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## **Heterogeneity in the Returns to Education and Experience: Evidence from a High and a Low Income S.E. Asian Country**

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**Heterogeneity in the Returns to Education and Experience: Evidence from a High and a Low  
Income S.E. Asian Country**

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**Abstract:** This study investigates the pattern of returns across the earnings distribution by first, contributing new evidence on the pattern of returns to education and experience for one developed and one developing S.E. Asian country (Singapore and the Philippines, respectively); subsequently the existence of a relationship between a country's development stage and the pattern of returns to education along the earnings distribution is investigated, by putting together the existing international evidence. It was found that quantile returns to an additional year of schooling in the Philippines decrease monotonically, while the opposite is the case for Singapore. This pattern is maintained for both men and women. Looking at the quality rather than quantity of education, we find that in the Philippines the pattern of quantile returns for those with tertiary qualifications are sharply decreasing with quantiles, while it exhibits a more moderate decrease for those with primary and secondary qualifications. In the case of Singapore the pattern of returns for those with primary and tertiary qualifications is increasing with quantiles, while it is relatively flat for those with secondary qualifications. A compilation of the available evidence from 27 case studies suggests that a pattern is emerging, with high income countries associated with increasing returns by quantile and low income countries associated with a decreasing pattern of returns.

## **1. Introduction**

Most studies estimate the mean return to education which may be interpreted as the return to additional schooling for an individual with mean ability. Recently, an increasing number of studies investigate the pattern of returns to an additional year of education along the earnings distribution using quantile regression analysis. An examination of the results of these studies (mostly for developed countries), we believe, may suggest that certain stylized facts are emerging. In particular, in developed countries we tend to observe increasing returns with quantiles, in middle income countries the evidence is inconclusive and in the few low income developing countries for which evidence exists, we observe decreasing returns with quantiles. Increasing returns as one goes from the lower to the higher end of the earnings distribution has been interpreted as an indication that ability and education (or skills) complement each other, with more able workers benefiting from additional investment in education.

The aim of this study is to contribute to the literature which investigates the pattern of returns across the earnings distribution by first, conducting a systematic investigation of the returns to education and experience in one developed and one developing S.E. Asian country (Singapore and the Philippines – a highly educated country for its level of development) and subsequently investigating the existence of a relationship between a country's development stage and the pattern of returns to education along the earnings distribution, after putting together the existing international evidence, including evidence from this study. From a policy perspective if, for example, marginal schooling returns in a particular country are higher for the less able (assuming that "ability" is captured by the residuals of the earnings function), educational

opportunities should be expanded for this section of society, as education an ability are substitutes.

It is hypothesized that heterogeneity in “abilities” which contribute to higher earnings (along with other factors, such as family background) are related to schooling acquisition. In other words, the response to the “treatment” (schooling) varies across individuals. Of the two important questions posed by Card (1995), namely, “what is the causal effect of education?” and “is there evidence of individual heterogeneity in returns to education?” the second will be addressed. To address the first, one needs a proper instrument to estimate returns to education using an IV-quantile analysis. The few empirical papers which address this question utilize data on twins in the context of a “family effects” model (see for example, Arias and others 2001; Ashenfelter and Rouse, 1998). In the absence of such data or a proper instrument, simply using family background information (such as parents’ years of schooling) as the instrument is less than ideal, even if it passes the standard econometric tests, such a Sargan test for the over-identifying restriction. The problem is that estimates of returns from family background instruments are expected to be biased as, along with any independent causal effect of parental background on earnings, it is also expected that ability persists across generations. Furthermore, the focus of this paper is the investigation of the quantile-returns relationship in high income vs. low income developing countries and, while theoretically schooling can not be taken as exogenous in Mincer equations, empirical results suggest that the extent of the bias may be small (see Card, 1999).

The concept of ability utilized here, as in Arias *et al* (2001) among others, is not one based on measures derived from tests (such as “IQ”) but rather, one that relates to those

unobservable, earnings-enhancing, human capital characteristics of an individual. Such ability characteristics are hypothesized to interact with education. As in Mwabu and Schultz (1996) and Arias and others (2001), we will be interpreting a negative relationship between ability and returns to education (decreasing returns with quantile) as evidence of substitutability between education and ability, and a positive relationship (increasing returns with quantile) as evidence of complementarity between education and ability.

In section 2 we discuss past empirical evidence on returns to education by quantile; in section 3 we discuss the methodology; in sections 4 and 5, respectively, we present the data used and derive and discuss the evidence for Singapore and the Philippines; finally, in section 5 we conclude with a summary of the evidence.

## **2. Literature review**

From the evidence available, in most countries, increasing returns with quantiles have been observed. In particular, increasing returns have been documented for 11 out of 15 European countries studied (Austria, Finland, France, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom), and the United States – all developed countries- as well as whites in South Africa, while only for 2 European countries, Greece and (only marginally) Germany, evidence points to a negative returns-quantiles profile<sup>1</sup>.

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<sup>1</sup> For Austria, Denmark, Finland, France, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, see Pereira and Martins 2000 and Martins and Pereira 2004; for South Africa see, Mwabu and Schultz (1996); for the U.S. see, Buchinsky (1998).

Pereira and Martins (2000) looked at returns by quantile over time and found four different patterns. First, for Austria, Finland, France, Ireland, Netherlands, Norway, Spain, Sweden, Switzerland and the UK, a positive and stable relationship exists over time; second, for Portugal, a positive relationship which is becoming more acute over time; third, for Denmark and Italy returns are very similar across the distribution over time; and fourth, for Germany (only marginally) and Greece the returns-quantile profile is negative.

