



ERC Working Papers in Economics 01/02
May 2002

**THE DETERMINANTS OF EARNINGS DIFFERENTIALS
IN ANKARA AND İSTANBUL**

İ. Semih AKÇOMAK

Middle East Technical University
Department of Economics
06531 Ankara Turkey
akcomak@metu.edu.tr

Zehra KASNAKOĞLU

Middle East Technical University
Department of Economics
06531 Ankara Turkey
zkasnak@metu.edu.tr

Abstract

In this study, an attempt is made to compare and contrast the determinants of earnings differentials in Ankara and İstanbul. The determinants of earnings differentials are first examined with semi-logarithmic single equation models based on the basic human capital approach. Secondly, extended models are formed in which all the variables are expressed as dummy variables. In general, the average per hour earnings in İstanbul, is higher than in Ankara. It is found that age, gender, education and job status have significant effects on the explanatory power of the model, whereas occupation and marital status have only limited effect.

I. INTRODUCTION

Starting with the early works in 1960s, personal income distribution and its determinants, has been one of the topics that took extensive attention in the economic literature. These early studies employed the human capital approach, which took investment to human capital as the basic determinant of personal earnings. According to this approach the main determinants of earnings are variables such as, education and experience (Becker and Chiswick, 1966; Mincer, 1974). However these models were criticized for not taking into account the socio-economic and physical capital. Therefore, researchers such as Morgenstern (1973) and Behrman and Taubman (1976) extended the basic human capital model by adding variables like occupation, employment status, gender, father's education and occupation. Other researchers went further and developed recursive and simultaneous equation systems to take into account the inner linkages between education, occupation and earnings (Psacharopoulos, 1977a; Kasnakoğlu, 1978; Tachibanaki, 1980; Varlier, 1982).

In this paper we make an attempt to analyze the determinants of earnings differentials in Ankara and İstanbul. Single equation models will be used to explain the variations in personal earnings in two of the largest cities of Turkey, namely Ankara and Istanbul. Another aim of this paper is to compare the current findings with the earlier studies for Turkey, by Varlier (1982), Kasnakoğlu and Kılıç (1983) and Kasnakoğlu and Dayıoğlu (1996).

The remainder of the paper is structured as follows: Section II gives the reasoning behind the selection of the two cities, Ankara and İstanbul. Section III briefly describes the econometric methodology employed. The source of the data used, definitions and summary statistics are given in the following section and in the appendix. The empirical findings are discussed in section V. Finally section VI offers some concluding remarks.

II. WHY ANKARA AND İSTANBUL?

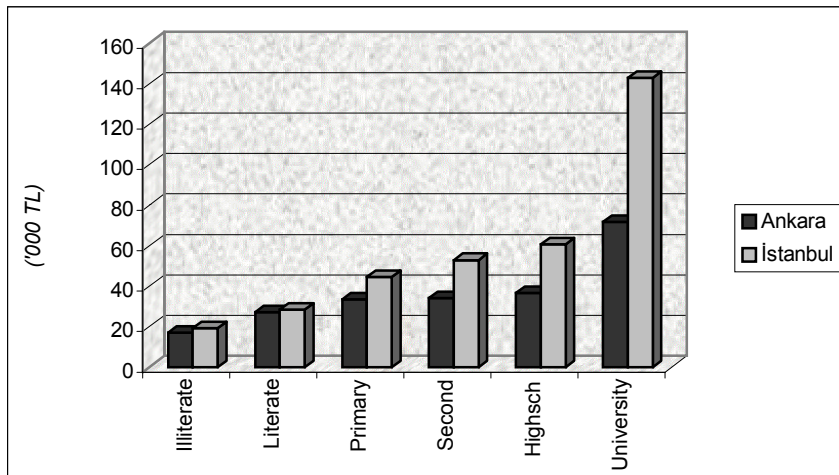
Three reasons behind the selection of the two cities- namely Ankara and İstanbul- can be summarized as follows:

First, comparing two cities with different degrees of income inequality, is more illuminating for the purposes of the study. According to the *Household Income Distribution Survey 1994* (SIS, 1997) İstanbul and Adana had the highest Gini coefficients (0.59) and thus were the cities with the most unequal distribution of income. The Gini coefficient of Ankara (0.39) is rather low when compared to İstanbul and Ankara was one of the cities with least unequal distribution of income, although there were smaller cities with slightly lower Gini coefficients –Malatya (0.35), Gaziantep (0.34) and Zonguldak (0.33).

