THREE ESSAYS ON EDUCATION IN TURKEY

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ABSTRACT

THREE ESSAYS ON EDUCATION IN TURKEY

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This thesis analyzes the pecuniary aspects of education in Turkey. It consists of three essays. The first essay deals with the demand for education, focusing on private tutoring expenditures of households. The study investigates the determinants of private tutoring expenditures of households using a Tobit model as the estimation method. It is found that wealthier households with higher levels of parental education are more likely to participate in private tutoring.

The second essay concerns the wage inequality in the male wages in 1994 and 2002. The study found that the differences in the educational attainment levels are a major determinant of wage inequality. However, returns to education declined at each school level from 1994 to 2002. Wage inequality is also found to exist within the same educational categories. The study shows that differences in returns to the same level of education at distinct points of wage distribution became more pronounced in 2002 compared to 1994. Secondary schooling is found to benefit the least able more compared to those positioned in the middle quantiles of ability distribution.

The last study in this thesis attempts to elucidate the determinants of self-employment versus wage employment choice and earnings in the two employment states. The study concludes that financial wealth and risk factor are important determinants of self-employment activity. As the educational attainment levels of individuals increase, the likelihood of becoming self-employed decrease. Education increases the earnings of both self-employed and wage earners. However, education returns are higher for the sub-group of wage employees compared to self-employed.

Key Words: Private Tutoring, Wage Inequality, Self-employment, Wage Earners, Human Capital

ÖZ

TÜRKİYE'DE EĞİTİM ÜZERİNE ÜÇ MAKALE

Bircan, Fatma

Doktora, İktisat Bölümü

Tez Yöneticisi: Aysıt Tansel

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Bu tez eğitimin parasal yönlerini inceleyen üç makaleden oluşmaktadır. İlk makale ailelerin özel ders harcamalarına vurgu yaparak, eğitim talebini ele almaktadır. Çalışma, ailelerin özel ders harcamalarının belirleyenlerini, Tobit modelini tahmin yöntemi olarak kullanarak araştırmaktadır. Daha varlıklı ve ebeveynlerin eğitim düzeyinin yüksek olduğu ailelerin, eğitim harcaması yapma olasılıkları daha yüksek bulunmuştur.

İkinci çalışma, 1994 ve 2002 yılları için, erkek ücretlilerin ücretlerindeki eşitsizliği irdelemektedir. Çalışma eğitim düzeyindeki farkların, ücret eşitsizliğinin önemli bir belirleyicisi olduğu sonucuna ulaşmıştır. Bununla birlikte, eğitimin getirisinin her okul düzeyinde 2002 yılında 1994 yılına göre azaldığı gözlenmiştir. Ücret eşitsizliğinin aynı eğitim düzeyinde de gerçekleştiği görülmüştür. 2002 yılında 1994'le karşılaştırıldığında, aynı eğitim düzeyinde, eğitimin getirisindeki farklar ücret dağılımının iki ucunda daha belirgin hale gelmiştir. Orta okul ve lise eğitiminin en az yetenek

düzeyindeki kişilere, yetenek dağılımının orta dilimlerinde bulunanlara göre, daha çok getirisi olduğu tesbit edilmiştir.

Bu tezin son çalışması, kendi hesabına çalışma ve ücretli çalışma durumlarının belirleyenlerini ve her iki iş durumundaki kazançların belirleyenlerini ortaya çıkarmayı amaçlamaktadır. Çalışma, faaliyet dışı gelirlerin ve riskin kendi hesabına çalışmada önemli belirleyenler olduğunu tespit etmiştir. Kişilerin eğitim düzeyleri arttıkça, kendi hesabına çalışma olasılıkları azalmaktadır. Eğitim hem kendi hesabına hem de ücretli çalışanların kazançlarını artırmaktadır. Ancak, eğitimin getirisi ücretli çalışan grup için kendi hesabına çalışanlara göre daha yüksektir.

Anahtar Kelimeler: Özel Ders, Ücret Eşitsizliği, Kendi Hesabına Çalışanlar, Ücretli Çalışanlar, İnsani Sermaye

To My Father Kâmil Bircan

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CHAPTER 1

INTRODUCTION

1.1 Overview

This thesis investigates the monetary aspects of education in Turkey. For this purpose, three distinct empirical studies are performed using Household Income and Expenditure Surveys collected by the State Institute of Statistics of Turkey in the years 1994 and 2002. The first study concerns the demand for education in Turkey in reference to private tutoring expenditures by households. The second study attempts to explain wage differentials for male wage earners, emphasizing the association between education and individual ability after controlling for different educational attainment levels and some institutional factors. Third, an analysis of self-employed and wage earner earnings in relation to their human capitals is carried out.

The existence of a market for private lessons owes itself, by and large, to the presence of a system (centrally administered university entrance examination) that rations the number of university students in Turkey. This phenomenon creates an interesting case in terms of equity and efficiency problems in the provision of education. If schooling is an investment, it should be made efficiently. Human capital theory argues that abler individuals are more successful in converting schooling into human capital. As a result, they can earn more in the market. Thus, providing cheaper funds to the abler students increases the efficiency of schooling investment. Efficiency of schooling investment, on the other hand, not only depends on the ability of individuals but also on the quality of schooling. Further, schooling enhances productive capacities of all individuals regardless of their initial abilities. Therefore, even if viewed in terms of its monetary benefits to the individual and society as a whole, leaving aside its being a merit good, human capital

theory implies that education can not be treated as a good whose amount to be determined by market forces as a result of "rational" choices of individuals. On the equity grounds, one would argue that if ability is inherited, abler individuals are likely to come from abler parents and relatively wealthier families. Therefore, letting the market forces to determine the equilibrium amount of schooling would result in a right-skewed schooling distribution and an even more skewed distribution of earnings granted that ability distribution itself is symmetric as often presumed by social scientists (Becker, 1993)[1].

The analysis of private tutoring expenditures is, therefore, essential as it provides empirical evidence on who is more likely to benefit from the subsidized university education in Turkey. The study relates the private tutoring expenditures of households to the income of households and parental education levels, controlling for other socio-economic factors using Tobit model as the estimation method. The results confirmed that there is a positive association between private tutoring expenditures and the parents' educational levels as well as incomes. Private tutoring expenditures increase by one percent in response to a one percent increase in the household income; that is they are unit elastic.

The second study concerns the determinants of inequality in the wages of male wage earners. Mincerian earnings equation[2] is widely used as a point of departure in almost any study of wage determination. This equation formulates earnings as a function of years of schooling and experience. In its econometric form, the coefficients on years of schooling, a measure of education human capital, and on potential experience, a proxy for labor market experience, are interpreted as the returns to human capital. They can also be interpreted as the prices of education and experience in the labor market. Using quantile regression analysis one can obtain these prices across the wage distribution.

The results of the study indicate that the returns to education declined on average and at distinct points of wage distribution from 1994 to 2002 (See Figures B.1 through B.6 in Appendix B). Reduction in skill prices in 2002 suggests that Turkish labor market responded to the economic downturns in recent years lowering the wages of the skilled workers. The price of experience human capital also decreased between the two years. Although private returns to schooling declined at each school level, the difference between the returns to schooling at the two opposite ends of wage scale within the same

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[1] This is the third edition of his textbook titled "Human Capital: A Theoratical and Empirical Analysis with Special Reference to Education."
[2] See below for detailed explanation of this function.

education category increased in 2002. Therefore, overall wage inequality was exacerbated from 1994 to 2002. While education and ability are found to be complementary at the university level, they are found to be supplementary at the secondary level suggesting the expansion of educational opportunities in favor of the least able.

The last study in this thesis aims at elucidating the earnings of self-employed and wage earners in Turkey. The study investigates the determinants of self-employment versus wage employment choice as well the determinants of earnings in the two employment states. For this purpose, two-step estimation methods are employed. First, a choice equation is estimated to elaborate the determinants of self-employment versus wage employment choice. Second, an earnings equation for each sub-group of workers is estimated. In addition to observable human capital factors, the selectivity variables indicating the effect of unobservable characteristics of individuals on their earnings calculated from the first-step were included in the earnings equations.

The findings of the study indicate that the more educated are less likely to become self-employed. The probability of becoming self-employed is inversely related to the experience human capital while it is positively affected by the financial capital. This result implies that the accumulation of financial capital is critical to the choice of self-employment rather than the accumulation of labor market capital. People from rural areas are more likely to participate in self-employment compared to people from urban areas. Home ownership is also positively related with one's decision to become self-employed. The parameter estimates on the selectivity variables included in the earnings functions for the self-employed males indicated that there was a negative association between one's unobservable characteristics and his earnings in 1994. More clearly, those who have chosen self-employment had a comparative disadvantage (low managerial ability) in that sector. However, the coefficient on the selectivity variable turned out to be insignificant in 2002 suggesting that earnings were no longer adversely affected by the unobservable abilities of individuals.

Therefore, the hypothesis that highly educated prefer wage employment and only those with low levels of educational attainment, who are not eligible for the paid-employment jobs choose low quality self-employment jobs is not supported by the Turkish data, at least strongly (Blau, 1985). However, the negative association between the higher levels of education and the probability of becoming self-employed implies that lucrative self-employment opportunities are not available for or not worth to be taken by the highly educated men and women. The log earnings in both sectors increase with

experience but at a decreasing rate after a certain level of experience. Similarly, the log earnings increase linearly with the level of education for both subgroups of self-employed and wage earners. Wage earners receive higher returns to their years at school. At each level of schooling, the return is significantly higher for the wage earners relative to the self-employed. This finding is in support of the screening hypothesis. Urban self-employed and wage earners obtain higher earnings compared to the workers from rural areas.

1.2 Structure of Education

Education system is structured to offer three-tier schooling. Compulsory basic education (primary schooling) constitutes the first tier of formal education and involves the education of children in the age group 7 to 14. It takes eight years and is compulsory for all boys and girls at primary school age in Turkey. Before 1997, compulsory primary education was only five years. A law passed in 1997 extended the minimum years of basic education to eight years eliminating the middle schools, which used to take three years to complete.

Secondary education constitutes the second layer of national formal education system and includes general, vocational and technical high schools of at least three years. Although it typically takes three years to complete following primary education, high schools with one year of preparatory foreign language courses are also available at each track, general, vocational and technical, extending the completion period to four years. Secondary schools where the medium of instruction is a foreign language (English mostly) are highly demanded and popular. Thus, the access to these schools is restricted by a general High School Entrance Examination. Primary and secondary schooling are provided by the state free of charge. In addition to public schools, private schools are also available at the primary and secondary levels. All primary and secondary education institutions, public and private, are under the control of the Ministry of Education of Turkey. High School Entrance examination applies to both public and private schools.

Tertiary education, the third tier, typically spans over two or four years depending on the type of higher education program entered when secondary schooling is completed. Higher education comprises of universities, institutes, higher schools, vocational higher schools, conservatories, and research and application centers. There are

around fifty-three public universities all over the country and twenty-five private universities concentrated in big cities (Ankara, Istanbul). New universities continue to be established in recent years. It is on the government's agenda that the number of public universities will be increased to reach 100 public universities throughout the country.

Public universities charge students nominal fees each term. The fees vary depending on the area of study. For example, a student studying engineering or medicine is charged higher fees compared to a student studying social sciences. But, they are not very high, and for those who can not afford them cheap credits are provided by the Higher Education Credit and Dormitory Institution, *Yüksek Öğretim Kredi ve Yurtlar Kurumu*. Scholarships are also provided for successful students by private individuals and organizations. As a result, state funded tertiary education is available at low cost.

The tertiary education system is, however, incapable of meeting the demand. Therefore, throughout the 1980s and 1990s a number of private universities in big cities and public universities in small cities have been established to increase the capacity. Students are placed in higher education institutions, public and private, according to the scores they obtained in the centrally organized Student Selection and Placement Examination (SSPE). In 2004, about 1.8 million students took the SSPE. 192,632 students (10.1 percent) were placed in four year university programs, and 164,251 (8.6 percent) in two year programs (two year programs are directed toward vocational training and grant higher education diplomas), and 217,984 (11.5 percent) in Open Education (Open education is provided through national TV broadcasts and offer four year university degrees. There are also two-year vocational and professional training programs granting Open University diplomas). To sum up, of those who took the exam only about 30 percent entered a higher education institution while 70 percent were deprived from tertiary education. Share of senior high school students who took the exam was about 41 percent while the share of repeat takers was about 40 percent. The rest consisted of those who were already placed at a program or graduates.

Educational expenditures in Turkey have traditionally been viewed as the sum of the shares of the budgets of the Ministry of Education (ME), Higher Education Council (HEC) and public universities in GNP. The GNP shares procured by these three major educational institutions have been considered to be an indication of how much emphasis the state places on education, and governments have been criticized for allocating too small budgets for education. Figure 1.1 demonstrates the ratios of ME and universities and HEC in GNP for the years 1996 through 2005. Both GNP shares doubled from 1996

to 2005. The share of HEC and universities in GNP went up to little more than one percent in 2005 from 0.5 percent in 1996. Similarly, the share of MEB in GNP increased from 1.7 percent in 1996 to 3 percent in 2005 (State Institute of Statistics, 2005).

In 2002, the share of educational expenditures by the central government and local administrations in GDP was 4.7 percent. The same figure for some OECD countries was as follows: 4.8 percent for the United States, 4.5 percent for the United Kingdom, 5.8 percent for Norway, and 3.7 for Greece, the OECD average was 4.3. The GDP share of the same educational expenditures in India was 4.1 percent and 6.4 percent in Jamaica and 4.5 percent in Argentina (State Institute of Statistics, 2005). Turkey seemed to close the notoriously high gap between her and OECD countries and some non-OECD countries she has been considered in the same league in terms of level of economic development.

In 2003, State Institute of Statistics of Turkey (SIS) conducted the first broadest survey focusing specifically on educational expenditures in Turkey. "2002 Turkey Education Expenditures Survey" included 29,674 households, 3,864 educational institutions (pre-school, primary and secondary school), 967 private kindergarten, 75 universities (public and private), and 95 ministries and government institutions together with ME and HEC.

It is the largest survey relating to educational expenditures from all sources and provides reliable information on private educational expenditures. The main results of the survey were released by SIS and a bulletin was publicized on the internet (SIS, 2004). The figures below (Figure 1.2 and 1.3) are reproduced from this publication. Distribution of total educational expenditures by source is given in Figure 1.2. The central government's share in total expenditures (62.73 percent) is the highest and followed by households (34.59 percent).
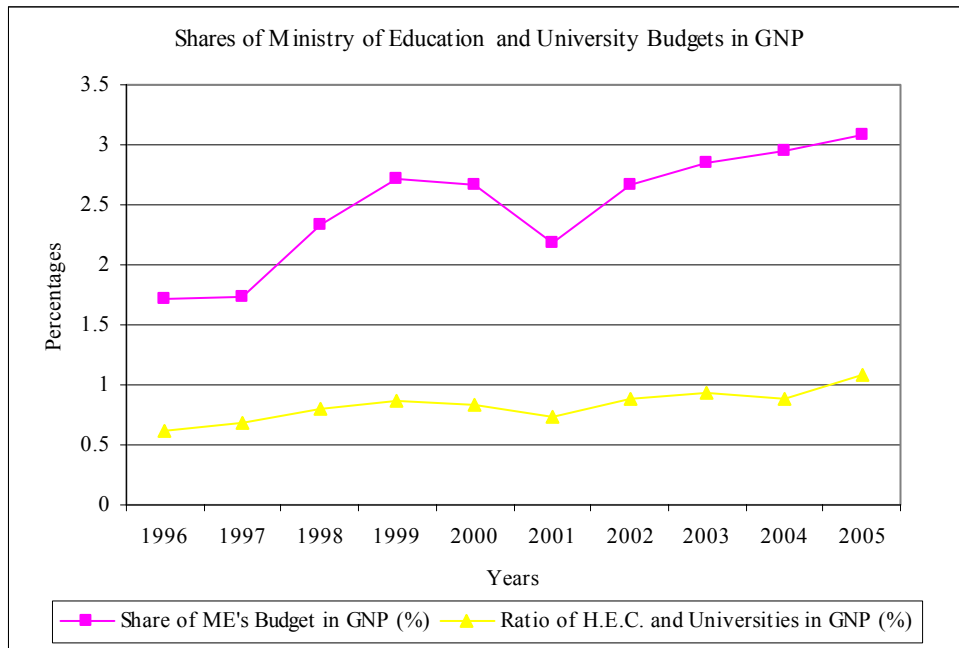
Figure 1.1 Shares of Ministry of Education and University Budgets in GNP.

Distribution of total educational expenditures from all sources (government, households, private organizations, international organizations etc.) by level of education is given in Figure 1.3. In the year 2002, the total expenditures on formal education (pre-school, primary, secondary, tertiary education) constituted 96.16 percent of total expenditures while the expenditure share of non-formal education was only 1.22 percent.

Figure 1.3 demonstrates that expenditures for primary school pupils have the highest fraction of total expenditures (40 percent). Expenditures for tertiary education (31.50 percent) ranked second. Expenditures for secondary education constituted the third highest fraction of total expenditures with 24.20 percent. The figure makes it clear that the primary and university education received the highest proportions of total educational expenditures in Turkey in the year 2002.
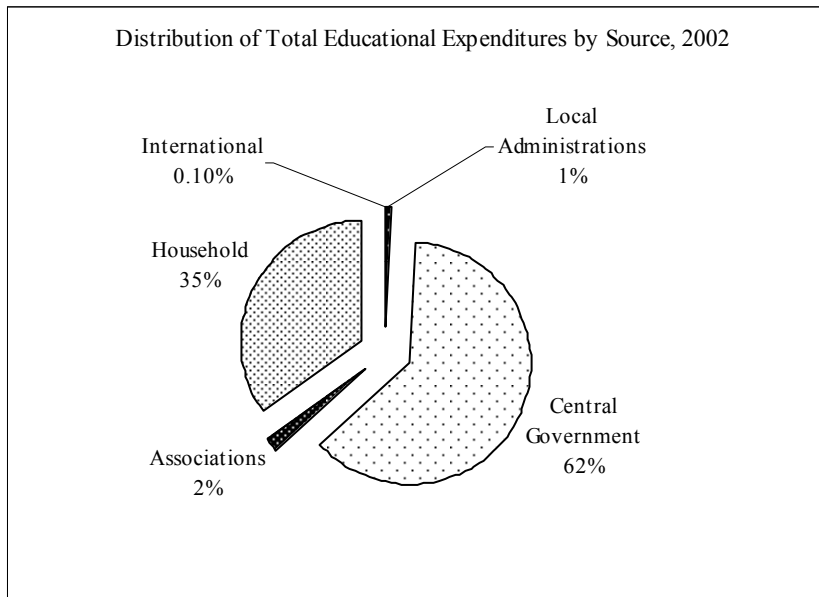
Figure 1.2 Distribution of Total Educational Expenditures by Source, 2002.
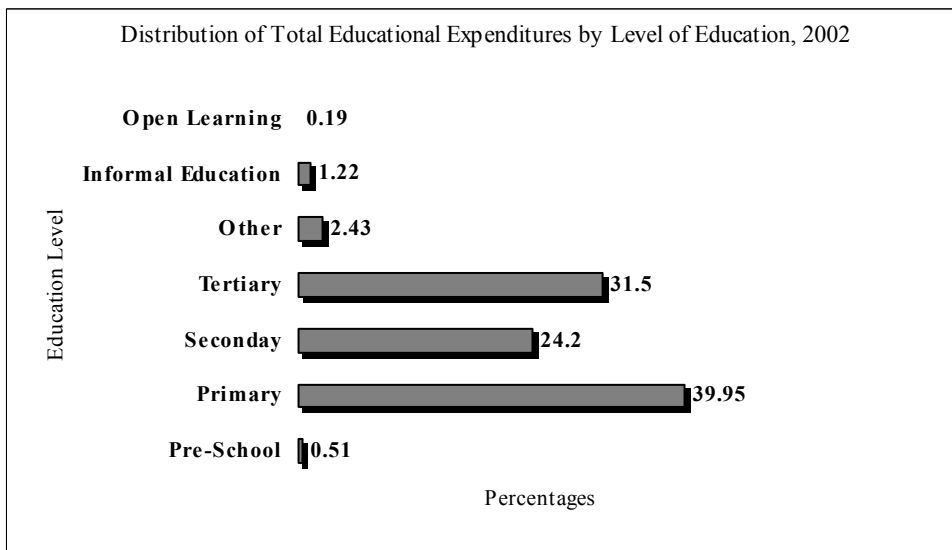
Figure 1.3 Distribution of Total Educational Expenditures by Level of Education, 2002

1.3 Structure of Labor Market

Turkish labor market is characterized by high unemployment rates, young and dynamic work force. Unemployment rates from 1994 to 2003 were as follows; 8.1 percent in 1994, 6.9 percent in1995, 6 percent in 1996, 6.7 percent in 1997, 6.8 percent in 1998, 7.7 percent in 1999, 6.6 percent in 2000, 8.7 percent in 2001, 10.3 percent in 2002 and 10.5 percent in 2003.

The relevant age group for labor force participation includes those who are 15 to 65 years old. In 2002, there were 44 million 225 thousand men and women who were at this age group in Turkey (This number does not include those who were in the military service, in prisons, etc.). Of 44 million 225 thousand, 21million 354 thousand men and women did not participate in labor force for they were housewives, students, retired, or disabled. Some do not participate as they have other sources of income, such as non-labor income. Out of 44 million 225 thousand, 23 million 818 thousand were in the labor force and 21 million 354 thousand were employed whereas 2 million 464 thousand were unemployed. Of about 2.5 million unemployed, 34 percent were in the 15-34 age interval and high school (including vocational high schools) and university graduates. This means that one third of unemployed is young and educated.

Work participation rates of men and women, composition of work force by area, employment status, sector of employment and social security coverage are presented in Table 1.1. There are three main social security institutions in Turkey. Social Security Institution, *Sosyal Güvenlik Kurumu*, covers private workers. Retirement Fund, Emekli *Sandığı* is compulsory for Public workers and a fund for independent workers, *Bağ-kur*, covers Self-employed. Workers covered by any of these institutions are referred to as formal sector workers and uncovered workers as informal sector workers.

The statistics are compiled from Household Income and Expenditure Surveys (HIES) collected by State Institute of Statistics in 1994 and 2002. The share of agricultural workers in working population was 34 percent while the share of non-agricultural workers was 66 percent in 1994. In 2002, the share of agricultural employment considerably dropped (20 percent) against non-agricultural employment (80 percent). The composition of agricultural and non-agricultural employment by gender reveals that although agricultural employment was low in absolute terms in both years and dropped considerably from 1994 to 2002, the shares of female workers in agriculture

were quite high in absolute terms in both years. 65 percent and 47 percent of female workers were employed in agriculture in 1994 and 2002 respectively.

The data also reveals that labor force participation rate is rather low, 39 percent in 1994 (68 and 11 percent for males and females) and 37 percent in 2002 (64 and 12 percent for males and females). These figures reconcile with the figures reported above compiled from Labor Force Surveys of SIS. Work participation rates are similar in rural and urban areas.

Table 1.1 Structure of Employment in Turkey; 1994-2002

	1994			2002		
Working	Total	Male	Female	Total	Male	Female
Agricultural	33.78	21.84	65.16	20.47	11.33	46.99
Non-agricultural	66.22	78.16	34.84	79.53	88.67	53.01
Total	100	100	100	100	100	100
Work Participation						
Total	38.75	67.82	10.99	37.04	64.23	12.12
Urban	39.71	68.97	11.77	37.54	64.78	12.5
Rural	34.95	63.24	7.88	32.32	58.87	8.63
Employment Status						
Wage Earner	69.62	67.94	79.53	76.48	75.12	83.11
Self-employed	19.27	20.18	13.94	13.18	14.02	9.08
Employer	7.19	8.2	1.2	6.42	7.59	0.73
Unpaid family	3.92	3.68	5.33	3.92	3.27	7.08
Total	100	100	100	100	100	100
Sector of Employment						
Public	41.05	40.41	44.28	26.49	25.94	28.92
Private	58.95	59.59	55.72	73.51	74.06	71.08
Total	100	100	100	100	100	100
Wage Earner						
Formal	66.06	66.33	64.8	63.51	63.65	62.89
Informal	33.94	33.67	35.2	36.49	36.35	37.11
Total	100	100	100	100	100	100
Self-employed						
Formal				42.3	46.08	13.97
Informal				57.7	53.92	86.03

Notes: 1. Figures are calculated excluding those employed in agriculture except for the fourth row of the table.
2. Sector of employment figures are calculated only for wage earners.
3. Registration status (formal or informal) was not reported for the self-employed category in the 1994 survey.
4. Age Group: 15-65.

Wage earners constitute the highest fraction of workers when classified by employment status (68 and 80 percent for males and females in 1994, 75 and 83 percent for males and females in 2002). Wage earners are classified by sector of employment,

public vs. private sector. In 1994, 41 percent of total wage earners were employed in public sector. In 2002, the same figure dropped to 26 percent. This huge decline in public employment was a result of two major economic crises in 2000 and 2001 and was in line with the IMF policies suggesting shrinking of public sector. In regard to the social security coverage of wage earners and self-employed, Table 1.1 indicates that 66 percent of wage earners were registered to either *Sosyal Güvenlik Kurumu* or *Emekli Sandığı* in 1994. In 2002, the percentage of covered wage earners declined, 64 percent, while the percentage of uncovered workers slightly increased to 36 percent. The decline in the percentage of formal sector workers in 2002 probably came from the big reduction in public employment. It is also observed that male and female wage earners are similarly distributed in terms of social security coverage.

Finally, Table 1.1 shows that a greater fraction of self-employed workers (58 percent) were uncovered and even greater percentage of female self-employed were in the informal sector (86 percent) in 2002.

The sectoral distribution of workers in 2002 was as follows; 33.2 percent of total employed worked in agriculture, while 19.2 percent were employed in industrial sector. The share of service sector was 43 percent and the 4.3 percent of employed worked in the construction industry in 2002 (Labor Force Surveys, State Institute of Statistics, 2005).

Educational composition of work force is summarized in Figures 1.4 and 1.5 produced from the same data sets. More detailed analysis of educational attainment of wage earners and self-employed can also be found in Chapter 4 of this thesis. Educational attainment level of Turkish working force is among the lowest in the OECD countries. Approximately 50 percent of workers aged 15 to 65 were primary school graduates. The percentage of working population with secondary education (junior high school, high school and vocational high school) was around 30 percent. The OECD average was 65 percent in 2003 (Society at a Glance, 2005). The proportion of those who achieved tertiary education was around 10 percent, 10.46 percent in 1994 and 12.52 in 2002 in urban areas, much lower than the OECD average.

Education level of non-agricultural wage earners by sector of employment is demonstrated in Figure 1.5. It is immediately seen that public sector was the major employer of university graduates in both years. 24 and 34 percent of wage earner university graduates were employed in the public sector in 1994 and 2002 respectively. It is also striking that higher percentages of high school and vocational high school graduates worked for the public sector. The percentage of primary school graduates in the

public sector was lowered to 19 percent in 2002 from 30 percent in 1994. Private sector absorbed mainly primary school level workers in both years. The data from household surveys implies that private sector is still too small to create job opportunities for the highly educated skilled workers.
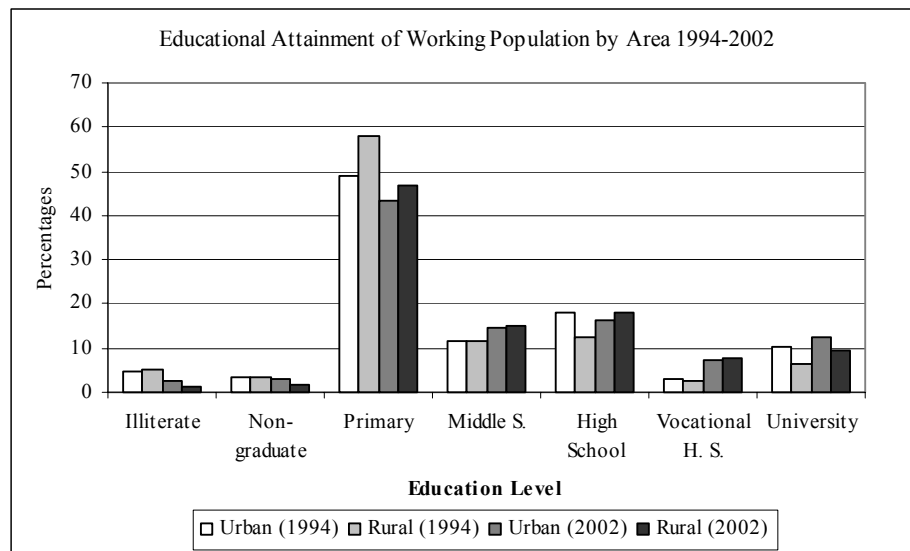
Figure 1.4 Educational Attainment of Working Population by Area 1994-2002.
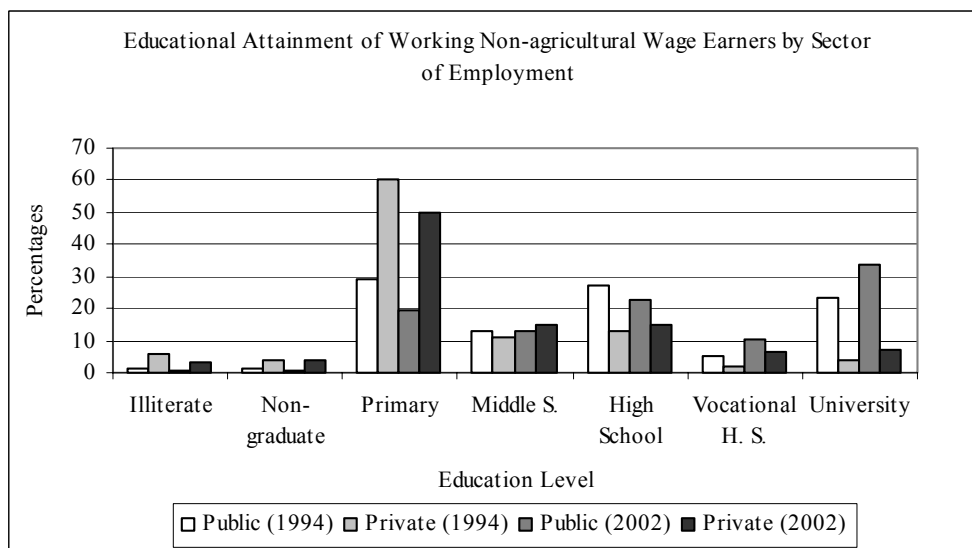
Figure 1.5 Educational Attainment of Working Non-agricultural Wage Earners by Sector of Employment.

1.4 Human Capital Theory

Capacities of workers can change the relationship between the amount produced and the time it takes to produce that amount. It would take less time for an abler person to produce a given amount of a good then for a less able person. Or given time, the quality of a work done by an abler worker would be superior to that done by a less able individual. In both sense, marginal product of an abler person is greater than that of a less able worker. In the classical analysis, marginal product of labor is equal to wage rate. Therefore, hourly earnings of a worker are directly linked to his or her productive capacity.

Education, more specifically formal schooling, has been considered to be the most important productivity increasing process since the introduction of human capital theory by G.S. Becker (1993). Schooling has been integrated into mainstream economic analysis as a form of investment. Investment, by definition, involves foregoing some current resources in order to earn future income. When this investment is made in human beings it becomes "accumulated knowledge" that can be sold in the labor market by its owner. Thus, schooling is defined as an investment that creates "knowledge asset" embodied in human beings and this asset is referred to by G. S. Becker himself as "human capital".

G. S. Becker (1993) argued, in his theory of human capital, that human capacities are developed by schooling, experience, on-the-job training, good health, environment, and morale. His theory successfully rendered the entire life span of an individual to a process in which individual traded (committed) her or his current time, effort and money with more time and money in the future. What come out of this exchange was, however, essential for both the individual himself and the society as a whole; it was essential for individual because his material well being entirely depended on the productive capacities he owned and society because education had spill over effects and increased individual productivity is critical to economic growth.

He argues that an individual invests in education to accumulate knowledge, to gain new skills and enhance the existing ones so that he can increase his life time earnings. When viewed this way, schooling becomes a rational choice variable. Rationality here refers to the fact that individuals invest in education as long as they believe that they can increase their earnings after a given period of schooling investment by a reasonable amount that would allow them to compensate at least the costs of

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education and their foregone earnings while at school. As a result, individuals who can gain more "capital" from one year of schooling would invest more in education, as this incremental increase in their capitals in fact constitutes their marginal productivities. But here, the subjects of investment are human beings and as theory argues the profitability of this investment can not be abstracted from the abilities of individuals. Individual ability would affect the efficiency with which schooling is converted into marketable skills and thus, earnings of individuals after leaving school. However, human capital theory argues that education enhances the productive capacities of workers. As a result, everybody who aspires to gain marketable skills through schooling should get chances to invest in schooling. Although public good and merit good aspects of education were little emphasized in human capital theory, because of its critical role as to the welfare of individual and society, public funding of education has not been widely criticized, at least explicitly.

Although these ideas about worker's productivity, the effect of skills on production and the costs of skill gaining processes were discussed in the economic literature, they were not formalized to be integrated into mainstream economic analysis. Becker brought these ideas into the economic sphere in a way that they could be analyzed by very established concepts of economics such as, cost-benefit analysis, investment decision as the one defined as a trade off between current earnings and future incomes discounted at a given rate and supply and demand schedules.

Becker (1993) treats schooling as an endogenous choice variable. An individual "buys" schooling in order to earn a future rate of return. In his analysis, the only costs of education are the foregone earnings during the years at school. He assumes zero direct costs (tuition, transportation etc.). Suppose there are two activities an individual can choose between. Activity X that requires no schooling investment and the activity Y that requires an investment in schooling. If individual choose Y then he foregoes earning form activity X. Becker shows that an optimal investment in schooling occurs when a rate at which present value of earnings from X is equal to present value of earnings stream form Y is possible. This rate is internal rate of return which is also a discount rate equating the present values of earnings, r (Becker, 1993: 61).

$$\sum_{j=0}^{n} \frac{Y_j}{(1+r)^{j+1}} - \sum_{0}^{n} \frac{X_j}{(1+r)^{j+1}} = 0 \qquad (1)$$

This formula can be written only when it is assumed that activity Y requires a single period investment; X_0 : net earnings from X in initial period Y_0 : net earnings from Y in initial period. $C = X_0 - Y_0$ C is the cost of choosing Y . $j = 0..........n$.

However, investment in education typically takes more than a single period, 8 to 15 years in Turkey. Suppose activity Y requires m years of schooling and activity X does not require any investment in schooling. Net earnings from activity Y is defined as gross earnings minus any direct costs of education (tuition costs) during period. Net earnings from activity X are the gross earnings at each period. They can also be defined as foregone earnings in the jth period, earnings that would occur if the individual did not invest in schooling and r the rate of return on the foregone earnings.

$$PV = \sum_{j=m}^{T} \left(Y_j - X_j \right) \left(1 + r \right)^{-j} - \sum_{j=1}^{m+1} X_j \left(1 + r \right)^{-j} \qquad (2)$$

The first item on the right hand side gives the present value of earnings after m years of schooling over earnings from activity X, no schooling up to time T, lifetime. The second term gives the present value of foregone earnings for m years, opportunity cost. Optimal level of schooling is chosen when present value (PV) is equal to zero (Aromolaran, 2002)

1.4.1 Mincerian Earnings Equation

Harmon et al. (2003) derive the Mincerian earnings equation from the basic human capital model. Their formulation is explained below (Harmon et al., 2003: 116). Assume w_s and w_{s-1} represent earnings from s years of schooling and s-1 years of schooling respectively. For T-S periods, a retirement date minus years of schooling, the difference between the present value of w_s and the present value of w_{s-1} is equal to w_{s-1} plus direct cost of s years of education, c_s .

$$\sum_{t=m}^{T-S} \frac{w_s - w_{s-1}}{(1+r_s)^t} = w_{s-1} + c_2 \qquad t = 1,2,........T-S \qquad (3)$$

where r_s is the internal rate of return that equates the income streams from s and s-1 years of schooling. This formulation suggests that as long as r_s is greater than the market rate of interest, i, individual chooses to invest s^{th} years in education. Assuming T is large enough and C_s is sufficiently small;

$$\frac{w_s - w_{s-1}}{r_s} = w_{s-1} + c_s \qquad (4)$$

that is

$$r_s \cong \frac{w_s - w_s - 1}{w_{s-1}} \cong \log w_s - \log w_{s-1} \qquad (5)$$

This formulation defines the rate of return to s^{th} years of schooling as the difference between the log earnings from finishing s years of schooling and s-1 (a year less) years of schooling. From this approximation, Harmon et al. (2003: 117) derive the empirical specification of human capital model, as formulated by Mincer (1974)[3] first.

$$\log w_i = X_i \beta + rs_i + \delta x_i + \gamma x_i^2 + u_i \qquad (6)$$

Here, r gives the effect of a year increase in s on earnings. Assuming years of schooling is a continuous variable and recognizing that wages are expressed in the log form, r, more specifically, shows, holding other things constant, by what percent the mean earnings increases per year of schooling. w_i is hourly wage rate of individual i, X

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[3] The author was not able to find a copy of his book titled Schooling, Experience and Earnings in which Mincer first introduced the widely used earnings functions. Instead, the author used a copy of his book published in 1993, which was a collection of his articles starting from as early as 1958.

is a set of variables that affect earnings, x is linear experience term and x^2 is a quadratic experience term, and u is the normally, distributed error term assumed to be independent of other explanatory variables.

The basic empirical earnings function assumes a positive association between earnings and schooling. Earnings are an increasing function of schooling but at a decreasing rate. This implies that marginal benefit from schooling declines as one invests in schooling. In application of the earnings function to cross section data sets it is assumed that intercept and slope terms are constant across individuals (Heckman and Lochner, 2003). Another implication of this basic Mincerian formulation of earnings is that earnings-experience profiles (post-schooling investments) are identical across individuals and levels of education. As we mentioned earlier this definition also assumes that direct costs of schooling are negligible[4]. Further more, when schooling is related to earnings in this way, schooling is stripped of its social benefits (externalities that do not accrue to individual himself but others) and non-pecuniary benefits (e.g. type of tasks, quality of working and living environment) Spill over effects to the society are also excluded in this definition. (Aramolaran, 2002; Sianesi and Reenen, 2003).

In spite of its flaws, Mincerian earnings functions have been applied to cross-section data sets in a huge number of studies. Evidence from developed and developing countries almost uniformly implies that private returns to education linearly increase with the level of schooling. Wage equations were widely estimated and many of these studies took account of selection bias (Heckman, 1974) and labor market segmentations due to gender, regional differences, rural-urban division, race and age cohorts.

For example, in India, Duraisamy (2002) found that returns to education increased significantly at the secondary level compared to per year returns at the primary level in 1983 and 1993. He also showed that females received higher returns to their education at middle, secondary and higher levels compared to males. His results indicated that the returns to education at primary, middle and secondary level were higher for the younger age cohorts compared to older cohorts. Finally, he considered the rural-urban differences in returns and concluded that primary and secondary levels of education were better rewarded in urban areas than they did in rural areas, 10-15 percent. Aramolaran (2002) estimated the schooling returns for Nigeria using the basic specification given

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[4] Heckman and Lockhern (2003) showed, however, that the tuition costs and income taxes are important when calculating private returns of education.

above for wage workers and self-employed. He found that private wage returns to college education differed from 10 to 15 percent in 1996-97 in Nigeria for both genders. Further, returns to post secondary education were higher, 13-14 percent, compared to those of older workers, 9-10.

Evidence from Burkina Faso for the years 1994 and 1998, (Kazianga, 2004), also showed that rates of return increase with the level of education. The estimation of Mincerian Earnings function for public and private sectors controlling for selection bias provided further evidence that better educated received higher earnings in the labor market. A study of earnings function for Malaysia also confirmed that economic returns to schooling rise with the level of educational attainment for a random sample of working women (Chung, 2004). Ryoo, Nam and Carray (1993) estimated rates of return to education, measured as level of education, for Korea in the 1970s and 1980s. Their results indicated that economic returns to college education consistently increase from the mid 1970s to late the 1980s while the returns to lower levels of schooling (primary, secondary) fell in both absolute terms and relative terms (to college education) during this period. In the face of high growth rates (especially in manufacturing industry) and large expansion of secondary and four year university education, these findings suggested that increased supply of university graduates was a response to increased demand for them and vice versa.

A recent study by Psacharopoulos and Patrinos (2002) provided rates of return estimates for 98 countries. The study was an update to the 1994 review of literature on human capital investments by Psacharopoulos (1994). The authors summarized the evidence on the private economic value of schooling investment from countries at different levels of development and highlighted some expected patterns in the rates of return literature. They also reviewed some issues that draw attention in recent years and remarked on the policy issues concerning education as an investment to secure both individual and social well being in a given country. The study presented rates of return to primary, secondary and higher education in 83 countries and provided coefficient estimates on the years of schooling measure with average years of schooling for each 73 countries over different years mostly from the 1980s and 1999s. It further presented returns by gender and over time for a number of countries. The compiled evidence revealed that returns to education per year are around 10 percent on average. The update confirms the general observation that returns are highest for low and middle-income

countries. Psacharopoulos and Patrinos (2002: 2) repoted the averages for specific regions in the world.

> Average returns to schooling are highest in the Latin America and the Caribbean region and for the Sub-Saharan Africa. Returns to schooling for Asia are at about the world average (10 percent). The returns are lower in the high-income countries of the OECD. Interestingly, average returns to schooling are lowest for the non-OECD European, Middle East and North African group of countries.

They also pointed out that average years of schooling increased while average returns slightly declined. Except for primary level, higher returns accrue to women at the secondary and upper education levels compared to men.

