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Cubicles or corner offices? Effects of academic performance on university graduates' employment likelihood and salary

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ABSTRACT

This paper uses a 2016/2017 sample of 1107 freshly minted university graduates from a public and a private university in Malaysia. Against a backdrop of an institutional setting very much different from that of western countries' and issues of high living costs and graduate unemployment, we analyse how academic performance affects graduates' employment likelihood, salaries, and salary distribution. Using quantile estimations, we find that academic performance is not a key determinant in whether or not a graduate secures a job upon graduation, and that having better academic performance would only be beneficial if the graduates are working in jobs at the lower half of the salary distribution. We fill the literature gap by analysing how academic performance affects new graduates in terms of where they are on the salary distribution continuum; such analyses are neglected in the literature.

KEYWORDS

Employment likelihood; salary distribution; academic performance; university graduates; quantile estimation

Introduction

Overview

Recent batches of freshly minted university graduates in Malaysia have spared no theatrics in making known their thoughts on what their starting salaries should be. Lamenting on escalating living costs, the graduates are asking for seemingly unrealistically high salaries, at least from the employers' perspectives (The Star 2017a). The graduates are reportedly demanding as high as RM6500 (approximately USD1625) per month (NST 2016a, 2016b). To put into a broader perspective of what Malaysian fresh graduates are demanding as compared to their peers worldwide, new graduates in the U.K. are demanding a starting salary of USD1900 (Jerrim 2011), and more than three-quarters of university graduates in Spain expect a USD2000 starting pay (Alonso-Borrego and Romero-Medina 2016). A key finding from the Malaysian Ministry of Education Graduate Tracer Study in 2015 reveals that 54% of the approximately 270,000 graduates with Bachelor's and Diploma degrees had a starting salary of less than RM2000 (≈ USD500).

Compounding the issue of new graduates' starting salary is the issue of graduate unemployment (The Star 2017b). Before the graduates could even start negotiating their salaries, they would have to overcome the first hurdle, i.e. to secure employment. Based on a report by the Central Bank of Malaysia (2016), the youth unemployment rate in Malaysia was 10.7% in 2015, which was more than three times higher than the national unemployment rate of 3.1%. In Malaysia, youths are defined as those between the age of 15 and 24; university graduates constitute part of the youths. Even more alarming

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is the fact that, at 23%, university graduates made up almost a quarter of the total number of unemployed youths in 2015. The unemployment rate for youths with tertiary education stood at 15.3%, compared to a relatively lower 9.8% for youths with non-tertiary education.

We need to understand the institutional setting in Malaysia in order to put into proper context the graduates' concerns with salaries and employment likelihood. Unlike university graduates in western countries where they would usually go for their gap-year experience upon graduation, Malaysian graduates would be seeking employment. This phenomenon stems from a deeply rooted culture of parental and peer pressure in securing not only a job, but ideally one that comes along with good pay and prestige. There is also the ingrained cultural Asian juggernaut of places high value on excellent academic achievement (Choi and Nieminen 2013; Sue and Okazaki 2009). To nudge fresh graduates against leaping straight on to the job market bandwagon, the Malaysian Ministry of Education has recently announced its Gap-Year programme with the first cohort of graduates taking up the programme in September 2017.

Selected literature

From the graduates' perspective, one way to stand out among their peers in obtaining jobs with good salary prospects upon graduation is through excellence in academic performance, i.e. in the form of high Cumulative Grade Point Average (CGPA hereafter) scores. The link between academic performance and salary expectations of university graduates can be traced back to the theoretical underpinnings of the human capital investment theory (Mincer 1958; Schultz 1961, 1962; Becker 1962, 1964) and the job market screening-signalling theory (Arrow 1973; Spence 1973; Riley 1975; Stiglitz 1975). The two strands of theories collectively link work productivity to human capital embodied in education. For example, Mincer (1958) and Schultz (1962) noted that income would be unequally distributed according to the level of accumulated human capital, a concept used to capture ability. Becker (1962) defined human capital investment as the embedding of resources in people; one such resource is education, which can affect both earning prospects and consumption patterns. The concept of human capital is built on the theoretical foundation of social capital where one's actions are shaped and constrained by the social norms of a society (Coleman 1988).

Academic performance, measured by CGPA, is a way of signalling ability and the quality of embodied human capital. CGPA also acts as a screening mechanism, with higher CGPA scores connoting higher job productivity. People invest in university education with the ultimate aim of securing a job with high pay. From the sociology point of view, educational attainment is regarded as a tool to improve on intergenerational social mobility (Goldthorpe 2014; Torche 2011). In fact, achieving good labour market outcomes and quality education are two of the important aspirations of the 2016–2020 Eleventh Malaysian Plan in producing more holistic graduates with better job prospects (Ministry of Education Malaysia 2015).

Recent empirical literature has focused on the link between academic performance/credentials with graduate employability/employment (Pinto and Ramalheira 2017; Figueiredo et al. 2017; Nunley et al. 2016; Pirog 2016). Using a resume-sifting experimental approach, Pinto and Ramalheira (2017) examined the effects of academic performance as one of the two key determinants on the perceived employability of Portuguese business graduates. Figueiredo et al. (2017) is another recent Portuguese study using macro level data for the 2000–2010 period; they analysed the gap between academic competency and post-employment job competency. In another European study on the labour market outcomes of Polish graduates, Pirog (2016) looked at how different components of educational capital affect the graduates' employment chances; the graduates' final cumulative grade is a component of educational capital, along with the level of education, discipline of study, and internship components. In yet another similar resume-sifting experimental study, this time in the United States, Nunley et al. (2016) analysed the impact of internship experience and the type of college majors on interview call-back (as a proxy to employment chances), for graduates with different levels of academic performance. Past Malaysian studies have also suggested academic performance as one of the key criteria of graduate employability and employment (Cheong et al. 2018; Jayasingam, Fujiwara, and Thurasamy 2018; Hashim 2012; Lim 2010; Lim, Rich, and Harris 2008). Using an online questionnaire survey on Malaysian university students and interviews with medium-sized and large firms, Cheong et al. (2018) examined the attributes perceived as most important for employability from both the students' and employers' perspectives. Jayasingam, Fujiwara, and Thurasamy (2018) conducted a field experiment on human resource and recruitment executives to determine the impact of graduates' choosiness and general skill competency on employability. Both of Lim's (Lim, Rich, and Harris's 2008; Lim 2010) studies analysed the employability and employment outcomes of graduates from a sole Malaysian university, while Hashim's (2012) work examined the important of academic performance from the employers' point of view. Our study complements these aforementioned Malaysian studies by using a sample comprising recent graduates from two Malaysian universities, and by analysing the importance of academic performance on labour market outcomes from the graduates' perspective.