Martins and Pereira (2004), examined quantile returns for 16 European countries, using single year data from the early 1990s. They find that returns increase with quantile for all countries (with Denmark, Germany and Italy being borderline cases), except Greece for which returns decrease moderately with quantiles. However, the data for Greece do not allow for a straightforward comparison with the other countries, as they are based in net wages. The authors point out that progressive taxes are likely to have a strong impact in eroding the returns to education at the top of the distribution than at its bottom. This may explain the Greek results.

Likely explanations given for the observed pattern of returns is the interaction between ability and schooling, which results in an amplification of the impact of ability upon earnings. Another possible explanation has to do with school quality differences. In particular, it may be that individuals who do worse in the labor market (for a given school attainment), are those individuals who received lower quality schooling).

Buchinsky (1998) applied the multiplicative heteroscedasticity quantile model considered by Koenker and Bassett (1982) to an augmented linear Mincer earnings equation, using 1972,

1979, 1985 and 1992 U. S. Current Population Survey data on white males. He finds that returns for college graduates are always higher at the higher quantiles, while for high school graduates, returns are lower at higher quantiles in years 1972 and 1979, but this pattern is reversed in the post-1985 period, during which an increase in wage differentials by education has been documented. He also finds that returns for the more experienced workers are significantly lower at all quantiles compared to less experienced workers, a finding consistent with life-cycle labor supply models.

Evidence for middle and low income developing countries is scarce, especially for the latter. For low income developing countries, Girma and Kedir (1994) presented evidence for Ethiopia. After controlling for endogeneity using parents' education, they find that education is more beneficial to the less able. In particular, returns in the lowest (10<sup>th</sup>) quantile of the earnings distribution (at about 20 percent) are twice that in the highest (90<sup>th</sup>) quantile.

Muabu and Schultz (1996) derive quantile-returns estimates for white and non-white South Africans. They find that, among Africans returns do not increase by their decile in the distribution of residuals, while among whites, returns to higher education increase significantly, from 9 to 18 percent. This is interpreted as evidence that ability and higher education are compliments for whites (one-third of whom obtained this form of education) and substitutes for African males, at least at the primary level.

Empirical evidence is also emerging for middle and upper-middle income South American countries. For Argentina, Fiszbein, Giovagnoli and Patrinos (2004) find increasing returns with quantiles and the same is the case for Venezuelan males, while returns for



Venezuelan females exhibit a U-shaped pattern (Patrinos and Sakellariou, 2004). Montenegro (2001) reports evidence for Chile and finds strong increasing returns by quantile. On the contrary, Patrinos and Metzger (2004) find that returns in Mexico decrease for higher quantiles. Finally, Arabsheibani, Carneiro and Henley (2003) derive quantile-returns over the 1988-1998 period for Brazil and find that for every survey year returns exhibit an increasing pattern for every survey year and that returns are higher for higher education levels.

Very little evidence exists from Asia. Lee and Lee (2002) report quantile regression results for Korea, a high income developing country, and conclude that the returns to education in the Korean labor market are low and relatively stable across wage quantiles. They comment that employers in the Korean labor market do not readily recognize education as an indicator of productive job skills.

### **3. Methodology**

The ordinary least squares (OLS) regression relies on the mean of the conditional distribution of the dependent variable. When it is suspected that unobservables (such as ability) influence parameters of the conditional distribution of the dependent variable other than the mean, quantile regressions are particularly useful, because they allow the full characterization of the conditional distribution of the dependent variable, rather than the conditional mean only. In short, the quantile regressions method allows an investigator to differentiate the contribution of regressors along the distribution of the dependent variable. In particular, the estimation of returns to education entails much more than the fact that, on average, one more year of education results in a certain percent increase in earnings.

The quantile regression model (Buchinsky, 1994) can be outlined as (for an excellent introduction, see also Koenker and Hallock, 2001):

$$\ln w_i = X_i\beta_\theta + u_{\theta i},$$

$$X_i\beta_\theta = (\text{Quantile})_\theta(\ln w_i|X_i); \quad (3)$$

where  $X_i$  is a vector of exogenous variables;  $\beta_\theta$  is the vector of parameters;  $(\text{Quantile})_\theta(\ln w_i|X_i)$  is the  $\theta$ th conditional quantile of  $\ln w$  given  $X$ , with  $0 < \theta < 1$ . The  $\theta$ th quantile is derived by solving the problem (using linear programming):

$$\begin{aligned} \text{Min } \sum \rho_\theta(\ln w_i - X_i\beta_\theta), \\ \beta \in R^k \end{aligned} \quad (4)$$

where  $\rho_\theta(\varepsilon)$  is the check function defined as  $\rho_\theta(\varepsilon) = \theta\varepsilon$  if  $\varepsilon \geq 0$ , and  $\rho_\theta(\varepsilon) = (\theta-1)\varepsilon$  if  $\varepsilon < 0$ . Standard errors are bootstrap standard errors. The median regression is obtained by setting  $\theta = 0.5$  and similarly for other quantiles. As  $\theta$  is varied from 0 to 1, the entire distribution of the dependent variable, conditional on  $X$ , is traced.

The quantile approach has a number of useful features, in addition to allowing the full characterization of the conditional distribution of the dependent variable, such as: (a) the linear programming representation of the quantile regression model makes estimation easy; (b) the quantile regression objective function is a weighted sum of absolute deviations, resulting in a robust measure of location, so that the estimated coefficient vector is not sensitive to outlier observation on the dependent variable; (c) when the error term is non-normal, quantile regression estimates may be more efficient than OLS estimators (Buchinsky, 1998).