Secondly, since we have a considerable number of independent variables especially when we use dummy variables, low number of observations could cause some econometric problems. Therefore, it was logical to choose two cities with a low and a high Gini coefficient and with high number of observations.

Finally, the earnings differentials in the two cities show important and interesting differences worth investigating further. In Figure 1, we can see that the average per hour earnings of every education category is higher in İstanbul than in Ankara. This difference becomes very significant when we move to the higher education levels. For example, at the secondary school level average per hour earnings in İstanbul is 55 percent higher than in Ankara; on the other hand, at the university level this deviation goes up to 100 percent. From Figure 2, it is again apparent that the average per hour earnings of each occupation group is higher in İstanbul than in Ankara. This difference is up to two times in some occupation groups such as sales and agriculture. Lastly, in Figure 3, we consider the average hourly earnings by gender and city. We can see that both females and males earn more in İstanbul on average.¹

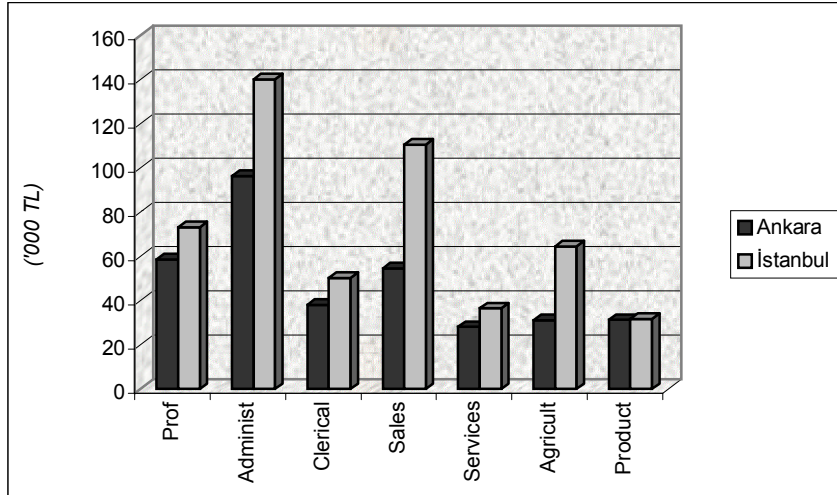
Figure 1: Average Hourly Earnings by Schooling and City



Note: The data covers the ages 12 to 65.

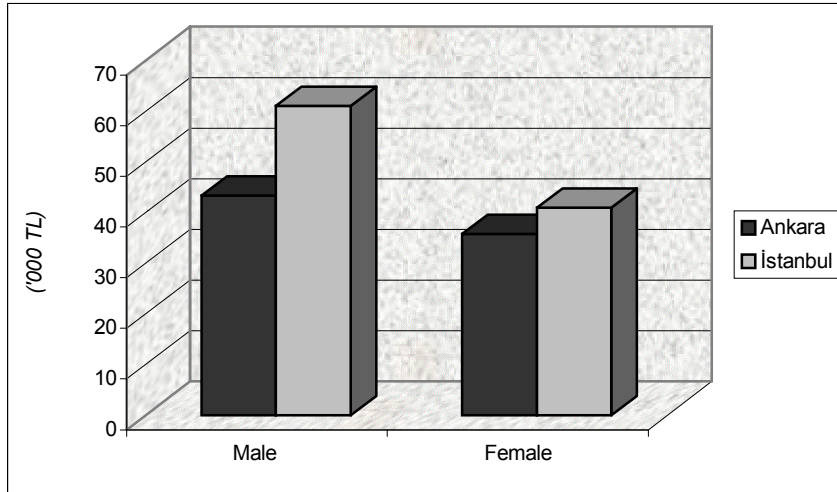
¹ The general view is that, the price level in İstanbul is higher than in Ankara. So in order to take into account the price effects, the nominal figures are deflated by the city CPI's. However it is found that there is only a slight difference in the general price levels between two cities. In 1994 the CPI for Ankara was 104.4, whereas in İstanbul it was 106.7 (SIS, 1996). It is apparent that these figures will not have important impact on the average per hour earnings in both Ankara and İstanbul. Therefore, nominal figures are used when calculating the average per hour earnings and presented in Figures 1-3.

Figure 2: Average Hourly Earnings by Occupation and City



Note: The data covers the ages 12 to 65.