The literature has also examined the relationship between academic performance and the salaries of fresh university graduates (Feng and Graetz 2017; Naylor, Smith, and Telhaj 2016; Freier, Schumann, and Siedler 2015). Using a regression discontinuity design on a sample of UK university graduates, Feng and Graetz (2017) estimated the causal effect of academic degree class on the graduates' earnings. In another causal estimation study, Freier, Schumann, and Siedler (2015) examined the earnings of German top graduates in law, using a difference-in-differences setup. Naylor, Smith, and Telhaj (2016) also analysed the relationship between academic degree classes and UK university graduates' earnings, though not within a causal estimation framework as the previous two studies. Malaysian studies looking at academic performance and graduates' salaries are somewhat lacking, perhaps with the notable exception of a related study which investigates the effects of the levels of education on the earnings of working adults (Arshad and Ghani 2015). Their study however emphasised on working adults, not fresh university graduates per se.

Research significance and objectives

The burgeoning literature has given separate treatment to the issues of fresh graduates' salary levels and employment likelihood. More importantly, these studies have been undertaken in an institutional setting very much different from that of Malaysia's. Our paper contributes to the literature pool by examining the issues of graduate employment and salaries in the Malaysian context using a recent unique dataset collected in the 2016/2017 period. We also fill the literature gap by providing an empirical analysis of how academic performance affects new graduates in terms of where they are on the salary distribution continuum. Analyses on salary distribution of new graduates appear to have been neglected in the literature. Our paper thus has three specific objectives. First, we examine how academic performance affects the graduates' employment likelihood. Second, we investigate how academic performance affects their salaries. Third, we analyse the effects of academic performance on different segments of salary distribution.

Method

Sample

The target population for this study is the recent 2016/2017 batch of Malaysian public and private university graduates. This paper uses a sample of 1107 respondents selected from a public university (Universiti Utara Malaysia, UUM), and a private university (Sunway University). Our sample is distinguished from those of past Malaysian studies (Lim 2010; Lim, Rich, and Harris 2008) in terms of (i) the inclusion of graduates from both the public and private universities, and (ii) the homogeneity of the programme types offered by these public and private universities. There were 710 respondents from UUM, and 397 from Sunway University. Only Malaysian graduates made up the final usable sample. Non-Malaysian graduates are required to return to their countries as they only possess student visas, and not work permits. The respondents were surveyed during their respective graduation robe collection period. The graduates were assigned designated days and time slots for robe collection. The designated robe collection slots were based on programme types. Graduates from UUM and Sunway University are selected because they are comparable in terms of programme types. The programmes offered by these two universities are typically in business, economics, accounting, management, and information technology among others.

Model specification and estimation

This paper specifies three different models to answer the three research objectives: binary logit model, ordinary least-square (OLS) model, and quantile model. To fulfil the first objective of this paper, we use a binary logit model to estimate the marginal effects of CGPA on the graduates' probabilities of gaining employment six months upon graduation. The hypothesis here is that graduates with higher CGPA have higher probabilities of being employed (Hypothesis 1). In the binary logit model, the graduates' actual employment outcome (y) is regressed on a vector of explanatory variables (X) such that $y = X\beta + \varepsilon$, where y and ε are $n \times 1$ vectors, β is a $k \times 1$ vector, and ε is a vector of error terms. X is an $n \times k$ matrix with k explanatory variables for n observations. The dependent variable y has a binary outcome with $y = 1$ as being employed and 0 otherwise. y^* is a latent continuous random variable related to its observable counterpart y with $y = 1$ ($y^* > 0$). The latent variable y^* represents the graduates' underlying tendencies to be employed. Such tendencies are associated with a vector of observable characteristics (X). Once the latent variable crosses the $y^* > 0$ threshold, we observe $y = 1$ (being employed). We define 'being employed' as having one of these three outcomes – being employed in a full-time job, being employed in a part-time job, or being self-employed. The numbers of self-employed graduates are negligible. We believe that it is partly due to the institutional setting in Malaysia in which graduates typically compete for coveted vacancies in either the public or private sector, unlike university graduates in western countries who are more likely to embrace the entrepreneurial attitude to be self-employed (Oinonen 2018). The explanatory variable of interest of the binary logit model is the CGPA (either scores or classes). This is also the explanatory variable of interest for the other two following models. In fact, the focus of this paper is to estimate the marginal effects of CGPA on the dependent variables for all three models.

To fulfil the second objective of this paper, we use an OLS model, in which the dependent variable (y) is the amount of salary earned for graduates who are employed. The OLS model of $y = X\beta + \varepsilon$ estimates the conditional mean function of the dependent variable, i.e. $\boldsymbol{E}[y|X] = X\beta$. This model estimates the marginal effects of CGPA (either scores or classes) on the employed graduates' salaries. We hypothesised that higher CGPA would have positive marginal effects on salaries (Hypothesis 2).

