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Return To Education By Ethnicity: A Case Of Malaysia

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ABSTRACT

This study investigates the factors that influence earning differentials across three different ethnics in Malaysia—Bumiputra, Chinese and Indian. A specific focus is given to the effects of education on earnings. The variable is considered vital in restructuring the socioeconomic positions of these Malaysian ethnics. Mincerian earning functions have been estimated. Positive effects of education with varying magnitudes on earnings across the three ethnics have been found. Estimates on returns to education also vary across educational levels and gender for all the ethnics. The marginal rate of returns to university degree is the highest, as compared to other lower qualifications. A comparison across ethnicity shows that for those with university degrees, the returns for Indian ethnic were the highest at 24.85%, followed by Bumiputra at 22.55% and Chinese at 14.8%. There is also significant evidence of earning differentials attributable to occupational activities and regional/urban-rural locations in Malaysia.

JEL Classification: I2, I21, I23, I26

Keywords: Education, Ethnicity, Human Capital, Return to Education.

INTRODUCTION

A university degree is a passport to the middle class. An individual's decision as to whether to pursue higher education or not affects his ethnic economic position. In a heterogeneous society like Malaysia, education has been considered as a crucial social transformation tool to ensure equitable socioeconomic growth.

Since gaining independence in 1957, the Malaysian government has considered education one of the strategic tools to re-engineer Malaysian society to achieve a more equitable

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distribution of income and wealth. Malaysian society consists of three major ethnic groups, namely, Bumiputra, Chinese and Indian. These ethnics are not just different in terms of their colours, cultures, and languages, they can be identified by their occupational status. Following independence, the Bumiputra generally worked as farmers, the Chinese as traders, and the Indian as estate workers (Selvaratnam, 1988). Bumiputra and Indian were economically marginalised. Income disparity became the underlying social grudges. The result of 1969 general election threatened the dominance of Bumiputra's political control, causing the notorious 13 May 1967 racial riot around the country.

The aftermath of the 1969 racial riot resulted in several affirmative policies by the government, such as the 1970 National Economic Policy (NEP), 1990 National Development Policy (NDP), 2001 New Vision Policy (NVP), and the National Education Policy. Eradicating huge socioeconomic disparity among these three ethnic groups has always been part of the agendas of the above policies (Jamil and Razak, 2010).

Access to better education for all has become a strategic long-term goal of the government to enable Malaysians to climb the social ladder. To ensure equity in university admission, an ethnic quota system in the proportion of 55:45 percent for Bumiputra and non-Bumiputra students was introduced by the National Operations Council (NOC) after the 1969 racial riots (Lee, 2012). Quotas and scholarships were given particularly to the majority ethnic group, Bumiputra, in order to improve their opportunity to enter universities. In 2002, this ethnic quota system was stopped and admission to university was based on a meritocracy. Critics of such policy aiming to socially re-engineer a society through a quota system are inevitable—Fogel (1966), Pong (1993 & 1999), Lee (2012) and Bakar (2014). Accusing the government of favouring the Bumiputra, the blunder between the politics of education and the economics of education has been a contentious issue in Malaysia's social landscape (Joseph, 2008; Brown, 2007).

Putting aside the politics of education, this study investigates the economics of education. Its main objective is to investigate the factors that influence earning differentials across three major ethnics in Malaysia—Bumiputra, Chinese and Indian. Specific focus is given on the effects of education on earnings. Findings from this study are crucial to assess whether the market has provided enough incentives (private rates of return) for individuals from each ethnic to invest in education. If the rates across the three main ethnics are different, the findings stand as another possible explanation of schooling enrolment differences by ethnicity in Malaysia. In the next section, I discuss extant literature on education issues and the findings of studies on private rates of return to education in Malaysia. In Section 3, the economic model employed in this study is presented. Data analyses and sample descriptions are detailed in Section 4. Results of the study are presented and discussed in Section 5, and some concluding remarks are provided in Section 6.

