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IN EGYPT

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EARNINGS AND REGIONAL INEQUALITY IN EGYPT*

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Abstract

This paper presents an empirical investigation of the determinants of labor market earnings inequality in Egypt. Using the Human Capital model, the determinants of regional earnings are examined. The relative importance of individual and regional effects on earnings inequality is assessed. This paper finds that the estimated rates of return to education increase with rising educational levels. This is different to common patterns found in most developing countries. Also, there are substantial variations in returns to education across regions. Moreover, estimates point to the importance of credentials in the Egyptian labor market.

ملخص

تقدم هذه الورقة بحثاً تطبيقياً في محددات تفاوت الدخول في سـوق العمالة المصرية. وتستخدم نمـوذج رأس المال البشري في بحث محددات الدخول في الأقاليم، كما تقيم الأهمية النسـبية للآثار الفردية والإقليمية على تفاوت الدخول. وتجد الورقة أن معدلات العائد على التعليم المقدرة تزداد مع ارتفـاع مستويات التعليم، بخلاف النمط السائد في أغلب الدول النامية. كما أن هناك اختلافات كبيرة في عوائـد التعليم بـين إقليـم وآخـر. وتشير التقديرات كذلك إلى أهمية المؤهلات في سوق العمالة المصرية.

1. INTRODUCTION

Variation in labour earnings is the primary contributor to overall income inequality in most developing countries. The principal inequality producing factor is that some people receive a great deal more income for their work than do others. This suggests that a valuable step in understanding overall income inequality would be to study those economic factors that might determine the amount and distribution of labour earnings.

For a long time, there has been substantial interest in the determinants of the distribution of personal income. This paper presents an empirical investigation of the determinants of labour market earnings and of earnings inequality in the Egyptian Labour market. Using Human Capital model, the determinants of regional earnings are examined. The objective is to measure the relative importance of personal and regional effects on earnings inequality.

A number of economists have advocated substantial human capital investment as one major set of policies directed towards the important goal of improving income and earnings distributions. In recent years, there has been considerable interest in whether, or not, schooling affects the distribution of income among individuals. There is an enormous literature devoted to estimating the returns of education in many countries (See Psacharopoulos (1994), but there are few on Egypt. There is little knowledge of how different patterns of human capital investment might affect the distribution of household earnings and its major components in rural and urban areas of developing countries.

The focus of this paper is earnings inequality within a human capital framework. Thus, the issue of income distribution in the broad sense is not within the scope of this study. Most of the recent studies of earnings determinants in the Egyptian labour market focused on the analysis of earnings differentials according to employment sector mainly private versus public. (See Assaad (1994) and Zaytoun (1991)). Thus, a search of the literature reveals little explicit study of determinants of regional labour market earnings in Egypt.

The plan of the paper is as follows. Section 2 introduces the theoretical framework used and human capital model. Section 3 describes the data and presents a descriptive statistics of some key variables. Section 4 presents estimates of the determinants of earnings for the whole country. Section 5 discusses the determinants of earnings by region. Then, the conclusion sums up the main finding of this paper.

2. THE THEORETICAL FRAMEWORK: THE HUMAN CAPITAL MODEL

The dominant economic theory of wage determination is Human Capital theory. Its development is due to important contributions by Mincer (1974) and Becker (1975). The basic framework is one in which the returns to an individual from labour market activity are a function of his/her stock of human capital. The standard form of the earnings function that is usually estimated is:

$$\text{Ln } y = \beta_0 + \beta_1 s + \beta_2 X + \beta_3 X^2 + \mu$$

where ln y is the natural logarithm of earnings or wages. s is schooling and X is experience (usually measured as age minus s minus 6 years). β_1 is the rate of return to schooling. β_2 is the

rate of return to on-the-job training. The earnings function is concave in experience as is suggested by Human Capital theory, so estimates of β_3 are negative, i.e. nonlinear because of diminishing marginal returns to increased on-the job training. μ is a well-behaved error term that captures other unobserved factors that contribute to labour earnings.

This basic equation has been extended to include a number of other variables such as hours of work, union membership, gender, race, economic sector, occupation, regions among others. (See Berndt (1991) for a survey of empirical studies on wage determination).

Following the traditions of a well-established empirical literature, the standard earning function and variants of it are going to be estimated by ordinary least squares. The conventional methodology is used to enhance the comparability of the present estimates with those obtained for other countries.

3. THE DATA AND DESCRIPTIVE STATISTICS

The data used in this analysis are from a special round of the Labour Force Sample Survey (LFSS) taken in October 1988. Given the data at hand, we are not able to correct for selectivity bias. For example, we are not able to estimate a participation function. In this sense, the present study falls within the framework of the "first generation" models. The present study defines earnings as income from work and annual earnings are used.

Summary statistics for the key variables are provided in Table 1. 79% of the sample is males and 52% of the sample have no schooling or less than a primary education: 36% are illiterates and 16% can only read and write. The mean age is 34.5 years. The mean of schooling is 5.47 years. The mean amount of experience in the sample is 23.95 years.

Table 2 provides data on annual earnings by region. The mean annual earnings amounted to L.E. 1394.8 for the whole sample. There is an apparent difference in average annual earnings across the different regions. Upper Egypt (urban and rural) seems to have the lowest average annual earnings.