1.4.2 Schooling and Income Distribution

Becker (1993) developed a supply-demand curve analysis to explain the relationship between investment in human capital (schooling) and earnings distribution. In his analysis, demand (supply) curve represents the locus of points connecting the amount invested in schooling in dollar terms (a unit investment costs a dollar) in the horizontal axis to the marginal rate of return (cost) on the vertical axis. As usual, demand curve is negatively sloping while the supply curve is positively sloping. His reasoning for the negatively inclined demand curve is as follows; unlike other forms of capital, human capital is embodied in the owner of the capital. Returns to each additional investment of a dollar will decline at margin, as human beings have limited time, physical and mental capacity. On the other hand, each additional investment in human capital (schooling) causes an increase of a greater proportion in marginal cost. Thus, the supply curve for human capital is positively sloped. This point can be better understood if one considers the marginal cost from investing one more unit in schooling as the financing cost, interest rate that must be paid to finance an additional dollar of investment in schooling. The availability of funds is critical. The funds to finance schooling are forthcoming at different rates. The capital markets are not perfect for schooling investments. Rather, public funds, subsidies, inheritances, family support cause segmentation in the funds market. The point is, the cheaper funds are rationed, thus, as one increases the amount of schooling he or she moves from cheaper to expensive funds. As a result, the supply of human capital is restricted by the availability of funds.

This analysis shows that those who have higher ability will benefit more from an incremental (a year) increase in schooling relative to those of lower ability, and thus, the abler individual's demand curve would be higher than that of a less able individual. Similarly, the cost of financing a year in school for those with favorable supply conditions (availability of funds) would be lower and thus, they would be represented by lower supply curves. They would invest more. This analysis makes clear that demand curve mainly relates to the capacities of individuals while the supply curve derives from the "opportunities".

The amount invested in schooling primarily depends on the demand (ability) conditions and the supply (opportunities) conditions. Becker provides a theoretical framework to work out the effects of abilities and opportunities on the personal income distribution using simple demand-supply curves. In order to elaborate this point further, he considers the two extreme approaches; 1) Elite approach and 2) Egalitarian approach. The actual case would be a combination of the two.

Egalitarian Approach

He assumes that the demand conditions are given. That is individuals do not differ in their capacities to convert education into productivity. They all benefit from schooling equally so, the marginal benefit of increasing human capital investment an additional unit is the same for everyone. In this case, distribution of earnings results from allocation of schooling opportunities. Allocation of schooling among individuals will be affected by supply conditions; for the ones with more luck, family resources, better access to public funds, the chances of investing in human capital will be increased compared to these who lack these opportunities. Positive skewness in earnings distribution results from the skewness in the distribution of opportunities in favor of some groups.

Elite Approach

He assumes that environment in which individuals search for schooling offers equal opportunities to anyone; costs of schooling is more or less the same for anyone, funds and access to institutions are equally available for all individuals. This is the equal opportunity case. Individuals, on the other hand, differ in their capacities to benefit from their education (human capital investment). As a result, any difference in the earnings mainly drives from the differences in the distribution of abilities among individuals. The

earnings are more unequally distributed the more unequally distributed and skewed the abilities.

1.4.3 Notes on the Returns to Schooling Coefficients

Despite the fact that Mincerian wage equations have been widely used to test the causal effect of education and hundreds of studies from all regions of the world provided consistent evidence that earnings linearly increase with the level of educational attainment, many researchers, at the same time, questioned the appropriateness of using schooling variable (measured as years of schooling or as educational categories) as explanatory variable because of its perceived and theoretically recognized correlation with individual ability and external factors that effects one's choice of amount of schooling (Hause, 1972; Grilliches and Mason, 1972; Card, 1994; Card, 2001; Heckman and Li, 2003). As outlined above, on the basis of Becker's account of the effect of individual ability and supply conditions on the amount of schooling, the causality debate concerns that the Ordinary Least Square (OLS) estimates of schooling coefficients would be upward biased because abler individuals choose higher levels of schooling as the marginal benefit of schooling is higher for them. Thus, failing to control for ability biases (individual heterogeneity) in the labor market earnings equations would result in exacerbated effect of education on earnings.

The other source of bias, as recognized by Becker (1993), comes from supply conditions. Card (1994) extended the Becker's analysis and established a more formal framework to study the individual heterogeneity resulting from demand and supply conditions. He argued that different tastes for schooling and conditions in terms of access to funds create varying marginal rates of substitution between current and future earnings. That is individual discount rates differ across individuals depending on tastes and access to founds (market conditions).

To sum up, in his model, individuals obtain different levels of schooling for two reasons: First, some individuals benefit more from schooling compared to others (marginal benefit of schooling is higher for the abler individual). Second, individuals have different marginal rates of substitution; some people value current earnings more than future earnings. These two factors, on the other hand, may be correlated with each other. Higher ability individuals are likely to come from higher ability (if ability is

inherited or affected by family background) and higher income families. Parents with higher levels of education will have strong taste for education and low discount rates. Assuming that ability is inherited and higher income families will have lower discount rates, abler individuals from high income families will receive more education compared to children of lower ability and low income families. In this case, a negative correlation between ability and discount rates occurs. On the other hand, public funds may help abler individuals from low income families who have higher discount rates to obtain the amount of education commensurate with their expected marginal benefits from education. In this case, a positive correlation between abilities and opportunities is possible.

Assuming there is no variation in individual ability, the only source of bias in the OLS estimates of schooling coefficients would be the discount rate. If individual has a high discount rate (less willing to substitute future earnings for current earnings), less schooling will be obtained and thus, the OLS coefficients will be downward biased. Number of studies dealt with these possible sources of endogeneity including proxy variables for schooling (instrumental variable approaches) or explicitly including variables that account for individual ability (IQ tests for example) or family background or variables that proxy for the availability of funds.

Grilliches and Mason (1972), for example, incorporated a measure of ability (mental ability test results) into the basic income model to account for the quantitative contribution of schooling to earnings more precisely. They defined earnings as a linear function of education and ability with an additive disturbance term included.

$$Y = \alpha + \beta_1 E + \beta_2 G + u \tag{7}$$

where E is education and G is ability. If there is a positive interaction between ability and schooling, the OLS coefficient from the regression of Y on E will be upward biased by the amount $\beta_2 b_{GE}$ where b_{GE} is the coefficient from the regression of ability on education. But, they recognized that inclusion of an ability variable did not solve the problem. Quality of school has also important implications in terms of effects of schooling on earnings (Card 1994, Card and Krueger, 1992). It is also correlated with ability. Students that are more able are more likely to go to better schools. They argued that if schooling is defined as the sum of quantity of schooling (years in school) and quality, of schooling, E=S+Q, the two sources of biases resulting from ability and school

quality can be precisely distinguished. Nevertheless, they recognized that quality of schooling and ability are correlated and quantity of schooling is affected by ability. A regression of earnings on quantity of schooling, quality of schooling and ability valuables would still produce biased coefficient estimates because of high colliniarity between Q and G and S and G.

$$Y = a + \beta_1 S + \beta_1 Q + \beta_2 G + u$$

(8)

Estimation of an earnings equation including ability variable requires very specific data set from which a measure of schooling abstracted from its quality and a reasonable measure of ability can be extracted. The authors used such data set and concluded that economic and statistical significance of schooling on earnings was not reduced by inclusion of ability variable.

As a result, the omission of schooling quality variable does not disturb their results because of the interaction of ability with quality of education. Hause (1972) performed another study including a different measure of ability and a different sample and setting out similar but different framework to distinguish the effect of ability on earnings and concluded that the effect of ability in explaining earnings differentials was modest. The OLS measure of schooling coefficient remained intact largely.

Another and more reliable way of obtaining the true effect of schooling on earnings is using an instrumental variable framework. Instrumental variable method simply relies on the existence of a variable that is highly correlated with years of schooling but uncorrelated with individual ability. Some supply side factors such as minimum school leaving age, tuition costs, and geographic proximity to school provide such instruments Card (2001). One can reasonably argue that a policy shift increasing minimum school leaving age can be used to predict the years of schooling for those who enter schooling after the policy shift has taken place. Given the availability of such an instrument what is needed is a system of simultaneous equations where the predictions from the first step instrumental variable (IV) estimations used as proxies for years of schooling in the second step in order to obtain the exact causal effect of education on earnings (Card, 2001). A number of studies used variety of instruments to get "correct" effect of schooling on earnings. Although results form these studies varied in regard to the magnitude of schooling coefficient in IV framework, they almost uniformly

confirmed that IV estimates of schooling coefficient was higher than the one obtained using the OLS method. These results implied that supply side factors caused a downward bias in OLS estimates. However, none of them denied that schooling increased earnings. A partial list of studies using instrumental variable method include, in addition to the ones cited in D. Card's 1994 paper and his 2001 paper; Denny and Harmon (2002) for Ireland; Rummery, Vella and Verbeek (1999) for Australia; Brunello and Miniaci (1999) for Italy; Levin and Plug (1999) for Netherlands; Ichino and Winter – Ember (1999) for Germany; Callan and Harmon (1999) for Ireland; Vierra (1999) for Portugal.

CHAPTER 2

DEMAND FOR EDUCATION IN TURKEY: A TOBIT ANALYSIS OF PRIVATE TUTORING EXPENDITURES

2.1 Introduction

Private tutoring can be defined as the education outside the formal schooling system where the tutor teaches particular subject(s) in exchange for a financial gain. This definition points to the three properties of private tutoring. First, it is separate from the formal education as it is an extra curriculum activity. Second, the teacher's supply of knowledge is mainly driven by profit motives. Third is that the students' expectations of the tutor are higher than that of a normal school teacher. Students who demand private tutoring believe that their chances of successfully moving through educational system will be increased by private tutoring. Otherwise, they would be satisfied with the formal school courses which are provided free of charge by the public.

Private tutoring has been a well-spread, large-scale industry in several countries in the world, especially in East Asia. Bray and Kwok (2003) give a review of the examples on private tutoring from a wide range of countries ranging from Egypt to Taiwan. The common feature of the educational systems of the countries where the practice of private tutoring is extensive is the existence of competitive entrance examinations to the universities. For example, in South Korea, Greece, Japan and Turkey high school graduates are required to take a nation-wide university entrance examination in order to gain a university place. In the developing countries, deficiencies in the educational system such as inadequate number of universities, large class sizes and low public educational expenditures are often cited as the reasons for the high demand for

private tutoring. As such private tutoring can be regarded as a demand driven reaction to the shortages in the public school system (Kim and Lee, 2001).

However, there is a growing demand for private tutoring in many developed countries where the formal education institutions meet the desired standards in terms of quantity of schooling (Bray and Kwok, 2003). In Canada, for example, the demand for private tutoring has grown immensely and became a major business activity over the last decade (Aurini and Davies, 2003).

Families who want their children to move successfully from high school to university and then to occupational careers spend more time and money on the informal educational activities (Stevenson and Baker, 1992). Kim and Lee (2001) emphasize that private tutoring is closely related to the economic competence of the families. In this regard, Stevenson and Baker (1992) questions whether "Is shadow education an avenue for the transmission of social advantages from parents to their children in the contest for educational credentials?" (p.1643). Therefore, it could also be regarded as a route to obscure the education equity and a tool that diverges economic and social advantages in favor of wealthier households. Bray (2003) considers contra-positive effects of private tutoring.

The study of private tutoring received little attention in the literature. Lack of official statistics and documentation on private tutoring is one reason for the neglect of the studies in this area. However, educational scientists are now turning attention to this area. The studies by Bray and Kwok (2003) for Hong-Kong and by Kim and Lee (2001) for South Korea are the recent examples.

This is the first empirical study of private tutoring in Turkey to our knowledge. The study examines the general features of the private tutoring in Turkey and estimate a private tutoring expenditure function for the Turkish households. For this purpose, the results of the 1994 Household Expenditure Survey[5] conducted by the State Institute of Statistics of Turkey are used. The main findings of the study can be summarized as follows: Households with higher incomes and higher parental educational levels devote more resources on private tutoring. Private tutoring expenditures are found to be unit elastic; one percent increase (decrease) in the household's permanent income would result in an increase in the private tutoring expenditures by the same amount. Private tutoring expenditures also increase with the age of household head but at a decreasing rate.

Whether a mother works or not does not significantly affect the level of private tutoring expenditures. Being a single mother who is also the household head is a factor that leads to an increase in private tutoring expenses. Private tutoring expenditures are higher in urban areas compared to the rural areas. However, they are not statistically significantly different between the developed and undeveloped neighborhoods and squatter settlements. This implies that households in urban areas regardless of their socio-economic location spend significantly larger amounts on private tutoring of their children.

2.2 Private Tutoring in Turkey

Private tutoring in Turkey takes mainly three different forms. The first type is one-to-one instruction by a privately-paid teacher either at the teacher's house or at the student's house. The second type is provided by school teachers during after hours at school where the students also take formal classes. The third type of private tutoring is undertaken by profit-oriented school-like organizations where professional teachers tutor in a classroom setting. This is called *dersane* in Turkish and it is more common than the other types and the facilities of this sort are spread all over the country. They will be referred to as private tutoring centers throughout this thesis. Such centers usually own or rent multi-story buildings in the city centers. Students attend these centers outside formal education hours. These centers provide smaller class sizes, better class materials and improved student-teacher relations compared to the formal schools. Private tutoring centers grew in number especially during the 1960s in order to prepare students for the university entrance examination. In 1984, there were 174 such centers in the country. A law passed in 1984 recognized them as part of the educational activities. Since then their numbers rapidly grew and reached more than 2100 in 2002 (Private Tutoring Centers Association, 2004). This is close to the number of general high schools, which was 2500 in 2002 (Ministry of Education of Turkey, 2004). Today the private tutoring centers operate under the supervision of the Ministry of Education. They also have a union called *ÖZDEBİR*, which stands for "Private Tutoring Centers Association" with headquarters in Ankara.

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[5] SIS conducted a larger household educational expenditures survey in 2002 and released the results in 2003. Nevertheless, this study started in 2002 and was completed in 2003.

Three main reasons are often cited for attending private tutoring centers. First is to prepare students for the university entrance examination. Second is to prepare for the entrance examinations of the special high schools (such as Anatolian High Schools where medium of instruction is English and Science High Schools) and private high schools. Third is to receive supplementary courses to the formal school courses of the basic and secondary education. These reasons make clear that private tutoring centers are examination oriented. They accommodate to students preparing for the two nation-wide examinations. One examination selects the basic education students into special high schools. The second nation-wide examination is the university entrance examination.

While there are no statistics available on the proportion of basic education students attending private tutoring centers, 35 percent of senior high school students attended them in 2001 (Private Tutoring Centers Association, 2003). It is believed that a larger percentage of high school graduates preparing for the university entrance examination attend them.

Private tutoring centers are expensive and usually beyond the reach of a household with average income. The per-capita income in Turkey was 2,500 US dollars in 2002. The average fee charged by private tutoring centers preparing for the university entrance examination was approximately 1,300 US dollars in 2002 (*Cumhuriyet Gazetesi*, December 10, 2002). During the 2001-2002 academic year the students preparing for high school examination and the university entrance examination paid in total 263 million US dollars to the private tutoring centers all over the country (*Cumhuriyet Gazetesi*, August, 3, 2002). This was 1.44 percent of GDP, while public education expenditures at all levels were 2 percent of GDP in 2002 (Ministry of Education of Turkey, 2003). These figures indicate the importance of private tutoring centers in the educational system of the country. Private rate of return to the university education in Turkey is substantially higher than that to the other levels of schooling. Tansel (1994 and 2001) provides recent evidence on this. This explains the excess demand for the university education and the need for rationing places by university entrance examination. High school graduates compete for the limited number of places of the university programs. The competition is intense for the highly restricted places at some of the programs of the prestigious universities. Graduates of these programs command better job prospects and higher incomes than average. Parents are aware of the high economic returns to the university education. For this reason, they send their children to private tutoring centers in order to increase their chances of success at the university entrance examination. This is usually

done with great financial sacrifices. There is also competition among the private tutoring centers to attract students. They advertise the examination achievement results of former tutees. Some private tutoring centers accept the students who perform above a certain level in an examination they administer. Those who achieve high scores are granted discounts in the centers fees.

Private tutoring centers are often in the center of public discussion. In the early 1980s, during the military intervention, there were discussions both in the public and the parliament about closing them down (Private Tutoring Centers Association, 2003). In these discussions, private tutoring centers were regarded to obscure the equal opportunity in education in favor of children from wealthy families. This concern over the equity issues still prevails in the public discussion today. It has been in the recent public discussion that parents who spend enormous sums on private tutoring during high school years of their children pay only nominal tuition fees at the prestigious public universities once their children secure a place at them. This line of argument has been used to rationalize imposing recent tuition fee increases in the public universities.

It was also in the public discussion that attending private tutoring centers disrupts the formal schooling. The subject matters taught in the last year in high school are not explicitly covered in the university entrance examination. For this reason, it is quite common that senior high school students, two to three months before the impending university entrance examination, stop attending high school classes and instead concentrate on attending the private tutoring centers. Such practices led the Ministry of Education to devise ways to increase the importance of formal schooling over private tutoring. It is only recently announced that high school GPA (grade point average) contributes points towards university entrance along with the result of the university entrance examination. It is planned that only in the 2005 university entrance examination and onwards the subject matters of the final year in high school will be covered. In spite of such measures, private tutoring continues to be a major activity in preparation for the university entrance examination.

2.3 Theoretical Model

This model relies on the model Kim and Lee (2001) used to investigate the private tutoring in South Korea. In this model, private tutoring is treated in a utility maximization framework. Formal education and private tutoring are considered to be perfect substitutes. Then, the household i's problem becomes to maximize the consumption of education (e) and all the other goods (x). There are two sources by which educational services can be obtained; formal schooling (e1) (public plus private schools) and private tutoring (e2). Families' preferences for education present idiosyncrasies. These differences are captured by the parameter (i. If the household's preference for education is high (i is high and if the preference is low the parameter value is low. Formally, each household is interested in maximizing the utility function (Kim and Lee, 2001: 21);

$$U_i = (x, e; \theta_i)$$

(9)

Subject to

1. $e = e_1 + e_2$

2. $e_1 = c_1$

3. $x + pe_2 = y - \eta c_1$

4. $x \geq 0, e_1 \geq 0, e_2 \geq 0$

The first constraint implies that total educational services are the sum of formal schooling and private tutoring. The second constraint says that formal schooling depends on the level of public school (c1). Assume that the income of the household is either spent on education and/or other goods. The government collects a lump-sum tax of the amount (c1 to provide public education free of charge. Subtracting this amount of tax from the household income and equating it to the sum of expenditures on other goods, whose prices is normalized to 1, and on education, p is the price of private tutoring, we obtain the first constraint. The parameter (represents the efficiency of the formal schooling. The lower the value of (the more efficient the formal schooling is. Thus, the utility maximization problem of the household reduces to choosing the amount of x and e2 subject to the constraints above.

The Lagrangian is given by (Kim and Lee, 2001: 22);

$$L = u(, c_1 + e_2) + \lambda(y - x - pe_2 - \eta c_1)$$

(10)

The reduced form solutions for demand for x and e2 are given by;

$$x = f(c_1, y, p, \eta, \theta_i)$$

(11)

$$e_2 = g(c_1, y, p, \eta, \theta_i)$$

(12)

The model has the following predictions. As the income of the household rises the demand for private tutoring goes up. An increase in the price of private tutoring reduces its demand. If the demand for publicly provided education goes up, the demand for private tutoring declines. Since the amount of lump-sum tax will increase parallel to an increase in the amount of publicly provided education we expect the parameter (to rise as the demand for private tutoring goes down. The higher the preference on education the higher the demand for private tutoring is.

2.4 Data

In this study, the 1994 Household Income and Expenditure Survey data collected by the State Institute of Statistics of Turkey is used. The number of the households reported educational expenses of some type was 4279. Educational expenses included in the questionnaire ranged from the child's school bag expenses to private school fees. Only three forms of private tutoring expenses are considered. These expenditures consisted of the fees paid by the household to private tutoring centers, the fees paid for one-to-one private tutoring, and the fees paid for the private tutoring at schools by teachers outside the formal schooling hours. Distribution of these expenditures is shown in Figure 2.1. The fees paid to private tutoring centers make up the highest percentage of total expenditures.

Only 646 households reported positive private tutoring expenses for these categories. The households with zero private tutoring expenses are restricted to those with children between the ages seven and twenty-three. The age interval is chosen on the basis

of the ages of the children from the households with positive private tutoring expenditures. After these restrictions, the data set is reduced to 3898 households of which 3252 had zero private tutoring expenditures. According to the school system in Turkey, a student normally starts primary school at the age of seven and finishes at twelve years old[6]. He or she then attends middle school between the ages 12 and 15 and is expected to graduate from high school at seventeen. If the student attends the university, he or she normally graduates at the age of twenty-one. According to this normal course of academic career of a student, he or she is expected to take private tutoring during his or her primary and secondary school study. Primary school students take the examination to enter the high schools at the fifth grade. Nevertheless, families might have their children take private tutoring as early as the first grade of primary school. The middle school students may take private tutoring to complement for their formal courses and in some cases for the early preparation for the university entrance examination or some special kinds of high schools, which have a selection examination. Approximately 40 percent of high school graduates take the university entrance examination more than once. Thus, the age interval is extended to include those who repeated and took the exam more than once.

Since the survey did not ask the households, the purpose of private tutoring whether the student took private tutoring for preparation for the specific high schools such as the Anatolian High Schools or university entrance examination or to supplement his or her normal school courses is not clear. As the other kinds of private tutoring was asked separately in the survey such as computer course, language course or other art-related or skill-improving courses, it is assumed that all the three types of private tutoring were for the purposes specified above, either supplementary or preparatory. The respondents were not asked to report which child in the household takes what form of private tutoring. The survey only contained the private tutoring categories and expenses by each household. Thus, the private tutoring expenses are aggregated per household rather than per child.

The survey took place over the twelve months in 1994. Relatively small number of households was surveyed during the summer, June-July-August, and the higher number of households was surveyed during the other months. The peaks were in January and September. 14.6 percent of the households were surveyed in January and 23.2 percent were surveyed in September (See Table 2.1). Thus, the educational expenditures of the

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[6] As the data obtained prior to the policy shift that increased the minimum years of basic education

households are well-represented by the data as the families do the most important part of their educational expenditures at the beginnings of the fall and spring semesters.
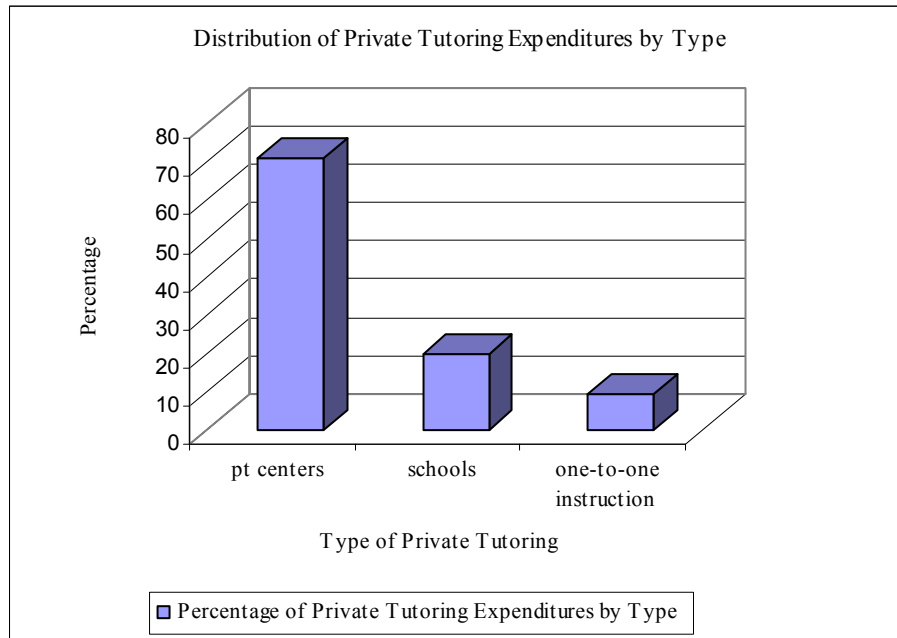
Figure 2.1 Distribution of Private Tutoring Expenditures

Table 2.1 The Number of the Households Surveyed by Month

MONTH	NUMBER OF HOUSEHOLDS	PERCENT
January	567	14.55
February	342	8.77
March	238	6.11
April	222	5.70
May	199	5.11
June	194	4.98
July	36	0.92
August	104	2.67
September	904	23.19
October	414	10.62
November	347	8.90
December	331	8.49
Total	3898	100.00

to 8 years, the age groups are in compliance with the system at the time.

Table 2.2 presents the results for the educational levels of parents. The link between parents' education and private tutoring expenses seems to be strong. For both father and mother, years of schooling are higher for the households where private tutoring expenses are positive. The percentages of parents with middle school and higher levels of education for the households with positive private tutoring expenditures are higher compared to that of parents with the same levels of education in the households with zero private tutoring expenditure.

Table 2.3 presents the income quartiles of households and shares of private tutoring expenditures in the total expenditures. Four income groups are defined. The incomes of the households from the lowest to the highest are divided into four income percentile categories according to their deflated monthly incomes. The households that fall in the first 25-percentile income range are in the lowest income category and the ones that fall in the highest 25-percintile income range are considered as the most affluent families. According to this classification the following tables are produced.

Table 2.2 Percentages of Households with Zero and Positive Private Tutoring Expenditures by Parents' Level of Education, 1994 Turkey.

Mother's Level Of Education	Households with Zero Private Tutoring Expenditures		Households with Positive Private Tutoring Expenditures	
	Number	Percent	Number	Percent
Illiterate	970	90.23	105	9.77
Non-graduate	209	91.27	20	8.73
Primary	1,538	84.6	280	15.04
Middle	183	75.93	58	24.07
High School	254	69.78	110	30.22
University	96	56.8	73	43.2
Masters	2	100	-	-
Total in Numbers	3252		646	
Household Head's Level of Education				
Illiterate	193	91.09	17	8.01
Non-graduate	160	93.57	11	6.43
Primary	1,740	88.28	231	11.72
Middle	359	79.96	90	20.04
High School	480	77.67	138	22.33
University	315	66.60	158	33.40
Masters	5	83.33	1	16.67
Total in Numbers	3252		646	

For all income groups, households whose private tutoring expenditures have a share in their total expenditures between 1 percent and 15 percent constitute approximately 80 percent of all households. Total monthly expenditure is considered to be a good proxy for permanent income. (Tansel, 1986). Thus, one can conclude that households do not hesitate to allocate a considerable fraction of their monthly incomes for their children's education. Note that private tutoring expenditures especially for examination-oriented courses are not regular items in the family budgets, rather they are one-period spending items and families seem to burden these out of pocket costs of education willingly, although quite large, in expectation of their children to be successful in major exams.

Table 2.3 Percentage of Households by Income Quartiles and Proportion of Private Tutoring   Expenditures in Total Expenditures, 1994 Turkey.

Percentage of Private Tutoring Expenditures in Monthly Total Expenditures	1st quartile	2nd quartile	3rd quartile	4th quartile
	N=68	N=126	N=189	N=263
	%	%	%	%
1 - 5	24.64	34.13	31.75	37.26
5 - 10	28.99	25.40	37.57	33.46
10-15	26.09	23.81	16.40	16.35
15 - 20	7.25	7.94	6.35	6.08
20 - 30	10.14	7.94	4.76	4.56
30 - 50	2.90	0.79	2.12	1.9
Total	100	100	100	100

Notes: First quartile corresponds to the lowest income households and the fourth quartile corresponds to the highest income households.

Bray and Kwok (2003) did the similar calculations for a sample of 110 households using low-middle-high-income classification. They looked at the percentages of private tutoring expenditures in monthly incomes of those households for Hong-Kong. The fraction of private tutoring expenditures in total monthly incomes of the households differed from 1 percent to 20 percent and the largest group of households spent between 1 percent and 5 percent of their monthly total incomes on private tutoring. This range seem to be much larger for the Turkish households (approximately 80 percent of households) as noted above that the largest group of households spend between 1 to 15 percents of their

total permanent incomes on private tutoring. It is also interesting to note that no households in their study reported private tutoring expenses more than 20 percent as a fraction of their total monthly incomes.

Table 2.4 also highlights that as the monthly income of households increase the participation in private tutoring activities increase. State Institute of Statistics of Turkey recently reported that the most affluent 3 million households in Turkey do the 73 percent of private educational expenditures. 13 million households share the rest. In total, families spent 160 billion Turkish Liras for education in 2002. The most affluent 20 percent made the 73 percent private educational expenditures while the share of the remaining 80percent in private educational expenses stayed as 27 percent. (*Milliyet Gazetesi*, November,3, 2003).

Table 2.4 Percentage of Households with Zero and Positive Private Tutoring
Expenditures by Income Quartiles, 1994 Turkey.

Income Quartiles	Households with Zero Private Tutoring Expenditures	Households with Positive Private Tutoring Expenditures
	%	%
1st quartile	93.54	6.46
2nd quartile	88.44	11.56
3rd quartile	81.97	18.03
4th quartile	75.44	24.56

Notes: See Table 2.3
Percentages of households with zero private tutoring expenditures and with positive private tutoring expenditures add up to 100.

2.5 Specification Issues

In the Engel curve function, the total expenditure is commonly used as a proxy for income. Absence of income figures and measurement errors in income in household surveys encouraged the use of total expenditures instead of income. In addition, the total expenditures are considered to reflect permanent income better. But, Summers (1959) discussed that there is a feedback between the components of total expenditures and individual expenditures and thus, they are simultaneously determined. This would lead a simultaneous equation bias. Livitian (1961) showed that this bias is eliminated using

income as instrumental variable. Therefore, we tested the exogeneity of total expenditures using the total household income as instrumental variable. The test of exogeneity for a Tobit model is proposed by Smith and Blundell (986). The test is performed using monthly deflated income of the household as instrumental variable and including the residuals from this first stage instrument regression. The test hypothesis is that the coefficient on these residuals is zero. The test hypothesis is not rejected at both 0.05 and 0.01 significance levels by using the appropriate F-table values.

Another specification issue arises from the fact that the possibility of heterocedasticity increases in the expenditure functions of the sort that we used in this study where the most of the households do not allocate any sums for the good in question. Therefore, we use the logarithmic transformations of the total expenditure and private tutoring expenditure variables to reduce the heterocedasticity that may come from the variation of private tutoring expenditures among high-income families. This specification also allows us to evaluate the elasticity of private tutoring expenditures with respect to permanent income. It is also a well-known fact that a log-transformation of income gives better approximation to normal distribution since the income variable is skewed toward low income levels. Our preliminary experiments boosted this argument.

2.6 Empirical Specification

In this study, the Tobit model is used to estimate an Engel curve function with private tutoring expenditures as the dependent variable. A number of the values of the dependent variable are clustered at zero. In this case, estimating the expenditure function by a standard OLS procedure would produce inconsistent estimates. OLS estimation presumes that the dependent variable is normally and independently distributed depending on the distribution of the error term. However, the private tutoring expenditures are censored at zero and thus, censored and truncated normal distributions need to be considered (Maddala, 1983: 151). In the classical OLS framework the expected value of the dependent variable is specified as a linear function of explanatory variables and the parameters to be estimated. In the case of censored sample, however, expected value of the observed dependent variable becomes a nonlinear function of the independent variables and the parameters. Tobin (1958) showed that we could relate the mean of the dependent variable in a censored sample to the independent variables and the

parameters by defining dependent variable as an unobserved index. The latent model is given by

$$Y_i^* = \beta'X + \varepsilon_i \tag{13}$$

Some values of Y are censored at $C = 0$

$$Y_i = Y_i^* \text{ if } Y_i^* > C \tag{14}$$

$$Y_i = 0 \text{ if } Y_i^* = C \tag{15}$$

The observed model is given by;

$$Y_i = \beta'X + u_i \text{ if } Y_i > 0 \tag{16}$$

$$Y_i = 0 \tag{17}$$

Where Y_i^* is the latent variable and Y_i is the observed counterpart of the latent variable which takes the value of zero for the limit observations and positive values for the non-limit observations. X is a vector of household and parent characteristics, β is the vector of parameters to be estimated and ε_i is the normally and independently distributed error term.

For the above model, there are three potential expectation functions (Maddala, 1983: 160). Although the conditional mean of the latent variable, $E(Y_i^*)$, is β`X which is a linear function of X and β, for the observed values of the dependent variable the conditional mean becomes a nonlinear function X and β.

$$E(Y_i^*) = \beta'X \tag{18}$$

$$E(Y_i|X_i) = F(z)(\beta'X_i + \sigma\lambda) \tag{19}$$

$$E(Y_i|Y_i^* > 0) = \beta'X_i + \sigma\lambda \tag{20}$$

$$\lambda = \frac{f(z)}{F(z)} \tag{21}$$

Where f(z) is the probability density function and F(z) is the cumulative density function of a standard normal respectively and z is equal to to $\beta'X_i/\sigma$. σ designates the standard error of the error term. Equations (18) to (20) represent the expected value of the latent variable, the unconditional expected value of its observed counterpart, and the conditional expected value of the dependent variable for the non-limit observations. Corresponding these three expectation functions there are three possible marginal effects obtained from a Tobit model (McDonald and Moffitt, 1980)

$$\frac{\partial E(Y^*)}{\partial X_j} = \beta_j \tag{22}$$

$$\frac{\partial E(Y)}{\partial X_j} = F(z)\beta_j \tag{23}$$

$$\frac{\partial E(Y_i|Y_i^* > 0)}{\partial X_j} = \beta_j(1 - (z)\lambda - \lambda^2) \tag{24}$$

Equation (23) shows that the total change in observed Y (the unconditional mean of all observations) due to a unit change in explanatory variables can be obtained by multiplying the fraction of non-limit cases in the sample by the Tobit parameter estimates. Equation (24) indicates that the correct regression effects for the positive observations can be obtained adjusting the Tobit maximum Likelihood parameters by the fraction $(1 - (z)\lambda - \lambda^2)$.

2.7 Empirical Results

This research concerned weather the wealthier households with better-educated parents spend more on private tutoring than their less affluent and less educated counterparts. To capture the level of welfare of the households and the levels of education of parents thirteen explanatory variables are defined. As mentioned above, private tutoring expenditures and monthly total expenditures of the households are in 1994 Turkish liras and these figures are deflated using appropriate monthly consumer price index. The variables indicating the years of education of parents are defined in the

following fashion. If he or she had no formal schooling the variable takes the value of zero. If he or she is primary school graduate, it takes the value of five. If he or she completed middle school, the variable takes the value of eight. For the high school graduates the variables take the values of 11 and finally for the university and masters' degree holders it takes the value of 15 and 17 respectively. The age of the household head and its square are other two variables. Five dummy variables are indtroduced. It is assumed that a working mother would have a positive effect on the private tutoring expenditures since this will lead to both an increase in the family income and may imply higher education level for the mother. Thus, a dummy is defined taking the value of 1 if the mother of the household works and zero otherwise. Similarly, it is assumed that if the household owns the house it resides this might have a positive effect on private tutoring expenditures by the household since a large share of household income is spent on rent otherwise. "Own House" is a dummy variable indicating whether the family owns the house in which they reside or not.

The neighborhood where the family is living is considered another indicator of the social and economic status of the household. Thus, we define two more dummies to consider the effect of social environment on private tutoring expenditures. If the household resides in a developed area in terms of physical conditions, infrastructure, availability of commuting to city centers etc., the dummy variable takes the value of 1 and zero otherwise. We also define another dummy to consider the effect of living in a squatter settlement. As a result, our base category becomes underdeveloped neighborhoods. In addition to these dummy variables, we are also interested whether the household lives in an urban or rural area affect the level of private tutoring and participation in private tutoring. Areas with a population over 20 thousand are defined as urban areas whereas the areas with a population of less than 20 thousand are called rural areas. Although private tutoring centers are widespread all over the country they are extensively located in more populated areas. If the household lives in a village or a small province, the child will probably have to commute a long distance to private tutoring center. In addition, the possibility for having one-to-one private tutoring is more limited in those areas. Thus, we consider the effect of whether the household lives in an urban area or not.

Whether the mother of the household is single or not is another qualification that we think that may have an effect on private tutoring expenditures of the household. Single mother headed households may have higher preference on the child's education since the

single mother might be more concerned about her old ages compared to a normal mother with a husband. Therefore, we include two dummies to see the effects of being a single mother and being a working single mother. Number of kids in the household is expected to have a negative effect on private tutoring expenditures. Thus, we include the number of children in the model. Table 2.5 provides a list of variables and their definitions.

The Tobit estimates are presented in the first column of Table2.6. The results show that all the explanatory variables have the expected signs except for the three variables, e.g. the dummy variable on whether the mother works or not, the dummy on whether the single mother works, and the dummy on whether the family resides in its own house (Various Tobit estimates excluding some of these variables are given Table A.2 in Appendix A). These three variables all have the minus sign and are statistically insignificant. The dummy variables relating to whether the household resides in a developed or a squatter neighborhood have the expected signs but they are statistically insignificant.

Table 2.5 Variable Definitions

Variables	Definition
Ln(Per household expenditure on private tutoring)	Log of monthly spending on private tutoring per household in Turkish Liras
Ln(T. H. Expenditure)	Log of monthly total household expenditures in Turkish Liras
Head Education	Years of education the household head has
Mother Education	Years of education the mother has
Head Age	Age of the household head
Head Age Square	Squared value of age of the household head
Mother Works	1 if the mother has a job; 0 otherwise
Single Mother	1 if the household head is single mother, 0 otherwise
Single Mother Works	1 if the single mother works, 0 otherwise
Urban Locations	1 if the household lives in urban area, 0 otherwise
Own house	1 if the household is the owner of the house it resides
Developed Street	1 if the street is located where the household resides in a developed area; 0 otherwise or the house lives in squatter
Squatter Settlements	1 if the household lives in squatter region
Number of children	The number of children in the household

The estimates show that the household's log permanent income and head's years of education have positive effects on the private tutoring expenses. The coefficients on these variables are both statistically significant and of the expected sings. Private tutoring

expenditures are unit elastic with respect to permanent income. They are neither a necessity nor a luxury item in the household budget. But they are equally close being both. The coefficients on the head's age and its square imply that the expenditures on private tutoring increase with the head's age but at a decreasing rate. This result is consistent with the presumption that over the life cycle of the household head the educational expenditures would increase as the income earnings of the head peaks. Earnings peak at upper-middle ages and it is likely that parents will have school age children at these ages.

Education of the mother has a greater effect on private tutoring compared to that of father, almost twice as the effect of father's education. A Similar differential effect is also found in Kim and Lee's study for South Korea. Tansel (2002) also found that the mother's education is more important than that of father on children's schooling attainment. Working mother has both a negative and insignificant effect on private tutoring expenditures and participation in private tutoring. This result contradicts with the primary intuition. Being a single mother has a positive and significant effect on the dependent variable whereas the dummy indicating whether the single mother works or not has a negative and insignificant effect on private tutoring expenditures. Those households living in urban areas have a higher likelihood of participation in private tutoring and spend more on private tutoring compared to their counterparts in rural areas. This result may be a reflection of both to outcompete others as noted by Kim and Lee (2001) and the availability of private tutoring in urban locations. Kim and Lee (2001) found the similar result for the high-density residential development areas and they attributed it to the competitive pressures from the neighborhood. In Turkey, the incentives to participate in private tutoring might be lower in rural areas. The belief that they have lower chances to outcmpete their fellow students from big cities with better education due to physical and qualitative conditions may preclude the students in rural locations from participating in private tutoring. There are either fewer or no private tutoring centers in rural areas. This also limits participation of rural students in privates tutoring. The dummy variable on whether the household resides in a developed neighborhood or not has the expected sign but it is statistically insignificant. Another variable to identify the effect of household's residing in a squatter neighborhood on the private tutoring expenses is also included, the squatter dummy. It also has the expected sign but it is statistically insignificant. The other dummy variable on which an unexpected sign is observed is the dummy on whether the household resides in its own house or not, i.e., rented house or

other. Kim and Lee also found that households that own their houses do not significantly spend more on private tutoring compared to the households who do not own houses. It is also found that the number of children in the household negatively affect the private tutoring expenses of the household.

The marginal effects are calculated and demonstrated in the second and third columns of Table 2.6. The marginal effects corresponding to the unconditional expected value of the dependent variable and to the expected value of the dependent variable conditional being on uncensored are evaluated at the sample means (See Table A.1 in Appendix A for the means and standard deviations of the variables). Column 2 gives the effects of changes in the exogenous variables on the expected mean of all observed private tutoring expenditures, zero and positive while the column 3 indicates the marginal effects for the observations above the limit.

The marginal effects relating to the mean of positive private tutoring expenditures are the regression coefficients for the uncensored cases. We see that the elasticity of private tutoring expenditures for the general model is quite high, 6,332, implying that private tutoring is a luxury good for the household. Remembering that the Tobit parameter estimates relate to the expected mean of the latent variable, equation (22), it is seen from the column 3 of Table 2.6 that the corrected permanent income elasticity of private tutoring expenditures for the positive sample is much lower, 1.213, than that for the latent index. This means that for the households in the positive sample private tutoring is unit income elastic and the effect of a one percent increase in permanent income on private tutoring expenditures is not as pronounced as for the latent model. In general , a unit change in the independent variables produce a stronger effect on the dependent variable for the non-limit cases (the column 3) compared to the marginal effects for the whole sample (the column2).

Many researchers also found that dividing the OLS coefficients by the fraction of positive cases in the sample, which is 0.167 for our sample, would give values very close to the Tobit MLE coefficients (Greene, 1997: 966). The fraction of non-limit observations ($P = 646/3898$) can be used as an estimate of $F(z)$ (Berndt, 1990: 621). Using these empirical regularities, scaled Tobit MLE and scaled OLS results are presented in Table 2.7. The scaled OLS estimates quite resemble to the MLE Tobit estimates and the Tobit MLE estimates are quite close to the OLS estimates in value. The marginal effects relating to the expected mean of all observed private tutoring expenditures are obtained by adjusting the Tobit parameters by $F(z)$ evaluated at the mean of explanatory variables

(equation 23). Thus, a comparison of the OLS results presented in the second column of Table 2.7 and the marginal effects in the column 2 reveal that the OLS results for the whole sample indeed give the marginal effects in Tobit model for the observed values of the dependent variable.