REVIEW OF LITERATURE

Brown (2007) identified two important agendas of public education in Malaysia: (i) the curriculum of public schools in Malaysia is aimed at promoting a sense of patriotism, and (ii) at the university level, education becomes a vital tool for the promotion of Bumiputra interests. Brown (2007) argued that these two agendas are not contradictory; rather, both are vital ingredients in eradicating inter-ethnic economic disparities. Preferential policies, he stressed, are essential for the economically disadvantaged, but numerically dominant, Bumiputra in the process of nation-building. The two agendas, according to Brown (2007), have resulted in sensitive sentiment in the politics of education in Malaysia. Non-Bumiputra (e.g. Chinese and Indian) educationalist activism, in general, has come to a broad acceptance of the government's strategic agenda, while continuing to ensure that educational opportunities for non-Bumiputra are not compromised.

Hirschman (1986) probed into the issue of income inequality in Peninsular Malaysia by focusing on ethnicity. In the case of Bumiputra, according to the author, preferential treatment became a necessary policy to support the group's upward mobility due to inheritance of poverty from colonization, which had weakened their socioeconomic progress.

A macro-level policy analysis of higher education in Malaysia after 1969 by Selvaratnam (1988) pointed to the significant expansion of the higher-education sector, intertwined with preferential treatment toward the Bumiputra to pursue higher education. Within a decade of the introduction of the preferential policies, Bumiputa's educational attainment caught up with the Chinese. The preferential treatment, he argued, brought about a discernible increase in the number of Bumiputra students enrolled in tertiary institutions at home and overseas. The system of Bumiputra preferences has been very effective in increasing the number of engineers, accountants, architects, lawyers, doctors, administrators, and educators in the Bumiputra class in the wider Malaysian society (Selvaratnam, 1988, p. 196). Such policy, he further argued, reflects an ethnic and class bias, which over times exacerbated ethnic and cultural polarization and enhanced further division and maintenance of Malaysian society.

Studies on Malaysia by Pong (1997) and Hirschman (1986) suggested the preferential treatment policy resulted in families of different ethnic groups adopting strategies not anticipated by policymakers. Both authors found evidence to suggest that the preferential treatment policy in education had resulted in lower fertility or sibship size for Chinese and Indian ethnic groups. With smaller family size, resources were more concentrated on fewer children and thus more support for pursuing higher education was possible.

The ethnic-based affirmative policy has improved Bumiputra university admissions and resulted in their growing middle class numbers since 1970. The change to a merit-based admission policy (meritocracy) in 2012 should now offer a more level competition ground for all Malaysians (Lee, 2012). Under a meritocracy, market-based incentives can be a crucial factor in an individual pursuing higher education. Although several studies on returns to education in Malaysia have been undertaken (Chung, 2003; Said *et al*., 2009; Kenayathulla, 2013 and Arshad and Ghani, 2015), these studies do not provide much insight into how education affects earnings across ethnicities in Malaysia.

Studies by Chung (2003), Said *et al*. (2009), Kenayathulla (2013) and Arshad and Ghani (2015) have employed data from the Household Income Survey (HIS), undertaken by the Department of Statistics, Malaysia. Their estimates on returns to education for upper secondary and tertiary levels of education are summarized in Table 1 below.

Table 1 Estimates on private rates of return to education for Malaysia

Authors	HIS	Lower secondary to upper secondary	Post-secondary to tertiary
Chung (2003)	1997	14.1%	17.1&
Said *et al*. (2009)	1984, 1989, 1992, 1995 and 1997 (the reported figures are the average)	16.65%	15.6%
Kenayathulla (2013)	2007	16.5%	15.5%
Arshad & Ghani (2014)	2009	11.9%	11.48

Results based on the extant literature have found high and positive private returns on education in Malaysia, especially at the upper and tertiary education levels. The figures in table 1 also show that over the study period, there are declining trends in the returns on education in Malaysia for both levels of education. Is there a difference for returns on education across the major ethnics in Malaysia? The above studies provide no answer to the question. This study takes a step further to investigate the private rates of return to education by ethnicity in Malaysia. The discussion now turns to the models employed for the estimations.