Figure 3: Average Hourly Earnings by Gender and City



Note: The data covers the ages 12 to 65.

III. THE METHODOLOGY

In this study, Mincer's (1974) basic human capital model is taken as a starting point. Education and experience are the basic independent variables of the model. The log of earnings is regressed over schooling, experience, and experience squared. The model is this:

$$\ln Y_t = \beta_0 + \beta_1 D_t + \beta_2 E_t + \beta_3 D_t^2 + u_t \quad (1)$$

where Y_t is the earnings, E_t denotes the total years of education and, D_t represents the experience. Square of experience is also included in the model in order to take into account the nonlinear relationship between experience and personal earnings.

Finding precise data for experience is not easy. Generally proxies are used to represent experience. Age is taken as a proxy for experience in this paper. However there are others, used in earlier works. Varlier (1982: 90) calculated experience as the difference between the current age and the age when the individual is first employed. Another widely used proxy is defined as, age minus schooling minus the beginning age to primary education (Kasnakoğlu and Dayıoğlu, 1996: 10 ; Kumar and Coates, 1982: 445). As a result, the model takes the following form:

$$\ln Y_t = \beta_0 + \beta_1 A_t + \beta_2 E_t + \beta_3 A_t^2 + u_t \quad (2)$$

where Y_t is the earnings, E_t denotes the total years of education and, A_t represents the age. β_2 measures the average rate of return to an additional year of schooling. Marginal contribution of experience to log income and income are $\beta_1 + 2\beta_3 A_t$ and $(\beta_1 + 2\beta_3 A_t) * Y_t$ respectively. u_t is the error term representing all other unmeasured determinants of earnings.

Expressing schooling and age variables as education and age groups is useful to measure the returns to each level of schooling and to each category of age. The model then takes the following form:

$$\ln Y_t = \alpha_0 + \sum_{i=1}^5 \beta_i A_{ti} + \sum_{j=1}^5 \delta_j E_{tj} + u_t \quad (3)$$

where education and age are represented by dummy variables.

As we have stated earlier, gender plays vital role in the determination of personal earnings. So it will be suitable to add gender as an independent variable to the model. The model takes the following form:

$$\ln Y_t = \alpha_0 + \sum_{i=1}^5 \beta_i A_{ti} + \chi G_t + \sum_{j=1}^5 \delta_j E_{tj} + u_t \quad (4)$$

where G_t represents gender.

This basic type of model was criticized for not taking into account the physical capital and socio-economic variables. Therefore three other variables – occupation, employment status, and marital status- are also included into the model. With the addition of these new variables, the model takes the following final form:

$$\ln Y_t = \alpha_0 + \sum_{i=1}^5 \beta_i A_{ti} + \chi G_t + \sum_{j=1}^5 \delta_j E_{tj} + \sum_{k=1}^5 \varepsilon_k OC_{tk} + \sum_{l=1}^2 \phi_l EMP_{tl} + \gamma MS_t + u_t \quad (5)$$

where, OC_t denotes the individual's occupation, EMP_t represents the employment status and MS_t denotes the marital status.

IV. DATA

Unpublished data provided by the SIS, Household Income Distribution Survey 1994 are used in the estimations. The survey included 2049 observations for Ankara and 2921 observations for İstanbul. When the data is filtered according to the requirements of the models, the number of observation used in the models reduced to 766-803 for Ankara and 1139-1238 for İstanbul. Selected statistics about the data set are given in the appendix in Table A-1. The independent variables used in the estimation process and their descriptions are also given in Table A-2.

V. EMPIRICAL RESULTS

The empirical estimates of the basic human capital model (equation 2 in section III) are given in Table 1. Log of per hourly earnings is used as the dependent variable. In the human capital model the signs of the coefficients of age and education are expected to be positive. To capture the non-linear relationship between earnings and age, square of age is also added to the model. The sign of square of age is expected to be negative. In the estimated model, the signs of the coefficients are found to be as expected and significant. Many researchers found similar results (Psacharopoulos, 1977b; Behrman, Wolfe and Blau, 1985; Pierce-Brown, 1998).

Table 1: Human Capital Model Regression Results

Independent Variables	Ankara	İstanbul
Constant	5.818*** (21.876)	6.971*** (34.256)
Age	0.182*** (12.095)	0.133*** (11.183)
Education	0.0763*** (10.808)	0.0886*** (13.106)
Square of Age	-0.002*** (-9.991)	-0.00144*** (-8.782)
R sqr.	0.347	0.279
adj. R sqr.	0.344	0.277
F	141.336	159.309
N	803	1238

Note: The values in parentheses are t-values.

