The Incidence and Wage Effects of Over and Under-Education Among Ethnic Groups In Malaysia

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Abstract

This paper extends the study of over-education in Malaysia by looking at the incidence and wage effects of over- and under-education across ethnic groups. Using the second Malaysia Productivity Investment Climate Survey (PICS-2), around 18% and 28% of workers employed in jobs for which they are overeducated and undereducated, respectively. By ethnic group, around 19% of Malays were overeducated with the corresponding figure of 15% each for the Chinese and The Indians. By contrast, around one-third of Chinese and Indian were undereducated as compared to 26% for the Malay. With respect to earnings outcomes, Ordinary Least Square (OLS) models showed that being over educated resulted in a greater earnings loss, around 9 to 11% irrespective of gender. However, being undereducated increases the individuals' wage premium by around 9 to 12%. Close examination by ethnic groups revealed that the penalty is greater for the Indians (15%) and followed up by the Malays (10%) and Chinese (5%).Nevertheless, the wage premium for being undereducated was higher for the Malays compared to the other two groups. These results imply that there are significant costs to work in an occupation unrelated to the major due to human capital acquired is not completely general and cannot simply be transferred to other occupations.

Keyword Over-education, under-education, wage penalty, wage premium, ethnic group, Malaysia

INTRODUCTION

Over-education and under-education are the terms used in the economics of education literatures as a way to identify to some extent individuals are utilised

in their job correspond to their educational background. Over-education can be defined as workers who have higher schooling than what their jobs require while those with lower schooling than what is required for their jobs are considered 'undereducated'.

Up to date, there are numerous studies related to both incidences in the literature across ethnic groups (Verdugo and Verdugo, 1988; Battu and Sloane, 2002, 2004; Green, Kler and Leeves, 2006; Kler, 2007; Nielson, 2007; Nielson, 2008; Wald and Fang, 2008; Lindley, 2009; Thomas, 2010; Chiswick and Miller, 2011). Despite extensive research on racial differences on over-education, the limitation with these studies is that the most of the studies are focused on western labour market, especially in the UK (Battu and Sloane, 2002, 2004; Nielson, 2008; Lindley, 2009), Australia (Green, Kler and Leeves, 2006; Kler, 2007; Chiswick and Miller, 2011), USA (Verdugo and Verdugo, 1988; Thomas, 2010), Canada (Wald and Fang, 2008) and Denmark (Nielson, 2007). There has no study on this particular topic focuses on non-western labour market.

Nevertheless, from those studies, it is clearly that the incidence and wage penalty for over-education are more prevalent among ethnic minorities and immigrants as compared to the native workers. For example, Battu and Sloane (2002, 2003) found that over-education stands at 19.7% for Whites and 24% for non-whites. Within non-whites, different ethnic groups have different levels of over-education with the highest incidence being amongst the Indian and African-Asian groups and Chinese, roughly 33% each. For under education, Bangladeshi suffers a greater incidence, with 36% and follows up by Chinese with 12%. Nielsen (2011) reveals that foreign-educated immigrants are found to be more prone to over-education (39%) than both native Danes (20%) and immigrants educated in Denmark (15%). In terms of wages, overeducated workers from ethnic minorities earn slightly lower than their well-matched counterparts. Even the penalty is much greater for ethnic minorities or immigrants as one to compare to the natives overeducated.

There are some reasons why over-education is more prone to ethnic minorities. One of them is due to discrimination (Verdugo and Verdugo, 1988: Battu and Sloane, 2002, 2003) where ethnic minority employees are more likely to be ignored during recruitment, less likely to be promoted, or are placed at the back of job queues, such practices are likely to cause higher levels of over-education. Riach and Rich (2002) and Heath and Cheung (2006) argue that some ethnic groups are more difficult to obtain employment that fully matches their skill levels than for others. Consequently, some ethnic minority people may be more likely to accept jobs at a lower level than appropriate for their level of qualification than the majority white or native population (Wald and Fang, Rafferty and Dale, 2008, Nielsen, 2011). Some employers, because of prejudice, might also only employ ethnic minorities with higher qualifications than the white majority for the same job (Alpin *et al*, 1998).

