

A STUDY ON THE PRIMARY COMPONENTS OF INCOME:
A CASE OF TURKEY

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Approval of the Institute of Social Sciences



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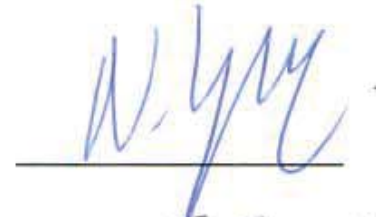
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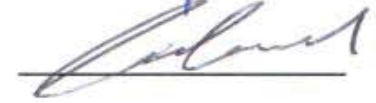
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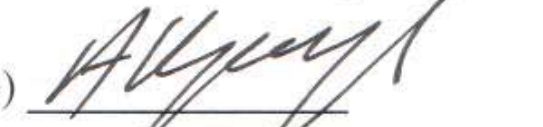
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ABSTRACT

A STUDY ON THE PRIMARY COMPONENTS OF INCOME: A CASE OF TURKEY

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The objective of this study is to analyze the effects of social, economic, and individual factors on individual earnings. This research study is motivated by Becker's Human Capital Model and Mincer's studies on wage models. The empirical analyses are conducted on a unique micro data set compiled by Turkish Statistical Institute's (TURKSTAT) in 2011, named Household Budget Survey and Income Distribution. The data set covers an effective sample size of 9,918 households and 37,121 individuals who are interviewed by TURKSTAT periodically. First, basic wage models are studied and then, these models are enriched by adding a gender effect. The findings indicate that the males earn more than females with similar characteristics, which confirm the existence of gender wage gap among economically active Turkish population. Moreover, vocational high school graduates perform economically better than other high school graduates. The study reveals other significant relationships between the earnings of economically active population and the primary determinants of income that are included in the models.

Keywords: Wage Differentials, Mincer Wage Equation, Human Capital Theory

ÖZET

GELİRİN TEMEL BİLEŞENLERİ ÜZERİNE BİR ÇALIŞMA:

TÜRKİYE ÖRNEĞİ

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Bu çalışmanın amacı bireysel kazançlar üzerinde sosyal, ekonomik ve bireysel faktörlerin etkilerini analiz etmektir. Bu araştırma çalışması Becker'in Beşeri Sermaye Modeli ve Mincer'in ücret modelleri üzerindeki çalışmalarına dayanarak ortaya çıkmıştır. Çalışmadaki ampirik analizlerde Türkiye İstatistik Kurumu (TÜİK)'in 2011 yılı için yayınladığı Hane halkı Bütçe Harcamaları ve Gelir Dağılımı anket verileri kullanılmaktadır. Kullanılan veri seti TÜİK tarafından anket yöntemi ile elde edilen 9,918 hane halkı ve 37,121 bireyi kapsamaktadır. Çalışılan modeller cinsiyet etkisini daha ayrıntılı incelemek amacıyla geliştirilmiştir. Analiz sonuçlarına göre, karakteristik özellikler aynı iken erkeklerin ortalama kazançlarının kadınlarınkinden yüksek olduğu görülmüştür. Bu durum ekonomik olarak faal nüfus içinde kazançlar arasında cinsiyet temelinde erkekler lehine bir farklılığın olduğuna işaret etmektedir. Yine, çalışmanın önemli bulgularından biri, meslek lisesi mezunlarının diğer lise mezunlarına göre ekonomik olarak daha avantajlı olduğudur. Analizler sonuçları, ekonomik olarak faal nüfusun bireysel kazançları ile modellerde kullanılan başlıca gelir bileşenleri arasındaki ilişkiler hakkında da önemli bilgiler vermektedir.

Anahtar kelimeler: Ücret Farklılıkları, Mincer Gelir Denklemi, Beşeri Sermaye Teorisi

To My Family...

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1. INTRODUCTION

Income and related issues have been main areas of interest for local and global economies alike, because earnings and income distribution related problems create significant challenges for countries on their way to economic prosperity. Economic policy makers usually struggle in their efforts to smooth out the relationship between earnings and the primary factors that have impact on earnings. This study has attempted to understand these primary determinants of earnings and their effects on individual earnings in Turkey. For this purpose, the analyses in this study focus on explaining the factors that are affecting the income and its distribution. Although the relationship between the labor market and socio-economic factors has been extensively investigated by previous studies; in this study, three different types of income depending on primary factors such as age, gender, education level, occupation, industry, and some other personal and labor characteristics have been studied with a unique data set within the scope of Turkish case. This study consists of five sections; the theoretical exposition is presented in the first two sections, with the introduction of the theoretical model and the results of the analyses are revealed in the subsequent chapters. The discussion of the findings is presented in the following two sections. The research study has been concluded along with the direction for related future research studies is proposed in the last section.

The first section of the study introduces the previous studies focusing on the conventional earning functions and discusses their findings. The literature on human capital models is summarized with the impact of formal education and on-the-job training separated from each other. The relationships between experience and income as well as education and income have been demonstrated in detail with the aid of graphical presentations.

The second section introduces the econometric model and identifies the explanatory and dependent variables of the model. TURKSTAT's micro-data set of 2011 Household

Budget Survey (conducted on 1,104 sample households) was utilized in this research study. The number of households was altered for each month adding up to 13,248 sample households in a year between 1 January – 31 December 2011 (the effective sample size was 9,918 households and 37,121 individuals).

The basic empirical analyses of the sample group in the survey have been documented in the following section in terms of each variable. This section provides clear information on descriptive statistics regarding the variables included in studied models, such as gender, age, marital status, education, type of industry, occupation, and unionization with the aid of graphical representations.

The fourth section outlines the development process of the model and presents the semi-logarithmic wage model. The study presents the measures on the effects of socio-economic and individual factors such as gender, age, marital status, education level, type of industry, occupation and unionization on the income of individuals. The discussion addresses the results of the analyses the effect of each factor on the types of individual earnings. STATA (version.10) is employed in conducting statistical and econometric analyses presented in this section.

Furthermore, in an effort to document the gender effect explicitly, the study estimates male-interacted wage models. The discussion of this additional model and its results puts emphasis on the impact of gender on income levels and distribution.

The last section concludes the study by summarizing the significant findings and offering extensions for possible future studies in the field.

2. LITERATURE REVIEW

One of the most vexing concerns of the developing economies like Turkey is the wage gap. This problem may sometimes stem from inefficient market mechanisms. It may also be due to different levels of human capital investments among individuals, each with their own reasons (Çelik & Selim, 2013). Human capital investment has a great impact on income, thus scholars have extensively studied the functioning and dynamics of income. Another way that wage gap issue manifests itself is income disparity. Income disparity, along with the income levels, is determined by myriad of factors that are intertwined with each other. Below is a discussion of income distribution in Turkey, which is comprised of income levels of the population.

Turkey's quintile based distribution of annual incomes by types of income is given in Table 1. First quintile has the minimum earnings whereas fifth quintile has the maximum. Wage and salary constitutes about 26% of earnings in the first quintile. On the other hand, this ratio increases dramatically to 46.7% in the fifth quintile. Besides, agricultural based entrepreneurial earnings are 14.4% in the first quintile but this ratio decreases gradually for all quintiles and ends up with 5.1% in the fifth quintile. Social transfers have the maximum value within third and fourth quintiles, 24.9% and 23.2% respectively. These differences are signs of major structural dissimilarities between high-earning and low-earning groups

Table 1- Quintiles ordered by equalized household disposable income and distribution of annual incomes by types of income

	Total	First 20%	Second 20%	Third 20%	Fourth 20%	Fifth 20%
Wage and salary	44.8	26.4	42.3	43.3	46.4	46.7
Casual	3.6	22.4	9.5	4.8	2.7	0.7
Entrepreneurial	21.4	24.7	20.7	17.9	18.3	23.6
• Agricultural	(6.8)	(14.4)	(10.0)	(7.5)	(7.2)	(5.1)
• Non-agricultural	(14.6)	(10.3)	(10.6)	(10.4)	(11.1)	(18.4)
Rental income	3.9	1.2	1.4	2.0	3.2	5.4
Property income	3.8	2.0	2.3	2.9	3.1	4.8
Social transfers	19.4	16.1	18.5	24.9	23.2	16.7
• Pensions and survivors' benefits	(17.8)	(9.5)	(15.6)	(23.0)	(21.8)	(15.9)
• Other social transfers	(1.5)	(6.6)	(2.9)	(1.9)	(1.3)	(0.8)
Inter-household transfers	3.0	6.2	4.8	3.9	3.0	2.1
Other Incomes	0.2	0.9	0.4	0.3	0.2	0.0
TOTAL	100	100	100	100	100	100

Source: TURKSTAT, www.tuik.gov.tr

A snapshot of Turkey's income inequality is presented in Table 2 with each quintile's share of total income. Also in this table quintiles are ordered with respect to their income levels; the first quintile has the minimum earnings whereas the fifth quintile has the maximum. For 2003, the first quintile is getting the 5.6% of total share and it increases gradually to 48.9% for the fifth quintile. This means that the fifth quintile's share is 8.7 times more than the first quintile's. Although there is a slight improvement over time as the income gap between the highest earning group and the least earning group is decreasing, there is still a striking difference within groups. In 2011, first quintile's share has increased from 5.6% to 6.1% and the fifth quintile's share has decreased from 48.9% to 44.8%.

Table 2-Income Quintile's share from total Income (%)

	2003	2004	2005	2006	2007	2008	2009	2010	2011
First 20%	5.6	5.4	5.4	6.0	6.0	5.9	5.8	6.3	6.1
Second 20%	10.1	10.3	10.8	11.3	11.3	10.9	11.0	11.3	11.1
Third 20%	14.4	15.3	15.9	16.2	16.3	16.0	15.8	15.8	15.8
Fourth 20%	20.9	21.9	22.8	22.4	22.7	22.6	22.2	22.1	22.1
Fifth 20%	48.9	47.0	45.1	44.1	43.7	44.7	45.3	44.4	44.8
First/Fifth	8.7	8.6	8.3	7.3	7.3	7.6	7.9	7.0	7.3

Source: TUSIAD, 2014, p.77

Most academic studies use the human capital theory to explain the dynamics of income disparity. From a macroeconomic point of view, total human capital of the society helps to explain the economic growth while personal human capital helps to understand the wage structure from a microeconomic perspective. (Mincer, 1996)

There have been numerous studies and theories outlining the importance of human capital improvements. The fact that underdeveloped countries observe

- Low literacy rate,
- Unplanned rapid population growth
- Malnutrition and unhealthy sheltering due to income disparities
- High rate of workplace accidents
- Low efficiency
- Falling behind the technological developments

could explain the importance of human capital investments. (Altay & Pazarlıoğlu, 2007, p.99)

Becker (1962, p.10) has outlined the empirical phenomena of human capital as follows:

- Earnings typically increase with age at a decreasing rate. Both the rate of increase and the rate of retardation tend to be positively related to the level of skill.
- Unemployment rates tend to be negatively related to the level of skill.
- Firms in underdeveloped countries appear to be more "paternalistic" toward employees than those in developed countries.
- Younger persons change jobs more frequently and receive more schooling and on-the-job training than older persons do.
- The distribution of earnings is positively skewed, especially among professional and other skilled workers.
- Able persons receive more education and other kinds of training than others.

The division of labor is limited by the extent of the market. Since this set of actions could be treated as an investment, the investor has to make the decision of the optimum investment amount based on cost/profit balance. However, it is not crystal clear as to what types of investments are human capital investments. Five categories of human capital investments have been listed in the literature:

- On-the-job training,
- Education at the primary, secondary, and higher education levels,
- Extensions and study programs for grown-ups especially in agriculture,
- Health facilities and services that improves job performance and life expectancy,
- Relocation of families and individuals due to job changes (Schultz, 1961, p.9).

Human capital investments yield efficiency improvements as well. Expenses such as nourishment, sheltering, etc. that help improve the efficiency and performance of an individual are treated as human capital investments. (Tunç, 1998)

Differences in the human capital levels of individuals result in a wide spectrum of income levels, which is also a result of their differing levels of productivity. Expectedly, firms and employers tend to compensate their more productive workers more generously. Individuals, therefore, choose to invest on human capital in order to maximize their expected future income, up to the point that marginal cost of the investment doesn't exceed the marginal the investment return. (Ünal, 1980)

Becker & Chiswick (1966) explain the supply and demand for investment in human capital with the Figure-1 below. There is a challenge in funding human capital investments due to lack of available funds. It is usually financed by family members or help from relatives or friends. Individuals may also use bank loans and simply borrow to finance his/her human capital investment. The financial support that young individuals get from their families varies substantially with the income level of the household and parents' educational background. Therefore, each individual has various choices and chances to find financial support with differing supply curves. The figure below presents three different supply curves for various sources. All three curves have positive slopes because when investment amount increases, risk will increase and the possibility of finding funds from that particular source will decrease. Demand curve of human capital, on the other hand, has a negative slope due to diminishing marginal benefit from adding more capital to an individual that has its own limits of improvement. Also it is an investment for lifetime earnings and when an individual keeps investing, marginal rate of return decreases due to finite lifetime of "harvesting" his investment. Demand curves may differ due to ability level of an individual as well, because as discussed before, the rate of return on an individual with higher level of skill is higher than that of lower skilled individual. Therefore, they demand more funds and demand curve shifts to the right. Furthermore, individual choices may lead to shifts in demand curve as well.

In practice, it is difficult to measure an individual's ability to determine his/her potential income. It is deductively accepted that who makes more money also has more ability (Becker, 1962).

Intersection points of supply and demand curves give us the optimum amount of human capital investments.

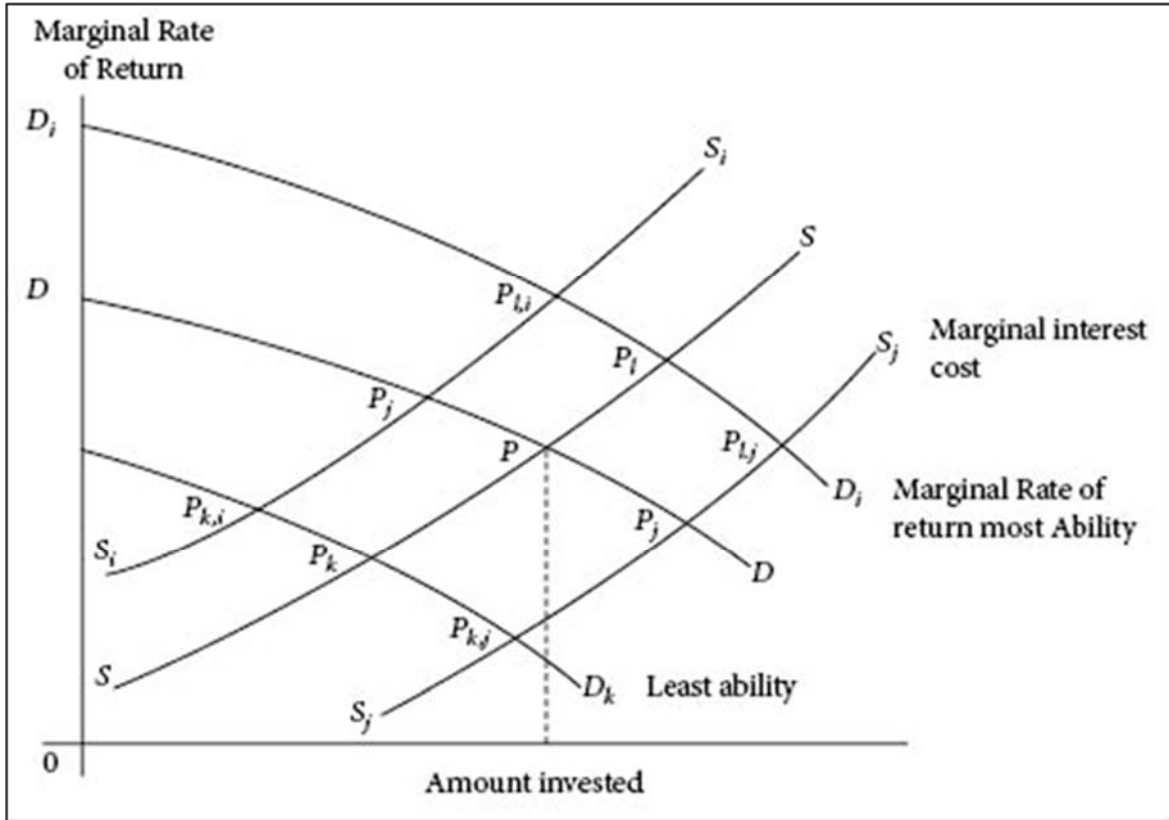


Figure 1-Supply and Demand Curves for Human Capital Investment
 (Becker & Chiswick, 1966, p. 360)

At first glance, occupation seems to be the determining factor of income level. On the other hand, education level plays a significant role on occupation. Therefore, income is strongly dependent on education background. The impact of human capital over income distribution is observed by several interrelated factors such as the occupational decision making process and the education level of parents that is highly correlated with education level of the kids.

The academic literature has also documented the impact of more fundamental factors on income distribution. Among the most important factors, gender, talent and age of the individuals play a significant role (Yumuşak & Bilen, 2000). Ilkcaracan and Selim (2007) pointed out in a recent study that there exist a wage gap based on occupational, industrial segregation as well as gender and unionization. The investment on personal education reveals itself as highly productive and talented workforce which leads to income increases. (Altay & Pazarlıoğlu, 2007).

Return on educational differences has a major effect on personal income distribution inequality. The cause of such inequality is not only limited to education but also ability, gender, age, marital status, industry types, occupation type and other social and economic factors (Tunç, 1998). The main subject of this study is to determine the influence of each of these factors on income level of an individual. The following section will cover the opinions and approach of other scholars on these factors and cover the literature on the topic to serve as the foundation of the model that will be developed later.

2.1 Education/ Training

Individuals make optimal choices to how much consume and how much invest in financial economics. But there are some activities such as education which can be considered consumption and investment at the same time. Education consists of paid services, physical equipment and materials which help it considered consumption. On the other hand, those expenses increase the expected income of individuals. Therefore, it can be considered as investment.

2.1.1 Education

According to Yumuşak & Bilen (2000), insufficient human capital investment leads to disparities in income. Due to an uneven distribution of population over education levels, income is not evenly distributed in Turkey. In order to paint the dramatic situation in education levels, consider that within the Turkish workforce, university graduates make up 7.3%, vocational school graduates 8.5% and high school graduates 15.5%. Remaining 70% of the workers are either primary school graduates or people with no formal schooling at all.

It is not a coincidence to find out that main explanatory variables are usually education and experience, namely human capital. Education level and income level is directly proportional and therefore one claim that education increases the economic growth. (Altay & Pazarlıoğlu, 2007)

Human capital model of MINCER, studies the contribution of education (schooling) and experience (on the job training or after-school education) on net present value of life-long earnings (income distribution as well) (Tunç, 1998).

$$\ln y = \ln y_0 + rS + \beta_1 X + \beta_2 X^2$$

Mincer equation above, relates the logarithm of hourly earnings to years of schooling, years of work experience and years of work experience squared. It is one of the most frequently estimated relationships in labor economics. There are several reasons for its fame. The most important one is possibly the practical use of results from human-capital theory to derive an estimating wage equation (Bjorklund & Kjellstrom, 2002).

This investment is surely related with the income level of the individual or household. Moreover; urbanization and demographic structure also has influence on the decision process of education investments. Return of the human capital investment is higher in urban than rural. Thus, people that live in the cities invest more on human capital. Demographic transition can reveal itself as decline in infant mortality rate and having longer and healthier life. This makes human capital investments more attractive because people can get the return of their human capital investments for longer periods. Families started to invest on their children (by education, health...etc.) more. However, since they have limited budget; they hesitate to bear more children. Therefore, birth rates dropped which means substitution of quality for quantity of children. This made it possible to invest more on children (Mincer, 1996).

As stated above demographic structure and urbanization caused individuals' invest in human capital in different amounts. Also average life expectancy is increasing in Turkey. According to World Bank data, life expectancy was 66 years on average in 1994 and it increased to 75 by 2012. This difference means that individuals as investors will enjoy that return nine more years which makes human capital investments more profitable and

appealing. Hence it is expected to see an increase in human capital investment in Turkey. However, even individuals with similar environments might invest diverse amounts on human capital. Growing market makes individuals more skilled. This is caused not only by practice but also because of division of labor (Becker, 1962). Again according to World Bank data, Turkey's GDP in 1994 was around 130 Billion \$ and it increased to 820 Billion \$ in 2013. At this point, Turkish economy is expecting more skilled employees in order to keep growing.

In literature, education's return is calculated with two common methods. First one is *full/elaborate type* which is used by T.W. Schultz and G. Becker. In this method; cost and earning distribution is determined based on age and education level. Second method is *basic earnings function method* which is used by J. Mincer. This method studies the contribution of additional each annual education to the personal income (Yumuşak, 2003, p.5).

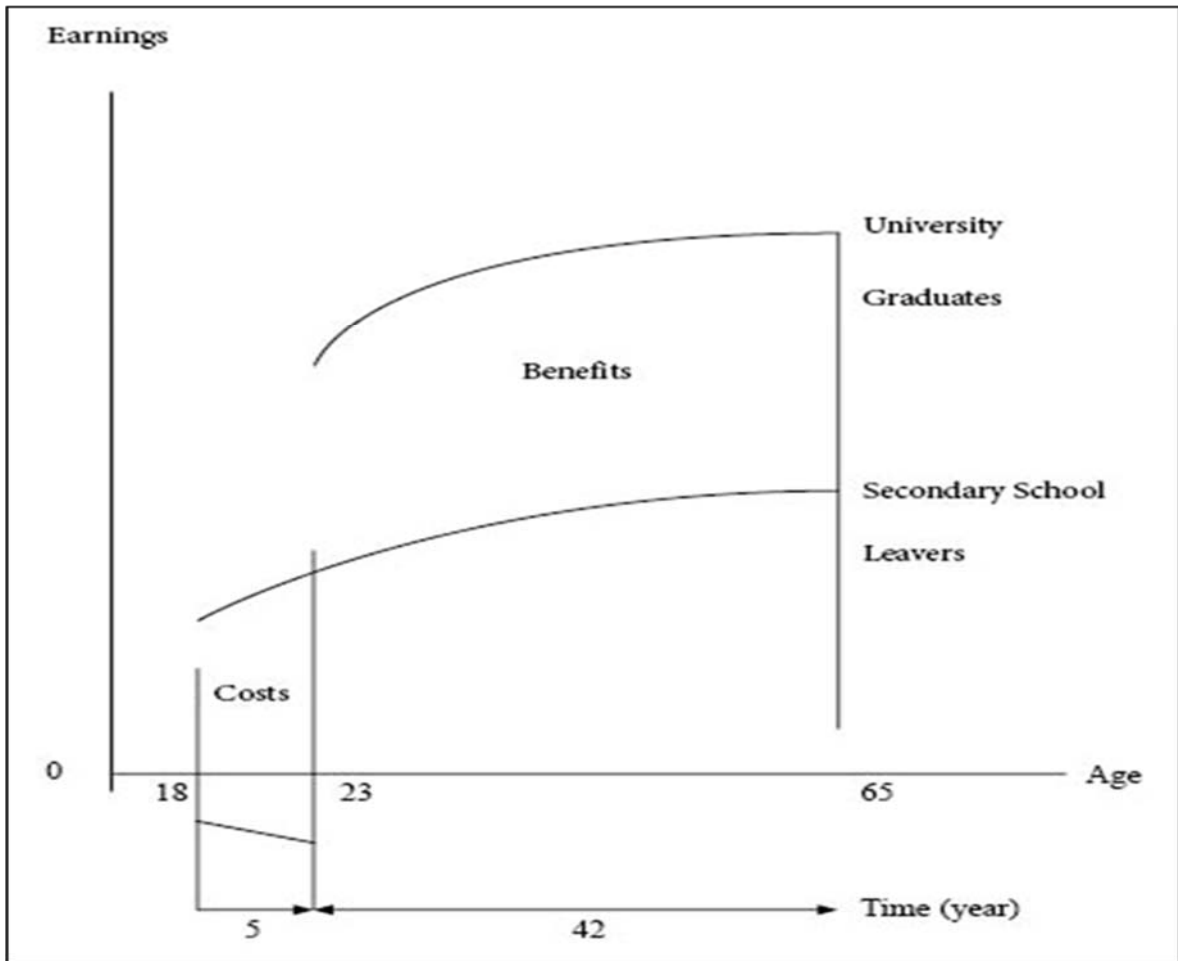


Figure 2-Stylized Age-earnings Profiles
(Psacharopoulos, 1995, p.3)

The cost/benefit trade-off can be depicted in another diagram, showing the income trends through ages. As seen in the diagram, a university graduate start to make money at the age of 23, while a high school graduate can start earning as early as 18. Although there is an advantage of summing up the earnings 5 years longer for a high school graduate, a university graduate will compensate that gap rapidly due to wage structure and human capital investment. Here, human capital investment consists of 5 years foregone earnings and educational equipment costs (Psacharopoulos, 1995).

