

THE RETURNS TO EDUCATION OVER TIME: THE MALAYSIAN OUTLOOK, 1984-1997

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Introduction

The returns to education over time are examined in Riveros (1990) for Chile, Demetriades and Psacharopoulos (1987) for Cyprus, Appleton *et al.* (1995) for Kenya, Funkhouser (1998) for Costa Rica, Palme and Wright (1998) for Sweden and Duraisamy (2000) for India. The list of studies can be extended further to include studies for countries like Korea (Ryoo, *et al.*, 1993), Taiwan (Gindling, *et al.*, 1995), Spain (Vila and Mora, 1998), the United Kingdom (Chevalier and Walker, 1999), Norway (Hægeland, *et al.*, 1999), the United States (Katz and Murphy (1995) and Arias and McMahon, (2000)), Brazil (Green, *et al.*, 2000) and Portugal (Hartog *et al.*, 2001).

While the verdict of the trends in the returns to education over time is mixed,¹ majority of these studies tend to relate the changes in the returns to education to the changing demand and supply of labour in the respective country of analysis.

Rate of Returns to Education in Malaysia Over time

To estimate the Malaysian marginal gross returns to education over time, we applied data from 6 sets of the

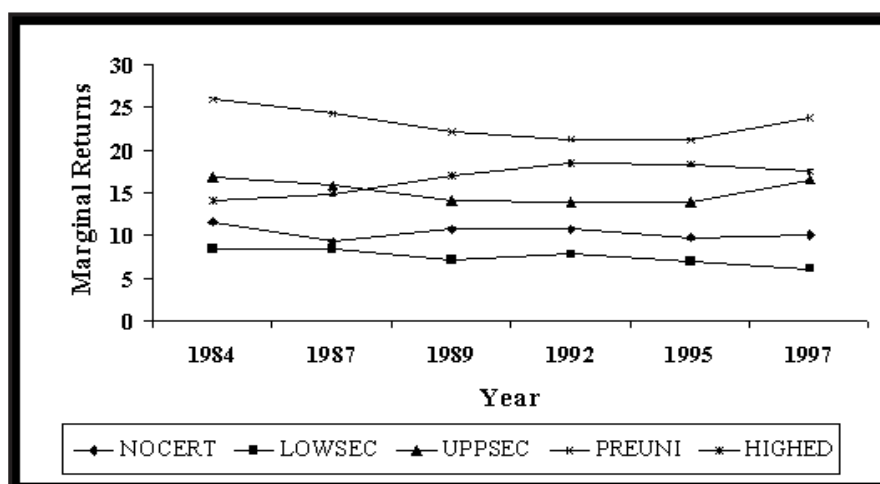
Malaysian Household Income Survey (i.e. 1984, 1987, 1989, 1992, 1995 and 1997) into a human capital earnings function (equation 1).

$$\ln Y_i = \alpha + \gamma_1 age + \gamma_2 age^2 + \beta_i S_{dum} + \delta_i X_i + \varepsilon_i \quad (1)$$

where $\ln Y_i$ is the logarithm of annual earnings, S_{dum} is a list of dummy variables indicating achievement of one particular level of education. Six categories of educational attainment are examined, i.e. the no formal education level (NOFED), those who did not obtain any certificate (NOCERT), the lower secondary level (LOWSEC), the upper secondary level (UPPSEC), the pre-university level (PREUNI) and the tertiary education level (HIGHED). Age and age^2 are the usual proxy variables for experience and X_i is a vector of control variables, i.e. marital status, gender, the logarithm of the number of hours worked in a week and ε_i is the error term.

Using the β estimates, we are able to measure the marginal gross return which indicates the returns to education for each additional year taken to achieve the next level of education. The results of the analysis showed that the returns to education over time to be stable for majority of the educational levels with the exception of the higher education level, which showed an increased marginal gross returns from 1984 to 1997 (See Figure 1).

Figure 1: Marginal gross returns to education, HIS 1984-1997



The Demand and Supply of Labour

Using a simple demand and supply framework (Katz and Murphy, 1992), we examine relative wages, relative demand and relative supply of higher education workers to explain the increasing marginal gross returns to the higher education schooling level. When considering relative wages, we attempt to investigate the determinants of the changes in relative wages of a group of high skilled individuals with a second group of low skilled individuals. For this analysis, the high-skilled individuals are those with a tertiary degree, i.e. the HIGHED graduates. Our low-skilled workers are those with the LOWSEC qualification level.²

In order to do this, we estimated the relative supply of the HIGHED and LOWSEC individuals. The relative supply of skilled labour is computed by using the values of the coefficients obtained from 4 regressions.³ The 'value' of a person with a particular qualification is measured by the individual educational group's average wages (notated by WNOCERT, WNOFED, WLOWSEC, WUPPSEC, WPREUNI and WHIGHED). Table 1 shows the regression results obtained.