While there has a growing number of over-education study in Malaysia (Lim *et. al*, 2008; Osman *et. al*, 2010; Lim, 2011; Zainizam, 2013; Zainizam and Battu, 2013), to date no study has addressed about the quality of job held by

workers in the labour market across ethnic groups. This lack of attention is somewhat surprisingly given Malaysia is not only a multi-racial country, consists of three major ethnic, Malay and indigenous (62%), Chinese (22%) and Indians (7%) but also on the involvement of the different ethnic groups at the economic activity in terms of labour force participation rate (LPFR) and employment. Looking at percentage of employed person among graduate by ethnic (Graduate Statistic Report, 1980-2010), the Malays has shown a tremendous increase from 50% in 1980 to 63% in 2010 whereas the percentages for the Chinese tend to decrease, from 37% to 26% over the same period. Yet, following the 2012 Labour Force Survey (LFS), Chinese has better labour market outcomes than that of the Malays, or even the Indians. While the LFPR stood at 66% in 2012, there was a variation across ethnics. The Chinese was ahead of other ethnic with 66% compared to the Malays and the Indians with 62% each. In terms of employment, while the Malays remained dominant with 57%, only a quarter of them were in professional and managerial jobs. This compares tonearly 40% for the Chinese. This would suggest that while there have been some improvement among highly educated Malays in the labour market, they are to some extent fail to get better jobs as compared to the Chinese counterparts. In fact, the 2012 Household Income and Expenditure Survey (HIES) shows that Chinese earns more than their Malay counterpart (RM6,366 against RM4,457).

These statistics particularly LFPR and employment by the ethnic groups indicates that the Chinese has advantageous over other ethnics. Though, this is consistent with many empirical studies in Malaysia where Chinese workers have better labour market outcomes than their Malays and Indian counterparts, particularly with respect to earnings (Mazumdar, 1981, 1991; Blau, 1985; Gallup, 1997; Chung, 2003, 2004; Milanovic, 2006). Yet, this contrast to many empirical evidences from other countries, where ethnic minorities have disadvantages over native workers in the labour market. Therefore, it is reasonable to expect that non-western labour market might vary compared to western labour market in how they perceive over-education and under education, especially Malaysia.

The main objectives of this paper are to document the extent of over and under-education and their impacts on individuals' wages across ethnic groups in Malaysia. In doing so, this paper is organised as follows. Section 2 outlines the data by mainly focusing on the measurement and the incidence of over and under-education while section 3 details empirical estimation methods. Section 4 highlights the results of the effects of over and under-education, and the final section concludes.

DATASET

Second Malaysia Productivity Investment Climate Survey (PICS-2) dataset is employed to ascertain the incidence and wage impacts of over education across ethnic groups in Malaysia. The PICS-2 is a workplace survey which was

carried out in 2007 by the World Bank and the Economic Planning Unit across manufacturing and business support services sectors. The survey attempts to understand the investment climate faced by enterprises and how this impacts upon business performance. The PICS-2 covers nine major industries in the manufacturing sector (i.e. - food processing, textiles, garments, wood and furniture, chemical and chemical products, rubber and plastics, machinery and equipment, electrics and electronics and motor vehicles and parts) and five major business support service industries (Telecommunication, Accounting, Advertising, Business Logistic and Information Technology). Total respondents in this survey were 13,500 across 1,418 workplaces. Respondents in this study however are confined to those who were in full-time employment, aged between 15 and 64 and who reported no missing in earnings. By such restriction, this leaves about 13,420 respondents, of which 53.6% are males and 46.4% are females.[1]

Table 1 provides summary statistics for the key variables used in this analysis. In line with other studies using this dataset, the data throughout are unweighted (World Bank, 2009; Zainizam, 2013). As such care should be taken in interpreting our descriptive statistics especially when comparing Malay and non-Malays. Respondents are on average 34 years old and reported to have had about 11.3 years of schooling attained which is equivalent in Malaysia to upper secondary qualifications. Nearly 40% of workers had once attended a training course at workplace. Married respondents and Malay ethnic represents a large proportion of respondents. Over 40% of the respondents were from the central region. With respect to occupation, nearly one-third of the workers were employed as skilled workers and about one-fifth were in professional and managerial jobs. On average, workers earn about RM 1,800 per month. Around 48% and 72% of workers employ in small firm size and firms purely domestically owned.