Table 2.6 Tobit MLE Results and Marginal Effects for Private Tutoring
            Expenditures   in Turkey, 1994

Variables	Tobit Results	Marginal Effects Unconditional Expected Value	Marginal Effects Conditional on Being Uncensored
Ln(T. H. Expenditure)	6.332	0.908	1.213
	(10.21)***	(10.21)***	(10.21)***
Head Age	1.004	0.144	0.192
	(3.14)***	(3.14)***	(3.14)***
Head Age Square	-0.008	-0.001	-0.001
	(2.23)**	(2.23)**	(2.23)**
Head Education	0.260	0.037	0.050
	(2.47)**	(2.47)**	(2.47)**
Mother Education	0.409	0.059	0.078
	(3.49)***	(3.49)***	(3.49)***
Mother Works	-0.201	-0.029	-0.038
	(0.23)	(0.23)	(0.23)
Single Mother	6.208	1.225	1.348
	(3.43)***	(4.72)***	(3.89)***
Single Mother Works	-4.001	-0.457	-0.707
	(1.14)	(0.91)	(1.05)
Urban Locations	3.602	0.451	0.657
	(3.08)***	(2.69)***	(2.93)***
Developed Street	0.892	0.129	0.172
	(1.16)	(1.17)	(1.16)
Squatter Settlements	-1.175	-0.158	-0.220
	(0.61)	(0.57)	(0.59)
Own House	-0.556	-0.080	-0.107
	(0.77)	(0.78)	(0.77)
Number of Children	-1.627	-0.233	-0.312
	(5.90)***	(5.90)***	(5.90)***
Constant	-122.406	-17.544	-23.454
	(11.71)***	(11.71)***	(11.71)***
Log likelihood	-35.482.118		
LR Chi-square (13)	482.77		
Pseudo R-square	0.0637		
Number of Observations	3898	3898	3898
* Significant at 10%; ** significant at 5%; *** significant at 1%			

Table 2.7 Scaled Tobit MLE Results and Scaled OLS Results for Private Tutoring
        Expenditures in Turkey, 1994

	Tobit Results	OLS Results	Scaled OLS Results	Scaled Tobit Results
Variables			Scale Factor = 1/P	Scale Factor = P
Ln(T.H. Expenditure)	6.332	1.108	6.675	1.051
Head Age	1.004	0.122	0.867	0.167
Head Age Square	-0.008	-0.001	0.006	0.001
Head Education	0.260	0.054	0.325	0.043
Mother Education	0.409	0.100	0.602	0.068
Mother Works	-0.201	0.052	0.313	0.033
Single Mother	6.208	1.184	7.133	1.031
Single Mother Works	-4.001	-0.706	4.253	0.664
Urban Location	3.602	0.416	2.506	0.598
Developed Street	0.892	0.227	1.367	0.148
Squatter Settlement	-1.175	-0.056	0.337	0.195
Own House	-0.556	0.012	0.072	0.092
Number of Children	-1.627	-0.199	1.199	0.270
Constant	-122.406	-16.438	99.024	20.319
Number of Obs.	3898	3898	3898	3898

CHAPTER 3

INEQUALITY IN THE WAGES OF MALE WAGE EARNERS IN TURKEY 1994-2002: AN APPLICATION OF QUANTILE REGRESSION ANALYSIS

3.1 Introduction

Many studies from developed and developing countries suggest that returns to schooling increase linearly with the level of education. (See for a review of studies Psacharopoulos and Patrinos, 2002). It has been an established fact that the individuals with higher levels of education earn more in the labor market. Fewer studies, however, investigated that this positive linear association between the level of schooling and earnings is also a source of wage inequality.

The log-linear earnings function, when estimated by the ordinary least squares (OLS), permits one to explore the effect of observable skills (e.g., education and experience) on the earnings. Coefficient on the schooling variable, being the internal rate of return in schooling investment, informs us about how the market values education. However, the productivity of a given worker is not fully uncovered by his observable skills. Therefore, the residuals from an OLS regression are roughly interpreted as unobservable ability (skills). Earnings have then two parts; the value that market places on the observed skills and the earnings that result from the unobserved ability.

Wage inequality derives from both of these factors. More technically, wage inequality can be decomposed into the differences in observable dimensions of skills and into the differences in unobservable dimensions of skills (Juhn et al., 1993). An extension to this fact stems from the recognition of deferring schooling coefficients across the ability distribution of the workers with identical observable characteristics.

Quantile regression (QR) analysis enables one to evidence whether the returns to schooling for individuals in the upper tail of wage distribution are different from those for the individuals in the lower tail of wage distribution. If there are such differences, we may conclude that wage inequality is present not only due to differentials increased by level of education but also due to differentials within the same educational categories across the wage distribution. The contribution of education to wage inequality then becomes twofold. Wage inequality that relates to the differences in the returns for different education levels (for instance, difference between the return coefficient for high school graduates and the one for primary school graduates) and wage inequality that is linked to the difference between the coefficients at distinct points of wage distribution[7] within the same education category. The first can be derived from an OLS estimation of earnings equation while the second from the estimation of the log-linear earnings function by quantile regression technique.

There is relatively small number of studies concentrating on wage inequality in this context. The existing studies come from a variety of developed and developing countries. While studies from developed countries provide over time evidence due to availability of data (Buchinsky, 1994; 1998, Juhn et al., 1993; Gosling et al 2002) the evidence from developing countries mainly come from one-year cross-sectional data sets from household surveys (see Falaris, 2003 for Panama; Girman and Kedir, 2003 for Ethiopia; Mwabu and Schultz, 1996 for South Africa).

Buchinsky (1994; 1998) and Juhn et al. (1993) report that the incremental return to schooling increased in the 1970s and 1980s in the united states for male wage earners. They point out that this increase was not evenly distributed across the wage distribution. While the return increased with the level of education, the return within the same education and experience groups differed significantly at distinct points of ability distribution. Juhn et al., (1993: 411) noted that

> Wages for the least skilled, as measured by the tenth percentile
> of the wage distribution, fell by about five percent, and wages
> for the most skilled, as measured by the ninetieth percentile of
> the wage distribution, increased by about forty percent.

Buchinsky (1993) also found that wage inequality increased over time. He also argued that the returns to education are higher at the higher quantiles. Their findings are

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[7] Ability and wage distribution is used interchangeably throughout the chapter.

important in that they interpret wage inequality not solely in terms of the dispersion in ability distribution but rather in terms of observable productivity variables. Juhn et al. state that this increase in the return mainly come from the shift of the labor demand towards more skilled labor. This demand shift, on the other hand, benefited those with higher education and higher ability, in which case the two are complements, compared to those with higher education and less ability.

A series of studies from European countries (Machoda and Mata, 2001 for Portugal; Hartog, Preiera, and Vieira, 2001 for Portugal, Martins and Periera, 2001 for 16 European countries) conclude that at the higher quantiles of wage distribution the returns to education are higher. The only exception comes from evidence from Austria. (Ferstere and Winter-Ebmer, 2003). Although they found that the return increases linearly with the quantile numbers, the returns tend to fall over time for the tertiary and high school graduates. Mwabu and Schultz (1996) used quantile regression to investigate whether there is a monotonic increase in returns to schooling in quantiles. They found that the returns increase as one goes up through the wage distribution for African white male at tertiary level. Evidence from Ethiopia (Girman and Kedir, 2003) suggests that schooling is more valuable for the less able. Mwabu and Schultz (1996) also find evidence from South Africa in compliance with the finding from Ethiopia. Returns to education were higher at the lower deciles for the secondary school graduate African males. These findings imply that, as argued by Mwabu and Schultz (1996), schooling and ability were complements at the secondary level for the less able individuals. Then their immediate conclusion is that the expansion of education for the less able would increase the private returns to schooling.

In this chapter, we seek to provide evidence whether education and other personal and firm attributes contribute to wage inequality. Public employment, location of residence, the existence or absence of collective bargaining power, firm size and industry in which the worker is employed are often cited among the factors that caused wage inequality. Then it would be interesting to pose the question whether these factors in addition to educational attainment contribute to wage inequality both between the groups and within the groups. In other words, a public employee may obtain a positive wage premium over a private sector employee but how equally this positive wage premium, among the public workers, is distributed across the wage distribution is another question. In short, we seek to find evidence whether there are between and within wage inequalities caused by the level of educational attainment and other employer and employee traits.

On the other hand, it also recognized that the Turkish labor market is not overwhelmingly dominated by any of these factors, namely, large firms, abundance of skilled labor, collective bargaining power. However, public employment has been traditionally large in the country. It is also found that a positive urban wage premium and a positive firm size premium exist and inter-industry differentials are also present (Tunalı et al., 2003). But how these premiums spread across the wage distribution is unexplored. Turkey went through several deep economic crises over the last decade and employment dropped considerably. The annual rate of unemployment stayed anywhere between 6 percent and 10.5 percent from 1994 to 2003 (State Institute of Statistics, 2004). Employment in manufacturing industry is notoriously shrunk since the early 1980s. We use Household Income and Expenditure Surveys collected by the State Institute of Statistics of Turkey in 1994 and 2002 for this study. Data from these surveys tell that real hourly wages of male workers in Turkey declined by about 2.5 percent from 1994 to 2002. On the other hand, educational attainment of male wage earners increased by about 25 percent at the tertiary level between the two periods under study. This brings to mind that many university graduates were unemployed and some more were employed in the jobs requiring less skill than they gained at school. Skill redundancy is expected to occur in a country where there are a growing number of university graduates in the face of declining employment in general and drop in the skill demand in particular. However, these issues will be tackled after the basic findings from our study are presented.

The results indicate that both between and within wage inequality resulting from educational attainment differences existed in 1994 and 2002. More explicitly, a university graduate obtained earnings consistently above a high school graduate and a middle school graduate and a primary school graduate. Earnings for high school graduates were, in return, above the earnings for middle school graduates and so on. This is the between wage inequality in terms of education groups. Wage inequality within educational categories is also present in 1994 and 2002 in Turkey. Although the schooling coefficients at distinct quantiles were not significantly different from each other at the secondary level (middle school, high school, and vocational high school) in both years, the returns at each quantile for the university graduates were significantly different from each other in 1994. In 2002, the returns at the university level were significantly different at the tenth and ninetieth deciles. At the primary level, the coefficients at the 25th quartile and 90th decile were significantly different from each other in 1994 and 2002. At the university level, the most able workers, placed around the 90th percentile of wage

distribution, received higher returns to their education compared to the least able workers, around the 10th decile of wage distribution. The Turkish data supports the general finding that education and ability were complements at tertiary level. The school premium for university graduates is not evenly distributed across the ability distribution. Those who are more able and who have university diplomas are able to increase the wage gap between themselves and their less able counterparts. In other words, university education increases earnings but not uniformly across the ability distribution. This finding is in compliance with the findings from other studies (Buchinsky, 1994; Mwabu and Schultz, 1996; Falaris, 2003). From this finding we can hypothesize that in case of a demand shift for the more skilled labor, wage inequality would enormously increase. Machoda and Mata (2001) present evidence from Portugal in line with this supposition. They state that after the European Union involvement of the country the skilled labor enjoyed significant wage increases because of increasing demand from foreign investments. The more able with higher levels of education, however, enjoyed this increase in wages more.

In general, public employees earn by about 47 percent more than their fellow workers in the private sector in 1994 and 2002. Public premium is not evenly distributed across the wage distribution. Among the public employees, the ones positioned around the lower tail of wage distribution (10th, 25th and 50th quantiles) receive higher public wage premium compared to ones in the higher end of wage distribution. In any case, public employment is more beneficial for both those with higher ability and those with lower ability than being employed in the private sector. In addition, the public sector employment mitigates the wage differentials among the public employees paying higher wage premium to those with lower wages. Falaris (2003) found that public employment penalized the most able workers paying them a negative wage premium in Panama.

Urban employment provided a positive wage premium in both years. However, the premium dropped considerably from 17 percent in 1994 to 9.7 percent in 2002. The urban employment wage premium was not evenly distributed across the quantiles. In both years, the urban premium was higher for the less able. In 2002, the coefficients on the urban dummy at the 75th and 90th quantiles were not statistically significant. In both years, urban employment lessened the wage differentials among the urban employees across the wage distribution.

3.2 The Model

Classical Regression analysis defines a particular relationship between the dependent variable and the independent variables. The association between the two variables is such that there are values of dependent variable whose mean correspond to a given value of the explanatory variable. What underlies this relationship is the assumption about the distribution of values of the dependent variable below and above the mean; they are assumed to be normally distributed. The whole point of OLS estimation is, then, to find an estimate of the mean value of dependent variable (Y) for given values of independent variable (X). The regression line is fitted to estimate the average points of Y for given Xs. Thus, the coefficients from OLS estimation give the effect of a unit change in X on the average (estimated) value of Y. However, the change in the mean value of Y resulting from a unit change in X may not characterize the effect on Y at different points of its distribution. At some points of conditional distribution of Y the effect might be more (less) important compared to some other parts.

To know how the conditional distribution of Y depend on X at particular segments of the conditional distribution of Y might be of primary interest in some cases rather thhan how the conditional mean of Y respond to a change in X. Quantile regression analysis allows us to pose such a question. Koenker and Basset (1978) introduced a technique to estimate such quantile functions. Koenker and Basset (1978: 38) show that a particular quantile, θth quantile, can be defined as solution to the minimization problem;

$$Min\left(\sum_{t \in y_t \geq x_t b} \theta \left| y_t - x_t b \right| + \sum_{t \in (t:y_t \prec xb_t)} \left| 1 - \theta \right| \left\| y_t - x_t b \right| \right) \tag{25}$$

This minimization problem is nothing but the minimization of asymmetrically weighted absolute residuals (Koenker and Hallock, 2001). OLS minimizes the sum of squared residuals giving more weight to more scattered observations. The minimization of absolute residuals, on the other hand, reduces the sensitivity of estimates to extreme observations giving them differing weights. In the OLS, the scattered observations receive more weight compared to residuals close to (around) the mean value. In the QR framework, positive and negative residuals have asymmetric weights. (Koenker and

Hallock, 2001). Just as the OLS model is formulized as y = a + b x +u, the QR model can be written as

$$Q_Y(\theta|x) = b_\theta x + u_\theta \tag{26}$$

Where Qy(θ| x) denotes the conditional quantile of y. The distribution of uθ , Fuθ (.) is unknown (Buchinsky, 1998) but it is assumed that it satisfies the quantile restriction Quantθ(θ| x) = 0.

At each particular quantile, both the intercept and the slope coefficcients are allowed to vary with individual heterogeneity. Consider bi = b + ui. Using QR we capture both the location shift and the variation in the slope parameter at each quantile. The coefficient for each quantile is the derivative of the dependent variable in the θth conditional quantile with respect to a unit change in the explanatory variable.

Since the ability and education (or other variables) may be correlated, the errors in the conditional quantiles may not be homoscedastic. Heterocedastic residuals in the quantiles would cause the standard errors to be biased. We avoid this possibility by employing bootstrap estimation of the standard errors with 20 repetitions.

3.3 Empirical Specification

The basic human capital model is extended to control for a number of variables that relate to the level of earnings. The log-linear earnings function we estimated by OLS and QR is specified as follow;

$$\ln(w_i) = a_0 + a_1 Edu._i + a_2 Exp._i + a_3 Exp.^2_i + \beta_1 C_i + \beta_2 P_i + \beta_3 U_i + \beta_4 F_i + \beta_5 I_i + u_i \tag{27}$$

Where w is the real hourly wage, Edu. stands for years of schooling, Exp. is the years of experience, $Exp.^2$ is the squared experience term. The upper case letters represent a set of qualitative variables. C stands for cohort dummies, P is the public employment dummy variable, F represents the firm size dummy and I stands for various industry dummies. In

a second specification we included educational level dummies instead of years of schooling. The subscript i refers to observations and u is the familiar disturbance term.

Education variable is simply the years that each level of schooling takes to complete. It takes the value of five for primary school graduates and eight for the middle school graduates[8] and 11 for high school and vocational high school graduates and 15 for the university graduates and 17 for above the four year-university level. For those who read and write but did not have any formal education the variable takes the value of two and zero for illiterates. Experience variable is the potential market experience, defined as age minus years of schooling minus six.

In addition to human capital variables we included a set of binary variables to control for cohort effects, the sector of employment (public versus private), firm size, and location. Industry effects are also controlled for. The public dummy is defined to include those who are employed in the State Owned Enterprises (SOE) in addition to public employees employed in public administrations. In 1994, there was no direct information on whether the employee worked in the public administrations or in SOEs. However, the information about the type of the social security institution the worker was registered to and in which sector he/she is employed, public or private. The SOE employees have to register to *Sosyal Güvenlik Kurumu* which covers the private sector wage earners while the public administration workers are covered by *Emekli Sandığı*. Since the registration is compulsory when starting to work in the public sector (including the SOEs) the social security coverage information let us to identify whether the worker is employed in an SOE or public administration once the information that he is a public sector employee is provided. For 2002, the respondents were asked specifically whether they were public workers or SOE workers. In 1994 38 percent of working males were employed by the public sector 18 percent of which belong to SOEs by our definition. In 2002, the percentage of public employment for males was 23 and SOE employment constituted only 3 percent of total employment. There was a significant drop in SOE employment in 2002. In Turkey, wages in SOEs are relatively higher than average. They are among the best paid. Many SOEs pay to its workers three to four times more than a civil servant with a university degree and high profile job in terms of career. Majority of SOEs have unions and they used to have strong bargaining power. Other public employment also dropped from 20 percent in 1994 to 18 percent in 2002.

The urban dummy takes the value of 1 if the individual lives in an urban area and 0 if he or she is rural resident. Cohort dummy has two categories. The first category accounts for the individuals between the ages 24 and 45, and the second cohort dummy is for those older than 45 years old. The base category is 15-24 age cohort. A firm size dummy is employed with two categories. The comparison category is the firms with less than 10 employees. The first firm size dummy takes on a value of 1 if the number of employees in the firm is between 10 and 25. The second dummy takes account of the firms with more than 25 employees. 16 industries were identified in the Household Income and Expenditure Surveys for both years. There was only one person working for international organizations in 1994 and 2002 data sets. We deleted these observations from both data sets. Then, we ended up with 15 industries. We choose agriculture as the comparison group.

3.4 Data

We used Household Income and Expenditure Surveys conducted by the State Statistics Institute of Turkey in 1994 and 2002. 1994 survey was held from January 1st to December 31st to include 26,256 households. The survey covered all geographical regions throughout Turkey. The geographical regions were split up into two layers considering rural urban division. Rural areas are defined as those with less than twenty thousand population and urban areas with twenty thousand populations and more. By this definition, there are 62 urban areas and 174 rural areas in Turkey. Each month 522 different urban households and 666 rural households were interviewed in seven regions. Over the 12 months a total of 26,256 households in urban and rural areas were interviewed in 1994.

State Institute of Statistics intended to replicate the survey in 1999 to keep up with the rapidly changing economic and demographic conditions. But 1999 was a particularly bad year. There was a recession in the country. The country went through an early election because of political turbulence. Turkey was also stricken by two severe earthquakes in August and November 1999 which caused huge economic losses. The first earthquake hit the biggest industrial region of Turkey where the majority of the plants

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[8] Individuals who completed 8 years basic education are grouped with middle school graduates

were located. Therefore, the SIS postponed the survey to 2001. However, in February 2001 political tensions between the coalition government and the president of Turkey quickly translated into political and economic chaos in the face of fragile macro economic policies in the country. The crisis had adverse effects on the incomes and expenditures of all households. It halved the nominal incomes of many Turkish families. Therefore, the year 2001 would not be representative of the Turkish households. Elections, natural disasters, economic crisis and ensuing calamities caused dramatic changes in the living standards and thus, the economic behavior of households as spending units.

The SIS decided to develop better techniques to minimize the effect of such exogenous shocks on the surveys. For this purpose the SIS, from 2002 onward, decided to carry out these surveys every year with a smaller sample of household units. As a result, the 2002 Income and Expenditure Survey were held between January 1st and December 31st interviewing 650 urban and 150 rural households each month. Each month different households were interviewed with a total of 800 over 12 months 9,600 households were included in the survey.

The 1994 survey consisted of 119,685 individuals from 26,256 households. The 2002 survey included 40,675 individuals from 9,600 households. The surveys gathered a rich information set on the demographic and economic characteristics of individuals; such as age, marital status, the position of individual in the household in relation to the household head, the level of schooling completed, whether the person worked in the month of survey, job status, sector of employment, social security registration status, monthly wages, income of all sorts and weekly working hours etc. For this study, only wage earner males between the ages 15 to 65 are considered, which is commonly accepted as the appropriate age interval for the labor force participation. Only male wage earners included for the purposes of comparison with other studies from a range of developed and developing countries. The male wage earners who did not work in the survey month and/or did not have positive income for that month were deleted. The regular salaried workers and the workers who work for compensation on a daily or weekly basis are defined as wage earners in 1994. The same definition applies in 2002 except for the apprentices who worked for a pay within the survey month were also included. This information was available in 2002 but not in 1994. They were a small proportion of wage earner males.

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prior to the reform.

The sample consisted of 13,182 wage earner males in 1994 and 5,866 male workers in 2002. In the 2002 survey the weekly hours worked for the second job holders was also reported unlike in 1994. This information lacked in the 1994 survey although the person was asked whether he or she holds a second job and his earnings from this activity. Therefore, in 1994 we were unable to calculate hourly wage rate for the wage earners who hold a second job. Thus, second job holders are excluded from the 1994 data while they were included in the 2002 data. They were only a small proportion. In 2002 data set there were 6 observations who reported more than 140 weekly working hours for both jobs (if he had a second job, otherwise this is the weekly hours only for the main job) and 12 observations who reported zero incomes although they reported that they worked in that month and they were wage earners. These observations were deleted and a total of 5,848 observations were reached.

Monthly incomes of wage earners included their salaries from the main job and in-kind payments. For the year 2002, the monthly cash and in-kind payments from the second job were added to the monthly earnings of wage earners who held a second job. The nominal monthly figures were deflated using the monthly consumer price index with 1987 as the base year. The monthly CPI figures were available on rural-urban division basis for seven regions and 19 selected cities. The monthly earnings of the survey population from rural regions were deflated using rural monthly CPI and the earnings of the survey population from urban areas were deflated using urban CPI for seven geographical regions and the incomes of those from the 19 selected cities in urban areas were deflated by the monthly CPI for these cities. Monthly earnings are then divided by 4.3 to reach the weekly earnings. For the year 2002 the monthly earnings from the main and the second jobs were added up.

The weekly real earnings are divided by the weekly hours worked to reach the real hourly earnings. The natural logarithm of real hourly earnings is used throughout the analysis. Hourly earnings indicate the pay per unit of time at work, and thus are most relevant in the returns to education analysis (Ehrenberg and Smith, 2000).

Both years were peculiar in terms of economic indicators. In April 1994, there was a severe devaluation that caused the monthly rate of inflation to skyrocket and GNP to decrease by 6.1 percent. The year 2002 was also a poor year in terms of economic performance due to the calamities explained above. The GNP contracted by 9.4 percent in 2002 (the rate is calculated for GNP at constant 1987 prices) (SIS, 2004). This was an unpreceded GNP contraction since the 1968. The growth rates for GNP for the years 1994

and 1999 were also exceptional throughout the period from 1968 to 2001; they were -6.1 for both years.

3.5 Wage Inequality and Education

Table 3.1 presents the main findings relating to earnings and education levels of male wage earners in 1994 and 2002. The mean hourly earnings were above the median earnings in both years. Mean real hourly wage of male wage earners has declined by 2.4 percent from 1994 to 2002. The standard deviation of mean real hourly wages increased by 10.8 percent from 1994 to 2002. This shows that while the real wages plunged the spread became larger. The log wage dispersion between the 90th and 10th quantiles is 2.12 in 1994. The same number is 1.46 for the United States in 1988 and 1.49 for Portugal in 1994[9]. The log wage differential between the lowest and highest deciles declined by 8 percent from 2.12 in 1994 to 2.08 in 2002, see Table 3.1. The differential between the natural logarithm of wages in the median and the 10th percentile was 1.08 in 1994 and 1.10 in 2002. The same figure for the United States was .80 in 1988. The log wage differential between the median and the 10th quantiles went down by 9 percent from 1994 to 2002. It seems that wage inequality was lowered from 1994 to 2002. However, wage inequality between the higher quantiles (90th and 75th and 90th and 50th) increased slightly.

In Table 3.1, it is observed that educational composition of male wage earners changed considerably from 1994 to 2002. The percentage of illiterate male workers dropped almost 50 percent from 1994 to 2002. The percentages of those who read and write and of primary school graduates also declined between the two periods, 14.5 percent and 12.7 percent respectively. While the percentages of male workers with lower educational attainment dropped dramatically from 1994 to 2002, the share of male wage earners with higher levels of educational attainment increased during the period under study except for the high school level. In 1994, only 9.3 percent of male wage earners were university graduates. In 2002 the same number increased to 12 percent. A striking change in the educational attainment of male workers, however, occurred in the vocational high school category. The share of vocational high school graduates increased

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by about 167 percent from 1994 to 2002. Another interesting finding in regard to educational attainment of male wage earners in the periods in question is the decline in the share of high school graduates within male workers while there is an increase in the share of middle school graduates. The decline for high school graduates was 5.2 percent while the increase in the middle school category was 20 percent. This was due to the increase in the years of basic education (eight-year basic education graduates were grouped with primary school graduates, see the footnote 6).

Figure 3.1 makes these changes more visible in the educational attainments of male workers from 1994 to 2002. Although only a small proportion of male workers had no formal education (illiterates and those who read and write together) the primary school graduates still constitute the highest proportion of male workers in both periods. These changes in the educational profiles of male wage earners took place when the older generations with lower levels of education exit from the payroll positions and the younger generations with higher levels of schooling enter to the labor force.

In Table 3.2, it is clearly observed that the mean real hourly earnings of male wage earners increase as the level of education completed increase in both years. However, the mean real hourly wage declined at each schooling category in 2002 compared to the levels in 1994. Wage inequality between the levels of education existed. From the OLS results, see Tables 3.5 and 3.6, it is seen that the return to education was higher at higher levels of education. Does the return to education at lower and upper parts of the wage distribution differ within the educational groups? This is the question we seek to answer in the next section.

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[9] The log wage differential figures are taken from Juhn et al (1993) for the USA and from Machado and Mata (2001) for Portugal.

Table 3.1 Descriptive Statistics

	1994	2002	CHANGE%
Mean	781.26	762.65	-2.38
Standard Deviation	975.55	1094.11	
Real Monthly Wage	136732.30	141863.50	3.75
Standard Deviation	108882.20	129746.10	
Hours Worked Per Week	49.00	52.00	
Standard Deviation	15.30	16.50	
Real Hourly Wage			
Private	563.87	606.70	7.60
std	809.75	1033.12	
Public	1128.97	1197.39	6.06
std	1108.53	1141.36	
Real Hourly Wage			
Quantiles			
q10	186.54	195.95	5.04
q25	304.84	310.30	1.79
q50	524.80	500.63	-4.61
q75	968.06	916.90	-5.28
q90	1548.98	1499.02	-3.23
Log Dispersion			
lnq90-lnq75	0.47	0.49	0.02
lnq90-lnq50	1.08	1.097	0.01
lnq90-lnq10	2.12	2.03	-0.08
lnq75-lnq50	0.61	0.61	0
lnq75-lnq25	1.16	1.08	-0.08
lnq50-lnq10	1.03	0.94	-0.09
lnq50-lnq25	0.54	0.48	-0.06
Variables	Mean	Mean	
Ln Real Hourly Wage	6.28	6.26	-0.02
Years of Schooling	7.22	7.82	8.31
Years of Experience	20.42	20.45	0.15
Years of Experience Sq.	545.04	536.85	-1.50
Educational Dummies	%	%	
Illiterate	3.99	2.05	-48.62
Non-graduate	3.10	2.65	-14.52
Primary School	50.99	44.48	-12.77
Middle School	12.46	14.91	19.66
High School	17.18	16.28	-5.24
Vocational High School	2.97	8.00	169.36
University	9.29	11.61	24.97
Public	38.47	26.39	-31.40
Urban	82.57	89.62	8.54
Firm Size*			
Less than 10 workers	15.82	38.52	143.49
Between 10 and 24	6.42	19.02	196.26
More than 24 workers	14.29	42.47	197.20

*63.47percent of male wage earners did not report the firm size in 1994. In 2002 there were no missing observations.

Percentages of Male Wage Earners By Level of schooling in 1994 and 2002
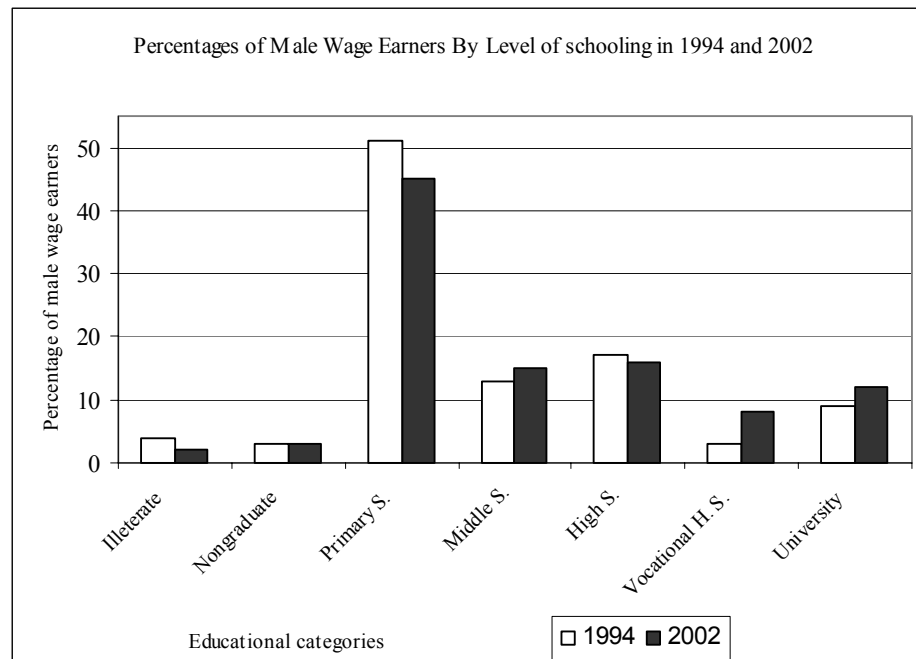
Figure 3.1 Percentages of Male Wage Earners By Level of schooling in 1994
and 2002.

Table 3.2 Mean Real Hourly Wages of Male Wage Earners in TL
by Education Level, 1994-2002.

LEVEL OF EDUCATION	MEAN HOURLY REAL WAGE	
	1994	2002
Illiterate	486.55	436.11
	(4)	(2.05)
Non-graduate	575.16	436.11
	(3.10)	(2.65)
Primary School	639.23	578.15
	(51)	(44.5)
Middle School	702.08	617.04
	(12.5)	(15)
High School	895.60	849.88
	(17.2)	(16.3)
Vocational High School	1064.44	876.85
	(3)	(8)
University	1559.88	1600.25
	(9.3)	(11.6)
Total	781.25	762.47
	(100.00)	(100.00)

3.6 Results

3.6.1 The Effect of Education on Wages

First, the log earnings regressions; both OLS and quantile regressions, are estimated assuming that labor market return for an extra year in school do not vary across the educational categories. In other words, the returns to schooling coefficients are restricted to be the same at each school level. For both years, the coefficients on years of schooling were statistically significant in the mean and quantile regressions. For the quantile regressions, tests of equal coefficients on years of schooling across the specified quantiles (10th 25th 50th 75th and 90th quantiles) were rejected in both 1994 and 2002. The test of parameter equality for the quantile regression is also an implicit test of homoscedasticity in the regression quantiles. The results are displayed in Tables 3.3 and 3.4. The first thing to note is that the pay off per year of schooling remained almost unchanged from 1994 to 2002 both in the mean regression and in each quantile. However, returns to an additional year of schooling declined at lower quantiles while they increased at higher quantiles in 2002 compared to 1994. The market return for education at the 10th quantile decreased from 7.8 percent in 1994 to 6.7 percent in 2002 while it increased at the 90th quantile from 8 percent in 1994 to 9 percent in 2002. In the middle quantiles, annual returns to schooling remained nearly unchanged between the two periods under study. For both years, the least able, as measured by the 10th percentile, benefited from schooling more compared to the ones in the second lowest quantile of wage distribution, the 25th quartile.

In 2002, the contribution of schooling to wage inequality increased. A worker at the lowest end of wage distribution was rewarded 36 percent less for staying one more year at school than a worker located at the highest end of the wage distribution , the coefficients being .067 and .091 respectively. At the middle quantiles, however, returns to an additional year of schooling were lower, around 7 percent at 25th, 50th, and 75th quantiles. The earnings regressions allowing the coefficients of returns to schooling to differ at each level of education controlling for the same personal and firm traits as in the first specification are rerun. The use of QR mechanism requires that some individuals in the top deciles of wage distribution have low education while some other in the lowest deciles have higher levels of educational attainment. The data satisfy this requirement

except for the non graduate category in 2002; neither OLS nor QR coefficients are statistically significant for the non-graduates.

The school level dummies are employed in OLS and quantile regressions to see the effect of level of schooling completed on the earnings. In a QR framework, employing educational level dummies allows one to assess whether the workers within the same educational category experience the same annual returns across the wage scale. The results are displayed in Tables 3.5 and 3.6. The OLS regression results indicate that as the level of education increases the returns to schooling also increase. However, for each school level, incremental rate of return declined from 1994 to 2002.

The calculated annual returns at each school level are presented in Table 3.7[10]. The findings from quantile regression results for 1994 can be summarized as follows. In the non-graduate category a male worker positioned around the 10th quantile of the wage distribution received 5.8 percent returns to schooling while a worker at the top decile received 12.4 percent returns to schooling. At primary level, returns to schooling for workers in the 90th quantile were higher than the returns to schooling for workers at successive lower quantiles. For the middle school category, returns to schooling were highest for the workers in the 10th quantile, namely 4.6 percent while at the successive upper quantiles returns to per year of middle school education remain almost at the same level. The same pattern in returns to high school education is observed. High school graduates positioned around the lowest quantile received the highest returns. Vocational high school graduates in the lowest end of wage distribution received the same returns to their level of schooling as their observationally equivalent counterparts located around the top quantile of the wage distribution. The findings show that secondary schooling (middle school, high school, and vocational high school) reduced the wage dispersion in 1994 in Turkey.

At the university level, the annual rate of return to university education increase linearly in quantiles. Workers positioned around the top quantile of wage distribution received consistently higher returns for his/her university education than the workers at the successive lower quantiles.

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[10] Per year returns to each level of education is computed as the difference between any successive schooling coefficients divided by the number of years separating the two education categories. For

Table 3.3 OLS and Quantile Regression Estimates of Log Earnings on a set of Worker and Firm Attributes, 1994

1994	OLS	Q10	Q25	Q50	Q75	Q90
Years of Sch	0.077	0.078	0.069	0.07	0.075	0.081
	(34.68)***	(21.82)***	(33.69)***	(29.01)***	(27.50)***	(15.53)***
Experience	0.062	0.075	0.061	0.056	0.054	0.057
	(25.15)***	(26.04)***	(25.09)***	(19.40)***	(20.28)***	(9.01)***
Experience S	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(20.40)***	(19.14)***	(20.37)***	(12.83)***	(15.43)***	(6.41)***
Cohort 25-44	0.196	0.195	0.199	0.182	0.195	0.176
	(8.41)***	(5.60)***	(7.15)***	(6.82)***	(7.34)***	(3.30)***
Cohort 45-65	0.097	0.118	0.133	0.104	0.154	0.1
	(2.52)**	(1.88)*	(2.86)***	(2.18)**	(3.43)***	-1.27
Public Emp.	0.473	0.604	0.586	0.576	0.479	0.276
	(26.70)***	(22.88)***	(25.18)***	(29.95)***	(22.55)***	(9.44)***
Urban	0.173	0.184	0.193	0.178	0.147	0.101
	(11.37)***	(9.30)***	(13.01)***	(10.26)***	(9.80)***	(4.79)***
Firm Size						
10 and 25	-0.027	0.02	-0.025	-0.069	-0.07	-0.043
	-1.19	-0.7	-1.05	(2.93)***	(2.99)***	-0.94
More than 25	0.063	0.035	0.061	0.08	0.062	0.081
	(3.84)***	-1.55	(2.82)***	(4.48)***	(2.91)***	(2.60)***
Constant	4.728	3.754	4.345	4.826	5.192	5.632
	(95.70)***	(39.57)***	(81.24)***	(90.18)***	(90.73)***	(41.93)***
Observations	13181	13181	13181	13181	13181	13181
R-squared	0.44					
t statistics in parentheses						
* significant at 10%; ** significant at 5%; *** significant at 1%						

Table 3.5 The Impact of Schooling on Log Earnings by Educational Categories, 1994

1994	OLS	Q10	Q25	Q50	Q75	Q90
Non-Grad	0.136	0.115	0.118	0.117	0.146	0.248
	(3.24)***	-0.94	(1.99)**	(2.27)**	(2.82)***	(3.00)***
Primary S.	0.219	0.194	0.217	0.18	0.255	0.302
	(6.81)***	(2.07)**	(4.74)***	(4.97)***	(6.52)***	(4.06)***
Middle Sch	0.343	0.332	0.306	0.281	0.363	0.403
	(9.42)***	(3.69)***	(6.39)***	(6.20)***	(6.56)***	(4.51)***
High School	0.598	0.589	0.529	0.506	0.602	0.643
	(16.06)***	(6.07)***	(10.17)***	(9.98)***	(11.40)***	(7.53)***
Vocational	0.741	0.746	0.677	0.691	0.78	0.814
	(15.70)***	(8.23)***	(13.05)***	(13.59)***	(11.36)***	(8.47)***
University	1.157	1.084	1.057	1.067	1.203	1.308
	(27.27)***	(11.58)***	(26.33)***	(23.05)***	(31.95)***	(21.73)***

instance, per year return to university education is calculated as the difference between the return coefficients on the university and high school level dummies divided by four.

Table 3.4 OLS and Quantile Regression Estimates of Log Earnings on a set of
Worker and Firm Attributes, 2002

2002	OLS	Q10	Q25	Q50	Q75	Q90
Years of Sch	0.076	0.067	0.062	0.07	0.08	0.091
	(23.94)***	(13.60)***	(16.32)***	(24.55)***	(17.54)***	(13.54)***
Experience	0.044	0.057	0.044	0.042	0.045	0.045
	(11.99)***	(7.70)***	(9.40)***	(9.13)***	(8.10)***	(5.47)***
Experience S	-0.001	-0.001	-0.001	-0.001	-0.001	0
	(8.54)***	(6.57)***	(7.79)***	(6.97)***	(5.64)***	(2.93)***
cohort 25-44	0.165	0.158	0.14	0.16	0.152	0.129
	(4.83)***	(2.81)***	(4.29)***	(4.82)***	(3.59)***	(2.01)**
Cohort 45-65	0.104	0.136	0.136	0.11	0.097	0.006
	(1.91)*	(1.83)*	(2.62)***	(2.05)**	-1.62	-0.06
Public Emp.	0.473	0.583	0.624	0.534	0.433	0.267
	(14.57)***	(13.11)***	(19.77)***	(15.08)***	(10.32)***	(4.40)***
Urban	0.097	0.184	0.187	0.139	0.045	-0.044
	(3.45)***	(3.83)***	(6.05)***	(4.48)***	-1.05	-0.81
Firm Size						
10 and 25	0.168	0.141	0.156	0.125	0.117	0.172
	(7.23)***	(3.81)***	(5.52)***	(4.81)***	(5.01)***	(3.53)***
More than 25	0.297	0.333	0.313	0.262	0.273	0.278
	(13.54)***	(12.04)***	(13.55)***	(10.28)***	(10.92)***	(7.79)***
Constant	4.551	3.413	4.199	4.656	5.073	5.477
	(59.13)***	(24.18)***	(46.40)***	(39.59)***	(49.15)***	(31.95)***
Observations	5847	5847	5847	5847	5847	5847
R-squared	0.45					
t statistics in parentheses						
* significant at 10%; ** significant at 5%; *** significant at 1%						

Table 3.6 The Impact of Schooling on Log Earnings by Educational Categories, 2002

2002	OLS	Q10	Q25	Q50	Q75	Q90
Non-grad	-0.019	-0.002	0.006	0.031	-0.034	-0.017
	-0.25	-0.01	-0.07	-0.49	-0.38	-0.06
Primary S.	0.18	0.153	0.189	0.185	0.208	0.342
	(2.95)***	-0.91	(2.29)**	(3.58)***	(3.08)***	(1.68)*
Middle Sch.	0.277	0.248	0.273	0.259	0.338	0.477
	(4.23)***	-1.45	(3.17)***	(4.60)***	(4.08)***	(2.28)**
High Sch.	0.491	0.456	0.436	0.436	0.545	0.708
	(7.36)***	(2.73)***	(5.13)***	(7.41)***	(6.34)***	(3.13)***
Vocational	0.572	0.498	0.509	0.548	0.644	0.803
	(8.15)***	(2.89)***	(5.82)***	(8.87)***	(7.56)***	(3.48)***
University	1.014	0.85	0.9	0.952	1.071	1.346
	(14.20)***	(5.18)***	(8.79)***	(11.86)***	(10.00)***	(5.49)***

The returns to schooling are higher for the university graduates holding highly paying jobs. Primary schooling is also more valuable for those who earn more. While primary and university education contributed positively to wage inequality secondary education reduced the wage inequality. Annual returns to secondary education were higher at the lowest quantile compared to those at the highest quantile. At the secondary level ability and schooling are substitutes. The less able the person is the highest the returns to schooling are at the secondary level (Mwabu and Schultz, 1996).

The results for the year 2002 can be summarized as follows. Returns to schooling coefficients on non-graduate category turned out to have a minus sign and became statistically insignificant in the mean regression. The coefficient was also no longer statistically significant at the specified quantiles. At the primary level, annual returns increased linearly in quantiles. 3.6 percent returns to schooling from the OLS specificationwas an average of differing returns over the range of quantiles starting from 3.1 percent at the 10th quantile and, which increased to 6.84 percent at the top quantile.

