A Study on The Determinants of Income in Turkey

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ARTICLE INFO	ABSTRACT
  	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. Turkish Statistical Institute's (TURKSTAT) micro data set that is revealed for the year 2011 and titled Household Budget Survey and Income Distribution is used for the analyses. The data set covers an effective sample size of 9,918 households and 37,121 individuals who are interviewed by TURKSTAT periodically. The studied models are then enriched with adding a gender effect. The findings indicate that the males earn more than women who posses similar characteristics with men. This reflects a gender wage gap among economically active Turkish population. Moreover, vocational high schools graduates perform better than other high school graduates economically. The results also reveal some other important relationships between the earnings of economically active population and the primary income components that are included in the models.

INTRODUCTION

Income and redistribution of income have always been a main discussion topic in economic literature for long time. Economic policy makers usually make attempts to implement efficient policies on the factors that have impact on personal and household incomes. This study examines the primary factors that are significant to explain variations in labor and personal earnings. It is very well known that some certain individual and demographic characteristics play key role in determining the level of individual revenues. This research study is motivated by Becker's Human Capital Model and Mincer's studies on wage models. Turkish Statistical Institute's (TURKSTAT) micro data set that is revealed for the year 2011 and titled Household Budget Survey and Income Distribution is used for the analyses. The data set covers an effective sample size of 9,918 households and 37,121 individuals who are interviewed by TURKSTAT periodically. The studied models are then enriched with adding a gender effect. The findings indicate that the males earn more than women who posses similar characteristics with men. This reflects a gender wage gap among economically active Turkish population. Moreover, vocational high schools graduates perform better than other high school graduates economically. The results also reveal some other important relationships between the earnings of economically active population and the primary income components that are included in the models.

1.Relevant Literature

One of the biggest concerns of the developing countries is the distributional issues of national income. Similar discussions also have been made for returns in labor markets in the growing economies. Discrepancy in earnings can be explained at large with different levels of human capital investments among individuals (Çelik & Selim, 2013).

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).

As Becker (1962) indicated earnings are expected to increase with age at a decreasing rate, and are positively related to skills, education, and training. Adding more skills and attaining higher educational levels can be treated as an investment in human capital. In general, on-the-job training, extensions and study programs for adults, health facilities and services that improve job performance and life expectancy, relocation of families and individuals due to job changes can be considered the kinds of human capital investments (Schultz, 1961).

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).

Mincer equation 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, 2000).

Psacharopoulos (1994) points out an important issue that is the quality rather than quantity of education. The author proved an increase in returns to education when the class size dropped to a reasonable level.

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).

There are several studies analyzing the gender effect on wage. In current economic system, high real wages triggers 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 that 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 seems to increase in the coming years.

Cankal and Gokce (2015) used the Household Budget Survey and Income Distribution Survey data for the year of 2005 in Turkey and found that education level, marital status, unionization, and gender play key roles in determining the earnings of economically active population.

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 (Akhmedjonova & Izgi, 2012).

2. The Model and Theoretical Framework

Jacob Mincer's model 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. The variable $\ln y_0$ on the other hand, shows the level of earnings of individuals with no formal 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 as explanatory variables of earnings of economically active people.

The model can be demonstrated explicitly with the following equation:

logINCOME = β_0 + β_1(MALE) + β_2(MAR) + β_3(PUB) + β_4(UNI) + β_5(EDU2) + β_6(EDU3) + β_7(EDU4) + β_8(EDU5) + β_9(EDU6) + β_{10}(EDU7) + β_{11}(EDU8) + β_{12}(EDU9) + β_{13}(IND1) + β_{14}(IND2) + β_{15}(IND4) + β_{16}(IND5) + β_{17}(IND6) + β_{18}(IND7) + β_{19}(IND8) + β_{20}(IND9) + β_{21}(IND10) + β_{22}(IND11) + β_{23}(IND12) + β_{24}(IND13) + β_{25}(IND14) + β_{26}(IND15) + β_{27}(IND16) + β_{28}(IND17) + β_{29}(IND18) + β_{30}(OCU1) + β_{31}(OCU2) + β_{32}(OCU3) + β_{33}(OCU4) + β_{34}(OCU5) + β_{35}(OCU7) + β_{36}(OCU8) + β_{37}(OCU9) + β_{38}(AGE) + β_{39}(AGESQ) + β_{40}(EXP) + β_{41}(EXPSQ) + β_{42}(AWHR) + ε

In this equation, excluded dummy variables to avoid "dummy variable trap" are

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

The dependent variable is the log of income. Three different income types are considered as dependent variables. These income types are the annual labor earnings and bonuses (LINC), annual labor earnings including in-kinds (LINC_IK), and total income (TOTAL_INC) that includes labor income, interest revenue, rent income, property income, investment income, government transfers and payments.

