

# Unemployment Duration of Graduates of Universiti Utara Malaysia: The Impact of English Language Proficiency<sup>1</sup>

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**Abstract.** This study estimates the impact of English language proficiency on the probability of exit from unemployment. We find that English 1119 and STPM English have a favourable impact. This finding supports government's efforts in increasing English language proficiency at pre-university level. The high-risk group that is experiencing prolonged unemployment consists of those who do not have English 1119 at SPM level and STPM English, are female, non-Accounting degree holders, Malay, and with low CGPA attainment.

## 1. Introduction

Since the Asian financial crisis in 1997, the Malaysian economy has witnessed a continuous slowdown with increasing unemployment especially among local university graduates. Based on statistics released by the Malaysian Department of Manpower on 16 June 2002, 44,000 local graduates were reported to be unemployed. This continuous increase in local graduate unemployment not only reflects a waste in the nation's valuable resources, but also indicates poor returns to huge investments on the local university system by the government. Besides, unemployment has a harmful impact on the unemployed person as well, either financially or psychologically, for instance, loss of income, self-confidence and dignity. Furthermore, employers may use the 'long unemployment duration' as an indicator of low quality employability of applicants and may not short-list them for possible employment. This effect is often termed the stigma of unemployment duration.

Unemployment consists of two elements, i.e. the inflow into the pool of unemployment and the duration of stay in the pool of unemployment. The inflow into the pool of unemployment has increased due to the (i) increased number of local universities, and (ii) increased intake in the past decade. For example, the total number of graduates of Universiti Utara Malaysia (UUM) in the year 2002 was 5,104 compared to only 652 in the year 1992. Fresh graduates who enter the labour market every year may increase the unemployment rate. Nevertheless, if the duration of unemployment is short, this effect will not be significant. In fact, economists have always considered the unemployment incidence caused by new entrants into the labour market as unavoidable and as no cause for alarm. Consequentially,

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no government intervention is required. However, if the unemployment duration of our local graduates is longer than expected, it will contribute significantly to increasing unemployment rate. Indeed, among western economies, unemployment duration was found to play an important role in an increased rate of unemployment in the mid-1970s (Lofgren and Engstrom 1988). Layard *et al.* (1991) also found that a change in unemployment rate from the late 1970s to the 1980s was largely contributed by the change in unemployment duration. For Malaysia, although there are no statistics available to reveal the contribution of unemployment duration to increasing unemployment rate of local graduates, we believe that unemployment duration influences this increasing unemployment rate. Due to the economic slowdown, the job search period of local university graduates has increased significantly. As a result, the duration of unemployment has also increased and has contributed to the increasing unemployment rate among local graduates. Hence, unemployment duration is essential to understanding local graduate unemployment. Policies that are designed to reduce local graduate unemployment should not ignore the features of unemployment duration.

Poor proficiency in English has been identified as one of the main causes for failure of local graduates to compete in the job market. The issue of poor proficiency in the English language sparked heated debates which eventually led to a drastic change in the Malaysian education system. To improve English language proficiency, the government decided that from year 2003 onwards, and in stages, Mathematics and Science subjects in primary and secondary schools would be taught in English, instead of Malay (the National Language). Several universities are considering the use of English as the medium of instruction for certain courses. In UUM, the School of Accountancy is using English Language as a medium of instruction for the courses offered. All these changes are based on the assumption that poor English language proficiency is one of the main factors that contribute to an increase in local graduate unemployment. Nevertheless, to our knowledge, there is no specific quantitative measurement introduced to estimate the effects of English language proficiency on graduate unemployment.

The objective of this study is to investigate the determinants of UUM graduate unemployment duration using a proportional hazard model with a competing risks framework. In particular, the effect of English language proficiency on the probability of exit from unemployment (hazard rate) will be estimated after controlling for various demographic variables. The study will also investigate the duration dependence of unemployment (baseline hazard). It is hoped that the study will shed light on the field of unemployment literature in Malaysia by unveiling the determinants of local university graduate unemployment duration. The high-risk group experiencing prolonged unemployment duration can be identified as well. Such information should assist the authorities in formulating better strategies and policies to combat local graduate unemployment.

Literature on unemployment duration analysis has grown rapidly during the past few decades (for example Lancaster 1979; Nickell 1979; Atkinson *et al.* 1984). The majority of the studies used a hazard function model in their analysis. In fact, the hazard function model is the key analysis tool in the duration model. This is due to the unique feature of unemployment duration data, i.e. the censoring and time-varying explanatory variables that have hindered the use of the ordinary least squares model (Allison 1984). The hazard function model indicates that individual heterogeneity variables found to be significant are age, gender,

marital status, schooling, and previous working experience (Edin 1989; Bradley and Taylor 1991; Narendranathan and Stewart 1993; Lazaro *et al.* 2000). These findings suggest that controlling for individual heterogeneity is important when accessing the impact of other variables.

Bradley and Taylor (1991) also found that ability to mix, self-reliance and academic attainment are among the more important variables that influence unemployment duration of minimum-aged school leavers. Academic attainment is assumed to be used by employers as a screening tool to short-list their candidates for job interviews. Personal characteristics such as the ability to mix and self-reliance are important factors as well. Thus, it is not surprising that those with a good ability to mix, are self-reliant, and have good academic attainment, have a lower unemployment duration. To our knowledge, language proficiency has yet to be included in the hazard function model. Hence, this study aims to assess the impact of English language proficiency on the hazard rate.