Annual returns to middle school graduates at the 10th quantile exceeded the returns to middle school graduates at the 25th and 50th quantiles. Returns to schooling for high school graduates at the 10th quantile exceeded those in the 25th, 50th, and 75th quantiles. Once again the secondary schooling benefited the less able more. Differently from how it was in 1994, returns to schooling per year at vocational level increased linearly in successive quantiles. In 2002, the impact of returns to schooling on wage dispersion became more pronounced at the university level compared to its impact in 1994. The absolute spread in annual returns for university education was 4.2 percent between the 10th and 90th quantiles in 1994 while it increased to 6.1 percent in 2002.

In general, annual returns to schooling declined at each level of schooling. No educational group experienced an increase in returns for staying an extra year in school. On the other hand, university graduates experienced the slightest fall in returns from 14 percent in 1994 to 13.1 percent in 2002, a decline of 6.4 percent. However, this fall was not evenly distributed across the quantiles. For a worker at the lowest tail of the wage distribution, annual returns to university education declined by 25 percent while this decline was only 4 percent for a worker at the highest tail of wage distribution. University graduates with high paying jobs were better protected against the fall in general level of wages. The wage gap between the low-skilled and high-skilled workers remained the same on average between two periods.

Table 3.7 Returns to Schooling per Year by School Level, 1994-2002

1994	OLS	Q10	Q25	Q50	Q75	Q90
Non-graduate	6.8	5.8	5.9	5.9	7.3	12.4
Primary School	4.4	3.4	4.3	3.6	5.1	6.04
Middle School	4.1	4.6	3	3.4	3.6	3.4
High School	8.5	8.6	7.4	7.5	8	8
Vocational H. School	13.3	13.8	12.4	13.7	13.9	13.7
University	14	12.4	13.2	14	15	16.6
University	10.4	8.5	9.5	9.4	10.6	12.4
2002						
Non-graduate	-1	-0.1	0.3	1.6	1.7	0.9
Primary School	3.6	3.1	3.8	3.7	4.2	6.84
Middle School	3.2	3.2	2.8	2.5	4.3	4.5
High School	7.1	7	5.9	5.9	6.9	7.7
Vocational H. School	9.8	8.3	7.9	9.6	10.2	10.9
University	13.1	9.9	11.6	12.9	13.2	16
University*	11.1	8.8	9.8	10.1	10.7	13.6

*Annual return above the vocational high school level.
Calculated using tables 3.5 and 3.6.

3.6.2 The Effect of Experience on Wages

The test of parameter equality for experience variable across quantiles was rejected in both 1994 and 2002. The OLS regression results indicate that returns to experience declined on average from 1994 to 2002. See Tables 3.3 and 3.4. Return to an additional year of market experience was lower in 2002. However, a worker at the lowest tail of wage distribution obtained the highest wage premium in both years. Across the wage distribution, among the observationally identical workers, the least productive worker receives the highest returns to an additional year of potential labor market experience in both 1994 and 2002. However, returns to experience dropped considerably from 1994 to 2002. Returns to experience lowered as one goes up to in wage distribution.

3.6.3 The Effect of Public Employment on Wages

Workers employed in the public sector received 47 percent wage premium on average over their otherwise equal counterparts in the private sector in both years. See Tables 3.3 and 3.4. A public employee at the lowest quintile was compensated 120 percent more than his otherwise identical fellow worker at the top quantile. Public

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premium was the highest at the lowest quantile and becomes less pronounced as one goes up to the higher quantiles. The pattern across the quantiles is the same as in 1994 in 2002 except that a worker at the 25th quantile obtains a higher wage premium than a worker at the lowest quantile. Our results show that public employment protected the less able in both years and, thus mitigated the wage dispersion.

3.6.4 The Effect of Urban Employment on Wages

On average, a worker living in urban areas obtained a wage premium of 17 percent over his counterpart living in rural areas in 1994. However, the wage premium for urban male workers declined considerably in 2002. The test of equality in the quantile coefficients is rejected. Living in an urban area protected the workers with low paying jobs mitigating the wage dispersion. An urban worker at the lowest quantile received a wage premium 82 percent higher than a worker at the top quantile. In 2002, urban employment penalized the workers at the highest end of wage distribution while wage premium were only slightly different than what they were in 1994.

3.6.5 Industry Effects

The distribution of mean real hourly wages and the percentages of workers in each industry are displayed in Table 3.8. It is observed that manufacturing, construction, whole sale and retail trade, and social and community services industries were the largest industries in terms of their employment capacity in 1994 and in 2002, each of which employed more than 10 percent of male workers. In 1994, the highest mean hourly earnings were in the Electric, Water and Gas industry. The second highest mean real hourly earnings were in the education sector, followed by the finance sector. The ordering of sectors in terms of mean real hourly wages obtained by its employees was totally altered in 2002. The finance industry was placed at the top and followed by the mining industry and the education sector took the third place.

In 1994, out of 14 industries only the coefficients on six industry dummies were statistically significant. The workers in mining and quarrying, manufacturing, construction, Electric Water and Gas and finance sectors received a positive wage

premium while the workers in the household services industry a negative wage premium compared to agricultural workers. The only industry for which the test of equal coefficients is rejected is the electric industry. The effect of being employed in the electric industry on wages is more pronounced at the two highest quantiles, 75th and 90th quatiles. This industry contributes the wage inequality boosting the wages of most able workers.

Table 3.8 Mean Hourly Wage by Industries, 1994-2002

INDUSTRY	1994	2002
Agriculture	492.99	388.78
	(2.47)*	(2.26)
Mining	1010.61	1475.77
	(2.42)	(1.90)
Manufacturing	703.49	668.83
	(25.45)	(26.01)
Construction	620.04	573.69
	(13.35)	(13.13)
Electric, Water& Gas	1544.73	1032.00
	(1.02)	(1.42)
Whole Sale and Retail Trade	538.17	534.86
	(11.83)	(14.83)
Hotels& Restaurants	449.20	623.04
	(5.02)	(5.61)
Transportation	782.87	932.16
	(7.22)	(8.55)
Finance	1177.93	1727.52
	(1.48)	(0.89)
Leasing	675.23	872.08
	(0.06)	(2.29)
Social and Community Services	1032.56	1045.87
	(19.64)	(10.42)
Educational Services	1286.03	1184.18
	(5.80)	(5.11)
Health Services	844.96	1068.22
	(2.53)	(2.65)
Other Services	358.72	706.53
	(1.43)	(4.29)
Household Services	358.72	668.37
	(0.28)	(0.63)

*Percentages of workers in each industry are in parentheses

In 2002, only eight industries' coefficients were statistically significant in the OLS regression. The parameter equality test is only rejected for manufacturing industry. Opposite the electric industry in 1994, manufacturing industry seemed to be egalitarian boosting the wages of the less able.

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Table 3.9 Firm Effects, 1994

1994	OLS	Q10	Q25	250	Q75	Q90
	0.636	0.677	0.526	0.597	0.611	0.489
Mining	(7.56)***	(3.87)***	(5.23)***	(5.87)***	(5.88)***	(2.69)***
	0.297	0.618	0.307	0.237	0.201	0.045
Manufacturing	(5.14)***	(4.58)***	(4.59)***	(3.49)***	(2.71)***	-0.4
	0.247	0.407	0.2	0.161	0.218	0.12
Construction	(4.20)***	(3.19)***	(3.08)***	(2.15)**	(2.72)***	-1.01
	0.316	0.5	0.239	0.383	0.336	0.179
Electric W. G.	(3.52)***	(2.34)**	(2.24)**	(3.22)***	(3.85)***	-1.4
	0.222	0.391	0.145	0.126	0.159	0.166
Hotels Rest.	(3.42)***	(2.73)***	(1.98)**	(1.69)*	(2.14)**	-0.95
	0.351	0.534	0.283	0.279	0.302	0.191
Transportation	(5.70)***	(3.65)***	(3.70)***	(3.16)***	(3.76)***	-1.53
	0.657	0.747	0.528	0.608	0.605	0.543
Finance	(6.37)***	(4.10)***	(2.86)***	(4.16)***	(3.73)***	(1.94)*
	0.259	0.488	0.142	0.152	0.173	0.08
Leasing	(3.35)***	(3.73)***	(1.80)*	(2.26)**	(1.91)*	-0.44
	0.134	0.346	0.055	0.062	0.109	0.077
Social Serv.	(2.04)**	(2.54)**	-0.7	-0.74	-1.3	-0.61
	0.153	0.384	0.094	0.087	0.104	0.03
Educational S.	(2.16)**	(2.47)**	-1.32	-0.96	-1.19	-0.2
	0.137	0.364	0.042	0.008	0.063	0.088
Health Serv.	(1.76)*	(2.33)**	-0.61	-0.09	-0.84	-0.64
	0.22	0.216	0.127	0.074	0.232	0.416
Other Services	(3.26)***	-1.2	-1.6	-0.72	(1.90)*	(2.53)**
	0.382	0.428	0.371	0.236	0.242	0.372
Household S.	(3.30)***	(1.73)*	(3.17)***	(2.00)**	-1.27	-0.52
	0.204	0.449	0.167	0.123	0.125	0.052
Trade	(3.45)***	(3.30)***	(3.14)***	-1.41	-1.63	-0.47

Table 3.10 Firm Effects, 2002

2002	OLS	Q10	Q25	Q50	Q75	Q90
Mining	0.276	0.364	0.303	0.22	0.248	0.326
	(5.32)***	(5.43)***	(7.13)***	(5.36)***	(5.63)***	(2.70)***
Manufacturing	0.134	0.199	0.126	0.112	0.179	0.176
	(3.50)***	(3.02)***	(3.38)***	(2.96)***	(3.72)***	(1.81)*
Construction	0.194	0.272	0.229	0.204	0.235	0.185
	(4.97)***	(4.13)***	(6.39)***	(5.15)***	(4.64)***	(1.74)*
Electric W. G.	0.379	0.276	0.219	0.34	0.532	0.517
	(5.66)***	(2.77)***	(5.20)***	(4.33)***	(6.94)***	(2.60)***
Hotels Rest.	-0.098	-0.152	-0.156	-0.148	-0.01	0.061
	(2.22)**	(1.75)*	(3.55)***	(3.29)***	-0.17	0.49
Transportation	0.062	0.075	0.007	0.004	0.112	0.2
	-1.49	1.1	0.17	0.09	(1.96)*	(2.11)**
Finance	0.2	0.138	0.126	0.158	0.25	0.313
	(3.38)***	1.19	(1.97)**	(2.80)***	(2.53)**	(1.84)*
Leasing	0.094	-0.029	0.264	0.208	0.076	0.134
	0.41	0.1	1.31	0.82	0.24	0.41
Social Serv.	0.034	0.004	-0.061	-0.063	0.102	0.202
	0.84	0.06	1.57	1.38	(2.21)**	(2.07)**
Educational S.	-0.025	0.068	-0.035	-0.094	-0.085	0.024
	0.53	0.94	0.85	(1.80)*	1.19	0.17
Health Serv.	-0.091	-0.019	-0.118	-0.188	-0.103	0.003
	(1.76)*	0.24	(2.29)**	(4.20)***	1.35	0.02
Other Services	-0.033	-0.164	-0.132	-0.063	0.077	0.329
	0.56	1.56	(1.70)*	0.82	1.05	1.56
Household S.	-0.308	-0.219	-0.247	-0.5	-0.165	0.112
	(2.77)***	0.93	(1.90)*	(4.06)***	0.76	0.29
Trade	-0.061	-0.058	-0.097	-0.09	-0.005	0.065
	1.53	0.72	(2.74)***	(2.18)**	0.12	0.67

3.7 Further Considerations

Unobserved ability may be signaled by not the level of education but the prestige of the school the worker graduated from. Then, it is no longer unobservable. It is indeed observationally measurable. It is just that we have information only on the level of schooling but not the rank of the school. The higher earnings that are contributed to unobservable ability of the worker may also be related to the field of study of the wage earner. This argument applies more often to the workers with a university degree. The quality and the field of study matter considerably in terms of initial pays that a worker obtains in the market. For instance, a METU, one of the few top ranked universities in Turkey, graduate is more likely to start a high paying job compared to a university graduate graduated from one of the newly-established small university in a small and traditional Anatolian city. The compatibility in computers and foreign language would cause the market to place a higher value on the graduates from top universities. Although many young graduates who did not have an opportunity to gain these capabilities during their years at school attempt to increase their compatibility in computers and languages upon graduation by way of having private tutoring, the graduates of prestigious universities are still more valued by the market. The university placement examination has an important signaling effect in this regard. Because only those who are most successful in the university entrance examination (placing themselves among the top %1 of those who passed the exam) can got to the top universities in Turkey. The field of study is also important. A graduate who studied computer science for example is more likely to command higher paying jobs compared to the ones who studied physics at the college. In this respect, the school quality and the field of study may not be observable to the researcher because of the unavailability of data but they are certainly observable by the employers. So, we should be careful about what we call observable skills and unobservable ones relying on our regression results. Another deviation in the Turkish school system is the availability of open universities for those who obtained the minimum score in the university examination. Many currently employed would prefer to complete open University to obtain slightly higher wages.

Lower returns to education at each school level in 2002 compared to 1994 may be an indication of the decline for the demand for more skilled labor. It might signal that workers were more qualified than the job required. Redundancy of education in many jobs in Turkey is quite striking. Because of high unemployment rates there is an excess of

engineers, economists, psychologists etc. When a job vacancy is available the employer hires the one with the highest qualifications. Many clerical jobs are taken by university graduates because it is very unlikely that they will be able to find jobs suitable to their qualifications in the near future. They are unable to find jobs suitable the skills they gained at school but they are at least privileged in the labor market to take the jobs they have qualifications in excess of. Their labor is low paid. A primary school graduate could very well do the same job. Then, the lower qualified workers take the jobs which pay even less, most of the time not even at the substance level. The relegation of highly qualified to the jobs requiring less qualification creates a serious job-worker mismatch. In such cases, the meaning of "returns to schooling" concept is absolutely lost. Skills are gained to add more productivity to one's work. If education will be an asset to his/her owner then its marginal benefit must be equalized to its marginal cost. If one gets much lower benefit to his/her skills that coasted him/her to gain them much higher at the margin then returns to schooling becomes an irrelevant concept. For education to be monetarily worthwhile to have one should be able to expect to have higher returns in the future than he would obtain today with the current level of schooling he or she has.

Similar to other factors of production human capital is also inefficiently used. What is interesting is in spite of the fact that many university graduates are unemployed and many more employed in the jobs for which their qualifications are redundant, university education is still most demanded item in Turkey. Education is not only wanted for its economic value but because of its other virtues.

CHAPTER 4

AN EMPIRICAL ANALYSIS OF SELF-EMPLOYMENT AND WAGE EMPLOYMENT IN TURKEY: 1994-2002

4.1 Introduction

The proportion of self-employed in total employment has been higher in developing countries compared to industrialized countries. In most developed countries, self-employment rate as a percentage of non-agricultural employment is around less than 10 percent. The figures for some advanced countries in 2002 are as follows; 9.5 percent in Germany, 11percent in U.K., 6.4 percent in USA, 7.2 percent in Denmark, 8.7 percent in Canada, and 12.1 percent in Australia. The same figures for some developing countries are as follows; 26 percent in Korea, 27.2 percent in Mexico, 24 percent in Turkey, 15.7 percent in Spain, and 11.8 percent in Hungary. The figures are taken from Blanchflower (2004).

Although self-employed constitute the higher portion of employment in developing countries there are very few studies on the determinants of choice of self-employment as an employment status. Studies for advanced countries and several developing countries reveal the following facts; men are more likely to be self-employed than women, probability of being self-employed increases with age, more educated are less likely to choose self-employment, capital is an important determinant of self-employment choice (Johansson, 2000; Blanchflower, 2000; Gill, 1988; Simpson and Sproule, 1998; Williams, 2002).

In this study, the determinants of self-employment versus paid-employment choice as well as the determinants of earnings in the two employment states are investigated. Two-step estimation methods are employed. In the first step, a probit model

to find out the determinants of self-employment versus paid-employment choice is specified. In the second step, the logarithmic earnings functions for the sub-samples of self-employed and paid-employed considering the selectivity effects are estimated. This is a general approach taken in the empirical investigations of self-employment. Here, the choice model is extended to consider the employment participation decision. A bivariate probit model is specified to take account of the effects of participation decision in addition to employment status choice decision. Thus, the selection effects resulting from the two-step decision making process are better handled in this second specification. Details are argued in the empirical specification section. Both choice equations and earnings equations are estimated for the years 1994 and 2002 and for the sub-groups of male and female workers.

The findings from the male sample in 1994 indicated that labor force participation and employment status choice decisions were dependently made. The results indicated that experience and education are reversely related to the choice of self-employment status. In other words, individuals with high level of potential labor market experience and education are less likely to become self-employed. They rather prefer paid-employment opportunities. People from rural areas are more likely to participate in self-employment activities compared to their observationally equivalent counterparts in urban areas.

It is also concluded that financial wealth is a major determinant of self-employment decision. Home ownership is also positively related to the probability of becoming self-employed. Home ownership can be thought as a proxy for the risk taking behavior of individuals. The ones who own their homes may feel more comfortable in attempting riskier jobs and save more as they do not have to make regular payments for rent. These findings support that capital requirements bind and risk is an important determinant of self-employment.

Parameter estimates on the selectivity variables included in the earnings functions indicate that those choosing self-employment had comparative disadvantage in that sector compared to a randomly selected person with the same observed characteristics in 1994. Since we cannot directly observe the sector specific abilities of individuals, such as managerial ability, selection variables are used as proxies in the earnings functions. Individuals with low level of education and with low managerial abilities are likely to become self-employed in 1994. But this finding is not supported by the estimation results from the 2002 male sample.

4.2 Literature Review

Self-employment slowed down as the primary production declined and the large-scale, mass production expanded in industrialized countries. Work force moving out of agriculture was absorbed by big firms during the course of industrialization. The qualifications needed to be employed by these mass production industries were not high. Anyone who had to live by his labor was eligible for employment given that the type of production and technology required only very simple operations to be performed by these employees. Large enterprises, capital intensive technologies, mass production, division of labor, specialization in very simple tasks, and low qualifications for labor were dominating features of industrialization in 1900s. Productivity was not tightly linked to the quality and skills of labor. It was more ascribed to capital intensive, labor-saving technologies. Large firms could easily divert labor from self-employment (Blau, 1987).

From the early 1900s to 1970s, the rate of self-employed within the labor force steadily declined (Blau, 1987; Becker, 1984; Fairlie and Meyer, 2000; Evans and Leighton, 1989). In the 1970s, the pattern in self-employment rates in industrialized countries (UK, USA, Japan, Australia, and Canada) changed remarkably. The rise of self-employment in industrialized countries was noted by economists but few studies dealt with the causes of re-emergence of self-employment in these countries. The first wave of studies of self-employment embarked on explaining this upward trend in the self-employed rates and a literature dealing with the determinants of choice of self-employment activity as an employment status followed.

Shifts in technology which made the small firms more viable in competitive product markets rather than large firms were seen as the reason for the upsurge in self-employment (Rees and Shah, 1986; Blau, 1987). Blau (1987) argued that self-employment can be explained by changes in technology using a general equilibrium model of self-employment. In the 1970s, technological change was such that it favored small scale industries. Workers with unobserved managerial ability would shift to self-employment to take advantage of this favoring climate in industrial structure. His model also concluded that an increase in tax rates surprisingly attracted workers into self-employment. This conclusion was in line with the previous studies and implied that the possibility and probability of under reporting self-employment income in the face of rising tax rates made self-employment more attractive to labor market entrants than wage employment where this possibility was simply non-existent.

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A shift into self-employment toward the end of working life is recognized as a significant feature of US labor market (Fuchs, 1982). Blau (1987) and Fuch (1982) both confirmed that older workers moved into self-employment; determinants varied from increase in retirement benefits, absence of pension funds, flexible work hours and willingness to keep attachment with work after retirement.

Economists' interest in self-employment was not only in the upsurge in its rates in developed countries and its causes but also they saw it as a way out of increasing unemployment during the 1980s. In turn, rising unemployment was considered as a push factor increasing self-employment. Parallel to the technological change, changes in the structure of industries arguments, expansion of service sector was also accounted for the rise in self-employment rates (Alba-Ramirez, 1994). Increasing unemployment rates, partial loss of competitiveness in the international product markets resulting from shifts in technology (computer revolution caused the small firms to gain comparative advantage in productivity and thus in product markets) increased share of service sector in the economy, the efforts to rejuvenate the "entrepreneurial spirit" by supply-side economists during the 1980s, tax breaks, subsidies for enterprise start-ups in USA, UK, Canada were all considered as the causes of upward trend in self-employment rates in industrialized countries from 1970s to 1990s. (Alba-Ramirez, 1994; Robson, 1998; Schuetze, 2002).

Using micro-economic data from Spain and USA, Alba-Ramirez (1994) found that the duration of unemployment was an important determinant of self-employment. He argued that as the unemployment spell lengthens the individual searches for profitable opportunities and discovers his "managerial ability" out of necessity. Joblessness also causes his reservation wage to go down. Then, self-employment becomes a viable option for the unemployed. However, self-employment resulting from economic downturns is associated with several problems. It is not certain that joblessness creates a situation in which the most talented is drawn into self-employment, who would otherwise be employed in payroll jobs. On the contrary, evidence suggests that self-employment jobs taken by the unemployed are of poor quality and bring low income opportunities. Part-time self-employment is also recognized as a characteristic of self-employment jobs taken by the unemployed. Therefore, policy incentives for the self-employment in the face of unemployment to promote growth creating new jobs are questionable as the allocation of people into self-employment in this case may not produce the optimal outcome.

Using a time-series data Robson (1998) found contrary evidence for UK in regard to the role of business downturns as a push factor into self-employment. However, his

main focus was the effect of accumulated wealth on the increase in self-employment activity in UK during the 1970s and 1990s. He concluded that increase in GDP and increased wealth (especially housing assets) were significant factors that led to an increase in the rate of self-employment in the 1980s. The accumulation of pecuniary assets draws people into self-employment for two reasons; People have start-up capital. They become more willing to (ready) to take risk due to availability of risk-capital. He also investigated the effect of tax cuts promoted by Teatcher government to create an entrepreneurial spirit. He found that this policy had no effect on the growth of self-employment. Schuetze (2000) also confirmed that declining macro economic trends and increasing tax rates contributed to the increasing trend in self-employment in US and Canada using micro-level data for the period of 1983-1994. Although trends in OECD countries varied for some countries there is firm evidence that rise in unemployment and tax increases were major determinants of resurgence in self-employment. Other demographic factors (increase in the female labor supply) and industrial shift and expansion in service sector explanations found less support in the literature.

4.3 Selection and Earnings Distribution

The studies of employment status choice decision are based on the idea that individuals choose the sector of employment in which they can obtain the highest earnings in accordance with their abilities. This refers to a very well known fact that human qualities are differentiated and individuals are aware of their different traits and choose the sector of employment that they can use their inherent capacities most productively. What was less recognized however, was the fact that this "purposive selection process" results in a non-random earnings distribution for any given subgroup of workers. This view was first stated in Roy's 1951 article. Roy (1951), in his article on the distribution of earnings where he assumed a simple society in which all the individuals had to live by their labor and can only choose between the two sectors of production with given very simple technology, pointed out that the distribution of earnings in each sector will depend on the allocation of labor between the two sectors.

If we translate this argument into the self-employment versus paid-employment choice decision we may argue that each sector requires different abilities and the selection process will have some implications on the earnings distribution in each sector. Suppose a

labor market entrant chooses between the two employment states under very general conditions. People would chose the employment status in which they can reap the maximum benefit of their abilities; that is, they choose the sector best suited to their qualifications and qualities. In the case of self-employed, "managerial ability" singles out itself as the most important unobserved quality that is only known by the individual himself prior to the selection of employment status. People may choose paid-employment because it offers a greater job security and social security benefits (Taylor, 1996). This is related to the risk taking behavior individuals. The degree of risk aversion is influenced by some other observable factors such as wealth, therefore it is not a random factor that we consider but rather attempt to approximate by including a home ownership variable in our regressions. The other unobservable factors that we approximate by observable variables that may influence the employment status choice are discussed below in detail. Thus, our interpretation of unobservable effects will mainly relate to the managerial ability.

The whole argument boils down to the fact that the evaluation of earnings in relation to observed human capital variables in any given sub-sector of employment ignoring the "purposive selection process" into that sub-sector will be misleading. Therefore, we need to take account of how the individuals select themselves into the given employment states when assessing the effects of observed characteristics on the earnings distribution.

Another merit of considering such a selection process is the fact that it will allow us to see whether the individuals really choose the sector of employment in which they have comparative advantage. This point is especially important in a developing country context. The argument is as follows; paid-employment formal sector jobs in developing countries are scarce and rationed. They are available only to those who have superior qualifications and better network in terms of contacting government officials or big firm owners. Thus, the ones who are unable to find jobs in well-paying formal sector are pushed into low productivity self-employment occupations (Blau, 1985). Then, the selection will be such that individuals with poor entrepreneurial ability will go into self-employment jobs. We test this hypothesis in the following sections when evaluating the results of our econometric models.

Following our remarks on the importance of selection process between the employment states we are ready to state the other aspects that our study will shed some light on. One of the most discussed topics among the human capital theorists is that

whether education is a screening device or is simply a process which allows individuals to acquire marketable skills enhancing their productive capacities (Spence, 1973; Frazis, 2002; Riley, 1979). If education has any value as a screening device to the employer we expect the returns to the same level of education differ between self-employed and wage earners. In the case of self-employed, education has no significance as a signaling device. Thus, the return to education for the self-employed will purely result from the contribution of education to one's productive capacity. In the case of wage earners, on the other hand, education may be used to truly signal the one's inherent productive capacity to prospective employer. In this case, the return coefficient on education would rather result from one's inherent capacity[11].

Thus far, we attempted to explain the main issues that our study deals with in a non-technical or for that matter non-econometric language. It becomes clear that the purpose of this chapter is to provide some empirical evidence on three propositions. The first proposition is that individuals select the sector of employment in which they posses comparative advantage. We test this hypothesis in the context of self-employment versus paid-employment choice accounting for the selection process using econometric methods. The second hypothesis follows from the first one and brings more policy discussion to the evaluation of the results of our study. Namely, we test whether individuals "choose" their states of employment or "pushed" into that state of employment in a developing country labor market context. Third, we test the widely discussed "screening hypothesis". That is we test whether the returns to education are lower in the self-employment sector where education has no signaling role than wage employment sector where employers may value education as a signaling device about the productive capacity of the workers they hire.

4.4 Screening Hypothesis

Economic returns resulting from education can be explained in two ways. First, education leads to the accusation of skills that increase the marginal product of an individual and thus, his or her earnings. This is the pure human capital explanation of

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[11] We do not discuss strong screening hypothesis. Rather, we are interested in weak screening hypothesis where the main role of education is signaling but the possibility that it contributes to inherent capacity of the individual exist immensely, Brown and Sessions (1999).

returns to education. Second explanation is due to screening hypothesis. In its most extreme form, screening hypothesis argues that education does not contribute to the productive capacities of individuals but allows the workers who posses it to be identified in the labor market. Individuals with high level of innate ability obtain higher levels of education compared to those with low pre-existing abilities to correctly signal themselves to their prospective employers. In other words, individuals self select themselves into education in accordance with their abilities for education is used as a screen by employers whose main concern is to place the right worker to the right job. It follows that returns to education result from its use as a signaling mechanism by employers.

Two arguments seem to lead controversial results in terms of education's role in creating social returns for the society. Wolpin (1997) argues that even if the sole role of education is to inform the innate productivity of the worker to prospective employers, social return of education remains important. Allocation of workers between the sectors of employment will be efficient if education level (diplomas) correctly signals the sector specific abilities of individuals. Wolpin (1997) pointed out that the "correct" assignment of workers into different jobs increases the level of aggregate output since they are allowed to perform the tasks that they can exhaust their productive capacities most efficiently. As a result, profit oriented employers would be interested to know the job-related abilities of individuals prior to employment. The assignment of right individuals to right jobs also increases the private rate of return because workers are paid their marginal products. In this sense, screening hypothesis in fact brings a different point of view in looking at the role of education as productivity and growth promoting instrument. He argued that education is both privately and socially feasible because not only people acquire skills that they can sell in the labor market but also because of its "informational role".

Further he explains that low dispersion in skills reduces the cost of assignment of right worker to right job. Skill dispersion is reduced within the educated category. More able choose higher level of education. Educated constitute more unified, homogenous group in terms of their innate abilities. Firms will be able to choose among from a unified group with high marginal products. In Wolpin's words (1997: 953) "From a social perspective, education may have a positive gross social product independent of its productivity augmenting capacity."

Then he poses the question whether screening suitably leads firms to identify job-related abilities of individuals? He makes the following points: If schooling is not a

perfect screen, employers will have to learn their employees' innate productivities over time. Within each education group, one expects the earnings dispersion to increase as time passes. Implied homogeneity of skill groups by use of schooling as a signal is challenged in this case. If education correctly signals productivity of the worker, earnings distribution will stay relatively stable over time.

If schooling leaves one's productive capacity totally intact those who do not need to inform will be satisfied with less schooling. He recognizes one such group (unscreened group) as self-employed. For some self-employed education can be used as screen by their clients or costumers, such as doctors and dentists. He emphasizes that schooling decision is made prior to employment status decision. Schooling may be purchased as insurance in case that self-employment becomes a non-viable option. For example, in Turkey, people who would potentially be more interested in establishing of their own jobs for the reasons as "internal locus of control" or independence or for some other cultural reasons as trade being seen as an occupation of respect and prosperity, are very likely to be discouraged by macro economic instabilities. Therefore, more people than normally would be will have more schooling to hedge against the risk of not being able to trace profitable enterprises. Schooling may also a result of macro economic conditions in Turkey. People do not see another way out but schooling. Freedom, "internal locus of control", work satisfaction from exploring new business opportunities, prospects to become future employers, to manage a productive business to contribute to long-wanted economic growth would all lead some individuals to be enthusiastic about setting up their own businesses. However, given the unstable economic conditions even those who accumulated abilities and technical knowledge face the risk of going out of business often. The ones with inherent ability and aspiring to establish their own business may purchase schooling as insurance. This has quite changed after the 2000 crises when many good educated bankers were displaced and some turned out to be self-employed using their savings. They were so severely wounded by loosing their good jobs.

It has been pointed out that initial ability of an individual and schooling is highly correlated. A simple regression of earnings on schooling variable gives upward biased estimates of schooling coefficient. However, studies show that schooling coefficient quite satisfactorily reflects the effect of schooling on earnings when regressions with some measure of ability included as explanatory variable compared with the ones without a measure of ability.

If screening hypothesis holds, inclusion of a selection term (unobserved sector specific ability as often referred to it) in earnings equations would be correlated with education variables. In case of wage employment earnings functions for example if unobserved selection effects include any component relating to sector-specific abilities of individuals, education variable and selection term would be positively correlated. However, in case of self-employed since they constitute the unscreened group the selection term (assumed to be a proxy for the managerial ability of individual or some residual resulting from individual's being observed in that particular state of employment) and ability can not be expected to be correlated.

Layard and Psacharapoulos (1974) attempt to provide evidence against screening hypothesis. Their tests of three essential hypotheses that derive from screening hypothesis are as follows: "Private returns are to certificates not to years of schooling." (1974: 989). They found that this was not supported by empirical evidence. Those who left school without receiving any diplomas were able to receive considerable returns to their years at school.

"Private returns to education fall with experience." (1974: 992). They found that returns to education do not decline with experience through which employers are assumed to learn about their employees' initial productivities.

"Education will not be demanded if cheaper screening methods exist." (1974: 993). Inherent in the screening hypothesis is that employers hire graduates because they believe that they are more productive compared to non-graduates whom they could hire at a much lower cost. All education is needed for screening. There could be much cheaper ways of screening than schooling alone to avoid hiring low productivity individuals.

Lang (1994) considered the imperfect version of screening hypothesis. Return coefficient suggests both the returns from education's use as a screening device and returns from its skill augmenting effect. He pointed that screening and human capital versions of education are not threatening to each other. He elaborated this point as follows. Define q as the marginal product of the employee, s is schooling and i stands for initial ability. $q = q(s, i(s))$ and $dq/ds = q_s + q_i*di/ds$. q_s and q_i*di/ds represent the returns to schooling and the ability bias respectively. Lang (1994: 354) points out that "The fact that in the human-capital model this ability bias arises solely because the eceonometrician does not observe ability, iwhile in the sorting model it arises because neither the econometrician nor the employer observes ability, is irrelevant." ds/di is greater if screening considerations apply and di/ds is smaller. di/ds is greater because

individuals with higher innate ability will be willing to acquire more schooling not to face earning losses resulting from being unable to appropriately signaling their true capacity. Thus, the return to schooling would be expected to be even greater under sorting considerations. "Informational role" of education would boost the arguments for education subsidies. He points that when informational imperfections are present ability bias in OLS coefficients of schooling might be lower.

Spence (1973) argued the role of informational imperfections when hiring employees. He emphasized that hiring workers involves risks since the employers cannot truly know the productive capacities of the employees at the beginning. Employer's perception about the productivity of the worker will be important to the determination of the wages he offered. He cannot directly observe the inherent ability but a given set of observables. On the basis of these observable attributes he sets the wage rate.

Employers' observations will be justified by the productivity of the workers over time. As each cohort of employees enter the market employers will adjust their offers according to whether their predictions about the productivity of workers, that they decide relying on the given information set, are realized in the old periods. The wages set by employers in this way will saddle on an equilibrium path only if their predictions do not render to be false each period. If they are surprised each time no stationary system will result. This implicitly implies that workers correctly signal their abilities by their chosen level of schooling and their degrees. He assumes two groups of individuals. Group I, G1, with the productivity level 1 and the group II, G2, with the productivity level 2. q1 (G1) + (1-q1) G2 qi i=1, 2 being the proportions of the two groups. To signal the productivity of the two groups we have only one signal, education which is available only at a cost. Cost of education for the group I is y_1 and for the group II is y_2. y* is the optimal level of education, perceived by the employer. If y< y* productivity is equal to 1, if y>= y* productivity is equal to 2. The group that can not select y* will be at a disadvantage. If y< y* y = 0 group I. If y>= y* it corresponds to y= y*, group II. This is not Pareto optimal. High School graduates' signaling is not worthwhile. Overinvestment in education will result.

Frazis (2002) provides empirical evidence to the human capital and screening hypothesis versions of market returns to education. He uses the US current population surveys and evaluates diploma effects in particular in reference to the Layard and Psacharopoulos (1974) study. He pointed out that if human capital explanation of returns to education holds, the ones with degrees, and the dropouts should receive the same skill

prices. However, he concluded that returns for those who graduate and for those who left school just a year before graduation differ considerably. He provided empirical evidence in support of screening version of market returns. He argued that if schooling enhances one's productivity, there should not be significant differences, as he found in his study, between the returns for graduates and non-graduates. He developed a human capital model that intends to explain the pattern of returns. He differentiated between the innate productivity and ability to gain human capital. He decomposed the returns into two factors, returns to a fixed factor which is assumed to be ability and returns that differ with the level of education. He called the second component as the "bias" in returns coefficient. The returns to initial ability will always be positive but the sign of "bias" cannot be decided a priori. If the "ability" and the ability to enhance human capital through schooling are inversely correlated, depending on the level of schooling, returns to education may turn out to be negative. For high innate ability individuals schooling might have deteriorating effect. This human capital model thus explains the changing pattern of returns for graduates and non-graduates. Nevertheless, he recognizes that this explanation of the returns is subject to change due to changing demand and supply conditions for labor.

4.5 Theory of Self-employment

4.5.1 Definition of Self-employment

There is no clear-cut definition of self-employed in the literature. In the broadest sense, self-employed category refers to the group of individuals who work independently for their customers or clients in exchange for economic benefit. They perform their profession or conduct their businesses on their own accounts. Wit (1993: 368) defines self-employed "… as individuals that earn no wage or salary but derive their income by exercising their profession or business on their own account and/or for their own risk." This definition points out that they do not work for others and they take risk in implementing their economic activity. This definition is too general. There is no plain distinction between those who practice their profession relying mainly on their labor or who hire other workers. There is neither distinction in reference to the type of labor used, manual, physical or mental, knowledge based, as well as type of economic activity (Wit,

1993). It includes wide range of economic activities. In general, highly-educated professionals such as doctors, computer programmers and occupations which require no formal education but only some training are included in the same category. Researchers include or exclude some these categories depending on their purpose of study or on the availability of data. They constitute a very heterogeneous group. Another issue arises from the association of self-employment with entrepreneurship. If entrepreneurs are defined as those who create their own employment all self-employed can be defined as entrepreneurs. The word "entrepreneurship" however evokes, although there is no consensus on its definition, the ones who engage in productive economic activities with growth prospects and followed by others providing employment for others not only for their own substance level income creating activities. Wit (1993) provides several definitions of entrepreneur due to some authors. For example, Say pointed out their combiner and coordinator roles in production process while Schumpeter emphasized their innovative sides. Wit (1993) emphasizes that self-employed is commonly identified with entrepreneurs. Therefore, any theoretical model of self-employment will be based on its entrepreneurial aspect. He offers a basic model to explain the choice of self-employment as an employment status. In the basic model, he assumes that all individuals posses identical entrepreneurial ability. In this case, the choice will depend on wage rate and product price. If the product price exceeds the prevailing wage rate one chooses self-employment.

4.5.2 Determinants of Self-Employment

Since self-employment is the simplest form of entrepreneurship (Blanchflower and Oswald, 1998) its choice as an employment status involves a different decision making process from that of wage employment. However, all empirical studies investigated the self-employed labor market participation decision in relation to wage employment participation decision. The choice between the employment states however depends on different factors. In the absence of impediments to entering into the desired state of employment, we assume that individuals correctly assign themselves between the employment states. However, some impediments exist as anywhere there is a "market[12]".

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[12] Not all the possible factors that may hinder individuals from entering into self-employment are

In the next section, we discuss some of these impediments and their relation to some observable characteristics as widely discussed in the literature. We also include "managerial ability" among these factors to better understand its interaction with some human capital variables although we mainly accept it as an unobservable factor.

4.5.2.1 Capital Requirements

Given macro-economic conditions[13], one of the most important determinants of self-employment choice is the availability of start-up capital. Research from developed countries indicates that people who run their own business feel more satisfied than people in paid-employment (Katz, 1993; Balchflower and Oswald, 1998). This is in part due to autonomy in one's own business. It may be argued that people who need achievement (a psychological factor) might find it more satisfying to attempt new business opportunities despite the risk. Given this observation, it is reasonable to ask why the self-employed constitute relatively small proportion of employment compared to wage employment. Risk and managerial ability play important roles in one's decision to become self-employed. However, these factors are very much related whether the individual has a start-up capital. Inheritance and gifts are found to be significant determinants of self-employment choice (Blanchflower and Oswald, 1998). Blanchflower and Oswald also found evidence that very small proportion of self-employed were able to obtain bank loans to start their own businesses. Evans and Javonic (1989) argued that financial constraints bind. Given that more people would prefer to be self-employed, the supply of self-employed is restricted. These studies also point that there is a correlation between the capital endowment and entrepreneurial endowment. In this case, people from a background of self-employed families and with capital will have a higher propensity to be self-employed.

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discussed. We consider the very general factors that may restrict the number of self-employed in any given country. Some studies on this area, on the other hand, show that some country-specific factors hamper the choice of self-employment. For example, consumer discrimination against some groups, cultural attitudes, and race are found to be important barriers into self-employment. in Canada, USA, and UK. See Borjas and Bronars (1989); Fairlie and Meyer (1996); Clark and Drinkwater (2000) ; Hout and Rosen (2000); Fairlie and Meyer (2000).

[13] Level of unemployment, tax policies, and incentives for business startups are some of the policy variables that may artificially alter the number of self-employed in any country.

4.5.2.2 Risk Factor

In theoretical models of self-employment choice, attitudes toward risk (risk taking or risk aversion) are considered to be an important determinant. Since it cannot be directly observed several observable variables are used as proxies in the empirical models. The ways these variables change the attitude toward risk, on the other hand, may vary with interpretation. For example, individuals with high levels of education are expected to be better informed, to have better capacity to see the job opportunities and more capable of operating these opportunities in a profitable way. Thus, they can better manage to smooth out the relatively volatile earnings in self-employment. This would reduce income variation and risk. The better educated can uncover the riskier but more profitable business handling them efficiently. But, a countervailing argument may follow. People choose high levels of education because they want to secure well-paying, high quality, high-career payroll jobs. Therefore, caution needed interpreting the effects of observable individual characteristics on the choice of employment status. Their interpretation is not as straightforward as in the case of paid employment where the personal traits can be assessed in ability boosting human capital framework[14]. Age and experience are also related with risk taking behavior of individuals as far as the employment status choice is concerned. Older people are considered to be more risk averse than young people (Rees and Shahs, 1986). However, evidence shows that the mean age for self-employed is greater than that for the paid-employed in most countries. Especially in USA, Becker (1984) and Fuchs (1982) found that the older males are more likely to switch to self-employment toward retirement.

On the other hand, age and experience may be correlated with wealth as the wealth is accumulated in the hands of elderly. Experience may reduce the risk increasing learning effects and managerial ability of the individual (Le, 1999). Nevertheless, in case wealth variables are absent from an empirical model, caution must be cast on the effect of experience and age on the probability of self-employment.
Married people are considered to be more likely to undertake riskier jobs (Rees and Shah, 1986) as they may have multiple income resources (a working spouse) and because of the availability of unpaid family workers who work for the business at no cost (Bernhardt, 1994).

4.5.2.3 Managerial Ability

Education, experience and family backgrounds are considered to flourish the managerial ability of an individual. However, sector specific comparative advantage of the worker can not possibly be uncovered entirely by the observable factors. Matching models argue that workers are aware of their sector specific abilities and correctly assign themselves between the employment states. Learning models, on the other hand, emphasize that individuals do not know initially their abilities but learn over time in which sector they are more successful. If the learning models apply then experience will partially reflect the selection effects (Hamilton, 2000). A negative experience effect on earnings then may be an indication of incorrect sector choice for the worker.