The OLS estimation, however, only provides a partial view and is unable to reveal if there are any relationships between CGPA and salaries at different points (segments or quantiles) in the conditional distribution of y. In order to do this, and to fulfil the third objective of this paper, we use a quantile model. A quantile model examines the impact of X on different segments or quantiles of the y variable. Quantile estimations basically model distributions, such as the salary distribution in this study. The marginal effects obtained from conditional mean estimations such as the OLS model assume the constant impact of a covariate across different segments of the dependent variable, which might not necessarily be the case. The marginal effects of a covariate on the dependent variable may be different, depending on different segments or quantiles of the dependent variable. In the context of this study, we hypothesise that the marginal effects of CGPA (either scores or classes) on the graduates' salaries are different, depending on which quantile of the salary distribution we are referring to (Hypothesis 3).

The quantile estimation is first developed by Koenker and Bassett in their 1978 seminal paper. Conditional on a matrix of covariates X, the quantile model is set up as follows:

$Quant_\tau(\boldsymbol{y}|X) = \alpha(\tau) + X\beta(\tau)$, where $Quant_\tau(\boldsymbol{y}|X)$ denotes the τth quantile of the dependent variable vector $\boldsymbol{y}$, τ denotes the τth conditional quantile of the continuous monthly salary (y) distribution, and $\tau \in (0, 1)$. We are modelling salary quantiles (i.e. the dependent variable) on X, with CGPA as the explanatory variable of interest. The quantiles are assumed to be linear in parameters; as in OLS estimations, X can include nonlinear functions of the explanatory variables (Wooldridge 2010, 450). Conventional OLS models answer questions such as 'Do CGPA scores affect salary?'. Quantile models, on the other hand, address questions like 'Do CGPA scores affect salary differently for those employed in jobs with salaries at the upper end of the salary distribution than for those employed in jobs with lower-end salaries?'. Using quantile models, the effects of CGPA on a particular salary quantile can be compared to those on other salary quantiles. Heterogeneity across different salary quantiles can therefore be studied; in fact, the quantile model is a tool to analyse such heterogeneities specifically (Koenker and Hallock 2001).

Findings and discussions

Discussion of findings I: summary statistics

Table 1 reports the summary statistics in two panels. Figures are reported as means for continuous variables, and proportions for categorical variables. The number of observations, *N*, is only reported for categorical variables. The panel on the left shows the sample statistics on employment status. The panel on the right reports statistics by quantiles (Q1 to Q4) of the monthly salary. Slightly less than half of the 1107 respondents in this study are gainfully employed at the time of the survey (i.e. being employed full/part-time or self-employed). There are no apparent differences in the CGPA scores between those employed (3.32) and unemployed (3.33). From the *p-value* column, there are no statistically significant differences in the CGPA scores or the three CGPA classes between the employed and unemployed. The *p-value* of 0.443, for example, indicates that there are no statistical differences between the proportions of first-class holders who are employed (0.17) and their unemployed (0.19) counterparts. Summary statistics for the remaining variables are similarly interpreted. The *p-value* reports the t-test (comparing the two employment categories) and F-test (comparing the four categories of salary quantiles) statistical significance results.

Among the employed, their average monthly salary is RM2054 (≈ USD515). The panel on the right shows four salary quantiles; the 'All' column combines all the quantiles. Salaries of those employed are first sorted in an ascending order and then grouped into the respective quantiles, with those in the highest quantile earning an average salary of RM3254 (≈ USD815). Significant *p-values* suggest differences across the salary quantiles. With *p-values* less than 1%, the proportions of those with first and second upper classes of CGPA are likely to be significantly different across the salary quantiles. The proportions of first-class holders increase discernibly across the salary quantiles, from 0.09 in the lowest quantile to 0.26 in the highest; 26% of the first-class holders have jobs in the highest salary quantile, compared to 9% with jobs in the lowest salary quantile. The summary statistics reveal the proportions of first-class holders with jobs in different salary quantiles.

Apart from the explanatory variable of interest, Table 1 also provides summary statistics for two sets of control variables: academic-related variables and demographic variables. In addition to these two sets of controls, there are four other sets of controls used in different models (logit and OLS) and model specifications (M1 to M6). A later section elaborates on the controls used.

Discussion of findings II: effects of CGPA on the probability of being employed

Table 2 presents the marginal effects of CGPA on the probability of being employed. We use five logit model specifications (columns M1 to M5). The M1 specification only looks at the marginal effect of the variable of interest (i.e. CGPA scores) on the dependent variable (i.e. probability of being employed). From Panel A, CGPA scores as the sole explanatory variable in M1 do not exhibit any significant

Table 1. Summary statistics.

	Employment status				Salary						
	N	Employed	Unemployed	*p-value*	*N*	All	Q1	Q2	Q3	Q4	*p-value*
Dependent variable											
Monthly salary (RM)	–	2054	–	–	–	2054	1091	1955	2351	3254	0.000
No. of observations, *N*	1107	544	563	0.352	544	–	181	138	91	134	–
Explanatory variable of interest											
CGPA scores[a]	–	3.32	3.33	0.834	–	3.32	3.26	3.30	3.37	3.37	0.018
First Class	196	0.17	0.19	0.443	196	0.17	0.09	0.15	0.21	0.26	0.000
Second Upper	753	0.68	0.67	0.990	753	0.67	0.75	0.69	0.58	0.61	0.007
Second Lower	151	0.14	0.12	0.437	151	0.14	0.14	0.15	0.16	0.11	0.783
Academic-related variables											
Private university graduates	396	0.35	0.33	0.678	396	0.35	0.16	0.36	0.34	0.59	0.000
Joined societies	405	0.42	0.34	0.007	405	0.42	0.46	0.40	0.37	0.44	0.494
Offered job before graduating	322	0.34	0.28	0.083	322	0.33	0.25	0.35	0.42	0.38	0.017
Internship salary (RM)	–	632	641	0.692	–	632	533	586	673	770	0.000
Socio-demographic variables											
Household size	–	5.6	5.8	0.316	–	5.6	6.3	5.6	5.2	5.1	0.000
Mother postsecondary educ	242	0.20	0.23	0.332	242	0.20	0.17	0.21	0.18	0.25	0.461
Father postsecondary educ	281	0.22	0.27	0.097	281	0.22	0.18	0.23	0.24	0.28	0.255
Parents' income (RM)	–	3483	4038	0.118	–	3463	3467	2649	2741	4786	0.008
Age	–	24.5	24.2	0.026	–	24.5	24.8	24.4	24.4	24.3	0.219
Female	748	0.69	0.66	0.481	748	0.68	0.72	0.67	0.72	0.63	0.260
Malay ethnic group	429	0.38	0.41	0.446	429	0.38	0.67	0.37	0.18	0.12	0.000