Studies have shown that despite large differentials in earnings between one geographical area and another, the great bulk of earnings inequality is within geographical areas rather than between them. (See Fields & Schultz (1980)). In several developing countries, for example, Taiwan, Pakistan and Colombia, it is found that variations within regions are far more important in accounting for inequality than variations between regions. Egypt is no exception. It is clear from Table 2 that earnings variation within regions is substantial.

Using the variance of log mean earnings as an indicator of earnings variation (see Fields (1980) and Chiswick (1974)), it is found that the variances of log mean earnings are 1.08, 0.92, 1.12, 0.96, 1.07 and 0.97 in region 1 to 6 respectively and 1.05 for the whole country. Thus, earnings variations or earnings inequality within regions is as important as, if not more important than, variations between regions.

It seems also important to get a brief idea on earnings distribution in each region. Diagram 1 shows the percentage of earners who receive less than or equal to L.E. 1000 annual earnings.

About 30% in Cairo and 57% in upper rural Egypt earns less than or equal to L.E. 1000 annually.

It is sometimes thought that earnings differentials, like those observed in Table 2, arise from failure to standardize for other factors determining earnings. Regional inequality in particular is attributed by some to differences in the educational composition of various regions. Egypt exhibits substantial variation in average income across regions. Thus, the earnings of the sample are disaggregated by region and educational level. Diagram 2 depicts average annual earnings by educational level across regions. Wide interregional differences are observed in all educational categories. The most striking feature is that those who can only read and write earn more than any person with less than university education in most of the regions. In other words, only university education, or higher, results in significantly better earnings opportunities. In four out of the six regions (all regions except for Alexandria & Canal cities and Urban Upper Egypt) those who can read and write earn more than any other person with either primary, preparatory or secondary education. Diagram 3 shows this pattern clearly for the entire country. Fergany (1993) also found this phenomenon. Fields and Schultz (1980) found that in a few instances workers with no schooling receive higher incomes than those with some primary schooling in Colombia.

4. THE DETERMINANTS OF EARNINGS

4.1. Returns to Education

A standard Human Capital specification of the earnings equation is used where log earnings are assumed to depend on schooling and experience.

The results of estimating the basic earnings function are presented in Column 1, Table 3. These estimates of the rate of returns to education are compared to other countries derived using the same methodology. As has been well documented in previous studies rates of returns to education are universally related to the level of economic development. Psacharopoulos (1994) has compiled estimates for more than 60 countries.

Thus our estimates of the rate of returns to education of 7.8% for the whole sample (Col 1) and 8.1%, if we control for gender (Col 2), are not very different from regional averages for the Middle East that is 8.2%, although the mean of years of schooling in our sample is less (5.47 years). Column 3 adds a further variable to the earning function, Union, to control for trade union membership. First, the estimates show that a male would earn 47% more than a female worker. The increase in earnings associated with unionisation is estimated to be 19%. Estimates for industrialised countries are usually of the order of 10 to 20%. The estimated rate of returns to on-the job training and its square is around 7%.

The extended earnings function method is used to estimate returns to education at different levels by including a set of dummy variables for educational qualifications in Column 4. Before turning to a more detailed discussion of these estimates, a comparison of these estimates of the rate of returns to the different educational levels with estimates from other countries would be useful. By international standards, rates of return to primary schooling are low in Egypt. Rates of return to secondary and university education in Egypt are well above those in comparable countries. Psacharopoulos (1994)reports average rates to primary education of 41.3% in Africa, 39% in Asia and 17.4% in the Middle East compared to our estimates of 4.7% in Egypt. He also reports

rates of return to secondary education of 27%, 19% and 16% in Africa, Asia, and the Middle East respectively. However, in the case of Egypt our estimates of the rate of returns to secondary schooling are much lower (7.7%). Returns to university and higher levels are also much lower in Egypt (14.2%). (See Pscaharopoulos (1994) pp.1325-6 for a discussion on methodological issues dealing with estimate of returns to education.)

According, to the literature the rates of returns are highest to primary education followed by secondary and then university levels. (See Psacharopoulos (1994) and Cohen & House (1994)). The largest improvements in productivity occur during the early years of primary education. Thus, the increase in the rate of returns with rising educational levels seems unconventional. Nevertheless, this has been found recently in the case of Khartoum, in the Sudan, by Cohen and House (1994). Their estimates of the rates of returns to university education is around 12%. Our estimates suggest that the lowest returns to education are to the first few years of schooling and the highest are to university education. In Malaysia, Mazumdar (1994) finds that increasing return to education is at levels higher than lower secondary. Also, a very recent paper by Gindling et al (1995) find that private rates of return in Taiwan are highest for higher levels (eg university levels) and lowest for lower educational levels.

4.2 Regional Impact

One feature of most developing countries is the substantial income differential between rural and urban sectors. This income gap is typically accompanied by, and tends to contribute to, sizeable inequalities of income within the urban sector.

Table 6 presents a series of earnings functions used to find to what extent and in what manner regional differences in the level and inequality of earnings are due to regional differences in human capital variables. Six variants of the extended human capital earnings function are estimated. First, five regional dummies are added; these are Alexandria & Canal Cities, Urban Lower, Urban Upper, Rural Lower and Rural Upper. The next set of variables is included to capture differences in earnings that arise due to geographical considerations. Thus, in Column 4, two dummies are included: Rural and Urban. In Column 5 another two geographical dummies are added: Upper and Lower. Greater Cairo is used as a reference for the regional and geographical dummies.

Column 2 presents the model with no regional or geographical dummies. This model explains 36.7% of the variance in log earnings. Adding regional dummies explains 38% of the variance in Column 3. However, inclusion of geographical dummies (Cols 4 & 5) does not alter the overall explanatory power.