This paper is organised into four sections. The background to the study constitutes the first section. Data and methodology are discussed in the second section. The third section of the paper presents the estimation and interpretation of results. The last section summarises the findings of the study.

## 2. Data and Methodology

### 2.1 Data

Data were collected using a questionnaire. A total of 3,000 sets of questionnaires were distributed (from 12 to 14 September 2002) to the graduates. Participation was on a voluntary basis. The targeted population was the 5,104 graduates that had attended the 15<sup>th</sup> convocation of UUM from 14 to 16 September 2002. The targeted sample size was 3,000 but the achieved sample size was 457 giving a return rate of 15.23 per cent.

The typical data requirement of duration analysis is a cohort of individuals who are followed and observed to a certain fixed point of time (event history data). Nevertheless, due to cost and time limitations, cross-section data were used in this study. The respondents were required to recall the date of their first entry into the labour market (after their final semester examinations) and their first job commencement date. The unemployment spell was measured in days and defined as the first unemployment spell that the graduate faced. The study did not investigate repeated unemployment spells. No time-varying variables were measured. The earliest unemployment spell began on 6 October 2001 with the censored period fixed at 14 September 2002. Therefore the unemployment duration considered in this study is less than 12 months. Thus, in this study, unemployment duration refers only to the short (1-5 months) and medium (6-11 months) terms. Long-term unemployment (12 months and more) is not addressed in this study due to data limitations.

### 2.2 Methodology

The assumption of a Weibull distribution on the baseline hazard (duration dependence), leads to a parametric estimation of the proportional hazard model. In fact, the Weibull is a popular specification among unemployment duration studies due to its mathematical simplicity. Nevertheless, it restricts hazard duration dependence which is either monotonically

increasing or decreasing. This assumption may be too restrictive (Arulampalam and Stewart 1995). In fact, Han and Hausman (1990) found that the Weibull restriction could be rejected using their data. Narendrana and Stewart (1993) also found that the Weibull did not provide for a satisfactory model for their British unemployment data. It is unfortunate that the economic theories do not really provide a guide on the shape of the baseline hazard. Thus, the parametric estimation of the proportional hazard model seems too restrictive in its assumption on the baseline hazard. Based on the spirit of ‘let the data speak for themselves’, Cox (1972) proposes a proportional hazard model that leaves the baseline hazard unspecified. This avoids the over-fitting problem of the parametric model. Nevertheless, it comes at a cost of having no precise estimate on the baseline hazard (duration dependence). Hence, a hypothesis test cannot be performed (Bennett 1999). Since this study does not intend to test or estimate precisely the baseline hazard, we used the Cox Proportional Hazard model that relaxes the parametric assumption on baseline hazard.

The majority of empirical studies on unemployment duration use the single risk model framework (see the survey by Lofgren and Engstrom (1988)). As Edin (1989) points out, this may lead to a “state aggregation bias”. The estimated coefficients will reflect the average effect of different exit states or channels (from unemployment) instead of the relevant one. The exit of unemployment may be through different states. For instance, the exit of unemployment can be through part-time work, or full-time work, or economic inactivity. Different exit states may be governed by different processes. As such, to aggregate them into one ‘state’ may distort the true picture of the unemployment duration process. Other studies, such as those by Moffitt (1985), Han and Hausman (1990) and Meyer (1990), use the competing risk model to avoid the bias of state aggregation. Boheim and Taylor (2000) demonstrate the benefit of differentiating the different exit states in their finding. Hence, in this study, we adopted the competing risk model, where the exit states will be specified as full-time employment commensurating with qualifications obtained, full-time employment not commensurating with qualifications obtained, part-time employment, self-employment, economic inactivity, full time studies, and following government programme for unemployed. We assumed that the occurrence of one event type (one exit state) removes the observation from the risk of the other event types (other exit states).

The Cox Proportional Hazard model can be specified as follows:

$$h_i(t) = h_0(t) \exp[x_i\beta] \quad i = 1, 2, \dots, n \tag{1.1}$$

where  $x_i$  = vector of explanatory variables  
 $\beta$  = vector of coefficient of explanatory variable  
 $h_0$  = baseline hazard

The partial maximum likelihood function can be specified as

$$L(\beta) = \prod_{j=1}^n \frac{\exp(x_j\beta)}{\sum_{i \in R_j} \exp(x_i\beta)}$$

To counter the problem of heteroscedasticity (that always exists in cross-section data), the Lin and Wei (1989) heteroscedasticity-robust estimation method was used.

The focus of this study will be on the impact of English language proficiency on probability of exit from unemployment after controlling for the effect of available covariates. Four dimensions were used to approximate English language proficiency.

First, the number of English language courses taken and the grade obtained during the undergraduate studies. This undergraduate English proficiency approximation score (UES) is calculated by using the following formula:

$$UES = \sum_1^j (1 XG_j) \tag{1.2}$$

where

- $j$  = number of English courses taken,
- $G$  = mark obtained

The mark obtained was calculated by the grade obtained, i.e. Grade F = 1, D = 2, D+ = 3, C = 4, C+ = 5, B- = 6, B = 7, B+ = 8, A- = 9, and A = 10. As such, the higher the UES, the higher the undergraduate English proficiency approximation. As the BC2012 (Public Speaking) is the only English course that trains students for confident use of English in public speaking, it may help during the job interview. Thus, a dummy variable was constructed to measure the effect of taking the BC2012 course. The dummy variable took the value of one if the graduates had taken the BC2012 course, and value of zero, if otherwise.