MODELS

The rate of return to education is commonly estimated using the Mincerian earnings function, proposed by Jacob Mincer (1974). Recent studies based on Malaysia that have adopted the function are Chung (2003), Said *et al*. (2009), Kenayathulla (2013) and Arshad and Ghani (2015). The estimation model is expressed as:

$$\ln earn_i = \alpha + \beta_1 age_i + \beta_2 age_i^2 + \beta_3 Q_i + \sum_{k=4}^{K} \beta_k X_{ki} + \varepsilon_i \quad (1)$$

where ln*earn*$_i$ denotes the natural log of earnings for individual i ($i = 1, 2, \ldots, I$), *agei* represents the age of individual i , Q_i is the dummy of individual i's schooling level and X_{ki}, ($k = 4, 5, \ldots, K$), are other variables deemed important (such as age/experience, education level, marital status, gender, geographical location, employment activities/sector, and ethnicity) with an influence on earnings of individual i and ε_i is the error term. The quadratic form of equation (1) is based on the shape of the age-earning profile of an individual's lifecycle (refer to (Borjas, 2016, 9. 263). The theory suggests that earning would initially rise with age, but eventually decline in later years of an individual's working life (e.g. due to obsolete skills). Therefore, the quadratic specification is employed as a control for life-cycle effects.

Despite being commonly used in empirical works to estimate the rate of return to education, the Mincerian function does not account for the direct costs of education. When the total costs of education are substantial, an individual's decision to pursue a higher educational level may be affected. Due to data limitation on costs of pursuing education at an individual level, most studies based on the Mincerian function only estimate the returns on education without considering the costs involved. An interpretation of results based on the Mincerian function, therefore, needs to be considered with this in mind.

In general, the estimation of the function involves an individual's earnings as the dependent variable and the dependent variables can be categorized into seven main categories, namely, age/experience, education level, marital status, gender, geographical location, employment activities/sector and ethnicity. In Table 2-, the descriptive statistics and the definition of the variables employed for our analysis are presented. The chow test conducted indicates the need to separately estimate the male and female earning functions. The Chow test is given as:

$$\frac{ess\_c-\left(ess\_m+ess\_f\right)/k}{ess\_m+ess\_f/\left(N\_m+N\_f\right)-2k} \tag{2}$$

where *ess_c* is the residual sum of the square of the entire sample, *ess_m* and *ess_f* are the residuals sum of the square for the male and female samples, respectively, *k* is the number of parameters (including the constant), *N_m* and *N_f* are the male and female sample size, respectively (refers to Chung, 2003, p. 838). Both Chung (2003) and Kenayathulla (2013) estimated separate male and female earning functions based on Malaysia's Household Income Survey (HIS) data.

DATA DESCRIPTION

This study employed the Household Income Survey (HIS) 2009, from the Department of Statistics (DoS), Malaysia. The survey was based on randomly selected individuals of both genders, aged 0 to 98, from West and East Malaysia. It offers comprehensive measures of individuals' earnings in Malaysia. The survey contains information on individual respondents' wage, age, race, gender, location, familial relationship, status of employment, industry involved, and highest qualification obtained. Each respondent is traceable based on a unique code identifier. With such quality and representation, the sample of this study is representative of Malaysian population.

Due to confidentiality of the data, DoS, Malaysia only provided me with 55,220 respondents' feedback from HIS 2009. From the total dataset obtained, I only considered those respondents aged 15 to 60 years old for the sample since this age group falls in the labour force category. As a result, the size of the sample is reduced to 20,184 respondents. The descriptive statistics of the sample are provided in Table 2 below. From the extant literature, those variables are considered important in explaining wage differentials in an economy. In the next section, we present estimation results based on earning function as given by equation (1), and discuss the findings.

Table 2 Descriptive statistics for the sample (age 16 to 60 years)