The regional dummies measured against the benchmark of Cairo indicate pronounced variations in regional earnings. Thus, earnings in Alexandria and Canal Cities are only about 2.7% less than Cairo's. However, in Rural Lower Egypt earnings can be at least 11.5% lower than Cairo and up to 28% lower in Rural Upper Egypt. Also, earnings are about 18% and 27% less in Urban Lower Egypt and Urban Upper Egypt respectively compared to Cairo. Moreover, another finding of interest is that there is a clear distinction between Lower versus Upper Egypt than between Urban versus Rural. Thus, as in Column 4, earnings in Urban Egypt are less than Cairo's by 16% while those of Rural Egypt are less by only 18%. However, earnings in Upper Egypt are 27% less than Cairo's, while those in Lower Egypt are less by 13%. (See Halvorsen and Palmquist(1980) for

4

interpretation of dummy variables in semilogarithmic equations.)

4.3 The Screening Hypothesis

The validity of our estimates of the rate of returns to education rests on the key assumption that the wage rate accurately reflects the marginal productivity of labour. This will not be the case when there are barriers that prevent labour markets from functioning competitively. These barriers may take several forms including minimum wage regulation, public sector hiring or strong union activity among others. If this is the case earnings can simply reflect the sector or region or occupation in which a worker is employed although access to this sector may be partly determined by a worker's formal qualification.

Suppose that education does very little if anything in terms of improving the productivity of workers. However, if firms nonetheless view degrees and diplomas as signals indicating that degree holders have superior abilities and productivity. In such a case, educational degrees provide a signal and serve as a convenient screen, but do not directly affect workers' productivity. This notion is called the screening hypothesis of education.

According to the screening hypothesis, therefore an educational degree is an admission ticket to higher-paying jobs in which there are attractive opportunities for further training and promotion. Less educated workers are screened from such positions, not necessarily because they are less able, but simply because they do not have the "sheepskin" to grant them access to the position.

Do workers compete for the most lucrative jobs by collecting credentials merely to signal their abilities to employers? Under such a scenario, workers have an incentive to overeducate themselves and exaggerate their true abilities and the private rate of returns to education will exceed the social rate of return. If education is human capital, the economy has benefitted greatly as the stock has deepened, since human capital formation is an important means towards economic growth. If education is purely a signal, growth in the economy's stock of education has not increased the productivity of the work force: more resources are being devoted to rent-seeking with no gain to the economy.

There is indication that the role of credentialism might be strong in Egypt. If "credentialism" is in fact an important feature of Egypt's earnings structure, then high private rates of returns to education may coexist with a situation in which the supply of educated labour is seriously out of balance with the demand for it. This leads into the general issue of the high level of unemployment of educated labour. According to Mazumdar (1983 and 1994) if "credentialism" is important in the labour market for the educated at a particular level, then the incremental returns to having a university certificate are much higher.

4.4 Labour Market Segmentation

Labour market segmentation is increasingly being offered as an explanation of earnings inequality in LDCs. (See Fields (1980)). A rather stringent definition of labour market segmentation is that a difference in earnings can be attributed to "institutional" factors after we have allowed for variations in measurable quality factors like education and experience. (See Mazumdar (1983)). Labour market segmentation theories argue that labour markets are restrictive in the sense that

some individuals are prevented from acquiring some education or moving to higher paying locations. A narrower definition of segmentation would be that labour with the same levels of education and experience tends to have different wage levels in different sectors.

Even if education and experience turn out to be major determinants of earnings, the returns to these factors may be different in different segments of the labour market. A specific location in the labour market does not shift the earnings function for a typical worker as much as alter its slope with respect to the human capital variables used in the function.

One of the purposes of the analysis of individual earnings is to assess the importance of labour market segmentation, which occurs when labour of equivalent quality earns different amounts in different parts of the market. According to Mazumdar (1994) the very existence of credentialism in the hiring of educated labour could be interpreted as an aspect of segmentation, since the phenomenon implies that educated workers get a premium for their certificates, irrespective of the quality of their effort or their output. Zaytoun (1991) believes that no reliable findings from the analysis of the Egyptian Labour market could be obtained without taking account of the phenomenon of segmentation.

5. DETERMINANTS OF REGIONAL EARNINGS

In order to increase our understanding of the relationship between earnings and regions more closely, we examine each region separately. Studies show that earnings inequality within regions is as important as between regions. (See Fields (1980)). Also, rates of return to schooling tend to be higher in less economically developed regions. (Heckman & Hotz (1985)). Table 7 presents estimates of the extended earnings function for different geographical areas. Comparing Column 1 to 6 or Urban to Rural areas, it read & write and university & higher. In other words, with no primary education (only read & write) a worker earns more in urban areas especially in Cairo. Also, holders of university & higher degrees earn more in urban areas compared to rural ones. However, in the case of rural areas only 32% of the log variance is explained compared to 40% in the case of urban ones. Also, returns to on-the-job training are higher in urban areas (11%) than in rural ones (8%).

Returns to education are higher in the case of less economically developed region when comparing Lower Egypt to Upper Egypt (Cols 4 and 5). Also, the specification of the earnings equations was estimated separately for each of the 6 regions in Egypt. These results are summarised in Table 8. The increase in the rate of returns with rising educational levels is also found in each region. Although Table 8 shows a variation between the returns to education among regions, the lowest returns are for primary education and the highest returns are for university & higher education. Also, it is interesting to note that, with the exception of Greater Cairo and Rural Upper Egypt, read & write is not significant. University degrees holders earn at least 146% more than persons with no schooling across all regions. Credentials seem to be important across all regions as well.