Table 1: Regression results leading to the calculation of relative supply

INDEPENDENT VARIABLE	WLOWSEC	WUNIV
WNOFED	0.420	0
WNOCERT	0.962	0
WUPPSEC	0	0.221
WPREUNI	0	0.382

Figure 2: Log of relative wages, 1984-1997

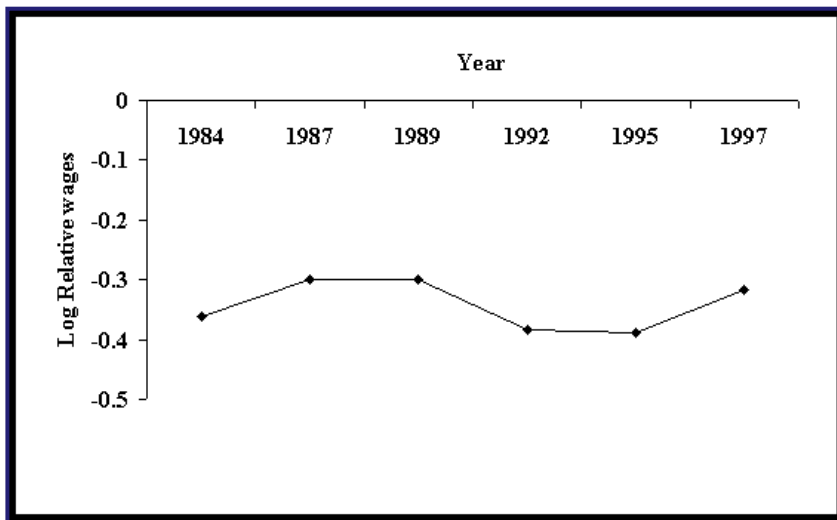
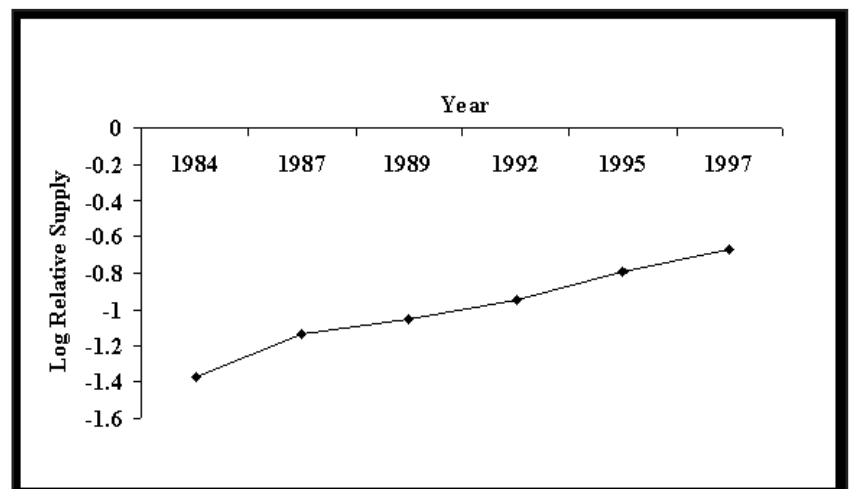


Figure 2 shows the log relative wages of the high skilled to low-skilled individuals in Malaysia for 1984 to 1997. Relative wages appear to have risen from 1984 to 1987 and are stable from 1987 and 1989, only to decline in 1992. It stabilised between 1992 and 1995 and increased in 1997.

The change in relative wages is related to a change in the relative market price of skills possessed by the high-skilled and low-skilled individuals. Hence, we need to determine the degree to which the change in relative wages is driven by fluctuations in the growth of supply versus the growth of demand side factors.

The results in Table 1 indicate that a person with NOFED is equivalent to a total of 0.42 of a LOWSEC person and a NOCERT person is 0.962 of a LOWSEC person. At the other end, a person with an UPPSEC qualification is 0.221 of a HIGHED person and a person with a PREUNI qualification is 0.382 of a person with a HIGHED qualification. These coefficients are used to form the supplies of HIGHED

Figure 3: Log relative supply of skilled labour, 1984-1997



and LOWSEC equivalents. Figure 3 shows the log of relative supply computed for the time period of 1984 to 1997.

Relative supply has increased over the time period of our analysis from Figure 3. There does not appear to be any obvious fluctuation in the relative supply. At this point, it does not give us the impression that supply itself is enough to explain the changes in the HIGHED wage premium.