Second, pre-university English proficiency approximation by the score of additional English examinations taken during pre-university studies (Pre-UES), i.e. SPM English 1119, and STPM English, was calculated by the following formula:

$$Pre-UES = (SPM1119 \times GradeSPM1119) + (STPMEnglish \times GradeSTPMEnglish) \tag{1.3}$$

- where SPM1119 = 1 if SPM English 1119 is taken, zero otherwise
- STPMEnglish = 1 if STPM English is taken, zero otherwise

The GradeSPM1119 was calculated based on A1 = 9, A2 = 8, C3 = 7, C4 = 6, C5 = 5, C6 = 4, P7 = 3, P8 = 2 and F9 = 1. The GradeSTPMEnglish was calculated based on A = 7, B = 6, C = 5, D = 4, E = 3, R = 2, and F = 1. As such, it is similar to the UES in that the higher the Pre-UES, the higher the pre-university English proficiency approximation.

Third, the use of English language as the main communication language at home (Ingfst1) was measured by a dummy variable which was equal to 1 if yes, and to zero, if otherwise.

Fourth, the use of English language as the main communication language among friends (Ingfrd) was measured by a dummy variable which was equal to 1 if yes, and to zero, if otherwise.

### 3. Estimation and Interpretation

This section consists of two parts. The first part presents the descriptive analysis of the UUM graduates. The second part presents the estimated Cox Proportional Hazard model and various goodness-of-fit tests. Appendix A provides the abbreviation listed in this section.

**Table 1a:** Characteristics of respondents

Variable		%	
Gender:	Male	15.32	
	Female	84.68	
Ethnic group:	Malay	81.84	
	Chinese	13.13	
	Indian and others	<b>5.04</b>	
	Unemployed	27.13	
Employment status:	Full-Time comm with qual (FT1)	21.88	
	Full-Time not comm with qual (FT2)	21.88	
	Part-time	7.44	
	Self-employment	1.75	
	Economic inactivity	1.53	
	Full-time study	0.88	
	Follow Government Programme for unemployed	17.51	
	Programme (Degree):	<b>B. Business Administration (BBA)</b>	<b>25.44</b>
		B. Tourism Management (BTM)	2.88
		B. Management (Banking) (MgtB)	2.65
B. International Affairs Management (IAF)		1.55	
B. Social Work (SoW)		1.55	
B. Public Management (MgtP)		6.86	
B. Technology Management (MgtT)		0.66	
B. Management with Education (MgtE)		6.42	
<b>B. Accounting (Acct)</b>		<b>19.25</b>	
<b>B. Information Technology (BIT)</b>		<b>15.71</b>	
<b>B. Economics (BEc)</b>		<b>11.28</b>	
B. Human Resource Management (HRM)		3.54	
B. Development Management (MgtD)		1.99	
B. International Business Management (IBM)		0.22	
English as main Communication language at home (Ingfst1)	Yes	4.21	
	No	95.79	
English as main Communication language among friends (Ingfred)	Yes	10.20	
	No	89.80	
Public Speaking Course (BC2012)	Yes	47.53	
	No	54.47	

*Note:*

FT1 – full-time employment that commensurates with qualification; FT2 – full-time employment that does not commensurate with qualification; comm – commensurate; qual – qualification

*3.1. Descriptive Analysis*

Tables 1a and 1b present the respondent characteristics of this sample. From Table 1a, it is clear that some variables have extremely low observations on certain categories. For instance, the category Indian and others in the ethnic group variable has only 23 observations. For degree (programme), the category IBM has only one observation. As this low representation

**Table 1b:** Characteristics of respondents

Variable	Mean	Standard deviation	Coefficient of variation
Age	23.20	1.19	5.13
CGPA	2.90	0.29	10.00
UES	20.04	5.01	25.00
Pre-UES	1.94	2.82	145.36
Jobap	16.64	22.00	132.21

*Note:*

1. CGPA=Cumulative Grade Point Average; UES = Undergraduate English proficiency approximation score; Pre-UES = Pre-University English proficiency approximation score; Jobap=number of job applications sent.