Estimated returns to education at different quantiles (0.10, 0.25, 0.50, 0.75 and 0.90, in this case) can provide further insight into within-education level/skill group changes and differences in returns at the upper and lower level of the income distribution, as well as differences by sex.

Quantile regression estimation is used to estimate standard earnings functions (Mincer 1974), which involves the fitting of a function specified as:

$$\ln Y_i = \alpha + \beta S_i + \gamma_1 EX_i + \gamma_2 EX_i^2 + \varepsilon_i,$$

where  $\ln Y$  is the natural logarithm of monthly wage,  $S$  is the number of years of schooling of individual  $i$ , and  $EX$  and  $EX^2$  are the years of experience and its square.

#### **4. Data**

The data for the Philippines is a working file on individuals who worked in a private establishment or for the government, aged 18 to 65 years, obtained from the 1999 Annual Poverty Indicator Survey (APIS)<sup>2</sup>, a large, nationally representative survey of households and their members. The file consists of 24,482 observations (16,203 of which are for men and 8,279 for women). It contains rich information on personal and economic characteristics, including education level, monthly earnings, number of days and hours per day worked during the past quarter. The dependent variable is the logarithm of hourly earnings, derived using the information on monthly earnings, and number of days and hours worked per day.

The data for Singapore is a random sample of an approximately equal number of fully employed majority (Chinese) men and women (7,124 observations in total), drawn from the mid-

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<sup>2</sup> Jointly undertaken by the National Statistics Office of the Philippines, the World Bank mission office and the UNDP.

1998 Labor Force Survey of Singapore. It contains detailed information on educational qualifications, along with other personal characteristics as well as earnings. Since no information was available on hours worked, the dependent variable (logarithm of hourly earnings of individuals, 18-65 years, who are employed full time in a private establishment or for the government), is derived by dividing the monthly earnings of those fully employed by the number of working hours for full time employment in Singapore.

## **5. Empirical Results**

### *Results*

Table 1 reports summary descriptive information on hourly earnings and the logarithm of hourly earnings, as well as years of education and the proportion of individuals with various educational qualifications for the Philippines and Singapore. Men in Singapore and the Philippines have comparable years of schooling, while women in the Philippines have significantly more years of schooling compared to men in both Singapore and the Philippines. The proportion of women in the Philippines with tertiary qualifications is three times that of men, while in Singapore the proportion of men with tertiary qualifications exceed that of women. The distribution of earnings is more unequal in the Philippines, where the hourly earnings in the top (90<sup>th</sup>) quantile are 10 times that in the lowest (10<sup>th</sup>) quantile, compared to 5 times in the case of Singapore.

Tables 2-4 and 7-9, for the Philippines and Singapore respectively, give the OLS and Quantile regression estimates of the returns to one more year of schooling and experience, which are illustrated in charts 1-4. OLS (average) returns are of comparable magnitude in the two countries, at about 13 percent. Similarly, the average return to one more year of experience is

about 4 percent for both countries, higher for men (4.5-5 percent) compared to women (2.5-3 percent).

Quantile returns to one more year of schooling and experience, however, are more revealing, and follow a sharply different pattern for the two countries. Quantile returns to schooling in the case of the Philippines decrease monotonically, while the opposite is the case for Singapore. This pattern is maintained for both men and women. Furthermore, in the case of women, the pattern of decrease (increase) for the Philippines (Singapore) is exacerbated: the return in the lowest quantile for the Philippines (at 22 percent) is twice that in the top quantile, while for Singapore the return in the top quantile (at 15 percent) is twice that in the lowest quantile.

Returns to experience by quantile follow a different pattern in the two countries. In the Philippines, returns to male experience decrease sharply as one goes to higher quantiles, while female returns are flat across quantiles. From Singapore, returns to experience are increasing with quantiles for both men and women, with women enjoying only negligible returns to experience in the lower quantiles of the earnings distribution.

Table 5 and 10 present OLS and quantile returns to schooling by educational qualification. Here, once more, we see that in the Philippines the pattern of quantile returns for those with tertiary qualifications are sharply decreasing with quantiles, while it exhibits a more moderate decrease for those with primary and secondary qualifications. In the case of Singapore the pattern of returns for those with primary and tertiary qualifications is increasing with quantiles, while it is relatively flat for those with secondary qualifications.

Finally, tables 6 and 11 present OLS and quantile returns for different years of experience. For both countries, the rate of return (OLS as well as for every quantile) decreases with experience. However, in higher quantiles of the earnings distribution the rate of return to one more year of schooling decreases only slightly with experience. On the other hand, quantile returns in the Philippines decrease with quantiles for all levels of experience, while in Singapore returns increase with quantiles, with the exception of those with less than 5 years of experience.

*Quantile returns: High vs. low income countries*

In this section we incorporate the results for the Philippines and Singapore into the available international evidence, including some recent studies. Chart 8 depicts the 9<sup>th</sup>-1<sup>st</sup> decile difference in the rate of return across 27 cases in 26 countries (results for Whites and Africans in S. Africa are reported separately). The results represent a collection of high, middle and low income countries. The high income countries are the 15 EU countries, the U.S.A and Singapore. The low income countries are represented by Ethiopia, the Philippines, as well as the case of Africans in S. Africa.

Casual observation of the evidence suggests that, of all the developed countries, only in the case of Greece returns decrease with quantiles, and this result is likely due to the use of after tax earnings as opposed to before tax earnings used in the other studies. For both low income countries (Philippines and Ethiopia) as well as the case of Africans in South Africa, returns decrease with quantiles, suggesting that ability and schooling are substitutes, resulting in a magnification of returns in lower quantiles. Finally, of the few middle income countries, only for Mexico we observe a moderate decrease in returns; for the rest, returns follow an increasing pattern.

