* **38**(152), 543–559.
- Rauch, J. & Evans, P. (2000), 'Bureaucratic structure and bureaucratic performance in less developed countries', *Journal of Public Economics* **75**(1), 49–71.
- Raut, L. K. (1996), 'Old-age security and gender preference hypotheses: A duration analysis of malaysian family life survey data', *Journal of Qualitative Economics* **12**(1), 81–104.
- Rodrik, D. (2000), 'What drives public employment in developing countries?', *Review of Development Economics* **4**, 229–243.
- Romer, P. M. (1986), 'Increasing returns and long-run growth', *Journal of Political Economy* **94**(5), 1002–1037.
- Romer, P. M. (1987), 'Growth based on increasing returns due to specialization', *American Economic Review* **77**(2), 56–62.
- Romer, P. M. (1990), 'Endogenous technological change', *Journal of Political Economy* **98**(5), S71–102.
- Rose, E. (1999), 'Consumption smoothing and excess female mortality in rural india', *The Review of Economics and Statistics* **81**(1), 41–49.
- Rosen, S. (1985), 'Implicit contracts: a survey', *NBER Working Paper* .
- Rosenzweig, M. (1988), *Labour Markets in Low-Income Countries*. in Hollis Chenery, and T.N. Srinivasan, eds., *Handbook of Development Economics*, Vol. I, North Holland Amsterdam.

- Rosenzweig, M. R. & Schultz, T. P. (1982), 'Market opportunities, genetic endowments, and intrafamily resource distribution: Child survival in rural india', *American Economic Review* **72**(4), 803–815.
- Rotemberg, J. & Woodford, M. (1992), 'Oligopolistic pricing and the effects of aggregate demand on economic activity', *Journal of Political Economy* pp. 1153–1207.
- Salop, S. (1979), 'A model of the natural rate of unemployment', *The American Economic Review* pp. 117–125.
- Schumpeter, J. A. (1934), *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*, Harvard University Press, Cambridge.
- Sen, A. & Sengupta, S. (1983), 'Malnutrition of rural children and the sex bias', *Economic and Political Weekly* **18**, 885–864.
- Shapiro, C. & Stiglitz, J. E. (1984), 'Equilibrium unemployment as a worker discipline device', *American Economic Review* **74**, 433–444.
- Smits, J. & Gunduz-Hosgor, A. (2006), 'Effects of family background characteristics on educational participation in turkey', *International Journal of Educational Development* **26**, 545–560.
- Solow, R. (1956), 'A contribution to the theory of economic growth', *Quarterly Journal of Economics* **70**, 65–94.
- Stiglitz, J. (1974), 'Alternative theories of wage determination and unemployment in LDC's: The Labour turnover model', *The Quarterly Journal of Economics* pp. 194–227.
- Stiglitz, J. (1976), 'The Efficiency Wage Hypothesis, Surplus Labour, and the Distribution of Income in LDCs 1', *Oxford Economic Papers* **28**(2), 185–207.
- Stokey, N. & Rebelo, S. (1995), 'Growth Effects of Flat-Rate Taxes', *Journal of Political Economy* **103**(3), 519.
- Swan, T. (1956), 'Economic growth and capital accumulation', *Economic Record* **32**, 344–361.
- Tansel, A. (1998), 'Workers Displaced Due to Privatization in Turkey: Before and After Displacement?', *METU Studies in Development* **25**(4), 625–647.
- Tansel, A. (2000), 'Wage earners, self employed and gender in the informal sector in turkey'. unpublished working paper.
- Tansel, A. (2001), 'Economic Development and Female Labour Force Participation in Turkey: Time-Series Evidence and Cross-Province Estimates'.

- Tansel, A. (2002), 'Determinants of schooling attainment for boys and girls in turkey individual, household and community factors', *Economics of Education Review* **21**, 455–470.
- Tansel, A. (2005), 'Public-private employment choice, wage differentials, and gender in Turkey', *Economic development and cultural change* **53**(2), 453–477.
- Terrell, K. (1993), 'Public-Private Wage Differentials in Haiti: Do Public Servants Earn a Rent?', *Journal of Development Economics* **42**(2), 293–314.
- Thiruvenkitasamy, S. (1992), 'Economic motivation and fertility behaviour:a comparison of rural and urban areas in tamil nadu', *The Journal of Family Welfare* **38**(1), 68–79.
- Thurow, L. (1975), *Generating inequality: Mechanisms of distribution in the US economy*, Basic Books.
- Todaro, M. (1969), 'A model of Labour migration and urban unemployment in less developed countries', *The American Economic Review* pp. 138–148.
- Tunali, I. (2003), 'Background study on labour market and employment in turkey'. unpublished working paper.
- Turkish Employment Organization, T. (2009), 'Website', <http://www.iskur.gov.tr> .
- Turkish High Audit Board, A. (2009), 'Website', <http://www.ydk.gov.tr> .
- Turkish Statistics Institute, S. (2009), 'Website', <http://www.tuik.gov.tr> .
- Turkish Undersecretariat of Treasury, H. (2009), 'Website', <http://www.hazine.gov.tr> .
- Turnovsky, S. (1996), 'Optimal tax, debt, and expenditure policies in a growing economy', *Journal of Public Economics* **60**(1), 21–44.
- Turnovsky, S. (2000), 'Fiscal policy, elastic Labour supply, and endogenous growth', *Journal of Monetary Economics* **45**(1), 185–210.
- TUSIAD (2004), Turkiye'de isgucu piyasasinin kurumsal yapisi ve issizlik, Discussion papers. www.tusiad.org.
- Ulusoy, M. (1986), 'The effect of the sex of living children on fertility', *Turkish Journal of Population Studies* **8**, 37.
- Unalan, T. (1993), 'Sex preferences in turkey', *Turkish Journal of Population Studies* **15**, 23–32.
- Uzawa, H. (1965), 'Optimum technical change in an aggregative model of economic growth', *International Economic Review* **6**(1), 18–31.

- Van Der Ploeg, F. (2003), 'Do Social Policies Harm Employment and Growth?', *SSRN eLibrary* .
- Van der Ploeg, F. (2006), 'Rolling back the public sector: differential effects on employment, investment, and growth', *Oxford Economic Papers* **58**(1), 103–122.
- Van Rijckeghem, C. & Weder, B. (1997), 'Corruption and the rate of temptation: Do low wages in the civil service cause corruption?'.
- Weiss, A. (1980), 'Job queues and layoffs in Labour markets with flexible wages', *The Journal of Political Economy* pp. 526–538.
- Yellen, J. (1984), 'Efficiency wage models of unemployment', *The American Economic Review* pp. 200–205.