



Do Higher Levels of Qualification Lead to Higher Returns to Education: Evidence from Malaysian Education Sector

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ABSTRACT

Using data from a household income survey, this study provides first evidence about returns to education at highest certificate of qualification in the Malaysian Education sector. We employ a simple ordinary least squares estimator with robust standard errors to estimate the Mincerian equation during the years 2002-2007. Our results show that workers with degree qualifications have high average returns, followed by diploma-educated workers during the period investigation. The results indicate that the returns to education show a linear relationship between certificates of qualification and earnings. For policy makers with scarce resources to allocate between competing policies, the findings from the return to education at highest certificate of qualification provides valuable information for the decision to provide extra funds for education. For individuals, the information on the returns to education is helpful in assessing whether it is efficient to opt for extra education.

Keywords: Certificates of Qualification, Earnings, Returns to Education

JEL Classifications: I26, J20, J30

1. INTRODUCTION

The importance of human capital development always has been a priority of the Malaysian government as it is seen as a potential engine to achieve a knowledge-based economy. Under the successive 5-year development plans, Malaysia's educational budget allocations for human capital development in education sector kept increasing with each budget session since the Second Malaysia Plan (2MP, 1971-1975) until now. For example, a sum of RM 54.6 billion or 21% was allocated in budget 2014 for education sector (EPU, 2010a).

According to the human capital theory, education or training increases the productivity of workers by imparting useful knowledge and skills, thereby raising workers' future income by increasing their lifetime earnings (Becker, 1962). Meanwhile, the human capital analysis suggests that the private benefits of investing in another year of education are the resulting gains in earnings (after taxes) for the rest of a person's working life (Levin and McEwan, 2002; Psacharopoulos, 1995). Mincer, in his

first model in 1958, shows that differences between the levels of schooling contribute to the differences in earnings received over people's lifetimes.

In spite of a plethora of studies provide mixed results regarding the returns to education related to the level of education, but the returns to education at certificates of qualification, that is the "sheepskin effect," is much less clear¹ (Trostel, 2005). Similarly, most empirical research on earnings functions has assumed an absence of "sheepskin" effects (e.g.: Hungerford and Solon, 1987; Park, 1999; Antelius, 2000; Trostel, 2005).

This paper contributes to expand our knowledge in two ways. We first present estimates of the returns to education uses the highest certificate of qualification or sheepskin effects in Malaysian education sector. In particular, the paper draws attention to the role of so-called sheepskin effects, defined as the gain in earnings associated with receipt of a degree, controlling for types of

¹ Sheepskin effects are referring to the independent effect that certificates of qualification appear to have even after controlling for years of education.

occupations. Unlike the previous studies including in Malaysia, they use the level of formal education to measure returns to education² (e.g.: Mazumdar, 1981; Said et al., 2009; Kenayathulla, 2013).

We then present the trend of returns to education at different levels of the highest certificate qualification achieved in the education sector during the years 2002-2007. An investigation the trend of returns to education in economics sector need to be given special attention, because, to date, this has not been adequately discussed in the Malaysian literature³. This study will not only potentially inform policy makers of the effectiveness of different types of qualification, but also determine the labour supply and demand conditions in Malaysian labour market.

The organization of this paper is as follows: The second section provides a review of the literature on returns to education. Section 3 provides research-related details in terms of data description and scope of study. Section 4 presents the empirical methodology. Section 5 discusses the results. Finally, section 6 closes with a conclusion and policy implication.

2. LITERATURE REVIEW

The estimates of the returns to education investment have attracted considerable attention in theoretical works since the early 1960s (Psacharopoulos, 1981; 1985). This is due to the investment in education, which has a greater impact for future earnings because education produces those skills that employers are willing to reward. Investment in education is found to continue to be a very attractive investment opportunity in the world today. Acemoglu and Angrist (2001) analysed the impact of human capital on returns to education and found evidence for substantial return to education. However, they also claimed that a private return is negligible. Based on this evidence, it is important to analyse the view of labour research on private returns to education due to the obvious link with human capital theory.