Dependent Variable is $\ln(\text{hourly earnings})$

The model estimated corresponds to equation (2) in section III.

*** Statistically significant at the 1 percent level

It is seen that a one-year increase in the education period, has a positive effect of 7.6 percent on earnings in Ankara, and 8.9 percent in İstanbul. The marginal effect of experience on earnings diminishes as age increases.

The model, in Ankara and İstanbul explains 34 percent and 28 percent of the variations in earnings respectively. These findings more or less coincide with the findings of the earlier studies for Turkey (Varlier, 1982; Kasnakoğlu and Kılıç, 1983).

There may be two possible reasons of high returns to education in İstanbul than in Ankara. Firstly the general education level in Ankara is higher than in İstanbul, so some people may have to work in jobs that pay relatively less than justified with their education levels, in Ankara. This point is also supported by Kasnakoğlu and Kılıç (1983: 182). Secondly, over 50 percent of the respondents in Ankara work for the public sector. It is a well-known fact that there is not a difference in earnings in the public sector, if two people are in the same rank of a permanent job, but have different educational life. So the effect of education on earnings is rather low for Ankara. In İstanbul only about 15 percent of the respondents work for the public sector and it is also another well-known fact that private sector pays differently when there are even small differences in education.²

The regression results of the extended models are presented in Tables 2 and 3. Log of per hourly earnings is again used as the dependent variable. In the estimation process all the variables in the extended models are tested whether they are significant as a group. So F-tests are employed whether age, education, occupation, employment status and marital status are significant predictors of earnings as a group. It is found that all the independent variable groups except occupation are significant at 5 percent level of significance in explaining the variations in earnings. Nevertheless, the occupation category is kept in the regression analysis. The model is estimated by adding one group of independent variable at a time to see the effect of each on earnings and on the explanatory power of the model. In summary the results of the extended models show that age, gender, education and employment status have

² The fact that the general education level in Ankara is higher than in İstanbul can be seen from Table A-1. The ratios of public sector employees to whole employees in each city are also presented in Table A-1.

significant effect on earnings and on the explanatory power of the model, whereas the impact of occupation and marital status are unclear.

From the regression results of the extended models, following conclusions emerge:

Table 2: Regression Results for Ankara and Istanbul

		ANKARA		İSTANBUL	
		MODEL 1	MODEL 2	MODEL 1	MODEL 2
	Constant	9.381*** (32.359)	9.146*** (30.971)	9.333*** (50.123)	9.052*** (48.099)
AGE	Age 18-29	-0.629*** (-6.205)	-0.385*** (-3.616)	-0.494*** (-5.055)	-0.216** (-2.181)
	Age 30-34	-0.172 (-1.538)	-0.128 (-1.174)	0.044 (0.416)	0.153 (1.554)
	Age 35-39	0.023 (0.201)	0.027 (0.249)	-0.054 (-0.506)	0.014 (0.138)
	Age 40-44	0.120 (1.054)	0.103 (0.947)	0.121 (1.103)	0.184* (1.799)
	Age 45-49	-0.010 (-0.083)	-0.011 (-0.093)	0.181 (1.498)	0.192* (1.713)
GENDER	Male	0.361*** (4.692)	0.262*** (3.368)	0.440*** (6.401)	0.325*** (4.858)
EDUCATION	Literate	0.218 (0.626)	0.196 (0.590)	0.340 (1.428)	0.347 (1.571)
	Primary	0.521* (1.809)	0.371 (1.351)	0.625*** (3.462)	0.524*** (3.114)
	Secondary	0.697** (2.353)	0.544* (1.926)	0.814*** (4.224)	0.725*** (4.026)
	High	0.824*** (2.841)	0.688** (2.456)	0.997*** (5.356)	0.791*** (4.471)
	University	1.457*** (5.017)	1.250*** (4.372)	1.742*** (9.177)	1.412*** (7.540)

Table 2: Regression Results for Ankara and İstanbul (cont.)