**Table 2:** Summary statistics by degree

Degree	UES		Pre-UES		Ing Fst1		Ing fred		BC2012	
	Mean	StdD	Mean	StdD	No(%)	Yes(%)	No(%)	Yes(%)	No(%)	Yes(%)
<b>BBA</b>	<b>20.05</b>	<b>4.18</b>	<b>2.21</b>	<b>2.89</b>	<b>96.52</b>	<b>3.48</b>	<b>88.70</b>	<b>11.30</b>	<b>75.70</b>	<b>24.30</b>
<b>Acct</b>	<b>19.68</b>	<b>4.80</b>	<b>1.77</b>	<b>2.67</b>	<b>95.35</b>	<b>4.65</b>	<b>91.86</b>	<b>8.14</b>	<b>46.91</b>	<b>53.09</b>
<b>BIT</b>	<b>22.06</b>	<b>4.24</b>	<b>3.16</b>	<b>3.01</b>	<b>95.77</b>	<b>4.23</b>	<b>94.37</b>	<b>5.63</b>	<b>4.41</b>	<b>95.59</b>
<b>BEc</b>	<b>19.08</b>	<b>5.65</b>	<b>0.66</b>	<b>1.78</b>	<b>96.08</b>	<b>3.92</b>	<b>86.27</b>	<b>13.73</b>	<b>68.00</b>	<b>32.00</b>
BTM	21.23	5.56	1.54	2.96	92.31	7.69	100.00	0.00	53.85	46.15
MgtB	22.00	3.97	2.13	2.95	100.00	0.00	75.00	25.00	22.22	77.78
IAF	27.29	4.75	1.71	2.98	100.00	0.00	100.00	0.00	14.29	85.71
SoW	18.00	6.25	1.43	2.15	100.00	0.00	85.71	14.29	71.43	28.57
MgtP	17.57	5.45	0.93	2.69	96.77	3.23	93.55	6.45	75.00	25.00
MgtT	24.33	2.52	2.33	4.04	100.00	0.00	66.67	33.33	0.00	100.00
MgtE	17.48	5.37	1.84	2.84	92.86	7.14	89.29	10.71	60.00	40.00
HRM	21.15	3.69	2.54	3.36	100.00	0.00	87.50	12.50	69.23	30.77
MgtD	18.56	6.19	2.67	3.35	77.78	22.22	77.78	22.22	33.33	66.67
IBM	23.00	.	0.00	.	100.00	0.00	100.00	0.00	0.00	100.00

*Note:*

1. IngFst1 – English as main communication language at home; Ingfred – English as main communication language among friends; BC2012 – Public Speaking course
2. BBA – B.Business Administration; Acct – B.Accounting; BIT – B.Information Technology; BEc – B.Economics; BTM – B.Tourism Management; MgtB – B.Management (Banking); IAF – B.International Affairs Management; SoW – B.Social Work; MgtP – B.Public Management; MgtT – B.Technology Management; MgtE – B.Management with Education; HRM – B.Human Resource Management; MgtD – B.Development Management; IBM – B.International Business Management.

problem will influence the estimation of the Cox Proportional Hazard model, we combined the relevant categories to increase the number of observations.

From Table 1b, we found that the age variable, CGPA and UES have a low variation with a coefficient of variation (CV) of 5.13, 10, and 25 respectively. The Pre-UES has the largest variation with a CV of 145.36. The average number of job applications sent (jobap) was 16.64 with a standard deviation of 22.

**Table 3:** Unemployment and exit state by ethnic group and gender

	Total (%)	Ethnic group (%)				Gender (%)	
		Malay	Chinese	Indian	Others	Female	Male
Unemployed	27.13	28.88	18.33	8.33	36.36	27.65	24.29
Full-time comm with qual. (FT1)	21.88	18.72	43.33	25.00	9.09	19.90	32.86
Full-time not comm with qual. (FT2)	21.88	19.79	31.67	41.67	18.18	22.74	17.14
Part-time employment	7.44	8.29	3.33	0.00	9.09	7.24	8.57
Self-employment	1.75	1.60	0.00	8.33	9.09	1.55	2.86
Economic inactivity	1.53	1.34	1.67	0.00	9.09	1.81	0.00
Full-time study	0.88	1.07	0.00	0.00	0.00	0.26	4.29
Follow Government programme for unemployed	17.51	20.32	1.67	16.67	9.09	18.86	10.00
Number of observations	457	374	60	12	11	387	70

*Note:*

FT1 - full-time employment commensurating with qualification; FT2 - full-time employment not commensurating with qualification.

Table 2 presents the summary statistics of the four dimensions of English language proficiency and CGPA by programme (degree). The analysis will focus on the programme having more than 10 per cent of the total sample size (see Table 1a), i.e. BBA, Acct, BIT, and BEc. In terms of UES and Pre-UES, BIT graduates have the highest scores, and almost all of them (95.59 per cent) took BC2012 Public Speaking during their undergraduate studies in UUM. The BEc graduates have the lowest average scores on UES and Pre-UES, which is 19.08 and 0.66 respectively. Nevertheless, it is the BEc graduates who have the largest percentage (13.73 per cent) for using English as the main language of communication among friends. For BBA, Acct and BIT graduates, it was 11.3 per cent, 8.14 per cent, and 5.63 per cent respectively.

Table 3 presents the employment status of the sample. It shows clearly that 27.13 per cent of the sample were unemployed, 21.88 per cent were employed with full-time employment commensurating with their qualifications, and 21.88 per cent were employed with full-time employment commensurating with their qualifications. Categorised by ethnic group, Indians were found to have the lowest unemployed percentage, whereas the Chinese have the highest percentage of full-time employment commensurating with their qualifications. The Malays have the largest percentage for following government programme for unemployed (20.32 per cent). By gender, the striking finding was the substantial difference in full-time employment (commensurating with qualifications) between males and females. The percentage of males (32.86 per cent) on full-time employment was 50 per cent more than the females (19.9 per cent). This shows the heterogeneity of employment status by ethnic group and gender.