There is a variation across ethnic groups. Chinese ethnic seems to have better human capital accumulation, especially education and employment as compared to other groups. Nearly 40% of Chinese employees hold higher education qualification, i.e. diploma and university degree with the corresponding figures of 26% and 22% for to the Malays and the Indians. Instead, a higher percentage of Malay and Indian hold an upper secondary qualification. The Chinese also have better jobs - around 40% of them work in the upper level job, i.e. professional and managerial. This compared to less than 25% for the Malays and the Indians. By contrast, a large proportion the Malays and the Indians were overrepresented in skilled level jobs. Better labour market outcomes among the Chinese may reflect the earnings they receive. They earn on average RM500 to RM700 higher than that the one earn by the Indians and the Malays counterparts.

[1] It should be acknowledged that the exact number of workers for the analysis purpose could be lower due to missing data in some explanatory variables.

Nevertheless, the main concern about the dataset is how one measured over-education. In general, over-education is measured by comparing an individual's actual education with the required education for a particular job. The PICS-2 allows us measuring over-education using the subjective method which relies on the worker's own assessment about the required education to obtain or do a particular job. In particular, respondents were asked directly about "*According to you, what is the most appropriate level of education for the work you are doing?"* There were seven educational levels to choose from, starting from (1) degree, to (7) no qualification.

Table 2 shows raw responses of the most appropriate level of education for the jobs respondent were doing. It is clear that upper secondary qualifications were the most appropriate level of education in doing their job (33%), followed up by Diploma (20%) and Degree qualification (16%). By ethnic group, while the Malays and the Indians show no difference, nearly 50% of Chinese believed that higher education (both diploma and degree) are the most appropriate level of education in doing their current job. This compares to just 28% for upper secondary education.

By comparing the survey respondents' actual educational attainment (Table 1) with the perceived appropriate education required for the job (Table 2), we derived conventional estimates of over-education. Where an individuals' actual schooling exceeds what the job requires they are considered to be overeducated ($S^a > S^r$). Where an individuals' actual level of education is below that required for the job they are classified as under-educated ($S^a < S^r$). Those whose actual educational attainment is appropriate for the job (i.e. actual and required education are the same) are deemed well-matched ($S^a = S^r$). By doing so, the estimate of over-education incidence as shown in Table 3 is 17%, well-matched (55%) and undereducated (28%). There is no gender difference in over-education. Nevertheless, well-matched job is higher for the women whereas under-education is overrepresented in the men sample.

Table 1 Mean and standard deviation of selected variables

Variable	POOLED (n = 13,420)		MALAY (n = 6,410)		CHINESE (n = 4,560)		INDIAN (n = 1,122)		OTHERS (n = 1,328)	
	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D
Age	34.207	9.565	33.684	9.128	35.765	10.326	36.503	9.640	29.437	6.401
Female	1.464	0.499	1.465	0.499	1.542	0.498	1.486	0.500	1.175	0.380
Educational level										
Degree	0.141	0.348	0.121	0.326	0.206	0.404	0.104	0.306	0.044	0.206
Diploma	0.145	0.352	0.140	0.347	0.188	0.391	0.123	0.328	0.041	0.198
Upper Secondary	0.363	0.481	0.436	0.496	0.309	0.462	0.321	0.467	0.236	0.425
Lower Secondary	0.217	0.412	0.211	0.408	0.185	0.388	0.298	0.458	0.290	0.454
Primary	0.105	0.306	0.082	0.274	0.096	0.295	0.132	0.338	0.220	0.414
Informal	0.029	0.169	0.011	0.106	0.016	0.124	0.022	0.148	0.169	0.375
Training	0.397	0.489	0.463	0.499	0.335	0.472	0.427	0.495	0.266	0.442
Marital status										
Single	0.368	0.482	0.331	0.470	0.392	0.488	0.291	0.455	0.531	0.499
Married	0.616	0.486	0.650	0.477	0.594	0.491	0.696	0.460	0.463	0.499
Separated/Widowed	0.016	0.125	0.020	0.139	0.014	0.119	0.012	0.111	0.006	0.077
Ethnic										
Malay	0.478	0.500								
Chinese	0.340	0.474								
Indian	0.084	0.277								
Others	0.099	0.298								

Continue... (Table 1)

