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A Study on the Waiting Time for the First Employment of Arts Graduates in Sri Lanka

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***Abstract*—**Transition from tertiary level education to employment is one of the challenges that many fresh university graduates face after graduation. The transition period or the waiting time to obtain the first employment varies with the socio-economic factors and the general characteristics of a graduate. Compared to other fields of study, Arts graduates in Sri Lanka, have to wait a long time to find their first employment. The objective of this study is to identify the determinants of the transition from higher education to employment of these graduates using survival models. The study is based on a survey that was conducted in the year 2016 on a stratified random sample of Arts graduates from Sri Lankan universities who had graduated in 2012. Among the 469 responses, 36 (8%) waiting times were interval censored and 13 (3%) were right censored. Waiting time for the first employment varied between zero to 51 months. Initially, the log-rank and the Gehan-Wilcoxon tests were performed to identify the significant factors. Gender, ethnicity, GCE Advanced level English grade, civil status, university, class received, degree type, sector of first employment, type of first employment and the educational qualifications required for the first employment were significant at 10%. The Cox proportional hazards model was fitted to model the waiting time for first employment with these significant factors. All factors, except ethnicity and type of employment were significant at 5%. However, since the proportional hazard assumption was violated, the lognormal Accelerated failure time (AFT) model was fitted to model the waiting time for the first employment. The same factors were significant in the AFT model as in Cox proportional model.

***Keywords*—**AFT model, first employment, proportional hazard, survey design, waiting time

I. Introduction

TRANSITION from university to employment is one of the key problems that graduates face after completing their university education. Since there exists a gap between the supply and demand in the labor market, the graduates with higher competences are more likely to be absorbed into the labor market more quickly compared to others [5], [17]. Therefore, some graduates have to wait a considerable amount of time to obtain their first employment. Arts graduates in Sri Lanka are mostly affected since their degree is not job oriented. According to [6], the majority of Arts graduates are females from rural areas who have less educated parents who are self-employed. These graduates had dedicated three years of their valuable time expecting that they will be able to acquire proper employment soon after graduation. However, due to many internal and external factors, most of them will not be able to achieve their expectation as they desire. This situation discourages prospective students and it also a waste of money to the government. By considering this, society may formulate a hypothesis that a university education is a long, costly and hopeless investment. It is, therefore, the responsible of policy-makers to investigate this, so that the government and the education institutes can provide proper guidance about the job market at the beginning of their university education, to prepare students for it. To provide proper guidance, it is essential to study the factors associated with waiting time to obtain the first employment of graduates. Understanding this transition is vital to improve the efficiency of allocating resources in higher education. However, there is little systematic evidence about the waiting time for the first employment of Sri Lankan Arts graduates. This is due partially to the lack of adequate data and even the data that exist are not obtained via random sampling. This paper attempts to fill this gap. The main objective of this study is to identify the determinants of the transition from higher education to employment of Arts graduates. These determinants describe the socio-economic factors and the general characteristics of the graduates. Survival models will be used to find the association between the transition period and these internal factors. The rest of the paper is arranged as follows. Section II illustrates past studies on the transition period. Section III presents the data description, while Section IV provides the necessary theoretical framework for survival analysis. Section V presents the survival analysis and the empirical results. And finally, Section VI provides the discussion and conclusions of the analysis.

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II. Literature

As discussed in the introduction section, only a few pieces of evidence were about the transition period in Sri Lankan context. A survey was conducted in 2006 of 517 University of Colombo graduates who obtained their degrees in 2000 or 2001 [5]. The Complementary log-log model was fitted since the time durations to find the first employment were in years (discrete). Gender, ethnicity, the field of study and mothers' education qualification were the significant factors associated with the waiting time. According to their findings, females, graduate holding a demography or political science degree had longer unemployment duration compared to others. However, this study was limited to the graduates only from the University of Colombo, it is a sample of both Management and Arts graduates and also waiting time was in years, which only provide overall changes within a year.