Table 4 presents employment status by degree. Again, the discussion focuses only on the degrees of BBA, Acct, BIT, and BEc. BIT is found to have the highest percentage of unemployed graduates while the Acct graduates have the lowest percentage of unemployed. In terms of full-time employment (commensurating with qualifications), BIT graduates have



**Table 4:** Unemployment and exit state (per cent) by degree

	Total		Degree						
	(%)	BBA Acct	BIT	BEc	SoW	MgtP	MgtT	MgtE	
Unemployed	27.13	<b>30</b>	<b>18</b>	<b>45</b>	<b>24</b>	14	26	33	17
Full-time comm with qual. (FT1)	21.88	<b>15</b>	<b>51</b>	<b>14</b>	<b>18</b>	14	3	33	28
Full-time not comm. with qual. (FT2)	21.88	<b>23</b>	<b>15</b>	<b>11</b>	<b>43</b>	43	19	33	17
Part-time employment	7.44	<b>9</b>	<b>5</b>	<b>8</b>	<b>6</b>	0	6	0	10
Self-employment	1.75	<b>2</b>	<b>2</b>	<b>1</b>	<b>0</b>	0	3	0	0
Economic inactivity	1.53	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	0	0	0	17
Full-time study	0.88	<b>1</b>	<b>0</b>	<b>0</b>	<b>4</b>	0	3	0	0
Follow Government Programme for unemployed	17.51	<b>21</b>	<b>9</b>	<b>17</b>	<b>6</b>	29	39	0	10
Number of observations	457	<b>115</b>	<b>87</b>	<b>71</b>	<b>51</b>	7	31	3	29

	Total		Degree				
	(%)	BTM	MgtB	IAF	HRM	MgtD	IBM
Unemployed	27.13	46	17	14	25	11	0
Full-time comm. with qual. (FT1)	21.88	15	17	0	13	22	0
Full-time not comm. with qual. (FT2)	21.88	23	17	71	13	33	0
Part-time employment	7.44	15	17	14	6	0	0
Self-employment	1.75	0	0	0	6	11	0
Economic inactivity	1.53	0	0	0	0	0	0
Full-time study	0.88	0	0	0	0	0	0
Follow Government Programme for unemployed	17.51	0	33	0	38	22	100
Number of observations	457	13	12	7	16	9	1

*Note:*

1. FT1 - full-time employment commensurating with qualification; FT2 - full-time employment not commensurating with qualification.
2. BBA - B.Business Administration; Acct - B.Accounting; BIT - B.Information Technology; BEc - B.Economics; BTM - B.Tourism Management; MgtB - B.Management(Banking); IAF - B.International Affairs Management; SoW - B.Social Work; MgtP - B.Public Management; MgtT - B.Technology Management; MgtE - B.Management with Education; HRM=B.Human Resources Management; MgtD - B.Development Management; IBM - B.International Business Management.

the lowest percentage. Only 14 per cent of BIT graduates successfully landed themselves jobs commensurating with their qualifications compared with 50 per cent for Acct graduates. In the case of BEc graduates, 18 per cent obtained full-time employment commensurating with their qualifications. This finding suggests that the Acct graduates are the least hit by unemployment, while BIT graduates are the worse hit group.

**Table 5:** Tests on Cox Proportional Hazard Model estimated

Type of test	ALL (SRM)	FT1 (Full-time emp. comm. with qual)	FT 2 (Full-time emp. not comm. with qual)	PTS (Part-time or self- employ.)	SI (Eco. inactivity, studies, Gov. prog.)
Schoenfeld Residuals Test on proportional hazards assumption	0.15	<b>0.55</b>	0.48	0.24	0.73
Link test on proportional hazards assumption	0.58	<b>0.21</b>	0.33	0.12	0.51
Martingale Residuals Plot to test on function form of covariate	Pass	<b>Pass</b>	Pass	Pass	Pass
LR goodness-of-fit test (Constraints all covariate equal to zero)	0.00	<b>0.00</b>	0.01	0.11	0.21

*Note:*

1. ALL – single risk model; FT1 – full-time employment commensurating with qualification; FT2 – full-time employment commensurating with qualification; PTS – part-time employment and self-employment; SI – economic inactivity, full-time study and following government programme for unemployed.
2. The figure shown represents  $p$ -value.
3. Pass – no evidence that the linear functional form is inadequate

### 3.2. Estimation

The Cox Proportional Hazard Model with competing risks was estimated. Due to the low number of observations for exit states of self-employment, economic inactivity and studying full-time, we combined the exit states. The exit state of self-employment was combined with part-time employment while the exit states of economic inactivity and full-time study were combined with the exit state of following government programme for the unemployed. This means we had four exit states from unemployment, i.e., full-time employment commensurating with qualifications (FT1), full-time employment not commensurating with qualifications (FT2), part-time employment and self-employment (PTS), economic inactivity and studying full-time and following government programme for the unemployed (SI). The aggregate of these four exit states was termed ALL, i.e. the single risk model (SRM). The focus of this estimation was on the exit state through full-time employment commensurating with qualifications (FT1). The other exit states mainly served as control for the aggregation bias. Thus the interpretation focused on the FT1. The competing risks model (CRM) estimated is presented in Table 6. Table 5 presents the results of goodness-of-fit tests on the estimated CRM.