Occupation										
Management	0.138	0.345	0.115	0.320	0.209	0.407	0.123	0.329	0.019	0.136
Professional	0.127	0.333	0.109	0.312	0.182	0.386	0.116	0.320	0.032	0.177
Skilled Worker	0.322	0.467	0.365	0.481	0.277	0.447	0.315	0.465	0.277	0.448
Unskilled Worker	0.243	0.429	0.229	0.420	0.157	0.364	0.256	0.437	0.592	0.492
Non-Production/ Clerical Worker	0.161	0.368	0.175	0.380	0.163	0.370	0.182	0.386	0.070	0.255
Apprentice	0.009	0.094	0.007	0.083	0.011	0.106	0.009	0.094	0.010	0.099
Salary (RM Monthly)	1,806.8	2,088.8	1,625.4	1,828.9	2,338.1	2,543.0	1,764.6	1,781.6	892.0	1,044.8
Firm size										
Small (<50 emp)	0.475	0.499	0.398	0.490	0.552	0.497	0.401	0.490	0.644	0.479
Medium (50-150 emp)	0.285	0.452	0.294	0.455	0.280	0.449	0.330	0.471	0.225	0.417
Large (>150 emp)	0.240	0.427	0.308	0.462	0.168	0.374	0.269	0.444	0.131	0.338
Ownership										
Purely domestically-owned	0.722	0.448	0.672	0.470	0.782	0.413	0.687	0.464	0.786	0.410
Less than 30% Foreign-owned	0.043	0.203	0.048	0.213	0.040	0.195	0.038	0.192	0.037	0.189
More than 30% foreign-owned	0.235	0.424	0.281	0.449	0.179	0.383	0.275	0.447	0.177	0.382

Table 2 Raw response of the most appropriate level of education for the current work

Appropriate education	Pooled (%)	Malay (%)	Chinese (%)	Indian (%)	Other (%)
Degree	2,188	886	1,115	145	42
	16.3	*13.82*	*24.45*	*12.92*	*3.16*
Diploma	2,602	1,262	1,104	192	44
	19.39	*19.69*	*24.21*	*17.11*	*3.31*
Upper secondary	4,389	2,421	1,278	363	327
	32.7	*37.77*	*28.03*	*32.35*	*24.62*
Lower secondary	2,638	1,208	643	290	497
	19.66	*18.85*	*14.1*	*25.85*	*37.42*
Primary	968	420	235	91	222
	7.21	*6.55*	*5.15*	*8.11*	*16.72*
Informal	635	213	185	41	196
	4.73	*3.32*	*4.06*	*3.65*	*14.76*
Total	**13,420**	**6,410**	**4,560**	**1,122**	**1,328**
	100.00	***100.00***	***100.00***	***100.00***	***100.00***

Table 3 The incidence over and under-education

	Pooled (%)	Male (%)	Female (%)
Well-matched	7,372	3,729	3,643
	54.94	*51.83*	*58.52*
Overeducated	2,302	1,247	1,055
	17.15	*17.33*	*16.93*
Undereducated	3,746	2,218	1,528
	27.92	*30.83*	*24.55*
Total	**13,420**	**7,194**	**6,226**
	100.00	***100.00***	***100.00***

Source: Author's own calculation

Across ethnic groups, Table 4 shows over-education is lower among the Chinese and higher among the Malays with 14% and 18%, respectively. Under-education is more prone to the Indians with over 30% with the corresponding figures of 25% and 29% amongst the Chinese and the Malays.

Table 4 The incidence overeducation and education across ethnic groups

	Malay	**Chinese**	**Indian**	**Others**	**Total**
Well-matched	3,623	2,606	604	539	7,372
	56.53	*57.15*	*53.83*	*40.59*	*54.94*
Overeducated	1,150	647	166	338	2,301
	17.94	*14.19*	*14.80*	*25.45*	*17.15*
Undereducated	1,636	1,307	352	451	3,746
	25.53	*28.66*	*31.37*	*33.96*	*27.92*
Total	**6,409**	**4,560**	**1,122**	**1,328**	**13,419**
	100.00	***100.00***	***100.00***	***100.00***	***100.00***