Note: Figures are reported as means for continuous variables, and proportions for categorical variables.
[a] The maximum CGPA score is 4.00.

Table 2. Logit estimations of the effects of CGPA on probability of being employed.

Dependent variable: *Prob. (Employed)*	M1	M2	M3	M4	M5
Panel A					
CGPA scores	−0.00892	0.0229	0.0318	0.0454	−0.177
	(0.0427)	(0.0510)	(0.0567)	(0.0646)	(0.0964)
Academic-related variables					
Private university graduates		0.0582	0.0728	0.0977	−1.277***
		(0.0434)	(0.0538)	(0.0817)	(0.456)
Joined societies		0.0731**	0.0596	0.0684*	0.0683*
		(0.0344)	(0.0366)	(0.0403)	(0.0399)
Offered job before graduating		0.0689*	0.0876**	0.103**	0.103**
		(0.0358)	(0.0379)	(0.0420)	(0.0419)
Internship salary		−0.00276	0.0154	−0.0184	−0.00914
		(0.0363)	(0.0390)	(0.0436)	(0.0440)
Socio-demographic variables					
Household size				−0.0132	−0.0947*
				(0.0125)	(0.0562)
Mother postsecondary educ				−0.0461	−0.0581
				(0.0627)	(0.0622)
Father postsecondary educ				−0.0883	−0.0886
				(0.0598)	(0.0595)
Parents' income				0.0164	0.0289
				(0.0302)	(0.0300)
Age				0.0352**	−0.134
				(0.0171)	(0.278)
Female				−0.00115	0.0604
				(0.0429)	(0.0557)
Malay ethnic group				0.0231	0.0520
				(0.0600)	(0.0867)
Panel B					
First Class	−0.0262	−0.0118	−0.0109	−0.0276	−0.0761
	(0.0391)	(0.0436)	(0.0496)	(0.0566)	(0.0577)
Second Upper	0.00672	0.0287	0.0447	0.0801*	0.0757*
	(0.0304)	(0.0366)	(0.0396)	(0.0430)	(0.0435)
Second Lower	0.0345	−0.00418	−0.00146	−0.0210	0.102
	(0.0443)	(0.0511)	(0.0533)	(0.0597)	(0.0767)
Controls (Set A, B, C)		✓A	✓A, B	✓A, B	✓A, B, C
N	1083	868	766	626	626

Note: Standard errors in parentheses. Significant at *10%, **5%, and ***1% level.

statistical effect on the probability of being employed, *Prob(Employed)*. M2 includes academic-related and types of programme controls (Set A). M3 expands the control list to include pre-university academic achievements (Set B). In M4, demographic controls are included. To capture nonlinearities, squared and interaction terms are included as additional controls in M5 (Set C). None of the five specifications capture any effects of CGPA scores on *Prob(Employed)*.

To check if CGPA classes are able to capture any significant marginal effects, we break down the CGPA scores, categorise them by classes, and re-estimate the five specifications using each of the three categorical variables, one by one (Panel B). Only the second-upper class dummy exhibits some statistically significant effects on *Prob(Employed)*. Graduates with a second-upper class have higher probabilities of being employed, as suggested by the statistically significant marginal effects in the M4 and M5 specifications of Table 2; the probability of being employed for these graduates is between 7 and 8 percentage points higher than those who are not second-upper class holders, ceteris paribus. The marginal effects, however, are only significant at the 10% level. Being first-class or second-lower class holders do not seem to have any significant effects on *Prob(Employed)*. Our findings here suggest no compelling evidence of academic performance being the sole determinant of graduate employment.

Our findings resonate with those from past studies. Pinto and Ramalheira (2017) found perceived employability to be higher for graduates who were both academically excellent and all-rounders in extracurricular activities. Perceived employability was also attributed to soft skills rather than to disciplinary knowledge competency (Cheong et al. 2018; Jayasingam, Fujiwara, and Thurasamy 2018). In fact, a review by Hogan, Chamorro-Premuzic, and Kaiser (2013) found that from the employers' perspective, academic performance played only a 'first-pass filter' minor role, as compared to other more important determinants of employability such as interpersonal skills, good attitude, work ethics, and job competency. From the graduates' perception, it was indeed found that university degrees do not equip them adequately with the skills required in the labour market (Figueiredo et al. 2017). Employment chances, in the form of interview call-backs, were found to be statistically significant for graduates with high academic performance only if they had had internship experience; high academic performance on its own did not exhibit any statistical significance on such employment chances (Nunley et al. 2016). Pirog (2016) also came to similar conclusions, i.e. the graduates' final grades did not have any statistically significant effect on employment outcomes. Results from these past studies indeed lend support to our findings here in this section.

Discussion of findings III: effects of CGPA on salary and related empirical issues

There are two panels in Table 3. The OLS estimation results in Panel A show statistically significant marginal effects of CGPA scores on the salaries earned, across all six model specifications. The dependent variable is the natural logarithm of the graduates' monthly salary. A 1.0-unit increase in CGPA scores results in between 16.6% and 32.7% increase in salary, depending on model specification.