Besides, studies show that age earnings profiles are likely to be steeper among more skilled and educated persons (Becker, 1962).

Here, Psacharopoulos (1994) points out another important issue which is the quality rather quantity of education. That is a vital factor of return to education. For instance, when student size drops to 25 from 30 per classroom, it is found that it leads to a 0.4 percent increase in the returns to education.

Return is affected by family status and health of individual as well. Better family status and better health conditions results better education performance (Psacharopoulos, 1994).

Schooling ratio has an influence on income and unemployment. Educational attainment and unemployment is inversely proportional. It is already discussed that human capital investments are likely to increase expected earnings. When earnings are increased, individual's opportunity cost of leisure time increases. Hence, individual's choices will change and his/her working hours will rise. There is a positive relation between working hours and education due to wage rates. It is pointed out that education increases earnings by two factors: increased wage rates and high working hours. Schooling reduces the unemployed periods while experience reduces already unemployed individual's unemployed duration. Indeed, it does not mean that education level decreases the aggregated unemployment. It only redistributes the vacant employment positions among individuals (Ashenfelter & Ham, 1979).

2.1.2 Training

According to Mincer (1997), Yoram's model addresses differences across periods of life cycle. Among his several suggestions for interpersonal variations in human capital investments, 4 of them are listed below:

- Individuals with more schooling keen to invest in more on job training.
- Training will likely to re-occur in individual's life cycle if he/she is heavily involved in the first one.
- Better education/schooling background will lead to more extensive job training.

- If the cost-effectiveness of schooling and job training increases, demand of human capital will rise in the short run. Eventually, rates of schooling and job training will increase. (Mincer, 1997)

As it is known, human labor force is a factor of production. Therefore, it has to be improved along with the real capital. Otherwise, the gain will not be as much as desired. Technological improvements cannot be a solution to bypass the bottle-neck of a production line, unless professionally handled by educated labor force. Therefore, human capital investment and improvement is one and only vital to effectively utilize real capital.

Investments usually produce assets which will eventually makes individuals live better off. Hence, they would like to optimize their investments due to limited budget. Similarly, training investment would have a return of "price change" which will allow them to sell their labor force with a higher price. Moreover, the added value of their time will force them to work more than uneducated work force due to higher opportunity cost of leisure time. Individuals, intuitively, expect to have a higher profit increase compared to their human capital investments after the price change. That change will affect all of their consumer behaviors as well. This altered consumption style will force them to spend more time working. Thus, increase of income is not only by the wage price but also longer working time (Lindsay, 1971)

It is observed that formal education is not sufficient enough for a successful job performance. On the other hand, if on-the-job training behaviors are studied carefully; the formal education can be treated as a preparation step to real on-the-job training which is going to increase the occupational skills of the workers. This training has different types most of which are related to experience. Some believe that formal school and on-the-job training are not complementary to each other. They are rather alternative to each other. According to them, school duration has to be shortened and on-the-job training has to be extended for a better occupational performance (Mincer, 1962)

Some individuals improve their efficiency by attaining new skills while others bring their skills to perfection. On-the-job training is different than formal school education due to

the fact that its aim is to improve efficiency. There is an opportunity cost involved in this type of education since they choose to be educated instead of producing. Besides, there might be equipment cost added. The duration of on-the-job training will change based on the job. If the job would not have lasted long, this training would have been pointless because it aims for improving the future productivity. Firms find this type of training investments beneficial because of expected increase of earnings or lessened expenditures over time.

On-the-job training is known to have two types: Specific on-the-job training and General on-the-job training. General training is not only useful for that particular firm providing the training but in any other firm as well. If the employee chooses to resign and choose another employer, training provider will lose that investment while the employee and new company will still benefit. Then, what is the motivation of the company behind this decision of providing training? The company would choose to provide the training if and only if the employee funds this general on-the-job training. Individuals are willing to fund it because they believe that their wage will be increased accordingly whether or not they keep working for the same employer. In other words, their salaries will be below the opportunity marginal product by the cost of education (Becker, 1962)

Becker (1962, p.15) pointed out the mechanism and the contribution of training over income in the figure below. As it is depicted by TT, age earnings curve of trained persons is steeper than that of untrained persons, shown by UU line. However, the difference between these two lines has a lot to do with the cost of training, ages of persons, etc... In an extreme case scenario, when an extreme concavity appears like T'T'; the income will be boosted immediately as soon as training period is over, in less extreme cases the principle would be the same and the concavity more continuous.

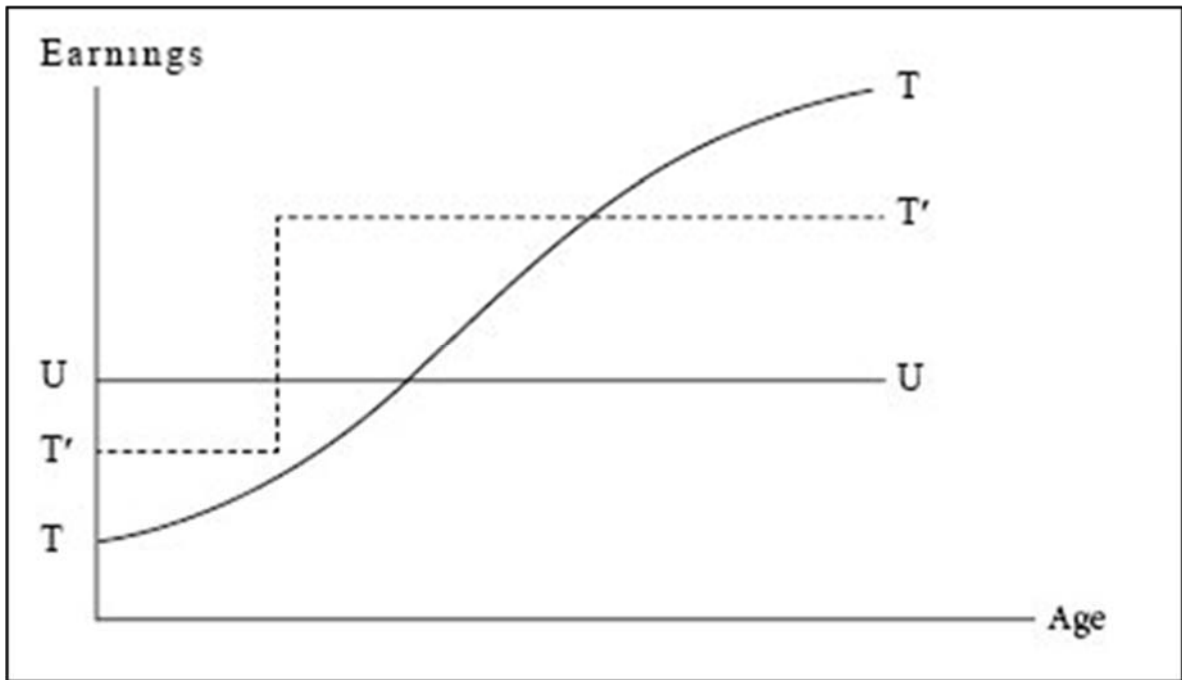


Figure 3- Mechanism and the contribution of training over income
(Becker, 1962, p.15)

2.2 Gender

Most of the models that explain the determinants of wage employ gender and age in the first place. In context there are several studies analyzing the gender effect on wage. In current economic system, high real wages trigger the growth of female labor force due to the opportunity cost of unemployment. Therefore, women tend to spend less time for household duties and spend more on their paid jobs (Mincer, 1996). This trend has a side effect which leads to drop of birth-rate in order to avoid additional household duties. Life expectancy and living standards of women tend to increase with elevated annual working hours. Thus, expected return of human capital investments such as education and on-the-job training increases (Mincer, 1996).

Although there are some measures taken to diminish the wage gap between males and females, there is a huge wage gap at the industry level between genders. Besides, female employees (especially part time workers) concentrate in the low-wage industries compared to males. At this point, those actions that are expected to close the wage gap do not solve

the problem and significant wage gap between males and females across industries is still a fact (Caju, Lamo, Poelhekke, Katay, & Nicolitsas, 2010).

It is also observed that education, training and experience variables contribute much more to an income of a woman than man in private sector. Therefore, it is crucial to educate women and keep track of female schooling in order to make sure that they have higher income and better status. Moreover, governments should apply policies to punish if they fail to send their daughters to school (Çelik & Selim, 2014).

Akhmedjonov and Izgi (2012) point out a similar fact with a little difference. According to their study, return of education is more profitable for women in public and private sectors. Women with an undergraduate education have a higher return than men.

As it can be deduced from the studies mentioned above, private sector appreciates more when it comes to more educated and experienced workers. On the other hand female are better off if they work in public sector for lower deciles where the public sector is more “fair employer” (Lucifora & Meurs, 2004)

2.3 Age

As it is described above, education expenses show the characteristics of an investment. When an individual invest on personal improvement, he/she gives up the present income and opportunity cost of his time. On the other hand, that low income level replaces with a higher one in the close future when the investment starts to pay off. The reason why young individuals tend to invest more on human capital is that they can “harvest” longer periods (Porath, 1967). That is why it is more logical to get educated/trained as early as possible. Otherwise, the return of the investment will be lower due to shortened career left. In addition, the opportunity cost of the time spent on education/training will be much more. By its nature, wage profile is upward at a decreasing rate. Wage rise is also related to life cycle and mobility of individuals. Furthermore, wage increase slows down by age due limits of human capacity and mobility decrease as people get older (Mincer, 1997)

According to Jovanovic and Lokshin (2004), private sector employees have higher income averages for all ages considering any particular education level.

2.4 Marital Status

Marital status is also another factor that affects income levels. Although there are several studies measuring the impact of age and education, marital status studies are limited comparatively. Toutkoushian's (1998, p.526) study reveals that single men earn between 4% and 9% less than married men. One of the reasons could be revealed by a study conducted by Çelik and Selim (2014); that married men have more extra working hours and weekend shifts in order to keep up with the needs of the family and increase their household income. The same fact is emphasized in another study showing that having a child triggers higher work effort and men's productivity increase in order to have a well ordered life style (Petersen, Penner, & Hogsnes, 2011). Nonetheless, marital status has limited effect on female groups according to the study. Namely, married women earn only about 4% more than single women (Toutkoushian, 1998, p.521).

There are notable differences in wage gap among different races and ethnic group. Therefore income differentials change across these groups as well. Considering the marital status, there is a higher income level for married men than single men. Contrary, studies do not testify the same fact for married women's salary premiums (Toutkoushian, 1998).

2.5 Industry Types

Although marital status has different effects on males and females, studies show that industry wage differentials are no different for both genders. There is a large variation between industry types and expected incomes. In other words, there is an irrefutable correlation between industry types and average income for both genders (Thaler, 1989). To illustrate, there is a tendency to migrate from rural areas to city centers for a higher income expectations. Agriculture sector is not as fruitful as of those service sectors of the urban regions. Since each industry requires different education level and human capital

investment, it makes sense to have varying average incomes. For instance, technology-involved sectors such as IT, would require a solid background on communication and computer technologies, therefore the employees would expect to earn more.

The same fact holds true for Eastern and Western European Countries. Among the sectors, computer industries, financial, chemical and energy sectors are the highest paying industries in the hierarchy. Contrary, traditional sector wages such as textile, clothing and leather industry, wood and cork industry, retailing, hotels and restaurants are in the lowest decile (Magda, Rycx, Tojerow, & Valsamis, 2011). In another study on EU states, inter-industry wage differentials are found to be significant. (Caju, Lamo, Poelhekke, Katay, & Nicolitsas, 2010).

2.6 Occupation Types

Although most individuals would love to get the highest hierarchical level in an institution, what they end up with is the position that their potential would allow. The occupation type is a combined result of individuals experience, training, education, gender, etc... Therefore its impact on income level is stronger than other variables that are subjects of this study. In other words, each individual will get a position in the hierarchical ladder based on their education level, training and experience. People with different education levels and training will be likely to choose or likely to be chosen for different positions (Mincer, 1958).

Although occupation types are mentioned to be a function of training and education, these factors do not give identical results for all the sectors. To illustrate; if annual earnings/age graphs are considered, some sectors have steeper lines compared to others. That implies higher return of training and education over years via higher occupational positions. In other words, the higher education investments, higher expected earnings and steeper the life path of earnings (Mincer, 1958). Figure below reflects the relationship between annual earnings and age for differently trained groups. Less trained groups have more flat relationship compared to more trained group with steeper slope. More trained group has a

greater initial investment on training and starts with level C whereas less trained group starts at level A. Over years, more trained group's annual earnings surpasses less trained group at point B and annual earning gap keeps increasing rapidly. Since the slopes are different, the earnings gap will result in higher income disparities for higher ages. At point B it is in its minimum value.

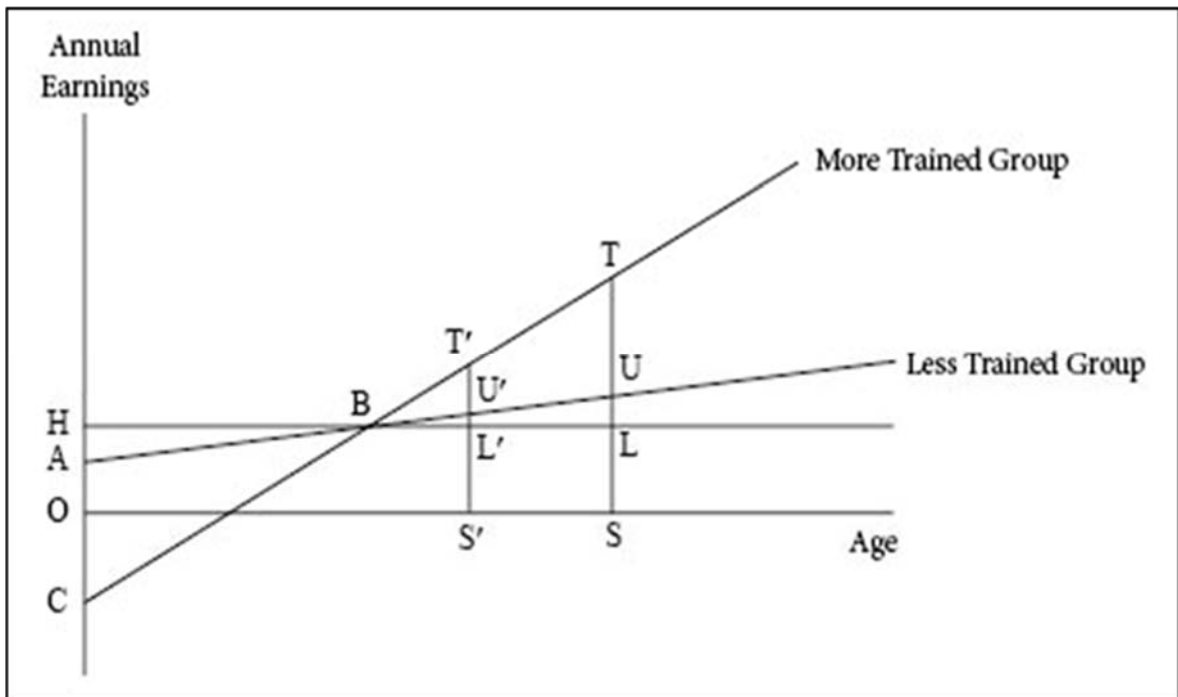


Figure 4- Relationship between annual earnings and age for differently trained groups (Mincer, 1958, p.289)

On the other hand, intra-occupational differentials are a function of age only. Among highly trained groups, annual income difference will be much more for chosen two ages compared to less trained groups. It is also a result of that steeper slope of annual earnings for highly trained group. It should also be kept in mind that it is almost impossible to move from one group to another after the training period is over due to several reasons including the opportunity cost of starting over again (Mincer, 1958).

2.7 Experience

As mentioned above, The Mincer equation, which relates the logarithm of hourly earnings to years of schooling, years of work experience and years of work experience squared, is one of the most commonly estimated relationships in labor economics (Bjorklund & Kjellstrom, 2002).

A farmer has to tolerate to earn less than other employees of the same age and gender if he decides to give up farming and work for that employer. It is mainly because of the educational and training backgrounds, human capital investments in short. Schooling, health condition, skills and ability has control over income. Therefore, younger generations have comparative advantage over older generations due to average education duration (Schultz, 1961)

Education and experience is occupied to explain the determinants of individual earnings. It is obvious that earnings increase with experience but its mechanism is not that obvious. According to Duncan & Hoffman (1979) the most commonly accepted explanation of the relationship between income and experience is that of the human capital model, which considers years of job experience as a proxy for unobservable investment in on-the-job training.

Ilkcaracan and Selim (2007) stated that work experience is the most important determinant of the wage gap and relatively the most important factor among all factors. Besides, that statement is pointed out by Akhmedjonov and Izgi (2012) in another article which shows that experience have a positive effect on wage for both public and private sectors. However, experience pays more for private sector than public as mentioned earlier.

2.8 Organization Type (Public/Private Sector)

Turkey has a relatively bigger public sector which forms a huge chunk of the employees market. There are lots of studies that try to outline the effectiveness of this sector, but there are not many of those studies to show the income disparities compared to private

sector. In this study, public/private sector comparison is also one of the subjects of the research. Moreover, worker characteristics and choice aspect of the sector selection is going to be discussed (Tansel, 2005).

It is mandatory to analyze the job market of the public sector in order to understand the characteristics of aggregate labor market due to the size of public sector. Public sector workers' wages has the biggest share in the government budget. Therefore, that is also the first item to be revised during the crisis period. It has important differences, compared to public sector; such as its control mechanisms, nature of output, etc... On the other hand, private sector is profit oriented that moves with the market mechanism. While private sector wages settle down on a demand curve at some point, public sector could be anywhere around that curve. It may be higher, lower or the same as the private sector wages. Normally, public sector also has a principle of minimizing the cost. However, sometimes, government's employment and distributional goals may necessitate the expansion of public employment beyond efficient levels. Hence, it is not always wise to expect the same criteria for both public and private sectors. The wages in public sector is being determined by non-market processes and increase with education level, experience, etc... There is a certain increase for the following years as well. It is relatively harder to get fired compared to private sector (Tansel, 2005).

According to study conducted by Tansel (2005), public sector wages are higher than private sector. Moreover, gender wage gap is lower in public sector due to wage determination characteristics mentioned above.

Jovanovic and Lokshin's (2004) study compares public and private sector wages with statistics of Moscow by Russian Labor Force Survey. According to the results, there is a significant difference between public and private sector wages. The gap is around 14% for men and 18% for women. In addition, men earn 24% more than women in private sector. In contrast to the findings of other scholars, Jovanovic and Lokshin (2004), states that gender wage gap is higher than private sector with 33% difference between men and women. Although it is expected to earn more over years, that holds true for only public

sector. Women have no return to tenure in private sector. Only men's wage increase over years in private sector.

When Turkey's job market is considered, both genders get higher returns of education in private sector than public. For both sectors, female workers get higher returns of education investment than men. Similar to findings above, public sector returns of experience and education are lower than private sector which leads to a cluster of skilled labor force in public sector. Therefore non-skilled workers tend to group in public sector (Akhmedjonov & Izgi, 2012)

This tendency can be seen in the graph below. Low skilled/Low Pay Jobs are better off in public sector with higher hourly wages. On the other hand, high skilled/high pay jobs have higher wage in private sector. Public sector fails to attract, hold and motivate high skilled workers (Lucifora & Meurs, 2004).

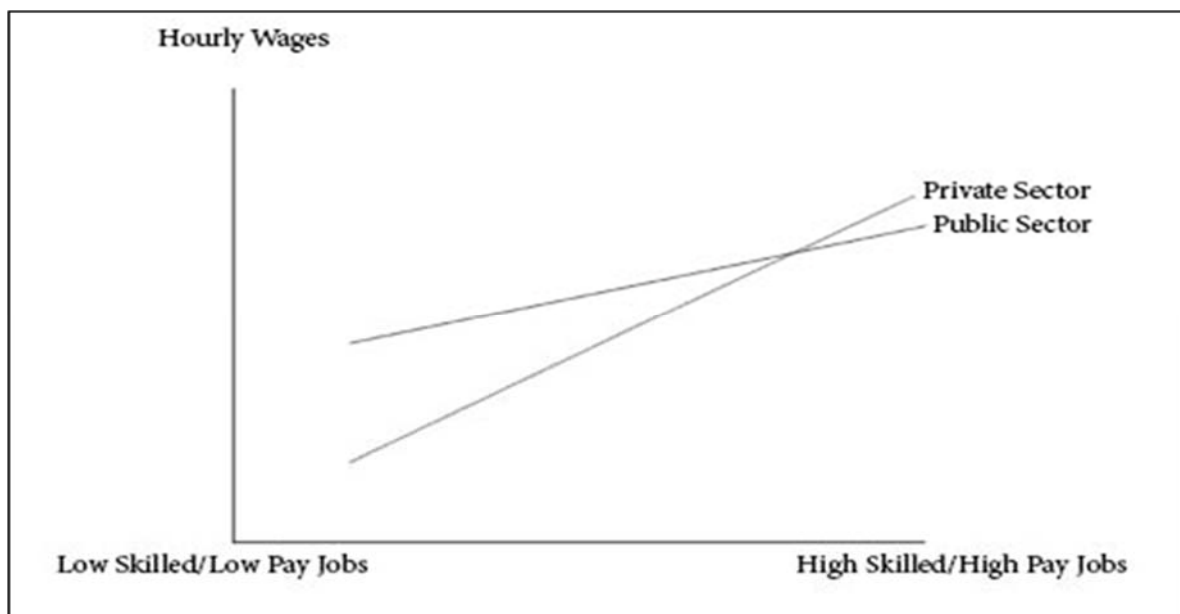


Figure 5-Pay profiles by skill: Public and private sector

(Lucifora & Meurs, 2004, p.6)

2.9 Unionization

The nature of unionization requires defending of its members interests such as monetary benefits. Therefore its members tend to earn more than non-unionized employees and stay above the poverty line. (Çankal & Sekmen, 2008)

Unionization effect on wage tends to be lower on educated work force. It can be deducted from this fact that union differentials used to be higher in the past due to the portion of less-educated employees. Nowadays that differential is declining. (Blackburn, 2008).

Moreover, the trend of declining unionization differentials will eventually lead to a further fall due to the weakened bargaining power of unions. Besides, union wage may show changes according to some variables such as gender, education and industry. (Blackburn, 2008).

3. DESCRIPTION OF VARIABLES AND DATA

In this section, variables and the data will be described. The data was generated by TURKSTAT (Turkish Statistical Institute).

3.1 Introduction

TURKSTAT is the official government agency that produces statistical data in Turkey. Among several data that they collect, the Institute administers Household Budget Survey each year. In this study, 2011 survey results were used. Although 2012 was available at the time, there were several missing variables that intended to be utilized in the model such as public/private sector differentiation and unionization.

According to TURKSTAT, the estimation level of 2011 Household Budget Survey covers whole Turkey. It's not possible to make estimations on regional basis by using this particular data because of sampling design of the survey.

Micro data set of 2011 Household Budget Survey was applied on 1,104 sample households. The number of households was increased every month to a total of 13,248 sample households in a year between 1 January – 31 December 2011 (the effective sample size was 9,918 households and 37,121 individuals).

In this study, the definition of income has a major role throughout the analysis. Therefore, the safest way to surpass any possible confusion, the official income definition of TURKSTAT was considered to be valid. TURKSTAT's statistics manual states that

... income is the total value of goods and services produced in a specified period of time, usually in one year, in a national economy. This is called national income or total output. As for a household or an individual, income can be defined as total of the sums earned in return of the contributions made to productions in a specified period of time. Income of a household may be as wage or salary, land rent (rent), capital income (interest) or entrepreneurial income (profit).

In this study, Mincerian Wage Model will be employed with a couple of adjustments. For instance, three different income types will be analyzed. Besides, the basic model consists of the natural logarithm of earnings as dependent variable where education, experience and experience-squared are the explanatory variables.

$$\ln y = \ln y_0 + rS + \beta_1 X + \beta_2 X^2$$

(Mincer, 1974) Variable $\ln y$ represents the log of expected earnings of individuals whereas $\ln y_0$ reflects the level of earnings of individuals with no education and experience). The model is enhanced by several socio-economic factors that may determine the expected income of an individual. These variables will be introduced below.

3.2 Description of Variables

In this section, explanatory and dependent variables are defined and described below. Dedicated notation for each variable is also shown.

3.2.1 Explanatory variables

Gender

MALE: 1 for males and 0 for females

Age

AGE: Completed age of individual

AGESQ: Square of age

Education Levels

EDU1:	Illiterate
EDU2:	Literate – not completed a school or graduated from Primary school or graduated from Primary education
EDU3:	Secondary School Graduates
EDU4:	Junior Vocational High School Graduates
EDU5:	High School Graduates
EDU6:	Senior Vocational High School Graduates
EDU7:	2-3 year-College Graduates
EDU8:	4-year-College or University Graduates
EDU9:	Post Graduate/PhD.