The second row in Table 5 shows the results of the Schoenfeld Residuals Test on proportional hazards assumptions on the covariates included in the model. The test is based on the generalisation given by Grambsch and Therneau (1994). It is a global test that combines all the covariates in the model with the  $H_0$  being the proportional hazards assumption that does not violate, and  $H_1$  otherwise. It is found that this does not reject  $H_0$  at 10 per cent significance level for all competing risks and the single-risk model. In addition to the Schoenfeld Residuals Test, the link test was also used to test the proportional hazard assumption. The results (fourth row of Table 5) were found not to reject  $H_0$  at 10 per cent

**Table 6:** Cox Proportional Hazard estimation for problem of exit from unemployment duration (Hazard Ratio)

Variable	Single Risk Model (SRM)	Competing Risk Model (CRM)			
		FT1 (Full-time emp. comm. with qual.)	FT 2 (Full-time emp not comm. with qual.)	PTS (Part-time or self employ.)	SI (Eco. inactivity, studies, Gov prog.)
UES (University English Proficiency Score)	1.02 (0.29)	1.00 (0.98)	1.02 (0.46)	1.08* (0.07)	1.03 (0.25)
Pre-UES (Pre-Univ English Proficiency Score)	1.07** (0.02)	1.11* (0.09)	0.97 (0.59)	1.27*** (0.01)	1.06 (0.33)
BC2012 (BC2012 Public Speaking)	0.97 (0.83)	0.91 (0.70)	1.53 (0.12)	0.66 (0.41)	0.67 (0.24)
Ingfst1 (Family use English lang.)	0.97 (0.95)	0.68 (0.50)	1.88 (0.32)	0.17 (0.28)	1.18 (0.85)
IngFrd (Among friends use English lang.)	1.00 (0.99)	1.55 (0.29)	1.18 (0.70)	1.13 (0.87)	0.25* (0.07)
Dprog1 (Degree Info Technology)	0.74 (0.27)	1.86 (0.25)	0.26* (0.07)	1.84 (0.39)	0.62 (0.30)
Dprog2 (Degree Accounting)	2.52 (0.16)	5.95* (0.09*)	3.39 (0.33)	0.66 (0.82)	0.15 (0.21)
Gender (Female)	0.94 (0.75)	0.58** (0.05)	1.94 (0.17)	0.87 (0.79)	1.24 (0.63)
Part (Part- time previous work experience)	1.27* (0.08)	1.37 (0.18)	1.39 (0.20)	1.77 (0.11)	0.73 (0.24)
Intre (Interview preparation reading)	0.93 (0.68)	0.85 (0.58)	0.78 (0.46)	0.94 (0.90)	1.45 (0.37)
Ethn1 (Malay)	0.53*** (0.00)	0.20*** (0.00)	0.64 (0.20)	0.62 (0.55)	1.51 (0.45)
CGPA (Cumm. Grade Point Average)	1.65* (0.10)	2.36* (0.09)	1.36 (0.60)	0.35 (0.34)	2.18 (0.29)
Jobap (Number of job applications sent)	0.99 (0.13)	0.99 (0.26)	1.00 (0.48)	0.98 (0.22)	0.99 (0.30)
Ipg2UES (interactive bt Dprog2 and UES)	0.98 (0.59)	1.02 (0.74)	0.93 (0.20)	1.02 (0.80)	1.03 (0.61)
Ipg2pu (interactive bt Dprog2 and Pre-UES)	0.96 (0.36)	0.92 (0.27)	1.08 (0.41)	0.90 (0.60)	0.95 (0.74)
Ipg1pu <sup>1</sup> (interactive bt Dprog1 and Pre-UES)	0.94 (0.32)	0.84 (0.17)	1.00 (0.98)	0.80 (0.19)	1.01 (0.91)

*Note:*

1. ALL – single risk model; FT1 – full-time employment commensurating with qualification; FT2 – full-time employment commensurating with qualification; PTS – part-time employment and self-employment; SI – economic inactivity, full-time study and following government programme for unemployed.
2. Interactive between Dprog1 and UES drop due to collinearity
3. \*\*\*: Significant at 1 per cent level ; \*\*: Significant at 5 per cent level ; \*: Significant at 10 per cent level
4. The value shown in parenthesis is *p*-value. The entries in the table are the estimated hazard ratio, i.e. the exponential of the estimated coefficient.

**Table 7:** Likelihood ratio (LR) restriction test

	<i>p</i> -value
<b>Model: ALL (Single Risk Model)</b> UES=Dprog1=Gender=Bc2012=Ingfst1= Ingfrd=Intre=Ipg2UES=Ipg2pu=Ipg1pu=0	0.5737
<b>Model: FT1 (Full-time commensurating with qual.)</b> UES=Dprog1=Part=Bc2012=Ingfst1=Ingfrd= Intre=Ipg2UES=Ipg2pu=Ipg1pu=0	<b>0.5380</b>
<b>Model: FT2 (Full-time not commensurating with qual.)</b> UES=Pre-UES=Dprog2=Partt=Ingfst1=Ingfrd= Intre=ethn1=cgpa=Ipg2UES= Ipg2pu=Ipg1pu= jobap=0	0.2004
<b>Model: PTS (Part-time Job or Self-Employment)</b> Dprog1=Dprog2=Gender=Partt=Bc2012= Ingfst1=Ingfrd=Intre=ethn1 =cgpa=Ipg2UES= Ipg2pu=Ipg1pu=jobap=0	0.8584
<b>Model: SI (Studying or following Gov. Prog. or Eco. Inactivity)</b> UES=Pre-UES=Dprog1=Dprog2=Gender=Partt= Bc2012=Ingfst1=Intre= ethn1=cgpa=Ipg2UES= Ipg2pu=Ipg1pu=jobap=0	0.2146

*Note:*

Refer to Appendix A for explanation on the abbreviations used.

significance level for all models. Hence, the sample shows no evidence of violation of the proportional hazards assumption.