Given the large differential in absolute earnings between males and females, Table 9 examines male earnings only by region. Table 9 presents the results of fitting the earnings functions within regions for males only. Again, the estimates support our previous results. Returns to education vary across regions, though the rising returns are found across all regions. Also, since we are

interested in regional earnings differentials as opposed to gender ones, clearly males' earnings exhibit similar estimates to the total sample estimates. Thus, we can use these results to arrive at some general conclusions.

The hypothesis of equality of slope coefficients across regions is strongly rejected by F-tests.Rates of return to education differ among regions. Various explanations are consistent with such regional variation in the estimates. Such evidence may suggest that the Egyptian labour market is geographically segmented as returns do not equilibrate across regional markets. Difference in cost of living will affect the intercept or the constant term. Geographical segmentation may be due to factors influencing the demand for labour or the supply of labour. Differences in the demand for labour may arise because regions differ with respect to the availability of complementary factors of production (e.g. natural resources) which alter the returns to schooling. Also, the supply side may be affected if mobility costs are not negligible or there are other forms of barriers. Evidence that estimated earnings equations is different in different regions suggests that there are in fact different markets or segments. This empirical strategy is pursued in many studies of labour market segmentation. However, according to Heckman & Hotz (1985) the presence of differences in earnings equations by region does not, by itself, constitute irrefutable evidence in favour of segmented labour markets. Yet, this is still the most widely used approach in studies of geographically segmented labour markets.

Another hypothesis about labour market segmentation is that it influences the rate of return to the education and experience variables. (See Mazumdar (1981)). This will happen if firms in the formal sector pursue wage policies that put a premium on formal education and seniority in employment. At this point the argument needs to take account of the debate between those who think of human capital attributes as enhancing the productivity of workers themselves and those who think of them as primarily screening devices. A formal sector employer may attach special importance on education or experience itself as a consequence of institutional factors in the wage determination process (for example, in the public sector).

Assaad (1995) and Zaytoun (1991) suggest that the Egyptian labour market is segmented along private/public sectors. Thus, it seems appropriate to examine whether our estimates are reflecting this form of sectoral segmentation as opposed to a geographical one. Thus, male earnings for public sector employees only were estimated in the different regions; i.e. controlling for differences in earnings due to working in the private versus public sector. Table 10 displays the estimates for each region.

Table 9 shows that a male university graduate earns 133% more than a worker with no schooling in Rural Lower Egypt and 282% in Cairo. Table 10 indicates that a male university graduate employed in the public sector would earn as much 116% more than a worker with no schooling working in the public sector in Rural Lower Egypt and 246% in Cairo respectively. The emphasis on formal qualifications suggests that the observed association between education and earnings is a result of credentialism rather than the higher marginal productivity of educated labour. This is also clear in the public sector. Table 11 shows the different returns to university education in all sectors and in the public sector in all the different regions for males. Returns to university education Are between 8.5% and 14.8% for all sectors and between 6.5% and 10.9% for the public sector. Thus, this is another indication to support the hypothesis that there is geographical segmentation in the Egyptian labour market.

CONCLUSION

This paper presents an empirical investigation of the determinants of earnings inequality in the Egyptian Labour market. Using a Human Capital model, the determinants of regional earnings are examined. The relative importance of personal and regional effects on earnings inequality is assessed.

The analysis has produced these main findings. First, the estimated rates of return to education increase with rising educational levels. This is different to the common pattern found in most developing countries. According to Psacharopoulos (1994), who surveys over 60 countries, the highest returns tend to be for primary education. In the case of Egypt, although rates of return to education are low by international standards, the rates of returns to educational qualifications are highest for university & higher education. Second, there are variations in returns to education across regions. However, a university graduate earns at least one and a half times more than a worker with no schooling in Urban Lower Egypt and twice as much in Cairo.

This study points to the importance of credentials in the Egyptian labour market. It appears that educational degrees provide a signal and serve as a convenient screen rather than improve workers' productivity. This is especially true in the case of university degrees mainly due to the public sector hiring practices. Also, there is an indication to support the view that the Egyptian labour market is segmented geographically. However, future tests are needed to have more conclusive evidence. Thus, this is a possible direction for future research.

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Table 1: Descriptive Statistics of Key Variables

Variable	Mean	Std. Deviation
ln Earning	6.80	1.05
Male (dummy=1 if male)	0.79	0.40
Age	34.50	1.65
Experience	23.95	15.75
Experience Square	821.30	921.56
Union (dummy=1 if member of union)	0.28	0.45
Schooling	5.46	5.50
Educational Dummies		
Illiterate	0.36	0.48
Read & Write	0.16	0.36
Primary	0.14	0.35
Preparatory	0.18	0.38
Secondary	0.05	0.21
University & Higher	0.12	0.33
Geographical Dummies		
Urban (not including Cairo)	0.31	0.46
Rural	0.45	0.50
Upper Egypt	0.26	0.44
Lower Egypt	0.39	0.49
Regional Dummies		
Cairo	0.24	0.43
Alexandria & Canal Cities	0.10	0.30
Urban Lower Egypt	0.12	0.33
Urban Upper Egypt	0.09	0.29
Rural Lower Egypt	0.27	0.45
Rural Upper Egypt	0.17	0.38