Marital Status

MAR:	Married
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Industry Types

IND1:	Agriculture, forestry, fishery
IND2:	Mining and quarry
IND3:	Manufacturing Industry
IND4:	Electricity, gas and water

- IND5: Construction and public works
- IND6: Wholesale and retail business, motor vehicles, repair of motorcycles, appliances
- IND7: Hotel and restaurants
- IND8: Transportation and storage services
- IND9: Information and Communication
- IND10: Financial brokerage services
- IND11: Real estate agency, rentals and business activities
- IND12: Public management and defense, mandatory social security
- IND13: Administrative and support service activities
- IND14: Public administration and defense, compulsory social security
- IND15: Education
- IND16: Human health and social work activities
- IND17: Arts, entertainment and recreation
- IND18: Other social, community and personal service activities

Occupation Types

- OCU1: Legislators and senior officials
- OCU2: Professionals
- OCU3: Associate professionals
- OCU4: Office and customer service clerks

- OCU5: Service and sales workers
- OCU6: Skilled agricultural, animal producers, forestry and fishery workers
- OCU7: Craft and related trades workers
- OCU8: Plant and machine operators and assemblers
- OCU9: Unskilled labor

Experience

- EXP: Number of years of employment. If duration of employment is less than half a year (6 months) the variable is taken as “0”.
- EXPSQ: Square of EXP

Annual Working Hours

- AWHR: Annual total working hours

Organization Type (Public/Private Sector)

- PUB: 1 for Public institutions and 0 (zero) for private institutions

Unionization

- UNI: 1 for Unionized employees and 0 (zero) for non-unionized ones.

3.2.2 Dependent Variables

Labor Income (Variable LINC)

LINC: According to TURKSTAT, this income includes considerations paid to persons as wage, salary or daily-fee, excludes pension, social insurance contributions and taxes, and is the net income that that person earns in a year. The sum of income earned as bonus that is paid during certain periods of the year (3 months, 6 months, etc.) and the other income such as premium, gratuities, Christmas or holiday pay to the regular or casual employees are covered. Tips and premiums paid to motivate the employers and to increase sales, and education allowances paid to teachers once in a year are covered with this variable. Received premium and incomes earned from additional duties and such income components as expertise charges, consultancy fees, tips and service charges are not included in salary, wage and daily-fee incomes and these components are covered under this variable.

Labor Income with In-Kind Income (Variable LINC_IK)

LINC_IK: This variable is the annual sum of labor income and total in-kind income components received by an individual as an employee. Goods and services (discount in transportation, mass transportation, utility bills, and in travel services, dinner, kinder garden fees, cloth, food, drinks etc.) received by a household individual in the last 12 months is included in income in-kind.

Total Income (Variable TOTAL_INC)

TOTAL_INC: Annual sum of all types of incomes such as wage, investment income, government transfers, veteran pension and disability pay and sickness benefits, widow pension, orphan pension, interest on bank deposits, real estate (rental) income etc...

3.3 SUMMARY STATISTICS

TURKSTAT's micro-data set of 2011 Household Budget Survey (conducted on 1,104 sample households) was utilized in this research study. The total number of households is 13,248 sample households in a year between 1 January – 31 December 2011 (the effective sample size was 9,918 households and 37,121 individuals).

3.3.1 Gender

37,121 individuals are included in the survey. 51.4% are female and 48.6% are male.

Table 3-Gender Distribution of the Sample

Gender	Frequency	Percentage
Female	19,066	51.4%
Male	18,055	48.6%
Total	37,121	100.0%

In the survey 19,066 female and 18,055 male participated. This ratio is a good reflection of the actual gender ratio of Turkish population.

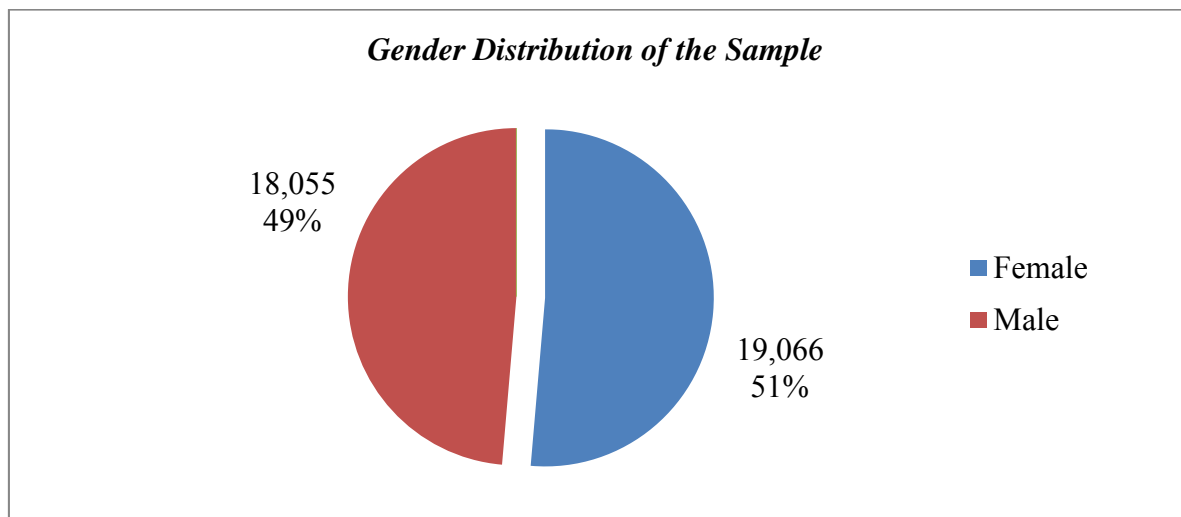


Figure 6-Gender Distribution of the Sample

3.3.2 Age

The age distribution of the individuals in the survey is as follows: 27% of the individuals are below age of 15; 15.4% of sample is between ages of 15-24; 15.7% of sample is between 25-34; 14.3% of sample is between 35-44; 12.1% of sample is between 45-54; 7.9% are at age 55-64; and 7.6% of sample is 65 and above respectively.

Table 4-Age Distribution of Sample

Age Interval	Total	Male	Female	Percent
Below 15	10,036	4,983	5,053	27.0%
15-24	5,724	2,730	2,994	15.4%
25-34	5,827	2,757	3,070	15.7%
35-44	5,294	2,622	2,672	14.3%
45-54	4,499	2,224	2,275	12.1%
55-64	2,933	1,454	1,479	7.9%
65 and above	2,808	1,285	1,523	7.6%
Total	37,121	18,055	19,066	100.0%

In the survey, 10,036 individuals are below 15 years of age; 5,724 individuals are between ages of 15-24; 5,827 individuals are between ages of 25-34; 5,294 individuals are between ages of 35-44; 4,499 individuals are between ages of 45-54; 2,933 individuals are between ages of 55-64 and 2,808 individuals are above age of 65 respectively. (Below 15 individuals are almost twice as much as the closest group).

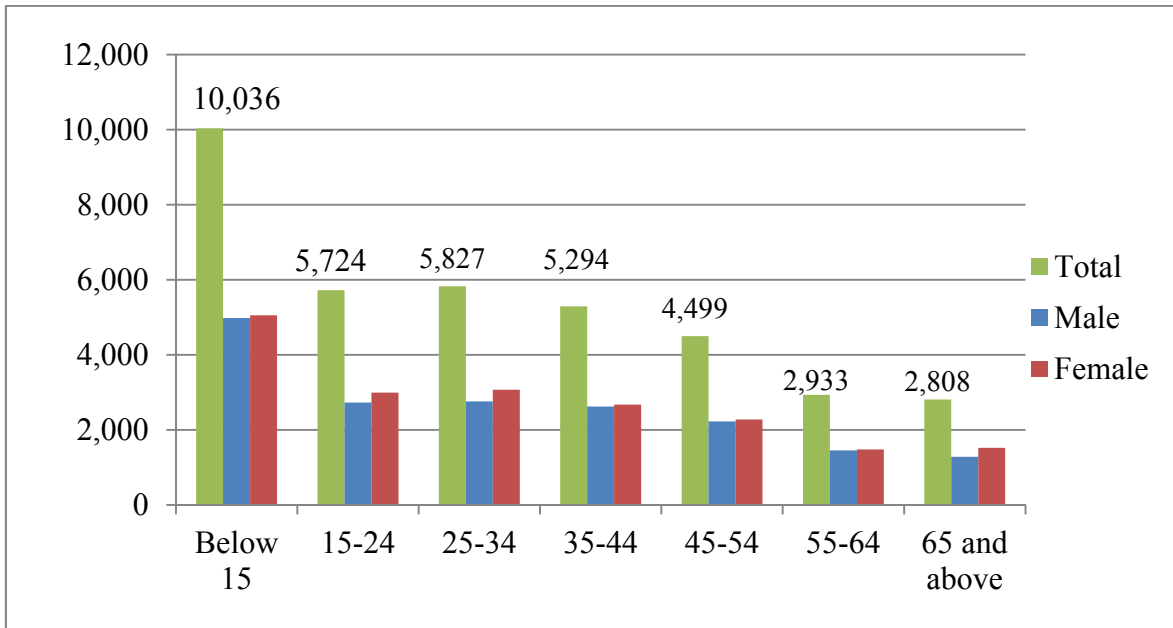


Figure 7- Age Distribution of the Sample

3.3.3 Marital Status

Non-married portion of the sample is 17.9% of the total; 49.7% are married; 4.0% are widowed; 1.4% are divorced and 27.0% are younger than 15.

Table 5-Marital Status

Marital Status	Frequency	Percent
Never Married	6,653	17.9%
Married	18,432	49.7%
Widowed	1,470	4.0%
Divorced	530	1.4%
Younger than 15 years of age	10,036	27.0%
Total	37,121	100.0%

In the survey 6,653 individuals are never married; 18,432 individuals are married; 1,470 individuals are widowed; 530 individuals are divorced and 10,036 individuals are younger than 15.

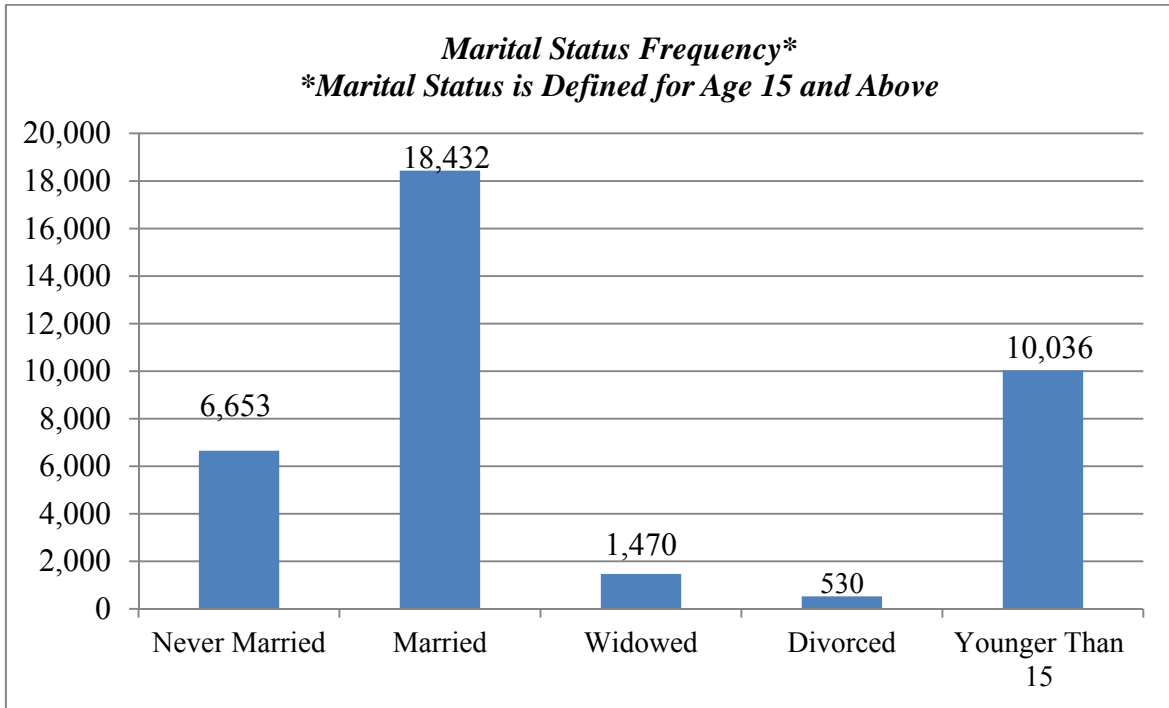


Figure 8- Marital Status Frequency

In the survey excluding the individuals younger than 15, 18,432 individuals are married and 8,653 individuals are non-married.

Table 6- Marital Status Groups

Marital Status	Frequency
Married	18,432
Non-Married	8,653

In the survey excluding the individuals younger than 15, 68% of the individuals are married and 32% non-married.

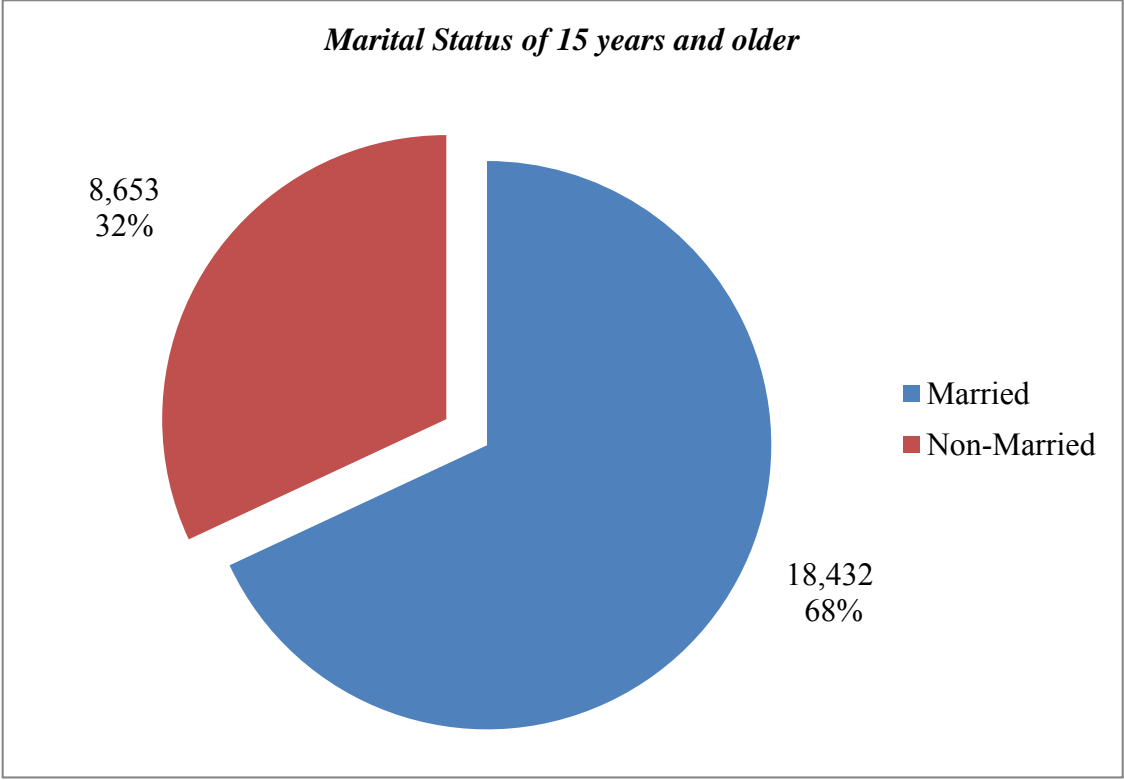


Figure 9-Grouped Marital Status

3.3.4 Education

In the survey 9.49% of the individuals are Illiterate (EDU1) consisting of 3,522 persons (738 male and 2,755 female), 55.94% are Literate-Graduate of Primary education at max (EDU2) consisting of 20,766 persons (10,065 male and 10,701 female); 4.69% are Secondary School Graduates (EDU3) consisting of 1,742 persons (1,128 male and 614 female); 0.11% are Junior Vocational High School Graduates (EDU4) consisting of 41 persons (25 male and 16 female); 7.35% are High School Graduates (EDU5) consisting of 2,406 persons (1,525 male and 1,204 female); 5.30% are Senior Vocational High School Graduates (EDU6) consisting of 1,967 persons (1,198 male and 769 female); 2.69% are 2-3 year-College Graduates (EDU7) consisting of 998 persons (574 male and 424 female); 4.27% are 4-year-College or University Graduates (EDU8) consisting of 1,584 persons (916 male and 668 female); 0.55% are Post Graduate/PhD (EDU9) consisting of 204 persons (123 male and 81 female) and 9.61% are below 6 years old consisting of 3,568 persons (1,763 male and 1,805 female).

Table 7- Education Levels of the Sample

Edu. Level	Total	Male	Female	Percent	Variable Explanation
EDU1	3,522	738	2,784	9.49%	Illiterate
EDU2	20,766	10,065	10,701	55.94%	Literate – Graduate of Primary education at max
EDU3	1,742	1,128	614	4.69%	Secondary School Graduates
EDU4	41	25	16	0.11%	Junior Vocational High School Graduates
EDU5	2,729	1,525	1,204	7.35%	High School Graduates
EDU6	1,967	1,198	769	5.30%	Senior Vocational High School Graduates
EDU7	998	574	424	2.69%	2-3 year-College Graduates
EDU8	1,584	916	668	4.27%	4-year-College or University Graduates
EDU9	204	123	81	0.55%	Post Graduate/PhD.
N/A	3,568	1,763	1,805	9.61%	Below 6 years old
Total	37,121			100.00%	

EDU2 (Literate – not completed a school or graduated from Primary school or graduated from Primary education) is the most dominant group with more than twenty thousand individuals whereas EDU4 (Junior Vocational High School Graduates) is the least represented group with only 41 individuals. Although most of the education groups have nearly equal gender distribution, when illiterate ones are considered, EDU1 (Illiterate) has more than 2,700 women participants which are approximately 4 times as much as male individuals.

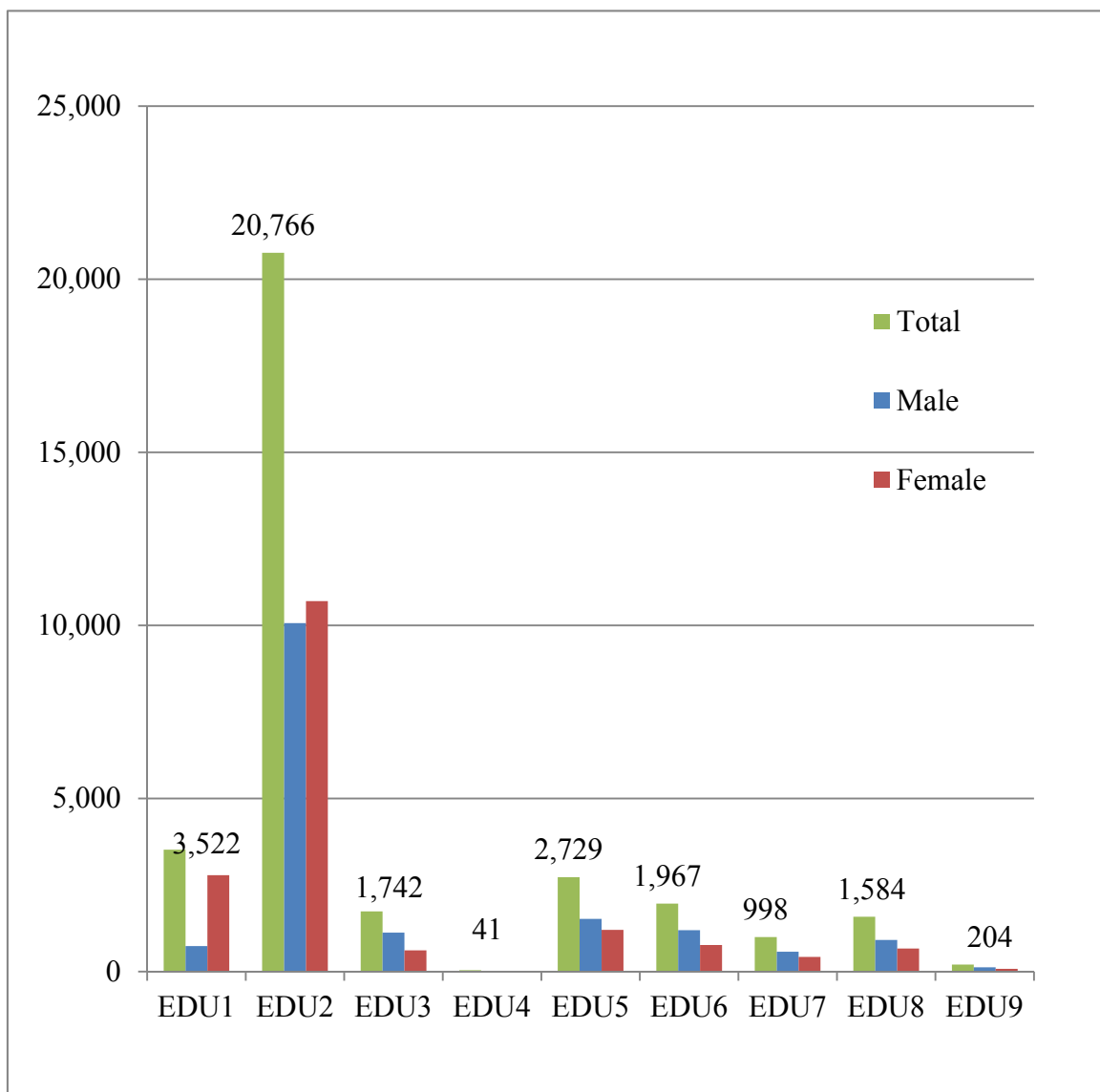


Figure 10- Education Levels

3.3.5 Industry Types

In the survey 25.4% of the individuals are working in agriculture, forestry, fishery industry (IND1) consisting of 3,301 persons (1,650 male and 1,651 female); 0.5% are working in mining and quarry industry (IND2) consisting of 64 persons (59 male and 5 female); 16.4% are working in manufacturing industry (IND3) consisting of 2,139 persons (1,565 male and 574 female); 0.8% are working in electricity, gas and water industry (IND4) consisting of 105 persons (100 male and 5 female); 7.6% are working in construction and public works industry (IND5) consisting of 991 persons (964 male and 27 female); 14.4% are working in wholesale and retail business, motor vehicles, repair of motorcycles, personal and house appliances industry (IND6) consisting of 1,871 persons (1,471 male and 400 female); 4.9% are working in hotel and restaurants industry (IND7) consisting of 640 persons (603 male and 37 female); 4.8% are working in transportation and storage services industry (IND8) consisting of 624 persons (492 male and 132 female) and 1.0% are working in information and communication industry (IND9) consisting of 125 persons (96 male and 29 female); 0.9% are working in financial brokerage services industry (IND10) consisting of 123 persons (78 male and 45 female); 0.7% are working in real estate agency, rentals and business activities industry (IND11) consisting of 88 persons (75 male and 13 female); 1.9% are working in the public management and defense, mandatory social security industry (IND12) consisting of 248 persons (170 male and 78 female); 3.2% are working in administrative and support service activities industry (IND13) consisting of 416 persons consisting of (281 male and 135 female); 5.3% are working in public administration and defense, compulsory social security industry (IND14) consisting of 693 persons (598 male and 95 female); 4.9% are working in education industry (IND15) consisting of 642 (324 male and 318 female); 2.6% are working in human health and social work activities industry (IND16) consisting of 336 (141 male and 195 female); 0.4% are working in arts, entertainment and recreation industry (IND17) consisting of 336 persons (141 male and 195 female); 4.3% are working in other social, community and personal service activities industry (IND18) consisting of 560 persons (263 male and 297 female). In total 13 021 individuals are working within below listed industry types.

Table 8-Industry Types of the Sample

Industry Type	Total	Percent	Male	Female	Explanation of the Variables
IND1	3,301	25.4%	1,650	1,651	Agriculture, forestry, fishery
IND2	64	0.5%	59	5	Mining and quarry
IND3	2,139	16.4%	1,565	574	Manufacturing Industry
IND4	105	0.8%	100	5	Electricity, gas and water
IND5	991	7.6%	964	27	Construction and public works
IND6	1,871	14.4%	1471	400	Wholesale and retail business, motor vehicles, repair of motorcycles, personal and house appliances
IND7	640	4.9%	603	37	Hotel and restaurants
IND8	624	4.8%	492	132	Transportation and storage services
IND9	125	1.0%	96	29	Information and Communication
IND10	123	0.9%	78	45	Financial brokerage services
IND11	88	0.7%	75	13	Real estate agency, rentals and business activities
IND12	248	1.9%	170	78	Public management and defense, mandatory social security
IND13	416	3.2%	281	135	Administrative and support service activities
IND14	693	5.3%	598	95	Public administration and defense, compulsory social security
IND15	642	4.9%	324	318	Education
IND16	336	2.6%	141	195	Human health and social work activities
IND17	55	0.4%	41	14	Arts, entertainment and recreation
IND18	560	4.3%	263	297	Other social, community and personal service activities
TOTAL	13,021	100.0%	8,971	4,050	

The most frequent 3 industries; IND1 (Agriculture, forestry, fishery), IND3 (Manufacturing Industry) and IND6 (Wholesale and retail business, motor vehicles, repair of motorcycles, appliances) add up to 56% of the total individuals represented in this study although there are 18 industry groups defined. On the other hand least populated industries are: IND17 (Arts, entertainment and recreation), IND2 (Mining and quarry), IND11 (Real estate agency, rentals and business activities) which have less than 100 participants.