Source: Author's own calculation

Over-education in Malaysia seems to be at the lower while under education seems to be higher as compared to the existing estimates.[2] This might be due to the fact that our country has experienced a skill shortage in the last decade (World Bank, 2009). As a result, perhaps employers in this sector employ individuals with lower educational attainment to do jobs that are typically done by highly educated workers, hence higher undereducation. However, this remains speculative as we have been unable to obtain specific growth rates to investigate this further. Higher over-education among the Malays relative to ethnic minorities, especially Chinese is contrast to finding from other countries (Verdugo, 1988; Battu and Sloane, 2002; 2003; Linsdley, 2009). The incidence is perhaps partly attributable to the fact that the PICS-2 is only for the private sector. Many studies in Malaysia have shown that the Chinese have more advantages over the Malay in the private sector in terms of higher earnings and better job position.[3]

With respect to earnings across mismatch, Table 5 postulates a well-matched worker earn much higher than their overeducated counterparts irrespective of ethnic groups. Unweighted data reveals that being employed in a well-matched job result in RM1,947 per month and this compares to RM1,341 and RM1,811 for the overeducated and undereducated workers, respectively. As Chinese earn more higher than other groups (see Table 1), it is not surprisingly that the wage premium for their well-matched, overeducated and undereducated workers also greater as one compared to the rest of the group.

2 Reviews from Groot and Maassen van den Brink (2000), McGuinness (2006) and Oosterbeek and Leuven (2011) show that the incidence of over-education is much higher than the incidence of under-education. For example, a recent review by Leuven and Oosterbeek (2011), over-education using the subjective method stands at an average over-education rate of 37% whilst under education stands at an average of 23%.

3 Indeed, data in hand revealed that Chinese workers have better educational attainment and occupation as compared to other groups.

Table5 Earnings differences among over and undereducated across ethnic group

	Pooled	**Malay**	**Chinese**	**Indian**	**Other**
Well-matched	1,947.3	1,714.6	2,459.0	1,989.5	976.5
	2,169.9	*1,823.1*	*2,609.7*	*2,161.2*	*1,135.3*
Overeducated	1,340.6	1,211.0	1,876.9	1,272.0	777.4
	1,368.2	*1,343.2*	*1,620.0*	*958.2*	*441.9*
Undereducated	1,811.0	1,713.8	2,296.9	1,612.2	887.6
	2,236.2	*2,077.9*	*2,721.1*	*1,205.3*	*1,251.0*
Total	**1,805.0**	**1,624.0**	**2,329.3**	**1,764.5**	**895.5**
	2,086.0	***1,828.0***	***2,534.5***	***1,780.8***	***1,053.1***

EMPIRICAL METHODS

To allow the effect of over-education (OE) and under-education (UE) on earnings, an augmented Mincer equation is employed by inducing a dummy for OE and UE following (McGuinnes, 2006), as shown in the following equation:

$$\ln w = x\beta_1 + \beta_2 S + \beta_3 OE + \beta_4 UE + \beta_5 Age + \beta_6 Age^2 + \mu \quad (1)$$

ln (w)is a natural logarithm of earnings (monthly),x is a vector of explanatory variables, S is educational attainment, OE and UE correspond to dummy variables, indicating that the individual is overeducated or undereducated, with the well matched being the omitted group. Age is used as proxy for individuals work experience and Age^2 is a quadratic term to see whether return to work experience subject to diminishing returns. ε is the error term for individual i. In equation (1), the overeducated and undereducated are being compared to individuals with the same education but are well matched. The majority of studies discovered that the coefficient on overeducation is generally negative: overeducated workers earn less than their comparably educated counterparts who are appropriately matched (e.g., Dolton and Vignoles, 2000; Green and McIntosh, 2007; Dolton and Silles, 2008).

All unknown parameters are estimated using Ordinary Least Square (OLS) technique. We also regress separately for men and women and by ethnic group to ascertain whether returns to over-education and under-education vary between men and women and between Malay and non-Malay. We should note that apart from over-education and under-education, we also controlled for other variables as shown in Table 1.

EMPIRICAL RESULTS

Tables 6 to 8 present the results of wage impacts of over and under-education. Looking at firstly Table 6, two specifications are proposed - specification 1 without controlling for educational mismatch and in specification 2, we included dummy variables for over-education and under-education. Focus on specification 1, around 59% of the variations in earnings (R-square) is explained by the model and 41% by unobserved characters. The results show that in line with human capital theory and many previous studies, earnings are positively associated with education, age and training. Respondents with a university degree earn much higher than those without one, approximately between 17% ($e^{-0.1904}$) and 43% ($e^{-0.5698}$).[4]Positive and negative coefficient of age and age square, respectively indicate that wage increases with age but at a diminishing rate. Nevertheless, return for each training session attended is around 9%, and the return is higher than the return to age.