Table 2: Regional Annual Earnings

Region	Mean	Std Dev.	Skewness	N
1. Cairo	1702.7	1768.0	4.96	2691
2. Alex.& Canal Cities	1532.3	1840.6	11.53	1097
3. Urban Lower Egypt	1380.7	2583.9	17.67	1332
4.Urban Upper Egypt	1235.8	1343.6	10.93	986
5. Rural Lower Egypt	1313.3	1654.6	7.45	3019
6. Rural Upper Egypt	1101.8	1575.1	9.62	1904
All Regions	1394.8	1813.1	11.56	11029

Table 3: Impact of Human Capital Variables on Earnings

	1	2	3	4
Constant	4.894 (180.33)	4.597 (148.84)	4.651 (147.75)	4.963 (172.26)
Schooling	0.078 (46.55)	0.081 (49.06)	0.073 (37.75)	
Experience	0.104 (54.50)	0.102 (54.60)	0.073 (50.78)	0.103 (53.86)
Exp. Square	-0.001 (-37.90)	-0.001 (-38.27)	-0.001 (-35.97)	-0.001 (-37.99)
Male		0.386 (19.14)	0.382 (18.98)	
Union			0.175 (8.23)	

Educational Dummies[1]

	1	2	3	4
Read				0.220 (8.80)
Primary				0.282 (10.31)
Preparatory				0.611 (24.03)
Secondary				0.746 (18.06)
University				1.315 (45.22)
R^2	0.335	0.357	0.361	0.340
F-statistics	1852	1852	1243	809
N	11013	11013	11013	11013

[1]Illiterate is the reference group.

N.B. t-statistics are in parentheses.

Table 4: Coefficient on Years of Schooling: Mincerian Rate of Return (Region Averages)

Country	Years of Schooling	Coefficient (%)
Sub-Saharan Africa	5.9	13.4
Asia*	8.4	9.6
Europe/Middle East/ N.America*	8.5	8.2
Latin America	7.9	12.4
OECD	10.9	6.8
World	8.4	10.1

*Non OECD
Source: Psacharopoulos(1994) p.1329.

Table 5: Private Returns to Education By Level

Country	Primary	Secondary	University
Sub-Sah. Africa	41.3	26.6	27.8
Asia*	39.0	18.9	19.9
Europe/Middle East/N. America*	17.4	15.9	21.7
Latin America	26.2	16.8	19.7
OECD	21.7	12.4	12.3
World	29.1	18.1	20.3

*Non OECD
Source: Psacharopoulos(1994) p.1328.

Table 6: Summary of Results with Alternative Specification

	1	2	3	4	5
Constant	7.010 (349.86)	4.721 (146.16)	4.891 (133.20)	4.896 (132.61)	4.891 (138.40)
Male		0.412 (20.03)	0.431 (21.12)	0.417 (20.33)	0.430 (21.06)
Experience		0.097 (50.01)	0.096 (49.82)	0.096 (49.74)	0.096 (49.82)
Experience Square		-0.001 (-35.91)	-0.001 (-35.45)	-0.001 (-35.59)	-0.001 (-35.42)
Union		0.171 (8.08)	0.161 (7.65)	0.165 (8.20)	0.157 (7.49)
Educ. Dummies[1]					
Read		0.132 (5.34)	0.096 (3.88)	0.115 (4.63)	0.093 (3.76)
Primary		0.181 (6.60)	0.123 (4.43)	0.136 (4.87)	0.118 (4.28)
Preparatory		0.592 (22.50)	0.552 (20.56)	0.550 (20.37)	0.545 (20.64)
Secondary		0.718 (16.79)	0.680 (15.89)	0.675 (15.69)	0.673 (15.83)
University		1.208 (36.78)	1.143 (49.82)	1.148 (34.07)	1.136 (34.37)
Regional Dummies[2]					
Alex. & Canal	-0.020 (-0.55)		-0.027 (-0.91)		
Urban Lower	-0.268 (-7.69)		-0.203 (-7.33)		
Urban Upper	-0.248 (-6.41)		-0.309 (-9.98)		
Rural Lower	-0.300 (-10.88)		-0.122 (-5.24)		
Rural Upper	-0.442 (-14.19)		-0.329 (-12.49)		

14

Table 6: Contd.

	1	2	3	4	5
Geographical Dummies[2]					
Urban				-0.177 (-9.16)	
Rural				-0.197 (-8.20)	
Lower					-0.142 (-7.15)
Upper					-0.317 (-14.87)
R^2	0.024	0.367	0.380	0.373	0.380
F-statistics	53.7	709	482	593	612
N	1013	11013	11013	11013	11013

[1]Illiterate is the reference group.

[2]Greater Cairo is the reference group.

Note: t-statistics are in parentheses.