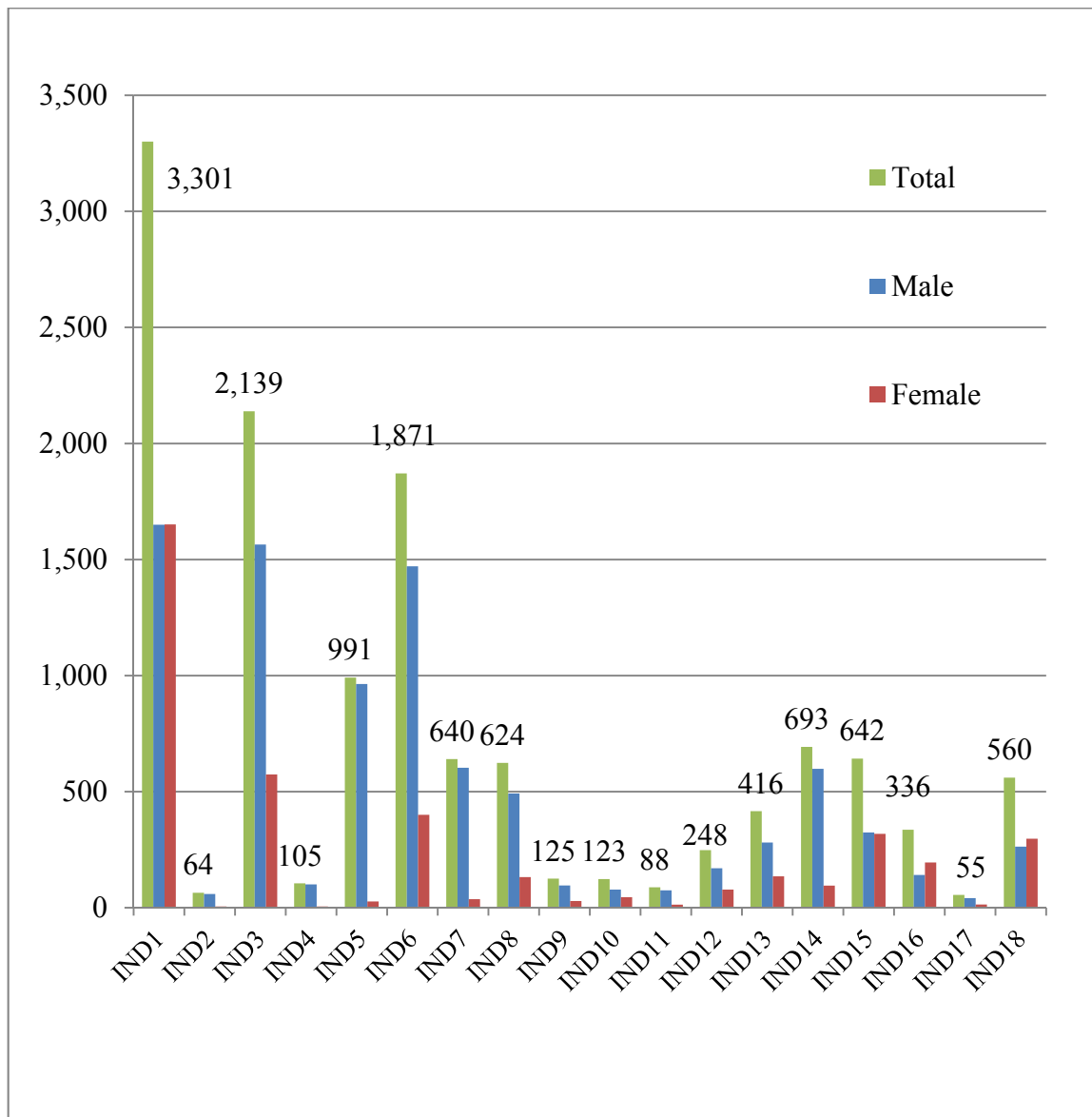


Figure 11- Industry Types

Industry Types by Education Level

In the following matrix, the education level distribution for each industry type is shown. In **IND1**; 557 individuals have EDU1, 2,389 individuals have EDU2, 139 individuals have EDU3, 102 individuals have EDU5, 80 individuals have EDU6, 20 individuals have EDU7, 12 individuals have EDU8 and 2 individuals have EDU9 respectively. In **IND2**; 38 individuals have EDU2; 7 individuals have EDU3; 6 individuals have EDU5 and 1 individual has EDU8. In **IND3**; 34 individuals have EDU1; 1,116 individuals have EDU2; 219 individuals have EDU3; 4 individuals have EDU4; 228 individuals have EDU5; 289 individuals have EDU6; 88 individuals have EDU7; 100 individuals have EDU8 and 11 individuals have EDU9. In **IND4**; 5 individuals have EDU1; 31 individuals have EDU2; 7 individuals have EDU3; 13 individuals have EDU5; 25 individuals have EDU6; 16 individuals have EDU7 and 8 individuals have EDU8. In **IND5**; 30 individuals have EDU1; 646 individuals have EDU2; 93 individuals have EDU3; 4 individuals have EDU4; 69 individuals have EDU5; 81 individuals have EDU6; 28 individuals have EDU7; 38 individuals have EDU8 and 2 individuals have EDU9. In **IND6**; 26 individuals have EDU1; 821 individuals have EDU2; 232 individuals have EDU3; 4 individuals have EDU4; 341 individuals have EDU5; 245 individuals have EDU6; 78 individuals have EDU7; 78 individuals have EDU7; 112 individuals have EDU8 and 12 individuals have EDU9. In **IND7**; 7 individuals have EDU1; 323 individuals have EDU2; 89 individuals have EDU3; 90 individuals have EDU5; 69 individuals have EDU6; 25 individuals have EDU7 and 37 individuals have EDU8. In **IND8**; 9 individuals have EDU1; 359 individuals have EDU2; 77 individuals have EDU3; 2 individuals have EDU4; 79 individuals have EDU5; 61 individuals have EDU6; 17 individuals have EDU7; 19 individuals have EDU8 and 1 individual has EDU9. In **IND9**; 27 individuals have EDU2; 8 individuals have EDU3; 29 individuals have EDU5; 14 individuals have EDU6; 12 individuals have EDU7; 31 individuals have EDU8 and 4 individuals have EDU9. In **IND10**; 8 individuals have EDU2; 2 individuals have EDU3; 21 individuals have EDU5; 12 individuals have EDU6; 13 individuals have EDU7; 54 individuals have EDU8 and 13 individuals have EDU9. In **IND11**; 1 individual has EDU1; 48 individuals have EDU2; 7 individuals have EDU3; 13 individuals have EDU5; 11 individuals have EDU6; 3 individuals have EDU7 and 5

individuals have EDU8. In **IND12**; 22 individuals have EDU2; 7 individuals have EDU3; 35 individuals have EDU5; 34 individuals have EDU6; 32 individuals have EDU7; 106 individuals have EDU8 and 12 individuals have EDU9. In **IND13**; 11 individuals have EDU1; 174 individuals EDU2; 43 individuals have EDU3; 2 individuals have EDU4; 76 individuals have EDU5; 65 individuals have EDU6; 28 individuals have EDU7 and 17 individuals have EDU8. In **IND14**; 1 individual has EDU1; 130 individuals have EDU2; 58 individuals have EDU3; 116 individuals have EDU5; 74 individuals have EDU6; 129 individuals have EDU7; 173 individuals have EDU8 and 12 individuals have EDU9. In **IND15**; 48 individuals have EDU2; 20 individuals have EDU3; 31 individuals have EDU5; 23 individuals have EDU6; 59 individuals have EDU7; 395 individuals have EDU8 and 66 individuals have EDU9. In **IND16**; 41 individuals have EDU2; 15 individuals have EDU3; 39 individuals have EDU5; 44 individuals have EDU6; 71 individuals have EDU7; 85 individuals have EDU8 and 41 individuals have EDU9. In **IND17**; 1 individual has EDU1; 20 individuals have EDU2; 8 individuals have EDU3; 15 individuals have EDU5; 5 individuals have EDU6; 1 individual has EDU7; 4 individuals have EDU8 and 1 individual has EDU9. In **IND18**; 23 individuals have EDU1. 346 individuals have EDU2; 43 individuals have EDU3; 1 individual has EDU4; 44 individual has EDU5; 50 individuals have EDU6; 32 individuals have EDU7; 18 individuals have EDU8 and 3 individuals have EDU9.

In IND1, education levels of EDU2, EDU1 and EDU5 are dominating with 93% and EDU4 is not represented by any individual. In IND2, education levels of EDU2; EDU3 and EDU6 are dominating with 81% and EDU4 is not represented by any individuals as well. In IND3, graduates of EDU2; EDU6; EDU5 and EDU3 are forming majority with 88%. In IND4, education levels of EDU2, EDU6 and EDU7 are dominating with 68% and EDU4 and EDU9 are not represented by any individuals. In IND5, education levels of EDU2, EDU3 and EDU6 are dominating with 82%. In IND6, education levels of EDU2, EDU5, EDU6 and EDU3 are dominating with 87%. In IND7, education levels of EDU2, EDU5 and EDU3 are dominating with 78% and EDU4 and EDU9 are not represented by any individual. In IND8, education levels of EDU2, EDU5 and EDU2 are dominating with 82%. In IND9, education levels of EDU8, EDU5 and EDU2 are dominating with 69% and

EDU1 and EDU4 are not represented by any individuals. In IND10, education levels of EDU8, EDU5, EDU7 and EDU9 are dominating with 82% and EDU1 and EDU4 are not represented by any individuals. In IND11, education levels of EDU2, EDU5 and EDU11 are dominating with 81% and EDU4 and EDU9 are not represented by any individuals. In IND12, education levels of EDU8, EDU5 and EDU6 are dominating with 70% and EDU4 is not represented by any individuals. In IND13, education levels of EDU2, EDU5 and EDU6 are dominating with 75% and EDU9 is not represented by any individuals. In IND14, education levels of EDU8, EDU2 and EDU7 are dominating with 62% and EDU4 is not represented by any individuals. In IND15, education levels of EDU8, EDU9 and EDU7 are dominating with 80% and EDU1 is not represented by any individuals. In IND16, education levels of EDU8, EDU7 and EDU6 are dominating with 58%. On the other hand, EDU1 and EDU4 are not represented by any individuals in IND16. In IND17 education levels of EDU2, EDU5 and EDU3 are dominating with 78% and EDU4 is not represented by any individuals. In IND9, education levels of EDU2, EDU6 and EDU5 are dominating with 78%. In overall EDU2 is the most dominant group in all industry groups.

Table 9-Industry Type and Education Level Distribution

	IND1	IND2	IND3	IND4	IND5	IND6	IND7	IND8	IND9	IND10	IND11	IND12	IND13	IND14	IND15	IND16	IND17	IND18
EDU1	557	0	34	5	30	26	7	9	0	0	1	0	11	1	0	0	1	23
EDU2	2,389	38	1,166	31	646	821	323	359	27	8	48	22	174	130	48	41	20	346
EDU3	139	7	219	7	93	232	89	77	8	2	7	7	43	58	20	15	8	43
EDU4	0	0	4	0	4	4	0	2	0	0	0	0	2	0	0	0	0	1
EDU5	102	6	228	13	69	341	90	79	29	21	13	35	76	116	31	39	15	44
EDU6	80	7	289	25	81	245	69	61	14	12	11	34	65	74	23	44	5	50
EDU7	20	5	88	16	28	78	25	17	12	13	3	32	28	129	59	71	1	32
EDU8	12	1	100	8	38	112	37	19	31	54	5	106	17	173	395	85	4	18
EDU9	2	0	11	0	2	12	0	1	4	13	0	12	0	12	66	41	1	3

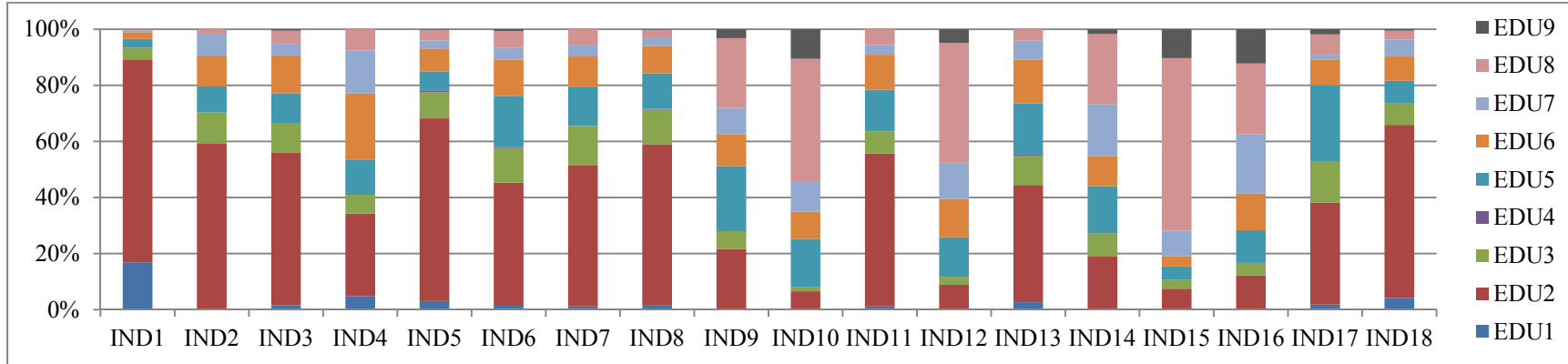


Figure 12- Education Level Distribution (%)

3.3.6 Occupation

Among all occupation types, OCU6 has the highest frequency whereas OCU4 has the lowest.

Table 10-Occupation Types of the Sample

Occu. Type	Male	Female	Total	Percent	Variable Explanations
OCU1	1,011	137	1,148	8.8%	Legislators and senior officials
OCU2	559	431	990	7.6%	Professionals
OCU3	570	229	799	6.1%	Associate professionals
OCU4	463	282	745	5.7%	Office and customer service clerks
OCU5	1,101	457	1,558	12.0%	Service and sales workers
OCU6	1,472	1,357	2,829	21.7%	Skilled agricultural, animal producers, forestry and fishery workers
OCU7	1,443	275	1,718	13.2%	Craft and related trades workers
OCU8	1,071	131	1,202	9.2%	Plant and machine operators and assemblers
OCU9	1,281	751	2,032	15.6%	Unskilled labor
Total	8,971	4,050	13,021	100.0%	

Majority of the individuals are occupied within occupation type OCU6, OCU9, OCU7, OCU5, OCU8 and OCU1 with 82%.

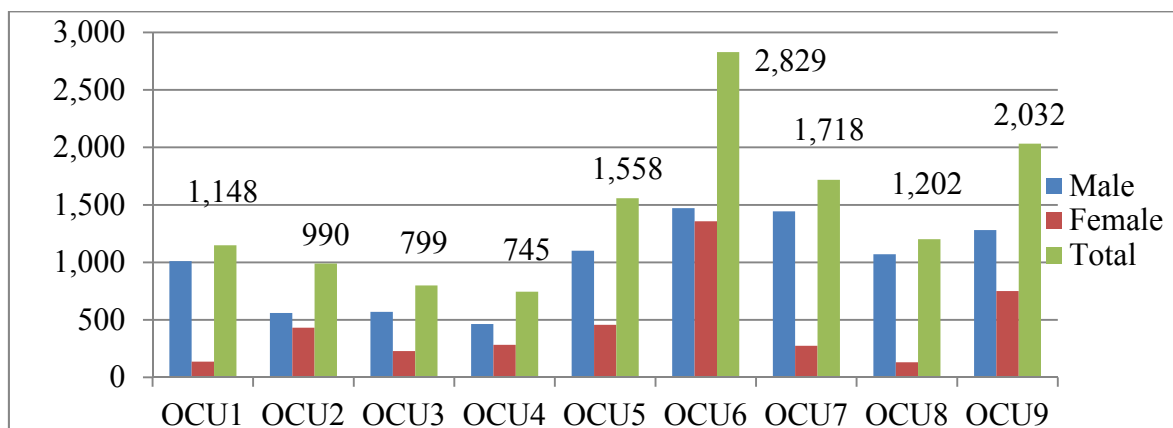


Figure 13- Occupation Types

3.3.7 Experience

Comparing the experience duration, 4,843 individuals have 1-5 years of experience, representing the 37.2% of the total participants. The number of individuals with less than 6 months experience is 1,443 which is 11.1% of the sample. 2,137 individuals have 6-10 years of experience, representing the 16.4% of the sample. 1,122 individuals have 11-15 years of experience, representing 8.6% of the sample. 742 individuals have 21-25 years of experience, representing 5.7% of the sample. 1,438 individuals have more than 26 years of experience, representing 11% of the participants.

Table 11-Total Years of Experience

Total Years of Experience	Frequency	Percent
0 (Less than 6 months)	1,443	11.1%
1-5	4,843	37.2%
6-10	2,137	16.4%
11-15	1,296	10.0%
16-20	1,122	8.6%
21-25	742	5.7%
26-Above	1,438	11.0%
Total	13,021	100.0%

Majority of the individuals, 4,843, have 1-5 years of experience, representing 37.2% of the sample.

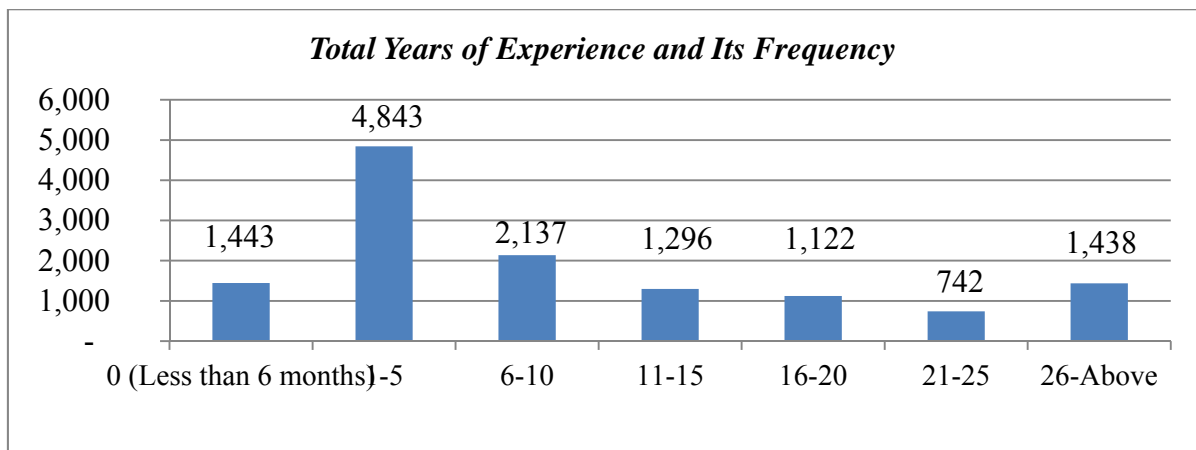


Figure 14- Total Years of Experience

3.3.8 Organization Types of the Employers

Among more than 13 thousands individuals, 86.8% of them are working in the private sector and 13.2% are working in the public sector.

Table 12-Organization Types

Organization Type	Frequency	Percent
Private	11,300	86.8%
Public (46 SOE workers are also included)	1,721	13.2%
Total	13,021	100.0%

11,300 individuals are working in private sector and 1,721 individuals are working in public sector, in which 46 SOE workers are also included.

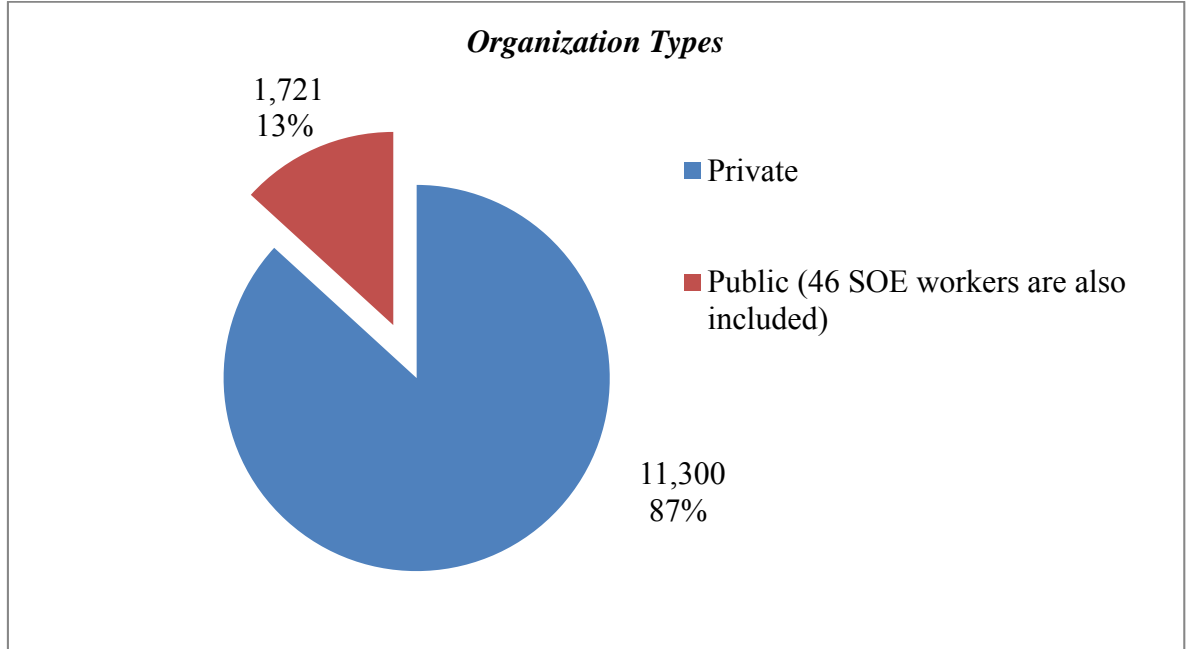


Figure 15- Organization Types

3.3.9 Unionization

Majority of the participated individuals which corresponds to 89% are not unionized and 11% are unionized. Among 13,021 participants, this question is not answered by 4710 individuals.

Table 13-Unionization of Private and Public Sector

Unionization	Public	Private	Total
Unionized	708	199	907
Non-Unionized	1,013	6,391	7,404

7,404 individuals are non-unionized and 907 individuals are unionized.

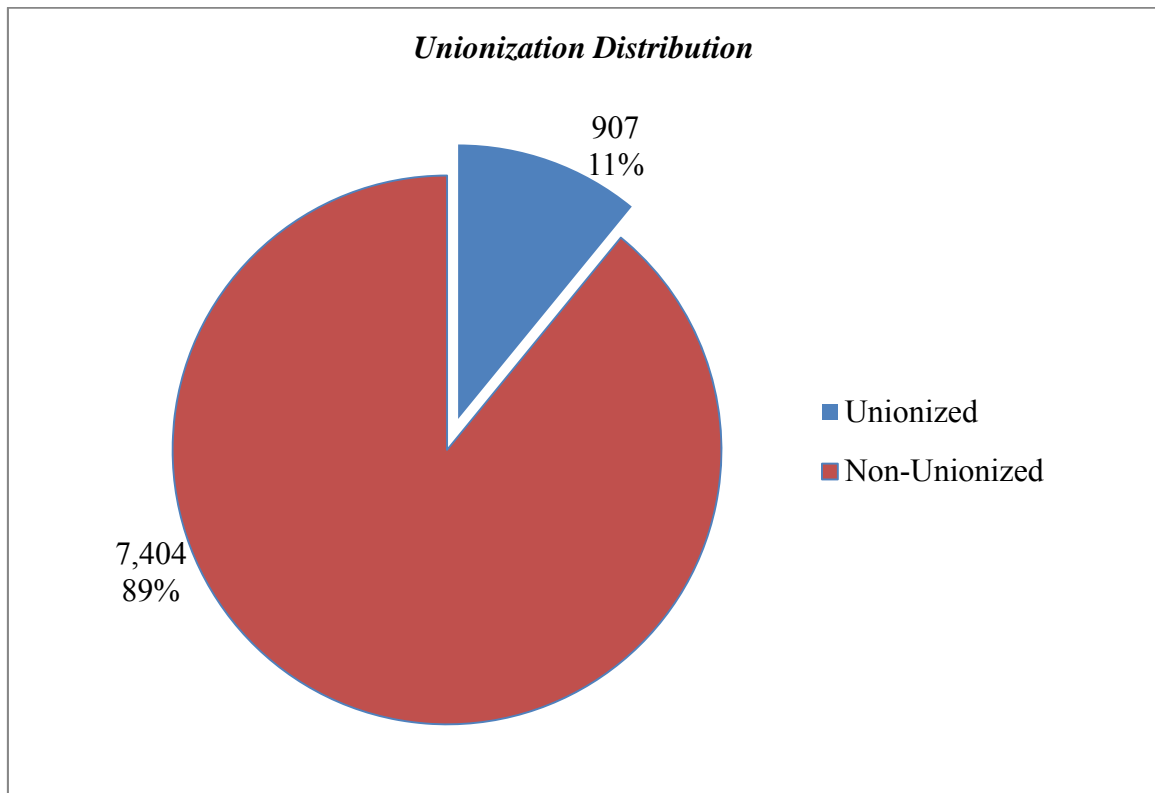


Figure 16- Unionization Distribution

3.3.10 Income

According to the three different income types the male average is much higher than female average between 79.10% - 82.28%. The overall average LINC income is 12,554 TRY, LINC_IK average is 13,318 TRY whereas TOTAL_INC average for the whole sample space is 15,283 TRY. By definition of these income types mentioned before, average income for both genders increase from LINC towards TOTAL_INC.