Concluding, while available evidence is far from conclusive (until more country evidence becomes available), there seems to be an emerging pattern, namely that of increasing returns for

high income and decreasing returns for low income countries. The policy implication, at least for low income developing countries, is that education opportunities should be expanded for the less able as schooling and ability are substitutes for this section of society.

## **Conclusions**

Recently, an increasing number of studies (mostly for European countries, the USA and Latin America) investigate the pattern of returns to an additional year of education along the earnings distribution using quantile regression analysis. This study investigates the pattern of returns across the earnings distribution by first, contributing new evidence on the pattern of returns to education and experience for one developed and one developing S.E. Asian country (Singapore and the Philippines, respectively); subsequently we investigate the existence of a relationship between a country's development stage and the pattern of returns to education along the earnings distribution, after putting together the existing international evidence.

It is hypothesized that heterogeneity in "abilities" which contribute to higher earnings (along with other factors, such as family background) are related to schooling acquisition. We use quantile regression estimation of the rate of return to schooling across the conditional distribution of the dependent variable, as it is expected that unobservables (such as ability) influence parameters of the conditional distribution of the dependent variable other than the mean.

It was found that quantile returns to an additional year of schooling in the Philippines decrease monotonically, while the opposite is the case for Singapore. This pattern is maintained for both men and women. Furthermore, in the case of women, the pattern of decrease (increase) for the Philippines (Singapore) is exacerbated. Looking at the quality rather than quantity of education, we find that in the Philippines the pattern of quantile returns for those with tertiary qualifications are sharply decreasing with quantiles, while it exhibits a more moderate decrease for those with

primary and secondary qualifications. In the case of Singapore the pattern of returns for those with primary and tertiary qualifications is increasing with quantiles, while it is relatively flat for those with secondary qualifications.

A compilation of the available evidence from 27 case studies (until more country evidence becomes available), suggests that a pattern is emerging, with high income countries associated with increasing returns by quantile (complementarity of ability and education) low income countries associated with a decreasing pattern of returns (substitutability of ability and education).



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Table 1: Descriptive Statistics

	Philippines 1999			Singapore 1998		
	All	Male	Female	All	Male	Female
Hourly earnings (Pesos/\$S)	63.246 (72.37)	60.412 (76.76)	68.786 (62.54)	12.963 (13.19)	15.453 (16.64)	10.503 (7.75)
Log(hourly earnings)	3.758 (0.95)	3.736 (0.89)	3.802 (1.05)	2.328 (0.65)	2.502 (0.64)	2.156 (0.60)
Education (in years)	11.435 (4.54)	10.620 (4.34)	13.026 (4.50)	10.284 (4.19)	10.398 (4.31)	10.172 (4.07)
% with Primary *	0.381 (0.49)	0.444 (0.49)	0.256 (0.44)	0.342 (0.47)	0.368 (0.48)	0.316 (0.46)
% with Secondary **	0.368 (0.48)	0.399 (0.49)	0.309 (0.46)	0.391 (0.49)	0.326 (0.47)	0.455 (0.50)
% with Tertiary ***	0.251 (0.43)	0.157 (0.36)	0.435 (0.49)	0.268 (0.44)	0.306 (0.46)	0.229 (0.42)
Experience (in years)	20.026 (11.87)	20.932 (11.69)	18.256 (12.01)	22.933 (11.84)	23.960 (11.23)	21.920 (12.33)
Hourly earnings <sub>q90</sub> / Hourly earnings <sub>q10</sub> (Pesos/\$S)	10.354	9.268	13.516	5.499	5.000	4.667
Log (hourly earnings) <sub>q90</sub> – Log (hourly earnings) <sub>q10</sub>	2.337	2.227	2.604	1.70	1.61	1.54

Standard deviation in parentheses.

\*Those with less than completed secondary. \*\* Those with completed secondary (includes A-levels in the case of Singapore). \*\*\*Those university qualifications (includes polytechnic graduates in the case of Singapore).

Table 2: OLS and Quantile Regression Estimates, Philippines 1999 (All)

	OLS	Q10	Q25	Q50	Q75	Q90
Education	0.132**	0.172**	0.159**	0.129**	0.107**	0.105**
Experience	0.038**	0.044**	0.048**	0.037**	0.028**	0.033**
Experience <sup>2</sup>	-0.0005**	-0.0006**	-0.0007**	-0.0005**	-0.0003**	-0.0004**
N	24,482					
R <sup>2</sup> /Pseudo R <sup>2</sup>	0.361	0.171	0.223	0.232	0.247	0.233
Wald $\chi^2$						

\*\* indicates significance at the 1% level.

Table 3: OLS and Quantile Regression Estimates, Philippines 1999 (Males)

	OLS	Q10	Q25	Q50	Q75	Q90
Education	0.122**	0.148**	0.138**	0.118**	0.105**	0.106**
Experience	0.045**	0.063**	0.058**	0.041**	0.032**	0.035**
Experience <sup>2</sup>	-0.0006**	-0.0009**	-0.0008**	-0.0005**	-0.0004**	-0.0004**
N	16,203					
R <sup>2</sup> /Pseudo R <sup>2</sup>	0.322	0.146	0.184	0.193	0.211	0.237
Wald $\chi^2$						

\*\* indicates significance at the 1% level.