4.5.2.4 Work Characteristics

Models of self-employment generally distinguish between non-pecuniary and pecuniary "earnings" from self-employment. Self-employed enjoy more autonomy in their business. On the other hand, they may have to work for longer hours putting more efforts in their jobs. But studies found that self-employed are happier individuals (Katz, 1993; Evans and Leighton, 1989; Blanchflower and Oswald, 1992). Therefore, a possible entrant into self-employment may consider working conditions in addition to other aspects of the choice decision.

4.6   Empirical Model

Thus far, we argued that isolating the labor market impediments into the employment states, the choice is a rational one. People choose the employment status by evaluating their potential earnings in each sector. The earnings in the two sectors are given by the following equations;

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[14] Some of the returns to education in the case of pai-employees might occur due to productivity-incentive relationship, Lazear and Moore (1984).

$$\ln y_{si} = \beta_s^{'} X_i + u_{si} \tag{28}$$

$$\ln y_{wi} = \beta_w^{'} X_i + u_{wi} \tag{29}$$

where the subscripts $_s$ and $_w$ refer to self-employment and wage employment respectively. On the left hand side, logarithms of real hourly incomes appear. X is a vector of explanatory variables. β is a vector of coefficients and u's are the usual error terms. The criterion function for the choice of employment states then can be formulated in the form of a structural equation (Madalla, 1983).

$$C_i^* = \varsigma^{'} R_i + \delta^{'} \left(\ln y_{si} - \ln y_{wi} \right) - u_i \tag{30}$$

where R is a set of variables that affect the choice of employment status and C_i^* is a resulting utility index, utility gained from being self-employed in excess of utility gained from paid-employment. If C^* exceeds a certain threshold, 0, individual will choose self-employment, and vice versa.

Since we can not observe the same individual in both self-employment and paid-employment, we can not calculate the earnings differential. Therefore, we substitute the earnings equations in (28) and (29) into (30) and obtain a reduced form binary choice equation.

$$C_i^* = \varsigma^{'} R_i + \delta^{'} \left(\beta_s^{'} X_i - \beta_w^{'} X_i \right) - u_i + u_{si} - u_{wi} \tag{31}$$

This gives the reduced form probit equation

$$I_i = \gamma' Z_i + u_{2i} \tag{32}$$

where $Z_i = (X_i, R_i)$ and $\gamma = [\delta(\beta_s - \beta_w), \zeta]$ and $u_{2i} = u_{si} - u_{wi} - u_i$

Estimation of a binary choice equation (probit equation) enables us to obtain both the estimates for probabilities of choosing between the two employment states and selectivity

variables. Selectivity problem arises since earnings of individuals are observed in only one sector. Thus, the earnings in both sectors are truncated. The observed samples are not random in this case. OLS estimation of a truncated sample produces inconsistent estimates of β_s as the expectation of error terms in the earnings equations, u_s and u_w will not be zero (Madalla, 1983). To account for this selection bias we specify a binary choice function in relation to the factors that determine which employment status individual is assigned to. Estimation of this model makes it possible to correct for the truncated means of expected earnings functions including the selection terms in the equations in (1) as additional variables (Heckman, 1979; Lee, 1978).

$$I = 1 \text{ if } u_{2i} > -\gamma'Z_i \text{ individual chooses self-employment}$$

$$I = 0 \text{ if } u_{2i} < -\gamma'Z_i \text{ individual chooses wage employment.}$$

The error term of selection equation is correlated with the error terms of earnings equations. The correlation matrix is given by

$$\Sigma = \begin{bmatrix} \sigma_s^{\;2} & \sigma_{sw} & \sigma_{su2} \\ & \sigma_s^{\;2} & \sigma_{wu2} \\ & & 1 \end{bmatrix}$$

(33)

The conditional expectations of the error terms in the earnings equations are

$$E\left(u_{si}\middle|u_{2i} > -\gamma'Z_i\right) = -\sigma_{su2}\frac{f(\gamma'Z_i)}{F(\gamma'Z_i)}$$

(34)

$$E\left(u_{wi}\middle|u_{2i} < -\gamma'Z_i\right) = \sigma_{wu2}\frac{f(\gamma'Z_i)}{1 - F(\gamma'Z_i)}$$

(35)

where f (.) is the standard normal density and F (.) is the standard cumulative distribution function . The terms on the right hand sides of te two equations are Inverse Mill's ratios. The selectivity corrected earnings equations can then be written as follow;

$$\ln y_{s_i} = \beta_s'X_i - \sigma_{su2}\frac{f(\gamma'Z_i)}{F(\gamma'Z_i)} + u_{s_i}'$$

(36)

$$\ln y_{wi} = \beta_w'X_i + \sigma_{wu2}\frac{f(\gamma'Z_i)}{1-F(\gamma'Z_i)} + u_{wi}'$$

(37)

Now, the expected values of the error terms are zero;

$$E\left(u_{si}'\right) = 0$$

(38)

$$E\left(u_{wi}'\right) = 0$$

(39)

Estimation of these equations by OLS will now produce consistent estimates[15].

In the reduced form probit equation the Z matrix should include variables other than the variables in X for identification. We use unearned income, per capita land and home ownership variables as identification variables. The probit is estimated by maximum likelihood methods and produce consistent parameter estimates.

Coefficients on the selectivity variables indicate the effect of unobserved characteristics on the wages. A negative coefficient on the selectivity variable in earnings equation for self-employed and a positive coefficient on the selectivity variable in the earnings equation for wage earners mean that individuals in each sector have comparative advantage in that sector. That is, persons in each sector would obtain lower earnings if they were randomly assigned between the sectors.

Although this specification is widely used in the empirical studies of self-employment vs. wage employment choice, it has recently been argued that it lacks another selection decision. Individuals choose whether to participate in the labor market prior to their decision on choosing between the employment states (Co, Gang, Yun, 2002). Tunalı (1986) offered a double selection mechanism to study the two-step decision making processes. People first decide whether to participate in employment and then those choosing to participate decide whether they become self-employed or wage earner. If the decision to choose between the employment states is not independent of

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[15] Error terms in earnings equations are still heterocedastic. Thus, they should be estimated by Generilized Least Squares rather than OLS. Howver, applications show that heterocedastic standard errors are not very different from the ones obtained by GLS Maddala (1983). In any case, Huber-White robust estimators are used.

participation decision, estimation of earnings equations by OLS relating to a single step selection model will result in inconsistent parameter estimates. In this case, we need to consider both participation decisions to correct for the truncation effects in wage equations.

The earnings for the subgroup of self-employed will be observed if and only if the individual both participates in employment and self employment. The same is true for the subgroup of wage earners.

$$P^* = \delta'V + u_1 \tag{40}$$

$$I^* = \gamma'Z + u_2 \tag{41}$$

P* is an index function representing the utility from participation in employment, δ is a vector of parameters, V is a set of covariates relating to personal qualities and other characteristics. I* is as defined before.

$$P = 1 \text{ if } u_1 > -\delta'V \quad \text{and } I = 1 \text{ if } u_2 > -\gamma'Z$$
$$P = 0 \text{ otherwise} \qquad \text{and } I = 0 \text{ otherwise}$$

That is, P is equal to one if the individual is observed to participate in employment and I is equal to one if the individual participates in self-employment and zero if he or she participates in wage employment.

Assume that the error terms of the two probit equations are (u_1 and u_2) are correlated. Then we are interested in the joint probabilities of the employment participation decision and the employment status choice decision. The probabilities of different states can be formulated as follows;

The probability of choosing self-employment status is

$$\Pr(P = 1, I = 1) = \Pr(P^* > 0, I^* > 0) \tag{42}$$

and the probability of choosing wage employment status is

$$\Pr(P = 1, I = 0) = \Pr(P^* > 0, I^* < 0) \tag{43}$$

Assuming that the two error terms are distributed bivariate normal we estimate the two selection equations simultaneously by maximum likelihood bivariate probit method. Then we can compute the selection terms similar to inverse Mill's ratio obtained for the single selection process and include them in the earnings equations. Formally;

$$E\left(\ln y_s \mid P=1, I=1\right) = \beta_s^{'} X_s + b_{\lambda 1}\lambda_1 + b_{\lambda 2}\lambda_2 \tag{44}$$

$$b_{\lambda 1} = \sigma_{u_s}\rho_{1s} \tag{45}$$

$$b_{\lambda 2} = \sigma_{u_s}\rho_{2s} \tag{46}$$

σ_{us} is the standard error of the earnings equation for the self-employed, $\rho 1s$ is the correlation between the error terms of employment participation equation and self-employed earnings equation, $\rho 2s$ is the correlation between the error terms of employment status choice equation and self-employed earnings equation. The definitions of the terms that appear in equations above are as follows;

$$\lambda_1 = f(P)F(I_1) \div F(P,I,\rho) \tag{47}$$

$$\lambda_2 = f(I)F(P_1) \div F(P,I,\rho) \tag{48}$$

$$P = \hat{\delta}'V \tag{49}$$

$$I = \hat{\gamma}^{'}Z \tag{50}$$

$$P_1 = P - \rho I \div \sqrt{1-\rho^2} \tag{51}$$

$$I_1 = I - \rho P \div \sqrt{1-\rho^2} \tag{52}$$

where f(.) and F(.) denote the standard univariate normal density and distribution functions respectively and F(I, P, ρ) is the standard bivariate normal distribution function. The selection terms for the wage employed earnings function is calculated as follows;

$$E\left(\ln y_w \mid P=1, I=0\right) = \beta_w^{'} X_w + b_{\lambda 3} + b_{\lambda 4} \tag{53}$$

$$\lambda_3 = f(P)F(-I_1) \div F(p,-I,-\rho) \tag{54}$$

$$\lambda_4 = -f(I)F(P_1) \div F(p, -I, -\rho) \tag{55}$$

$$b_{\lambda 3} = \sigma_{u_w} \rho_{1w} \tag{56}$$

$$b_{\lambda 4} = \sigma_{u_w} \rho_{2w} \tag{57}$$

σuw is the standard error of the error term in the earnings equation for the wage earners, $\rho 1w$ is the correlation term between the errors of employment participation equation and the earnings equation, $\rho 2w$ is the correlation term between the errors of employment status choice equation and the earnings equation.

The estimates of the standard error of the regression and the standard errors of the coefficients will be inconsistent (Tunalı, 1986). We use Huber-White sandwich estimators but not employed the estimation procedure offered by Tunalı in detail to obtain the correct standard errors.

4.7 Data and Variables

For this study, we use cross-sectional data produced from the Household Income and Expenditure Surveys for the years 1994 and 2002 collected by the State Institute of Statistics of Turkey. While the 1994 survey is representative of seven regions in Turkey, 2002 survey is not representative on the regional basis. Both surveys are representative of rural and urban areas in Turkey.

In this study, we included all male and females between the ages 15 and 65. The surveys asked individuals to mark the relevant employment status category. Individuals are classified as wage earners or self-employed according to their reporting of employment states. The State Institute's definition of self-employed refers to those who work on his/her account basically relying on their own labor. Wage earners are defined as wage and salary workers. We included only non-agricultural wage earners and self employed in our data sets. We deleted the observations who reported that they held a secondary job. We included all the wage earners and self-employed with positive incomes who worked at least one hour within the month of the survey. Monthly incomes included cash and in-kind payments and are deflated using monthly CPI with base year 1987.

Potential labor market experience is calculated as age minus the years of education minus six. We defined five educational dummies; primary school, middle school, high school, vocational high school and university level dummies. The base category included the non-graduates and illiterate. We also defined cohort dummies. The youngest cohort included those between the ages 15 and 24. The second cohort dummy is constituted for those between the ages 25 and 45 and the last cohort dummy takes the value of 1 if the individuals are between the ages 46 and 65. The comparison category is defined as the youngest cohort. We also accounted for the rural/urban difference by defining an urban dummy variable taking the value of 1 if the individual is located in an urban area and zero otherwise. Regional and month dummies are defined for both years and employed in each regression to account for the regional and monthly variations in the dependent variables. But we only reported the regional dummies for the 1994 data set as the 2002 data is not representative on the regional basis. The months are only included to purge off the effects of monthly variations in the variables and not reported in either years. In the behavioral probit equations we included non-labor income, land and home ownership variables. The monthly unearned income included rent and interest income in cash and in-kind and deflated by the monthly CPI with base 1987. The other household members' real unearned income is calculated as household real unearned income minus the individual's real unearned income. The per capita land is measured in acres.

The home ownership dummy takes the value of 1 if the individuals own the house he or she resides and zero otherwise. We used logarithm of real hourly earnings for the self employed and wage earners.

We first look at some statistics revealed by the row data pertaining to the years 1994 and 2002. In Table 4.1, the percentages of self-employed and wage earner males and females are presented by three age cohorts and in total. The percentage of male wage earners is four times (78 percent) as the percentage of male self-employed (22 percent). Female self-employed is almost one sixth of female paid-employees in 1994. In 2002, we observe that the percentage of self-employed in both sexes considerably dropped while the percentage of wage earners increased. A relationship between the incidence of self-employment and age cohorts is visible for both years and both genders. While the percentage of wage earners decrease as the age cohort gets older the reverse is true in the case of self-employed. Of the working males at the oldest age cohort, 40 percent are self-employed and 60 percent are wage earners. In the 25-44 age group 22 percent of working males are self-employed and 80 percent are wage earners followed by 10 percent and 90

percent respectively at the youngest cohort in 1994This observation is in line with the observations in other countries. The more detailed analysis of age-employment status relationship is presented in the following figures for both years and sexes.

Figures 4.1 and 4.2 present the age distribution of self-employed and wage earners males and females respectively in 1994. Wage earners and self-employed between the ages 15 and 65 are split into ten age intervals with each interval having five year period. We clearly see that the percentages of self-employed increase by age while the percentages of wage earners decline by age for both sexes in 1994. The percentages of male self-employed increase significantly relative to the percentages of male wage earners after the age 40. The percentage of female self-employed exceeds the percentage of wage earner females at earlier ages, at the age interval 26-31 the percentage of self-employed females is greater than that of wage earner females and the difference between the percentages for two groups is maximum at the age interval 31-35, see Figure 4.1. However, the highest percentage of both self-employed and wage earner males are between the ages 26 and 40. At the age intervals 26-30, 31-35, and 36-40, the percentages of wage earners are around 17 percent totaling to 51 percent of total wage earners. At the same age intervals, the percentages of self-employed are around 16 percent at each interval. This means that approximately 48 percent of self-employed are between the ages 26 and 40.

An examination of Figure 4.1 indicates that female wage earners are even younger than male wage earners. The highest percentage of female wage earners is at the 15-20 age interval followed by 21-25 age group and so on. This finding implies that females at school age (15-20) are more likely to work as wage earners than males in the same age group. While only 12 percent of total wage employed males is between the ages 15 and 20 the same percentage for females is 20.

Table 4.1 Percentages of Self-employed and Wage Earners by Cohort

1994	Male		Female	
Cohort	Self-employed	Wage Earner	Self-employed	Wage Earner
15-24	10.43	89.57	6.2	93.8
25-45	21.87	78.13	16.82	83.18
46-65	38.73	61.27	31.46	68.54
Total	22.51	77.49	14.56	85.44
2002	Male		Female	
Cohort	Self-employed	Wage Earner	Self-employed	Wage Earner
15-24	5.24	94.76	2.66	97.34
25-45	15.14	84.86	12.61	87.39
46-65	28.47	71.53	21.14	78.86
Total	15.73	84.27	9.85	90.15
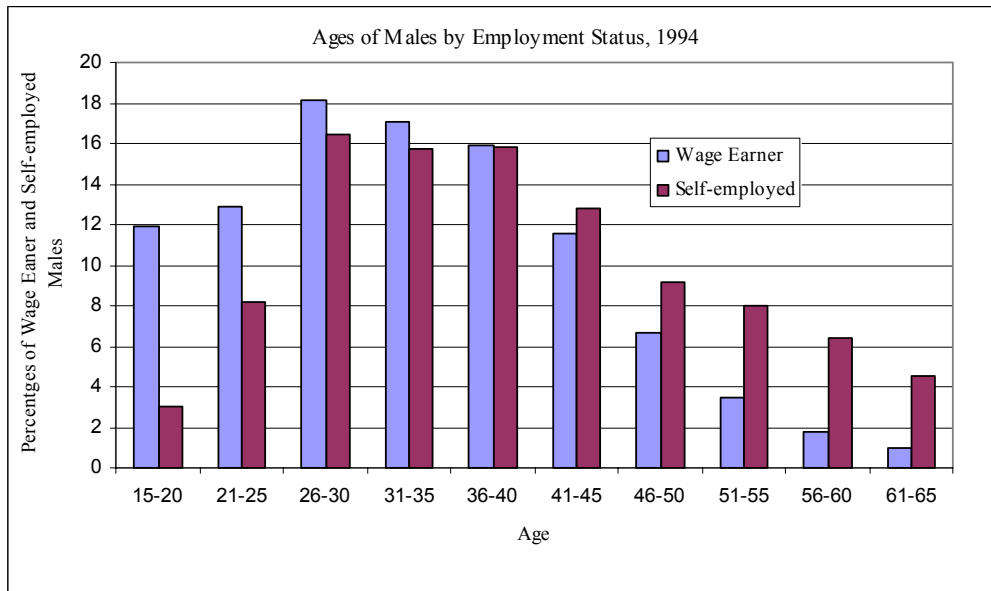
Figure 4.1 Age Distribution of Wage Earner and Self-employed Males, 1994

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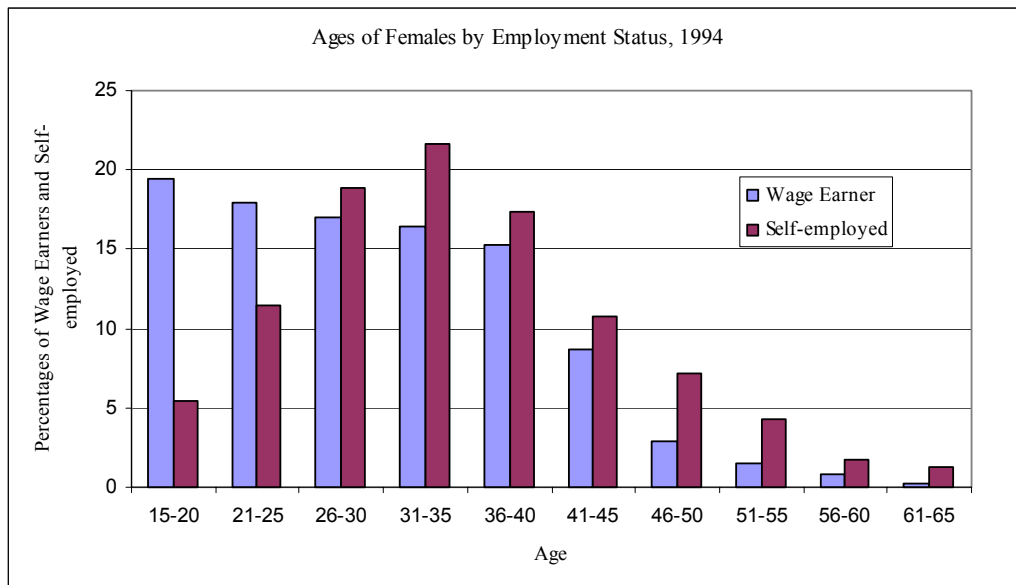
Figure 4.2 Age Distribution of Wage Earner and Self-employed Females, 1994

Percentages of male and female self-employed and wage earners against distinct age groups for 2002 are demonstrated in Figures 4.3 and 4.4. Figure 4.5 reveals that age distribution of males in general is similar to that in 1994. However, we that the percentages of both wage earner and self-employed males in the youngest age group (15-20) dropped in 2002. This suggests that participation of school age males in employment declined in 2002. Differently from 1994, in 2002 the percentage of self-employed males exceeded that of wage earner males in the 31-35 age group. The percentages of self-employed males older than 30 years old are higher than the percentage of male wage earners older than 30 years old. Majority of both wage earner and self-employed males are between the ages 26 and 45 as in 1994.

In 1994, 15-20 age groups constituted the majority of female wage earners20 percent. Figure 4.2 shows that the percentage of youngest cohort remained the same as in 1994 but the 21-25 age group makes up the majority in 2002. This suggests that the share of university graduate female wage earners increased from 1994 to 2002. Age distribution of female wage earners indicates that females participate in wage employment in their late teen ages and early twenties and withdraw toward their mid twenties. It is likely that female wage earners leave work, as they get married.

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Figure 4.3 Age Distribution of Wage Earner and Self-employed Males, 2002

Figures 4.5 and 4.6 demonstrate the mean real hourly earnings of self-employed and wage earner males and females against equally divided ten age cells in 1994. The real mean hourly earnings are higher for wage earners at younger ages while the reverse is true for the self-employed. Real hourly earnings of male wage earners increase until the age interval 41-45 and then start declining while the real hourly earnings of male self-employed linearly increase at age intervals. The same pattern is observed for female wage earners and self-employed although the real hourly earnings of female self-employed present flatter association to age intervals. It becomes clear that self- employed earnings are significantly lower at earlier ages than wage earners' earnings until about age 50 but self-employed earnings significantly increase after the age interval 45-50. This occurrence brings to mind that retired men and women take up self-employed jobs in significant proportions Fuchs, 1982).

Ages of Females by Employment Status, 2002

Figure 4.4 Age Distribution of Wage Earner and Self-employed Females, 2002

Age-Earnings Profile for Self-employed and Wage Earner Males, 1994
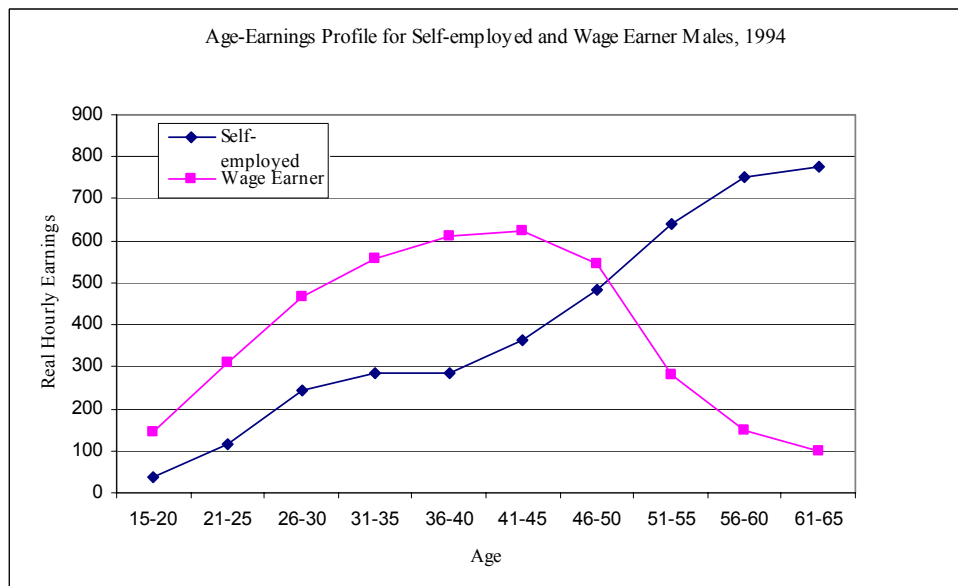
Figure 4.5 Age-Earnings Profile for Self-employed and Wage Earner Males, 1994
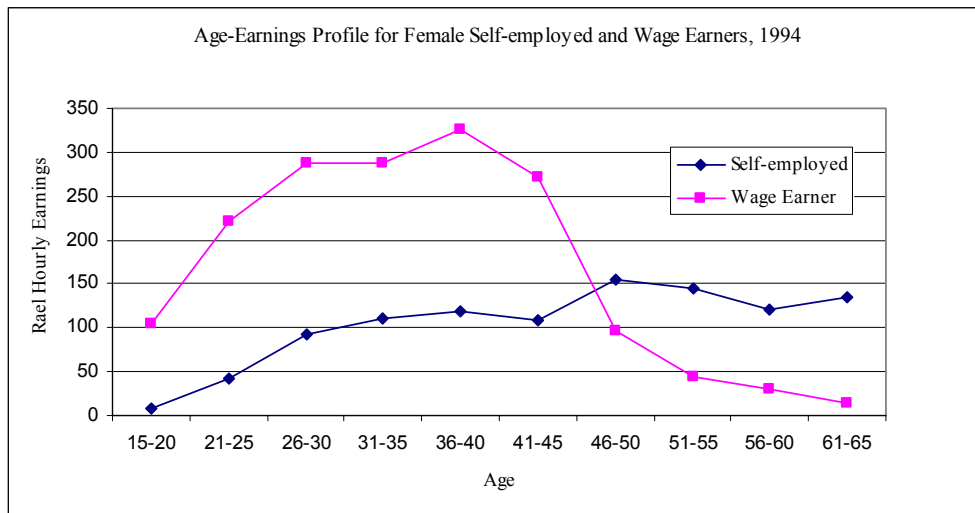
Figure 4.6 Age-Earnings Profile for Self-employed and Wage Earner Females, 1994

The figures for the year 2002 present the similar happenings for age-earnings profiles for both male and female workers. See Figures 4.7 and 4.8. Nevertheless, it is immediately noticeable that the earnings of self-employed males drop considerably after the age interval 51-56. Female self-employed earnings are very low and quite flat in relation to age. This may be related to severe economic downturn in 2000 and 2001 in Turkey. Due to the economic calamities in these years many wage earners and self-employed lost their jobs. It may be surmised that the older men had smaller incentive to coup with the daunting market conditions and readily went out of market.

The steeper age-earnings profile at the earlier ages for the wage earners is consistent with the hypothesis that the employers pay higher wages to their employees to induce them to be more productive increasing the present value of their life-time earnings (Lazear and Moore, 1984). The earnings of self-employed increase steadily by age since such incentives are inapplicable in the case of self-employed.
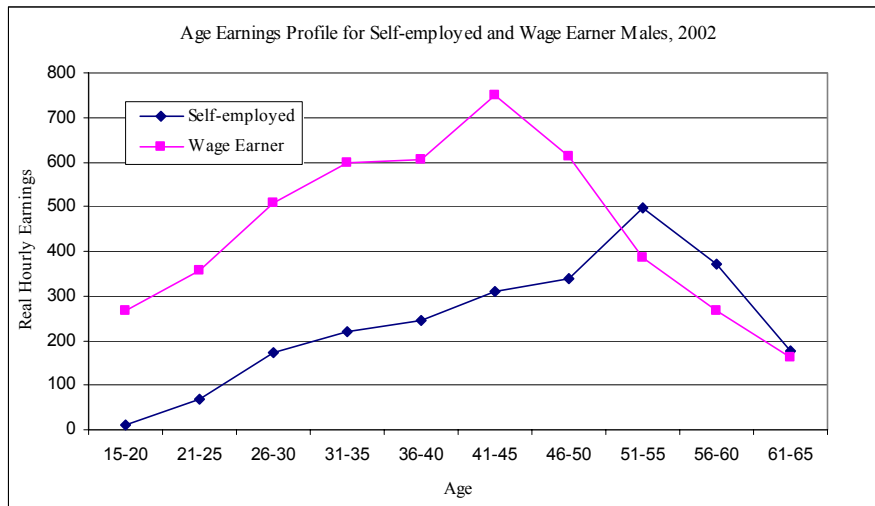
Figure 4.7 Age-Earnings Profile for Self-employed and Wage Earner Males, 2002
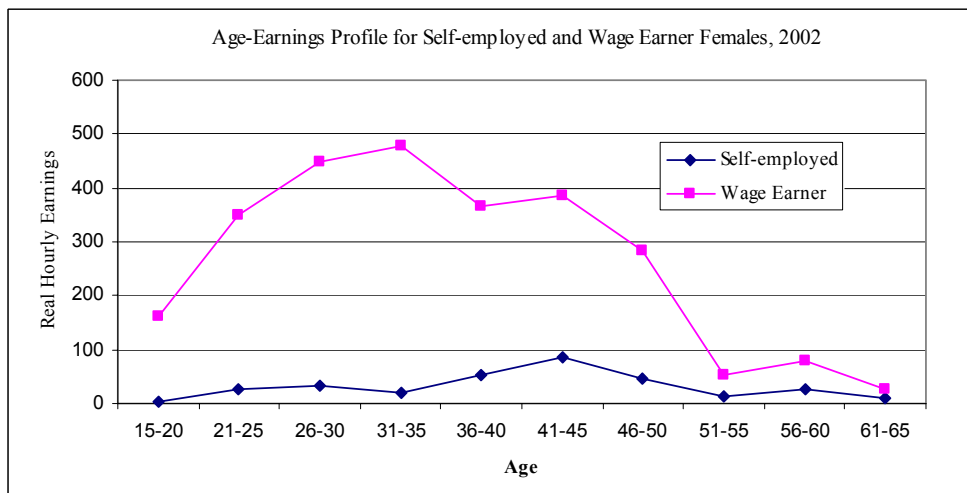
Figure 4.8 Age-Earnings Profile for Self-employed and Wage Earner Females, 2002

Figures 4.9 and 4.10 depict the percentages of self-employed and wage earner males and females at each education category. It is clear from the two figures that primary school graduates make up the highest percentage of working males and females in 1994. Beyond primary school level, percentages of male wage earners are higher compared to male self-employed. Illiterate and non-graduate males make up approximately 4 percent of wage earners whereas self-employed males in these categories make up nearly 10 percent of total self-employed. 50 percent of male wage earners are

primary school graduates while 60 percent of male self-employed hold primary school diplomas. Middle school graduate males constitute 12 percent of total wage earners and 10 percent of self-employed. Percentage of high school graduate wage earners is 18 percent and the same figure for self-employed is 12 percent. Vocational high school and university gradates together make up little more than 10 percent of total wage earners. Percentage of university graduate self employed is about 3 percent and the percentage of vocational high school graduate self-employed is very small.
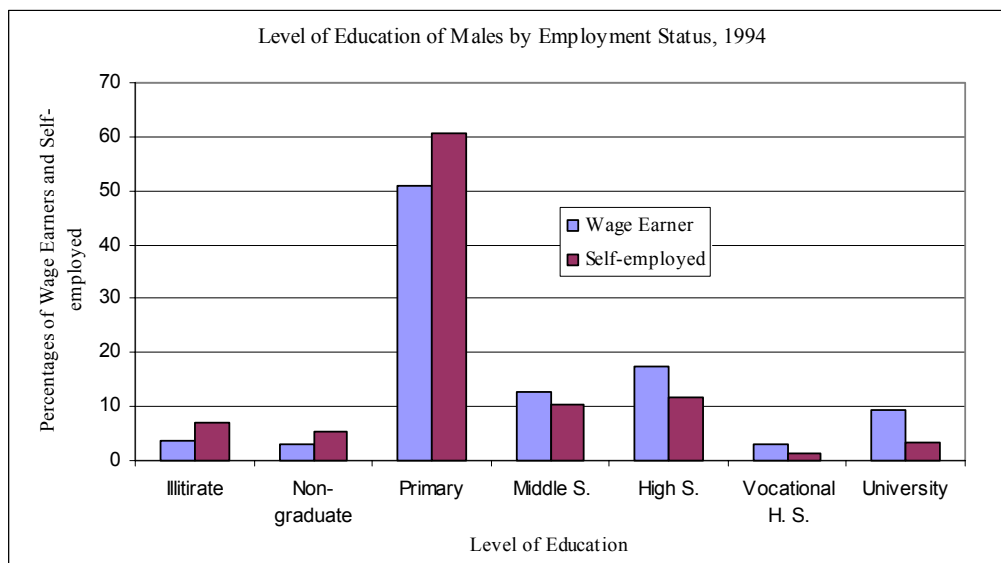
Figure 4.9 Level of Education of Males by Employment Status, 1994

Figure 4.10 indicates that the gap between the percentages of self-employed and wage earner females at lower education levels, illiterate, non-graduate, primary, is considerably wider compared the gap for males.
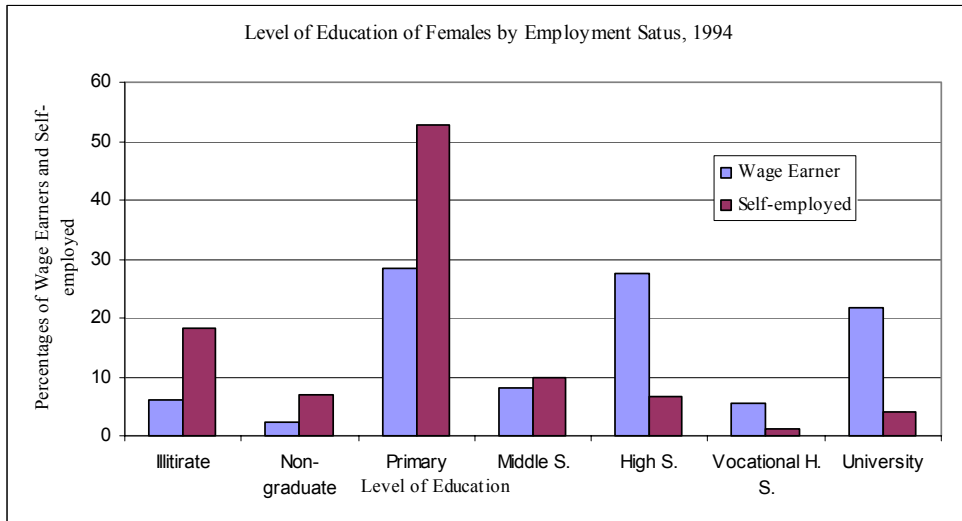
Figure 4.10 Level of Education of Females by Employment Status, 1994
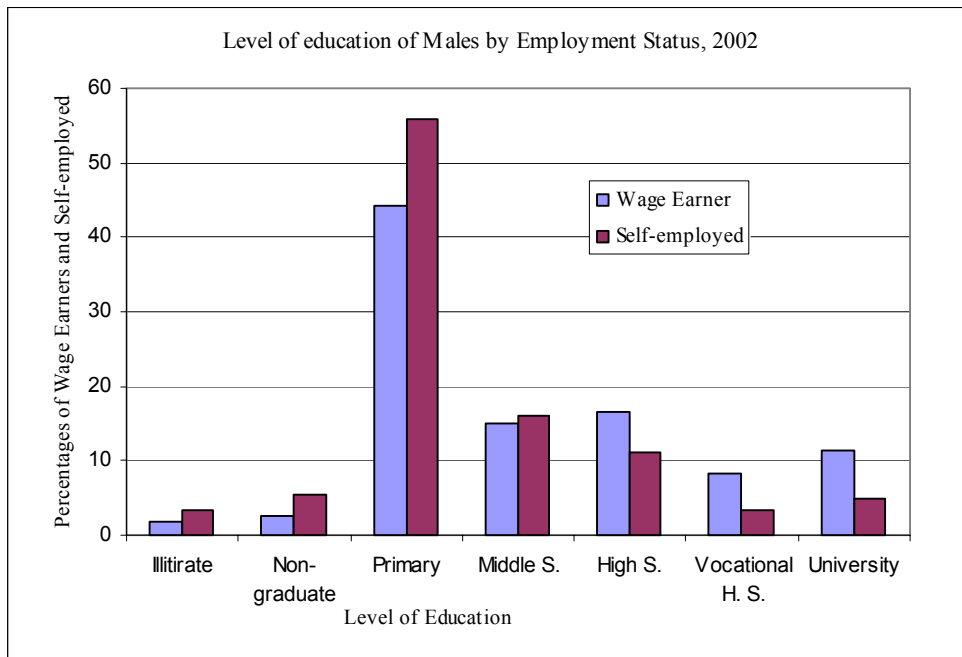
Figure 4.11 Level of education of Males by Employment Status, 2002
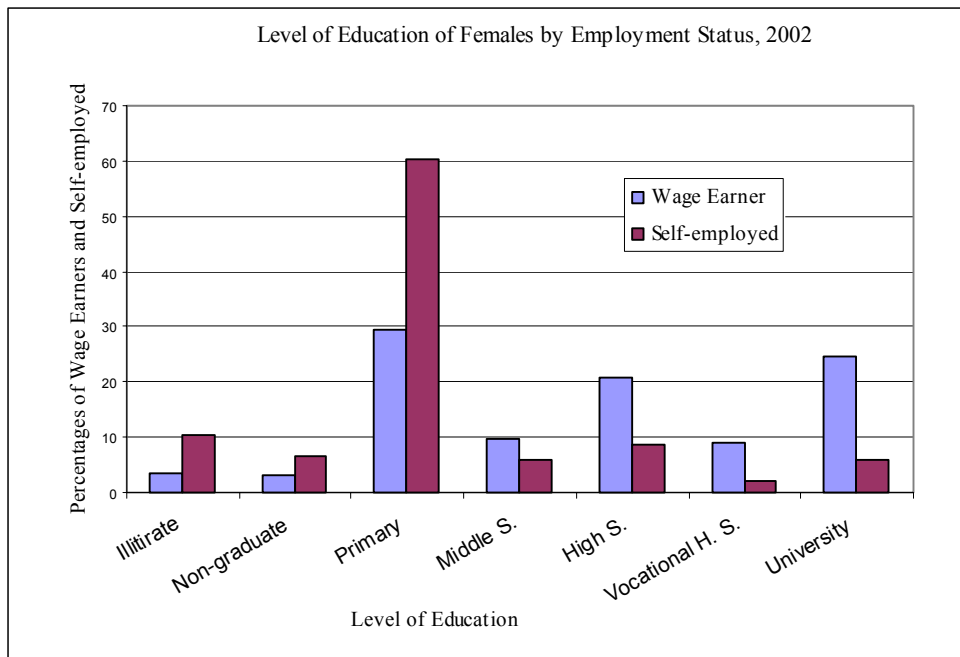
Figure 4.12 Level of Education of Females by Employment Status, 2002

Some other observations that pertain to the data are as follows; Potential labor market experience of self-employed males and females in both years is approximately 8 years more than that of wage earners. See Tables 4.2 and 4.3 for means and standard deviations. This is not surprising having seen that self-employed have a higher mean age and less schooling attainment compared to wage earners. We also observe in the same Tables that self-employed males work longer hours than wage earners. In both years, the self-employed males' weekly working hours exceed the hours worked in a week by wage earner males' by about 5 hours . This finding is in line with the general judgment that self-employment activity demand high level of physical and mental activity (Rees and Shah, 1986). On the other hand, we see from the summary statistics tables that women in self-employment occupations have lower weekly working hours compared to their wage earner counterparts. They work about 10 hours less than wage earner females in both years.

Self-employed men had higher mean monthly real non-labor income and per capita land compared to wage earner men in 1994. The percentage of self-employed males who owned houses was also higher than the percentage of wage earner males who owned houses, the percentages are 67 and 54 for self-employed and wage earner males

respectively. The mean value of other house hold members' real unearned income for the sub-sample of self-employed males was lower than that for the wage earners in 1994. In general, the self-employed males had more assets (financial and non-financial) compared to wage earner males. The same observations are valid for the year 2002 except that, in 2002, the mean monthly real unearned incomes for the both sub-samples are not very different from each other. On the other hand, female self-employed sub-sample owned fewer assets than their wage earner fellows in both years except that they possessed more per capital land in 2002. We may conclude that male and female sub-samples are quite different in terms of their characteristics in relation to their employment states.

It is widely observed and expected phenomenon that the earnings of self-employed are higher and more dispersed compared to the earnings of regular employees. In Tables 4.2 and 4.3 we see that the mean hourly earnings of male self-employed are higher than of male wage earners in both years and also they have higher standard errors indicating that they are more dispersed. We examine the dispersion in the earnings more closely looking at the distribution of it at different income percentiles. Our figures in the Appendix show that self-employed income is more right skewed and thus more dispersed compared to wage earners' earnings.