Variables	Variable notation	Definition	Statistics	All	Bumiputra	Chinese	Indian	Others
Earnings	earn	Yearly earnings	Mean	25936.93	23443.88	34738.8	25881.84	15696.13
			Std dev	29034.41	26289.1	35807.33	27244.55	23055.61
			Min	120	120	200	600	200
			Max	1102000	1102000	796900	344644	248797
Age	age	Age	Mean	35.28476	34.5	37.86	35.97	33.72
			Std dev	12.896	12.8	18.05	12.65	10.33
			Min	16	16	16	16	16
			Max	60	60	60	60	60
Married	Marry	Maried (=1 if married)	No	22751	15892	4922	1512	425
			%	69.04	67.58	72.38	70.92	83.99
Not married		No	10203	7624	1878	620	81	
			%	30.96	32.42	27.62	29.08	16.01
Male	Male	Male (=1 if male)	No	16264	11636	4922	1056	121
			%	49.35	49.48	72.38	49.53	23.91
Female			No	16690	11880	3451	1076	385
			%	50.65	50.52	50.75	50.47	76.09
No qualification	Noqua	No qualification (base category)	No	7622	5101	1648	577	296
			%	23.13	21.69	24.24	27.06	58.5
Low secondary	Lowsec	Dummy (=1 if low secondary	No	6327	4445	1363	452	67
			%	19.2	18.9	20.04	21.2	13.24
Upper secondary	Upsec	Dummy (=1if upper secondary)	No	13023	9695	2470	761	97
			%	39.52	41.23	36.32	35.69	19.17
Post secondary	Postsec	Dummy (=1 if post secondary)	No	1694	1360	243	69	22
			%	5.14	5.78	3.57	3.24	4.35
University	Uni	Dummy (-1 if university)	No	4288	2915	1076	273	24
			%	13.01	12.4	15.82	12.8	4.74
Bumiputra	Bumiputra	Base category	No	23516	23516			
			%	71.36	100			
Chinese	Chinese	Dummy (=1 if Chinese)	No	6800		6800		
			%	20.63		100		
Indian	Indian	Dummy (=1 if Indian)	No	2132			2132	
			%	6.47			100	
Other ethnics	Others	Dummy (=1 if other ethnics)	No	506				506
			%	1.54				100

Table 2 (Cont.)

Employer	Employer	Dummy (=1 if employer)	No	299	118	163	14	4
			%	0.91	0.5	2.4	0.66	0.79
Public sector	Public	Public servant (base category)	No	3421	3144	164	93	20
			%	10.38	13.37	2.41	4.36	3.95
Private sector	Private	Dummy (=1 if private sector worker)	No	11824	7425	3145	1014	240
			%	35.88	31.57	46.25	47.56	47.43
Self-employed	Selfemp	Dummy (=1 if self-employed)	No	3344	2575	622	111	36
			%	10.15	10.95	9.15	5.21	7.11
Not working	Not-work	Dummy (=1 if unemployed or not in labor force)	No	14066	10254	2706	900	206
			%	42.68	43.6	39.79	42.21	40.71
North	Northa	Dummy (=1 if north of West Malaysia)	No	7866	5065	1953	727	121
			%	23.87	21.54	28.72	34.1	23.91
Centre	Centreb	Dummy (=1 if Centre of West Malaysia)	No	4631	3057	908	615	51
			%	14.05	13	13.35	28.85	10.08
South	Southc	Dummy (=1 if south of West Malaysia)	No	5096	3198	1385	460	56
			%	15.46	13.6	20.32	21.58	11.07
East	Eastd	Dummy (-1 if east of West Malaysia)	No	6291	5724	417	101	49
			%	19.09	24.34	6.13	4.74	9.68
Borneo	EMsiae	Dummy (=1 if East Malaysia)	No	7253	5702	1328	26	197
			%	22.01	24.25	19.53	1.22	38.93
Urban	Urban	Dummy (=1 if urban)	No	18568	11151	5603	1491	323
			%	56.35	47.42	82.4	69.93	63.83
Rural			No	14386	12365	1197	641	183
			%	43.65	52.58	17.6	30.07	36.17

Notes: a = comprise of the states of Perlis, Kedah, Penang and Perak.; b = comprise of the states of Selangor and Federal Territory Putrajaya; c = comprise of the sates of Melaka, Negri Sembilan, and Johor; d = comprise of the states of Pahang, Terengganu and Kelantan, and e = comprise the states of Sabah, Sarawak and Federal Territory Labuan.