There are a few studies conducted globally on waiting times in this context. Reference [2] discussed a study of the determinants of the transition from higher education to work across nine European countries. Initially, a Cox proportional hazards model was constructed. However due to assumption violations, a log normal regression with gamma heterogeneity was fitted; it confirmed that individual characteristics such as the field/level of studies, the socioeconomic background, and individual job search bear a significant relationship to the probability of finding a job. Hence, there is a gender difference in transition duration in favor of males, and younger graduates are at an advantage compared with mature ones. Additionally, parental education and the university degree are also factors which explain the transition.

A proportional hazards model was fitted to identify the determinants of time-to-first-job after leaving high school in the USA using data from the National Education Longitudinal Study 1988–2000 [8]. It was found that time to get the first job is correlated with educational attainment and type of school program attended, but the family background was insignificant. In reference [1], the waiting time for the first job of Italian graduates using non-parametric discrete time single risk models were considered. A large data set from a survey on job opportunities of 1998 Italian graduates was used to identify the determinant associated with waiting time to first employment. All these studies reveal that mostly the degree type, gender and age are the most significant factors that correlated with the transition period [1], [2], [12]-[15]. However, these studies have not discussed whether they had incorporated survey design into the study.

III. Data and Variable Description

A. Data Description

A survey was conducted in the year 2016 on a random sample of all Arts graduates from Sri Lankan universities who had graduated in 2012 to identify the changes in their employment over time. A stratified sampling scheme was used to obtain the sample from the target population where these 10 universities were chosen as the strata. In all 986 questionnaires were mailed. After many attempts, 469 graduates responded resulting in a response rate of 48%. The waiting time for first employment was calculated as the duration between effective date of the degree and the date of first employment. Thirteen (3%) of these times were right censored. These right censored data corresponds to unemployed graduates who were willing to be employed during the reference period. Also, 36 (8%) waiting times were interval censored, i.e. these graduates had not specified the first employment date, even though they were employed during the reference period. Furthermore, 16 (3%) of the graduates were employed even before they had completed their degree. These data and the interval censored data were not considered for this study. Hence, left truncated right censored data were analyzed using survival models.

B. Variables

The variables of interest, the variables descriptions and the categories are shown in Table I. It should be noted that all variables except the response are qualitative variables.

TABLE I
Variable Description

Variable	Description	Categories
University		**CMB**-University of Colombo **EUSL**-Eastern University **JFN**-University of Jaffna **KLN**-University of Kelaniya, **PDN**-University of Peradeniya **RHN**-University of Ruhuna, **RUSL**-Rajarata University **SEUSL**- South Eastern University **SJP**-Univ of SriJayawerdenapura, **SUSL**-Sabaragamuwa University
Gender	Gender	Male and Female
Ethnicity	Ethnicity	Sinhala, Tamil and Muslim
Arealived	Area lived by graduates for most of their life time	Urban, Semi urban and Rural
SchoolType	Type of School attended for GCE Advanced level	National School, Provincial school, Piriven, Private or Semi government
ParentsHE	Highest educational qualification achieved by either Mother or Father	Less than GCE Ordinary level, Passed GCE Ordinary level, Passed GCE Advanced level, Degree or equivalent, unknown
F_Sector	fathers' sector of employment	Private, Public, self-employed, semi government, others
CivilStatusFE	Civil status of graduates at the time of first employment	Single and married
GCEO/L	GCE Ordinary level English grade	A, B, C, S, W/F
GCEA/L	GCE Advanced level English grade	A, B, C, S, W/F, Absent
Class	Class received from the degree	First class ,second upper, second lower, General pass
Degree	Type of Degree	Special and General
TypeofEMp	Type of first employment	Full time permanent, full tie temporary, part time temporary
Sector	sector of first employment	Private, public, semi government, self-employed and university staff
Qualification	Required education qualification for employment.	Less Than or GCE Ordinary level, GCE Advanced level, Bachelor, postgraduate

IV. Theoretical Framework

To accomplish the intended objective, survival analysis techniques were chosen as the best method since the response variable, the waiting time for the first employment has censored observations and is a non-negative continuous variable that represents a time to an event [3], [7]. Due to the occurrence of the event, a state transition takes place. In this study, the interested state is the transition from unemployment to employment after graduation. This section contains a brief summary of the survival theory.