To ensure sufficiency of the linear function form used for the covariates in the CRM estimated, the Martingale residuals plot was used to test it. The residuals plot showed no evidence of insufficiency of the linear functional form of the covariates.

For the overall goodness-of-fit, the likelihood ratio (LR) test was used. The  $H_0$  constraints all covariate coefficients as being zero. Table 5 (fifth row) shows that the exit states of PTS and SI are not significant with a *p*-value of 0.11 and 0.21 respectively while the exit states of FT1 and FT2 are significant at 1 per cent level.

One should be cautioned that multicollinearity might mask the significance of individual covariates. As multicollinearity may cause the significant covariate to be found insignificant by the *t*-test, a restriction test was performed on the insignificant covariates (other than those that were significant at 1 per cent, 5 per cent, 10 per cent and close to 10 per cent significance levels (with a *p*-value of less than 0.15)) as shown in Table 6. As multicollinearity affects only the individual significance test, a restriction test based on joint tests should not be influenced by multicollinearity. Table 7 presents the results of the restriction test. The covariates were not found to be significant individually or jointly. Thus the influence of multicollinearity on *t*-test should be at its minimum.

Table 6 presents the estimated CRM and the first column shows the covariates included (refer to Appendix A for details on definition and measurement). The second column shows the aggregation of all exit states, i.e. the SRM (Single Risk Model). The SRM is estimated along with CRM (Competing Risks Model) to compare the aggregation bias. The third,

fourth, fifth, and last columns represent the CRM with exit state from unemployment through FT1, FT2, PTS and SI, respectively.

The third to seventh rows in Table 6 estimate the impact of English language proficiency on the probability of exit from unemployment. For the SRM (second column), we found that only Pre-UES has a significant impact on exit from unemployment. One unit increase in the Pre-UES score will increase the hazard (probability of exit from unemployment) by 7 per cent. For the CRM, one unit increase in the score of Pre-UES will contribute a 11 per cent increase in the probability of exit from unemployment, that is by getting full-time employment commensurating with qualifications, and a 27 per cent increase by getting part-time jobs or being self-employed. Comparing the SRM and CRM, it appears that aggregation bias does exist.

The UES is found to be significant in increasing the probability of unemployment through part-time or self-employment only. For other exit states, UES is not significant. Nevertheless, this should not be taken as evidence that university level English courses are not effective in helping graduates to compete in the labour market. The UES represents English courses that all students need to take (at least a minimum number of such courses). Hence, it is quite homogenous in terms of the number of English subjects taken and much of the variation is from the grade obtained. In fact, as shown in Table 1b, we found that the C.V. for UES is only 25 (for Pre-UES, it is 145.36). Further research is needed to confirm this insignificant finding.

In terms of probability of exit from unemployment by getting a job commensurating with qualifications (FT1), the Pre-UES is the only English language proficiency covariate that is found to be significant. Other covariates, UES, BC2012, the use of English language in family, and the use of English language among friends, are not significant. These results lend support to government policies that emphasise the usage of English language in the secondary school. In fact, extra efforts extended to taking English SPM1119 and STPM English yield good returns.

The BIT graduates have significantly lower probability of exit from unemployment through getting full-time employment not commensurating with qualifications (FT2). It is 74 per cent lower compared to other degree holders. For the other exit states, the BIT degree does not have significant effects. The Accounting degree has a significant positive impact on the probability of exit from unemployment through getting full-time employment commensurating with qualifications. On other exit states from unemployment, the Accounting degree does not have a significant effect.

In terms of other individual heterogeneity characteristics, it is found that females have a lower probability of exit from unemployment by getting full-time employment (commensurating with qualifications) than males. For females, the probability is 42 per cent lower. Malays were also found to be a high-risk group with regard to high unemployment duration. Malays (compared to non-Malays) have 80 per cent lower probability of exit from unemployment by getting full-time employment (commensurating with their qualifications). Academic attainment during undergraduate study increases the probability of exit from unemployment by getting full-time employment (commensurating with their qualifications). In fact, one unit increase in CGPA will increase the probability by 136 per cent. This significant impact may be due to the use of CGPA as a screening tool to short-list job interview candidates.

In essence, it is found that the effect of covariates on exit from unemployment is different by exit states. Focusing on the probability of exit from unemployment through full-time employment commensurating with qualifications, we found that higher scores of Pre-UES, being an accounting graduate, male and non-Malay, and a higher CGPA, have a favourable impact. The group with the highest risk of having high unemployment duration (i.e. low probability of exit from unemployment) consists of those who do not have SPM English 1119, STPM English, who are female, non-Accounting graduate, Malay, and with a lower CGPA score.