		ANKARA		İSTANBUL	
		MODEL 1	MODEL 2	MODEL 1	MODEL 2
OCCUPATION	Professional		0.187* (1.769)		0.249** (2.469)
	Administration		0.026 (0.175)		0.189 (1.574)
	Clerical		0.118 (1.200)		0.238** (2.335)
	Sales		0.024 (0.248)		0.219*** (3.068)
	Services		-0.105 (-1.250)		0.017 (0.215)
EMPLOYMENT STATUS	Employer		0.856*** (7.471)		1.037*** (9.680)
	Self-employed		0.024 (0.241)		0.135* (1.868)
MARITAL STATUS	Married		0.358*** (4.348)		0.224*** (3.198)
R. sqr.		0.269	0.354	0.248	0.360
adj. R. sqr.		0.258	0.337	0.241	0.349
F		25.182	21.479	33.871	33.121
N		766	766	1139	1139

Note: The values in parentheses are t-values.

Dependent Variable is $\ln(\text{hourly earnings})$

*** Statistically significant at the 1 percent level

** Statistically significant at the 5 percent level

* Statistically significant at the 10 percent level

There are 6 occupation groups in these models. Persons working in the agricultural sector are excluded from the data.

Model 1 corresponds to equation (4); Model 2 corresponds to equation (5)

The constant term in model 1 represents a person who is older than 49; female; illiterate.

The constant term in model 2 represents a person who is older than 49; female; illiterate; working in the production sector; employee and non-married.

First of all, the extended model is able to explain 35 percent and 36 percent of the variations in earnings by age, education, gender, occupation, employment status and marital status in Ankara and İstanbul respectively (model 2 in Table 2).

Second, it should be pointed out that in a semi-log model with dummy variables as independent variables, the percentage effect of the independent variables are not equal to the estimated coefficients of the dummy variables. The following formula is thus used to obtain the estimated effects of the dummy independent variables and presented in Table 3:

$$100.g = 100[\exp(c) - 1] \quad (6)$$

where the right hand side of the equation is the percentage effect, and “c” is the estimated coefficient of the corresponding dummy variable (Kasnakoğlu, 1982).

Thirdly, among the age groups, only the effect of the 18-29 age category is found to be significant in Ankara. Whereas in İstanbul besides this, the effects of 40-44 and 45-49 age categories are also found to be significant. All the other things held constant, the average earnings of the 18-29 age category is lower than the ones who are older than 50, by 32 percent and 19 percent for Ankara and İstanbul respectively. So the persons who are in this category and live in İstanbul earn relatively more when compared to the ones living in Ankara.³ These findings agree with those in the literature (Varlier, 1982: 130-36; Kasnakoğlu and Kılıç, 1983: 184-88).

Fourthly, as expected and as found by many earlier studies (Blau and Beller, 1988; Rupert and Schweitzer, 1996; Pierce-Brown, 1998), male earnings are 30 percent and 38 percent more than the female earnings in Ankara and İstanbul respectively.

The next point to be made is about the effects of education. Education as expected, has positive effect on earnings. The percentage contribution and significance levels increase as the individual becomes more educated. Lambropoulos and Psacharopoulos (1992) and Rupert and Schweitzer (1996) also report similar results regarding, the positive effect of education on earnings increases as one moves up the education levels. In Ankara the percentage effect is significant starting from secondary school level. Whereas in İstanbul, significance starts from

³ The model is estimated by also adding a 12-17 age category. The results are not posted here but the estimates of the coefficients show that the effect of 12-17 age category on earnings is negative and significant. It also adds to the explanatory power of the model.

the primary school level. For all levels of education the percentage contributions are higher in İstanbul than in Ankara. All the other things held constant, the average earnings of the secondary school graduates, are higher than the illiterates, by 72 percent and 106 percent in Ankara and İstanbul respectively. This differential increases up to 249 percent and 310 percent at the university level, in Ankara and İstanbul respectively (Table 3). Kasnakoğlu and Kılıç (1983: 188-89) and Kasnakoğlu and Dayıoğlu (1996: 11-12) also state similar findings.

Table 3: Percentage Effect of the Independent Variables on Earnings

		ANKARA	İSTANBUL
AGE	Age18-29	-31.95*	-19.43*
	Age30-34	-12.01	16.53
	Age35-39	2.74	1.41
	Age40-44	10.85	20.20*
	Age45-49	-1.09	21.17*
GENDER	Male	29.95*	38.40*
EDUCATION	Literate	21.65	41.48
	Primary	44.92	68.88*
	Secondary	72.29*	106.47*
	High	98.97*	120.56*
	University	249.03*	310.42*
OCCUPATION	Professional	20.56*	28.27*
	Administration	2.63	20.80
	Clerical	12.52	26.87*
	Sales	2.43	24.48*
	Services	-9.97	1.71
EMPLOYMENT STATUS	Employer	135.37*	182.07*
	Self-employed	2.43	14.45*
MARITAL STATUS	Married	43.05*	25.11*

Source: The estimated coefficients of model 2 in Table 2.