Let the survival function be:

$$S(t) = P(T > t) \tag{1}$$

where T is the time at which the event occurred and $0 < t < \infty$.

Let the hazard function be denoted by:

$$h(t) = \frac{f(t)}{S(t)} \tag{2}$$

where *f (t)* is the probability density function.

A. Non-Parametric Methods

Several survival distributions are available for modeling survival data. However, if no distributional assumptions are made then nonparametric methods may be used to estimate the survival function. The Kaplan-Meier estimator produces the survival function directly, from the data as:

$$\hat{S}(t) = \prod_{t_i \le t} \left(1 - \frac{d_i}{n_i}\right) \quad (3)$$

where n_i is the number of subjects at risk at time t_i and d_i is the number of individuals who fail at that time.

To compare two or more survival curves of two or more populations, Mantel-Haenszel/log-rank test or Gehan-Wilcoxon test can be used. The log-rank test statistic compares estimates of the hazard functions of the two groups at each observed event time. Then the statistic is based on the observed and expected number of events in one of the groups at each observed event time and then adding these to obtain an overall summary across all-time points where there is an event.

B. Semi-Parametric Methods

The Cox proportional hazards regression model [7] is a semi-parametric model that use hazard rate as a function of two components.

$$h(t) = h_0(t)\exp(X\beta) \quad (4)$$

where h_o is called as the baseline hazard, while β are coefficient parameters of covariates. The main assumption of the model is proportional hazards (PH). PH means that the hazard function of one individual is proportional to the hazard function of the other individual. To measure the model adequacy Schoenfeld residuals, Cox-Snell residual and the deviance residuals can be used.

C. Parametric Methods

AFT is an alternative to the PH model. In AFT models, the direct effect of the explanatory variables on the survival time is measured rather than the hazard.

$$\log T_i = \mu + \beta X + \sigma\varepsilon_i \quad (5)$$

where μ is the intercept, σ is scale parameter and ε_i is a random variable assumed to have a particular distribution. The AFT models are named for the distribution of T, rather than the distribution of ε_i. Hence, the best-fitted distribution of T should be identified to find the type of the AFT model. As specified under Cox, proportion model residual analysis can be done to check the adequacy of the model.

D. Model Selection

To measure of goodness-of -fit of a model, likelihood ratio test can be considered. However, the likelihood is increased with the increment of the number of parameters. Therefore, Akaike information criterion (AIC) can be used instead, which is defined as:

$$AIC = -2l + 2(k + c) \quad (6)$$

where l is the log-likelihood, k is the number of covariates in the model and c is the number of model-specific ancillary parameters.

V. Survival Analysis and Results

Survival and *Survey* packages in R were used to perform the analysis [9]-[11]. Since the data were collected using stratified random sampling, Survey package in R was used to incorporate the survey design into the analysis. Sample weights and the finite population correction were used to construct the design weights. All models were fitted with this survey design. However, since likelihood ratio test and AIC were not defined in the survey package, the survival package was used for model selection.

Initially, the non-parametric method was used to understand the relationship between the response variable and the explanatory variable to identify the significant variables to select for the parametric and semi-parametric model.

A. Non-Parametric Models

Kaplan Meier estimates were used to construct the survival function for the waiting time to the first employment. As shown in Fig. 1, there is a steep decline in the unemployment probability at the beginning but this rate of decrease reduces with time. Nearly after a year, 50% of the graduates were able to find an employment.