RESULTS

Based on equation (1), I have estimated 12 separate models where:

i. model (1) involves the entire sample,
ii. model (2) involves the male sample only,
iii. model (3) involves the female sample only,
iv. model (4) involves the entire Bumipura sample only,
v. model (5) involves the entire Chinese sample only,
vi. model (6) involves the entire Indian sample only,
vii. model (7) involves the Bumiputra male (BM) sample only,
viii. model (8) involves the Chinese male (CM) sample only,
ix. model (9) involves the Indian male (IM) sample only,
x. model (10) involves the Bumiputra female (BF) sample only,
xi. model (11) involves the Chinese female (CF) sample only, and
xii. model (12) involves the Indian female (IF) sample only.

Table 3 Estimation Results For Overall Sample (Lnearn As Dependent Variable)

	(1)	(2)	(3)
VARIABLES	Overall	Male	Female
Age	0.076***	0.083***	0.067***
	(0.003)	(0.004)	(0.006)
Age2	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)
Lowsec	0.183***	0.177***	0.177***
	(0.015)	(0.016)	(0.035)
Upsec	0.424***	0.397***	0.462***
	(0.013)	(0.015)	(0.028)
Postsec	0.637***	0.592***	0.680***
	(0.022)	(0.025)	(0.041)
Uni	1.067***	1.028***	1.078***
	(0.016)	(0.019)	(0.031)
Marry	0.274***	0.361***	0.145***
	(0.013)	(0.016)	(0.022)
Male	0.405***	—	—
	(0.010)		
North	-0.213***	-0.213***	-0.209***
	(0.013)	(0.014)	(0.023)
Centre	0.083***	0.083***	0.071***
	(0.014)	(0.017)	(0.024)
East	-0.219***	-0.207***	-0.228***
	(0.014)	(0.016)	(0.027)

Table 3 (Cont.)

Borneo	-0.196***	-0.201***	-0.184***
	(0.014)	(0.016)	(0.025)
Employer	0.210***	0.282***	0.125
	(0.040)	(0.043)	(0.112)
Private	-0.352***	-0.266***	-0.456***
	(0.011)	(0.013)	(0.020)
Selfemp	-0.562***	-0.400***	-0.878***
	(0.017)	(0.018)	(0.036)
Notwork	-0.990***	-0.952***	-1.042***
	(0.028)	(0.035)	(0.043)
Urban	0.167***	0.165***	0.184***
	(0.010)	(0.011)	(0.018)
Chinese	0.336***	0.331***	0.327***
	(0.012)	(0.014)	(0.022)
Indian	0.084***	0.093***	0.061**
	(0.017)	(0.020)	(0.031)
Others	-0.055	0.060	-0.066
	(0.042)	(0.072)	(0.052)
Constant	7.467***	7.604***	7.814***
	(0.061)	(0.069)	(0.115)
Observations	20,184	12,912	7,272
R-squared	0.521	0.535	0.484

Notes: Robust standard errors in parentheses. *** significant at 1%, **significant at 5%, *significant at 10%.

Results for models (1) – (3) are presented in Table 3. For models (4) – (12), the results are shown in Table 4. Heteroscedasticity has been detected in the sample. The problem is solved with Huber-White sandwich estimators (Huber, 1967). I also run regressions with robust standard errors to address concerns about the failure to meet the normality assumption or to deal with some observations that exhibit large residuals, leverage or influence, which is common to survey data such as the HIS 2009 dataset at hand. Note that the point estimates of the coefficients under the robust standard errors are exactly the same as in OLS.

The results in Tables 3 and 4 show that there is a quadratic relationship between earnings of Malaysians and age. The quadratic specification is employed as a control for life-cycle effects. The results suggest that earnings would first rise and then slowly decline with age, *ceteris paribus*. For example, based on Model (1) as shown in Table 3, earnings for Malaysians initially increased, until they peaked at the age of 38 years, before slowly declining. The first order differentiation between earnings and age based on Models ((4), (5) and (6), as shown in Table 4, indicates that earnings for Bumiputra reach a pinnacle at the age of 36 years, while earnings for Chinese and Indian peaked at 46.5 and 38.5 years old, respectively.