Table 4.2 Means and Standard Deviations, 1994

Male	Self-employed		Wage Earner	
Variables	Mean	Std. Dev	Mean	Std. Dev
Real Hourly Income	1087.58	2230.4	788.57	973.97
Ln Real Hourly Income	6.53	.86	6.30	.85
Hours worked per week	54.18	19.95	49.10	15.26
Experience	27.26	12.81	20.29	11.20
Experience Squared	906.92	782.30	536.88	554.45
Illiterate	0.07	0.25	0.04	0.19
Non-graduate	0.05	0.23	0.03	0.17
Primary School	0.61	0.49	0.51	0.50
Middle School	0.11	0.31	0.13	0.33
High School	0.12	0.32	0.18	0.38
Vocational H. School	0.01	0.11	0.03	0.17
University	0.03	0.18	0.09	0.29
Age: 1524	0.09	0.28	0.21	0.41
Age: 25-45	0.63	0.48	0.66	0.47
Age: 46-65	0.28	0.45	0.13	0.33
Real Unearned Income	7140.85	47011.13	5713.62	27208.53
Others' R.U.I.	2152.40	18247.66	3563.10	39267.79
Per-capita Land	0.84	6.26	0.73	7.12
Own House	0.67	0.47	0.54	0.50
Urban	0.81	0.39	0.84	0.37
Number of observations	3734		12856	
Female	Self-employed		Wage Earner	
Variables	Mean	Std. Dev	Mean	Std. Dev
Real Hourly Income	525.83	924.17	696.74	787.73
Ln Real Hourly Income	5.61	1.11	6.14	.91
Hours worked per week	34.68	22.34	43.32	14.69
Experience	23.94	11.25	15.05	10.63
Experience Squared	699.43	631.66	339.47	466.28
Illiterate	0.18	0.39	0.06	0.24
Non-graduate	0.07	0.25	0.02	0.15
Primary School	0.53	0.50	0.29	0.45
Middle School	0.10	0.30	0.08	0.28
High School	0.07	0.25	0.28	0.45
Vocational H. School	0.01	0.11	0.05	0.23
University	0.04	0.20	0.22	0.41
Age: 1524	0.13	0.34	0.33	0.47
Age: 25-45	0.73	0.45	0.61	0.49
Age: 46-65	0.15	0.35	0.05	0.23
Real Unearned Income	2172.22	14530.48	3217.52	18392.63
Others' R.U.I.	7938.56	44454.53	11420.01	45415.46
Per-capita Land	0.60	3.03	1.04	14.68
Own House	0.56	0.50	0.53	0.50
Urban	0.84	0.37	0.87	0.34
Number of observations	462		2711	

Table 4.3 Means and Standard Deviations, 2002

Male	Self-employed		Wage Earner	
Variables	Mean	Std. Dev.	Mean	Std. Dev.
Real Hourly Income	875.67	1959.779	765.60	1097.50
Ln Real Hourly Income	6.30	.85	6.27	.82
Hours worked per week	56.10	20.74	51.26	15.56
Experience	27.42	11.87	20.29	10.92
Experience Squared	892.50	707.13	530.97	512.01
Illiterate	0.03	0.18	0.02	0.14
Non-graduate	0.05	0.23	0.03	0.16
Primary School	0.56	0.50	0.44	0.50
Middle School	0.16	0.37	0.15	0.36
High School	0.11	0.31	0.17	0.37
Vocational H. School	0.03	0.18	0.08	0.27
University	0.05	0.22	0.11	0.32
Age: 1524	0.06	0.23	0.19	0.39
Age: 25-45	0.63	0.48	0.66	0.47
Age: 46-65	0.31	0.46	0.15	0.35
Real Unearned Income	6761.12	36827.96	6832.17	34901.90
Others' R.U.I.	1974.35	18588.57	2665.42	18808.82
Per-capita Land	1.15	5.22	0.92	5.11
Own House	0.66	0.47	0.59	0.49
Urban	0.89	0.31	0.91	0.28
Number of observations	1020		5463	
Female	Self-employed		Wage Earner	
Variables	Mean	Std. Dev.	Mean	Std. Dev.
Real Hourly Income	501.10	1289.18	694.06	734.35
Ln Real Hourly Income	5.37	1.16	6.17	.85
Hours worked per week	29.71	19.16	44.67	15.55
Experience	25.60	11.93	14.52	10.91
Experience Squared	796.78	702.72	329.61	465.35
Illiterate	0.10	0.31	0.04	0.18
Non-graduate	0.07	0.25	0.03	0.18
Primary School	0.60	0.49	0.29	0.46
Middle School	0.06	0.24	0.10	0.30
High School	0.09	0.28	0.21	0.41
Vocational H. School	0.02	0.15	0.09	0.29
University	0.06	0.24	0.24	0.43
Age: 1524	0.10	0.30	0.38	0.49
Age: 25-45	0.71	0.45	0.54	0.50
Age: 46-65	0.19	0.39	0.08	0.27
Real Unearned Income	1407.00	9880.86	3848.83	25737.50
Others' R.U.I.	5007.03	21141.24	12360.84	68384.30
Per-capita Land	3.01	14.35	0.96	4.88
Own House	0.57	0.50	0.59	0.49
Urban	0.93	0.26	0.94	0.24
Number of observations	136		1245	

4.8 Results

4.8.1 Selection Equations

The probit (single step selection) and bivariate probit (double selection specification) equations are estimated using the Maximum Likelihood methods. These equations are estimated to examine the potential determinants of self-employment versus wage employment choice and to form the selectivity variables to be included in the logarithmic earnings functions. As discussed above, in the empirical specification section, double selection specification takes account of an individual's decision whether to participate in employment or not in addition to the choice made between the employment states, self-employment versus wage employment. This specification is especially reasonable in a country where a high level of unemployment is persistent (Stillman, 2000). People who participate in employment may have common unobserved characteristics that may associate with their sector choice decision and these characteristics may also affect the earnings of the working sub populations.

The results from the estimation of selection equations for the sub-sample of males in 1994 are presented in Table 4.4. The bivariate probit model indicates that participation in labor market and choosing between employment states are dependently determined. The correlation between the error terms of the two choice equations is negative (Rho = -.96) and significant for the sub-sample of males in 1994. The negative correlation term implies that there is a reverse association between the unobserved factors. The unobservable characteristics of those who choose to participate (or more correctly are able to find employment) in employment are reversely related to the unobserved factors that leads one to become self-employed.

The coefficients on the explanatory variables in both models reflect the impact of changes in these variables on the probability of becoming self-employed (for the bivariate probit, this includes the choice of employment too but as we are mainly interested in the employment choice decision we interpret the results for this choice). In the probit estimate results, the effect of experience on the probability of becoming self-employed is positive and significant at one percent level whereas financial wealth variables (real unearned income and other household members' unearned income) have no significant effect. In the bivariate specification on the other hand, the self-employment effect of experience turned out to be negative and significant while the financial wealth variables

have positive and significant effect on the probability of becoming self-employed. It has been noted that the positive effect of experience on the probability of being self-employed may indeed reflect the financial wealth effects as people accumulate capital over time (Le, 1999; Berndhardt, 1994). The control of financial capital in the bivariate probit estimates eliminates this possibility allowing for the true effect of experience on the probability to be estimated. A likelihood ratio test of independent equations showed that the two decisions are dependently made. Thus, the bivariate specification is superior to the probit specification. These findings suggest that when the choice equation is correctly specified, the financial capital factor better explains the incidence of self-employment than human capital factor, namely potential labor market experience. Both specifications show that as the level of schooling increases the likelihood of choosing self-employment status declines. Only the coefficient on the primary school level dummy in the reduced-form probit specification has a positive and significant effect on the probability compared to the non-graduate and illiterate category. In the bivariate probit specification, the coefficients on primary and middle school dummies have positive and significant signs. In both specifications, high school, vocational high school and university level dummies' coefficients have negative signs and are statistically significant. Clearly, more educated have lower propensity to become self–employed. This result does not support the hypothesis that education increases the managerial ability of individuals and thus increases the likelihood of becoming self-employed. Rees and Shah (1986) found a significant and positive effect of education on the probability of entering into self-employment in UK. Our results rather support the hypothesis that highly educated prefer wage employment. This implies that lucrative self-employment opportunities are not available for or not worth to be taken by the highly educated. Given instable macro economic conditions, even if these opportunities exist highly educated may not prefer to take up these jobs in a risky economic environment. Rather they prefer regular payroll jobs available to the highly educated in the market.

In the reduced-form probit specification neither of the wealth variables has a significant impact on the self-employment probability. Only home ownership has a positive and significant effect. In the bivariate specification, both the individual's real unearned income and others' real unearned income affect the probability positively. The coefficients on these variables are significant at 1 percent level. Per capita land is also

Table 4.4 Maximum Likelihood Estimates of Selection Equations for Men, 1994

Variables	Probit Estimates	Bivariate Probit Estimates	
	Employment Status	Employment Status	Employment Participation
Experience	0.025	-0.083	0.132
	(7.02)**	(19.91)**	(68.73)**
Experience Square	-3.58E-06	1.81E-03	-2.47E-03
	0.05	(27.31)**	(68.55)**
Primary School	0.089	0.053	-0.003
	(2.02)*	(1.69)+	0.1
Middle School	0.011	0.111	-0.118
	0.2	(2.88)**	(3.43)**
High School	-0.028	-0.153	0.233
	0.52	(4.01)**	(6.72)**
Vocational H. School	-0.271	-0.434	0.444
	(2.94)**	(6.75)**	(7.47)**
University	-0.363	-0.55	0.579
	(5.51)**	(11.50)**	(12.98)**
Urban	-0.067	-0.536	0.691
	(2.22)*	(24.40)**	(32.72)**
Real Unearned Income	3.34E-07	1.52E-06	-1.86E-06
	1.03	(6.97)**	(9.52)**
Other H.H. Member's R.U.I.	8.70E-08	8.56E-07	-1.04E-06
	-0.24	(3.70)**	(5.52)**
Per Capita Land	0.001	0.015	-0.018
	0.91	(4.52)**	(5.94)**
Home Ownership	0.213	0.118	
	(8.96)**	(7.86)**	
Aegean	0.075	0.058	-0.029
	(1.74)+	(1.87)+	1
Mediterranean	0.158	0.22	-0.188
	(3.92)**	(7.60)**	(6.93)**
Central Anatolia	-0.001	0.128	-0.185
	0.03	(4.45)**	(6.87)**
Black Sea	0.144	0.263	-0.265
	(3.45)**	(8.90)**	(9.65)**
East Anatolia	0.173	0.239	-0.206
	(4.20)**	(8.06)**	(7.46)**
South East Anatolia	0.15	0.156	-0.104
	(3.60)**	(5.17)**	(3.67)**
Constant	-1.521	0.908	-1.421
	(19.02)**	(10.61)**	(28.61)**
Observations	16590	33832	33832
Censored observations		17242	
Uncensored observations		16590	
Log likelihood	-8235.29	-26819.68	
LR chi2(29)	1222.89		
Pseudo R2	0.0691		
Wald chi2(29)		3995.37	
Rho		-0.96	
LR test of independent equations		28.16	
Prob >chi2		0	
Absolute value of z statistics in parentheses			
+ significant at 10%; * significant at 5%; ** significant at 1%			

significant at 1 percent level and has a positive impact on the probability. Home ownership coefficient is positive and significant at 1 percent level.

These results indicate that financial capital is a significant determinant of participation in self-employment. The positive and significant sign on the home ownership variable is in line with the conjecture that individuals who own houses feel more comfortable to take up risky employment opportunities. They are also likely to save more as they do not have to make regular payments for rent and thus are likely to have more resources to start up their own businesses.

Coefficients on regional dummies indicate that residing in Aegean, Mediterranean, Central Anatolia, Black Sea, South East Anatolia and East Anatolia regions increases the probability compared to the Marmara region where the large portion of wage-employment jobs are available.

The probit and censored probit results for females are given Table 4.5. Although the correlation term between the errors terms of working decision equation and employment choice decision is insignificant, the significance levels of coefficients from bivariate probit specification are more improved compared to probit specification. Experience has no effect on the choice of self-employment. All the coefficients on the education level dummies are statistically significant and have minus signs. The likelihood of becoming self-employed declines with school level. Females' real unearned incomes have no significant effect on their becoming self-employed. However, the other household members' non-labor income positively affects the choice of self-employment. Per capita land and ownership variables have no effect on the probability either. These results suggest that female self-employed use other household members' savings to start their businesses. As in the males case, regional dummies have positive and significant signs indicating that the probability of becoming self-employed increases unless the person live in Marmara region. Similarly, females from rural areas are more likely to be self-employed compared to their counterparts in urban areas.

Third, the results pertaining to the sub-sample of males for the year 2002 are considered. The results are presented in Table 4.6. In the second column of Table 4.6, we see that the experience and its square terms enter into self-employment versus wage employment choice equation, determined simultaneously with the employment choice equation, with significant magnitudes. School level dummies for primary, middle, and high school also enter the bivariate specification with negative but insignificant coefficients. For the year 2002, we see that real unearned income and home ownership

variables are significant at 10 percent level. Home ownership positively affect the probability of becoming self-employed.

Table 4.5 Maximum Likelihood Estimation of Selection Equations
for Women, 1994

Variables	Probit Estimates	Bivariate Probit Estimates	
	Employment Status	Employment Status	Employment Participation
Experience	0.075	-0.011	0.035
	(7.95)**	1.23	(12.53)**
Experience Square	-0.0011	0.0004	-0.0008
	(5.67)**	(3.08)**	(14.36)**
Primary School	-0.019	-0.081	0.083
	0.19	(1.86)+	(2.48)*
Middle School	-0.18	-0.3	0.284
	1.36	(5.08)**	(6.03)**
High School	-0.898	-1.133	0.975
	(6.80)**	(15.50)**	(22.82)**
Vocational H. School	-1.021	-1.5	1.336
	(4.67)**	(14.94)**	(18.64)**
University	-1.071	-2.292	2.245
	(7.34)**	(33.55)**	(39.09)**
Urban	-0.138	-0.376	0.371
	1.55	(10.40)**	(13.39)**
Real Unearned Income	8.26E-07	1.17E-07	-3.39E-08
	0.48	0.14	0.07
Other H.H. Member's RUI	4.72E-07	1.89E-06	-2.01E-06
	0.6	(5.55)**	(7.15)**
Per Capita Land	-0.003	0.002	-0.002
	0.56	1.01	(2.41)*
Home Ownership	0.004	0.002	
	0.06	0.09	
Aegean	-0.156	-0.113	0.076
	1.56	(2.47)*	(2.11)*
Mediterranean	-0.055	0.196	-0.232
	0.53	(4.30)**	(6.52)**
Central Anatolia	0.169	0.395	-0.387
	1.63	(8.70)**	(10.70)**
Black Sea	0.184	0.232	-0.196
	(1.92)+	(5.25)**	(5.66)**
East Anatolia	0.201	0.559	-0.557
	1.54	(10.45)**	(13.44)**
South East Anatolia	-0.004	0.658	-0.728
	0.02	(9.60)**	(14.68)**
Constant	-1.388	1.786	-1.924
	(6.98)**	(11.19)**	(30.08)**
Observations	3173	38156	38156
Censored observations		34983	
Uncensored observations		3173	
Log likelihood	-1073.4676	-9575.055	
LR chi2(29)	486.7		
Pseudo R2	0.1848		
Wald chi2(29)		2674.64	
Rho		-0.98	
LR test of independent equations		2.44	
Prob >chi2		0.12	
Absolute value of z statistics in parentheses			
+ significant at 10%; * significant at 5%; ** significant at 1%			

Once again, we find that living in urban locations reduce the likelihood of entering into self-employment.

Table 4.6 Maximum Likelihood Estimation of Selection Equations for Men, 2002

| Variables | Probit Estimates | Bivariate Probit Estimates | |
	Employment Status	Employment Status	Employment Participation
Experience	0.027	0.07	0.138
	(3.98)**	(3.92)**	(41.62)**
Experience Square	2.98E-05	-0.0009	-0.0028
	0.23	(2.22)*	(42.73)**
Primary School	0.042	0.051	0.006
	0.48	0.62	0.12
Middle School	0.148	0.106	-0.142
	1.48	1.11	(2.37)*
High School	-0.039	-0.012	0.056
	0.37	0.12	0.91
Vocational H. School	-0.272	-0.174	0.311
	(2.15)*	1.38	(4.26)**
University	-0.262	-0.162	0.336
	(2.25)*	1.39	(4.85)**
Urban	-0.135	0.016	0.476
	(1.96)*	0.18	(11.84)**
Real Unearned Income	-5.52E-07	-1.04E-06	-2.08E-06
	0.92	(1.82)+	(6.35)**
Other H.H. Member's RUI	4.78E-07	-5.23E-07	-2.92E-06
	0.42	0.47	(5.74)**
Per Capita Land	0.004	-0.004	-0.02
	1.06	0.77	(9.60)**
Home Ownership	0.066	0.065	
	1.58	(1.69)+	
Constant	-1.596	-2.37	-1.432
	(9.97)**	(7.94)**	(16.33)**
Observations	6483	12253	12253
Censored observations		5770	
Uncensored observations		6483	
Log likelihood	-2604.3071	-9483.204	
LR chi2(29)	434.49		
Pseudo R2	0.077		
Wald chi2(29)		359.62	
Rho		0.57	
LR test of independent equations		1.31	
Prob > chi2		0.25	
Absolute value of z statistics in parentheses			
+ significant at 10%; * significant at 5%; ** significant at 1%			

Last, we interpret the results from the selection equations for the female sub-sample in 2002. The results are presented in Table 4.7. Although Wald and Likelihood Ratio tests reject that the explanatory variables have no explanatory power on the dichotomous dependent variables in both specifications; the coefficients on the very few variables have statistically significant effect on the employment status choice. The rho term in the bivariate specification is also insignificant indicating that the participation in self-employment is determined independently of the participation in employment.

Table 4.7 Maximum Likelihood Estimation of Selection Equations for
Women, 2002

| Variables | Probit Estimates | Bivariate Probit | |
	Employment Status	Employment Status	Employment Participation
Experience	0.063	0.018	0.016
	(4.09)**	0.61	(3.56)**
Experience Square	-0.0006	0.0002	-0.0006
	(1.85)+	0.52	(6.23)**
Primary School	0.282	0.055	0.102
	1.510	0.330	(1.82)+
Middle School	-0.144	-0.142	0.088
	0.540	0.970	1.190
High School	-0.163	-0.533	0.560
	0.680	(3.74)**	(8.20)**
Vocational H. School	-0.545	-0.966	0.853
	1.610	(5.31)**	(9.88)**
University	-0.394	-1.447	1.571
	1.590	(5.61)**	(20.45)**
Urban	-0.123	-0.405	0.420
	0.560	(3.13)**	(6.77)**
Real Unearned Income	0.000	0.000	0.000
	0.340	0.290	0.150
Other H.H. Member's RUI	-3.82E-06	-7.21E-07	-1.43E-06
	1.460	0.320	(4.51)**
Per Capita Land	0.015	0.009	-0.002
	(2.14)*	1.390	1.010
Home Ownership	-0.039	-0.019	
	0.360	0.340	
Constant	-1.973	0.996	-1.805
	(5.20)**	0.850	(16.27)**
Observations	1381	13683	13683
Censored observations		12302	
Uncensored observations		1381	
Log likelihood	-350.746	-4060.821	
LR chi2(29)	187.120		
Pseudo R2	0.210		
Wald chi2(29)		476.370	
Rho		-0.910	
LR test of independent equations		0.140	
Prob>chi2		0.710	
Absolute value of z statistics in parentheses			
+ significant at 10%; * significant at 5%; ** significant at 1%			

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The negative correlation between the level of education and the probability of becoming self-employed is also evident for the female sub-sample in 2002; see the coefficients on the high school, vocational high school, and university level dummies in column 2 of Table 4.7.

4.8.2 Logarithmic Earnings Functions

Ordinary Least Squares and selectivity corrected two-step estimates of earnings equations for males for the year 1994 are presented in Table 4.8. The first two columns give the coefficient estimates for self-employed and wage earners from OLS regressions (specification 1) respectively. The third and fourth columns of Table 4.8 give the same estimates resulting from the two-step estimation of earnings equations pertaining to single-step selection equation (specification 2). The estimation results from the two-step estimation pertaining to double selection process (specification 3) are given in the last two columns of Table 4.8. It is observed that the magnitudes of coefficients for the self-employed sub-sample are somewhat greater in specification 3 compared to OLS (specification 1) and two-step estimates accounting for the selection bias only from the single-step decision making process (specification 2). The significance levels of parameter estimates do not change across our three specifications in general.

Linear and non-linear experience terms have expected signs and they are statistically significant at 1 percent level for both self-employed and wage earner males across the three specifications. Earnings in both sectors increase with experience but at a decreasing rate after a certain level of experience. One year increase in potential experience leads to a 3 to 5 percent increase in the log earnings of the self-employed males in the first two specifications while the log earnings increase by about 10 percent for the wage earner males across the three specifications. This finding is in conformation with the predications of human capital theory.

Coefficients on educational level dummies indicate that log earnings increase linearly with the level of education for both subgroups of self-employed and wage earners across the three specifications. A primary school graduate male self-employed obtains

approximately 15.7 percent[16] higher earnings compared to a non-graduate and illiterate in the third specification

A university graduate self-employed receives 180 percent higher earnings compared to the base category. Wage earner males receive higher returns to their years in school. At each level of schooling, the return is significantly higher for the wage earner males relative to self-employed males. This finding is in support of the screening hypothesis. Self-employed constitutes a benchmark to evaluate the role of education in enhancing one's inherent productivity. Self-employed do not need education as a signal to inform their inherent capacities in the labor market. Therefore, the returns to education for the self-employed would purely reflect enhancing effect of education. On the other hand, wage earners are screened in the market and need education to signal their in-born productivity. If this holds, higher returns to education in the case of wage earners result both from their inherent capacities and augmenting effect of education. Some other studies also found evidence in support of screening hypothesis. Brown and Sessions (1999) concluded that returns to education for employees were higher than that for self-employed in Italy. Garcia-Mainar and Montuenga-Gomez (2005) also found that the returns were higher for wage earners than they were self-employed in Portugal and Spain.

Urban self-employed and wage earners obtain higher earnings compared to workers from rural areas across the three specifications. The coefficients on regional dummies for the self-employed sample are not significant across the three specifications except the coefficient on South East Anatolia Region. Self-employed in South East Anatolia seem to receive lower earnings compared to the self-employed in Marmara Region. In the third specification we also observe that the coefficient on Black Sea Region dummy has a negative sign and is significant at 5 percent level of significance. For the sub-sample of male wage earners, on the other hand, coefficients on regional dummies are statistically significant and have minus signs in general implying that employees in other regions earn less compared to their fellows in Marmara Region.

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[16] The effect of the dummy variable on the log earnings is calculated as g=exp(c-1/2(Var©)-1 where c is the estimated coefficient on the dummy variable and Var© is the variance of it. See Kenedy (1981).

Table 4.8 Estimates of Logarithmic Earning Equations for Men, 1994

Variables	OLS		Two-Step		Two-Step(Double-selection)	
	Self-employed	Wage Earner	Self-employed	Wage Earner	Self-employed	Wage Earner
Experience	0.038	0.102	0.032	0.101	0.054	0.097
	(8.02)**	(56.06)**	(5.19)**	(48.60)**	(3.83)**	(22.75)**
Experience Sq.	-0.0006	-0.0016	-0.0006	-0.0016	-0.0010	-0.0016
	(7.43)**	(42.49)**	(7.20)**	(34.24)**	(4.01)**	(17.17)**
Primary School	0.144	0.212	0.123	0.2	0.125	0.205
	(2.99)**	(7.86)**	(2.41)*	(6.80)**	(2.48)*	(7.11)**
Middle School	0.354	0.452	0.351	0.45	0.324	0.461
	(5.57)**	(14.44)**	(5.38)**	(13.88)**	(4.87)**	(14.13)**
High School	0.529	0.821	0.532	0.824	0.554	0.828
	(8.26)**	(26.85)**	(8.17)**	(25.80)**	(8.28)**	(25.55)**
Vocational H. S.	0.241	0.977	0.303	1.001	0.346	1.018
	(1.89)+	(22.44)**	(2.08)*	(22.17)**	(2.36)*	(21.90)**
University	0.888	1.397	0.974	1.428	1.022	1.442
	(9.99)**	(41.99)**	(9.32)**	(37.59)**	(9.85)**	(36.53)**
Urban	0.168	0.114	0.191	0.127	0.305	0.128
	(4.77)**	(7.05)**	(5.09)**	(7.17)**	(4.21)**	(4.33)**
Aegean	0.013	-0.15	-0.003	-0.157	-0.002	-0.16
	0.24	(6.69)**	0.05	(7.29)**	0.04	(7.49)**
Mediterranean	-0.023	-0.142	-0.058	-0.16	-0.079	-0.169
	0.47	(6.63)**	1.05	(6.90)**	1.45	(7.20)**
Central Anatolia	0.007	-0.076	0.006	-0.075	-0.028	-0.074
	0.14	(3.72)**	0.11	(3.54)**	0.48	(3.40)**
Black Sea	-0.053	-0.105	-0.084	-0.118	-0.118	-0.125
	1.04	(4.85)**	1.52	(5.12)**	(2.10)*	(5.08)**
East Anatolia	0.07	0.025	0.028	0.006	0.007	-0.005
	1.38	1.13	0.47	0.23	0.12	0.19
South East A.	-0.145	-0.092	-0.183	-0.109	-0.188	-0.12
	(2.84)**	(4.10)**	(3.35)**	(4.56)**	(3.58)**	(5.10)**
λ_s			0.295			
			1.62			
λ_w				0.274		
				(1.99)*		
λ_1					0.231	
					(2.38)*	
λ_2					-0.283	
					(2.63)**	
λ_3						-0.14
						(2.47)*
λ_4						-0.214
						(2.78)**
Constant	5.758	4.766	6.297	4.715	5.745	4.763
	(57.90)**	(116.07)**	(18.21)**	(89.04)**	(18.15)**	(44.39)**
Observations	3734	12856	3734	12856	3734	12856
R-squared	0.08	0.38	0.08	0.38	0.08	0.38
Adj. R2	0.074	0.381				
Absolute value of t statistics in parentheses						
+ significant at 10%; * significant at 5%; ** significant at 1%						

Table 4.9 gives the estimates of the earnings equations from the three specifications for the sub-samples of female self-employed and wage earners. We observe quite small R-square vales for the self-employed sub-sample, 0.11. Hardly any coefficients on the explanatory variables have a statistically significant effect on the

earnings of self-employed. For the sub-sample of wage earners, on the other hand we observe statistically significant parameter estimates in general. This is probably due to the small number of self-employed females in the sample.

Table 4.9 Estimates of Logarithmic Earnings Equations for Women, 1994

Variables	OLS		Two-Step		Two-Step (Double Selection)	
	Self-employed	Wage Earner	Self-employed	Wage Earner	Self-employed	Wage Earner
Experience	0.056	0.067	0.037	0.067	0.086	0.071
	(3.04)**	(17.98)**	0.31	(12.80)**	1.12	(11.41)**
Experience Sq.	-0.0009	-0.0011	-0.0006	-0.0011	-0.0014	-0.0012
	(2.67)**	(11.67)**	0.35	(9.55)**	1.2	(8.94)**
Primary School	0.126	0.31	0.126	0.311	0.139	0.336
	0.87	(5.02)**	0.87	(4.02)**	0.95	(4.29)**
Middle School	0.275	0.625	0.314	0.626	0.315	0.708
	1.32	(8.52)**	0.96	(6.88)**	1.18	(7.26)**
High School	0.519	1.037	0.74	1.039	0.557	1.304
	(2.07)*	(15.87)**	0.51	(9.88)**	0.58	(8.42)**
Vocational H. S.	0.565	1.271	0.815	1.273	0.679	1.616
	1.23	(15.58)**	0.49	(11.02)**	0.62	(8.67)**
University	1.518	1.754	1.782	1.756	1.901	2.245
	(5.12)**	(26.49)**	1.01	(15.71)**	1.53	(9.56)**
Urban	0.144	0.062	0.175	0.063	0.218	0.148
	1.01	1.6	0.7	1.57	0.93	(2.93)**
Aegean	-0.134	-0.059	-0.094	-0.059	-0.15	-0.032
	0.77	1.45	0.32	1.41	0.69	-0.74
Mediterranean	0.034	-0.099	0.048	-0.099	-0.044	-0.141
	0.19	(2.33)*	0.22	(2.14)*	0.19	(2.90)**
Central Anatolia	0.041	-0.038	0.003	-0.038	-0.027	-0.121
	0.24	0.85	0.01	0.84	0.1	(2.22)*
Black Sea	-0.074	-0.014	-0.116	-0.015	-0.088	-0.059
	0.48	0.34	0.35	0.33	0.36	1.27
East Anatolia	-0.035	0.034	-0.082	0.034	-0.148	-0.083
	0.17	0.64	0.22	0.62	0.41	1.16
South East Ana.	0.289	0.167	0.29	0.167	0.078	0.024
	1.05	(2.38)*	1.37	(2.12)*	0.21	0.24
λ_s			0.31			
			0.16			
λ_w				0.009		
				0.04		
λ_1					0.242	
					0.55	
λ_2					-0.166	
					0.3	
λ_3						0.283
						(2.23)*
λ_4						-0.314
						(2.02)*
Constant	4.715	4.813	5.295	4.81	3.685	4.119
	(13.54)**	(54.91)**	-1.41	(37.61)**	(2.01)*	(12.88)**
Observations	462	2711	462	2711	462	2711
R-squared	0.11	0.47	0.11	0.47	0.11	0.47
Adj. R2	0.061	0.465				
Absolute value of t statistics in parentheses						
+ significant at 10%; * significant at 5%; ** significant at 1%						

Table 4.10 Estimates of Logarithmic Earnings Equations for Men, 2002

Variables	OLS		Two-Step		Two-Step (Double)	
	Self-employed	Wage Earner	Self-employed	Wage Earner	Self-employed	Wage Earner
Experience	0.049	0.08	0.047	0.079	0.037	0.095
	(4.99)**	(27.22)**	(1.95)+	(23.00)**	-0.61	(8.07)**
Experience S.	-0.0008	-0.0012	-0.0008	-0.0013	-0.0006	-0.0016
	(4.68)**	(19.31)**	(4.66)**	(13.44)**	-0.72	(7.44)**
Primary School	0.183	0.306	0.18	0.298	0.177	0.298
	(1.75)+	(6.47)**	(1.67)+	(6.19)**	-1.63	(6.19)**
Middle School	0.339	0.538	0.328	0.518	0.329	0.496
	(2.70)**	(10.42)**	(1.98)*	(9.44)**	(2.18)*	(9.20)**
High School	0.65	0.869	0.652	0.874	0.65	0.879
	(4.87)**	(16.78)**	(5.26)**	(16.73)**	(5.27)**	(16.94)**
Vocational H. S.	0.653	0.941	0.675	0.97	0.675	1.005
	(3.63)**	(16.55)**	(2.61)**	(15.21)**	(2.79)**	(16.39)**
University	0.885	1.485	0.905	1.516	0.904	1.548
	(5.54)**	(27.53)**	(3.42)**	(24.70)**	(3.74)**	(26.59)**
Urban	-0.145	0.006	-0.133	0.029	-0.158	0.101
	(1.71)+	0.2	0.9	0.7	1.5	(1.90)+
λ_s			0.093			
			0.1			
λ_w				0.415		
				0.98		
λ_1					-0.114	
					0.23	
λ_2					-0.153	
					0.14	
λ_3						0.177
						1.43
λ_4						-0.406
						1.17
Constant	5.703	4.845	5.885	4.774	6.152	4.432
	(26.78)**	(66.16)**	(3.10)**	(44.15)**	(2.17)*	(20.26)**
Observations	1020	5463	1020	5463	1020	5463
R-squared	0.12	0.34	0.12	0.34	0.12	0.34
Adj. R2	111	111	111	111	111	111
Absolute value of t statistics in parentheses						
+ significant at 10%; * significant at 5%; ** significant at 1%						

Table 4.11 Estimates of Logarithmic Earnings Equations For Women, 2002

Variables	OLS		Two-Step		Two-Step (Double)	
	Self-employed	Wage Earner	Self-employed	Wage Earner	Self-employed	Wage Earner
Experience	0.016	0.07	0.061	0.075	0.104	0.078
	0.49	(13.44)**	0.99	(13.12)**	-1.29	(12.47)**
Experience Sq.	-6.52E-05	-0.0012	-0.0005	-0.0012	-0.0015	-0.0013
	0.12	(9.63)**	0.63	(8.08)**	-1.13	(7.06)**
Primary School	-0.035	0.029	0.167	0.085	0.367	0.097
	0.12	0.34	0.45	0.82	-0.86	-0.93
Middle School	0.595	0.217	0.519	0.198	0.626	0.207
	1.15	(2.16)*	0.77	1.58	-0.92	(1.65)+
High School	0.461	0.663	0.337	0.633	1.081	0.723
	0.96	(7.10)**	0.69	(5.71)**	-1.24	(5.14)**
Vocational S.	1.076	0.724	0.686	0.665	1.76	0.802
	1.47	(7.06)**	0.49	(5.52)**	-0.91	(4.46)**
University	1.798	1.438	1.483	1.384	3.645	1.62
	(3.27)**	(15.64)**	(2.37)*	(12.58)**	-1.64	(6.55)**
Urban	0.23	-0.006	-0.035	-0.032	0.568	0.035
	0.59	0.08	0.07	0.38	0.66	0.33
λ_s			-0.863			
			0.9			
λ_w				-0.665		
				(2.03)*		
λ_1					1.369	
					0.92	
λ_2					-0.656	
					0.56	
λ_3						0.217
						1.09
λ_4						0.151
						0.6
Constant	4.951	5.219	3.041	5.295	-0.579	4.832
	(7.10)**	(37.32)**	1.35	(31.47)**	0.12	(10.32)**
Observations	136	1245	136	1245	136	1245
R-squared	0.28	0.47	0.29	0.48	0.29	0.48
Adj. R2	111	111	111	111	111	111
Absolute value of t statistics in parentheses						
+ significant at 10%; * significant at 5%; ** significant at 1%						

4.8.3 Selectivity Variables

The variables λ_s and λ_w denote respectively the selectivity variables for the self-employed and for the wage earner sub-samples in specification 1. Inserting these variables into OLS equation one is able to see the effect of unobserved characteristics of individuals on the earnings. It is found positive and insignificant coefficients on the

selectivity variables for both male and female self-employed in 1994. The same coefficients for the year 2002 are also insignificant.

The interpretations of the selectivity variables in the third specification are as follows; the variable λ_1 denotes the selectivity variable pertaining to employment participation decision for the self-employed and λ_3 denotes the same selectivity variable for the wage earners. λ_2 and λ_4 stand for the selectivity variables pertaining to self-employment versus wage employment choice for the sub-samples of self-employed and wage earners respectively in the bivariate model. The coefficient on the variable λ_1 is positive and significant at 5 percent level for the male self-employed, 1994. This indicates that there is a significant bias in the OLS estimates of earnings equations considering only the selection terms from single selection process. The coefficient on λ_2 is negative and significant at 1 percent level. The earnings distribution for the observed sample of individuals in self-employment is lower than the earnings distribution that would be observed had the sample been randomly derived. Those choosing self- employment are not the ones with the unobserved characteristics better suiting for the self-employment jobs.

However, the coefficients of selectivity variables turned out to be insignificant in 2002. For the female self-employed, neither selection variables have a significant effect. For the female wage earners, both the participation decision and choosing between the employment states play important role on their earnings. The coefficients on λ_2 and λ_4 have negative signs and are statistically significant. The negative signs imply that the unobserved characteristics of female wage earners have a negative effect on their earnings.

CHAPTER 5

CONCLUSIONS

The first essay in this thesis attempts to elaborate private tutoring expenditures in Turkey. Private tutoring is a demand driven reaction to the shortages and/or inefficiencies in the formal education systems in some countries. It is a wide spread phenomenon in the countries where there is a general university entrance examination to ration the number of those who demand tertiary education. Since it is mainly a profit-oriented activity it has been emerging as a large-scale service industry in countries such as Turkey, Japan, Korea, and Greece.

Implications of private tutoring on educational system and welfare of people are important. In terms of its effect on the educational system, two points are worth to have special emphasis. First, it obscures equal opportunity rule in education. Private Lessons can only be taken by those who can pay for them. Those who can not afford private lessons will become disadvantaged in going through their educational careers. Second, in the long run, people may progressively rely more on private tutoring institutions to increase their chances in passing the general examinations required to go to the most prestigious schools. Their attachment to formal education may be weakened. This situation jeopardizes the whole educational system in a given country.

From the welfare implications point of view, it is a well known fact that the better educated have higher chances in labor market; they are more likely to find employment and receive better earnings compared to their less educated fellows. Children from wealthier families have higher chances to have quality education and, in turn their chances of obtaining high-paying jobs are increased. This has immense implications in terms of income distribution in a country.

In the first essay, a private tutoring expenditure function is estimated using the Tobit model to see the determinants of private tutoring expenditures. The study concluded

that households with higher incomes and higher parental educational levels devote more resources to private tutoring. Private tutoring is found to have unitary elasticity indicating that it is as equally close to being a necessity as it is close to being a luxury item in the consumer's budget. Private tutoring expenditures are higher in urban areas compared to the rural areas. However, within urban areas private tutoring expenditures are not statistically significantly different between the developed and undeveloped neighborhoods and squatter settlements.

To sum up, private tutoring appeals any households in Turkey regardless of their socio-economic standings. On the other hand, wealthier families are more likely to benefit from private tutoring services compared to the poorer ones. Private tutoring expenditures constitute significant shares in the households' budgets putting serious strains on financial capacities of families.

The second study in this thesis concerns the inequalities in the wages of male wage earners. Distribution of Earnings mainly drives from the distribution of abilities. In a given society, individuals with "average" ability would be concentrated. The "low" ability and "high" ability individuals would be scattered in the two opposite ends (tails) of earnings distribution. Human capital theory, however, puts forward that earnings distribution could be altered by investing in "human skills" by schooling and training. If this holds, individual productivity can be decomposed into two factors. The first is the observable dimensions of productivity and the second is the unobservable dimensions of productivity (Juhn et al., 1993).

Given the facts above, wage inequality can be defined as the differentials at distinct points of earnings distribution resulting from the observed and unobserved skills of individuals. In this case, how much of these differentials can be attributed to observable skills and how much of them can be attributed to the unobservable, or random abilities of individuals is an interesting question to ask. Quantile regression analysis provides one with a useful technique to explore this question.

The findings relating to "within wage inequality" can be summarized as follows: At the tertiary level, education and ability are found to be complements implying that those who were more able and who had university diplomas were able to increase the wage gap between themselves and their less able university graduate counterparts. At the secondary level, we found somewhat higher returns for the workers at the tenth quantile, the lowest quantile. This suggests that education and ability are substitutes at the secondary level. The expansion of educational opportunities in favor of the less able

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would lead to an increase in private returns to education for those individuals. We also found that public wage premium is not evenly distributed across the wage distribution. Among the public employees, the ones at the lower tail of wage distribution (10th 25th and 50th quantiles) receive higher public premium compared to the ones at the higher end of wage distribution. Public employment mitigates the wage differentials in favor of the less able. Urban employment provided a wage premium above the rural workers. Workers at the lower end of wage distribution benefited more from this premium compared to the ones at the upper tail of wage distribution.

The third study in this thesis aims at elucidating the earnings of self-employed and wage earners in Turkey. The purpose of the study was to investigate the determinants of self-employment versus wage employment choice as well the determinants of earnings in the two employment states.

"Rational" individuals would choose the sector of employment in which they can obtain the highest earnings in accordance with their abilities. If each individual chooses the sector in which he or she has comparative advantage, the labor would be efficiently allocated between the sectors. We are interested in seeing whether the choice is a rational one or some individuals are simply "pushed" into that state of employment and what observable characteristics of individuals would lead to the choice of self-employment versus wage employment. This selection process results in a non-random earnings distribution for any given subgroup of workers. Thus, the evaluation of earnings in relation to observed human capital variables in any given sub-sector of employment ignoring the selection process will be misleading. Therefore, we need to take account of how the individuals select themselves into given employment states when assessing the effects of observed characteristics on the earnings distribution.

In general, chapter four attempts to explore how the earnings vary with human capital variables (education, experience etc.) in the two sectors. In particular, a test of the "screening hypothesis" is attempted. Self-employed constitute a benchmark to evaluate the role of education as a screening device. Self-employed do not need education as a signal to inform their inherent capacities in the labor market. Therefore, the returns to education for the self-employed would purely reflect enhancing effect of education. On the other hand, wage earners are screened in the market and need education to signal their in-born productivity. Higher returns to education in the case of wage earners would imply that education is used as a screening device by the employers.

Two-step methods are employed to estimate the log-linear earnings functions in the two sectors of employment. In the first step, a binary choice model (selection equations) is estimated in relation to a set of explanatory variables. In the second step, the earnings equations is fitted in relation to human capital variables and including the selection terms from the first step as an additional variable to see the effect of unobserved factors, that led one to choosing that particular sector, on the earnings.

The conclusions from the empirical study of wage earners and self-employed can be summarized as follows: The more educated are less likely to become self-employed. The probability of becoming self-employed is inversely related to potential labor market experience. People from rural areas are more likely to participate in self-employment compared to people from urban areas. Financial wealth is a major determinant of self-employment decision. Home ownership is also positively related with one's decision to become self-employed. Parameter estimates on the selectivity variables included in the earnings functions indicate that those choosing self-employment had a comparative disadvantage (low managerial ability) in that sector in 1994. Individuals with low level of education and with poor managerial ability seemed to be more likely to choose self-employment. However, in 2002, selection variables did not have significant signs indicating that the self-employed jobs were no longer involuntarily chosen. The negative association between the level of education and the choice of self-employment seemed also to be weakened. (See Tables 4.6 and 4.7).

Log earnings in both sectors increase with experience but at a decreasing rate after a certain level of experience. Log earnings increase linearly with the level of education for both subgroups of self-employed and wage earners. Wage earners receive higher returns to their years at school. At each level of schooling the return is significantly higher for the wage earners relative to the self-employed. This finding is in support of the screening hypothesis. Urban self-employed and wage earners obtain higher earnings compared to workers from rural areas.

Private wage returns to education is an indication of productivity enhancing effect of education. Productivity gains at individual and firm level would suffice alone for one to argue in favor of expansion of education. Moreover, even when education is purely used to identify the job-related abilities of individuals, efficiency gains would continue to exist at the firm level because it helps to reduce informational imperfections in the labor market (Stiglitz, 1975). On the other hand, private returns derived from the Mincerian human capital earnings equations would seem relevant when arguing for the expansion of

education as a private investment decision. However, this individual level analysis could only be a departure point to study "education" at the microeconomics level. The true return of education cannot be confined to "private returns". The benefits of education to society go far beyond its private returns (Sianesi and Reenen, 2003; Schultz, 2003). Further, in a developing country context, even the individual level returns from education would not interfere in the pro argument for the public support of education as education help many to move out of poverty.

Educated people affect other individuals positively at the firm and society level. At the firm level, individually acquired education may spill over to others in the form of "learning effects" and this produces efficiency gains. Education's role in creating a conducive environment for macro economic growth is not restricted to the firm level positive externalities. Education leads to the improved public health, better parenting, better educated children, increased social cohesion, and wider political involvement. These are all social returns resulting from education and help to promote economic growth.

Although social returns to education, defined by Schultz (2003) as "private returns plus net public spillovers", are difficult to quantify, endogenous growth theorists provided compact theoretical framework for arguing the growth enhancing effect of schooling investment (Romer, 1986; Lucas, 1988; Romer, 1990). Despite the fact that there is no widely accepted econometric procedure to measure the overall social return in the economics literature, studies using different methods provide concrete evidence that education has spill over effects and social returns to schooling is important (Sianesi and Reenen, 2003). The distribution of these social returns across individuals is also important. Public expenditures on education are justified in terms of growth prospects and distributional considerations.

Expenditures on education are typically higher at the tertiary level. Student loans are available at the university level. However, the first essay in this thesis showed that students with more family resources are more likely to benefit from publicly provided university education[17]. Except for family borrowing from close relatives market for funds for such expenditures is not available despite the high returns to education. Returns to university education are around 15 percent for men and 20 percent for women. However,

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[17] Tansel and Bircan (2003) also studied the effect of private tutoring on the performance of students taking the university entrance examination and found that private tutoring is critical to the student's success.

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human capital is not considered to be a good collateral for lending such funds to the families and students. In this case, the only way to overcome financial barriers to education is the increase in the family income. Nevertheless, many low-income families have almost no way out of poverty but through the education of their children. Governments should reconsider the allocation of educational expenditures. More resources should be allocated to secondary education to reduce the importance of private lessons.