Table 7: Estimates of Earnings Function for Different Regional Areas

	1	2	3	4	5	6
Constant	4.792	4.852	4.809	4.735	4.682	4.69
	(105.28)	(83.73)	(67.96)	(97.69)	(71.71)	(99.48)
Male	0.306	0.227	0.204	0.403	0.528	0.581
	(11.57)	(6.39)	(4.61)	(12.85)	(12.50)	(17.70)
Exp	0.107	0.106	0.104	0.097	0.080	0.085
	(39.43)	(29.77)	(24.43)	(32.20)	(21.51)	(29.91)
Exp Sq	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(-27.82)	(-21.25)	(-16.97)	(-22.13)	(-16.00)	(-21.71)
Union	0.183	0.187	0.276	0.116	0.284	0.105
	(7.27)	(5.59)	(6.46)	(3.51)	(6.11)	(2.66)
Educ. Dummies[1]						
Read	0.120	0.035	0.004	0.029	0.120	0.095
	(3.31)	(0.78)**	(0.07)**	(0.76)**	(2.57)	(2.73)
Prim	0.116	0.112	0.060	0.097	0.188	0.163
	(3.18)	(2.31)	(0.99)**	(2.15)	(3.33)	(3.64)
Prep	0.516	0.422	0.382	0.477	0.549	0.549
	(14.67)	(9.34)	(6.91)	(10.83)	(10.51)	(11.96)
Sec	0.641	0.561	0.473	0.620	0.657	0.682
	(12.34)	(8.20)	(5.61)	(8.25)	(7.41)	(8.36)
Univ	1.144	0.977	0.901	0.980	1.048	1.039
	(28.09)	(18.25)	(13.41)	(16.97)	(14.20)	(14.69)
R^2	0.400	0.391	0.407	0.381	0.305	0.320
F-stat	451	242	176	296	141	256
N	6097	3410	2316	4345	2887	4917

[1]Illiterate is the reference group. **Statistically insignificant.
t-statistics are in parentheses.

Note:
Column 1: All Urban
Column 2: Urban not including Greater Cairo
Column 3: Urban not including Greater Cairo, Alexandria or Canal Cities
Column 4: Lower Egypt
Column 5: Upper Egypt
Column 6: Rural only

Table 8: Estimates of Earnings Function By Region

	1	2	3	4	5	6
Constant	4.643 (64.88)	4.989 (51.35)	4.731 (50.37)	4.731 (44.35)	4.734 (83.92)	4.561 (55.65)
Male	0.410 (10.43)	0.318 (5.58)	0.200 (3.27)	0.258 (3.79)	0.551 (13.63)	0.691 (12.35)
Exp	0.117 (28.55)	0.107 (16.99)	0.116 (20.69)	0.101 (16.17)	0.092 (12.83)	0.078 (17.24)
Exp Sq	-0.002 (-19.57)	-0.001 (-12.38)	-0.001 (-13.23)	-0.001 (-11.61)	-0.001 (-18.67)	-0.001 (-13.02)
Educ. Dummies[1]						
Read	0.286 (4.85)	0.049 (0.70)**	-0.0004 (-0.01)**	0.005 (0.60)**	0.037 (0.87)**	0.159 (2.82)
Prim	0.152 (2.73)	0.172 (2.25)	0.025 (0.32)**	0.239 (2.59)	0.138 (2.49)	0.196 (2.75)
Prep	0.672 (12.27)	0.506 (6.89)	0.471 (6.41)	0.522 (6.98)	0.485 (8.81)	0.719 (10.58)
Sec	0.803 (10.40)	0.742 (6.74)	0.674 (6.08)	0.662 (5.93)	0.581 (5.90)	1.000 (8.16)
Univ	1.436 (25.40)	1.114 (14.49)	1.057 (13.53)	1.176 (13.54)	0.999 (12.83)	1.287 (11.16)
R^2	0.419	0.376	0.436	0.342	0.362	0.279
t-stat	242	82	128	63	213	91
N	2687	1096	1331	985	3014	1902

[1]Illiterate is the reference group. **Statistically insignificant. t-statistics are in parentheses.

Note:
Column 1: Greater Cairo
Column 2: Alexandria & Canal Cities
Column 3: Urban Lower Egypt
Column 4: Urban Upper Egypt
Column 5: Rural Lower Egypt
Column 6: Rural Upper Egypt

Table 9: Estimates of Male Earnings Function By Region

	1	2	3	4	5	6
Constant	5.074 (72.73)	5.202 (50.56)	4.884 (55.61)	4.952 (50.49)	5.358 (86.25)	5.273 (70.27)
Exp	0.120 (26.32)	0.115 (15.66)	0.122 (19.40)	0.105 (15.87)	0.089 (22.61)	0.078 (16.43)
Exp Sq	-0.002 (-18.76)	-0.001 (-11.79)	-0.001 (-12.54)	-0.001 (-11.36)	-0.001 (-16.22)	-0.001 (-12.60)
Educat. Dummies[1]						
Read	0.249 (4.05)	0.054 (0.72)**	-0.030 (-0.37)**	0.028 (0.33)**	0.020 (0.44)**	0.146 (2.60)
Prim	0.096 (1.61)	0.169 (2.08)	0.022 (0.25)**	0.225 (2.45)	0.093 (1.60)	0.161 (2.26)
Prep	0.609 (9.75)	0.503 (5.86)	0.441 (5.53)	0.348 (5.46)	0.670 (9.43)	0.549 (11.96)
Sec	0.752 (8.09)	0.721 (6.28)	0.433 (2.66)	0.589 (4.54)	0.362 (2.95)	0.848 (6.23)
Univ	1.342 (21.16)	1.108 (12.63)	1.002 (11.42)	1.106 (11.89)	0.848 (9.94)	1.186 (9.92)
R^2	0.424	0.391	0.474	0.381	0.290	0.227
F-stat	214	77	132	69	139	69
N	2039	841	1034	788	2395	1642

[1]Illiterate is the reference group. **Statistically insignificant.
t-statistics are in parentheses.