Table 6 The wage effects of over-education and under-education

Log income (monthly)	**Pooled**		**Male**		**Female**	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Education (ref group - degree)						
Diploma	-0.1904***	-0.2317***	-0.1997***	-0.2341***	-0.1765***	-0.2215***
	(0.0155)	(0.0156)	(0.0245)	(0.0246)	(0.0195)	(0.0197)
Upper sec	-0.3754***	-0.4431***	-0.3775***	-0.4322***	-0.3484***	-0.4253***
	(0.0158)	(0.0162)	(0.0249)	(0.0252)	(0.0203)	(0.0209)
Lower sec	-0.4569***	-0.5609***	-0.4410***	-0.5294***	-0.4522***	-0.5660***
	(0.0183)	(0.0195)	(0.0267)	(0.0284)	(0.0258)	(0.0274)
Primary	-0.5789***	-0.7148***	-0.5069***	-0.6229***	-0.6186***	-0.7676***
	(0.0218)	(0.0239)	(0.0304)	(0.0333)	(0.0323)	(0.0350)
Informal	-0.5698***	-0.7408***	-0.4701***	-0.6188***	-0.7008***	-0.8817***
	(0.0289)	(0.0314)	(0.0369)	(0.0408)	(0.0502)	(0.0527)
Mismatch (ref group -Well-matched)						
Overeducated		-0.0995***		-0.0948***		-0.1061***
		(0.0110)		(0.0153)		(0.0153)
Undereducated		0.1070***		0.0868***		0.1164***
		(0.0104)		(0.0139)		(0.0154)

[4] Since the earnings regression specification is in semi-logarithmic form, the percentage point effect (PE) is obtained using the following formula:
PE = (e^{β} – 1) x 100, where β is the coefficient estimate.
The percentage point effect will be used throughout the discussion in this paper.

Continue... (Table 6)

Age	0.0559***	0.0553***	0.0586***	0.0592***	0.0599***	0.0576***
	(0.0029)	(0.0029)	(0.0037)	(0.0037)	(0.0047)	(0.0047)
Age square	-0.0005***	-0.0005***	-0.0005***	-0.0006***	-0.0006***	-0.0006***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0001)	(0.0001)
Training	0.0925***	0.0773***	0.0623***	0.0487***	0.1239***	0.1081***
	(0.0093)	(0.0093)	(0.0130)	(0.0130)	(0.0131)	(0.0130)
Female	-0.2363***	-0.2348***				
	(0.0086)	(0.0086)				
Ethnic (ref group – Malay)						
Chinese	0.3120***	0.3031***	0.2726***	0.2681***	0.3323***	0.3200***
	(0.0097)	(0.0096)	(0.0145)	(0.0144)	(0.0127)	(0.0127)
Indian	0.0448***	0.0440***	0.1033***	0.1041***	-0.0164	-0.0200
	(0.0152)	(0.0151)	(0.0210)	(0.0208)	(0.0212)	(0.0209)
Others	0.0538	0.0556	0.0439	0.0471	0.0344	0.0322
	(0.0472)	(0.0459)	(0.0690)	(0.0671)	(0.0658)	(0.0636)
Cons	6.5591***	6.6296***	6.2374***	6.2808***	6.2730***	6.3742***
	(0.0808)	(0.0799)	(0.1066)	(0.1054)	(0.1284)	(0.1266)
N	13200	13200	7076	7076	6124	6124
R-square	0.5947	0.6018	0.5913	0.5969	0.6167	0.6246
R-adjusted	0.5932	0.6003	0.5884	0.5940	0.6136	0.6215
Log-likelihood	-8172.57	-8055.29	-4426.02	-4376.91	-3522.14	-3457.89

Robust standard errors in parentheses
, ** and * denote 0.1, ** and ***, respectively*