Table 14-Average Incomes of the Sample

Income Types	Male Average (in TRY)	Female Average (in TRY)	Overall Average (in TRY)
LINC	14,294	7,981	12,554
LINC_IK	15,135	8,543	13,318
TOTAL_INC	17,455	9,576	15,283

Below, three different income types for male, female and overall income averages are depicted as a bar graph.

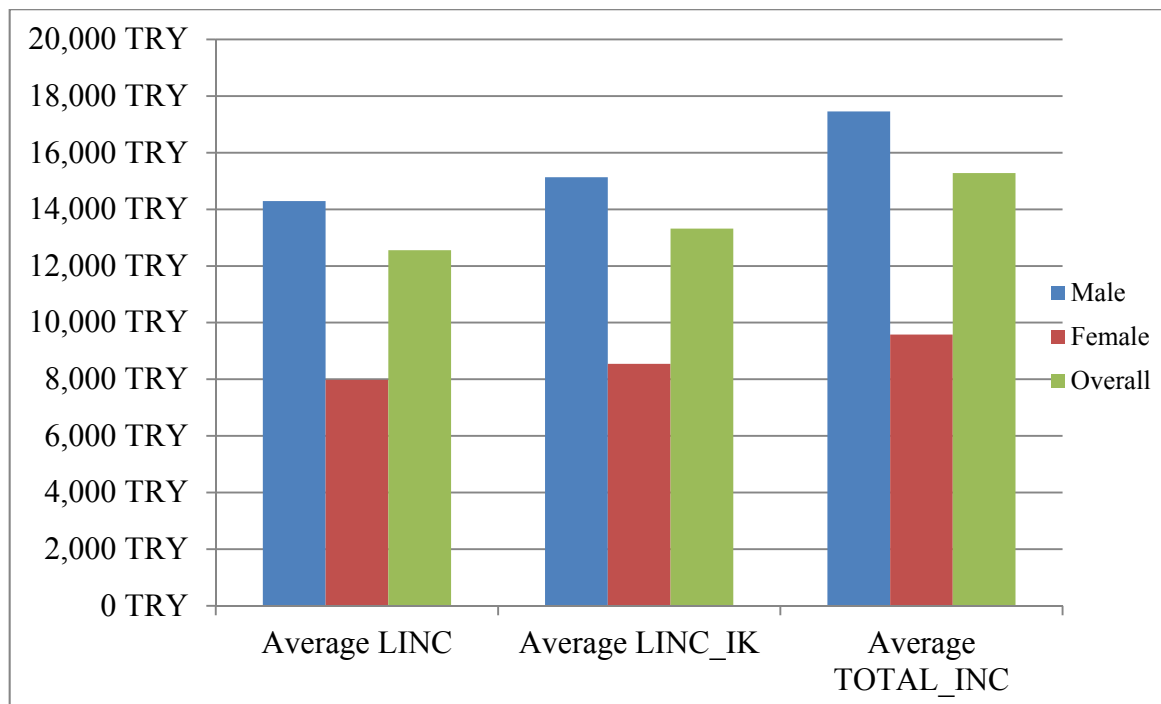


Figure 17- Average Incomes by Gender

Industry-based Income

The detailed outcomes of the income for male and female samples are shown below. In all industries the three income types are increasingly for both genders. Among these industries; IND7 (Hotel and restaurants) and IND17 (Arts, entertainment and recreation) female average earnings are higher than men for all three types of incomes. Also in industries; IND9 (Information and Communication), IND10 (Financial brokerage services) and IND14 (Public administration and defense, compulsory social security) both genders have almost same income averages. For the rest of them, average income for males is higher than females.

Table 15-Industry Based Average Income for Male and Female Samples

MALE				FEMALE			
TYPE	LINC (in TRY)	LINC_IK (in TRY)	TOTAL (in TRY)	TYPE	LINC (in TRY)	LINC_IK (in TRY)	TOTAL_INC (in TRY)
IND1	11,220	11,332	15,649	IND1	3,200	3,270	4,536
IND2	14,889	16,124	16,830	IND2	9,624	13,232	14,368
IND3	14,808	16,305	17,748	IND3	6,562	7,572	8,040
IND4	14,734	15,687	16,525	IND4	11,052	11,123	12,435
IND5	12,156	12,689	14,721	IND5	8,097	8,971	9,261
IND6	15,789	17,039	19,360	IND6	8,801	9,891	10,842
IND7	14,710	15,458	18,174	IND7	17,082	18,289	19,091
IND8	10,950	12,194	13,583	IND8	7,026	8,197	9,217
IND9	19,263	20,460	21,704	IND9	18,316	19,825	20,769
IND10	27,106	28,380	30,771	IND10	25,236	26,777	28,839
IND11	11,338	13,532	17,875	IND11	9,648	11,958	13,817
IND12	24,649	25,346	30,430	IND12	13,389	14,258	16,551
IND13	13,575	14,714	15,994	IND13	6,307	6,887	7,297
IND14	22,689	23,479	24,606	IND14	21,497	21,926	22,807
IND15	23,301	23,768	25,529	IND15	16,830	17,171	18,532
IND16	26,890	27,827	30,236	IND16	18,618	19,398	20,217
IND17	11,382	11,760	13,728	IND17	23,481	24,640	29,014
IND18	12,809	13,430	15,379	IND18	6,211	6,575	7,629

Looking at the industry based average earnings; men working in IND10 (Financial brokerage services) earned the most which is 27,106 TRY, on average. For the industries IND16 (Human health and social work activities), IND12 (Public management and defense, mandatory social security), IND15 (Education) and IND14 (Public administration and defense, compulsory social security); male members have the highest average respectively which is above 20,000 TRY for LINC income type. In IND14 and IND18 industries, men earn more than 15,000 TRY, on average, for LINC. IND8 male members have the minimum average LINC income which is 10,950 TRY. Men earns the minimum average which is below 13,000 TRY in the industries IND1 (Agriculture, forestry, fishery), IND11 (Real estate agency, rentals and business activities), IND17 (Arts, entertainment and recreation), IND5 (Construction and public works) and IND18 (Other social, community and personal service activities).

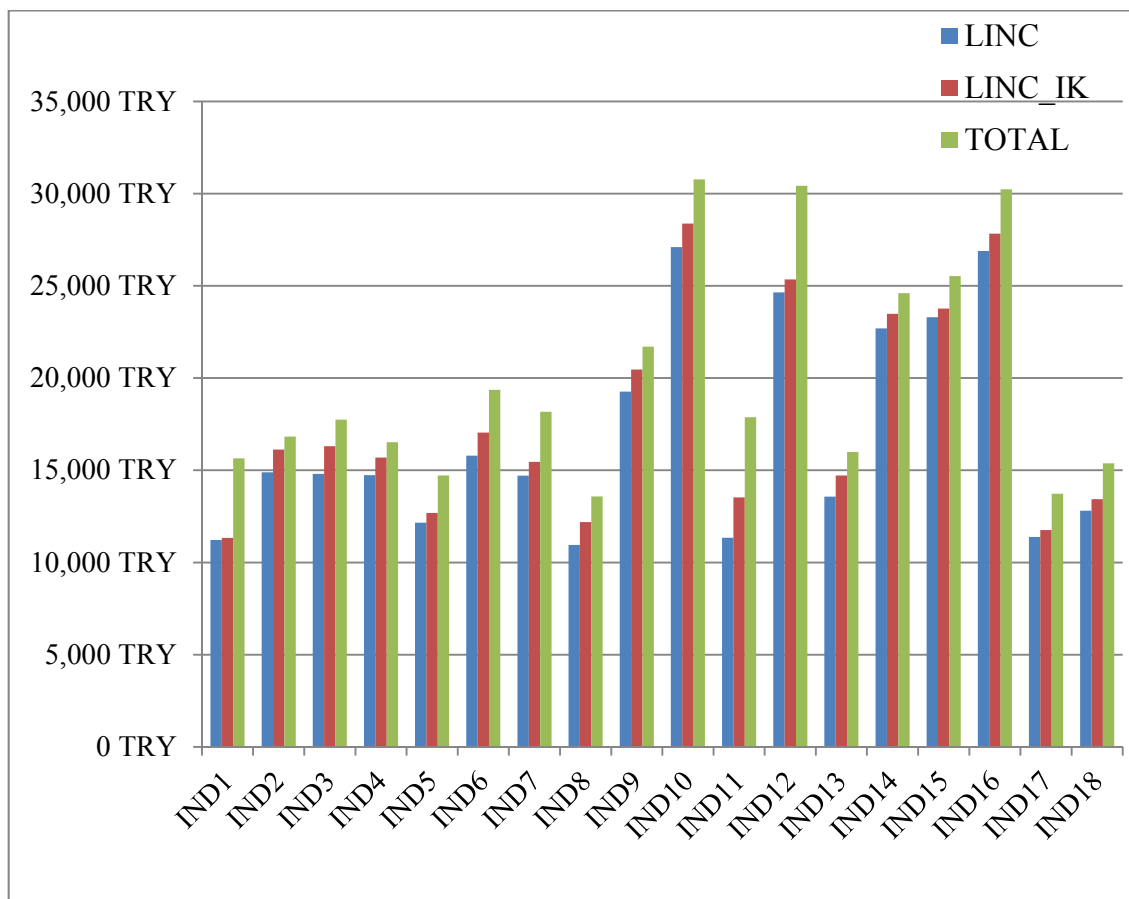


Figure 18- Industry Based Average Income for Male Samples

Considering the females; industry based average the overall average surpasses 5,000 TRY except IND1 (Agriculture, forestry, fishery) which has the lowest average of 3,200 TRY for LINC type of income. Women have the lowest income average of less than 10,000 TRY in the industries IND18 (Other social, community and personal service activities), IND13 (Administrative and support service activities), IND3 (Manufacturing Industry), IND8 (Transportation and storage services), IND5 (Construction and public works), IND6 (Wholesale and retail business, motor vehicles, repair of motorcycles, appliances), IND2 (Mining and quarry) and IND11 (Real estate agency, rentals and business activities). On the other hand, women get the highest income in IND10 which is 25,236 TRY, on average. Next, women have the second and third highest income level in IND17 and IND14 respectively which is above 20,000 TRY for LINC type of income

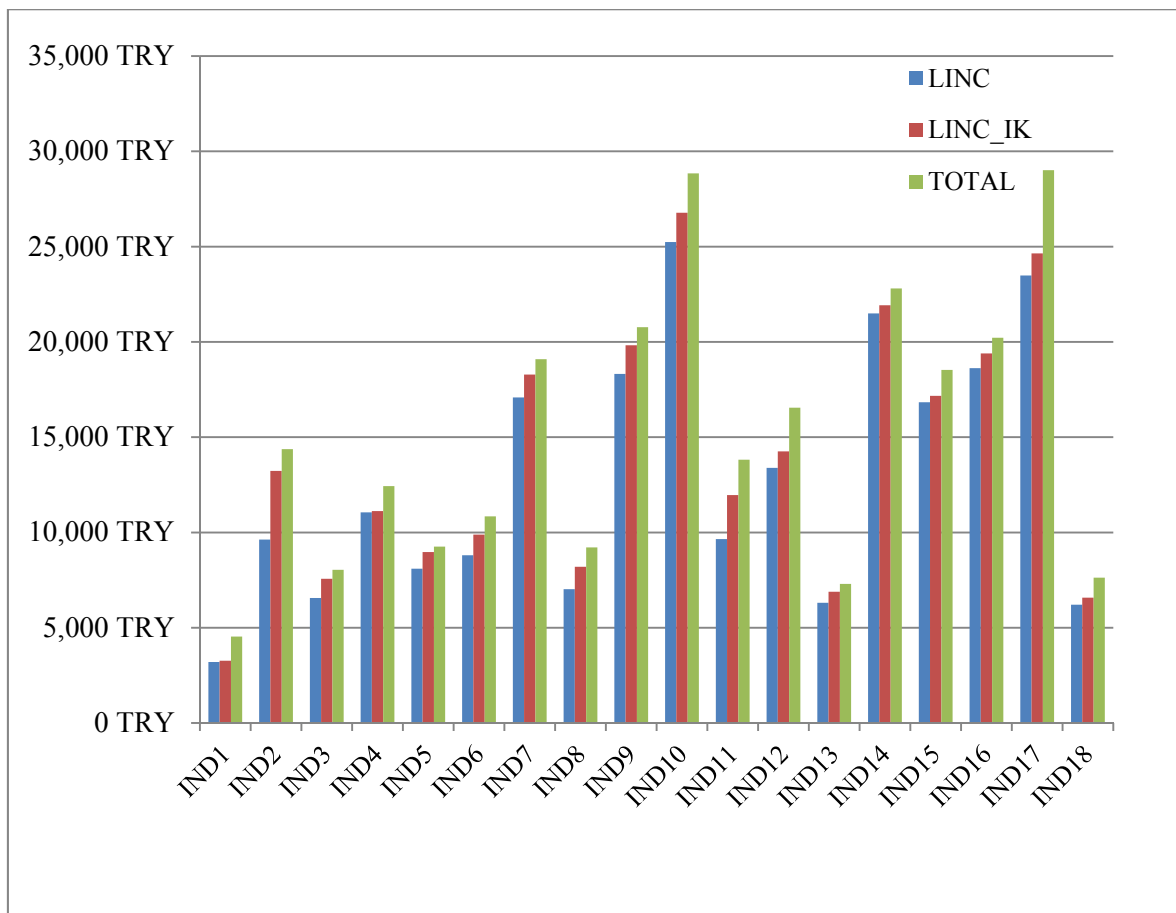


Figure 19- Industry Based Average Income for Female Samples

The industry-based average income for the whole sample is shown in Table 16. According to the survey group IND10 (Financial brokerage services) members have the highest wage which is 26,441 TRY. Then, IND14 (Public administration and defense, compulsory social security), IND16 (Human health and social work activities), IND12 (Public management and defense, mandatory social security) and IND15 (Education) members have the next highest level of earnings respectively which is above 20,000 TRY. IND1 (Agriculture, forestry, fishery) members have the lowest income level which is 9,012 TRY. IND18 (Other social, community and personal service activities), IND8 (Transportation and storage services), IND11 (Real estate agency, rentals and business activities) and IND13 (Administrative and support service activities) members come next, in terms of the least earning groups based on industry types.

Table 16-- Industry Based Average Income for the Whole Sample

TYPE	LINC (in TRY)	LINC_IK (in TRY)	TOTAL_INC (in TRY)
IND1	9,012	9,113	12,590
IND2	14,471	15,895	16,635
IND3	12,642	14,011	15,198
IND4	14,558	15,469	16,331
IND5	12,043	12,585	14,569
IND6	14,411	15,630	17,681
IND7	14,844	15,618	18,226
IND8	10,202	11,433	12,751
IND9	19,054	20,319	21,497
IND10	26,441	27,811	30,084
IND11	11,076	13,289	17,247
IND12	21,141	21,892	26,107
IND13	11,247	12,207	13,209
IND14	22,525	23,266	24,358
IND15	20,091	20,495	22,058
IND16	22,106	22,952	24,442
IND17	14,462	15,039	17,619
IND18	9,306	9,791	11,265

Overall industry based average is over 10,000 TRY for TOTAL_INC type of income. IND1 (Agriculture, forestry, fishery) members have the lowest average LINC type of income which is 9,012 TRY. IND18 (Other social, community and personal service activities) members' average LINC income is below 10,000 TRY. In addition, IND8 (Transportation and storage services), IND11 (Real estate agency, rentals and business activities) and IND13 (Administrative and support service activities) members respectively have the lowest average income which is below 12,000 TRY for LINC type of income. IND10 (Financial brokerage services) members have the highest average LINC income which is 26,441 TRY. Finally, IND14 (Public administration and defense, compulsory social security), IND16 (Human health and social work activities), IND12 (Public management and defense, mandatory social security) and IND15 (Education) members respectively have the highest LINC income average which is above 20,000 TRY.

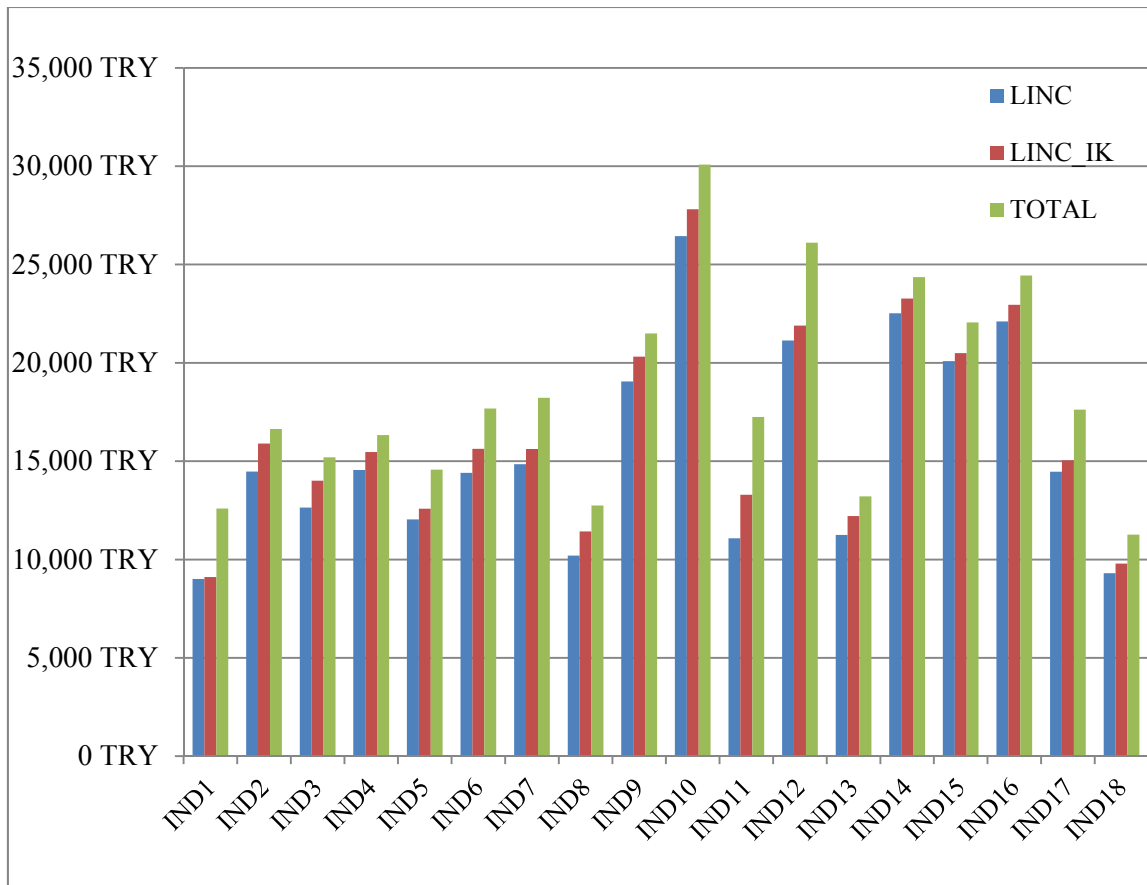


Figure 20- Industry Based Average Income for the Whole Sample

Occupation-based Income

The occupational-based income is shown in below. Men are making approximately 30% more than the women in OCU2 (Professionals) which has the lowest average income gap between genders. This income gap due to gender increases about 40% in OCU4 (Office and customer service clerks), OCU3 (Associate professionals) and OCU1 (Legislators and senior officials). Highest difference is in OCU6 (Skilled agricultural, animal producers, forestry and fishery workers) in which males are earning 3.12 times more than the females. Besides, males are making approximately 3 times more than the females in OCU7 (Craft and related trades workers).

Table 17-Occupation-based Average Income for Genders

MALE				FEMALE			
TYPE	LINC (in TRY)	LINC_IK (in TRY)	TOTAL_INC (in TRY)	TYPE	LINC (in TRY)	LINC_IK (in TRY)	TOTAL_INC (in TRY)
OCU1	30,948	32,309	37,009	OCU1	21,180	23,202	26,211
OCU2	28,644	29,533	32,116	OCU2	21,948	22,493	23,895
OCU3	18,022	19,362	21,269	OCU3	12,709	13,774	14,786
OCU4	15,512	16,594	18,138	OCU4	11,154	12,190	12,522
OCU5	11,720	12,688	13,679	OCU5	6,895	7,539	8,57
OCU6	11,965	12,050	12,687	OCU6	3,829	3,840	5,550
OCU7	10,860	11,721	12,999	OCU7	3,624	4,089	4,698
OCU8	12,397	13,525	15,107	OCU8	7,350	8,624	8,744
OCU9	8,053	8,888	10,081	OCU9	4,252	4,774	5,286

The average income is higher in skilled occupations than unskilled occupations. OCU9 (Unskilled labor) male members have the lowest average of income which is 8,053 TRY for LINC income type. Male members of OCU7 (Craft and related trades workers), OCU5 (Service and sales workers), OCU6 (Skilled agricultural, animal producers, forestry and fishery workers) and OCU8 (Plant and machine operators and assemblers) have respectively lowest average LINC income which is below 13,000 TRY. Conversely, OCU1 (Legislators and senior officials) male members earns the most which is 30,498 TRY on average. Male members of OCU2 (Professionals) and OCU3 (Associate professionals) earns the most on average.

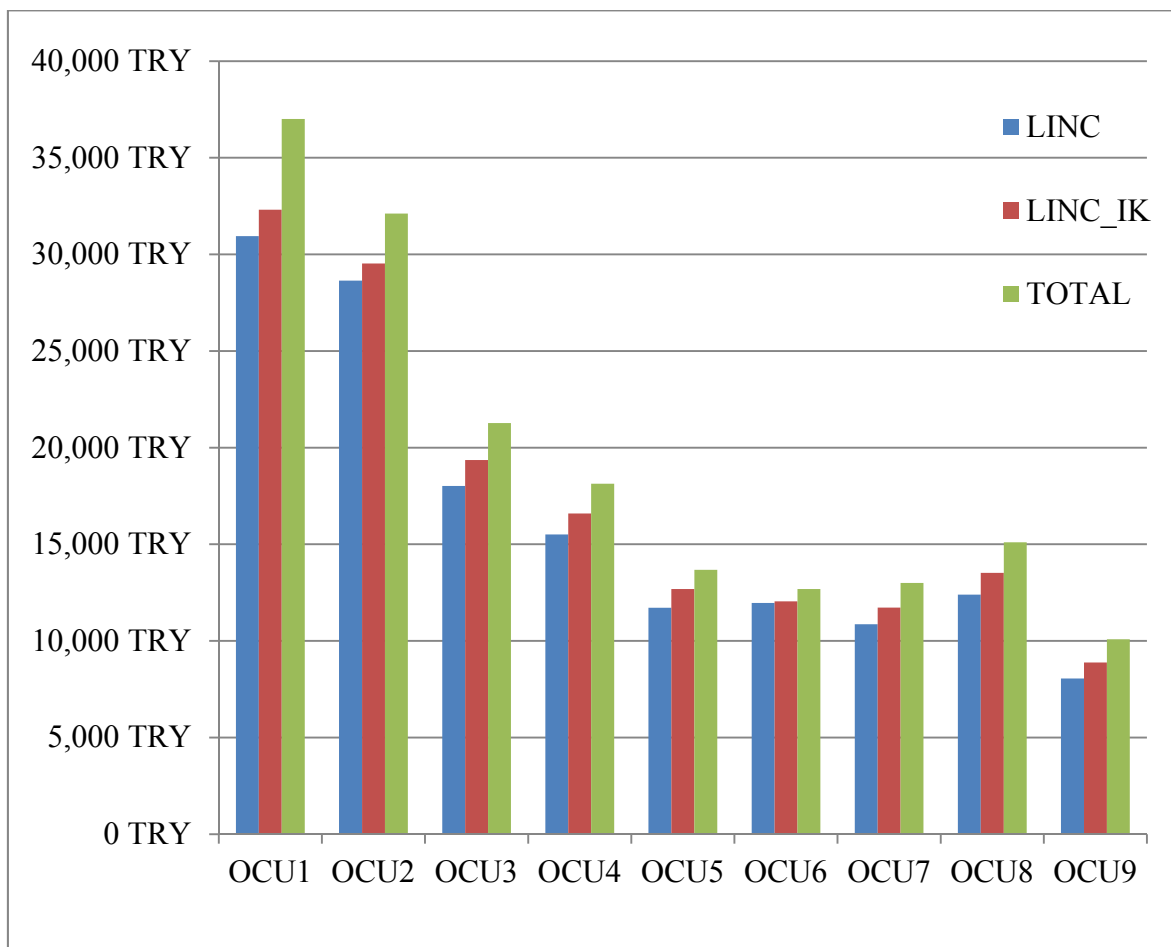


Figure 21- Occupation-based Male Incomes

Occupation based income is higher in skilled occupation than unskilled occupation for women as well as for men. Female members of OCU7 (Craft and related trades workers) have the lowest average LINC which is 3,624 TRY. OCU6 (Skilled agricultural, animal producers, forestry and fishery workers), OCU9 (Unskilled labor), OCU5 (Service and sales workers) and OCU8 (Plant and machine operators and assemblers) members earns the lowest respectively on average which is less than 7,500 TRY. Contrarily, OCU2 (Professionals) female members earns the most on average which is 21,948 TRY. Following OCU2, female members of OCU1 (Legislators and senior officials) have the second highest average which is 21,180 TRY and OCU3 (Associate professionals) comes next with an average income of 12,709. Obviously, there is a huge gap between them.