The secondary education system has become very complex as a result of proposals of ministers of short-lived governments. For example, in the 1980s a program for the expansion of vocational high schools was initiated and students were encouraged to go to these schools. It was argued that this would help children from poor families since technician-level qualifications would be highly demanded in the labor market. It was believed that students would find jobs as soon as they graduated from these schools in an environment of rapid economic growth. But, Turkey went through severe political and economic instabilities and the demand for technical vocational high school graduates did not increase as expected.

Changes in the system of university entrance examination also frustrated secondary school students and their families. Frequent changes in the system adversely affected vocational high school graduates. The weight of the high school grade point averages for vocational high school graduates in the total entrance score was reduced with the result that they were forced to go to two-year post secondary vocational schools.

Although all high school graduates are eligible to take the entrance examination, general high school graduates have the highest chance of being placed in a four-year university program. The fragmentation of secondary schools as Anadolu lycees, super lycees, science lycees, tourism lycees, religious lycees, technical lycees, and private lycees create barriers to university education in the first place as they vary in the quality and success of their students. Complex structure of secondary education and frequent changes in the university entrance examination system further increase the pressures on the students and their families and they rely more and more on private tutoring. Variation in the types of secondary education institutions and thus, their quality force students to take private lessons to level the differences in their education. Turkey needs immediate effective innovations in the secondary school system. Quality of education and learning in high schools needs to be evened out. The quality of education in terms of motivation of high school teachers and class sizes should be sufficient to prepare the students for the

university entrance examination. Families spend large amounts on private tutoring. One option to improve the secondary schools could be a provisional tax arrangement. Families may be convinced to allocate funds for the improvement of the secondary education instead of paying fees to private tutoring centers. The ties between school boards and parents could be strengthened by wider involvement of families in the decision making process. This way, greater efficiency in the operation of schools will decrease the need for private lessons.

Decreasing entry barriers to education and directing the distribution of education to the disadvantaged groups will increase the number of highly educated. This cannot be sustained unless the demand for skilled labor increases accordingly. Jobs should also be created to absorb the increasing skilled labor.

The expansion of education will also result in the downward substitution of the highly educated with the lower educated since the employers expectations are increased as the educational attainment level of young workers increase (Ryoo, Nam, and Carnoy, 1993). The school system's responsiveness to changing demand needs to be increased. Turkey needs targets in its education policy. Some service sectors have become important in the Turkish economy. Tourism, transport, finance, and commerce have rapidly developed and modernized. The industrial structure has also been changing together with the rise in the technology level and needs to be further diversified considering the European Union (EU) involvement prospects. An abrupt increase in foreign investment is also expected as the possibility of EU membership increases. The Turkish educational system needs to be organized to provide knowledgeable and adaptable workers in response to changing economic conditions. There is a need for programs and networks to help secondary school students choose their future occupational careers and to provide information on rising fields of study. Investment targeted secondary education in selected fields that match the economy's needs will reduce wage inequality.

The second study of this thesis has shown that secondary school graduates at the lowest end of the wage distribution receive higher economic returns to their education. Thus, for the less able, the expansion of secondary education relevant for the labor market is essential. It causes both the wage inequality and unemployment to decrease. University graduates at the highest end of wage scale experienced an increase in their schooling returns while others at the lower deciles of wage distribution with university diplomas received lower returns in 2002. Better students select better universities. Employers tend to pay higher wages to the graduates of top universities. The abler and better educated is

more likely to benefit from the growth of demand for skilled and knowledgeable labor. Educational opportunities have been expanding at the tertiary level through the establishment of new universities. Planning is required to determine the fields of study that are more suited for the needs of Turkish economy and these needs should be considered when opening new departments or fields of study. Relevancy of departments to the needs of economy deserves a great deal of consideration. Thus, the average university graduate will be less likely to lose his or her job during downturns in the economy. These university graduates and secondary school graduates meeting the increasing demand from the service sector constitute the backbone of the labor market.

The results from the third study of this thesis show that financial capital and risk factor are important entry barriers into self-employment. Secondary school graduates can be encouraged to take up self-employment jobs. Provision of funds and cheap credits can be given to the secondary school graduates to start up their own businesses. Such policies would help both a relief in unemployment and reduce the pressures on the supply of higher education. For future, the possibilities of expanding self-employment in Turkey should be investigated.

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APPENDICES

APPENDIX A

SUPPLEMENTARY TABLES FOR CHAPTER TWO

Table A.1 Means and Standard Deviations

	Mean	Standard Deviation	Minimum	Maximum
Households with zero private tutoring expenditures; Observations = 3252				
Ln (P.T. Expenditure)	0	0	0	0
Ln (T. H. Expenditure)	12.22258	0.5965314	10.34955	15.50927
Head Age	41.63684	8.314602	24	97
Head Age Square	1802.738	763.5464	576	9409
Head Education	6.759533	3.879449	0	17
Mother Education	4.255843	3.720847	0	17
Mother Works	0.211255	0.408261	0	1
Single Mother	0.046741	0.211115	0	1
Single Mother Works	0.01476	0.12061	0	1
Urban Location	0.811808	0.390925	0	1
Developed Street	0.368389	0.482442	0	1
Squatter Settlement	0.045203	0.207781	0	1
Own House	0.622694	0.484787	0	1
Number of Children	3.172817	1.668172	1	15
Households with positive private tutoring expenditures; Observations = 646				
Ln (P. T. Expenditure)	9.886173	0.9420721	6.389497	13.32741
Ln (T. H. Expenditure)	12.63794	0.5656912	10.97149	15.17062
Head Age	43.83437	7.913219	27	74
Head Age Square	1983.974	753.0194	729	5476
Head Education	8.981424	4.314349	0	17
Mother Education	6.51548	4.507246	0	15
Mother Works	0.23839	0.426429	0	1
Single Mother	0.049536	0.217152	0	1
Single Mother Works	0.009288	0.096	0	1
Urban Location	0.921053	0.269866	0	1
Developed Street	0.594427	0.491383	0	1
Squatter Settlement	0.024768	0.155537	0	1
Own House	0.626935	0.483994	0	1
Number of Children	2.509288	1.204285	0	10

Table A.2 Tobit MLE Results for Private Tutoring Expenditures in Turkey, 1994

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Ln(T.H. Expenditure)	6.332	6.336	6.332	6.263	6.387	6.375
	(10.21)***	(10.22)***	(10.21)***	(10.21)***	(10.47)***	(10.46)***
Head Age	1.004	1.004	1.009	0.992	1.014	1.005
	(3.14)***	(3.14)***	(3.16)***	(3.11)***	(3.17)***	(3.15)***
Head Age Square	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008
	(2.23)**	(2.23)**	(2.24)**	(2.22)**	(2.26)**	(2.24)**
Head Education	0.260	0.261	0.263	0.270	0.282	0.288
	(2.47)**	(2.48)**	(2.50)**	(2.57)**	(2.72)***	(2.77)***
Mother Education	0.409	0.400	0.401	0.401	0.420	0.416
	(3.49)***	(3.61)***	(3.62)***	(3.61)***	(3.80)***	(3.76)***
Mother Works	-0.201					
	(0.23)					
Single Mother	6.208	6.207	6.247	6.207	5.439	6.429
	(3.43)***	(3.43)***	(3.45)***	(3.43)***	(3.39)***	(3.57)***
Single Mother Works	-4.001	-3.997	-4.006	-3.999		-4.050
	(1.14)	(1.14)	(1.14)	(1.14)		(1.15)
Urban Locations	3.602	3.660	3.555	3.641	4.178	4.143
	(3.08)***	(3.20)***	(3.15)***	(3.24)***	(3.91)***	(3.88)***
Developed Street	0.892	0.901	0.993	1.035		
	(1.16)	(1.17)	(1.32)	(1.37)		
Squatter Settlements	-1.175	-1.176				
	(0.61)	(0.61)				
Own House	-0.556	-0.563	-0.598			
	(0.77)	(0.78)	(0.83)			
Number of Children	-1.627	-1.628	-1.625	-1.625	-1.663	-1.662
	(5.90)***	(5.91)***	(5.90)***	(5.90)***	(6.05)***	(6.05)***
Constant	-122.406	-122.490	-122.620	-121.700	-123.959	-123.576
	(11.71)***	(11.72)***	(11.73)***	(11.73)***	(12.00)***	(11.98)***
Log likelihood	-3548.2118	-3548.2081	-3548.4256	-3548.7708	-3550.4041	-3549.7154
LR Chi-square (13)	482.77	482.72	482.34	481.65	478.38	479.76
Pseudo R-square	0.0637	0.0637	0.0636	0.0635	0.0631	0.0633
Number of Observations	3898	3898	3898	3898	3898	3898
Absolute value of t-statistics in parentheses						
* significant at 10%; ** significant at 5%; *** significant at 1%						
Number of left-censored observations at ln(p.t. expenses)=0: 3252						
Number of uncensored observations: 646						

APPENDIX B

SUPPLEMENTARY FIGURES FOR CHAPTER THREE
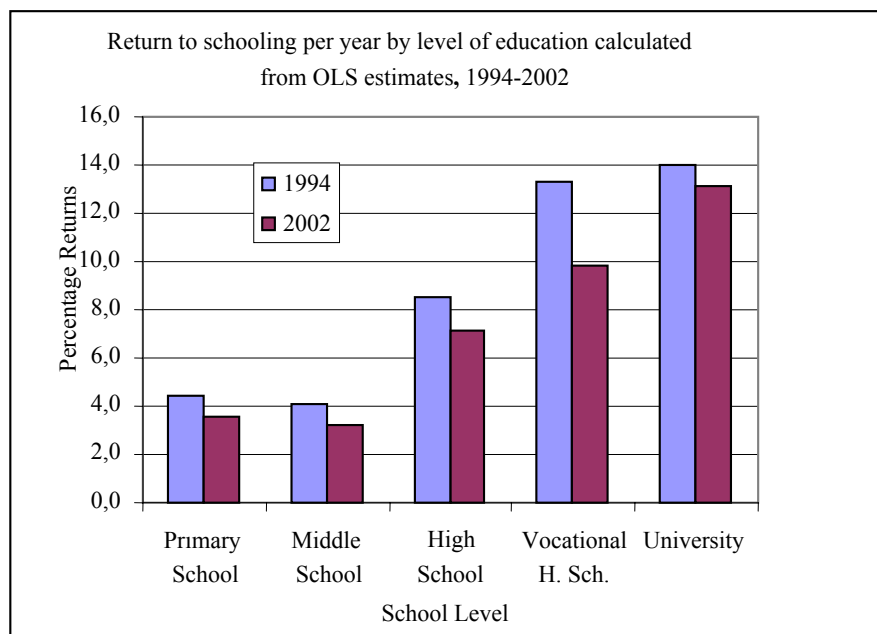
Figure B.1 Per Year Return to schooling by level of Education
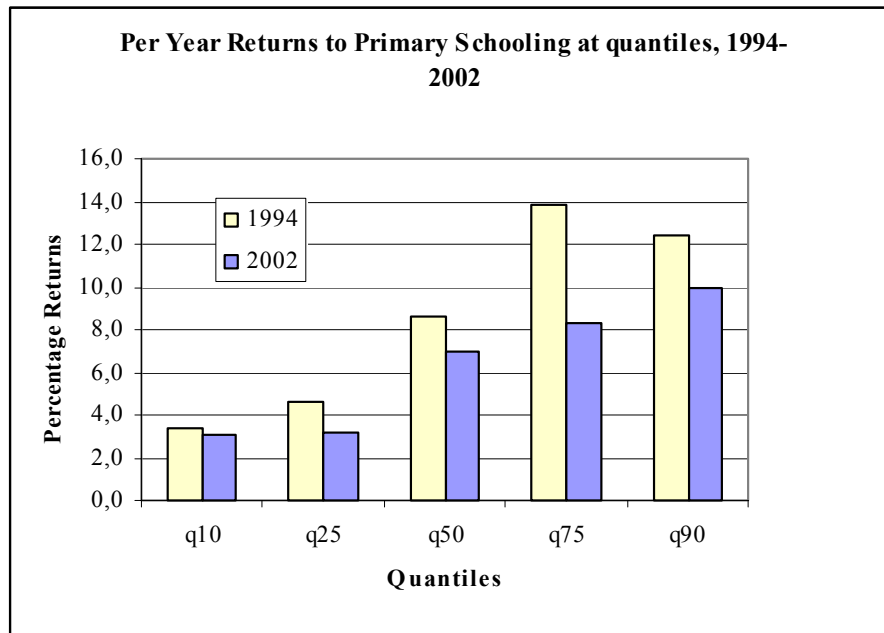
Figure B.2 Per Year Returns to Primary Schooling at Quantiles, 1994-2002
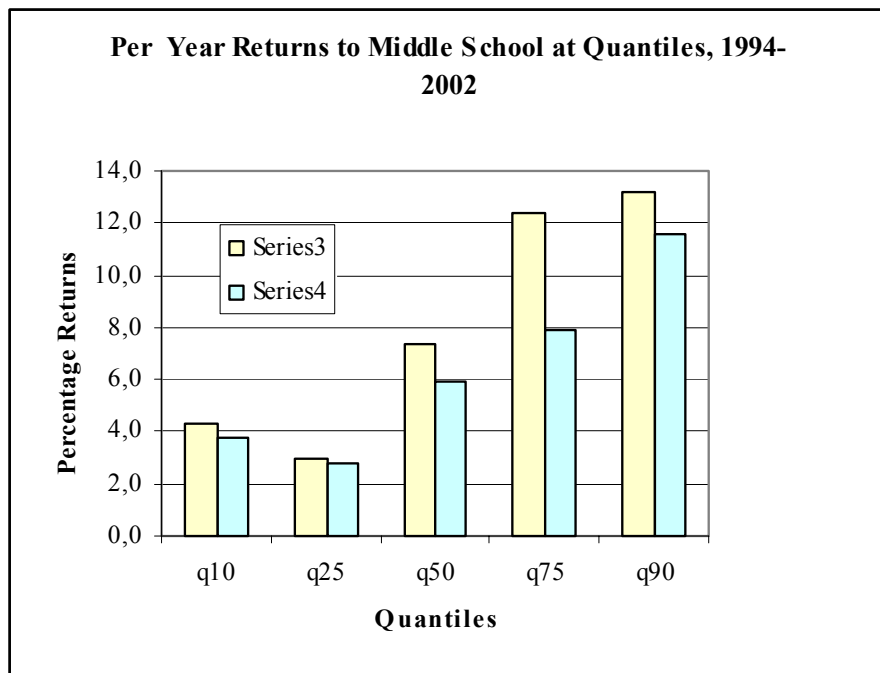
Figure B.3 Per Year Returns to Middle School at Quantiles, 1994-2002
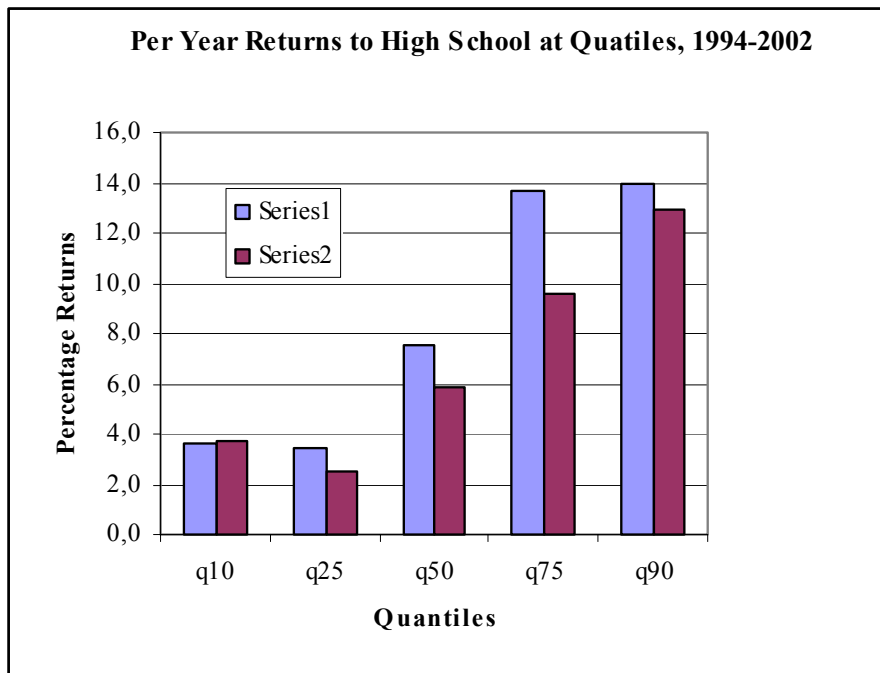
Figure B.4 Per Year Returns to High School at Quantiles, 1994-2002
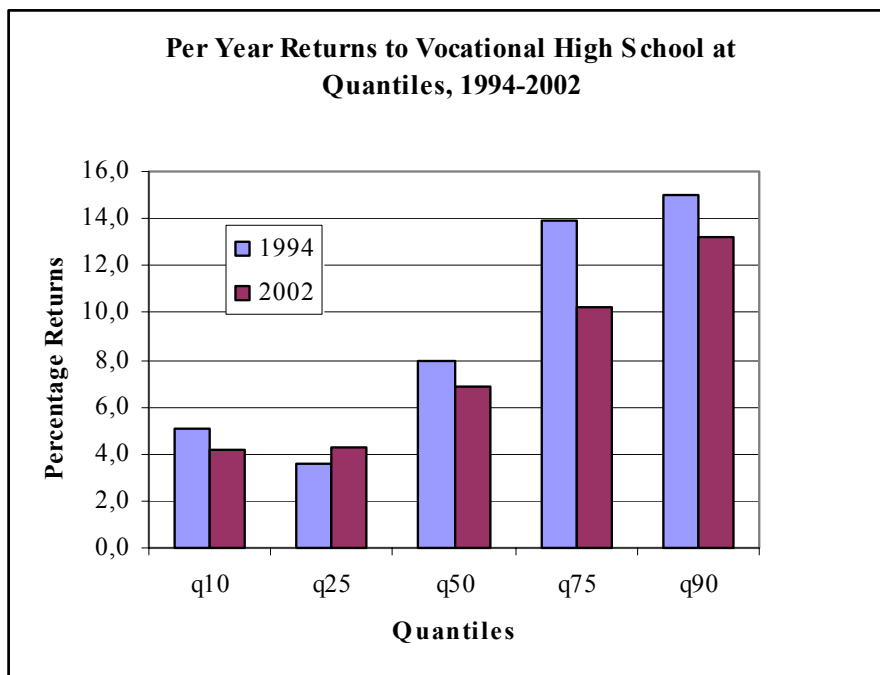
Figure B.5 Per Year Returns to Vocational H. School at Quantiles, 1994-2002
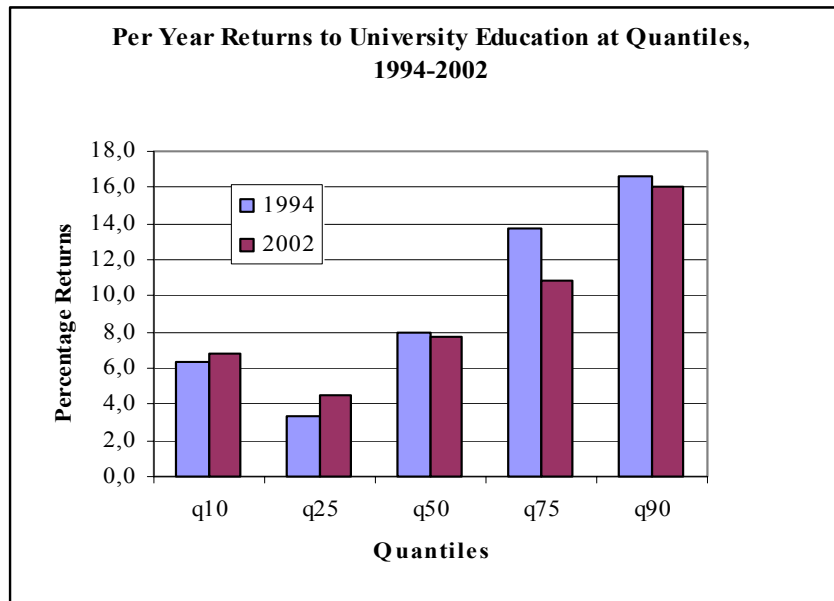
Figure B.6 Per Year Returns to University at Quantiles, 1994-2002

APPENDIX C

SUPPLEMENTARY FIGURES AND TABLES FOR CHAPTER FOUR

Distribution of Male Real Monthly Earnings by Income percentiles, 1994
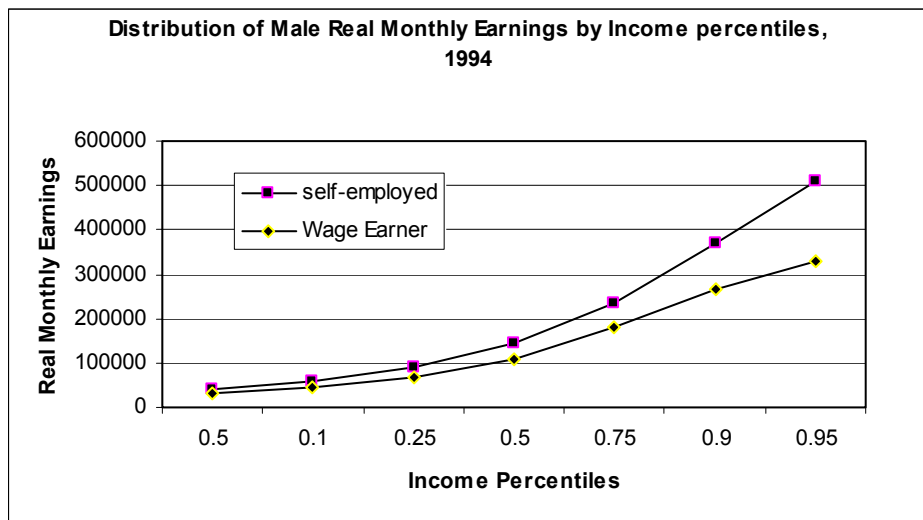
Figure C.1 Distribution of Male Real Monthly Earnings by Income Percentiles, 1994
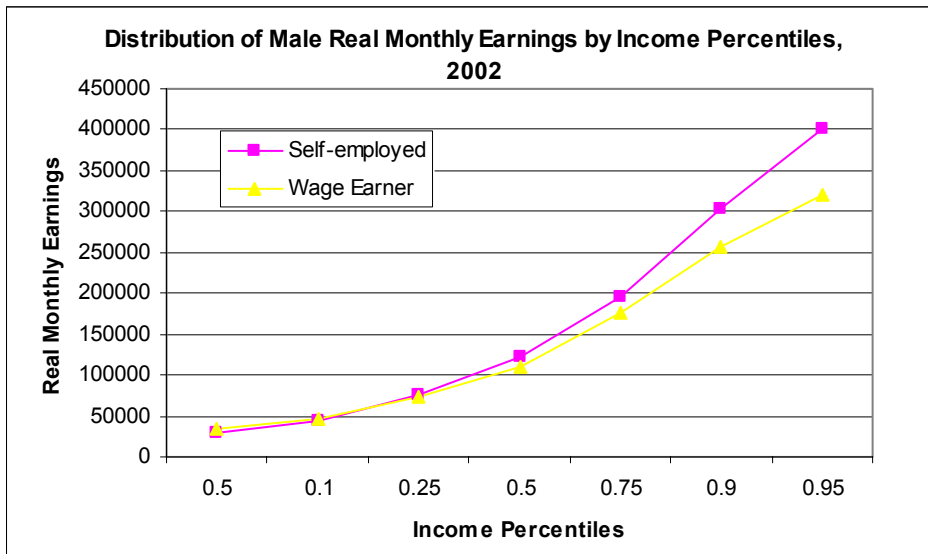
Figure C.2 Distribution of Male Real Monthly Earnings by Income Percentiles, 2002
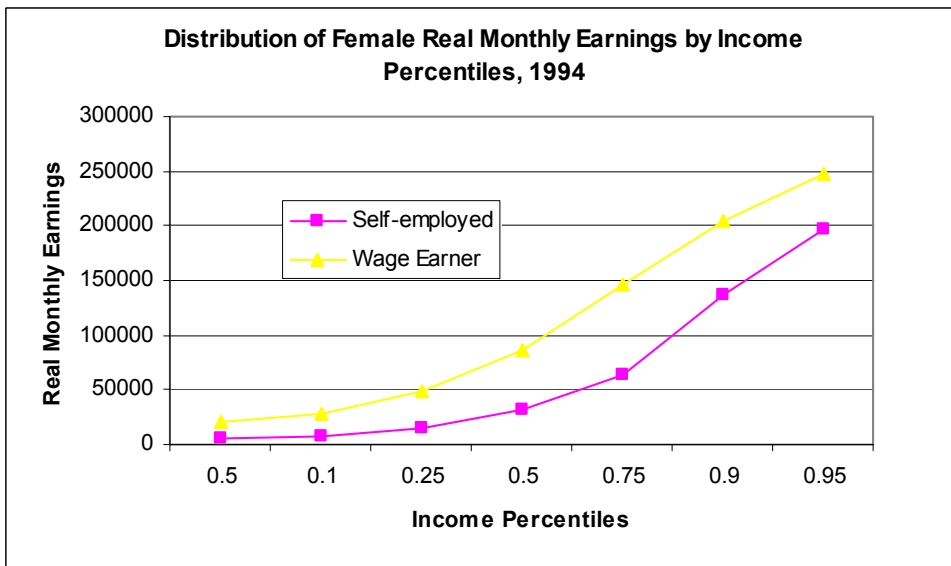
Figure C.3 Distribution of Female Real Monthly Earnings by Income Percentiles, 1994

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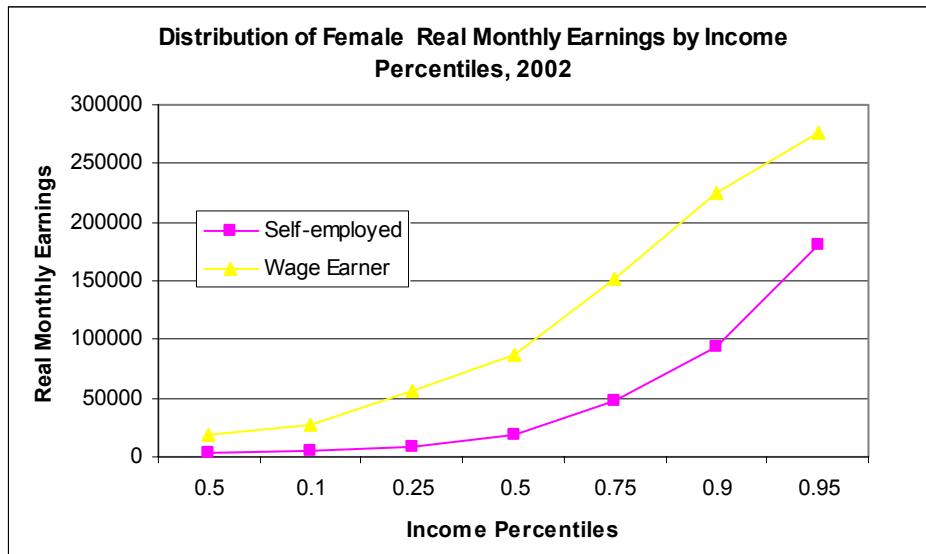
Figure C.4 Distribution of Female Real Monthly Earnings by Income Percentiles, 2002

Table C.1   Means and Standard Deviations, 1994

Male	Self-employed		Wage Earner	
Variables	Mean	Std. Dev	Mean	Std. Dev
Real Hourly Income	1087.58	2230.4	788.57	973.97
Ln Real Hourly Income	6.53	.86	6.30	.85
Hours worked per week	54.18	19.95	49.10	15.26
Experience	27.26	12.81	20.29	11.20
Experience Squared	906.92	782.30	536.88	554.45
Illiterate	0.07	0.25	0.04	0.19
Non-graduate	0.05	0.23	0.03	0.17
Primary School	0.61	0.49	0.51	0.50
Middle School	0.11	0.31	0.13	0.33
High School	0.12	0.32	0.18	0.38
Vocational H. School	0.01	0.11	0.03	0.17
University	0.03	0.18	0.09	0.29
Age: 1524	0.09	0.28	0.21	0.41
Age: 25-45	0.63	0.48	0.66	0.47
Age: 46-65	0.28	0.45	0.13	0.33
Real Unearned Income	7140.85	47011.13	5713.62	27208.53
Others' R.U.I.	2152.40	18247.66	3563.10	39267.79
Per-capita Land	0.84	6.26	0.73	7.12
Own House	0.67	0.47	0.54	0.50
Urban	0.81	0.39	0.84	0.37
Number of observations	3734		12856	
Female	Self-employed		Wage Earner	
Variables	Mean	Std. Dev	Mean	Std. Dev
Real Hourly Income	525.83	924.17	696.74	787.73
Ln Real Hourly Income	5.61	1.11	6.14	.91
Hours worked per week	34.68	22.34	43.32	14.69
Experience	23.94	11.25	15.05	10.63
Experience Squared	699.43	631.66	339.47	466.28
Illiterate	0.18	0.39	0.06	0.24
Non-graduate	0.07	0.25	0.02	0.15
Primary School	0.53	0.50	0.29	0.45
Middle School	0.10	0.30	0.08	0.28
High School	0.07	0.25	0.28	0.45
Vocational H. School	0.01	0.11	0.05	0.23
University	0.04	0.20	0.22	0.41
Age: 1524	0.13	0.34	0.33	0.47
Age: 25-45	0.73	0.45	0.61	0.49
Age: 46-65	0.15	0.35	0.05	0.23
Real Unearned Income	2172.22	14530.48	3217.52	18392.63
Others' R.U.I.	7938.56	44454.53	11420.01	45415.46
Per-capita Land	0.60	3.03	1.04	14.68
Own House	0.56	0.50	0.53	0.50
Urban	0.84	0.37	0.87	0.34
Number of observations	462		2711	

Table C.2 Means and Standard Deviations, 2002

Male	Self-employed		Wage Earner	
Variables	Mean	Std. Dev.	Mean	Std. Dev.
Real Hourly Income	875.67	1959.779	765.60	1097.50
Ln Real Hourly Income	6.30	.85	6.27	.82
Hours worked per week	56.10	20.74	51.26	15.56
Experience	27.42	11.87	20.29	10.92
Experience Squared	892.50	707.13	530.97	512.01
Illiterate	0.03	0.18	0.02	0.14
Non-graduate	0.05	0.23	0.03	0.16
Primary School	0.56	0.50	0.44	0.50
Middle School	0.16	0.37	0.15	0.36
High School	0.11	0.31	0.17	0.37
Vocational H. School	0.03	0.18	0.08	0.27
University	0.05	0.22	0.11	0.32
Age: 1524	0.06	0.23	0.19	0.39
Age: 25-45	0.63	0.48	0.66	0.47
Age: 46-65	0.31	0.46	0.15	0.35
Real Unearned Income	6761.12	36827.96	6832.17	34901.90
Others' R.U.I.	1974.35	18588.57	2665.42	18808.82
Per-capita Land	1.15	5.22	0.92	5.11
Own House	0.66	0.47	0.59	0.49
Urban	0.89	0.31	0.91	0.28
Number of observations	1020		5463	
Female	Self-employed		Wage Earner	
Variables	Mean	Std. Dev.	Mean	Std. Dev.
Real Hourly Income	501.10	1289.18	694.06	734.35
Ln Real Hourly Income	5.37	1.16	6.17	.85
Hours worked per week	29.71	19.16	44.67	15.55
Experience	25.60	11.93	14.52	10.91
Experience Squared	796.78	702.72	329.61	465.35
Illiterate	0.10	0.31	0.04	0.18
Non-graduate	0.07	0.25	0.03	0.18
Primary School	0.60	0.49	0.29	0.46
Middle School	0.06	0.24	0.10	0.30
High School	0.09	0.28	0.21	0.41
Vocational H. School	0.02	0.15	0.09	0.29
University	0.06	0.24	0.24	0.43
Age: 1524	0.10	0.30	0.38	0.49
Age: 25-45	0.71	0.45	0.54	0.50
Age: 46-65	0.19	0.39	0.08	0.27
Real Unearned Income	1407.00	9880.86	3848.83	25737.50
Others' R.U.I.	5007.03	21141.24	12360.84	68384.30
Per-capita Land	3.01	14.35	0.96	4.88
Own House	0.57	0.50	0.59	0.49
Urban	0.93	0.26	0.94	0.24
Number of observations	136		1245	

Table C.3 Percentage of Work Force by Sector and Employment Status, 1994-2002

Year	Total				Agricultural				Nonagricultural			
	Self-employed	Wage Earner	Employer	Unpaid Family	Self-employed	Wage Earner	Employer	Unpaid Family	Self-employed	Wage Earner	Employer	Unpaid Family
1994	25.06	48.04	5.02	21.89	36.4	5.72	0.77	57.11	19.27	69.62	7.19	3.92
2002	18.11	62.67	5.34	13.88	35.59	10.78	0.8	52.83	13.58	76.12	6.51	3.79

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Table C.4 Percentages of Males and Females by Sector and Employment Status, 1994-2002

Employment Status	1994						2002					
	Total		Agricultural		Nonagricultural		Total		Agricultural		Nonagricultural	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Self-employed	83.83	16.17	77.93	22.07	89.51	10.49	81.64	18.36	72.41	27.59	87.91	12.09
Wage Earner	82.35	17.65	56.37	43.63	83.43	16.57	80.7	19.3	51.75	48.25	81.76	18.24
Employer	97.33	2.67	92.63	7.37	97.58	2.42	97.73	2.27	84.21	15.79	98.16	1.84
Unpaid Family	31.94	68.06	25.45	74.55	80.25	19.75	31.47	68.53	21.05	78.95	69.05	30.95

Table C.5 Percentages of Males and Females by Employment Status and Cohort, 1994-2002

	1994				2002				Change 1994-2002		Change 1994-2002	
	Self-Employed		Wage Earner		Self-Employed		Wage Earner		Self-Employed		Wage Earner	
Cohort	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
15-24	84.21	15.79	75.04	24.96	81.69	18.31	68.77	31.23	-2.52	2.52	-6.27	6.27
25-45	87.73	12.27	83.64	16.36	86.94	13.06	84.35	15.65	-0.79	0.79	0.71	-0.71
26-65	94.02	5.98	91.88	8.12	92.4	7.6	89.11	10.89	-1.62	1.62	-2.77	2.77

150   Table C.6 Percentages of Self-Employed and Wage Earner Males and Females in Industries with at Least 5 percent of the Self –employed

Industry	Male				Female			
	1994		2002		1994		2002	
	Self-Employed	Wage Earner	Self-Employed	Wage Earner	Self-Employed	Wage Earner	Self-Employed	Wage Earner
manufacturing	9.59	26.09	8.82	26.91	63.64	28.44	69.12	29.88
trade	55.01	12.13	59.71	15.28	17.32	9.11	16.18	14.06
hotels	5.73	5.15						
commuting	16.34	7.41	13.14	8.84				
othrserv	7.42	5.03			9.52	6.93		
construction			6.67	13.55	6.49			
housekeep						6.34	7.35	11.08

Table C.7 Distribution of Mean Real Hourly Income by Education and Cohort for Wage Earners, 1994

Male								
Education	Obs.	15-24	Obs.	25-45	Obs.	46-65	Obs.	All ages
Illiterate	49	309.10	224	575.838	192	472.29	465	504.97
Non-graduate	44	422.17	204	591.892	130	647.46	378	591.25
Primary	1647	329.92	4104	739.118	784	791.66	6535	642.29
Middle School	398	357.95	1068	819.733	157	820.71	1623	706.59
High School	456	475.36	1648	996.681	147	1107.19	2251	898.29
Vocational School	78	561.13	272	1187.601	39	1248.24	389	1068.06
University	59	848.56	952	1536.368	204	1887.97	1215	1562.00
Total	2731	3304.19	8472	6447.230	1653	6975.51	12856	5973.45
Female								
Education	Obs.	15-24	Obs.	25-45	Obs.	46-65	Obs.	All ages
Illiterate	14	221.00	96	425.61	59	358.14	169	385.10
Non-graduate	5	245.72	40	345.24	15	522.51	60	381.26
Primary	404	293.22	334	477.62	36	598.16	774	386.98
Middle School	90	451.92	129	633.63	5	325.31	224	553.74
High School	298	441.46	440	746.66	8	787.53	746	625.18
Vocational School	50	574.20	95	915.01	1	1203.32	146	800.27
University	47	1030.36	523	1356.14	22	1655.43	592	1341.40
Total	908	3257.87	1657	4899.92	146	5450.39	2711	4473.93

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Table C.8 Distribution of Mean Real Hourly Income by Education and Cohort for Self-Employed, 1994

Male								
Education	Obs.	15-24	Obs.	25-45	Obs.	46-65	Obs.	All ages
Illiterate	11	724.19	102	931.01	147	815.95	260	857.21
Non-graduate	18	732.57	62	705.02	122	864.29	202	803.67
Primary	184	616.63	1477	1072.68	604	1041.72	2265	1027.38
Middle School	39	1264.21	289	1249.20	65	1434.64	393	1281.36
High School	56	1181.35	325	1313.25	54	1252.59	435	1288.74
Vocational School	5	513.17	26	1251.89	19	1182.78	50	1151.76
University	5	1697.04	90	1792.29	34	1683.33	129	1759.88
Total	318	6729.17	2371	8315.34	1045	8275.29	3734	8169.98
Female								
Education	Obs.	15-24	Obs.	25-45	Obs.	46-65	Obs.	All ages
Illiterate	5	122.22	48	512.68	31	499.71	84	484.65
Non-graduate	2	219.97	22	374.94	8	484.92	32	392.75
Primary	38	375.21	187	486.59	19	405.82	244	462.95
Middle School	8	203.31	34	838.13	4	630.56	46	709.68
High School	6	321.09	25	615.29	0		31	558.35
Vocational School	0		3	422.75	3	548.57	6	485.66
University	1	483.18	16	1268.68	2	1522.93	19	1254.10
Total	60	1724.98	335	4519.06	67	4092.51	462	4348.14

Table C.9 Distribution of Mean Real Hourly Income by Education and Cohort for Self-Employed, 1994

Male								
Education	Obs.	15-24	Obs.	25-45	Obs.	46-65	Obs.	All ages
Illiterate	12	286.45	49	506.52	43	441.74	104	454.35
Non-graduate	37	223.05	69	413.20	34	531.06	140	391.57
Primary	400	406.32	1646	606.48	375	688.31	2421	586.09
Middle School	233	321.20	494	725.29	94	818.77	821	621.31
High School	210	534.37	622	944.26	71	1084.49	903	859.97
Vocational School	107	477.23	293	985.00	47	1184.56	447	884.43
University	49	764.26	448	1609.69	130	1699.38	627	1562.22
Total	1048	3012.88	3621	5790.44	794	6448.31	5463	5359.93
Female								
Education	Obs.	15-24	Obs.	25-45	Obs.	46-65	Obs.	All ages
Illiterate	6	163.99	20	396.58	18	328.41	44	336.98
Non-graduate	10	663.48	21	424.89	9	461.81	40	492.84
Primary	147	308.77	197	511.58	22	367.60	366	421.47
Middle School	79	300.74	32	593.13	9	674.23	120	406.72
High School	130	395.21	119	878.88	10	1134.90	259	646.00
Vocational School	52	369.49	53	859.86	6	955.48	111	635.31
University	52	835.28	230	1334.29	23	1667.28	305	1274.32
Total	476	3036.97	672	4999.19	97	5589.72	1245	4213.63

Table C.10 Distribution of Mean Real Hourly Income by Education and Cohort for Self-Employed, 2002

Male								
Education	Obs.	15-24	Obs.	25-45	Obs.	46-65	Obs.	All ages
Illiterate	1	335.13	10	399.50	23	985.22	34	793.83
Non-graduate	4	113.72	17	496.44	34	528.29	55	488.29
Primary	20	388.20	353	728.75	197	1121.74	570	852.62
Middle School	17	416.77	125	941.15	21	726.95	163	858.86
High School	11	585.19	84	984.97	18	952.86	113	940.94
Vocational School	3	437.20	25	932.00	6	2201.49	34	1112.37
University	2	2400.22	32	1261.14	17	1414.51	51	1356.94
Total	58	4676.41	646	5743.95	316	7931.06	1020	6403.85
Female								
Education	Obs.	15-24	Obs.	25-45	Obs.	46-65	Obs.	All ages
Illiterate	1	561.71	9	151.55	4	203.23	14	195.61
Non-graduate	0		5	341.94	4	608.55	9	460.44
Primary	5	233.15	62	250.40	15	255.39	82	250.26
Middle School	1	34.75	5	1281.87	2	261.36	8	870.85
High School	5	482.25	7	289.59	0		12	369.87
Vocational School	0		2	5959.90	1	315.62	3	4078.47
University	1	8156.08	7	1278.40	0		8	2138.11
Total	13	9467.94	97	9553.65	26	1644.15	136	8363.61

APPENDIX D

TURKISH SUMMARY

Çalışma, eğitim talebi ve eğitimin kazançlara etkisini insani sermaye teorisi çerçevesinde irdeleyen üç ayrı araştırmadan oluşmaktadır. İlk çalışmada, eğitim talebi hanehalklarının "özel ders" için yaptıkları harcamalar bağlamında irdelenmektedir. İkinci çalışmada, eğitimin kişisel kazançlar üzerindeki etkisi ücret eşitsizliğiyle ilişkilendirilerek ele alınmaktadır. Son olarak, kendi hesanına ve ücretli olarak çalışanların, kazançlarını ve işteki durum tercihlerini belirleyen faktörler insani sermayeleri bakımından incelenmektedir.

Tezin ilk çalışmasını ailelerin yaptığı özel ders harcamaları oluşturmaktadır. Eğitim, ekonomi alanında sıklıkla kişisel kazançalara etkisi bağlamında çalışılmaktadır. Ancak, son yıllarda veri elde etme imkânlarının artmasıyla birlikte, iktisatçılar eğitimin ekonomiyle ilişkili diğer alanlarında da çalışma imkânı bulmuşlardır. Türkiye için, bu alanlardan önemli bir tanesini de, genel olarak özel ders harcamaları, özel olarak ise bu harcamalırın büyük bir bölümünü oluşturan "özel dersane" harcamaları oluşturmaktadır. Özel ders harcamalrı, ilk bakışta eğitimde fırsat eşitlsizliğini ve eğitim sisteminin eksiklerini akla getirmekle birlikte, bu harcamalar iktisatçıların daha geleneksel olarak çalıştıkları eğitimin kişisel kazançlara etkisi bakımından da önemlidir.