Table 4: OLS and Quantile Regression Estimates, Philippines 1999 (Females)

	OLS	Q10	Q25	Q50	Q75	Q90
Education	0.165**	0.221**	0.213**	0.170**	0.129**	0.118**
Experience	0.026**	0.028**	0.033**	0.030**	0.026**	0.033**
Experience <sup>2</sup>	-0.0004**	-0.0004**	-0.0004**	-0.0005**	-0.0005**	-0.0005**
N	8,279					
R <sup>2</sup> /Pseudo R <sup>2</sup>	0.486	0.263	0.343	0.337	0.295	0.243
Wald $\chi^2$						

\*\* indicates significance at the 1% level.

Table 5: Estimates of Rates of Return to an Additional Year of Schooling by Education Level, Philippines 1999

Education level	OLS	Q10	Q25	Q50	Q75	Q90
Primary (N=9,147)	0.089**	0.087**	0.092**	0.099**	0.076**	0.051**
Secondary (N=9,094)	0.083**	0.087**	0.101**	0.069**	0.063**	0.079**
Tertiary (N=6,241)	0.260**	0.350**	0.222**	0.214**	0.239**	0.198**

\*\* indicates significance at the 1% level.

Table 6: Estimates of Rates of Return to an Additional Year of Schooling by Years of Experience, Philippines 1999

Education level	OLS	Q10	Q25	Q50	Q75	Q90
< 5 years (N=2,783)	0.165**	0.217**	0.207**	0.161**	0.120**	0.118**
5 to 15 years (N=6,907)	0.143**	0.181**	0.163**	0.138**	0.114**	0.113**
16-25 years (N=6,645)	0.128**	0.166**	0.145**	0.124**	0.109**	0.110**
>25 years (N=8,147)	0.126**	0.163**	0.158**	0.127**	0.103**	0.095**

\*\* indicates significance at the 1% level.

Table 7: OLS and Quantile Regression Estimates, Singapore 1998 (All)

	OLS	Q10	Q25	Q50	Q75	Q90
Education	0.125**	0.098**	0.114**	0.130**	0.136**	0.142**
Experience	0.041**	0.014**	0.029**	0.042**	0.057**	0.067**
Experience <sup>2</sup>	-0.0005**	-0.0002**	-0.0004**	-0.0005**	-0.0007**	-0.0008**
N	7,124					
R <sup>2</sup> /Pseudo R <sup>2</sup>	0.483	0.208	0.272	0.309	0.328	0.332

\*\* indicates significance at the 1% level.

Table 8: OLS and Quantile Regression Estimates, Singapore 1998 (Males)

	OLS	Q10	Q25	Q50	Q75	Q90
Education	0.121**	0.105**	0.115**	0.117**	0.126**	0.135**
Experience	0.049**	0.029**	0.039**	0.046**	0.063**	0.073**
Experience <sup>2</sup>	-0.0007**	-0.0004**	-0.0005**	-0.0006**	-0.0009**	-0.0009**
N	3,540					
R <sup>2</sup> /Pseudo R <sup>2</sup>	0.497	0.227	0.285	0.316	0.327	0.322

\*\* indicates significance at the 1% level.

Table 9: OLS and Quantile Regression Estimates, Singapore 1998 (Females)

	OLS	Q10	Q25	Q50	Q75	Q90
Education	0.123**	0.077**	0.101**	0.125**	0.143**	0.150**
Experience	0.029**	0.002	0.011**	0.032**	0.046**	0.052**
Experience <sup>2</sup>	-0.0004**	-0.0001*	-0.0002**	-0.0004**	-0.0006**	-0.0006**
N	3,584					
R <sup>2</sup> /Pseudo R <sup>2</sup>	0.493	0.210	0.266	0.317	0.348	0.364

\*\* indicates significance at the 1% level.

Table 10: Estimates of Rates of Return to an Additional Year of Schooling by Education Level, Singapore 1998

Education level	OLS	Q10	Q25	Q50	Q75	Q90
Primary (N=2,434)	0.055**	0.037**	0.044**	0.060**	0.070**	0.073**
Secondary (N=2,783)	0.136**	0.126**	0.124**	0.136**	0.159**	0.111**
Tertiary (N=1,907)	0.209**	0.173**	0.184**	0.275**	0.279**	0.244**

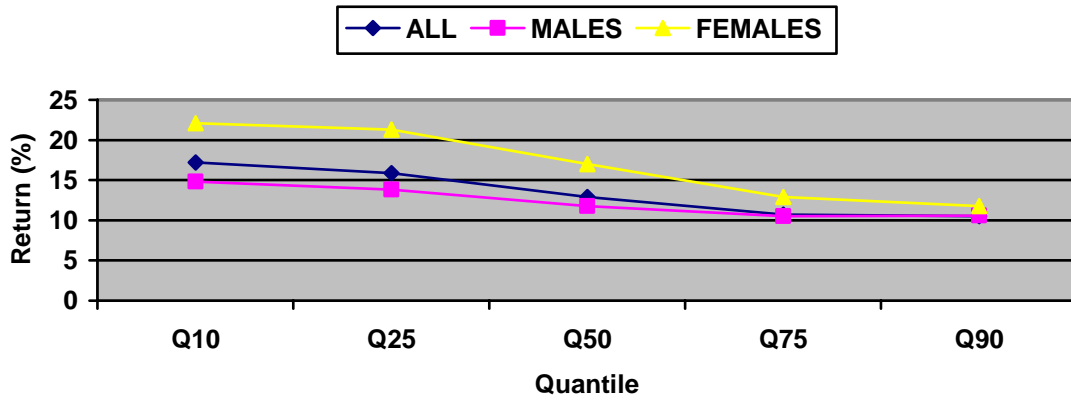
\*\* indicates significance at the 1% level.