Note:
Column 1: Greater Cairo
Column 2: Alexandria & Canal Cities
Column 3: Urban Lower Egypt
Column 4: Urban Upper Egypt
Column 5: Rural Lower Egypt
Column 6: Rural Upper Egypt

Table 10: Estimates of Male Earnings in the Public Sector By Region

	1	2	3	4	5	6
Constant	5.375 (55.04)	5.216 (39.55)	5.016 (37.00)	4.988 (40.84)	5.654 (50.50)	5.356 (36.61)
Exp	0.08 (8.62)	0.088 (10.76)	0.100 (13.36)	0.084 (12.07)	0.062 (8.80)	0.074 (8.38)
Exp Sq	-0.001 (-9.44)	-0.001 (-7.19)	-0.001 (-9.22)	-0.001 (-7.21)	-0.001 (-6.79)	-0.001 (-6.36)
Union	0.163 (4.28)	0.09 (1.78)	0.234 (4.47)	0.205 (4.08)	0.174 (4.43)	0.199 (3.82)
Educ. Dummies[1]						
Read	0.289 (4.34)	0.195 (2.48)	0.045 (0.46)**	0.155 (1.78)	0.111 (2.00)	0.087 (1.15)**
Prim	0.334 (4.78)	0.339 (3.76)	0.222 (2.01)	0.321 (3.40)	0.282 (3.99)	0.234 (2.52)
Prep	0.669 (9.22)	0.683 (7.76)	0.555 (5.52)	0.644 (6.95)	0.320 (4.83)	0.478 (5.49)
Sec	0.803 (8.62)	0.933 (6.50)	0.638 (4.44)	0.758 (6.56)	0.450 (4.68)	0.707 (5.98)
Univ	1.238 (16.54)	1.241 (13.41)	0.942 (8.814)	1.173 (11.40)	0.767 (9.38)	0.986 (8.38)
R^2	0.387	0.456	0.436	0.501	0.490	0.279
F-stat	77	45	48	54	22	19
N	982	443	511	439	698	393

[1]Illiterate is the reference group. **Statistically insignificant.
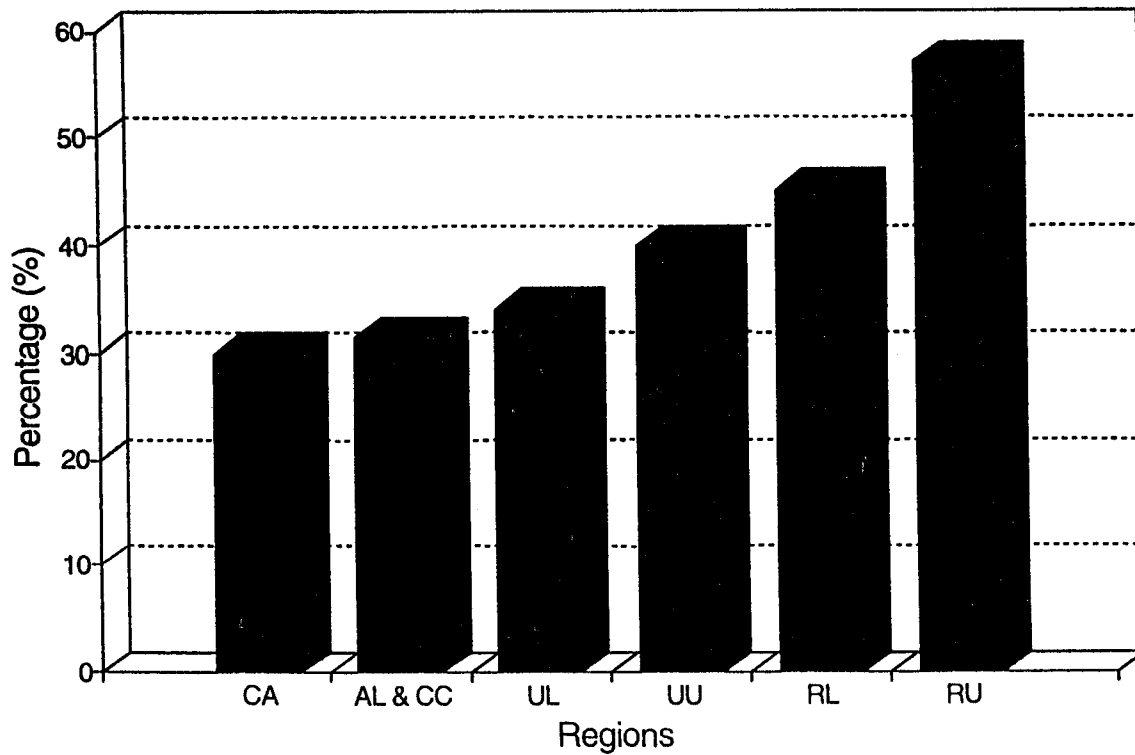t-statistics are in parentheses.