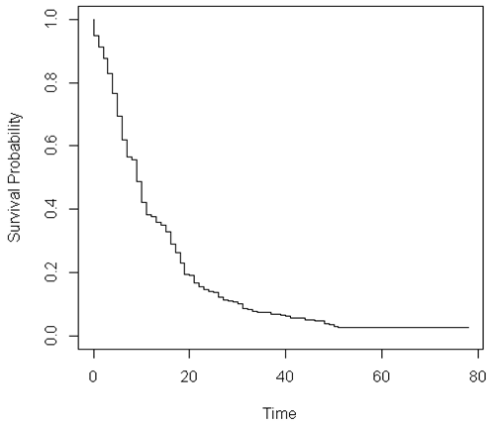

Fig. 1 Kaplan Meier Curve for the waiting time for the first employment

Kaplan Meier curves were drawn for all 15 explanatory variables. All the variables except Arealived, SchoolType, and F_Sector show a considerable difference between the survival curves. Only significant figures are included to discuss the association between the response variable and explanatory variables. Fig. 2 (a) depicts the curve estimation for gender while Fig 2 (b) represents curve estimation ethnicity. When considering the gender, the differences between the two curves are almost nonexistent at the beginning and the end. However, between four to 22 months after graduation, the unemployment rate of females has dropped faster than that of males. Fig 2 (b)

also shows an immense difference among the survival curves related to the ethnicity of graduates. Compared to Muslims, Tamil and Sinhala groups were able to find employment much faster. This difference is more prominent for Sinhala graduates.