Note: The values are in percentages.

* denotes that the estimated coefficients of model 2 in Table 2 are found to be significant at least at 10 percent level of significance.

For a better evaluation of the effect of occupation on earnings, we exclude the agricultural sector from the analysis, for at least two reasons. First there are insignificant number of observations in this category, for both Ankara and İstanbul. Secondly, especially in İstanbul there are some extreme values, which can distort the regression analysis. So the agricultural sector is excluded and production sector is taken as a base. Generally the researchers found that the professional and the administration categories earn more than the others (Varlier, 1982; Kasnakoğlu and Dayioğlu, 1996). However the results change according to which other independent variables used in the models. For example when the employment status enters the equation, some of the effects of occupation on earnings, might be captured by the employment status.⁴ For both Ankara and İstanbul, the professionals earn 21 percent and 28 percent more on the average respectively, than the production sector workers. The positive effect of sales category on earnings by 24 percent seems to be reasonable for İstanbul, especially when we consider the importance of commercial, sales and marketing activities in İstanbul. However an interesting result is, when all other things held constant the average earnings of clerical personnel, is higher by 27 percent than the production workers in İstanbul. Therefore the percentage effect of professionals, sales sector personnel and clerical personnel on earnings, ranges from 24 to 28 percent in İstanbul, which does not seem to be consistent with what is observed in reality. This finding might be resulting from two limitations of our analysis. Firstly there may be problems in the aggregation of the different occupations into six or seven categories. For example a person who is working as a civil servant and another one working as a manager secretary in a big company with significant earning differentials could be pooled together in clerical category. Secondly, there are important differences in earnings within the private sector in İstanbul and

⁴ In the estimation process, we estimated the model by adding one group of independent variable at a time to see the effect of each on earnings and the explanatory power of the model. It is found that when employment status enters the equation most of the effect of administration category on earnings is captured by the employer category.

the earnings stated in the survey may not reflect the true earnings of the individuals who are working in the private sector.

The employment status also adds to the explanatory power of the model, in line with the earlier findings (Kasnakoğlu and Dayıoğlu, 1996). As expected employers are found to be earning more than the employees, by 135 percent and 182 percent respectively in Ankara and İstanbul.

The findings in literature about the effect of marital status on earnings are more or less the same that is the married people earn more than the non-married. However some found this effect to be small and insignificant (Dolton and Makepeace, 1987); on the other hand, others found the effect to be significant (Korenman and Neumark, 1991; Kasnakoğlu and Kılıç, 1983). We found that the ones who are married earn more on average than the ones who are non-married both in Ankara and İstanbul, by 43 percent and 25 percent respectively (Table 3).

VI. CONCLUSION

In this study, human capital model and extended human capital models are used to investigate the determinants of the personal earnings differentials in Ankara and İstanbul.

The findings of the human capital model show that, the effects of education and experience on personal earnings are significant in both Ankara and İstanbul. It is also found that the returns to education in İstanbul is higher than in Ankara.

In the second part of the study, the human capital model is extended, by adding available socio-economic and physical capital variables to the traditional variables, education and experience. The results of the extended models show that age, gender, education and employment status have significant effect on earnings and on the explanatory power of the model, whereas the impact of occupation and marital status are unclear.

The last point to be made is on data. It is a fact that in many countries, availability of data sets limit to the studies that can be carried out. Previous studies on Turkey and on other countries reveal the importance of family background factors on education and occupation. Therefore a simultaneous model of income determination where education and occupation variables to be included as endogenous variables might better explain income differential mechanism taking into account socio-economic background factors. Unfortunately, data on social and economic background factors such as father's and mother's education and income are usually unavailable. Another problem is related to the macroeconomic situation of a country during the data collection process. Psacharopoulos and Velez (1996) states that in general, during recessions earnings differentials flatten, however they widen in recoveries. So a simultaneous equation model, which also takes into account the macroeconomic environment in Turkey might lead to a better assessment of earnings differentials and its determinants.