Table 3. OLS estimations of the effects of CGPA on salaries

Dependent variable: ln(Salary)	M1	M2	M3	M4	M5	M6
Panel A						
CGPA scores	0.166***	0.260***	0.219***	0.297***	0.244***	0.327**
	(0.0615)	(0.0703)	(0.0827)	(0.0934)	(0.0919)	(0.142)
Academic-related variables						
Private university graduates		0.270***	0.262***	0.252**	0.237*	0.494
		(0.0584)	(0.0757)	(0.114)	(0.121)	(0.604)
Joined societies		−0.0539	−0.0328	−0.0419	−0.0599	−0.0677
		(0.0455)	(0.0475)	(0.0539)	(0.0534)	(0.0526)
Offered job before graduating		0.0823*	0.112**	0.0924	0.0567	0.0618
		(0.0477)	(0.0498)	(0.0617)	(0.0613)	(0.0599)
Internship salary		0.159***	0.211***	0.235***	0.192***	0.158***
		(0.0520)	(0.0482)	(0.0549)	(0.0569)	(0.0551)
Socio-demographic variables						
Household size				−0.0275*	−0.0254*	−0.0549
				(0.0157)	(0.0149)	(0.0575)
Mother postsecondary educ				0.0645	0.0904	0.0655
				(0.121)	(0.115)	(0.114)
Father postsecondary educ				0.00274	−0.0287	−0.0193
				(0.124)	(0.118)	(0.117)
Parents' income				0.00866	−0.000874	0.00986
				(0.0432)	(0.0418)	(0.0420)
Age				0.0560***	0.0569***	−0.216**
				(0.0196)	(0.0204)	(0.0922)
Female				−0.0457	−0.0435	−0.141*
				(0.0597)	(0.0577)	(0.0743)
Malay ethnic group				−0.158*	−0.0815	−0.172
				(0.0875)	(0.0858)	(0.148)
Panel B						
First Class	0.208***	0.189***	0.171***	0.161**	0.113*	0.109
	(0.0469)	(0.0517)	(0.0602)	(0.0731)	(0.0677)	(0.0760)
Second Upper	−0.188***	−0.0548	−0.0428	−0.0214	−0.00776	−0.0447
	(0.0438)	(0.0485)	(0.0540)	(0.0612)	(0.0564)	(0.0633)
Second Lower	−0.0319	−0.128*	−0.104	−0.141	−0.133	−0.0736
	(0.0634)	(0.0676)	(0.0748)	(0.0860)	(0.0840)	(0.103)
Controls (Set A, B, C, D)		✓A	✓A, B	✓A, B	✓A, B, D	✓ A, B, C, D
N	544	437	387	302	302	302

Note: Standard errors in parentheses. Significant at *10%, **5%, and ***1% level.

In terms of controls, the first four specifications are the same as those explained in the previous logit estimation section. M5 includes work-related controls (Set D), and M6 expands the control list further to include squared and interaction terms (Set C). M5 is used as the main specification here since its Bayesian Information Criterion gives the lowest readings (unreported here) across the six specifications, regardless of whether CGPA scores or CGPA classes are used. The M5 specification shows that a 1.0-unit increase in CGPA scores is associated with a nontrivial 24.4% increase in salary, ceteris paribus.

Panel B shows the results when CGPA scores are being replaced with CGPA class dummies. For example, if we use the First Class dummy in M5, its coefficient suggests that first-class holders would have a salary of about 11.3% higher than those who are not first-class holders, ceteris paribus. If we use the Second Upper dummy, we get a statistically insignificant coefficient from M5; and similarly, if the Second Lower dummy is used. Our results here are similar to those found by Feng and Graetz (2017), in which they concluded that a First Class would increase the probability of working in a high-wage industry, as compared to obtaining a Second Upper class. As for Naylor, Smith, and Telhaj (2016), they found both the First Class and the Second Upper class to be significantly associated with higher salaries. Re-categorising CGPA scores into CGPA classes has helped detect the CGPA class that is actually driving the results. Panel A shows that CGPA scores are statistically significant throughout all six specifications. Panel B however, shows that not all CGPA classes exhibit significant marginal effects on the salaries earned. Having a Second Upper or a Second Lower class has no statistically significant effects on the salaries earned in M5.

On controls

The use of a cross-sectional dataset in this study precludes the possibility of testing for plausible unobserved individual-specific heterogeneity as in using a panel dataset. If unaccounted for, such unobserved heterogeneity could lead to omitted variable bias. We circumvent this data limitation by including as many relevant controls as practically feasible, depending on the data we have and ensuring we have sufficient degrees of freedom for meaningful estimations. We have six sets of controls altogether: academic-related variables, socio-demographic variables, types of university programmes (Set A), pre-university academic achievements (Set B), squared/interaction terms (Set C), and work-related variables (Set D). Results for the Set A to Set D controls are not displayed in the result tables to minimise unnecessary clutter in reporting.

As reported in Table 1, academic-related controls include variables such as whether the respondent graduated from a private university (to control for the type of university, i.e. public and private), whether the graduate participated in university societies/clubs/association (to control for all-rounder graduates, and not just the academically inclined), whether the graduate was already offered a job prior to graduating (to control for the graduate employability), and the graduate's internship salary (to control for hints of initial work productivity; also note that, internship has been made a compulsory requirement for graduation in both the Malaysian public and private universities). Socio-demographic controls include variables to control for a graduate's socioeconomic status such as household size, parents' education level, and household income. Age, gender, and ethnic groups are also included as individual demographic controls.