Table 4 Estimation Results By Ethnicity And Gender (Lnearn As Dependent Variable)

	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	Bumiputra	Chinese	Indian	BM	CM	IM	BF	CF	IF
Age	0.072***	0.093***	0.077***	0.073***	0.109***	0.078***	0.071***	0.067***	0.081***
	(0.004)	(0.007)	(0.013)	(0.004)	(0.008)	(0.016)	(0.007)	(0.014)	(0.021)
Age2	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Lowsec	0.163***	0.204***	0.322***	0.155***	0.185***	0.312***	0.160***	0.238***	0.330***
	(0.019)	(0.033)	(0.042)	(0.020)	(0.034)	(0.052)	(0.045)	(0.084)	(0.079)
Upsec	0.415***	0.413***	0.549***	0.394***	0.360***	0.502***	0.449***	0.512***	0.622***
	(0.016)	(0.030)	(0.040)	(0.017)	(0.032)	(0.048)	(0.034)	(0.069)	(0.075)
Postsec	0.618***	0.692***	0.825***	0.569***	0.646***	0.867***	0.672***	0.756***	0.826***
	(0.025)	(0.049)	(0.103)	(0.028)	(0.054)	(0.129)	(0.048)	(0.095)	(0.174)
Uni	1.066***	1.005***	1.322***	1.016***	0.972***	1.280***	1.081***	1.058***	1.401***
	(0.020)	(0.034)	(0.059)	(0.024)	(0.037)	(0.073)	(0.038)	(0.073)	(0.099)
Marry	0.295***	0.262***	0.154***	0.399***	0.317***	0.213***	0.149***	0.158***	0.057
	(0.016)	(0.027)	(0.048)	(0.020)	(0.031)	(0.060)	(0.026)	(0.047)	(0.079)
Male	0.401***	0.379***	0.434***						
	(0.012)	(0.021)	(0.033)						
North	-0.239***	-0.156***	-0.218***	-0.239***	-0.155***	-0.221***	-0.234***	-0.166***	-0.208***
	(0.016)	(0.023)	(0.037)	(0.018)	(0.027)	(0.046)	(0.029)	(0.044)	(0.067)
Centre	0.067***	0.111***	0.047	0.066***	0.117***	0.045	0.056*	0.087	0.083
	(0.017)	(0.030)	(0.038)	(0.021)	(0.035)	(0.047)	(0.030)	(0.055)	(0.067)
East	-0.238***	-0.219***	-0.130	-0.227***	-0.197***	-0.155	-0.251***	-0.261***	-0.082
	(0.016)	(0.042)	(0.086)	(0.018)	(0.048)	(0.097)	(0.031)	(0.079)	(0.159)
Borneo	-0.225***	-0.098***	0.109	-0.241***	-0.070**	0.317*	-0.199***	-0.145***	-0.351
	(0.016)	(0.027)	(0.204)	(0.019)	(0.032)	(0.174)	(0.031)	(0.048)	(0.462)
Urban	0.159***	0.132***	0.227***	0.159***	0.141***	0.224***	0.178***	0.125**	0.223***
	(0.011)	(0.026)	(0.034)	(0.012)	(0.030)	(0.040)	(0.020)	(0.053)	(0.065)
Employer	0.209***	0.408***	0.313*	0.287***	0.465***	0.131	0.094	0.317	1.472***
	(0.067)	(0.061)	(0.162)	(0.077)	(0.074)	(0.160)	(0.127)	(0.233)	(0.138)
Private	-0.363***	-0.150***	-0.083	-0.265***	-0.093	-0.148**	-0.495***	-0.195***	0.008
	(0.012)	(0.039)	(0.057)	(0.014)	(0.058)	(0.060)	(0.022)	(0.054)	(0.101)
Selfemp	-0.627***	-0.187***	-0.201**	-0.460***	-0.065	-0.220**	-0.935***	-0.514***	-0.286
	(0.019)	(0.048)	(0.086)	(0.020)	(0.064)	(0.087)	(0.040)	(0.095)	(0.200)
Notwork	-0.962***	-0.927***	-0.707***	-0.918***	-0.899***	-0.940***	-1.031***	-0.934***	-0.394***
	(0.031)	(0.076)	(0.096)	(0.040)	(0.099)	(0.127)	(0.048)	(0.114)	(0.140)
Constant	7.558***	7.338***	7.240***	7.771***	7.325***	7.701***	7.776***	7.921***	7.136***
	(0.072)	(0.134)	(0.222)	(0.081)	(0.161)	(0.270)	(0.140)	(0.248)	(0.389)
Observations	14,185	4,382	1,311	9,117	2,853	855	5,068	1,529	456
R-squared	0.519	0.451	0.535	0.529	0.479	0.522	0.503	0.363	0.495

Notes: Robust standard errors in parentheses. *** significant at 1%, ** significant at 5%, * significant at 10%.