It is important to mention that the income refers to the income of individuals rather than households in this study. Therefore, in the dataset, people who can legally work 15 years old and older are included, and people whose ages below 15 are excluded from the sample.

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 contributions of marital status, organization type, age, experience, unionization, different occupation and education types on income level are analyzed. The explanatory variables are expected to explain the variations in all three types of incomes in this model.

3. The Definition of Data and Variables

TURKSTAT (Turkish Statistical Institute) 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 13,248 sample households in a year between 1 January – 31 December 2011.

The definition of variables are as the following:

Gender:

MALE: 1 for males and 0 for females

Age:

AGE: Completed age of individual

AGESQ: Age squared

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

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 for non-unionized ones.

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...

4.Summary Statistics and Estimation Results

37,121 individuals were included in the survey. 51.4% were female and 48.6% were male. Table 1 shows distribution of males and females in the constructed sample.

Table 1: 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 representation of the real gender ratio of the Turkish population.

Table 2 shows the number of males and females in each educational category including the total number of degree holders.

Table 2: 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%	

The three income types of economically active people are summarized based on gender in Table 3.

Table 3: 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

Male and female earnings for each educational category are also summarized in Table 4 for the all three income types considered.

Table 4: 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

The estimation result of the semi-logarithmic model is given in Table 5.

Table 5: Estimation Results

Variable	LINC		LINC_IK		TOTAL_INC	
	Coeff.	P-Value	Coeff.	P-Value	Coeff.	P-Value
Male	0.323269	0.000*	0.317359	0.000*	0.336489	0.000*
Mar	0.108823	0.000*	0.097575	0.000*	0.102702	0.000*
Pub	0.226330	0.000*	0.186891	0.000*	0.121910	0.001*
Uni	0.217604	0.000*	0.225611	0.000*	0.186165	0.000*
Edu2	0.266175	0.000*	0.287402	0.000*	0.335127	0.000*
Edu3	0.421575	0.000*	0.446848	0.000*	0.503706	0.000*
Edu4	0.570463	0.003*	0.568570	0.003*	0.511652	0.007*
Edu5	0.491129	0.000*	0.513944	0.000*	0.576152	0.000*
Edu6	0.566045	0.000*	0.582572	0.000*	0.662379	0.000*
Edu7	0.674911	0.000*	0.686177	0.000*	0.748958	0.000*