The remaining sets of controls, Set A to Set D, are used in different models and model specifications for model robustness checks, and for selecting the most inclusive model specification as the main specification. Set A controls involve the types of university programmes, i.e. business, information technology, accounting, economics, entrepreneurship, finance, and management-related programmes such as hospitality, tourism, human resource, operation, logistics, and risk management among others. To reiterate, graduates from UUM and Sunway were selected due to the homogeneity in the types of programmes offered by these two public and private universities. Set B is a list of controls on pre-university academic achievements, i.e. English language proficiency level of the

Malaysian University English Test (MUET), high-school (Form 5) English and the Malaysian national language proficiency levels, and university entrance exam CGPA scores.

To capture nonlinearities, Set C controls are included. In this set, continuous variables are squared, e.g. household size and age, whereas categorical variables are interacted with each other, e.g. gender with ethnic groups, and CGPA class with types of university. The sets of controls used for the logit (Table 2) and OLS (Table 3) estimations differ slightly. Since the dependent variable used in the logit estimations is whether or not a recent graduate has gained employment, work-related controls (Set D) are excluded. Work-related controls are included in the OLS estimations on the salaries of employed graduates. The work-related controls in this study include (i) geographical state/region where the company is located, (ii) the type of company, i.e. public-listed, small-and-medium enterprises, or foreign-owned, and (iii) the type of business sector, i.e. manufacturing, service, or construction. With the exception of work-related controls, both the logit and OLS estimations use the same sets of controls.

On endogeneity

There might be concerns over the issue of the variable of interest (CGPA scores and classes) being endogenous. The CGPA might be correlated with the error term, i.e. CGPA might be correlated with, for instance, unobserved innate ability which is being subsumed in the error term. We used a two-stage least square (2SLS) estimation on the M5 specification of Table 3 to test the endogeneity of CGPA (scores and classes). We instrumented CGPA with a dummy of whether or not the student loans received were convertible to scholarships. Loan convertibility status satisfies the first condition of a good instrument, $Cov(Z, u) = 0$, i.e. it is unrelated to how much salary a person is earning. This first condition is the exclusion restriction because the instrument, Z, is excluded from the model of interest (i.e. the model in which salary is regressed on CGPA). In the post-estimation endogeneity test, it returned a *p-value* of more than 0.10, indicating insufficient statistical proof to reject the null hypothesis of CGPA being exogenous. The first condition, $Cov(Z, u) = 0$, is being met. We then proceeded to check the second condition of a good instrument, $Cov(Z, X_k)$ [?] 0, using a first-stage regression, as suggested by Wooldridge (2010, 92). Results from this first-stage regression revealed that there was a statistically significant association between CGPA (X_k) and the instrument (Z), with a *p-value* less than 0.001. This therefore satisfies the $Cov(Z, X_k)$ [?] 0 condition. These two conditions are the key identifying assumptions for the CGPA coefficient being exogenous. Since there is no statistical evidence of CGPA being endogenous, concerns over the endogeneity issue are perhaps unwarranted.

On sample-selection bias

In estimating the marginal effects of CGPA on the probability of being employed, the entire sample of $N = 1107$ observations is used in the logit estimations. The observed dependent variable, Y, would either be 1 (employed) or 0 (otherwise). All the 1107 respondents in the sample would have an observed Y outcome. In using OLS estimations to capture the marginal effects of CGPA on the salary earned however, the issue of self-selection or sample-selection bias might arise. We use self and sample selection interchangeably. In a sample-selection bias problem, incidental truncation is where certain variables are observed only if other variables take on particular values (Wooldridge 2010, 777). The dependent variable in the OLS estimations, i.e. the monthly salary, is only observed for graduates who are employed.

Self-selection bias arises if the graduates self-select themselves into employment, and therefore earn a salary; how much salaries they earn might be related to the very characteristics that have the graduates employed in the first place. Therefore, there might be potential sample-selection bias if we only use data on the subsample of those employed to estimate the salary. To ensure that the OLS estimation results we obtained in Table 3 were not plagued by sample-selection bias, we used the Heckman selection model on the M5 specification to check for the presence of sample-selection bias. The results showed no evidence of such bias; there was no statistical evidence to reject the null hypothesis of independent equations (i.e. the 'Employed' selection equation and the 'Salary' outcome equation) or equivalently, H_0: $\rho = 0$ (i.e. the rho, ρ, is the correlation coefficient of the error terms from the selection and the outcome equations). Since the Heckman selection model results suggested no presence of sample selection bias, the marginal effects in Table 3 can therefore be deemed unbiased.

Discussion of findings IV: effects of CGPA on different segments of salary distribution

In the earlier Table 3, we examined the marginal effects of CGPA on salary. The OLS estimates in Table 3 however only tell a partial story. The effects of CGPA may not necessarily be constant across different segments or quantiles of the graduates' salary distribution. Before we discuss how CGPA might have different effects across segments of the salary distribution, let us first examine the salary's probability density function (PDF). Figure 1 suggests that the First Class cohort earns more, with a mean salary of RM2296 (≈ USD575). The Second Upper and Second Lower cohorts earn a mean salary of RM1918 (≈ USD480) and RM1957 (≈ USD490) each. The PDF for the First Class cohort is at the rightward-most position, compared to the other two PDFs. A statistical test for differences in the mean salary by GCPA classes quickly confirmed that the mean salary indeed differs between the three classes, i.e. the test returned an F-statistic of 8.96 with a *p-value* of 0.0001. The results from Figure 1 are possible tell-tale signs that the effects of CGPA on salary are not as straightforward as what they might have seemed in Table 3. There might be considerable heterogeneity in the effects of CGPA across different segments of the salary distribution, which typical OLS estimation would be unable to capture.