In line with human capital theory, much evidence has confirmed that a greater amount of educated individuals leads to them having the higher returns to education, working in more prestigious occupations compared to when there are less educated workers available. For instance, Park (1999) revealed that the returns to education for workers with a bachelor's degree was 21% compared to workers with an associate degree and

high-school diploma, which were at 11% and 9%, respectively. A recent study by Liu et al. (2015) showed that the returns to associate and bachelor's degrees remain strong over the late 2000s despite the great recession in the North Carolina. The returns to certificates and diplomas were weak. From the student perspective, this study showed that the completion of an associate degree appears to be a very high-yielding investment. Cellini and Chaudhary (2014) in the United States showed those students enrolled in associate degree programmes in for-profit colleges experienced earnings gains of between 6 and 8%, although a 95% confidence interval suggested a range from -2.7 to 17.6%, while students who completed their associate degrees in for-profit institutions earned around 22%, or 11% per year. Meanwhile, Quinn and Rubb (2006) found that wages increased by 6.5% for those workers with additional years of schooling, particularly for male workers. This study showed that educational attainment is positively linked with wages due to the increased number of workers with tertiary education in line with the requirements of the firm. The increase in demand for workers with degree qualifications is also in line with the effect of technological change because educated workers are more likely to adopt new technology and thus are paid accordingly higher (Beblavy et al., 2013; Acemoglu, 2002).

In spite of there are growing number of studies investigate returns to education uses the certificates qualification, but most of these studies focus on gender, ethnicity, countries, broad subject groups and more narrowly defined discipline (e.g: Liu et al., 2015; Bol and Van de Werfhorst, 2011; De Silva, 2009; O'Leary and Sloane, 2005). Less attention has been given to estimate the private returns to education in the economics sector. Among the recent studies, Thrane (2010) investigates the sheepskin effects in returns to education in the Norwegian tourism industry. This study revealed that the earnings returns to educational degrees net of the returns to accumulated years of schooling. The results showed statistically and economically significant sheepskin effects, with the returns to educational degrees clearly exceeding the returns to years of schooling for both male and female employees. A similar result performed by Heywood (1994) in the United of States labor market showed that the sheepskin effects are strongest in private sector with the degree-educated workers enjoys higher earnings than the non-union labor markets and virtually absent in any public sector or unionized. Alba-Ramírez and San Segundo (1995) indicated that secondary education is better compensated in the private sector, whereas a university degree receives a greater rate of return in the public sector in Spain. The returns to university education is higher among women than among men regardless of the class of worker and the sector of employment. These results could be explained by the particular recruitment system of large firms in Japan, which makes university diploma as a screening device unimportant for large firms and the admission policy of Japanese universities.

Empirical studies since the work of the Chicago economists, and part of neoclassical economics, claims that an expansion of education has resulted in an excess supply (Miller, 1984). The increase in the supply of graduate output coming on the labour market just as the demand for such a qualification becomes

2 The level of education is more general, due to its measure of groups of people who were at school for a certain period of time, but who may not have achieved the equivalent qualification level. The estimation based on the highest level of schooling completed (credentials) is more accurate, because it provides an alternative structure for recovering the returns to schooling (Harmon et al., 2003). In fact, educational credentials are important to employers when hiring, because it is seen as a signal of the skills of a person, and thus provides better access to occupations (Black and Lynch, 1996; Blundell et al., 2004).

3 In Malaysia, Lee (1980) investigated the rates of return to education from a non-random sample of 1179 private sector employees and 792 public sector employees in the Klang Valley. Lee et al. (1995) estimate rates of return for males and females separately on 1445 employees in eight manufacturing industries. Both studies used the level of formal education to estimate the rates of returns to education and focus on inter-racial earnings.

stagnant might be evidence that the return to a first degree is falling. A study by Purnastuti et al. (2013) in Indonesia is supported the Freedman's finding in 1977 that documented a fall in the returns to education is due to the country's education sector in the United of States. This study finds that the returns to education in Indonesia generally declined between 1993 and 2007-2008. They found that both recent growth in the education sector (which by itself could depress the returns to education) and uneven growth across the Indonesian economy (which could differentially increase demand for graduates at various levels of education) have played a role in determining the pattern of change over time in the profitability of education in Indonesia. A similar result performed by Chuang and Lai (2010) in Taiwan. The declining trend of returns to university education may have been caused by the rapid expansion of the number of colleges and universities and the increasing supply of college graduates in the 1990s.