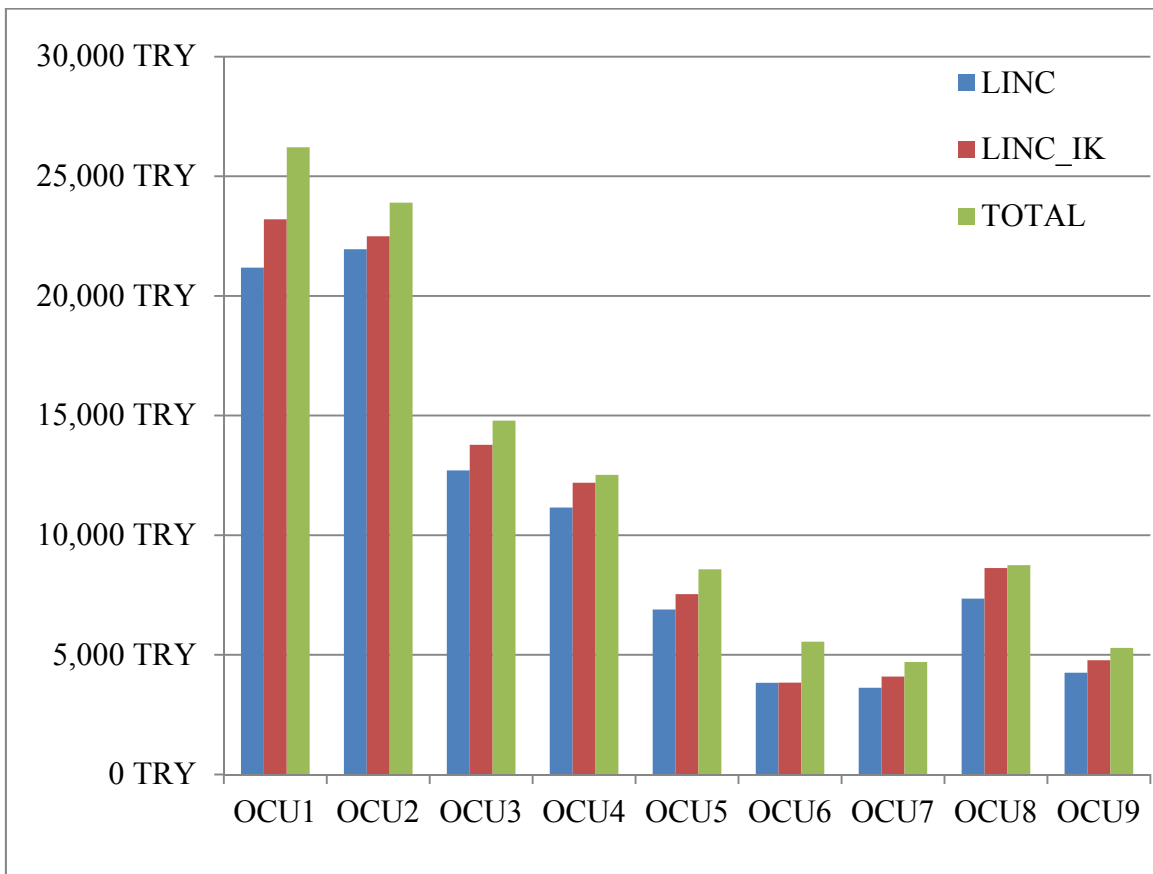


Figure 22- Occupation-based Average Income for Females

Overall, OCU1 (Legislators and senior officials) members have the highest average income of 29,795 TRY which is slightly higher than OCU2 (Professionals). Those two occupations are followed by OCU3 (Associate professionals). On the other hand, OCU9 (Unskilled labor) members have the lowest average income which is 6,193 for LINC type of income. OCU7 (Craft and related trades workers) and OCU6 (Skilled agricultural, animal producers, forestry and fishery workers) professions comes next in regard to the lowest average incomes.

Table 18-Average Income of the Entire Sample based on Occupation

TYPE	LINC (in TRY)	LINC_IK (in TRY)	TOTAL_INC (in TRY)
OCU1	29,795	31,234	35,734
OCU2	25,731	26,470	28,539
OCU3	16,502	17,763	19,415
OCU4	13,881	14,946	16,036
OCU5	10,405	11,285	12,287
OCU6	10,152	10,221	14,283
OCU7	9,736	10,536	11,710
OCU8	11,859	13,003	14,429
OCU9	6,193	7,525	8,492

Generally, average income is higher in skilled occupation than unskilled occupation. This fact holds true for this study group as well. As shown above, the pattern is similar for both males' and females' occupation based income averages.

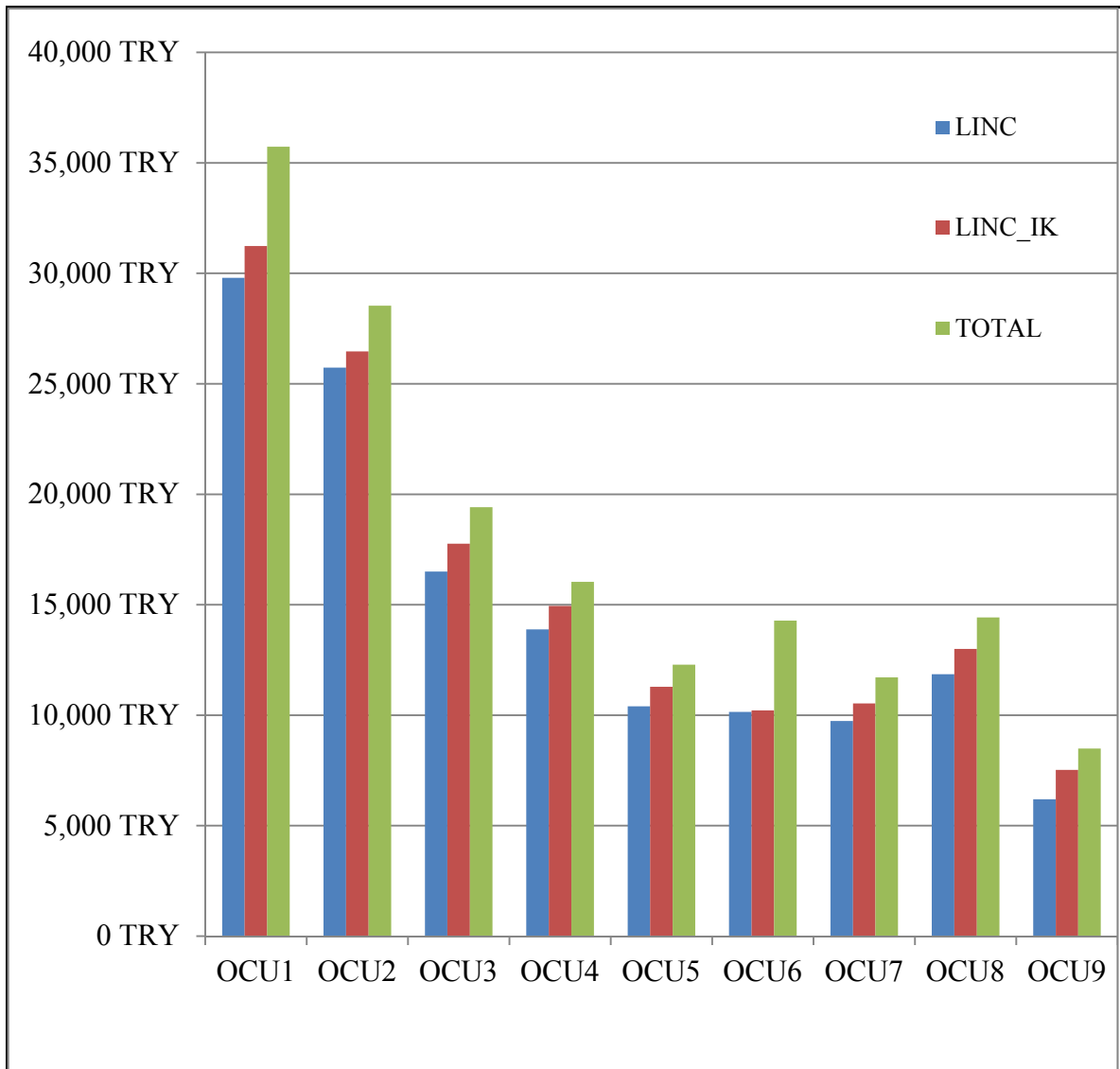


Figure 23- Average Income of the Entire Sample based on Occupation

Education-based Income

The education-based income for both genders is shown in below. There is an intense income gap between female and male averages. However, this gap tends to decrease when higher education levels are considered. Men are making approximately five times more money than women on average in EDU4 (Junior Vocational High School Graduates) and EDU2 (Literate – not completed a school or graduated from Primary school or graduated from Primary education). Lowest gap is in EDU8 (4-year-College or University Graduates) and males earn 35% more than females within this group. EDU7 (2-3 year-College Graduates) and EDU9 (Post Graduate/PhD) groups have the least income gap between genders, which is about 50%.

Table 19-Education-based Average Income for Genders

MALE				FEMALE			
TYPE	LINC (in TRY)	LINC_IK (in TRY)	TOTAL_INC (in TRY)	TYPE	LINC (in TRY)	LINC_IK (in TRY)	TOTAL_INC (in TRY)
EDU1	5,819	6,019	8,295	EDU1	2,793	2,968	4,344
EDU2	10,704	11,386	13,736	EDU2	3,682	4,043	4,858
EDU3	16,257	17,178	19,486	EDU3	6,307	7,138	8,362
EDU4	9,938	10,671	12,013	EDU4	2,000	2,000	2,000
EDU5	14,507	15,566	17,311	EDU5	8,566	9,343	10,202
EDU6	14,440	15,569	17,573	EDU6	7,719	8,530	9,412
EDU7	19,845	20,898	22,793	EDU7	13,471	14,240	15,395
EDU8	27,230	28,252	31,239	EDU8	20,087	20,862	22,548
EDU9	49,837	51,119	57,857	EDU9	31,838	33,420	34,359

Men with EDU1 (Illiterate) level are earning the least among male participants on average. Widest gap between LINC and TOTAL_INC with 43% is again valid for the EDU1 (Illiterate) male graduates. Following that, EDU4 (Junior Vocational High School Graduates) male graduates have the second minimum income on average. Male graduates of EDU9 (Post Graduate/PhD) have the highest income, which is 49,837 TRY, on average for LINC. Next, EDU8 (4-year-College or University Graduates) male graduates are the second highest income on average.

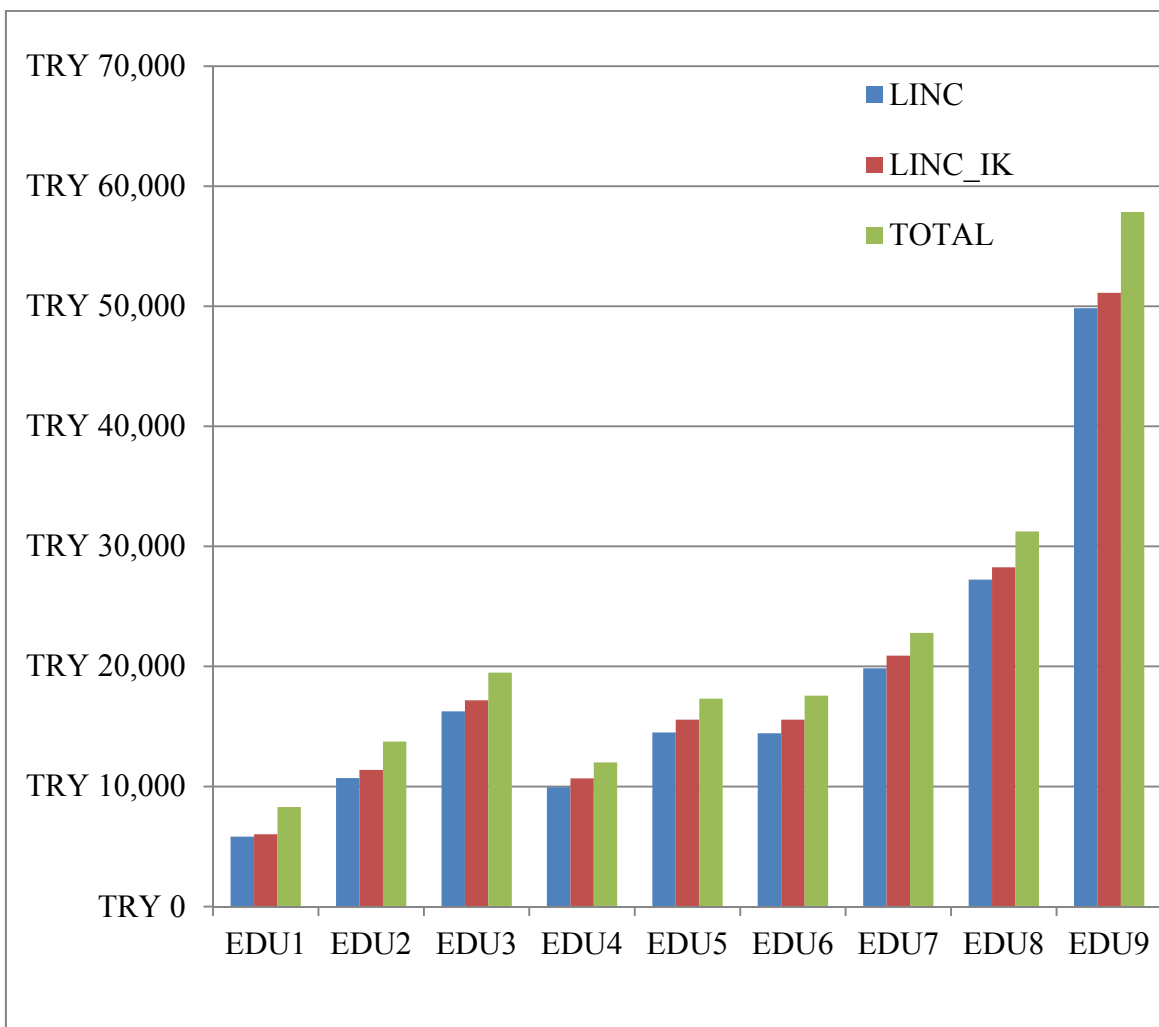


Figure 24- Education-based Average Incomes of Males

On the other hand, EDU4 (Junior Vocational High School Graduates) female graduates are earning the least among female participants on average. Next, EDU1 (Illiterate) level female graduates have the second lowest minimum income on average. On the contrary, EDU9 (Post Graduate/PhD) female graduates have the highest income of 31,838 TRY. Following EDU9; females with EDU8 (4-year-College or University Graduates) degree have the second highest income on average.

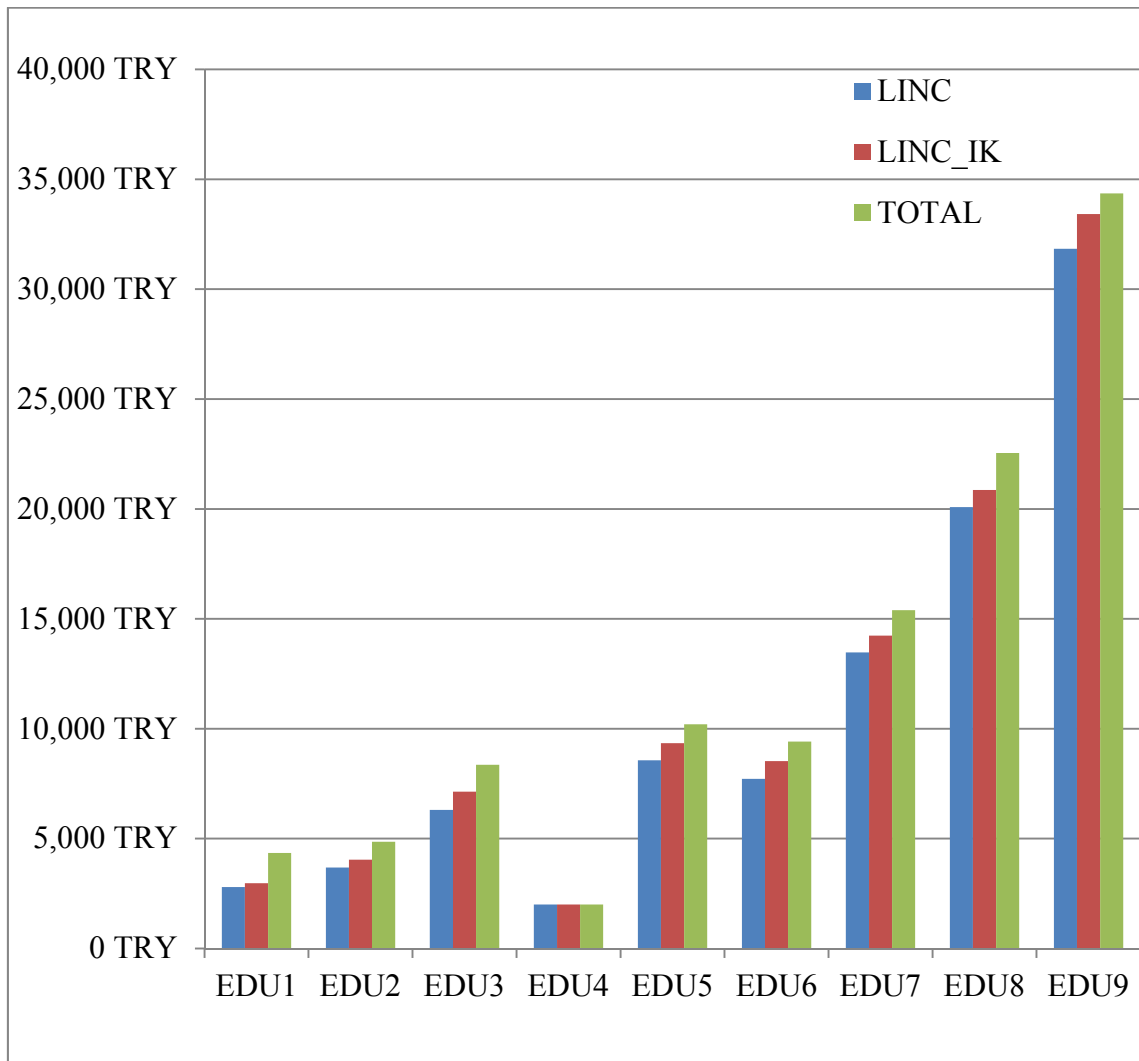


Figure 25- Education-based Average Incomes of Females

The education-based income for whole sample is shown below. EDU1 (Illiterate) group have minimum income which is 3,985 TRY on average. Widest gap between LINC and TOTAL_INC is 48% for EDU1 (Illiterate). After that group, EDU2 (Literate – not completed a school or graduated from Primary school or graduated from Primary education) degree holders have the second minimum income on average. EDU9 (Post Graduate/PhD) graduates have the highest income, which is 42,860 TRY. EDU9 is followed by EDU8 (4-year-College or University Graduates) with the second highest income on average.

Table 20-Average Income of the Entire Sample based on Education

TYPE	LINC (in TRY)	LINC_IK (in TRY)	TOTAL (in TRY)
EDU1	3,985	4,169	5,900
EDU2	8,891	9,490	11,444
EDU3	14,770	15,679	17,825
EDU4	9,541	10,238	11,513
EDU5	13,080	14,068	15,599
EDU6	12,860	13,917	15,658
EDU7	17,710	18,672	20,320
EDU8	24,470	25,396	27,880
EDU9	42,860	44,422	48,965

Income table of the whole sample based on education level is depicted below by a bar graph. It has an increasing trend from EDU1 (Illiterate) through EDU9 (Post Graduate/PhD) with an exception of EDU3 (Secondary School Graduates).

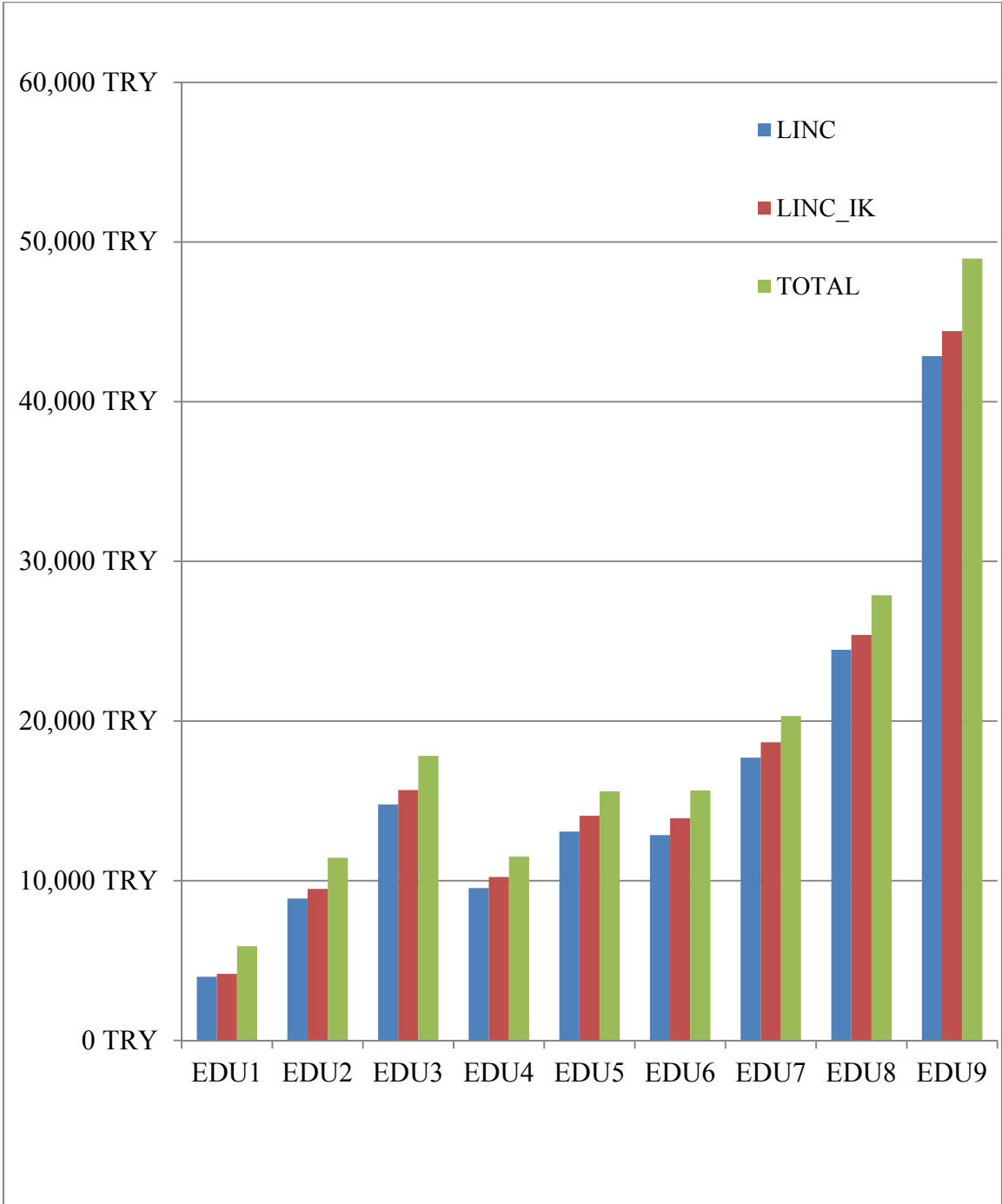


Figure 26- Average Income of the Entire Sample based on Education

4. MODEL AND EMPIRICAL RESULTS

This section outlines the development process of the model and presents the semi-logarithmic wage model. The study presents the measures on the effects of socio-economic and individual factors on the income of individuals.