Table 11: Estimates of Rates of Return to an Additional Year of Schooling by Years of Experience, Singapore 1998

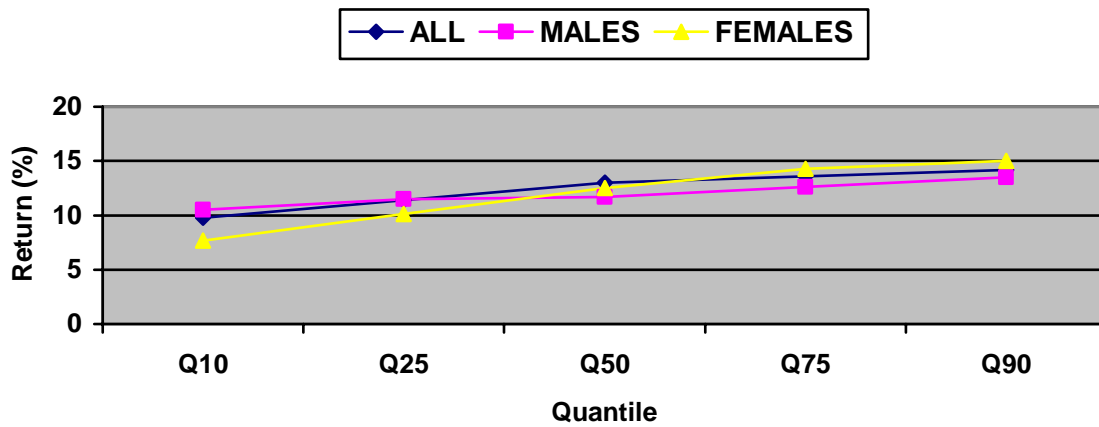
Education level	OLS	Q10	Q25	Q50	Q75	Q90
< 5 years (N=444)	0.149**	0.200**	0.170**	0.135**	0.131**	0.145**
5 to 15 years (N=1,647)	0.152**	0.135**	0.145**	0.153**	0.156**	0.157**
16-25 years (N=2,008)	0.135**	0.113**	0.139**	0.136**	0.142**	0.137**
> 25 years (N=3,025)	0.110**	0.056**	0.088**	0.109**	0.122**	0.134**

\*\* indicates significance at the 1% level.