With respect to demographic background, females are found to earn significantly lower, i.e – 21% than that of males. With regards to the ethnic group, the Chinese and the Indians earn 37% and 5%, respectively higher than the Malays counterpart (reference group). This finding is consistent with other studies for Malaysia (Mazumdar, 1981, 1991; Blau, 1985; Gallup, 1997; Chung, 2003; Rahmah and Zulridah, 2005; Milanovic, 2006; Zainizam, 2012; 2013).[5]

We also run separate analysis for males and females since our dataset allows us to do so. As shown in Table 7, the overeducation coefficient is negative and statistically significant and the size of effect is slightly higher for females

[5] We also control for other controlled variables such as marital status (3), household size, region (5),commuting time, work distance, occupation (7), hours of work, tenure, union, industry (15), firm size(3), ownership (3) and age of firm. The results are not discussed here but available upon request.

than males. Overeducated men earn about 9% less than their well-matched counterpart with the corresponding figure of 11% for women. Yet, women enjoy a higher wage premium of under-education than their men counterpart (12% against 9%).[6]

Table 7 The effect of over and under-education on wages across ethnic groups

Log wage (monthly)	Malay	Chinese	Indian	Others
Mismatch (ref group -Well-matched)				
Overeducated	-0.1059***	-0.0524**	-0.1650***	-0.0560**
	(0.0153)	(0.0207)	(0.0374)	(0.0277)
Undereducated	0.1278***	0.0926***	0.0433	0.0231
	(0.0148)	(0.0190)	0.0355)	(0.0287)
Education (ref group - degree)				
Diploma	-0.2911***	-0.1701***	-0.2544***	-0.1210
	(0.0234)	(0.0229)	(0.0639)	(0.0994)
Upper sec	-0.5090***	-0.3317***	-0.4582***	-0.3691***
	(0.0241)	(0.0259)	(0.0630)	(0.0757)
Lower sec	-0.6283***	-0.4578***	-0.6381***	-0.3676***
	(0.0284)	(0.0337)	(0.0708)	(0.0785)
Primary	-0.7552***	-0.6769***	-0.7349***	-0.4293***
	(0.0361)	(0.0432)	(0.0848)	(0.0821)
Informal	-0.8522***	-0.8669***	-0.7092***	-0.3932***
	(0.0662)	(0.0660)	(0.1090)	(0.0832)
Age	0.0638***	0.0577***	0.0447***	0.0191
	(0.0044)	(0.0048)	(0.0104)	(0.0122)
Age square	-0.0007***	-0.0005***	-0.0004***	-0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0002)
Training	0.0920***	0.0752***	0.0559*	0.0186
	(0.0126)	(0.0172)	(0.0311)	(0.0249)
Female	-0.2293***	-0.2030***	-0.3624***	-0.1665***
	(0.0116)	(0.0155)	(0.0284)	(0.0295)
Cons	7.2747***	6.8371***	6.8599***	7.2979***
	(0.3132)	(0.1506)	(0.2141)	(0.2371)

[6] Yet, when we did a t-test to ascertain whether the returns to over- and under-education differ between males and females, the test showed the returns did not significantly different from zero.

Continue... (Table 6)

N	6302	4522	1111	1265
R-square	0.5988	0.5156	0.6192	0.5284
R-adjusted	0.5956	0.5103	0.6020	0.5094
Log-likelihood	-3579.43	-2951.94	-637.80	-403.35

Robust standard errors in parentheses
, ** and * denote 0.1, ** and ***, respectively*

To ascertain whether the returns to over and under-education also differ across ethnic groups, we run separately for Malay, Chinese and Indian samples. Table 7 demonstrates the wage effects of over and under-education across ethnic groups. It is clear from the table that being employed in overeducated (undereducated) jobs reduces (increases) the workers' earnings regardless of ethnic group. Interestingly, however, there is a variation in the earnings penalty or premium where the magnitude of effects does ethnic matter. The penalty for being overeducated is lower (higher) among the Chinese (Indian) workers. In particular, an overeducated Chinese earns around 5% less than his/her counterpart, adequately-matched worker. This compared to 16% for overeducated Indians and 10% for overeducated Malays. In other words, the wage loss for being overeducated among the Chinese is 2 and 3 times lower than the loss reported for the Malays and the Indians, respectively. With respect to under-education, there is evidence of wage premium for being undereducated, particular among Malay and Chinese. The Malays, however experience a greater wage premium than the Chinese one (14% against 9%). There is no evidence of wage premium among the Indians and Others.[9]