The declining returns education for degrees' holders is closely associated with the fall in the value of a degree for those workers particularly for young graduates who fail to get a graduate-level job. Robst (2007) investigated the mismatch issues between years of schooling and the schooling required for the job by uses the national survey of college graduates. The result asserted that 20% of workers reported that their work was not related to their degree field in the Mexico. Meanwhile, Lamo and Messina (2010) in Estonia. The results showed that more than 12% of workers were formally over-education for their jobs. Unlike with some empirical studies, Allen and Van der Velden (2001) and Badillo Amador et al. (2012) showed that the impacts of both educational and skill mismatches emerge as a much better predictor of job satisfaction. However, the skill mismatches were much better predictors of job satisfaction and on-the-job search compared to educational mismatches as the effects of the latter are related to unobserved heterogeneity among workers These results are contradicts with the theory of assignment⁴.

Xiu and Gunderson (2013) showed that even though the returns to education increased according to credentials and additional years of schooling in China, but the trend of returns for some workers decreased between 1995 and 2002. This was due to firms having greater discretion to select the best-suited employees to increase the firm's productivity without relying on credentials and gender Mazumdar (1981) also found evidence of particularly high returns for education from completed educational phases after the primary level, although the returns to additional years of schooling were not constant. These results are supportive of screening/signalling hypothesis that explains that earning differences might be due to the superior ability of the more educated rather than to their extra education that contributes to firm productivity (Spence, 1973; Groot and Oosterbeek, 1994). In fact, employers attach more importance to workers' possession of a certificate of completion of a given phase of education than to the number of years of schooling *per se*.

4 The theory of assignment discusses on the problem of assigning workers to jobs (Sattinger, 1993). The theory states that a highly educated individual are more likely to be matched with job vacancies. However, in some circumstances, the matching process may not be perfect especially when too many workers vie for a specific position. This may lead to some individuals being assigned jobs lower down the hierarchy. For instance, workers may be over-educated, whilst others prove to be under-educated.

3. DATA DESCRIPTION AND SCOPE OF STUDY

The present study uses the Malaysian Household Income Survey (HIS) for the year 2002, 2004 and 2007. The HIS was conducted by the Malaysian Economic Planning Unit (EPU) and Malaysian Department of Statistic. The HIS is the one of the most comprehensive surveys of individuals' earnings in Malaysia, to analyse the returns to education at different levels of certificates qualification in the economy sector, making it an ideal data source for this research.

This study focuses on education sector. Under Economic Transformation Programme, education sector act as an enabler by feeding in talent into the rest of the New Key Economic Areas to ensure that we have sufficient human capital in place to sustain the growth and development of our Malaysian economy. In fact, as a main component of Malaysia's transformation into a high-income nation, the Education NKEA undertakes initiatives which develop the education spectrum in the country, ranging from early childcare and education to professional skills training (EPU, 2010b).

Since the purpose of this study is to investigate the returns to education at different levels of certificate qualification, there are several aspects that must be considered when performing sample selection. First, the number of people chosen is restricted to those employees who are between the ages of 15 and 64⁵. Secondly, the sample selection in this study is restricted to those individuals who have completed their schooling at highest certificate qualification and excludes individuals who did not attend school or those workers who have no formal educational qualifications. The sample also does not cover those people who have received a traditional Islamic education or those, mainly migrant workers, who have qualifications which are not recognised within the Malaysian education system by the Ministry of Education (MOE). Thirdly, the sample chosen is also restricted to employed individuals. They are employers and workers either in private or government sectors and thus, the self-employed or those who work on their account are excluded. The exclusion of the self-employed is because of the problems associated with the measurement of self-employment income (McNabb and Said, 2013). Similarly, for unpaid family workers or those working without pay, housewives, people looking after the home, students, pensioners, children not at school and those who have never worked are outright excluded from the sample. In addition, unpaid family workers may also be classed as self-employed.