**Chart 1: Return to One More Year of Education by Quantile, Philippines 1999**

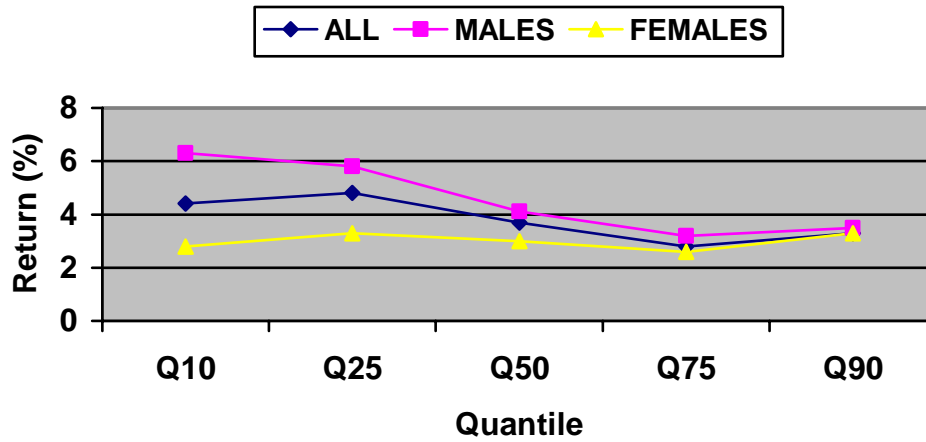


**Chart 2: Return to One More Year of Education by Quantile, Singapore 1998**

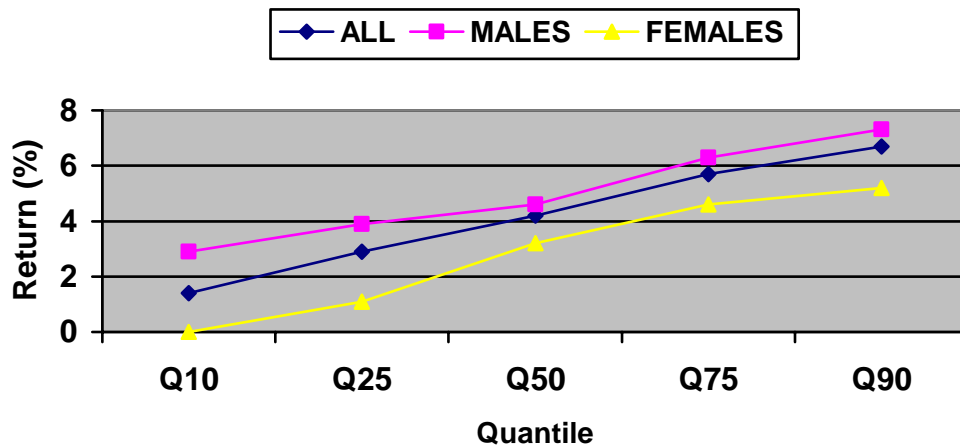




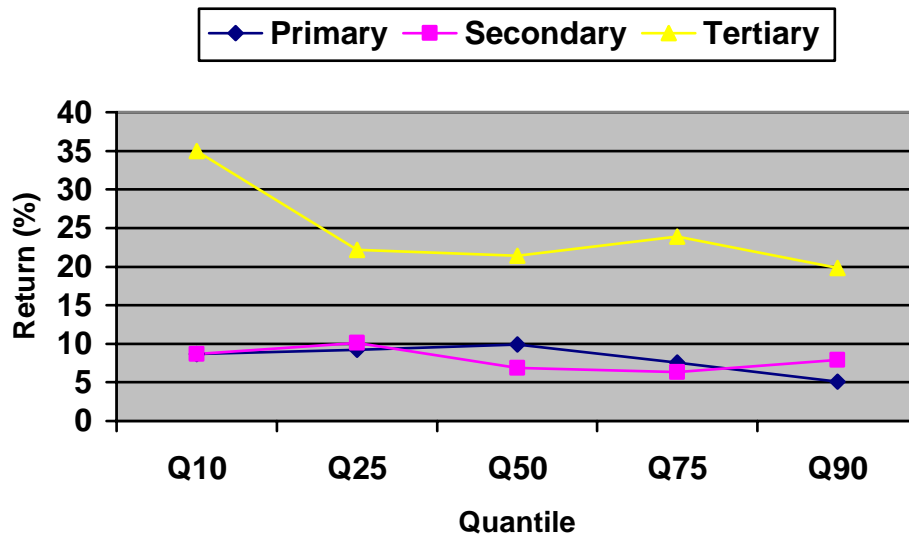
**Chart 3: Return to one more year of experience by quantile, Philippines 1999**