The focus of the discussion now turns to the results in Table 4 since the table provides regressions estimates across ethnicities. In general, factors such as educational levels, marital status, gender, geographical location, and occupational status have been found to be statistically

significant in explaining earnings across the three major ethnic groups in Malaysia. Those factors are also significant in explaining earnings across the three ethnics by gender, as can be observed in Models (7), (8), (9), (10), (11) and (12). All levels of education have a positive relationship with earnings (the base category is no qualification), where the increases in earnings are greater as a person reaches higher levels of education. For university degree (uni), the marginal increase in earnings for male Chinese [as shown in Model (8)] is the lowest, as compared to the other Models. This interesting finding could be explained by the fact that the Chinese, particularly males, are known for their entrepreneurial abilities and most of them are entrepreneurs. Having a university degree is not a prerequisite to becoming a successful entrepreneur (higher earnings), and thus, the variable uni has a much lower effects for male Chinese. The variable uni, however, has the highest effects on Indian female, followed by Bumiputra female, as shown by the results in Models (12) and (10), respectively. These findings suggest that university education is one of the most important factors for Indian and Bumiputra females to earn better income levels.

Marriage has positive effects on earnings across all models. The effects of marriage, however, are stronger for male (for all ethnics) as compared to female. Within the family, the male as the breadwinner of the family, works hard to ensure a better life for his dependents. This responsibility results in higher productivity for male than female. Higher productivity, in turn, results in higher earnings.

In terms of gender, there is a significant difference between the earnings of men as compared to women in Malaysia. Indian males, on average, earn 54.3% more than their female counterparts. The estimate is given by:

$$100[\exp(male) - 1] \quad (3)$$

$$= 100[\exp(0.434) - 1] = 54.34\%$$

Note that equation (3) is used because the dependent variable is in natural logged, while the independent variable, male [refer to Table 4, Model (6)] is a dummy. The results also show that Bumiputra males earn 49.3% more than their female counterparts. Chinese males, on average, earn 46.1% more than their female counterparts, *ceteris paribus*. The findings suggest there are huge earning differentials based on gender in the country. Issues such as the glass ceiling and glass wall are often associated with gender discrimination at the workplace. The glass ceiling refers to an unofficial barrier for women or minority groups to advance their careers in an organization. The glass wall, on the other hand, refers to any barrier that prevents someone from doing a different job, such as moving to another department. These two issues have been associated with limited opportunities for women to advance their careers (Ismail & Ibrahim, 2008). Policymakers in Malaysia should take a serious look at these issues in order to ensure women are fairly compensated for their contributions.

Geographical location also explains the difference in earnings across ethnics in Malaysia. The categorical variables *North, Centre, South, East* and *Borneo* show the relationship between regions and earnings in Malaysia. The reference category is Kuala Lumpur (capital city of Malaysia). The average earnings of workers in *North* and *East* are, on average, lower than in Kuala Lumpur. Across all the models, Bumiputra male in *North*, earn 27% less than their

counterparts in Kuala Lumpur—the highest gap for the variable. This finding provides an explanation for the migration trends among natives, particularly from the northern and eastern parts of West Malaysia to Kuala Lumpur.

There is also a significant gap between the earnings of urban workers as compared to rural workers across all the ethnics. Urban workers earned 18.3% more than rural workers, *ceteris paribus*. A study by Kenayathulla (2013) estimated the difference to be 22.7%. The lack of job opportunities for positions that pay higher income is one possible reason for the existence of wage differential across regions and urban-rural locations in Malaysia.