4. EMPIRICAL METHODOLOGY

This section presents the empirical methodology used to investigate the returns to education in economy sector. To estimate the earning function, this study follows the empirical model of earnings developed by Mincer (1974) under Becker's (1973) framework. The basic model is presented as follows:

5 Labour force refers to those who, during the reference week are in the 15-64 years (in completed years at last birthday) and who are either employed or unemployed.

$$\ln W_{itk} = \alpha_0 + B_0 \sum_E Edu_{itk} + B_1 EXP_{itk} + B_2 EXP_{itk}^2 + \gamma S_{itk} + \varepsilon_{itk} \quad (1)$$

Where, i indexes individuals ($i= 1, \dots, N$), and t indexes time period of ($t= 2002, 2004$ and 2007) and k represents a vector for education sector. $\ln W$ is the natural log of the yearly earnings of an individual. Edu is the level of educational attainment by E types of highest certificate of qualification obtained at school, college or university. The dummy variable with a full set of education dummies which is dummy (=1 if degree) dummy (=1 if diploma), dummy (=1 if higher school certificate [HSC]) dummy (=1 if middle certificate education/vocational [MCE/MCEV]), dummy (=1 if lower certificate education [LCE]), dummy (=1 if primary) and dummy (=1 if below primary) with a reference category of below primary. The below primary classification is used as a reference group as this study is interested in finding the changes of returns to education for other certificates qualifications relative to below primary. EXP is the potential experience (age minus years of schooling-7). It reflects the assumption that a child begins schooling at the age of 7 and starts working immediately after completing schooling; and this formula is akin to the Malaysian education policy of compulsory schooling for children beginning at age 7. EXP^2 is the quadratic of experience that used to capture the concavity of the experience earnings profile⁶. Sis another explanatory variable assumed to affect earnings. A series of dummy variables are included representing occupation types (OCC)⁷. There are nine occupational categories created from the 2-digit occupational code following the Malaysia Standard Classification of Occupations code, 2008.

As a common practice in the literature, the average returns to education (r_i) for each qualification level is measured by comparing to the level below (e.g.: Buchinsky, 1994; Kenayathulla, 2013). It is calculated using the estimated OLS coefficients in the following way: $r_i=(B_i-B_{i-1})/(B_i-B_{i-1})$; where: i is the level of the highest certificate obtained. S_i is the years of schooling at level of highest certificate qualification achieved. For instance, the returns to degree qualification is calculated as $r(\text{degree})=(B_1 \text{ degree}-B_{\text{diploma}})/(S_1 16.5-14.5)$. The detail of years of schooling according to level of highest certificates qualification achieved as shown in Table 1.

This study employs OLS estimators with robust standard errors to analyse the returns to education at highest levels of certificates

6 To calculate experience, the value is obtained after taking the exponential value of the coefficients in the OLS model and minus 1 and then multiplying by 100. For instance, the value is obtained as follows: $(\exp(0.058)-1)*100=(1.061-1)*100=6.1\%$.

7 The occupation is most closely associated with skills possessed and it is possible to explain the different return to education at different levels of qualification. The types of occupations and jobs undertaken by individuals differ in the requirement of skills and thus affect the returns to education (Aslam, 2009). The occupation category generally does not lead to major changes in the estimated return to schooling which is lower at around 1 % and the effect of changes upon the return to schooling is small (Blundell et al., 2004). Additionally, the occupation category is able to capture the return for overeducated workers. Educational credentials are important to employers when hiring, because it is seen as a signal of the skills of a person, and thus provides better access to occupations (Black and Lynch, 1996; Blundell et al., 2004).