4.1 Base Semi-logarithmic Regression Model

As it is discussed in the previous sections, Jacob Mincer's model of schooling, experience and earnings created solid and lasting applications for itself in the last 40 years. The basic model consists of the natural logarithm of earnings as dependent variable where education, experience and experience-squared are the explanatory variables. Model is shown below:

$$\ln y = \ln y_0 + rS + \beta_1 X + \beta_2 X^2$$

In this model, $\ln y$ represents the log of expected earnings of individuals. *Variable* $\ln y_0$, on the other hand, shows the level of earnings of individuals with no education and experience). The model is enhanced by several socio-economic factors that may determine the expected income of an individual. These factors are deducted from the literature discussed in the previous section.

The base model was transformed the following equation:

$$\begin{aligned} \log \text{INCOME} = & \beta_0 + \beta_1(\text{MALE}) + \beta_2(\text{MAR}) + \beta_3(\text{PUB}) + \beta_4(\text{UNI}) + \beta_5(\text{EDU2}) + \\ & \beta_6(\text{EDU3}) + \beta_7(\text{EDU4}) + \beta_8(\text{EDU5}) + \beta_9(\text{EDU6}) + \beta_{10}(\text{EDU7}) + \beta_{11}(\text{EDU8}) + \beta_{12}(\text{EDU9}) \\ & + \beta_{13}(\text{IND1}) + \beta_{14}(\text{IND2}) + \beta_{15}(\text{IND4}) + \beta_{16}(\text{IND5}) + \beta_{17}(\text{IND6}) + \beta_{18}(\text{IND7}) + \beta_{19}(\text{IND8}) \\ & + \beta_{20}(\text{IND9}) + \beta_{21}(\text{IND10}) + \beta_{22}(\text{IND11}) + \beta_{23}(\text{IND12}) + \beta_{24}(\text{IND13}) + \beta_{25}(\text{IND14}) + \\ & \beta_{26}(\text{IND15}) + \beta_{27}(\text{IND16}) + \beta_{28}(\text{IND17}) + \beta_{29}(\text{IND18}) + \beta_{30}(\text{OCU1}) + \beta_{31}(\text{OCU2}) + \\ & \beta_{32}(\text{OCU3}) + \beta_{33}(\text{OCU4}) + \beta_{34}(\text{OCU5}) + \beta_{35}(\text{OCU7}) + \beta_{36}(\text{OCU8}) + \beta_{37}(\text{OCU9}) + \\ & \beta_{38}(\text{AGE}) + \beta_{39}(\text{AGESQ}) + \beta_{40}(\text{EXP}) + \beta_{41}(\text{EXPSQ}) + \beta_{42}(\text{AWHR}) + \varepsilon \end{aligned}$$

In this equation excluded dummy variables to avoid multi-collinearity are the following:

EDU1 (Illiterate), IND3 (Manufacturing Industry), OCU6 (Skilled agricultural, animal producers, forestry and fishery workers)

Controlled Groups are:

Female (represented by MALE instrumental variable), Unmarried (represented by MAR instrumental variable), The Private Sector (represented by PUB instrumental variable), Non- Unionized (represented by UNI instrumental variable)

Three different analyses have been conducted based on different income types. The first income type is labor income which consists of the annual wage and bonuses (Defined as Variable LINC). The other income type is the total of cash and in kind income (Defined as Variable LINC_IK). The final income type is the sum of all types of incomes such as wage, interest revenue, rent income, property income, investment income, government transfers, etc... (Defined as Variable TOTAL_INC)

In the analysis, the earnings will be examined by industry and occupation types, educational attainment, age, experience, and marital status. In other words, regression tests are run on income types by taking into account of gender, union, and work status. The logarithmic transformation of wages is used to prevent both the skewness and heteroscedasticity. The robust regressions are also employed to correct for heteroscedasticity.

It is important to mention that the income refers to the income of individuals in this study, not the households. Therefore, in the dataset, people above legal working age are included and people that are younger than 15 are excluded.

As it can be seen from the equation above, the income equation is defined as a semi-logarithmic linear model. Income variable that is the dependent variable is calculated by taking the logarithmic value of the income. The explanatory variables cover the gender,

age, education level, marital status, industry type, occupation, experience, annual work hours, organization type (public/private sector) and unionization. The Ordinary Least Squares (The OLS) is used to estimate the income. In this analysis, STATA software and MS Excel has been used.

The explanatory variables are expected to predict all these three income types in this model. The variables are chosen in such a way that, explanatory variables such as education, experience, etc... would have solid impact on income types based on general economic theory. The contribution of marital status, organization type, age, experience, unionization, different occupation and education types on income level are analyzed.

The estimated model of for the incomes of economically active population is given above. Here, all the explanatory variables that are affecting labor income are regressed to see the magnitude and sign of each factor on labor incomes.

4.1.1 Empirical Results

Based on this model; males, on average, earn approximately 30% more than their female counterparts with same characteristics for all three income types that are considered in this study. On average, the earnings of married individuals are about 10% higher than non-married groups. The people who are employed in public sector makes 22% more than the ones who are in the private sector regarding LINC income type. On the other hand, this gap drops to 12% for TOTAL_INC in favor of public sector. Moreover, unionization helps around 20% higher labor earnings for its members.

When the effect of education levels on earnings are considered; all higher level education groups earn more than illiterate group as expected. Income gaps seem to be expanding at higher level education groups. For instance, EDU2 (Literate – not completed a school or graduated from Primary school or graduated from Primary education) earns about 26% to 33% more than the EDU1 (Illiterate) for various income types. Besides, EDU3 (Secondary School Graduates) members earn about 42% to 50% more compared to EDU1. EDU4 (Junior Vocational High School Graduates) individuals earn 57%, EDU5 (High School

Graduates) 49%, EDU6 (Senior Vocational High School Graduates) 56%, EDU7 (2-3 year-College Graduates) 67%, EDU8 (4-year-College or University Graduates) 94% and EDU9 (Post Graduate/PhD) 131% more than illiterate individuals for LINC income type. On the other hand, the effect of education on income is larger for TOTAL_INC. However, it is interesting to find that graduates of EDU4 are making more than EDU5 and EDU6. This finding emphasizes the importance of vocational schools on income levels.

This study also aims to analyze the effect of industrial sectors on earnings. The control group is the IND3 which is manufacturing industry. According to the results IND1 (Agriculture, forestry, fishery), IND5 (Construction and public works), IND6 (Wholesale and retail business, motor vehicles, repair of motorcycles, appliances), IND7 (Hotel and restaurants), IND8 (Transportation and storage services), IND12 (Public management and defense, mandatory social security), IND15 (Education) and IND18 (Other social, community and personal service activities) are earning less than IND3. Although there are other sectors with negative coefficients implying lower income level compared to IND3, they are statistically insignificant like IND11 (Real estate agency, rentals and business activities). On the other hand, IND10 (Financial brokerage services) members earn higher than IND3. Similarly, IND2 (Mining and quarry) seems to have a higher income level, yet it fails to have a significance based on its p-value.

OCU6 (Skilled agricultural, animal producers, forestry and fishery workers) is the control group in order to see the effects of occupation types on incomes. OCU1 (Legislators and senior officials) occupants earn 42%, OCU2 (Professionals) 32%, OCU3 (Associate professionals) 13%, OCU4 (Office and customer service clerks) 4% and OCU8 (Plant and machine operators and assemblers) 3% higher than the OCU6 occupants. However, OCU3, OCU4 and OCU8 results are statistically insignificant. In contrast, OCU5 (Service and sales workers) occupants make 1%, OCU7 (Craft and related trades workers) 20% and OCU9 (Unskilled labor) 27% less than OCU6. Similarly, the coefficient of OCU5 is statistically insignificant.

The coefficient of age proves the theoretical expectation that income increases with age. Age variable affects all types of incomes approximately 10% upward. Again, the

coefficient of AGESQ is negative, which is consistent with the theory. As individuals get older, their earnings increase at a decreasing rate (0.1%). Consequently, experience seems to be an important factor in explaining the variation in income. The seniority makes a positive difference of about 7% at a workplace. Although, AWHR doesn't make a huge difference in earnings, the coefficient is statistically significant to show that it has some effect on earnings. Based on the control groups, one can deduct from the analysis is that, a single illiterate female employed in IND3 private sector without unionization, is expected to make 5,431 TRY per year on average.

The F value shows that the model is statistically significant as a whole. R-square about 51% in all estimations, which means the total variation in earnings, can be explained by the explanatory variables that are included in the models. The value of R-square is high enough for a cross sectional study.

Table 21- Base Semi-logarithmic Regression Model

LINC			LINC_IK		TOTAL_INC	
<i>Variable</i>	<i>Coeff.</i>	<i>P-Value</i>	<i>Coeff.</i>	<i>P-Value</i>	<i>Coeff.</i>	<i>P-Value</i>
MALE	0.3232	0.000*	0.3173	0.000*	0.3364	0.000*
MAR	0.1088	0.000*	0.0975	0.000*	0.1027	0.000*
PUB	0.2263	0.000*	0.1868	0.000*	0.1219	0.001*
UNI	0.2176	0.000*	0.2256	0.000*	0.1861	0.000*
EDU2	0.2661	0.000*	0.2874	0.000*	0.3351	0.000*
EDU3	0.4215	0.000*	0.4468	0.000*	0.5037	0.000*
EDU4	0.5704	0.003*	0.5685	0.003*	0.5116	0.007*
EDU5	0.4911	0.000*	0.5139	0.000*	0.5761	0.000*
EDU6	0.5660	0.000*	0.5825	0.000*	0.6623	0.000*
EDU7	0.6749	0.000*	0.6861	0.000*	0.7489	0.000*
EDU8	0.9485	0.000*	0.9492	0.000*	1.0047	0.000*
EDU9	1.3134	0.000*	1.3141	0.000*	1.3329	0.000*
IND1	-0.7580	0.000*	-0.8311	0.000*	-0.7729	0.000*
IND2	0.1312	0.213	0.0980	0.361	0.0756	0.484
IND4	0.0841	0.218	0.0259	0.704	-0.0182	0.792
IND5	-0.1206	0.000*	-0.1954	0.000*	-0.1456	0.000*
IND6	-0.0794	0.01*	-0.1051	0.001*	-0.0714	0.017*
IND7	-0.0708	0.07*	-0.1296	0.001*	-0.0730	0.05*
IND8	-0.1506	0.001*	-0.1458	0.002*	-0.1084	0.014*
IND9	0.0032	0.973	-0.0449	0.644	-0.0310	0.734
IND10	0.2192	0.000*	0.1669	0.006*	0.2033	0.001*
IND11	-0.0654	0.497	0.0973	0.326	0.1969	0.013*

TABLE 21 (Continued)

LINC			LINC_IK		TOTAL_INC	
<i>Variable</i>	<i>Coeff.</i>	<i>P-Value</i>	<i>Coeff.</i>	<i>P-Value</i>	<i>Coeff.</i>	<i>P-Value</i>
IND12	-0.1822	0.005*	-0.2308	0.000*	-0.1805	0.003*
IND13	0.0418	0.341	0.0034	0.938	-0.0018	0.965
IND14	0.0000	0.999	-0.0588	0.152	-0.0467	0.242
IND15	-0.2601	0.000*	-0.3243	0.000*	-0.3133	0.000*
IND16	-0.0061	0.897	-0.0595	0.211	-0.0335	0.473
IND17	-0.1152	0.394	-0.1668	0.202	-0.1498	0.286
IND18	-0.1857	0.000*	-0.2727	0.000*	-0.2690	0.000*
OCU1	0.4191	0.000*	0.4255	0.000*	0.4718	0.000*
OCU2	0.3180	0.005*	0.3252	0.005*	0.3979	0.000*
OCU3	0.1329	0.230	0.1450	0.199	0.1867	0.079*
OCU4	0.0377	0.734	0.0538	0.633	0.0907	0.394
OCU5	-0.0975	0.373	-0.0941	0.398	-0.0448	0.669
OCU7	-0.1992	0.07*	-0.2044	0.068*	-0.1544	0.142
OCU8	0.0272	0.802	0.0377	0.733	0.0628	0.546
OCU9	-0.2707	0.011*	-0.2561	0.019*	-0.2344	0.022*
AGE	0.1053	0.000*	0.1038	0.000*	0.0811	0.000*
AGESQ	-0.0012	0.000*	-0.0012	0.000*	-0.0007	0.000*
EXP	0.0789	0.000*	0.0793	0.000*	0.0658	0.000*
EXPSQ	-0.0020	0.000*	-0.0020	0.000*	-0.0018	0.000*
AWHR	0.0002	0.000*	0.0002	0.000*	0.0001	0.000*
Constant	5.4310	0.000*	5.5719	0.000*	5.8758	0.000*

*Statistically significant at 10 % level

Table 22-Regression Summary of the Base Model

	LINC	LINC_IK	TOTAL_INC
Number of Obs.	8,267	8,267	8,267
F (42, 8224)	202.29	187.12	181.86
Prob > F	0.0000	0.0000	0.0000
R-squared	0.5217	0.5084	0.5062
Root MSE	0.7628	0.7669	0.7448

4.2 Semi-logarithmic Regression Model Interacted with Gender

This part of the study will largely be dealing with the interacted variable gender in order to find and discuss the marginal effects of fundamental factors that are capable of explaining the variations in labor and non-labor returns to economically active individuals. In this regard, the interpretation of the findings will be based on the coefficients. That emphasizes the marginal contribution but not the average value of the interacted dummy variable. Thus, the interpretation will be heavily using the regression coefficients that reveal the marginal effect of contributing gender factor in the model.

Male-interacted model is the following:

$$\begin{aligned} \log\text{INCOME} = & \beta_0 + \beta_1(\text{MALE}) + \beta_2(\text{MAR}) + \beta_3(\text{PUB}) + \beta_4(\text{UNI}) + \beta_5(\text{MALEMAR}) + \\ & \beta_6(\text{MALEPUB}) + \beta_7(\text{MALEUNI}) + \beta_8(\text{EDU2}) + \beta_9(\text{EDU3}) + \beta_{10}(\text{EDU4}) + \beta_{11}(\text{EDU5}) + \\ & \beta_{12}(\text{EDU6}) + \beta_{13}(\text{EDU7}) + \beta_{14}(\text{EDU8}) + \beta_{15}(\text{EDU9}) + \beta_{16}(\text{MALEEDU2}) + \\ & \beta_{17}(\text{MALEEDU3}) + \beta_{18}(\text{MALEEDU4}) + \beta_{19}(\text{MALEEDU5}) + \beta_{20}(\text{MALEEDU6}) + \\ & \beta_{21}(\text{MALEEDU7}) + \beta_{22}(\text{MALEEDU8}) + \beta_{23}(\text{MALEEDU9}) + \beta_{24}(\text{IND1}) + \beta_{25}(\text{IND2}) + \\ & \beta_{26}(\text{IND4}) + \beta_{27}(\text{IND5}) + \beta_{28}(\text{IND6}) + \beta_{29}(\text{IND7}) + \beta_{30}(\text{IND8}) + \beta_{31}(\text{IND9}) + \beta_{32}(\text{IND10}) \\ & + \beta_{33}(\text{IND11}) + \beta_{34}(\text{IND12}) + \beta_{35}(\text{IND13}) + \beta_{36}(\text{IND14}) + \beta_{37}(\text{IND15}) + \beta_{38}(\text{IND16}) + \\ & \beta_{39}(\text{IND17}) + \beta_{40}(\text{IND18}) + \beta_{41}(\text{MALEIND1}) + \beta_{42}(\text{MALEIND2}) + \beta_{43}(\text{MALEIND4}) + \\ & \beta_{44}(\text{MALEIND5}) + \beta_{45}(\text{MALEIND6}) + \beta_{46}(\text{MALEIND7}) + \beta_{47}(\text{MALEIND8}) + \\ & \beta_{48}(\text{MALEIND9}) + \beta_{49}(\text{MALEIND10}) + \beta_{50}(\text{MALEIND11}) + \beta_{51}(\text{MALEIND12}) + \\ & \beta_{52}(\text{MALEIND13}) + \beta_{53}(\text{MALEIND14}) + \beta_{54}(\text{MALEIND15}) + \beta_{55}(\text{MALEIND16}) + \\ & \beta_{56}(\text{MALEIND17}) + \beta_{57}(\text{MALEIND18}) + \beta_{58}(\text{OCU1}) + \beta_{59}(\text{OCU2}) + \beta_{60}(\text{OCU3}) + \\ & \beta_{61}(\text{OCU4}) + \beta_{62}(\text{OCU5}) + \beta_{63}(\text{OCU7}) + \beta_{64}(\text{OCU8}) + \beta_{65}(\text{OCU9}) + \beta_{66}(\text{MALEOCU1}) + \\ & \beta_{67}(\text{MALEOCU2}) + \beta_{68}(\text{MALEOCU3}) + \beta_{69}(\text{MALEOCU4}) + \beta_{70}(\text{MALEOCU5}) + \\ & \beta_{71}(\text{MALEOCU7}) + \beta_{72}(\text{MALEOCU8}) + \beta_{73}(\text{MALEOCU9}) + \beta_{74}(\text{AGE}) + \beta_{75}(\text{AGESQ}) + \\ & \beta_{76}(\text{EXP}) + \beta_{77}(\text{EXPSQ}) + \beta_{78}(\text{AWHR}) + \beta_{79}(\text{MALEAGE}) + \beta_{80}(\text{MALEAGESQ}) + \\ & \beta_{81}(\text{MALEEXP}) + \beta_{82}(\text{MALEEXPSQ}) + \beta_{83}(\text{MALEAWHR}) + \varepsilon \end{aligned}$$

Male interacted regression results show that average married male income is approximately 32% higher than those of females. In terms of total income, this difference is almost 50% in the advantage of male earners. Public male earners receive around 13% higher than their female counterparts both in labor and total income but the estimated coefficients are statistically insignificant at 10% level. This shows that there is no gender difference in incomes of public sector employees, as should be expected.

Males with EDU2 (Literate – not completed a school or graduated from Primary school or graduated from Primary education) education level earn about 40% more than females with same education level for all three income types. Male earners with EDU3 (Secondary School Graduates) level are earning nearly 41% more than females for all income types as well. However, as the education level reaches to EDU4 (Junior Vocational High School Graduates) and above, the difference between males and females disappears.

When it comes to industry types, men that are employed in IND1 (Agriculture, forestry, fishery) seems to be earning 64.7% more than women. In contrast, IND7 (Hotel and restaurants) and IND8 (Transportation and storage services) male earnings are less than female earnings by a factor of 30% overall. For the other sector there is no significant difference in earnings of males and females

Besides, the coefficients of gender-occupation interacted variables are all statistically insignificant. Therefore, they can be ignored. Similarly males in unions do not earn significantly different than females in unions.

Regarding the age effect, the empirical results are consistent with the theoretical background. Aging of males create about 8% wage discrepancy between males and females for the advantage of males.

The F value indicates that the model is statistically significant as a whole. R-squared value is about 55% which is high enough and acceptable for a cross sectional study.

Table 23- Semi-logarithmic Regression Model Interacted with MALE

	LINC		LINC_IK		TOTAL_INC	
<i>Variable</i>	<i>Coeff.</i>	<i>P-Value</i>	<i>Coeff.</i>	<i>P-Value</i>	<i>Coeff.</i>	<i>P-Value</i>
MALE	-0.5676	0.177	-0.5427	0.194	-0.0790	0.853
MAR	-0.0650	0.13	-0.0799	0.062*	-0.1904	0.000*
PUB	0.1421	0.05*	0.0925	0.204	0.0349	0.632
UNI	0.2173	0.000*	0.2305	0.000*	0.2257	0.000*
MALEMAR	0.3156	0.000*	0.3252	0.000*	0.4996	0.000*
MALEPUB	0.1295	0.115	0.1422	0.085*	0.1245	0.128
MALEUNI	-0.0262	0.635	-0.0338	0.542	-0.0781	0.142
EDU2	0.0616	0.546	0.0710	0.492	0.1036	0.33
EDU3	0.1560	0.271	0.1809	0.21	0.2237	0.126
EDU4	0.6921	0.001*	0.7105	0.001*	0.6160	0.002*
EDU5	0.3612	0.003*	0.3577	0.004*	0.3927	0.002*
EDU6	0.4524	0.000*	0.4550	0.000*	0.5118	0.000*
EDU7	0.5559	0.000*	0.5489	0.000*	0.5364	0.000*
EDU8	0.8947	0.000*	0.8950	0.000*	0.8681	0.000*
EDU9	1.2643	0.000*	1.2746	0.000*	1.1945	0.000*
MALEEDU2	0.3782	0.012*	0.4104	0.007*	0.3897	0.009*
MALEEDU3	0.4130	0.022*	0.4311	0.019*	0.4033	0.026*
MALEEDU4	(dropped)					
MALEEDU5	0.2587	0.12	0.3074	0.069*	0.3008	0.066*
MALEEDU6	0.2249	0.178	0.2576	0.129	0.2459	0.134
MALEEDU7	0.2135	0.211	0.2526	0.144	0.3086	0.066*
MALEEDU8	0.1204	0.483	0.1359	0.434	0.2067	0.213

Table 23 (Continued)

	LINC		LINC_IK		TOTAL_INC	
<i>Variable</i>	Coeff.	P-Value	Coeff.	P-Value	Coeff.	P-Value
MALEEDU9	0.1254	0.531	0.1234	0.543	0.2320	0.225
IND1	-1.2074	0.000*	-1.2861	0.000*	-1.2008	0.000*
IND2	-0.3364	0.527	-0.2837	0.61	-0.3296	0.551
IND4	-0.5219	0.383	-0.6136	0.305	-0.6783	0.253
IND5	0.0008	0.996	-0.0310	0.85	-0.0834	0.608
IND6	-0.1008	0.19	-0.1198	0.121	-0.1056	0.169
IND7	0.2326	0.162	0.1536	0.365	0.1746	0.305
IND8	0.0585	0.526	0.0835	0.368	0.1357	0.125
IND9	0.2177	0.124	0.1650	0.247	0.1255	0.385
IND10	0.2166	0.027*	0.1577	0.111	0.1886	0.06*
IND11	-0.1372	-0.478	0.1636	0.453	0.1146	0.606
IND12	-0.3304	0.006*	-0.3778	0.002*	-0.3202	0.003*
IND13	0.0126	0.903	-0.0454	0.661	-0.0462	0.648
IND14	0.0083	0.93	-0.0564	0.555	-0.0158	0.868
IND15	-0.2382	0.012*	-0.2958	0.002*	-0.2655	0.006*
IND16	-0.0474	0.591	-0.1008	0.252	-0.0674	0.443
IND17	0.2565	0.446	0.2172	0.513	0.2676	0.458
IND18	-0.0863	0.322	-0.2057	0.018*	-0.2050	0.019*
MALEIND1	0.6473	0.000*	0.6424	0.000*	0.6133	0.000*
MALEIND2	0.4044	0.456	0.3099	0.584	0.3377	0.549
MALEIND4	0.5869	0.33	0.6209	0.302	0.6415	0.282
MALEIND5	-0.1824	0.253	-0.2276	0.175	-0.1281	0.44
MALEIND6	-0.0086	0.918	-0.0181	0.828	0.0035	0.966

Table 23 (Continued)

	LINC		LINC_IK		TOTAL_INC	
<i>Variable</i>	Coeff.	P-Value	Coeff.	P-Value	Coeff.	P-Value
MALEIND7	-0.3564	0.037*	-0.3333	0.056*	-0.3031	0.082*
MALEIND8	-0.2487	0.02*	-0.2755	0.01*	-0.2910	0.004*
MALEIND9	-0.2720	0.138	-0.2652	0.15	-0.1830	0.311
MALEIND10	-0.0563	0.648	-0.0490	0.694	-0.0514	0.682
MALEIND11	0.0192	0.935	-0.1435	0.552	0.0126	0.957
MALEIND12	0.1726	0.219	0.1702	0.229	0.1541	0.227
MALEIND13	0.0298	0.79	0.0535	0.633	0.0550	0.615
MALEIND14	-0.0470	0.653	-0.0412	0.694	-0.0699	0.5
MALEIND15	-0.0660	0.536	-0.0714	0.506	-0.1040	0.329
MALEIND16	-0.0309	0.766	-0.0236	0.819	-0.0464	0.649
MALEIND17	-0.5682	0.114	-0.5875	0.096*	-0.6142	0.108
MALEIND18	-0.0964	0.367	-0.0351	0.743	0.0089	0.933
OCU1	0.9115	0.002*	0.9176	0.001*	1.0171	0.001*
OCU2	0.7672	0.007*	0.7746	0.006*	0.8576	0.004*
OCU3	0.4346	0.12	0.4591	0.096*	0.4949	0.092*
OCU4	0.4086	0.14	0.4398	0.106	0.4418	0.128
OCU5	0.2348	0.394	0.2586	0.34	0.3158	0.274
OCU7	-0.2227	0.442	-0.2496	0.384	-0.2096	0.49
OCU8	0.3509	0.222	0.3830	0.177	0.3590	0.233
OCU9	0.2027	0.459	0.2463	0.36	0.2297	0.425
MALEOCU1	-0.4099	0.187	-0.4131	0.18	-0.4823	0.129
MALEOCU2	-0.4038	0.189	-0.4069	0.181	-0.4285	0.173
MALEOCU3	-0.1933	0.522	-0.2117	0.478	-0.2025	0.517

Table 23 (Continued)

<i>Variable</i>	LINC		LINC_IK		TOTAL_INC	
	Coeff.	P-Value	Coeff.	P-Value	Coeff.	P-Value
MALEOCU4	-0.3235	0.28	-0.3456	0.243	-0.2910	0.348
MALEOCU5	-0.2136	0.473	-0.2400	0.415	-0.2393	0.437
MALEOCU7	0.1943	0.531	0.2155	0.484	0.2379	0.459
MALEOCU8	-0.2351	0.445	-0.2646	0.386	-0.2029	0.524
MALEOCU9	-0.3748	0.204	-0.4137	0.156	-0.3554	0.245
AGE	0.0442	0.000*	0.0432	0.000*	0.0488	0.000*
AGESQ	-0.0005	0.001*	-0.0005	0.001*	-0.0004	0.006*
EXP	0.1312	0.000*	0.1317	0.000*	0.1158	0.000*
EXPSQ	-0.0034	0.000*	-0.0034	0.000*	-0.0030	0.000*
AWHR	0.0003	0.000*	0.0003	0.000*	0.0003	0.000*
MALEAGE	0.0799	0.000*	0.0790	0.000*	0.0432	0.002*
MALEAGESQ	-0.0010	0.000*	-0.0009	0.000*	-0.0004	0.01*
MALEEXP	-0.0732	0.000*	-0.0736	0.000*	-0.0713	0.000*
MALEEXPSQ	0.0020	0.000*	0.0020	0.000*	0.0017	0.003*
MALEAWHR	-0.0002	0.000*	-0.0002	0.000*	-0.0002	0.000*
Constant	5.9712	0.000*	6.0828	0.000*	6.0689	0.000*

*Statistically significant at 10 % level

Table 24- Summary of MALE Interacted Regression Model

	LINC	LINC_IK	TOTAL_INC
Number of Obs.	8,267	8,267	8,267
F (82, 8184)	112.56	104.20	103.40
Prob > F	0.0000	0.0000	0.0000
R-squared	0.5498	0.5383	0.5423
Root MSE	0.7418	0.7450	0.7188

5. CONCLUSION and DIRECTION FOR FUTURE STUDIES

This study is based on TURKSTAT's micro-data set of 2011 Household Budget Survey which was conducted on 1,104 sample households per month. (The effective sample size was 9,918 households and 37,121 individuals in a calendar year). The data obtained in this survey has been filtered to extract the necessary data for economically active population. The refined data was analyzed in a framework within the Human Capital Model developed by Becker. Mincerian wage models are also employed in this context and estimated in order to bring light to the relationship of primary income determinants and individual earnings. With the constructed model, primary factors such as age, gender, education level, occupation, industry, and some other personal and labor characteristics have been studied with a unique data set within the scope of Turkish case.