The baseline hazard is recovered to estimate time dependence of unemployment duration and the presence of unobserved heterogeneity. Baseline hazard can be used to check the presence of unobserved heterogeneity. As suggested by Allison (1984: 32)

...if one observes evidence for an increasing hazard rate, this can always be regarded as evidence that the hazard really increases with time.

Unobserved heterogeneity will cause faster exit of high hazard rate individuals from the unemployment duration compared to others. Hence, as time passes by, the unemployment pool will remain only with those with low hazard rate. We will observe a decreasing hazard rate over time due to unobserved heterogeneity. Appendix B presents the baseline hazard estimated for SRM and CRM by exit states. All baseline hazards display an increasing trend over time. Thus, we conclude that the sample shows no evidence on exit of unobserved heterogeneity. A similar conclusion is drawn by Edin(1989) in his study.

The baseline hazard estimated also represents the duration dependence of unemployment. Appendix B shows that over time, there is increased probability of exit from unemployment (hazard) with the exit state of PTS having the highest increasing rate. Hazard through FT1 displays a slower increase over time; but after being unemployed for around 350 days, the hazard increases drastically. For all exit states from unemployment, the highest hazard was found to be below 0.5. This shows that for some, unemployment duration may persist even after 352 days (after almost one year).

#### **4. Conclusion**

In conclusion, the study found that the impact of English language proficiency as related to the scores of SPM English 1119 and STPM English does affect the probability of exit from unemployment by getting full-time employment commensurating with qualifications. One unit increase in the Pre-UES will lead to a 11 per cent increase in the probability of exit from unemployment through full-time employment commensurating with qualifications. This supports government efforts in increasing English language proficiency at primary and secondary school levels (pre-university).

The insignificance of UES should not imply that the English courses taken by the undergraduate are not helpful. The number of taught English courses for all UUM students is almost similar. As such, we found a low variation in the UES. To compete in the tight labour market, extra effort is required and the Pre-UES that represents extra effort expended to learn the English language is found to be significant.

This study found that Bachelor of Accounting graduates have the highest probability of exit from unemployment through full-time employment commensurating with qualifications,

while Bachelor of Information Technology graduates have a lower probability of exit from unemployment through full-time employment commensurating with qualifications. This finding seems to suggest that the Accounting degree has the highest employability, with the Information Technology degree (BIT) having the lowest. Nevertheless, this may be due to the difference in industrial training (practicum) requirement between BIT and Accounting students. Before graduating, the BIT and Accounting students are required to have 4 and 2 months of industrial training respectively. The longer industrial training duration may deter BIT students from starting their job search as quickly as the Accounting students. Moreover as the censored date of this study was set at 14 September 2002, BIT graduates had less time to search for jobs compared to Accounting graduates.

In terms of individual heterogeneity, gender differences play an important role in determining the probability of exit from unemployment. Female graduates have a 42 per cent lower probability compared to males. Malays have 80 per cent lower probability of exit from unemployment compared to non-Malays. Overall, the high-risk group with a prolonged duration of unemployment is identified as those who do not have SPM English 1119 and STPM English, who are female, non-Accounting graduate, Malay, and with a low CGPA attainment. Thus given the limited resources, the study suggests that focus should be on this group in order to significantly reduce local university graduate unemployment.

Finally, it is noted that this study limited unemployment duration (less than 12 months) data. Thus, the unemployment duration analysed was limited to short-term and medium term only. As such, this study was not able to address the issue of long-term unemployment duration (defined as 12 months or longer) among graduates. It is suggested that future research should look at a longer time span to include long-term unemployment duration.

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### Appendix A: Definition and Measurement of Variables

Variable abbreviation	Definition	Measurement
Acct	Bachelor of Accounting	
ALL	Single Risk Model	
BBA	Bachelor of Business Administrative	
BC2012	Bc2012 Public Speaking course	Yes = 1 ; No = 0
Bec	Bachelor of Economics	
BIT	Bachelor of Information Technology	
CGPA	Cummulative Grade Point Average	
CRM	Competing Risks Model	
Dprog1-2	Dummy variable for degrees obtained	Dprog1 = 1 if BIT Dprog2 = 1 if Acct Dprog1 = Dprog2 = 0 if other than BIT/Acct
other		1 if Malay; 0 if non-Malay
Ethn1	Dummy variable for ethnicity	
FT1	Full-time employment commensurating with qualifications	
FT2	Full-time employment not commensurating with qualifications	
Gender	Dummy variable for gender	1 if female; 0 if otherwise
IngFrd	English as main communication language among friends	Yes = 1 ; No = 0
Ingfst1	English as main communication language at home	Yes = 1 ; No = 0
Intrc	Dummy variable for interview reading preparation	Yes = 1 ; No = 0
Ipg1pu	Interactive variable between Dprog2 and Pre-UEI	
Ipg1UES	Interactive variable between Dprog1 and UEI	
Ipg2pu	Interactive variable between Dprog2 and Pre-UEI	
Ipg2UES	Interactive variable between Dprog2 and UEI	
Jobap	Number of job applications sent	
Partt	Dummy variable for previous part-time work experience	Yes = 1 ; No = 0
Pre-UES	Pre-University English proficiency approximation score	
PTS	Part-time employment & self-employment	
SI	Economically inactive, full-time studies & following government programmes for unemployed	
SRM	Single Risk Model	
UES	Undergraduate English proficiency approximation score	

### Appendix B: Estimated Baseline Hazard