REFERENCES

- BECKER, G. S. and CHISWICK, B. R. (1966), "Education and The Distribution of Earnings", *American Economic Review*, 56 (2), 358-69.
- BEHRMAN, J. R. and TAUBMAN, P. (1976), "Intergenerational Transmission of Income and Wealth" *American Economic Review*, 66 (2), 436-440.
- BEHRMAN, J. R., WOLFE, B. L. and BLAU, D. M. (1985), "Human Capital and Earnings Distribution in a Developing Country: The Case of Pre-revolutionary Nicaragua", *Economic Development and Cultural Change*, 34 (1), 1-29.
- BLAU, F. D. and BELLER, A. H. (1988), "Trends in Earnings Differentials by Gender, 1971-1981", *Industrial and Labor Relations Review*, 41 (4), 513-29.
- DOLTON, P. J. and MAKEPEACE, G. H. (1987), "Marital Status, Child Rearing and Earnings Differentials in the Graduate Labor Market", *The Economic Journal*, 97 (388), 897-922.
- KASNAKOĞLU, Z. (1978), "A Simultaneous Model Approach to the Determinants of Male Earnings Differentials in Turkey for 1968", *The Review of Economics and Statistics*, 60 (2), 307-12.
- _____ (1982), "Yarı-logaritmik Modellerde Kukla (Dummy) Değişkenlerinin Yorumlanması Üzerine bir Not" (A Note on The Interpretation of Dummy Variables in Semi-logarithmic Equations) , *METU Studies of Development*, 9 (3&4), 535-41.

- KASNAKOĞLU, Z. and KILIÇ, A. (1983), "Ankara'da Gelir Farklılıklarını Belirleyen Etmenler 1977" (Determinants of Income Differentials in Ankara 1977), *METU Studies of Development*, 10 (2), 179-198.
- KASNAKOĞLU, Z. and DAYIOĞLU, M. (1996), "Education and Earnings by Gender in Turkey", *ERC Working Papers in Economics*, No: 96/10, Ankara: METU Economic Research Center.
- KORENMAN, S. and NEUMARK, D. (1991), "Does Marriage Really Make Men More Productive", *Journal of Human Resources*, 26(2), 282-307.
- KUMAR, P. and COATES, M. L. (1982), "Occupational Earnings, Compensating Differentials and Human Capital: An Empirical Study", *Canadian Journal of Economics*, 15 (3), 442-457.
- LAMBROPOULOS, H. and PSACHAROPOULOS, G. (1992), "Educational Expansion and Earnings Differentials in Greece", *Comparative Education Review*, 36 (1), 52-70.
- MINCER, J. (1974), *Schooling, Experience and Earnings*, New York: Colombia University Press.
- MORGENSTERN, R. D. (1973), "Direct and Indirect Effects on Earnings of Schooling and Socio-Economic Background", *The Review of Economics and Statistics*, 55 (2), 225-33.
- PIERCE-BROWN, R. (1998), "An Application of Human Capital Theory to Salary Differentials in the Accounting Profession" *Women in Management Review*, 13 (5/6), 192-200.
- PSACHAROPOULOS, G. (1977a), "Family Background, Education and Achievement: a Path Model of Earnings Determinants in the U.K. and Some Alternatives", *British Journal of Sociology*, 28 (3), 321-335.
- _____ (1977b), "Schooling, Experience and Earnings: The Case of an LDC", *Journal of Development Economics*, 4 (1), 39-48.
- PSACHAROPOULOS, G. and VELEZ, E. (1996), "Returns to Education During Economic Boom and Recession: Mexico 1984, 1989 and 1992", *Education Economics*, 4 (3), 219-30.
- RUPERT, P. and SCHWEITZER, M. E. (1996), "Earnings, Education and Experience" *Federal Reserve Bank of Cleveland Economic Review*, 32 (4), 2-12.
- SIS (1996), *Statistical Indicators 1923-1995*, Ankara: State Institute of Statistics, Republic of Turkey.
- _____ (1997), *Household Income Distribution Survey: Income Distribution by 20%, 10%, 5% and 1% Groups in 19 Selected Province Center*, Ankara: State Institute of Statistics, Republic of Turkey.
- TACHIBANAKI, T. (1980), "Education Occupation and Earnings: Recursive Approach for France", *European Economic Review*, 13 (1), 103-27.
- VARLIER, O. (1982), *Türkiye'de Kazanç Eşitsizliklerinin Nedenleri*, Gazi Üniversitesi Yayınları No: 13, Ankara: Gazi Üniversitesi Yayınları.