Table 5: Estimation Results

Variable	LINC Coeff.	LINC P-Value	LINC_IK Coeff.	LINC_IK P-Value	TOTAL_INC Coeff.	TOTAL_INC P-Value
Edu8	0.948573	0.000*	0.949289	0.000*	1.004713	0.000*
Edu9	1.313414	0.000*	1.314155	0.000*	1.332916	0.000*
Ind1	-0.758009	0.000*	-0.831105	0.000*	-0.772995	0.000*
Ind2	0.131239	0.213	0.098092	0.361	0.075654	0.484
Ind4	0.084103	0.218	0.025936	0.704	-0.018270	0.792
Ind5	-0.120643	0.000*	-0.195417	0.000*	-0.145644	0.000*
Ind6	-0.079498	0.01*	-0.105174	0.001*	-0.071459	0.017*
Ind7	-0.070802	0.07*	-0.129686	0.001*	-0.073060	0.05*
Ind8	-0.150630	0.001*	-0.145840	0.002*	-0.108448	0.014*
Ind9	0.003288	0.973	-0.044930	0.644	-0.031007	0.734
Ind10	0.219285	0.000*	0.166961	0.006*	0.203388	0.001*
Ind11	-0.065401	0.497	0.097302	0.326	0.196936	0.013*
Ind12	-0.182243	0.005*	-0.230826	0.000*	-0.180518	0.003*
Ind13	0.041895	0.341	0.003428	0.938	-0.001863	0.965
Ind14	0.000036	0.999	-0.058817	0.152	-0.046761	0.242
Ind15	-0.260129	0.000*	-0.324345	0.000*	-0.313304	0.000*
Ind16	-0.006196	0.897	-0.059595	0.211	-0.033598	0.473
Ind17	-0.115285	0.394	-0.166822	0.202	-0.149807	0.286
Ind18	-0.185745	0.000*	-0.272760	0.000*	-0.269018	0.000*
Ocu1	0.419193	0.000*	0.425567	0.000*	0.471880	0.000*
Ocu2	0.318080	0.005*	0.325295	0.005*	0.397909	0.000*
Ocu3	0.132979	0.230	0.145005	0.199	0.186702	0.079*
Ocu4	0.037733	0.734	0.053866	0.633	0.090743	0.394
Ocu5	-0.097549	0.373	-0.094188	0.398	-0.044889	0.669
Ocu7	-0.199284	0.07*	-0.204429	0.068*	-0.154453	0.142
Ocu8	0.027277	0.802	0.037798	0.733	0.062883	0.546
Ocu9	-0.270787	0.011*	-0.256139	0.019*	-0.234470	0.022*
Age	0.105396	0.000*	0.103832	0.000*	0.081197	0.000*
Agesq	-0.001291	0.000*	-0.001280	0.000*	-0.000792	0.000*
Exp	0.078996	0.000*	0.079369	0.000*	0.065846	0.000*
Expsq	-0.002005	0.000*	-0.002025	0.000*	-0.001839	0.000*
Awhr	0.000222	0.000*	0.000231	0.000*	0.000190	0.000*
Constant	5.431070	0.000*	5.571982	0.000*	5.875837	0.000*

	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	0.76284	0.76695	0.74483

*Statistically significant at 10 % level.

THE EVALUATION OF THE RESULTS AND CONCLUSION

This study is based on TURKSTAT's micro-data set of 2011 Household Budget Survey conducted on 1,104 sample households. (The effective sample size was 9,918 households and 37,121 individuals in a calendar year). The data obtained in this survey has been analyzed by using the model of Mincer earnings function. The effects of socio-economic and individual factors on individual income levels have been analyzed in detail.

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.

According to the results, males, on average, earn approximately 30% more than females for all three income-types. On the other hand, the earnings of married individuals are about 10% higher than non-married groups. Public sector employees earn more than private sector employees as well. Moreover, unionized workers earn 20% higher labor earnings compared to non-unionized workers, excluding the employees who cannot be union member because of legal barriers.

When the effect of education levels on earnings are considered, all categories of education levels earn more than the control group of illiterate individuals. Income discrepancy seems to be expanding for high-level education groups compared to the control group. An interesting finding points out that graduates of EDU4 (Junior Vocational High School Graduates) are earning more than EDU5 (High School Graduates). This finding emphasizes the importance of vocational schools on labor earnings. The policy makers should give more importance to vocational high schools. The graduates of these schools are able to share a significant percentage of labor earnings. The discrepancy in earnings among bachelor and above degree holders is narrowing compared to high school and below degree holders.

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 the manufacturing industry (IND3). On the other hand, IND10 (Financial brokerage services) members, earn on average, higher than the manufacturing industry.

Occupation types were another factor that affects income level. Results show that OCU1 (Legislators and senior officials) OCU2 (Professionals), OCU3 (Associate professionals), OCU4 (Office and customer service clerks) and OCU8 (Plant and machine operators and assemblers) occupants are earning more than the OCU6 (Skilled agricultural, animal producers, forestry and fishery workers) occupants. In contrast, OCU5 (Service and sales workers), OCU7 (Craft and related trades workers) and OCU9 (Unskilled labor) occupants are earning less than OCU6 group.

In addition, age variable affects all types of incomes approximately 10% upward whereas 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%).

Experience is another factor that has positive effect on income levels. The contribution was found to be 7% for an additional year of experience.

This study contains the data of year 2011 only. However, TURKSTAT keeps collecting this data set every year. 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. Researchers should pay attention to determine the related variables while making regression analyses with panel data. Unfortunately, TURKSTAT

may change the questionnaire in which some variables may drop. For example, 2011 questionnaire includes unionization variable whereas 2012 questionnaire does not.

One of the important findings of this study highlights vocational schools. This study clearly reveals that graduates of vocational schools earn more than regular high school graduates on average. Therefore, vocational schooling has to be promoted among Turkish students.

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