Note:
Column 1: Greater Cairo
Column 2: Alexandria & Canal Cities
Column 3: Urban Lower Egypt
Column 4: Urban Upper Egypt
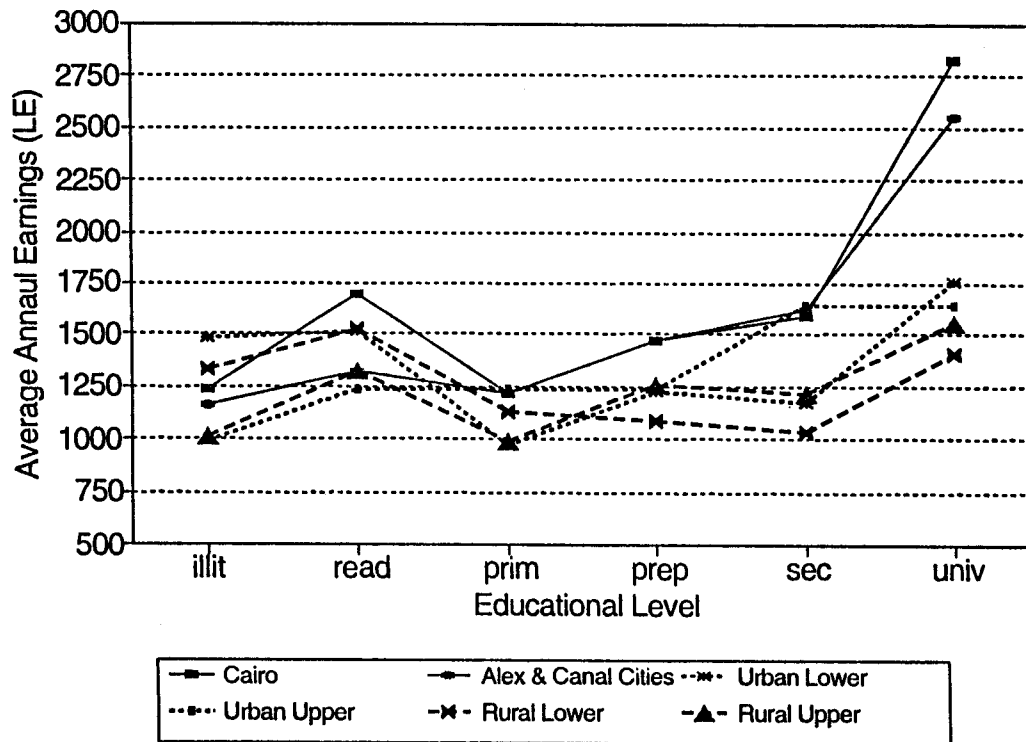Column 5: Rural Lower Egypt
Column 6: Rural Upper Egypt

Table 11: Returns to University Education (Males Only)

Region	All Sectors	Public Sector
Cairo	14.8	10.9
Alex. & Canal Cities	9.7	7.7
Urban Lower Egypt	14.2	6.9
Urban Upper Egypt	12.9	10.3
Rural Lower Egypt	12.2	7.9
Rural Upper Egypt	8.5	6.5

Diagram 1: Percentage of Those Earning
LE 1000 or Less

Bar chart. Y-axis: Percentage (%), ranging from 0 to 60. X-axis: Regions — CA, AL & CC, UL, UU, RL, RU.

Diagram 2: Average Annual Earnings
By Education & Region

Cairo · Alex & Canal Cities · Urban Lower · Urban Upper · Rural Lower · Rural Upper

Diagram 3: Average Annual Earnings
In Egypt

Average Annaul Earnings (LE) vs Educational Level (illit, read, prim, prep, sec, univ)
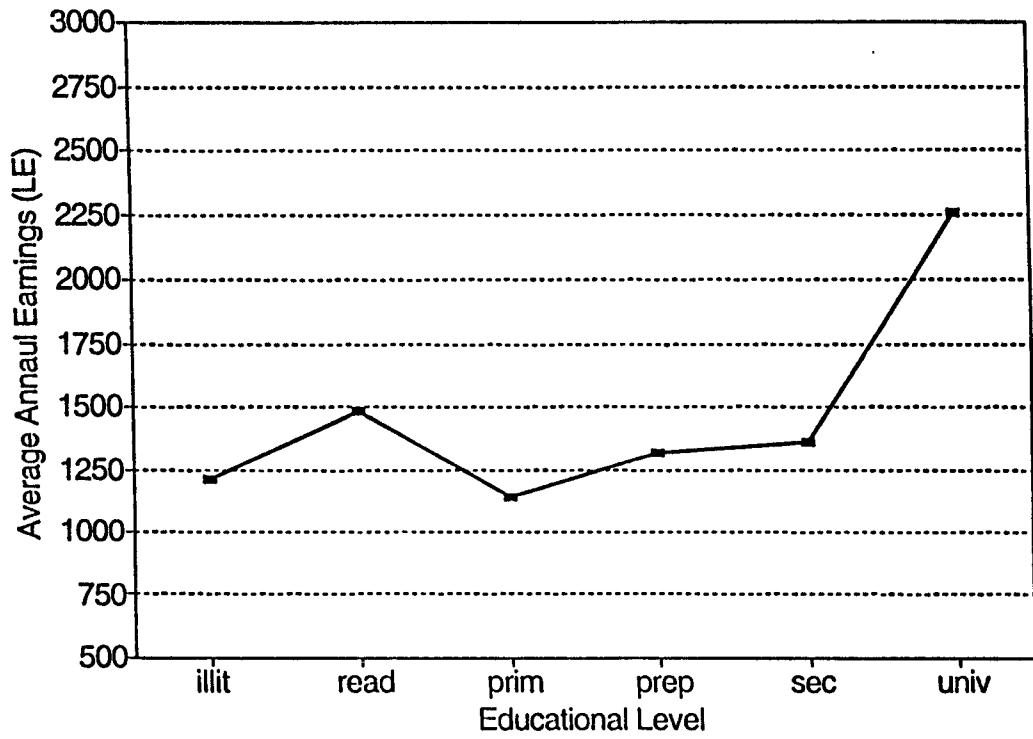
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