Table 1: Years of schooling by level of highest certificate of qualification

Years of completed schooling	Level of certificates of qualification
3	Below primary (no certificate)-standard 1 to standard 3
6	Primary (no certificate)-standard 4 to standard 6
9	LCE
11	MCE/MCEV
13	HSC
14.5	Diploma
16.5	Degree and above

Source: Malaysia's Ministry of Higher Education (MOHE). LCE: Lower certificate education, MCE: Middle certificate education, MCEV: Middle certificate education and vocational, HSC: Higher certificate education

qualification in the education sector⁸. The application of the OLS estimator in the present study is sufficient to interpret the result in line with the objective of this study to analyse the trend of returns to education at different levels of certificates qualification between 2002 and 2007. Although the methodology employ is only regression analysis, but the outcome of this analysis still be able to provide preliminary picture about returns to education at different level of qualification in Malaysian economics sector.

5. RESULT AND DISCUSSION

This section presents the parameter estimates for the earnings Equation 1. It begins to present the regression result as shown in Table 2. Next, this study discusses the average returns to education and its trends in the education sector as reported in Table 3. The regression result in Table 2 shows that education at all levels of qualification in general is positively associated with earnings in the education sector during the period of 2002 to 2007. The result in Table 3 reports that education has a steady increase at all levels of qualification except for primary education level (deceased by 0.51%) between 2002 and 2007.

The overall results in Table 3 clearly indicate that those workers with degree qualifications have high average return, followed by diploma-educated workers throughout the sample period in the education sector. The trend for workers with degree qualifications shows the largest increase at 8.33% followed by diploma holders at 5.54%, compared to their counterparts over the same period. This result indicates that income increases linearly with education level, implying a match between education and occupation in the education sector. Our result is supportive of human capital theory, which reveals that higher educated workers earn higher wages partly due to their higher productivity level (Becker, 1973).

8 With the robust option the point estimate of the coefficients is exactly the same as in the OLS, but the standard errors take into account issues concerning heterogeneity and the lack of normality as well as the observations within districts being non-independent. Robust standard errors is safe to deal with the heteroscedasticity problem because we usually do not know the structure of heteroscedasticity (especially in our case, the sample size is large) as suggested by Huber (1992).

Table 2: Regression result in the education sector, 2002-2007

Variables	2002		2004		2007	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Primary	0.094	0.069	0.115	0.076	0.079	0.121
LCE	0.146	(0.068)**	0.234	(0.075)**	0.207	(0.019)**
MCE/MCEV	0.431	(0.063)*	0.543	(0.073)**	0.582	(0.032)**
HSC	0.712	(0.071)*	0.796	(0.077)*	0.886	(0.154)*
Diploma	0.991	(0.065)*	1.114	(0.074)*	1.249	(0.127)*
Degree	1.457	(0.038)*	1.521	(0.016)*	1.881	(0.006)*
EXP	0.025	(0.002)*	0.026	(0.003)*	0.035	(0.000)*
EXP ²	-0.001	(0.001)***	0.001	(0.000)*	-0.001	(0.047)***
Directors and specialized managers	0.255	(0.075)*	0.594	(0.142)**	0.337	(0.025)**
General managers SMEs	0.139	0.0712	0.538	(0.039)*	0.161	0.091
Professionals teaching	0.051	(0.051)***	0.324	(0.126)***	0.046	(0.086)**
Associate life science and health professionals	0.015	0.092	0.066	0.056	0.379	0.056
Associate teaching	0.145	(0.046)*	0.072	0.126	0.271	(0.792)**
Associate finances, sales and related business	0.392	(0.097)**	0.451	0.374	0.306	0.003
Supervisor	0.079	0.055	0.339	(0.060)***	0.105	0.062
Clerical office	0.291	0.052	0.351	0.024	0.106	0.029
Driver and mobile plant operator	-0.464	(0.089)**	-0.413	(0.145)**	0.646	(0.062)**
Elementary sales	-0.102	0.067	0.166	0.137	0.896	0.012
R ²	0.632		0.648		0.741	
Number of observation	3879		4087		2094	

This study using robust standard errors. *P<0.05; **P<0.1; ***P<0.001. LCE: Lower certificate education, MCE: Middle certificate education, MCEV: Middle certificate education and vocational, HSC: Higher certificate education, SE: Standard error