The effects of socio-economic factors on the income level have been analyzed in detail. The first variable is the gender effect although its isolated influence was studied in a dedicated chapter with an interaction analysis. The results of econometric analyses point out some important facts. One of the main findings provides sufficient evidence to reject the hypothesis that there is no gap between male and female earnings. The magnitude of this gap seems to be quite high and alerts policy makers to imply urgent policies in reducing the wage differentials between men and women with similar characteristics. On the other hand, the earnings of married individuals are higher than that of non-married groups. The results show that the public sector employees, on average, earn more than private sector employees. This may be a reason for many prospective employees as to why public sector employment is still attractive. Moreover, unionized workers have higher labor earnings compared to non-unionized workers. Unionization is still a problematic area for some occupations and it was not even a common practice for many government jobs. Since the unions are not expectedly powerful in determining labor earnings, the conclusion

that can be drawn from the analyses has limitation and the unionization may not contribute much to the earnings as it can be expected.

When the effects of education levels on earnings are considered; all higher level education groups earn more than control group of illiterate individuals. Income discrepancy seems to be expanding at higher levels of education. As an interesting finding, graduates of junior vocational high school graduates are earning more than high school graduates. This finding emphasizes the importance of vocational schools on earnings. This finding will shed light to national education policy makers in perceiving the significance of having vocational high schools. Therefore, vocational schooling has to be promoted among Turkish students.

The results also indicate that the effects of industrial sectors and occupation types are well worth to mention and have impact on earnings. The earnings differ dramatically by industry types as well as the occupation types.

As stated above, gender effect was also separately studied via instrumental variables. Male interacted regression results show that average married male earnings are higher than those of females. Males with EDU2 (Literate – not completed a school or graduated from Primary school or graduated from Primary education) and EDU3 (Secondary School Graduates) education level earn more than females with same education level for all three income types that are considered in the models. However, as the education level reaches to EDU4 (Junior Vocational High School Graduates) and above, the difference between male and female earnings vanishes. It can be concluded that at higher education levels there is no gender gap. Considering industry types, it is hard to come up with a uniform statement for all. Men and women earn differently for each industry type.

This study contains the data of year 2011 only. However, TURKSTAT keeps launching this type of data set yearly after conducting a survey. A further research study using the data for the upcoming years and for a certain time interval can be conducted depending on the availability of the data. However, the yearly data may be erratic because TURKSTAT change the questionnaire in which some variables may drop for some years. For example, 2011 questionnaire includes unionization variable whereas 2012 questionnaire does not.

That is why the researchers should pay attention to picking up the variables while performing their analyses with these types of micro level data. The panel data analyses are also possible to conduct and may provide more detailed suggestions on the effects of demographic, industrial, economic, and social characteristics on earnings. Therefore, it would be a very useful tool for the policy-makers to monitor and consider the effects of socio-economic factors using panel data in order to increase the efficiency of the policies and investments. The annual analyses also provide valuable information in showing the differences in various years and enable comparisons with the studies for other economies.

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APPENDIX A-TURKISH SUMMARY

Gelir ve bunu etkileyen faktörler ekonomik çalışmalarda önemli bir yer tutmaktadır. Bunun en önemli sebepleri ise gelir dağılımı adaletsizliği ve gelir dağılımı adaletsizliğini önlemeye yönelik politika çalışmalarıdır. Gelir ve kazançları belirleyen faktörler ile ilgili sorunlar ekonomik refahı hedefleyen ülkelerin üstesinden gelmeleri gereken zorlu problemlerdendir. Ekonomi politika uygulayıcıları, kazançlar ve bunları etkileyen temel faktörleri düzenlemede ciddi uğraşlar vermektedir. Bu konunun hayatiyeti ve önemi bu çalışmayı motive edici unsurların başında gelmektedir.

Bu çalışmanın amacı bireysel kazançlar üzerinde sosyal, ekonomik ve bireysel faktörlerin etkilerini Türkiye örneğinden yola çıkarak analiz etmektir. Bunun için öncelikle bu faktörlerin neler olduğu ve bu alanda yapılan çalışmaların belirlenmesi için ayrıntılı bir literatür çalışmasına yer verilmiştir. Buradan hareketle, ülkemiz ve farklı ülkeler için gerçekleştirilen çalışmalar ve bulguları incelenmiştir. Bu çalışmada işgücüne bağlı gelir ve farklı gelir tipleri itibariyle bireylerin yaş, cinsiyet, eğitim durumu, medeni hal, hangi sektörde çalıştığı, hangi meslek grubuna dahil olduğu, iş tecrübesi süresi, iş yerinin statüsü (kamu veya özel sektör oluşuna göre), sendikaya kayıtlılık durumu, yıllık çalışma saati gibi temel sosyal, ekonomik, bireysel ve demografik faktörler dikkate alınarak analizler gerçekleştirilmiştir. Bu araştırma çalışması Becker'in Beşeri Sermaye Modeli ve Mincer'in ücret modelleri üzerindeki çalışmaları temel alınarak izlenmiş ve veri setinin elverdiği ölçüde değişken sayısı artırılarak söz konusu modeller zenginleştirilmeye çalışılmıştır. Çalışmadaki ampirik analizlerde Türkiye İstatistik Kurumu (TÜİK)'in 2011 yılı için yayınladığı Hanehalkı Bütçe Harcamaları ve Gelir Dağılımı anket verileri kullanılmaktadır. Kullanılan veri seti Türkiye İstatistik Kurumu tarafından anket yöntemi ile elde edilen 9,918 hanehalkını ve 37,121 bireyi kapsamaktadır.

Yapılan literatür çalışmasının sonucunda beşeri sermaye yatırımlarının gelir üzerinde ciddi katkıları olduğu gözlemlenmiştir.

Bunun yanı sıra Türkiye için gelirin dağılımında cinsiyet, sektör ve meslekler bazında problemler olduğu ortaya konmuştur. Türkiye İstatistik Kurumu'nun verilerine dayanılarak elde edilen bilgilere göre; Türkiye gelir grubuna göre beş farklı gruba ayrılmış ve bunun sonucunda en fazla kazanan % 20'lik grup en az kazanan % 20'lik gruptan 2011 yılı için 7,3 kat daha fazla kazandığı görülmüştür. Kişi başına düşen gelir artmasına rağmen gruplar arası gelir farkı, her ne kadar 2003 yılından 2011 yılına kadar geçen sürede 8,7 kattan 7,3 kata düşmüşse de gelinen nokta itibariyle hala ülkemiz için üzerinde çalışılması gereken bir sorun olarak önemini korumaktadır.

Birçok akademik çalışmada beşeri sermaye yatırımları, gelir eşitsizliğini açıklamada kullanılmaktadır. Makroekonomik açıdan ele alındığında toplumun toplam beşeri sermayesi ekonomik büyümeyi ve toplumsal refahı açıklarken, mikroekonomik açıdan kişinin beşeri sermayesi ele alındığında kişisel gelir yapısını açıklamaya yardımcı olmaktadır. (Mincer, 1996)

Beşeri sermayenin ülkeler için önemini vurgulayan akademik çalışmalarda; gelişmemiş ülkelerde karşılaşılan:

- Düşük okuma-yazma oranı
- Plansız, hızlı nüfus artışı
- Gelir yetersizliğinden kaynaklanan eksik beslenme ve sağlıksız barınma koşulları
- Yüksek oranda karşılaşılan işyeri kazaları
- Düşük verimlilik
- Teknolojik yeniliklerin gerisinde kalma

gibi sorunların temelinde beşeri sermaye yatırımlarının eksikliği görülmektedir. (Altay & Pazarlıoğlu, 2007, p.99)

Becker'in (1962, p.10) yaptığı çalışmada, beşeri sermaye ile ilgili ortaya konulan bazı ampirik bulgular şunlardır:

- Gelirler yaşla beraber azalan oranda artmaktadır.
- İşsizlik oranı kişisel beceri seviyesi ile ters orantılıdır.
- Gelişmemiş ülkelerdeki firmalar, gelişmiş ülkelere göre çalışanlarına karşı daha fazla ataerkil davranmaktadırlar.
- Gençler, ileri yaştaakilere göre daha fazla iş değiştirirler, daha fazla okul ve iş yeri eğitimi alırlar.
- Daha kabiliyetli kişiler daha fazla eğitim alırlar.

Beşeri sermaye düzeyini artırmak adına yapılacak yatırımlar, sermaye yatırımları olarak kabul edileceğinden; yatırımcının kendisi için ideal yatırım tutarını belirlemesi gerekmektedir. Buradaki büyük problemlerden biri ise nelerin beşeri sermaye yatırımı olarak kabul edilip edilemeyeceğinin belirlenmesidir. Bunun için, Schultz (1961, p.9) beş temel kategori belirlemiştir. Bunlar:

- İşyerinde alınan eğitimler,
- İlkokul, ortaokul ve daha yüksek seviyede alınan okul eğitimi,
- Yetişkinler için düzenlenen mesleki ve diğer eğitimler (özellikle ziraat alanında),
- Yaşam süresini ve iş performansını artıran sağlık hizmetleri,
- Ailelerin ve kişilerin iş değişikliği sebebiyle yaptıkları yer değişiklikleri (taşınma).

Tunç (1998) yaptığı çalışmada ise kişinin verimliliğini etkileyecek olan beslenme ve barınma gibi faktörlerin de beşeri sermaye yatırımları arasında kabul edilebileceğini vurgulamıştır. Beşeri sermaye yatırımlarındaki farklılıklar gelir seviyesindeki farklılıklara yol açmaktadır. Beklendiği üzere, firmalar ve işverenler daha verimli ve üretken çalışanlarına daha fazla bir ücret ödemeye hazırdırlar. Beşeri sermaye yatırımlarının orta ve uzun vadede daha fazla gelir getirmesinden ötürü, kişiler beşeri sermaye yatırımları yapmayı ve potansiyel getirilerini maksimize etmeyi hedeflemektedirler. Bu yapacakları yatırımı ise bir yatırımcı gözüyle değerlendirip, getirisinin maliyete ancak karşılayacağı denge noktasına kadar artıracaklardır. (Ünal, 1991)

Becker & Chiswick (1966) yaptıkları çalışmada beşeri sermaye yatırımlarının arz ve talep eğrilerini açıklamıştır. Beşeri sermaye yatırımlarında bütün yatırım projelerinde olduğu gibi kullanılabilir fonların yetersizliği en önemli kısıtlardandır. İlk etapta bu tarz yatırımlar kişinin yani yatırımcının aile bireyleri ve akrabaları, yakınları tarafından fonlanmaktadır. Bunun yanı sıra kişiler bankadan veya herhangi bir kuruluştan bu yatırımlarında kullanmak üzere borç alabilirler. Burada her bir bireyin ailesinin maddi durumu farklı olduğundan ve bireylerin borçlanma tutarı farklı olacağından, farklı arz eğrileri ile karşılaşacağız. Burada karşılaşacağımız eğriler borçlanma tutarı arttıkça risk artacağından ve ailelerin karşılayabileceği tutarı belirli bir noktadan sonra aşacağından, pozitif eğimli olacaktır. Ayrıca, beşeri sermaye yatırımlarının talep eğrileri de negatif eğimli olacaktır. Bunun sebebi ise belirli bir yatırım tutarından sonra kısıtlı bir çalışma süresine sahip bireyin; getirisinin, maliyetinden düşük olmasıdır. Burada dikkat çeken husus, daha becerikli

kişilerin daha fazla yatırım talep etmeleridir. Bu arz ve talep eğrilerinin kesiştiği noktalar ise bize ideal yatırım tutarlarını verecektir. Pratik hayatta kişinin beceri seviyesini ölçmek zor olacağından sonuçtan sebebe gidilip, daha fazla kazananların daha becerikli oldukları kabul edilmektedir. (Becker, 1962)

Yapılan akademik çalışmalarda gelir dağılımını, kişinin eğitim durumu, cinsiyeti, yaşı, medeni durumu, çalıştığı iş kolu, meslek grubu, tecrübesi, işyeri statüsü ve sendikalılığı gibi temel faktörlerin etkilediğine değinilmiştir.

Bu çalışmada yapılan analizde Türkiye İstatistik Kurumunun 2011 yılı için yaptığı Hanehalkı Bütçe Anketi kullanılmıştır. Her ne kadar 2012 yılı anketi bu çalışma yapılırken mevcut idiyse de, elinizdeki çalışmada kullanılması planlanan bazı verilerin (bireyin sendikalılık durumu, kamu-özel sektör ayrımı gibi) ankette yer almaması sebebiyle 2011 yılı verileri kullanılmıştır. Çalışmanın ikinci kısmında kullanılan verilerin detaylı bir özeti çıkarılmıştır. Kısacası, Türkiye İstatistik Kurumundan alınan veriler analizde kullanılabilir hale getirilmiştir. Analizde kullanılan değişkenler ve kısaltmaları ise şunlardır:

Açıklayıcı değişkenler:

Cinsiyet

MALE: 1 erkekler için, 0 kadınlar için

Yaş

AGE: Bireyin bitirdiği yaş

AGESQ: Bireyin bitirdiği yaşın karesi

Eğitim Seviyesi

EDU1: Okur-yazar değil

EDU2: Okur-yazar olup bir okul bitirmeyenler veya İlkokul veya ilköğretim mezunları

EDU3: Ortaokul mezunları

EDU4: Orta dengi meslek okulu mezunları

EDU5: Lise mezunları

EDU6: Mesleki veya teknik lise mezunları

EDU7: 2-3 yıllık yüksekokul mezunları

EDU8: 4 yıllık yüksekokul, fakülte mezunları

EDU9: Yüksek lisans, doktora mezunları

Medeni Durum

MAR: Evli

Sektör Tipi

IND1: Tarım, ormancılık, balıkçılık

IND2: Madencilik ve taş ocakçılığı

IND3: İmalat Sanayi

IND4: Elektrik gaz, buhar, su ve kanalizasyon

IND5: İnşaat

IND6: Toptan ve perakende ticaret; motorlu taşıtların ve motosikletlerin onarımı

IND7: Konaklama ve yiyecek hizmeti faaliyetleri

IND8: Ulaştırma ve depolama

IND9: Bilgi ve iletişim

IND10: Finans ve sigorta faaliyetleri

IND11: Gayrimenkul faaliyetleri

IND12: Mesleki, bilimsel ve teknik faaliyetler

IND13: İdari ve destek hizmet faaliyetleri

IND14: Kamu yönetimi ve savunma; zorunlu sosyal güvenlik

IND15: Eğitim

IND16: İnsan sağlığı ve sosyal hizmet faaliyetleri

IND17: Kültür, sanat eğlence, dinlenme ve spor

IND18: Diğer faaliyetler

Meslek Tipi

OCU1: Kanun yapıcılar, üst düzey yöneticiler ve müdürler

OCU2: Profesyonel meslek mensupları

OCU3: Yardımcı profesyonel meslek mensupları

OCU4: Büro ve müşteri hizmetlerinde çalışan elemanlar

OCU5: Hizmet ve satış elemanları

OCU6: Nitelikli tarım, hayvancılık, avcılık, ormancılık ve su ürünleri çalışanları

OCU7: Sanatkarlar ve ilgili işlerde çalışanlar

OCU8: Tesis ve makine operatörleri ve montajcıları

OCU9: Nitelik gerektirmeyen işlerde çalışanlar

Tecrübe

EXP: Toplam yıllık iş tecrübesi. Türkiye İstatistik Kurumu tarafından 6 ay ve daha az tecrübeye sahip olanlar sıfır olarak kabul edilmiştir.

EXPSQ: Tecrübenin karesi

Yıllık Çalışma Süresi

AWHR: yıllık toplam çalışma saati

İşyerinin Statüsü (Kamu/Özel Sektör)

PUB: Kamu sektörü için 1, özel sektör için 0

Sendikalılık Durumu

UNI: Sendikalılar için 1, olmayanlar için 0

Bağımlı Değişkenler:

Burada üç farklı gelir tipi belirlenmiştir. Bunlar:

LINC: Bu gelir, maaş ücret veya yevmiye adı altında kişilere ödenen; emeklilik, sosyal sigortalar keseneği ve vergiler hariç, eline geçen net yıllık gelir olarak kapsanmıştır. Yıllık ikramiye, bahşiş, çalışmayı teşvik edici ve satışı artırıcı primler, yılda bir kez öğretmenlere verilen eğitim ödenekleri bu tutara ilave edilmiştir.

LINC_IK: LINC gelir tutarına ferdin, son 12 ay içinde ücretli olarak elde ettiği aynı gelir bileşenlerinin toplamının ilave edilmesiyle bulunmuştur. Hanehalkı fertlerinin son 12 ay içinde bir işte çalışarak elde ettikleri mal ve hizmetler (servis, toplu taşıma, elektrik, gaz, su, telefon faturalarında indirim, seyahat hizmetlerinde indirim, yemek, kreş ücreti, giyecek, yiyecek, içecek vb.) yıllık aynı gelir olarak kapsanmıştır.

TOTAL_INC: ferdin elde ettiği bütün gelirlerin toplanması ile edilmiştir. Maaş, ikramiye, gayrimenkul kira geliri, banka hesabından elde edilen faiz, menkul değerlerden elde edilen yıllık faiz geliri, temettü geliri, emekli maaşı geliri, yıllık sosyal yardım fonu ve aile yardımı, yıllık dul, yetim, öksüz maaşı, Yıllık gazilik ve malullük maaşı, hastalık yardımı, yurt dışından yıllık emeklilik maaşı vb. bütün kişisel gelirlerin toplanması ile elde edilen gelir tutarı bu bağımlı değişkeni oluşturmaktadır.

Çalışmanın bir sonraki bölümünde bağımlı değişken olarak belirlenen yukarıdaki gelir tiplerinin açıklayıcı değişkenlerle olan ilişkisi ve yönü, oluşturulan model ile belirlenmeye çalışılmıştır. Becker ve Mincer'in ücret modelleri temel alınarak tahminler yürütülmüş ve önemli bulgulara ulaşılmıştır. Bunun için gerekli ekonometrik analizler STATA (10) ve MS Excel yardımıyla gerçekleştirilmiştir. Gelir denklemi, ücretlerin düşük gelirlere doğru

eğilimli olması ve böylece asimetrik özelliğinden dolayı yarı logaritmik model kullanılarak analiz edilmiştir.

Bu bulgulardan elde edilen bilgilere göre, erkeklerin ortalama olarak aynı özelliklere sahip kadınlardan daha fazla kazandıkları gözlenmektedir. Bu durum ekonomik olarak faal nüfus içinde kazançlar arasında cinsiyet temelinde erkekler lehine bir farklılığın olduğuna işaret etmektedir. Erkek ve kadın gelirleri arasında cinsiyete bağlı fark olduğu çalışmanın ana bulgularından biridir. Bu fark yaklaşık %30 oranında olup, politika yapıcılarının bu konuda acil önlemler alması gerektiği sonucuna yer verilmiştir. Evli bireylerin, aynı özelliklere sahip evli olmayan bireylerden ortalamada daha fazla kazandığı gözlemlenmiştir.

Kamu sektörü çalışanları, aynı özelliklere sahip özel sektör çalışanlarından ortalamada daha fazla kazandığı görülmüştür. Bu durum ise kamu sektörünün halen istihdam alanında cazibesini sürdürdüğünü ortaya koymaktadır. Sendikalı çalışanlar aynı özelliklere sahip sendikasız çalışanlardan ortalamada daha fazla kazanmaktadır.

Eğitim seviyesinin gelir üzerindeki etkileri incelendiğinde, bütün eğitim seviyelerinin kontrol grubu olarak belirlenen “okuma yazma bilmeyenler” grubundan daha fazla kazandığı görülmektedir. Eğitim seviyesi arttıkça aradaki fark da artmaktadır. Yine, çalışmanın önemli bulgularından biri, meslek lisesi mezunlarının diğer lise mezunlarına göre ekonomik olarak daha avantajlı olduğudur. Bu sonuçlara göre, eğitim politikası uygulayıcılarının öğrencilere mesleki eğitim veren okulları daha cazip hale getirmeleri geliri üzerinde olumlu bir etki oluşturması beklenebilir. Ayrıca gelirlerin kişinin meslek grubu ve çalıştığı sektöre göre ciddi değişiklikler gösterdiği kaydedilmiştir.

Yukarıda bahsedilen modelin yanı sıra cinsiyetin gelir üzerindeki etkisini daha ayrıntılı analiz edebilmek adına açıklayıcı değişkenler cinsiyet değişkeni ile çarpılıp yeni değişkenler elde edilmiştir. Elde edilen bu yeni değişkenlerin eklenmesi ile başka bir model oluşturulmuş ve benzer özelliklere sahip farklı cinsiyete mensup bireyler incelenmiştir. Kısaca, cinsiyet faktörünün izole olarak değerlendirilmesi fırsatı oluşturulmuştur. Bu sonuçlara göre erkeklerin aynı eğitim seviyesinde bulunan kadınlara göre ortalamada daha fazla kazandıkları sonucu önem taşımaktadır. Belirli bir eğitim

seviyesi üzerinde ve kamu istihdamında kadınların ve erkeklerin kazançları arasında önemli bir farklılığın olmadığı sonucu göze çarpmaktadır.

Bundan sonra yapılacak olan çalışmalarda ise birbirini izleyen yılları içerecek biçimde havuzlanmış yatay kesit ya da panel veri çalışmaları yürütülebilir. Bu noktada araştırmacıların dikkat etmesi gereken önemli hususlardan başında, Türkiye İstatistik Kurumunun anketlerinde kullandığı verilere ilişkin değişkenlerin süreklilik arz etmemesi ve değişik yıllarda farklılıklar gösterebilmesidir. Hem farklı yıllarda konu ile ilgili durumun ortaya konulması ve hem de ilgili politika analizlerine ışık tutması bakımından bu konuda yapılacak çalışmalar oldukça önem arz etmektedir.

APPENDIX B- Curriculum Vitae

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- **Presidency of the Republic of Turkey** April 2010 – Present
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- **Prime Ministry Investment Support and Promotion Agency** April 2009 - April 2010
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