Table 5 Average Private Return To Education By Ethnicity and Gender

Education level	Overall sample				Male				Female			
	All	Bumi	Chi	Ind	All	Bumi	Chi	Ind	All	Bumi	Chi	Ind
lower-sec	6.10	5.43	6.80	10.73	5.90	5.17	6.17	10.40	5.90	5.33	7.93	11.00
Upper-sec	12.05	12.60	10.45	11.35	11.00	11.95	8.75	9.50	14.25	14.45	13.70	14.60
Post-Sec	5.33	5.00	7.40	6.90	4.88	4.38	7.15	9.13	5.45	5.58	6.10	5.10
Uni	21.50	22.55	14.80	24.85	21.80	22.35	16.30	20.65	19.90	20.45	15.10	28.75

Note: Bumi = Bumiputra, Chi = Chinese and Ind = Indian.

Now the discussion turns to estimates on private rates of return to education in Malaysia, as shown in Table 5. The average rates of return in the table are computed by $r_i = (b_i - b_{i-1})/(S_i - S_{i-1})$, where i is the level of education (lower secondary, upper secondary, post-secondary and university), S_i is the years of schooling at educational level i, and b_i is the estimated coefficient for education level i. Since I used a dummy variable for each educational level for the estimates in Tables (2) and (3), years of schooling, S_i, are based on average schooling years. On average, students in Malaysia take 6 years to complete primary education, 9 years for lower secondary education, 11 years for secondary education, 13 years for upper secondary education and 17 years for university education.

The estimates in Table 5 show that in Malaysia, returns on education vary across educational level, ethnicity, and gender. The highest returns are obtained by Indian female with university degree (28.75%), while the lowest returns are by Bumiputra male with post-secondary education (4.38%). Those with university degrees have the highest private returns on education (21.5%), as compared to other educational levels.

Across ethnicity, for those with university degrees, the returns for Indian ethnic are the highest at 24.85%, followed by Bumiputra at 22.55%, and Chinese at 14.8%. These results suggest that for Indian and Bumiputra, pursuing for university degrees would result in higher marginal returns in terms of earnings as compared to Chinese. One possible explanation for this observation is that in Malaysia, the Chinese are mainly entrepreneurs (Yen, Chun, Abidin, Ariffin, & Noordin, 2007). Having a university degree may not necessarily be that important for the success of an entrepreneur. For the least-entrepreneurial ethnics (Indian and Bumiputra), academic qualification is the key to better job opportunities, thus higher returns.

Based on gender, the rate of returns on education for male with university degree is higher at 21.8%, as compared to female with the same qualification at 19.9%. On the other hand, the

rates of returns for female are much higher than male for lower qualification levels (lower secondary, upper secondary and post-secondary). The glass ceiling faced by female workers may be one reason for the lower returns for female with university degree.

CONCLUSION

This study investigated the effects of education on the earnings of three main ethnic groups in Malaysia. To achieve the objective, I estimated the Mincerian earning function using Malaysia's Household Income Survey 2010. Apart from considering levels of qualification, factors such as age, marital status, gender, ethnicity, occupational types and geographical locations were considered in the estimations. Based on the estimations, private rates of returns to education were then computed.

In general, earnings for the three major ethnic groups in Malaysia were influenced by factors such as educational levels, marital status, gender, geographical location, and occupational status. The effects of pursuing higher levels of education on earnings were significantly positive for all three ethnics. Returns to education, nevertheless, varied across educational level, ethnicity and gender. The marginal rate of returns on university degree were the highest, as compared to other lower qualifications. A comparison across ethnicities showed that for those with university degrees, the returns for Indian ethnic were the highest at 24.85%, followed by Bumiputra at 22.55%, and Chinese at 14.8%. The results seem to imply that better educational levels generate much higher returns for ethnics with less entrepreneurial inclination (Indian and Bumiputra).

Even though the study found varying effects of education on earnings across different ethnic groups in Malaysia, the effects of pursuing better qualifications, in general, were positive. In an effort to achieve balanced and equitable socioeconomic growth in Malaysia, policy decisions need to carefully consider these factors in the country's future plan. Policy debates, nevertheless, should not just be on narrow ethnic-centric education issues. Focus also needs to be placed on issues related to gender discrimination, occupational opportunities, and regional/urban–rural development, as these factors also significantly affect earnings across all ethnics in Malaysia.

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