APPENDIX: Data Summary Statistics and Descriptions

Table A-1: Means and Standard Errors of Key Variables

	Ankara	İstanbul		Ankara	İstanbul
Age	35.570 (10.880)	33.560 (11.27)	Professional	0.149 (0.357)	0.086 (0.281)
Weekly working hours	49.310 (15.077)	52.036 (15.645)	Administration	0.046 (0.210)	0.065 (0.246)
Yearly Earnings*	101401709 (125002966)	131058569 (272835809)	Clerical	0.153 (0.360)	0.076 (0.265)
Education period	8.848 (4.111)	7.235 (3.727)	Sales	0.127 (0.333)	0.162 (0.368)
Hourly Earnings*	41838.684 (48830.440)	57313.890 (142847.89)	Services	0.177 (0.382)	0.111 (0.314)
Male	0.806 (0.396)	0.813 (0.390)	Agriculture	0.012 (0.111)	0.007 (0.085)
Illiterate	0.010 (0.100)	0.023 (0.1487)	Production	0.335 (0.472)	0.494 (0.500)
Literate	0.021 (0.144)	0.023 (0.151)	Employee	0.818 (0.386)	0.771 (0.421)
Primary	0.382 (0.486)	0.567 (0.495)	Employer	0.076 (0.265)	0.083 (0.276)
Secondary	0.133 (0.340)	0.112 (0.316)	Self-employed	0.106 (0.308)	0.146 (0.354)
High	0.250 (0.434)	0.174 (0.379)	Married	0.771 (0.421)	0.711 (0.454)
University	0.203 (0.403)	0.101 (0.301)	Public**	0.510 (0.500)	0.143 (0.350)

Notes: N= 803 for Ankara and N= 1238 for İstanbul. Sample includes aged 12 to 65.

* In 1994 Turkish Lira

** N=657 for Ankara and N=954 for İstanbul

Table A-2: Independent Variables in the Extended Models and Their Descriptions

	Independent Variables	Descriptions
AGE	Age18-29	-
	Age30-34	-
	Age35-39	-
	Age40-44	-
	Age45-49	-
	Age50+	Age bigger than or equal to 50
GENDER	Male	-
	Female	-
EDUCATION	Illiterate	-
	Literate	No diploma, but can read and write. (2 years of education)
	Primary	Primary school. (5 years of education)
	Secondary	Includes secondary school and vocational school at the secondary school level. (8 years of education)
	High	Includes high school and vocational school at the high school level. (11 years of education)
	University	Higher educational institutions or faculty. (15 years of education)
OCCUPATION	Professional	Scientific and technical workers
	Administration	Entrepreneurs, upper level managers
	Clerical	Clerical and related workers
	Sales	Trade and sales workers
	Services	Service workers
	Production	Non-agriculture production workers
	Agriculture	Agriculture, forestry workers
EMPLOYMENT STATUS	Employer	A person who employs at least one person in his field of activity
	Self-employed	A person working in his own business. Agents who are working in family work is also classified in this group
	Employee	Salary or wage earner, daily wage earner (seasonal worker, casual employee)
MARITAL STATUS	Unmarried	Includes single; widow; divorced; separated categories.
	Married	-

Source: Some of the descriptions are taken from SIS (1997)

ANKARA VE İSTANBUL'DA KAZANÇ EŞİTSİZLİKLERİNİ BELİRLEYEN ETMENLER

Bu çalışmada, Ankara ve İstanbul'da kazanç eşitsizliklerini belirleyen etmenlerin saptanması ve bulguların değerlendirilmesi amaçlanmıştır. Ankara ve İstanbul'da kazanç eşitsizlikleri, önce Temel İnsan Sermayesi Modeli çerçevesinde yarı-logaritmik tek denklemlilerle modellenmiştir. Daha sonra diğer değişkenler de eklenerek, tüm değişkenlerin kukla değişken olarak ifade edildiği, genişletilmiş modeller oluşturulmuştur. Elde edilen sonuçlar ışığında, İstanbul'da saat başına ortalama kazancın, bütün eğitim seviyelerinde, meslek gruplarında, kadınlarda ve erkeklerde, Ankara'da ki saat başına ortalama kazançtan daha yüksek olduğu görülmektedir. Yaş, eğitim, cinsiyet ve iş statüsü değişkenleri, modelin açıklama gücüne önemli katkı sağlarken, meslek ve medeni durum değişkenlerinin modelin açıklama gücü üzerinde ancak sınırlı etkileri olduğu saptanmıştır.