Looking across different segments of the salary distribution, quantile model estimations could unveil underlying patterns not readily detectable from OLS estimations. The quantile model specification in Table 4 follows the M5 model specification of Table 3. For ease of comparison, OLS estimates from M5 of Table 3 are reproduced here in Table 4. To reiterate, an OLS model estimates the

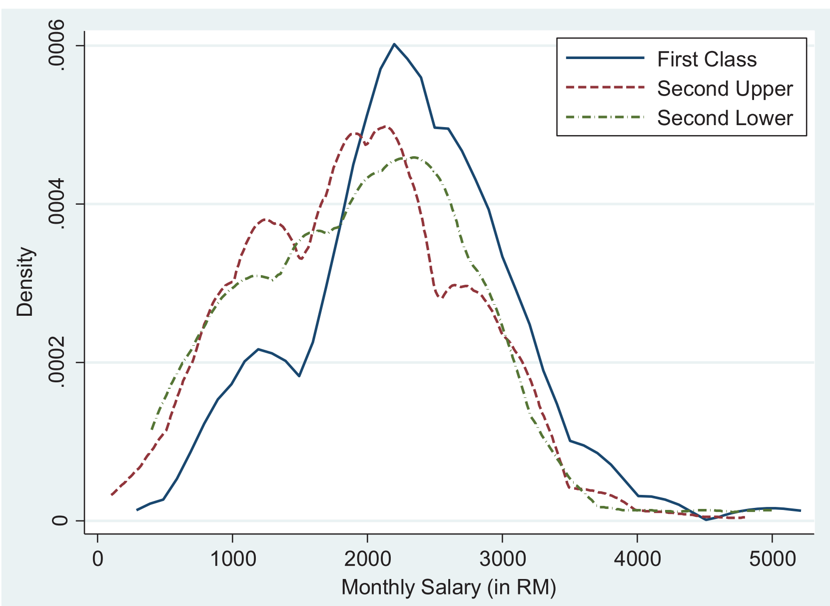

Figure 1. Probability density function of salary by CGPA classes.

Table 4. Quantile estimations of the effects of CGPA on salary quantiles.

DV: log(salary)	OLS	Quantiles				
	M5	Q10	Q25	Q50	Q75	Q90
CGPA scores	0.244***	0.395**	0.398***	0.129	0.149**	0.0825
	(0.0919)	(0.191)	(0.107)	(0.0836)	(0.0702)	(0.0914)
First Class	0.113*	0.231	0.183**	0.0980*	0.0619	0.00721
	(0.0677)	(0.146)	(0.0771)	(0.0526)	(0.0472)	(0.0634)
Second Upper	−0.00776	−0.118	−0.0832	−0.0207	0.0244	0.0860*
	(0.0564)	(0.131)	(0.0819)	(0.0538)	(0.0508)	(0.0515)
Second Lower	−0.133	−0.239	−0.206	−0.102	−0.0757	−0.168*
	(0.0840)	(0.194)	(0.148)	(0.0836)	(0.0748)	(0.0962)

Note: Standard errors in parentheses. Significant at *10%, **5%, and ***1% level. The sample size is 302 observations for the OLS and quantile estimations. The quantile model specification here in Table 4 follows the M5 model specification of Table 3.

conditional mean, while a quantile model analogously estimates the conditional quantiles. As shown in Table 4, the marginal effects of CGPA (scores or classes) on salary are very different when we look across the salary distribution quantiles. Reporting the OLS estimate of 0.244 would have overestimated the CGPA scores coefficient on salary for graduates with jobs at the uppermost end of the salary distribution. Focusing just on the coefficient magnitudes and disregarding statistical significance for a moment, higher CGPA scores have much smaller marginal effects on the salary for those with jobs at the topmost-end of the salary distribution (i.e. the top quantile, Q90). Quantile model estimations analyse the effect of CGPA at different points of the salary distribution, thus describing the entire conditional salary distribution in a parsimonious way.

The marginal effect of CGPA scores at the highest 0.9 quantile of salary distribution is statistically insignificant though. Compared to their counterparts with jobs at lower salary quantiles, an increase in CGPA scores has no statistically significant effect on the salary for graduates with jobs at the highest salary quantile. On the contrary, CGPA scores have a nontrivial statistically significant effect at the lower ends of the salary distribution. For example, a 1.0-unit increase in CGPA scores is associated with about 39% increase in salary for those with jobs at the two lowest salary quantiles (Q10 and Q25). At the upper end of the salary distribution, i.e. at the 0.75 quantile, a 1.0-unit increase in CGPA scores is associated with only about 15% increase in salary. CGPA scores, therefore, have larger effects on the salary for those with jobs at lower ends of the salary distribution. Had we just relied on OLS estimations of the conditional mean, we would be unable to capture the effects of the CGPA scores on different quantiles of the salary distribution.

CGPA scores are then substituted with a CGPA class dummy each. First-class degree holders with jobs at the lower quantile (Q25) have a salary of 18.3% higher than those without first-class degrees. The effect of having a first-class degree decreases as we move up the quantile (from Q25 to Q50). First-class degree holders with jobs at the 0.5 quantile have a salary of only 9.8% higher than those without first-class degrees. Substituting CGPA scores with a second-upper or a second-lower class dummy, these dummies display significant marginal effects (but only at the 10% significance level) at the top salary quantile (Q90).

What are the quantile estimates telling us? The marginal effects of the CGPA scores suggest having higher CGPA scores would be most beneficial if the graduates are working in jobs at the lower half of the salary distribution (Q50 or below). These jobs would likely be entry-level jobs for new university graduates. It makes sense that the magnitude of the CGPA effects decreases as we move up the salary distribution. This is because the upper quantiles of the salary distribution are often associated with jobs that require not only good academic achievement, but also work experience as well. This may explain why CGPA scores and the first-class dummy do not exhibit any statistically significant effects at the highest quantile (Q90).