Table 3: Average returns to education in the education sector (%), 2002-2007

Level of qualification	2002	2004	2007	% changes, 2002-2007
Primary	3.13	3.67	2.62	-0.51
Lower certificate education (LCE)	1.74	4.12	4.28	2.54
Middle certificate education/vocational (MCE/MCEV)	14.24	15.46	18.75	4.51
Higher school certificate (HSC)	14.05	12.64	15.20	1.15
Diploma	18.64	21.20	24.18	5.54
Degree	23.30	20.37	31.63	8.33

Source: Author's calculation

The highest return at both tertiary education levels is due to the increasing demand for academicians at the tertiary education. This is in line with the establishment of community colleges, technical colleges and private universities. For instance, the number of universities established in Malaysia has doubled from six universities in 1990 to 12 universities in 2000. During the period of 2002-2007, students' enrolment in polytechnics and community colleges are also increases by 37.2% and 98.6%, respectively (MOHE, 2012). Meanwhile, the demand for teachers increases in line with the Cabinet's decision in July 2006 to increase teacher-class ratio to 0.2 in all primary and secondary schools under the Ministry of Education (MOE) in response to the changes in curriculum and pedagogy demand in the technological era (Mokshein et al., 2009). The result in Table 3 also exhibits that the average returns for workers with MCE/MCEV and HSC qualifications do experience any significant difference with percentage variance of 1-3% throughout the sample period. Lastly, it is interesting to note that the lowest average return is recorded at the LCE and primary education levels, signifying the favouritism towards high- and medium-skilled workers in the education sector.

Shifting the attention on the returns to occupation, the result in Table 3 reveals that most jobs in the education sector show an increased trend with the return for teaching associate professionals

recorded the largest earning compared to other occupation categories in the education sector. The return for teaching associate professionals' category is at 46.4% relative to associate professionals not elsewhere classified, while education holding is constant between 2002 and 2007. The result also indicates that there is remarkable achievement in the level of education at higher qualifications, thus implying the high demand for educated workers in the education sector. This result is in line with the government's strategy as stated in Malaysian Blueprint Education, 2013-2025, to upgrade the entrance requirements for new teachers, especially in primary schools from diploma or pre-university qualification to university degrees. This effort is to ensure 90.0% and 60.0% of secondary and primary school teachers to have a first degree by 2015 in order to improve the quality and credibility of Malaysia's education system towards "World Class Education" (MOHE, 2012).

In terms of the working experience effect, the returns to experience for workers in the education sector shows an increase in trend from 2.53% to 3.07% between 2002 and 2007, given ceteris paribus. This result is in line with the government's effort to upgrade the Teacher's Training Colleges to Institutes of Teacher's Education in order to focus on the preparation and training of pre-service and in-service teachers for both primary and secondary education (MOHE, 2012).

6. CONCLUSION AND POLICY IMPLICATION

The present study provides new evidence by examining the trend of returns to education at highest certificate of qualification in the Malaysian education sector during the years 2002-2007. The main finding from this study shows that workers with degree qualifications have high average returns, followed by diploma-educated workers during the period investigation. Our results also show that the returns to education show a linear relationship between earnings and certificates of qualification; there is a match between the skills supplied/education profile with the sector's demand. Thus, this study suggests that the government needs to increase further public expenditure for the education sector and increase efficient funding on the basis of efficiency allocation. The quality assurance framework for universities need framework for universities needs to be geared in terms of their role to control, monitor and maintain quality in higher education. This is in line with the Malaysian government's efforts to become the centre of learning and educational excellence by the year 2020.

Regarding the declining trend of returns for workers with primary education in this sector, the Malaysian government is suggested to provide large scale merit based scholarships and financial assistance to students to ensure low drop-out rates at higher schooling levels. The potential for free primary education without complementary investments in secondary and tertiary education makes the education policy deemed as somewhat not seriously continuous to develop high education skills, yet only put much focus to eradicate illiteracy poverty.

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