İkinci çalışma, farklı eğitim düzeylerindeki kişilerin ücret farklılıklarıyla birlikte aynı eğitim düzeylerindeki kişilerin ücret farklarını çeşitli kişisel ve kurumsal faktörleri de kontrol ederek açıklmaya çalışmaktadır. Aynı eğitim düzeyindeki kişilerin ücret farkları incelenirken, kişilerin yetenek farkları vurgulanmaktadır. Ücret ölçeğinin üst tarafında yer alan kişilerin eğitimlerinden, ücret dağılımının alt tarafında bulunan aynı eğitim düzeyindeki kişilere göre daha çok yararlanıp yararlanmadığı sorgulanmaktadır.

Aynı şekilde, ücret ölçeğinin alt ucunda bulunanların, üst ucunda bulunanlara göre eğitimlerinden elde ettikleri getirinin farklı olup olmadığına bakılmaktadır.

Tezin üçüncü ve son çalışması, ilk aşamada, kendi hesabına ve ücretli olarak çalışanların, o iş durumunu seçimlerine neden olan faktörleri araştırmaktadır. İkinci aşamada çalışma, bu her iki iş durumunda bulunan kişilerin ücretlerini, birinci aşamada hesaplanan gözlenemeyen unsuru da dikkate alarak insani sermayeleri bakımında incelemektedir. Eğitimin hangi grubun kazançları üzerinde daha etkili olduğu amprik olarak test edilmektedir. Bu üç çalışmanın da çıkış noktalarını, insani sermaye teorisi oluşturduğundan, detaylı açıklamalarına geçmeden önce insani sermaye teorisi kısa bir şekilde ifade edilecektir.

İnsani Sermaye Teorisine Bir Bakış

Eğitim, kişilerin işgücü verimliliklerini atrıran en önemli unsur olarak kabul edilmektedir. İşgücü tecrübesi, iş-içi eğitim, kişinin bedensel ve ruhsal sağlığı yine kişinin işgücü verimliliğini belirleyici önemli etkenler olarak görülmüşlerdir. İşgücü verimliliği ve yukarıda bahsedilen unsurlar arasındaki ilişki, iktisat biliminin ilk çalışılmaya başlanıldığı yıllardan bu yana bilinmekle birlikte, bu ilişkiyi Neo-klasik iktisadın alışılagelmiş analiz araçları çerçevesinde ilk irdileyen Gary S. Becker olmuştur. "İnsani sermaye teorisi" işgücü verimliliğini artıran unsurları arz-talep kuramı, maliyet-fayda analizi gibi mikroiktisadın iyi bilinen araçlarını kullanarak, akılcı kişisel karar verme süreçleriyle açıklanabilir hale getirmiştir.

Bu unsurların içinde özellikle eğitim ön plana çıkmıştır. Bu teori eğitimi, kişilerin gelecekteki işgücü verimliliklerini, dolayısıyla da kazançlarını belirleyecek bir yatırım planı olarak ele almaktadır. Kişiler, örgün eğitime devam ettikleri dönemde işgücü piyasasına katılmamakta ve bu nedenle eğer çalışıyor olsalardı elde edebilecekleri kazançlardan mahrum kalmaktadırlar. İnsanların akılcı daha doğru bir ifadeyle, ekonomik faydalarını en yükeğe çıkarmaya yönelik planlarla haraket ettikleri varsayımı altında, bu kazançlardan vazgeçmeleri ancak ve ancak eğitimleri sonrasında elde edecekleri kazançlarının, eğitimlerine yaptıkları harcamalarının ve okula gitmeyerek elde edebilecekleri kazançlarının toplamlarını aşmasıyla mümkün olabilecektir. Bu kazançların kişinin emekli olma zamanına kadar dönemsel olarak (aylık ya da yıllık) belirlendiği gerçeğinden haraketle, kazançların bugün karşılaştırılması için belli bir

iskonto oranı uygulanarak bugünkü değerlerine indirgelenmelri gerekir. Eğitim sonrası kazançların bugünkü değerinin, okula gitmeden elde edilecek kazançların bugünkü değeri ve eğitim maliyeti toplamına eşit olduğu nokta, optimal eğitim yatırımını vermektedir. Bu hesaplamada kullanılan iskonto oranı aynı zamanda eğitimin getirisini oluşturmaktadır. Bu şekilde eğitim, gelecekteki kazançları en yükseğe çıkarma planlarının sonucu olan bir yatırım süreci haline dönüştürülmektedir.

Bu teorik modelden hareketle, insani sermaye çalımalarının öncülerinden olan bir diğer iktisatçı Jacob Mincer, bu ilişkinin ekonometrik olarak ölçülmesini mümkün hale getiren ünlü kazanç fonksiyonunu belirlemiştir. Bu fonksiyon, kişisel kazançların logaritmasını eğtim yılları ve kazançların bir diğer önemli belirleyicisi olarak görülen işgücü tecrübesiyle doğrusal olarak ilişkilendirmektedir. Ekonometrik olarak bu ilişki, kazançların eğitim ve tecrübe insani sermayeleriyle açıklanmaları anlamına gelmektedir. Bu ölçümsel modelde, açıklayıcı değikenlerin parametreleri, sırasıyla eğitimin ve tecrübenin getirisi olarak adlandırılmaktadır.

Kişisel düzeyde verilerin, kişilerin kazançları, eğitim süreleri, yaşları, çalışma saatleri ve benzeri, ülkelerin istatistik toplama kurumları tarafından düzenli olarak toplanması ve yayınlanmasıyla birlikte, bu ekonometrik ilişki pek çok ülke için test edilmeye başlanmıştır. Bu çalışmalar eğitimin kişisel kazançlara etkilerini bu basit ama güçlü olduğuna inanılan ilişki çerçevesinde açıklamaya çalışmış ve çok yaygın hale gelmişlerdir. Bu tip kazanç fonksiyonlarına, işgücü piyasasının, kişinin ve de yapılan işin kazançları etkileme olasılığı olan özellikleri de eklenerek pek çok ülke için tahmin elde edilmiştir. Örneğin, kişinin cinsiyeti, çalıştığı endüstri kolu, ya da sektör (kamu ya da özel sektör) kazancını etkileyecek unsurlar olarak görülmüş ve insani sermaye değişkenlerinin kazançlar üzerindeki etkisini "daha doğru" bir şekilde ortaya çıkarmak için kukla değişkenler şeklinde ekonometrik tahmin modeline eklenmişlerdir.

İnsani sermaye teorisi, okula gitme ve kişilerin yetenekleri arasındaki ilişkiye önemli ölçüde yer vermiştir. Kendilerini eğitim konusunda ve bu eğitimi daha fazla kazanç elde etmelerine yolaçacak bir sermaye unsuru haline getirme konusunda yetenekli bulan kişilerin daha fazla eğitim alabileceği vurgulanmıştır. Ancak eğitimin kişisel yetenek farklılıklarından bağımsız olarak ortalama bir insanın işgücü verimliliğini artırdığı bu teorinin temel çıkış noktası olmuş ve vurgu daha çok bu konu üzerinde olmuştur. Bu bağlamda, okula gitmenin yetenek düzeyleri yanında "imkânlara" bağlı olduğu önemle vurgulanmıştır. Eğitim imkânlarının her isteyene eşit şekilde sağlanmadığı gerçeği ve eğitimin kişilerin çalışma verimliliklerini artırdığı göz önünde

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bulundurulduğunda, eğitimin bir kişisel karar verme süreci olarak irdelenemeyeceği kendiliğinden ortaya çıkmaktadır.

Kişilerin eğitimlerini işgücü verimliliğine dönüştürme kabiliyetleri eğitimin yatırımının etkinlik tarafında vurgulanması gerekirken, fırsatların herkes için eşit şekilde sağlanmadığı noktasından haraketle eğitimin dağıtımının eşitlilikçi yanı unutulmamalıdır. Bu konular insani sermaye çerçevesinde teorik olarak incelenmiştir.

Özel Ders Harcamalarının bir Analizi

Türkiye de özel ders olgusunun varlığı, büyük ölçüde, bir üniversite giriş sınavının olmasından kaynaklanmaktadır. Bunun yanısıra, lise giriş sınavlarına hazırlanan öğrencilerin özel ders talepleri de özel ders olgusunun yaygınlığına katkıda bulunmaktadır. Bu bağlamda, okul derslerine takviye amaçlı ders alanların oranının göreceli olarak az olduğu söylenebilir. Bu nedenle, Türkiye deki özel ders sistemi, benzeri giriş sınavlarının olduğu ülkelerdeki gibi; örneğin Japonya, Güney Kore, Yunanistan, yüksek eğitime talebin artması ve mevcut eğitim sisteminin bu talebi karşılamakta yetersiz kalmasından kaynaklanmaktadır.

Özel dersler, çoğunlukla dersanelerde alınmaktadır. Bu dersaneler, toplam olarak bakıldığında hizmet sektörü içinde büyük bir pay oluşturmakta ve bu pay giderek artmaktadır. Aileler, çocuklarının üniversiteye hazırlıkları sırasında, kâr amaçlı bu kurumları vazgeçilmez olarak görmektedirler. Bunların öğrenci başına aldıkları ücretler oldukça yüksektir ve aile bütçesi içinde önemli bir pay oluşturmaktadır. Aileler, çoğu zaman, çocuklarının daha iyi bir eğitime sahip olmaları ve mezuniyet sonrasında yönelecekleri iş piyasasında yer edinebilmeleri için böyle bir ekonomik yük üstlenmekten kaçınmamaktadırlar.

Eğitimli kişilerin daha yüksek ücretli işler bulabildiği ve hayatın pek çok alanında daha iyi koşulları kendileri için oluşturabildikleri ailelerce bilindiğinden, aileler kamusal olarak sağlanmasında yetersizlikler olan eğitim sistemi içinde bu türden çözümlere yönelmektedirler. Böylelelikle, hanehalkları özel dersanelere önemli miktarda kaynak aktarmaktadır. Artan eğitim talebine piyasanın kendi içinde ürettiği bu çözüm, diğer yandan, eğitimde eşitsizliklerin daha da belirgin hale gelmesine neden olmaktadır. Eğitim, çocukların gelecekteki refahlarını artırabilecek tek çıkış yolu olarak görülürken, aynı zamanda piyasanın eğitim talebine cevap olarak ürettiği çözümler, pek çok dar gelirli

aile için bu çıkış yolunu tıkamaktadır. Bir üniversite giriş sisteminin varlığı, beceri ve öğrenme düzeyi daha yüksek çocukların daha iyi okullara gidebilmesine olanak sağlamak zemininde tartışılabilir. Ancak, böyle bir sistem, yüksek öğretim görmek isteyen her öğrencinin becerileri doğrultusunda bir yüksek öğretim kurumuna gidebildikleri bir ortamda ve görece fırsatlardan daha az yararlanma durumunda oldukları halde, eğitimlerinde başarılı öğrencilere kaynak sunulmasına yönelik olarak düzenlenmelidir.

Bu çalımanın, temel varsayımlarından biri, gelir düzeyi daha yüksek olan ailelerin özel ders faaliyetlerine katılımının daha çok olacağı şeklindedir. Diğer bir deyişle, ailelerin gelir düzeyi ve özel ders harcamaları arasında pozitif yönlü bir ilişki olduğu vurgulanmaktadır. Eğitim ve gelir düzeyi arsındaki ilişkiden haraketle, aynı zamanda eğitim düzeyi yüksek ailelerin özel ders katılımının daha yüksek olacağı varsayılmaktadır. Anne ve babaların eğitim düzeyleri ve özel ders arasındaki ilişkiyi kuvvetlendiren bir diğer unsurun eğitim düzeyi daha yüksek ebeveynlerin çocuklarının eğitimine daha çok önem verecekleri varsayımıdır. Genel olarak, özel ders harcamalarının ailenin soyal ve ekonomik düzeyine göre farklılık gösterdiği düşünülmektedir. Bu varsayımları amprik olarak test etmek üzere hanehalkı verileri kullanılarak aşağıdaki çalışma gerçekleştirilmiştir.

Çalışmada, özel ders harcamaları 1994 yılında Devlet İstatistik Enstitüsü tarafından oluşturulan Hanehalkı Gelir ve Harcama Anketi kullanılarak analiz edilmiştir. Bu ankete göre 4,279 hanehalkı eğitim harcaması bildirmiştir. Bunlardan sadece 646 hanehlkı özel ders harcaması yapmıştır. Çocukları dersaneye devam etme yaşlarında olan ailelerin sayısı 3,898 olarak tesbit edilmiştir. Daha açık bir ifadeyle, dersaneye gitme yaşında çocuğu olduğu halde özel ders harcaması olmayan ve hâlihazırda özel ders harcaması yapan, yedi ve yirmi üç yaşları arasında çocukları olan, toplam 3,898 hanehalkı örnek kapsamına alınmıştır. Özel ders harcamalrı üç grupta toplanmıştır. İlk grup bire bir alınan özel derslere yapılan harcamaları kapsarken, ikinci grup öğrencilerin okulda ders saatleri dışında öğretmenlerden aldıkları ücretli derslerden oluşmaktadır. Üçüncü grubu ise ailelerin özel dersanelere yaptıkları harcamalar oluşturmaktadır.

Çalışma, yukarıdaki varsayımların geçerli olup olmadığını ekonometrik yöntemlerle sınamıştır. Bu amaçla, hane başına yapılan özel ders harcamalarının logaritması bağımlı değişken olarak tanımlanmıştır. Açıklayıcı değişkenler, hanehalkı toplam harcamalarının logaritması (toplam harcamaların hanehalkı sürekli gelirinin iyi bir göstergesi olduğu düşünüldüğünden hanehalkı geliri yerine hanehalkı toplam harcaması kullanılmıştır), hanehalkı reisinin eğitim durumu, yaşı, annenin eğitim durumunu

kapsamaktadır. Ayrıca, annenin tek ve çalışan bir anne olup olmadığı, hanenin kentsel bir yerleşim yerinde oturup oturmadığı, kentsel yerleşim yerinde oturuyorsa oturduğu bölgenin az gelişmiş ya da gecekondu bölgesi olup olmadığı kukla açıklayıcı değişkenler kullanılarak kontrol edilmiştir. Ailedeki çocuk sayısının, özel ders harcamalrına etkisini belirlelemek için çocuk sayısı da açıklayıcı değişken olarak eklenmiştir.

Bu denklem, Tobit modeli kullanılarak tahmin edilmiştir. Hanehalklarından bir çoğunun eğitim harcaması olmakla birlikte, özel ders harcaması yoktur. Bu durumda, bağımlı değişken pek çok aile için sıfır değerini almaktadır. Ancak, bu haneler için açıklayıcı değişken değeleri mevcuttur. Bu durumda, Tobit modeli bağımlı değişkenin gözlenemeyen bir indeks değişkeni olarak tanımlanmasına izin vererek tahmin yapmayı mümkün kılmaktadır. Böylelikle çeşitli hanehalkı, ebeveyn ve yerleşim yeri özelliklerinin özel ders harcamalarını ne şekilde etkilediği belirlenmektedir. Yukarıda tanımlanan ekonometrik denklem Tobit modeli kullanılarak tahmin edilmiştir.

Modelden elde edilen sonuçlar şu şekilde özetlenebir: Özel ders harcamaları ebeveynlerin eğitim düzeyi ve hanehalkı geliriyle aynı yönde ilişkilidir. Tahmin sonuçları, hanehalkı gelirindeki yüzde birlik bir artışın, bu harcamalarda aynı şekilde yüzde birlik bir artışa yol açacağını göstermektedir. Bu bulgu, özel ders harcamalarının hanehalkı bütçesi içinde bir lüks ya da gereklilik olarak gözükmediğini göstermektedir. Lüks harcama kalemi olmaya ve gerekli harcama kalemi olmaya aynı ölçüde yakındır. Sınırda bir yer teşkil etmektedir. Annenin eğitim düzeyinin yükselmesi, özel ders harcamalarını babanın eğitim düzeyinin yükselmesine kıyasla, pozitif yönde daha çok etkilemektedir. Bu tahminden elde edilen diğer bir bulgu, hanehalkı resinin yaşı arttıkaça özel ders harcamalarının arttığı şeklindedir. Ancak, hanehalkı reisinin yaşının karesi, bu harcamaların, beklendiği üzere belli bir yaştan sonra azalacağını göstermektedir. Kentsel yerleşim yerlerinde oturan hanelerin özel ders harcamalarının, kırsal yerlerde oturanlara göre daha fazla olduğu belirlenmiştir. Bu sonuç, kırsal yerlerde özel dersanelerin daha az olmasıyla ilişkilendirilebilir. Aynı zamanda, kentsel yerlerde ikamet edenlerin üniversite giriş sınavının yarışma havasına daha çok girmeleri söz konusu olabilir. Ancak sonuçlar, kentsel yerleşim yerlerinde gelişmiş, daha az gelişmiş ve gecekondu bölgeleri arasında istatiksel olarak anlamlı bir fark olmadığını göstermektedir. Bu durum, kısmen, kentlerde dersane fiyatlarındaki büyük dalgalanmalarla açıklanabilir. Yüksek ücret talep eden dersaneler olduğu gibi daha uygun fiyatlar belirleyen ve ekonomik düzeyi daha düşük olan ailelerin çocuklarının tercih ettiği dersaneler de vardır. Ayrıca, yerleşim yeri,

hanehalkının gelir düzeyiyle beklendiği şekilde doğrudan ilişkili olmayabilir. Hane deki çocuk sayısı, harcamaları negatif yönde etkilemektedir.

Ücretli Çalışan Erkeklerin Ücretlerindeki Eşitsizlikler

Eğitim gelecekteki refahın artırılması için önemli bir etken olarak görülürken aynı zamanda farklı eğitim düzeylerindeki insanların kazançlarına bir eşitsizlik kaynağı olarak da yansımaktadır. Dünyanın her yanında yapılan çalışmalar, eğitim düzeyi yükseldikçe kişilerin kazançlarının arttığını göstermektedir. Örneğin bir lise mezunu, tipik olarak bir ilkokul mezunundan daha yüksek ücret almaktadır. Aynı şekilde, bir üniversite mezununun yaşam boyu elde edeceği kazançların, lise mezunlarına göre daha yüksek olduğu bilinmektedir.

Yukarıda bahsi geçen kazanç denklemleri, çeşitli eğitim düzeylerindeki insanların, eğitimlerinden elde ettikleri kazançları tespit etmek için sıklıkla kullanılmıştır. Ancak, aynı eğitim düzeyinde oldukları halde, kişilerin eğitimlerinden kazançlarına yansıyan pay, eğitimin getiri katsayısı, kişiler arasında farklılıklar göstrebilmektedir. Yukarıdaki teori, bu tip farkları kişilerin eğitimlerini insani sermayeye çevirme becerisine bağlamakta ve böylelikle daha yetenekli kişilerin eğitimlerinden parasal kazanç anlamında daha çok yararlanabileceklerini söylemektedir.

Bu durum, özellikle yüksek öğretimli kişiler arasında ücret farklılıklarını artırmaktadır. Yüksek öğrenime sahip işgücünün artmasıyla birlikte, bu tür bir eşitsizliğin daha ciddi boyutlara ulaşması beklenebilir. Eğitimli işgücü artarken, işverenlerin işe alacakları kişilerin eğitimleri konusundaki beklentileri yükselmektedir. Örneğin, daha önce ilkokul mezunlarının yapabilecekleri işler için rahatlıkla lise mezunu olma şartı getirilebilmektedir. Lise mezunlarının tuttukları işler de üniversite mezunlarına kaymaktadır. Ülkemizde, üniversite mezunlarının sayıları artarken, iş bulma imkanları azalmakta ve giderek artan bir hızla, yüksek eğitimli işgücünün düşük eğitimli işgücüyla ikamesi gerçekleşmektedir. Bu durumda, az sayıda olan ve teknolojiye yakınlık gerektiren yüksek ücretli işler en yetenekli kişilere gitmekte ve aynı eğitim düzeyinde oldukları halde, bu yetenekli kişiler ve diğer yüksek öğrenimliler arasındaki kazanç farkları açılmaktadır.

Eğitimli ve yetenekli işgücü talebinin ciddi şekilde artmasıyla, yüksek eğitimli ve iyi donanımlı kişilerin diğer yüksek öğretimli kişiler ve kendileri arasındaki kazanç

farkını daha da artırması beklenir. Böyle bir talep artışı, ekonomide teknolojik gelişmelerin arttığı ve teknoloji altyapılı endüstrilere geçişle birlikte görülmektedir. Amerika Birleşik Devletleri ve İngiltere'de 1980'li yıllarda, teknoloji kullanımına yatkın becerikli yüksek eğitimli talebi artmış ve bu artışın ücretlerde önemli eşitsizlik yarattığı gözlenmiştir.

Ülkemizde Avrupa Birliği'ne girme yönünde büyük gayretler vardır. Avrupa Birliği'ne girme olasılığı yakınlaşırken, yabancı yatırımların artması muhtemeldir. Böyle bir durumda, bu yatırımların, dünyadaki teknolojik gelişmelerin bir sonucu olarak, ciddi şekilde eğitimli ve teknolojiye yatkın Türk işgücüne talebi artırması beknebilir. İyi üniversitelerden mezun olmuş kişilerin, kazançlarında ciddi bir zıplama ve diğer üniversite mezunlarına göre eğitimlerinden daha çok faydalanmaları söz konusu olacaktır.

Bu çalışmanın amacı, hâlihazırdaki ücret eşitsizliğini belirleyen etkenleri tespit etmek ve yukarıdaki olasılıklar çerçevesinde eğtimli işgücünü irdelemektir. İlk çalışmayla bağlantılı olarak, eğitimli ve yetenekli olmanın avantajları vurgulanırken, eğitim imkanları olmadığından dolayı yetenekli olup olmadıklarını hiçbir zaman bilemeyecek olanlar için, eğitim fırsatlarının eşit bir şekilde dağıtımının önemi vurgulanmaya çalışılmıştır.

Eğitim ve yetenek arasındaki ilişki incelenirken, bir takım kurumsal faktörlerin de kazançlar üzerinde önemli olduğu unutulmamış ve bu unsurlar da kontrol edildikten sonra, daha "doğru" bir eğitim kazanç ilişkisi belirlenmeye çalışılmıştır. Bu amaçala, 1994 ve 2002 yıllarında Devlet İstatistik Enstitüsü tarafından elde edilen Hanehalkı Gelir ve Harcama Anketleri sonuçları kullanılmıştır. Örnek grubu 15 ve 65 yaş arasındaki ücretli erkek çalışanları kapsamaktadır. Bu kişilerin aylık gelirleri deflate edildikten sonra, haftalık çalışma süreleri kullanılarak, saatlik ücretlerine ulaşılmıştır. Bağımlı değişken olarak, bu saatlik ücretlerin logaritması kullanılmıştır. Logaritması alınan saatlik ücretlerin dağılımı aynı zamanda, kişilerin marjinal verimliliklerinin bir dağılımı olarak kabul edilebilir. Klasik teori, kişilere marjinal verimliliklerinin ödendiğini varsayar. Dolayısıyla, saatlik ücretlerin dağılımı aynı zamanda, bir verimlilik dağılımı, insani sermaye teorisi terimleriyle söylersek, yetenek dağılımı olarak alınabilir. Açıklayıcı değişkenler, her bir okul seviyesi (okur-yazar olup bir okul bitirmemiş olanlar, ilkokul mezunları, orta okul mezunları, lise mezunları, meslek lisesi mezunları ve üniversite mezunları) için oluşturulan kukla değişkenler ve ücretlinin potansiyel iş tecrübsine ek olaralrak, işyeri büyüklüğü kukla değişkeni, çalıştığı endüstriyi gösteren kukla değişkenleri, yaş grubunu gösteren kukla değişkenleri, kent-kır yerleşim yeri kukla

değişkeni ve özel sektör ya da devlet sektöründe mi çalıştığını gösteren kukla değişkenlerinden oluşmaktadır.

Çalışma, işte bu yetenek dağılımının belli noktarında bulunan ve aynı eğitim düzeyine sahip kişilerin eğitimlerinden parasal anlamda nasıl faydalandıklarını tespit etmeye yöneliktir. Eğitimin parasal getrisini belirlemek için yapılan çalışmalar, bilinen En Küçük Kareler (EKK) yöntemini kullanmaktadır. Bu yöntemde, ortak değerler alan açıklayıcı değişkenlere tekebül eden bağımlı değikenin bir ortalaması alınmakta ve farklı açılayıcı değişkenlere tekabül eden bu ortalamalara uygun bir doğrusal ilişki kurulmaktadır. Bu nedenle, EKK yöntemiyle elde edilen katsayılar her bir açılayıcı değişkenin bağımlı değişkeni ortalama olarak nasıl etkilediği belirlemektedir. Örneğin, açıklayıcı değişkenin, kişinin lise mezunu olup olmadığını gösteren bir kukla değişken olduğunu düşünelim. Lise mezunlarının hepsi aynı ücreti almamaktadır. Ancak, EKK yöntemi, açıklayıcı değişkendeki bir değişmenin ortalama kazanç üzerindeki etkisini verecektir. Bu nedenle, aynı kategorideki kişilerin, ücret dağılımının farklı noktalarında bulunmasından kaynaklanan etkiler belirlenemeyecektir.

Ancak, bu etkileri belirlememize yardımcı bir teknik vardır ve bu tekniğin adı *Quantile Regression* tekniğidir. Bu teknik kullanılarak, ücret dağılımının farkalı noktalarındaki kişilerin aynı eğitim düzeyinden elde ettikleri farklı parasal getiriler belirlenebilmektedir. Örneğin, ücret ölçeğinin ilk yüzde onluk diliminde yeralan bir lise mezunununun aynı ölçeğin enüst yüzde onluk diliminde, doksanıncı dilimde, yeralan aynı eğitim düzeyinde bir kimseye göre eğitimin getirisinin ne şekilde farklı olduğu tesbit edilebilmektedir. Bu yöntemi kullanarak elde edilen sonuçlar aşağıda özetlenmiştir.

Bu sonuçlara göre, eğitimin getirisi 2002 yılında, her okul seviyesinde 1994 yılına göre düşmüştür. 2002'de, sadece okur-yazar olanların getirileri, okur-yazar olmayanlara göre düşmüştür. Eğitimin getirisindeki bu düşüşler, hem ortalama olarak hem de ücret dağılımının çeşitli noktalarında gerçekleşmiştir. 1994 yılında, ücret ölçeğinin 10 nuncu, 25 inci, 50 inci, 75 inci ve 90 ıncı diliminde bulunan üniversite mezunlarının eğitim getiri katsayıları önemli ölçüde birbirlerinden farklıdır. Getiriler, ücret dilimiyle birlikte artmıştır. 2002 yılında, en alt dilim ve en üst dilim arasındaki getiri farkı daha da artmıştır. En üst dilimdeki, 90 nıncı dilim, üniversite mezunlarının eğitim getirileri artarken en alt dilimdekilerin, 10 uncu dilim, azalmıştır. Ücret aralığı aynı eğitim düzeyinde açılmıştır. Ücret ölçeğinin alt ucunda yer alan, lise ve orta okul mezunlarının her iki yılda da eğitim getirilerinin 25 inci ve 50 inci dilimlerdeki aynı okul düzeyindeki mezunlara göre daha yüksek olduğu gözlenmiştir. Bu bulgu, görece olarak

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düşük yetenekli kişilerin eğitimden daha fazla kazanç sağladığını göstermektedir. Diğer bir deyişle, yetenek ve eğitim arasında bir ikame etkisi gözlenmektedir.

Bu bulgular, yetenekli ve eğitimli işgücüne bir talep artışı olması durumunda, üniversite eğitimli kişiler arasındaki ücret farklarının önemli ölçüde artabileceğini işaret etmektedir. Bunun yanı sıra, eğitimin daha az kabiliyetli insanlara yaygınlaştırılmasının ücret eşitsizliğini azaltıcı bir katkısı olacağı ortaya çıkmıştır (düşük yetenek düzeylerindeki eğitim ve yetenek arasındaki ikame ilişkisinden dolayı). Yüksek eğitim düzeyinde ise, tam tersine eğitim ve yetenek arasında tamamlayıcı bir ilişki bulunmuştur. Üniversite düzeyinde daha yeteneklilerin eğitimden daha az yeteneklilere göre daha fazla faydalanmaktadır. İş tecrübesinin getirisi 2002 yılında düşmüştür. Ancak, her iki yılda da, en az verimli işçilerin iş tecrübelerine getirilerinin en yüksek olduğu gözlenmiştir. Ücret dağılımında yukarı doğru çıkıldığında iş tecrübesinin getirisinin düştüğü görülmektedir.

Kurumsal faktörlerden olan, kamu istihdamının ücret eşitsizliğini azaltıcı yönde bir etkisi olduğu bulunmuştur. Kamuda çalışanların özel sektörde çalışanlara göre daha yüksek ücret aldıkları tespit edilmiştir.Aynı şekilde, kentsel yerleşim yerinde ücretli olarak çalışanlar, krısal yerledeki ücretlilerden daha iyi ücret almaktadırlar. Kentsel istihdamın da ücret eşitsizliğini azaltıcı yönde katkısı olduğu ortaya çıkmıştır.

Kendi Hesabına Çalışanlar ve Ücretli Çalışanların İş Seçimlerinin ve Kazançlarının Amprik Olarak İncelenmesi

Ücretlilerin kazançları insani sermayeleriyle ilişkili olarak oldukça sık çalışılmasına karşın, kendi hesabına çalışanlar, ekonomide az çalışılan bir konu olarak kalmıştır. Çalışmada, kendi hesabına çalışanlar, sadece kendi emekleriyle, sahip oldukları bir mesleği kazanç karşılığı icra edenler olarak tanımlanmıştır. Ancak, bu tanımlama genel geçer olmayıp bazı çalışmalar, yanlarında belli sayıda işçi çalıştıranları da kendi hesabına çalışan olarak tanımlamıştır. Kendi hesabına çalışanlar, girişimci olarak da vurgulanmaktadır. Girişimci tanımı da açıklığa kavuşmuş bir tanım olmamakla beraber, kendi risklerini üstlenerek, kendi işlerini kuranlar olarak düşünülebilir. Çırak olarak öğrendiği ya da okul sistemi içinde eğitimini aldığı bir işi icra etmek üzere çalışsalar da kendi hesabına çalışma, ücretli çalışmaya göre farklı özellikler göstermektedir. Bu özellikler, çalışma saatlerinin esnek ve uzun olması, kendi hesabına iş kurmanın ya da meslek icra etmenin bir risk taşıması, belli bir başlangıç sermayesi gerektirmesi ve

girişimcilik yeteneği gerektirmesi olarak kabul edilmektedir. Bu faktörler, kişinin insani sermayesine ek olarak, kendi hesabına çalışan olmayı tercih etmesinde önemli rol oynamaktadır.

Ekonomide, kendi hesabına çalışan işçiler ve ücretli çalışanlar birlikte incelenmektedir. Bunların kazançlarını belirleyen unsurları irdelemeden önce, kişilerin, bu iki iş durumu arasındaki tercihlerini nelerin belirlediği incelenmiştir. Hangi iş durumunu neye göre seçtikleri, kazançların belirlenmesinde önemlidir. Kişilerin becerilerine göre iş seçimi yaptıkları, bu tip çalışmalarda sıkça vurgulanmıştır. Kişiler becerilerine en uygun işi seçerek kazaçlarını artırma imkânı elde edeceklerdir. Bu nedenle, kişilerin seçimleri, gelir dağılımını etkilemektedir. Belli bir iş kolunda, o iş koluna daha yatkın insanlar olması dolayısıyla, yetenekler açısından o iş kolu içinde normal bir dağılım olmaması söz konusudur. Bu nedenle, kazançları normal dağılım varsayımı altında incelemek doğru sonuçlar vermeyecektir. Becerilerin bu dağılımını göz önünde bulundurmak için, öncelikle bir seçim denkleminin tahmin edilmesi gerekmetedir. Bu seçim modelinden elde edilen ve gözlenemeyen yatkınlık faktörü kazanç fonksiyonunda kapsanarak, kazançlar üzerindeki etkisi belirlenmektedir. Bu etki, kişinin yatkın olduğu işi seçmesi durumunda pozitif olurken yatkın olmadığı işi seçmiş olması durumunda negatif olmaktadır.

Kendi hesabına çalışanlar söz konusu olduğunda bu beceri, girişimcilik yeteneği olmaktadır. Ücretli ve kendi hesabına çalışanların işteki durum tercihleri incelendiğinde, genellikle tek aşamalı bir seçim olduğu varsayılmaktadır. Çalışanların ücretli ya da kendi hesabına çalışma arasında bir tercih yaptıkları ve bu tercihlerinin eğitim ve iştecrübesi yanında, finansal sermaye gibi unsurlardan etkilendiği varsayılmaktadır. Bu çalışmada, tek aşamalı seçime ek olararak, kişilerin çalışma ya da çalışmama arasındaki tercihleri iki aşamalı bir seçim denklemi oluşturularak dikkate alınmaktadır. Dolayısıyla, çalışmayı tercih etmesine neden olan gözlenemeyen özelliklerin iş seçimi tercihlerini ne yönde etkilediği dikkate alınmaktadır. Bu tek aşamalı seçim için bir *probit* denklemi kullanılırken, iki aşamalı seçim için bir *bivariate probit* denklemi kullanılmaktadır. Bu seçim denklemlerinin tahmin edilmesi sonucunda hesaplanan seçim değişkenleri, kazanç fonksiyonlarına diğer kazanç belirleyici unsurlara ek olarak eklenmekte ve seçimin kazançlara etkisi belirlenmektedir.

Bu çalışma için de diğer çalışmada olduğu gibi 1994 ve 2002 hanehalkı anketleri sonuçları kullanılmaktadır. Ancak, bu çalışmada kadın ve erkek ücretli ve kendi hesabına çalışanlar için her iki yıl için de ayrı ayrı tahminler yapılmaktadır. Kazançlar yine

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yukarıda belirtildiği gibi saatlik olarak belirlenmekte ve logaritması alınarak bağımlı değişken olarak kullanılmaktadır.

Tek aşamalı seçim denkleminde, bağımlı dğişken bir ve sıfır değerlerini alan bir sınırlı seçim değişkeni olarak tanımlanmaktadır. Kişi kendi hesabına çalışıyorsa bu değişken bir değerini alır, kişi ücretli olarak çalışıyorsa bu değişken sıfır değerini alır. İki aşamalı seçim de ise, ilk aşamada çalışanlar için bağımlı değişken bir değerini alır ve çalışmayan herkes için bu değişken sıfır değerini alır. İkinci aşamada, çalışanlar içinde kendi hesabına çalışanlar için bağımlı geişken bir değerini alırken ücretliler için sıfır değerini alır ve bu iki denklem *bivariate probit* tekniği kullanılarak birlikte tahmin edilir. Bu tahmin sonucunda her iki denklemin artık, *residual,* terimleri arasındaki ilişki istatistiksel olarak anlamlı çıkmışsa iki aşamalı seçimin, iş seçimini daha iyi açıkladığına karar verilir.

Her iki denklemde, tecrübe, eğitim seviyeleri ve faaliyet dışı kazançların açıklayıcı değişkenler olarak kullanılmasıyla tahmin edilmiştir. Bunlara ek olarak, iki aşamalı sistemin ikici aşamasında, ev sahipliği değişkeni iş tercihi denkleminde açıklayıcı değişken olarak kullanılmıştır. Bu değişkenin, kişinin işgücüne katılım kararını etkilemediği ancak, kendi hesabına ya da ücretli olarak çalışma kararını etkilediği varsayılarak, birinci aşamadaki denklemden ayırdedici değişken olarak kullanılmıştır.

Seçim denklemlerinden elde edilen tahmin sonuçlarını şu şekilde özetlemek mümkündür: Eğitim seviyesi yükseldikçe, lise ve üstü, kendi hesabına çalışma tercihi azalmaktadır. Kendi hesabına çalışma tercihi ve iş tecrübesi arasında aksi yönde bir ilişki vardır. Faaliyet dışı kazançlar arttıkça, kendi hesabına çalışma olasılığı artmaktadır. Bu nedenle, iş piyasası tecrübe birikiminden daha çok sermaye birikiminin kendi hesabına çalışma tercihini olumlu etkilediği sonucuna varılmıştır. Faaliyet dışı gelirlerin, bir birikim sonucu olduğu düşünüldüğünde ve bu birikimin yıllara yayılabileceği göz önüne alındığında, faaliyet dışı gelir ve yıl olarak hesaplanan iş piyasası tecrübesi arasındaki olası bir pozitif ilişkinin etkisi, faaliyet dışı gelir değişkeninin denklemde yer almasıyla bertaraf edilmiş olmaktadır. Ayrıca, iki aşamalı seçimin, iş seçimi kararını daha iyi açıkladığı görülmüştür. Bu sonuçlar, kadınlar için yapılan tahminler pek anlamlı çıkmadığından, erkekler için yapılan 1994 tahminleri için geçerlidir.

2002 yılında, açıklayıcı değişkenlerin erkeklerin iş seçimini 1994'e göre daha farklı etkilediği gözlenmiştir. Eğitim düzeyinin bu seçime etkisi istatiksel olarak anlamsız hale gelirken, finansal sermayenin kendi hesabına çalışma seçimini etkileme gücü istatiksel olarak azalmıştır. Buna karşın, iş piyasası tecrübesinin, kendi hesabına

çalışmayı olumlu şekilde etkilediği görülmüştür. Bu sonuçlar, 2002 yılında, önceki yıllarda yaşanan ekonomik krizlerin, eğitim ve kendi işini kurma arasındaki olumsuz ilişkiyi zayıflattığının bir göstergesi olabilir. Ayrıca, faaliyet dışı gelirinden çok, iş tecrübesinin kendi işini kurma seçimini etkilemesi, daha çok insanın ücretli işlerini kaybettikten sonra, kendi hesabına çalışmayı tercih ettiklerinin bir göstergesi olabilir. 2002'de çalışmaya katılıp katılmama denklemi ve iş seçimi denklemi arasındaki ilişkinin istatiksel olarak anlamlı olmadığı tespit edilmiştir. Seçim denklemlerinde, ev sahibi olmanın kendi hesabına çalışma olasılığını olumlu yönde etkilediği gözlenmiştir. Bu bulgu, kira ödemek zorunda olmayan ve kendi evinde oturan kişilerin kendi işini kurma riskini daha rahatlıkla üstlenebildiklerini göstermektedir. Ayrıca, kira vermemek, birikimlerini artırabilecek bir unsur olduğundan, kendi hesabına çalışmayı pozitif yönde etkilemektedir.

Kazanç fonksiyonlarından elde edilen sonuçlar şu şekilde özetlenebilir: Eğitimin ve iş piyasası tecrübesinin getirileri, ücretli çalışanlar için daha yüksek olmakla birlikte kendi hesabına çalışanların kazançlarının da eğitim düzeyi arttıkça arttığı gözlenmektedir. Kişilerin gözlenemeyen ve girişimciliklerini yansıttıkları düşünülen, seçim değişkeni, kendi hesabına çalışanların kazançlarını negatif olarak etkilemiştir. Dolayısıyla, kendi hesabına çalışanlar yetenekleri açısından normal dağılmış bir gruptan seçilmiş olsaydılar, kazançları daha yüksek olabilecekti. Bu, kendi hesabına çalışanların, karşılaştırmalı üstünlüklerinin olmadığını göstermektedir. Bu sonuçlar, erkekler için 1994 yılı verileriyle yapılan tahminler için geçerlidir. 2002 yılı verileriyle, yine erkekler için yapılan tahminlerde, eğitim ve tecrübe düzeyine ilişkin olarak benzer örüntüler gözlenirken, seçim değişkeninnin artık istatiksel olarak kazançlar üzerinde bir etkisi olmadığı gözlenmiştir.

Sonuç olarak, risk faktörü ve finansal sermayenin kendi hesabına çalışma tercihini etkileyen önemli unsurlar olduğu tesbit edilmiştir. Kendi hesabına çalışanların, bu işte özellikle bir karşılaştırmalı üstünlükleri olmadıkları tesbit edilmekle birlikte, 2002 yılı için böyle bir önerme verilerle desteklenmemektedir. İnsani sermaye değişkenleri kendi hesabına çalışanların kazançlarını olumlu yönde etkilemekle birlikte ücretlilerin kazançları üzerindeki etkileri görece olarak daha fazladır. Eğitimin ücretli kazançları üzerinde daha etkili olması, "ayrıştırma hipotezini", *screening hypothesis*, destekler niteliktedir. "Ayrıştırma hipotezi", eğitimin kişilerin, işgücü verimliliklerini artırmaktan daha çok, doğduklarında varolan yeteneklerini işverenlere işaret ettiğini ortaya koymaktadır. Buna göre, başlangıçta yetenekleri daha yüksek olan kişiler, kendilerini iş

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piyasasında doğru olarak gösterebilmek için daha çok eğitim alacaklardır. İşverenler, daha eğitimli olanların daha yetenekli oldukları varsayımı altında, eğitimli işçilere daha yüksek ücret ödeyeceklerdir. Bu nedenle, bu hipotez eğitimin getirisinin, böyle bir ayırdedilmeye yaramasından kaynaklandığını söylemektedir. Kendi hesabına çalışanlar kendi yeteneklerini bildikleri ve bunu kimseye işaret etmek zorunda olmadıkları düşünüldüğünde, eğitimin bu grubun kazançlarına katkısı sadece ve sadece beceri kazandırma özelliğinden kaynaklanacaktır. Böylelikle, aynı eğitim düzeyinde, eğitimin getirisinin, bir ücretli için bir kendi hesabına çalışana göre daha yüksek olması, ayrıştırma hipotezinin kısmen de olsa geçerli olduğunu göstermektedir.

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PUBLICATIONS

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