Moving on to measure the relative demand of HIGHED graduates, we use the relationship between the log of relative wages, demand and the log of relative supply as follows: -

$$\log RW = \frac{1}{\sigma} [D(t) - \log RS] \quad (2)$$

where

log RW is the log of relative wages,

σ is the elasticity of substitution between
HIGHED and LOWSEC qualifiers,

D(t) is the relative demand and

log RS is the log of relative supply.

Rearranging equation (2), relative demand can be calculated using the following equation: -

$$D(t) = \sigma \log RW + \log RS \quad (3)$$

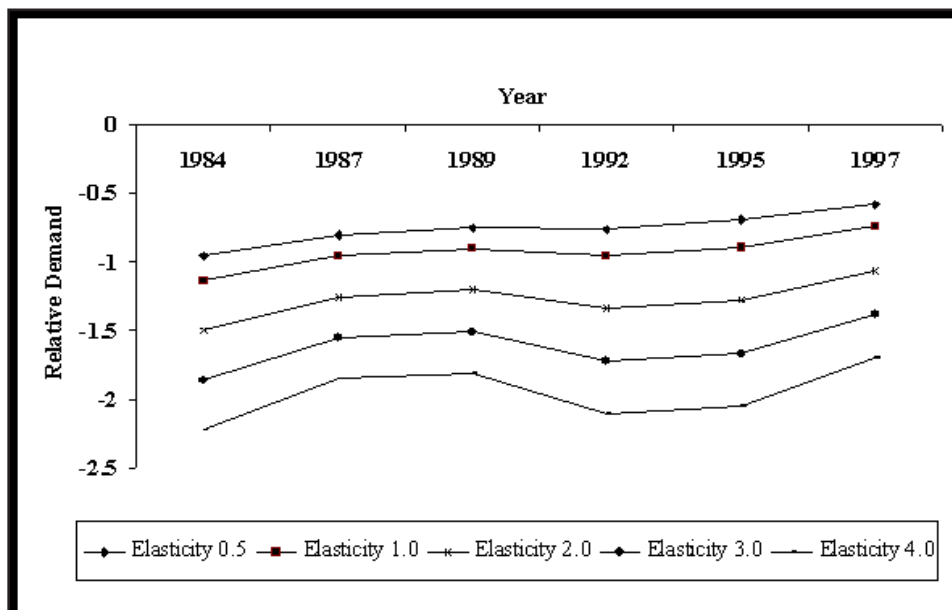
We substitute σ with various elasticities of substitution to measure relative demand. We use σ ranging from 0.5 to 4. Figure 4 shows the measured log of relative demand with the different elasticities of substitution.

Looking across the board, there is an upward trend in the log of relative demand of the HIGHED graduates. At the lower levels of σ , the upward slope of the relative demand curve is markedly clearer (when σ is from 0.5 to 2) compared to the log of relative demand with higher elasticity of substitution (when σ is equal to 2.0 and above).

Conclusion

This paper examines the returns to education over time in Malaysia and attempts to provide an explanation of a probable cause for the increasing marginal gross returns to the higher education level. The findings show that the relative demand for higher educated (HIGHED) workers has been increasing amidst increasing relative supply from 1984 to 1997. The time period of our analysis coincides with the Malaysian industrialisation period. Hence, we may expect the relative demand for higher educated

Figure 4: Relative demand, 1984-1997



workers to have exceeded the supply of higher educated workers given the accelerated industrial development in the mid-1980s. The increased demand for higher educated workers is further plausible considering that relative wages in Malaysia have increased from 1984 to 1997.

Policy Implication

These results have policy implications on the Malaysian labour market. If an increasing demand for higher skilled labour continues to exist, the supply of skilled labour needs to be monitored. Are we facing a condition of skill shortage or is there a case of mismatches in the labour market (i.e. conditions of over-education or under-education or inadequate skills supply). Future research could attempt to investigate the more specific causes of the increased demand for higher skilled labour.

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(Endnotes)

¹ Declining returns were found in Chile, Cyprus, Kenya, Costa Rica, Sweden and India while increasing returns were detected in Korea, Spain, the United States, United Kingdom and Portugal. Another category of studies showed that there were stable returns over time in Taiwan, Brazil and Norway.

² We justify the usage of these two levels of education by arguing that basic education was a minimum of 9 years (until the change in 1997 to extend basic education in Malaysia to 11 years), hence we can consider the LOWSEC education level as a benchmark for low-skilled individuals. On the higher end of the skill level, HIGHED would be an appropriate proxy considering the emphasis of the Government in attempting to increase the number of degree holders in the last decade.

³ These regressions do not contain an intercept term and have White corrected Standard errors.