In using quantile regression models, a caveat applies. Note that the quantile estimates show the effects on distributions, and not on individuals (Angrist and Pischke 2009). For example, if we find that CGPA scores increase the salary at the lower quantiles of the salary distribution, this does not imply that a freshly minted graduate with a job at the lower salary distribution would be able to shift to a job at higher quantiles if his or her CGPA score increases. The quantile estimates simply show that that those graduates with jobs at lower quantiles of the salary distribution would see an increase in their salaries with a unit increase in CGPA scores, but he or she is still ranked within that particular salary quantile. In other words, the salary increase is just within the quantile, not an upgrade to a higher quantile. This is also where the subtlety of a quantile estimate interpretation differs from that of interpreting a typical OLS estimate. In addition to the caveat mentioned, we are unable to use more refined versions of the quantile regression approach given the constraints of our dataset, e.g. the instrumental variable quantile regression (Chernozhukov and Hansen 2008), and the panel quantile regression (Koenker 2004).

Conclusion

This paper uses a 2016/2017 sample of 1107 freshly minted university graduates from a public and a private university in Malaysia. The emphasis of the paper is on the marginal effects of the variable of interest – academic performance, proxied by CGPA – (i) on the probability of employment upon graduation, (ii) on the salaries earned, and (iii) on different quantiles of the salary distribution. This paper contributes to the literature pool by examining the issues of graduate employment likelihood upon graduation and their salaries in the Malaysian institutional setting. We fill the literature gap by providing an empirical analysis of how academic performance affects new graduates in terms of where they are on the salary distribution; such analyses are typically overlooked in the literature.

The key findings of this paper are as follows: (i) An increase in CGPA scores is not associated with any statistically significant changes in employment likelihood. However, the probability of being employed for graduates with second-upper CGPA class is about 7–8 percentage points higher than those who are not second-upper class holders. (ii) A 1.0-unit increase in CGPA scores is associated with a nontrivial 24.4% increase in salary, on average. For first-class holders, they have a salary of about 11.3% higher than their non-first-class counterparts. (iii) The marginal effects of the CGPA scores suggest having higher CGPA scores would be most beneficial if the graduates are working in jobs at the lower half of the salary distribution. The effect of having a first-class degree decreases as we move up the quantiles of the salary distribution.

Our empirical findings show no strong evidence of academic achievement being a key determinant in whether or not a graduate secures a job upon graduation. Academic achievement aside, employers are looking at other hiring criteria such as good articulation of ideas, real-world exposure, good work ethics, and professional attitude. These criteria are inadequately captured by the existing CGPA formulation, which is entirely based on academic performance such as examination scores. The Malaysian Ministry of Education, however, is in the midst of fine-tuning an improved version of the CGPA, i.e. the iCGPA or integrated CGPA. The iCGPA is meant to be a more holistic way to evaluate and assess the graduates, in terms of ethics, soft skills, entrepreneurial skills, leadership, and critical thinking among others (Ministry of Education Malaysia 2015). In fact, as outlined in the Malaysian Education Blueprint 2015–2025, it is one of Malaysia's aspirations to produce holistic, entrepreneurial and balanced graduates. The recent Gap Year programme for Malaysian university students introduced in 2017 is another excellent way of producing more holistic graduates, i.e. by exposing them to the world beyond the ivory tower; students can take a year off their studies to immerse in volunteerism, travelling, or artistic pursuits. This way, it is hoped that they would graduate with a well-rounded outlook of the real world in general. Our results here have yet another policy implication, i.e. pertaining to the National Higher Education Fund Corporation loan. Since its inception in 1997, it has become the most popular education loan for the majority of Malaysian students pursuing their tertiary education at local public and private universities. Graduates with first-class honours are exempted from repaying the loan. This stipulated condition, to a certain extent, could inevitably steer students towards striving only for academic excellence and to the detriments of neglecting non-academic achievement. Since our findings show no strong statistical significance between academic achievement and employment, perhaps it is high time the Malaysian Ministry of Education tweaked the exemption conditions to emphasise non-academic achievements. Our results could inform policy debates on the over-emphasis of the academic achievement of the university curriculum.

Using quantile estimations on salary distribution as an extension to the typical OLS estimation on salary, we find that the effects of CGPA scores are not constant across the salary distribution. The quantile estimations show that CGPA scores have larger effects on the salary for graduates with jobs at the lower ends of the salary distribution. This is understandable since such jobs would most likely be typical entry-level jobs for new university graduates. Academic excellence in the form of high CGPA scores could only help up to a certain level, since jobs at higher salary quantiles would entail more than just academic excellence alone. More often than not, jobs at the upper echelons of the salary distribution would require professional qualification or special skill sets, for instance. From this aspect, educational policies can be tailored towards the inclusion of related professional qualification into the curriculum of the undergraduate programmes. For example, graduates in the Banking programme from Malaysian universities would also receive their Executive Banker Certificate, which is a professional qualification awarded by the Asian Institute of Chartered Bankers. The professional qualification would pave the way for the graduates towards being full-fledged chartered bankers. This idea of pairing professional qualifications with university programmes could be extended to other disciplines such as accounting, finance, sports science, and architecture, among others. University graduates, geared with professional qualifications, would thus be better equipped for jobs at higher quantiles of the salary distribution. Also, in line with the aspirations of the Malaysia Education Blueprint, graduates should acquire entrepreneurial skills to be proactive job creators rather than mere passive job seekers. Moreover, in today's fast-changing labour market, graduates could look into embracing the gig economy concept, thus moving away from conventional forms of employment.

Our findings provide further insights and complement the Malaysian Tracer Study, a large-scale comprehensive study conducted nationwide by the Ministry of Education on fresh university graduates (access to that dataset is strictly off-limit to the public). Policy-makers from the ministry could scrutinise our findings for better informed decision-making in outlining future education policies. Admittedly, one of the limitations of this study lies in the sample size; it would be ideal if the sample could be expanded to include recent graduates from more public and private universities. Another limitation is the cross-sectional nature of the dataset; a panel dataset following the graduates over a period of time would be the gold standard. To compensate for the study's limitations, we have rigorously checked for empirical issues such as endogeneity bias and sample-selection bias.

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