Table 8 provides the estimation returns to over-education and under-education for men and women separately across ethnic group. Looking at firstly the males sample (Table 7), the earnings loss for being overeducated only evidence among the Malays and the Indians sample, approximately 10% and 11%, respectively. There is no evidence reported among Chinese male. For under-education, there is strong evidence at 0.01 that undereducated men from the Malays and Chinese ethnic experience a higher wage premium. Turning to female sample, there is evidence that being employed in jobs for which corresponds to individuals' actual educational attainment result in greater earnings loss, between 6% and 18%. The highest paying loss belongs to the Indians whilst the lowest one reported for Chinese. The penalty for Malay females stands at 11%. Nevertheless, Malay females earn higher wage premium of under-education than their Chinese female colleagues (16% vs 9%).

Table 8 The wage effect of over and under-education across ethnic groups – Male sample

Log wage (monthly)	Malay	Chinese	Indian	Others
MALE				
Mismatch (ref group -Well-matched)				
Overeducated	-0.1021***	-0.0461	-0.1136*	-0.0310
	(0.0226)	(0.0312)	(0.0588)	(0.0318)
Undereducated	0.1012***	0.0877***	0.0006	0.0318
	(0.0193)	(0.0297)	(0.0490)	(0.0312)
N	3383	2083	572	1038
R-square	0.5668	0.4644	0.5872	0.4855
R-adjusted	0.5606	0.4518	0.5502	0.4611
Log-likelihood	-1981.94	-1412.29	-314.28	-329.06
FEMALE				
Mismatch (ref group -Well-matched)				
Overeducated	-0.1112***	-0.0655**	-0.1868***	-0.1673**
	(0.0202)	(0.0273)	(0.0539)	(0.0721)
Undereducated	0.1501***	0.0933***	0.0593	0.0193
	(0.0228)	(0.0243)	(0.0529)	(0.0670)
N	2919	2439	539	227
R-square	0.6292	0.5604	0.6226	0.7607
R-adjusted	0.6230	0.5515	0.5873	0.6962
Log-likelihood	-1489.68	-1445.23	-283.81	-32.61

Robust standard errors in parentheses
, ** and * denote 0.1, ** and ***, respectively*

To summarise thus far, the earnings penalty for over-education stood at 10% (Table 5) but by ethnic group (Table 6), the loss was higher reported for Indian and was much lower for Chinese. Nevertheless, the wage loss of over-education among Malay is moderate (between the Chinese and the Indians). Greater earnings loss for Indian and lower pay loss for Chinese were robust even after we run separately by gender (Table 7). Indeed, Indian females who were overeducated earned significantly lower at 17% less than their well-matched counterparts. A lower wage penalty among the overeducated Chinese compared to the Malays however is not comparable to other studies. The greater pay penalty for the Indians and the Malays are perhaps as compared to Chinese counterpart explained by the fact that they are crowded into lower level jobs which offer fewer opportunities for a successful job match.

CONCLUSIONS

This paper is an attempt to fill a lingering gap in the existing studies on overeducation by examining the incidence and the effects of over-education on earnings across ethnic groups in the context of a developing country such as Malaysia.

Using the workers' own self-assessment, we find whilst the majority of are in well-matched jobs, overeducation accounted for about 17% of the sample and nearly 30% of our sample was undereducated. The estimate of over-education and under education was vary across ethnic groups where Chinese had lower over-education incidence than their Malay counterparts. Nevertheless, the Indians experienced highest over-education incidence than other groups.

Looking into earnings outcomes, overeducated workers earned 10% less than their comparable well-matched workers whilst under education enjoyed a wage premium of 11%. However, the magnitude of effects was differ with respect to ethnic groups where the Chinese (the Indians) experienced lower (higher) wage penalty, while the Malays have a moderate effect (between Chinese and Indian). In other words, the pay loss among Chinese is 2 and 3 times lower than the loss reported for Malay and Indian, respectively. The pay loss was differ by gender across ethnic groups. For men, the pay loss for being overeducated was only evidence for the Malays and the Indians samples. For female, Indian (Chinese) faced a greater (lowest) paying loss.

These results from this paper imply that there are significant costs to work in an occupation unrelated to the major due to human capital acquired is not completely general and cannot simply be transferred to other occupations.

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