**Chart 4: Return to one more year of experience by quantile, Singapore 1998**



**Chart 5: Quantile Returns by Educational Qualification, Philippines 1999**



**Chart 6: Quantile Returns by Educational Qualification, Singapore 1998**

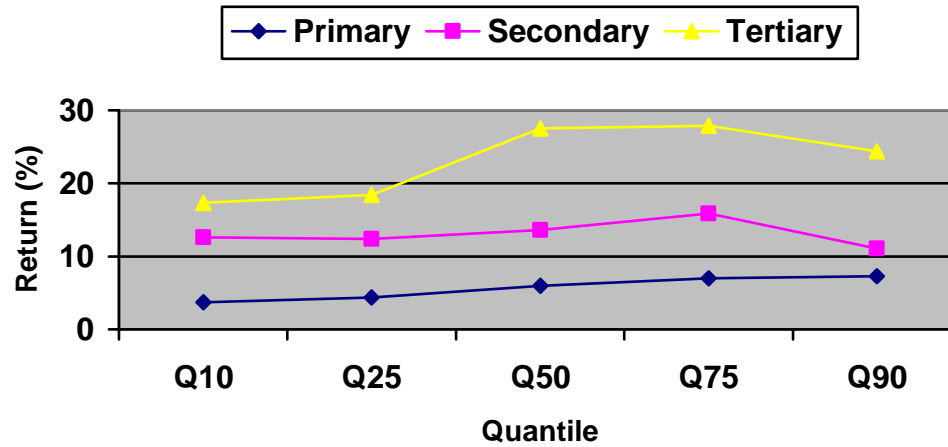


Chart 7: Quantile Returns by Years of Experience, Philippines 1999

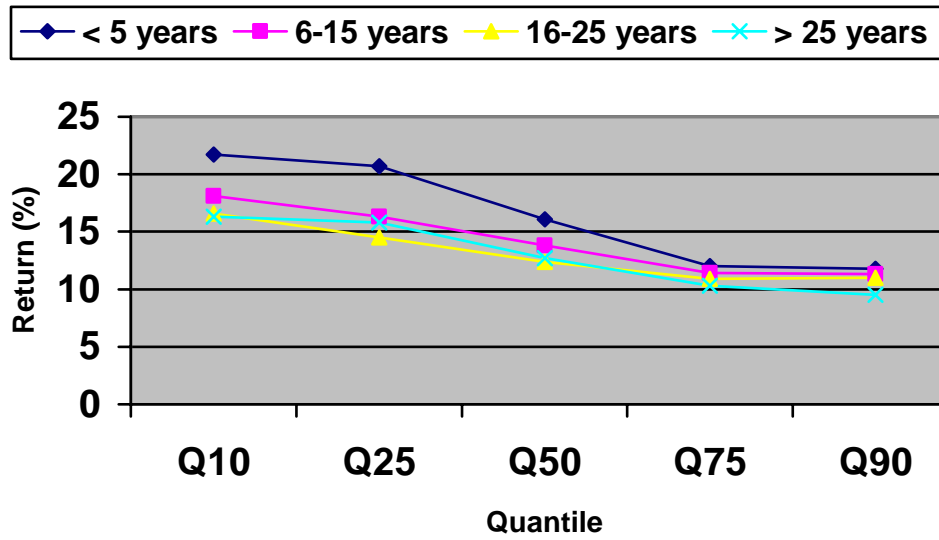
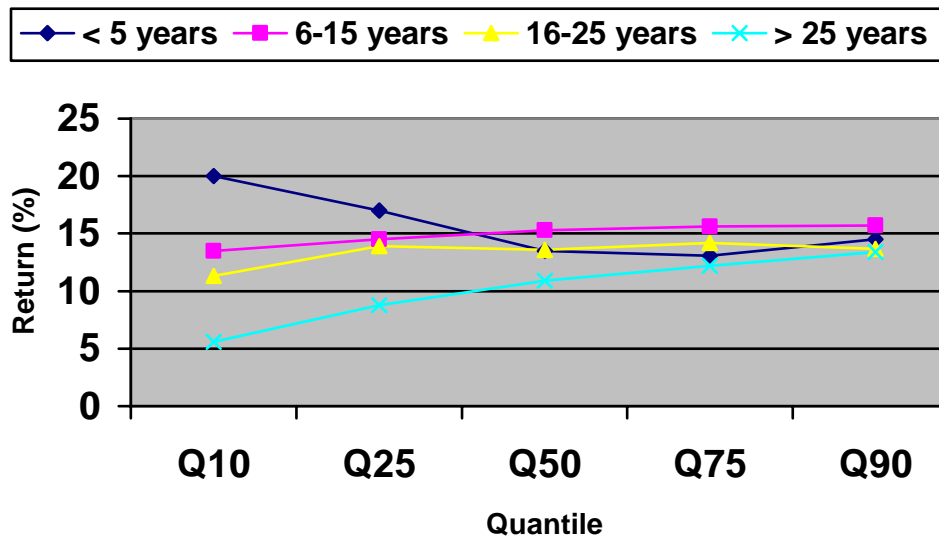
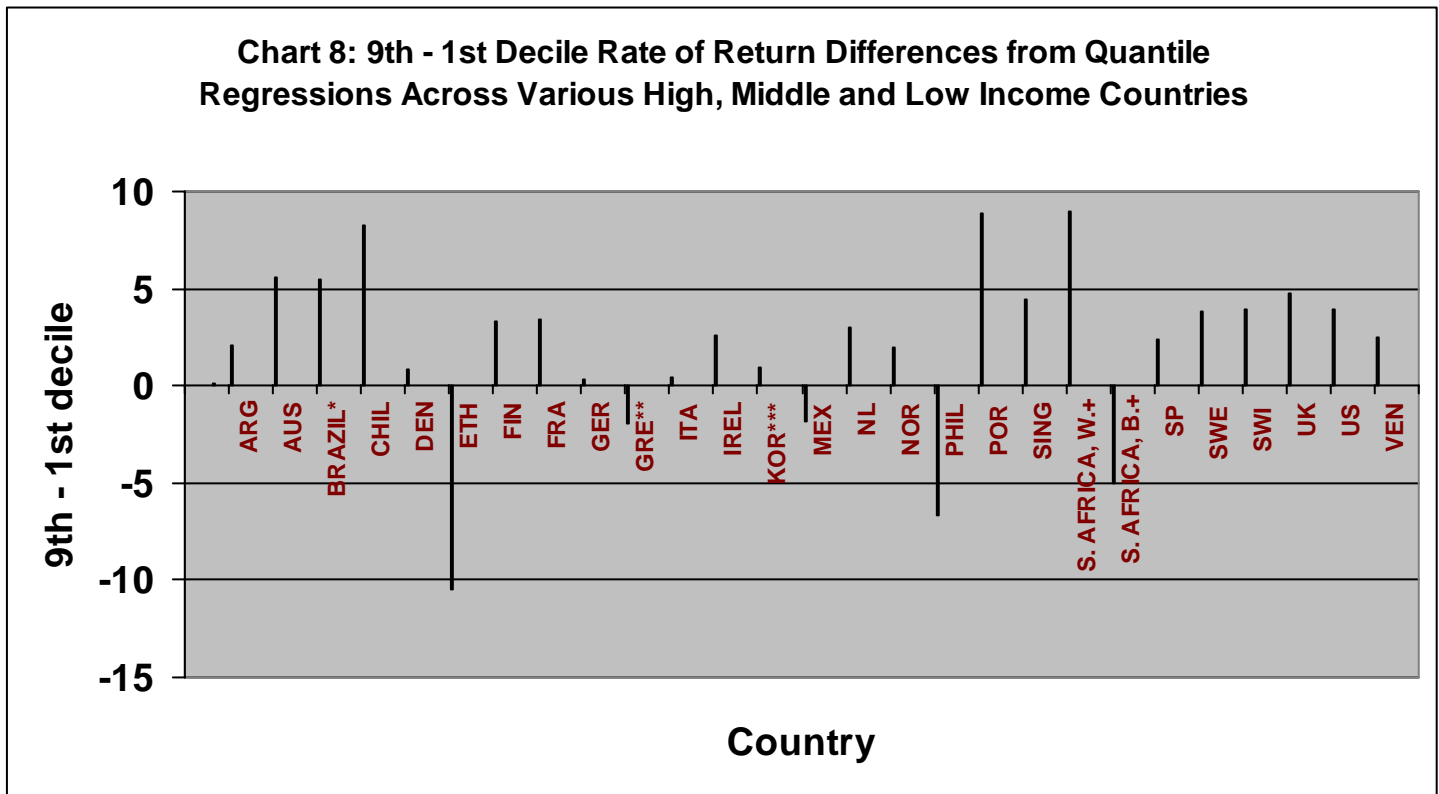


Chart 7: Quantile Returns by Years of Experience, Singapore 1998



**Chart 8: 9th - 1st Decile Rate of Return Differences from Quantile Regressions Across Various High, Middle and Low Income Countries**



Note: Estimates for 14 EU countries are based on Pereira and Silva Martins (2000), and for Germany on Martins and Pereira (2004).

\* The results for Brazil are based on a specification which included a education-experience interaction dummy, using 1998 data.

\*\* The results for Greece were based on after tax earnings.

\*\*\* For Korea, the 95<sup>th</sup> – 5<sup>th</sup> quantile difference is reported, as authors' (Lee and Lee, 2002) quantile estimates are over the 5<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and 95<sup>th</sup> quantiles; also, in the case of Korea the regression equation included several controls.

+ For higher education only.