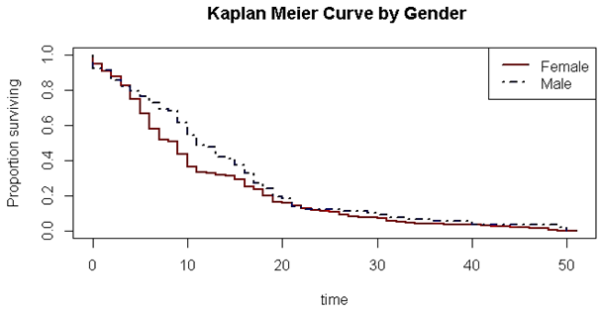

Fig. 2 (a) Kaplan Meier Curve for Gender

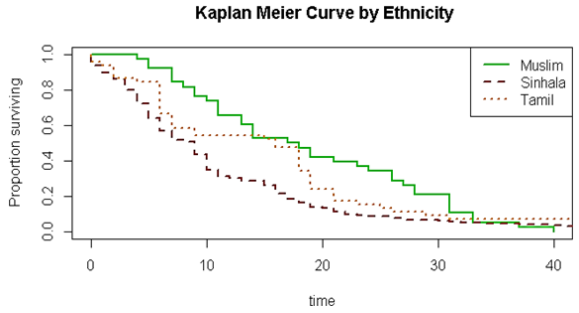

Fig. 2 (b) Kaplan Meier Curve for Ethnicity

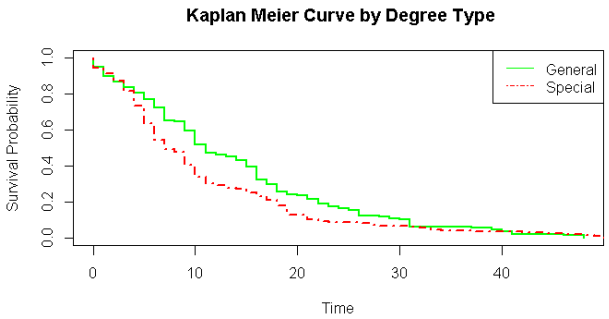

Fig. 3 (a) Kaplan Meier Curve for Degree type

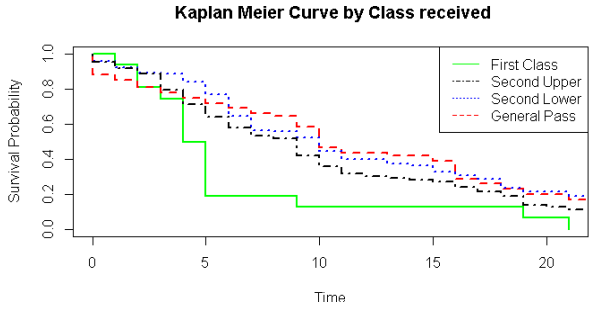

Fig. 3 (b) Kaplan Meier Curve for Class received

Figs. 3 (a) and (b) represent the Kaplan Meier curves for educational characteristics, degree type and the class received, respectively. There are two types of Arts degree in Sri Lanka, the general degree is a three year degree, while a special degree is a four year degree with a specialization in one subject area. It is clear that the special graduate's unemployment rate dropped faster than that of general graduates.

According to Fig. 3 (b), survival curves for the class that students have received are quite different. The first class graduates found employment much faster than the others, followed by the second uppers.

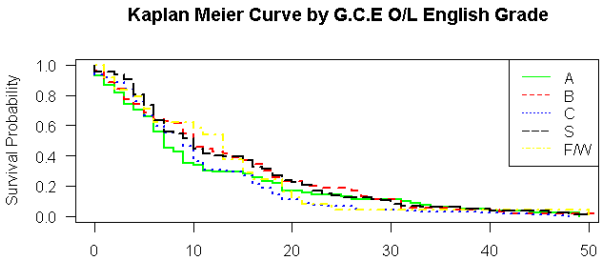

Fig. 4 (a) Kaplan Meier Curve for GCE O/L

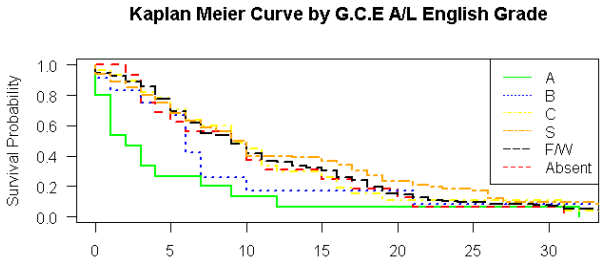

Fig. 4 (b) Kaplan Meier Curve for A/L English Grade

As depicted in Fig 4 (a), there is no clear distinguishing factor between survival curves for English grade in GCE ordinary level at the beginning. However, compared to others, grade A receivers seem to have found employment swiftly. Furthermore, when considering English grades for the advanced level is a clear distinction between curves (Fig 4 (b)). In general, compared to lower graders, those who received an A and B have found jobs quickly.

Civil status at the time of first employment was also considered. As shown in Fig. 5, married students had to wait longer to find an employment compared to those who were single.

Figs. 6 (a) and (b) depict a few characteristics about first employment. As shown in Fig. 6 (a), the majority of graduates who had found employment quickly had resorted to taking jobs that did not require their degree as a job requirement, also those that were not permanent (Fig. 6 (b)).

The Kaplan Meier curves for the sector of employment are shown in Fig. 7. As depicted in Fig. 7, it is clear that the graduates who desired to be employed in public sector waited a long time compared to others while those who joined the private sector secured their first employment quickly.

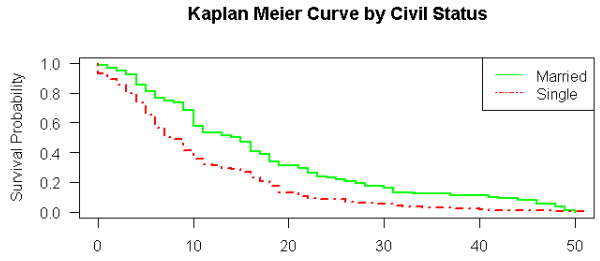

Fig. 5 Kaplan Meier Curve for Civil Status

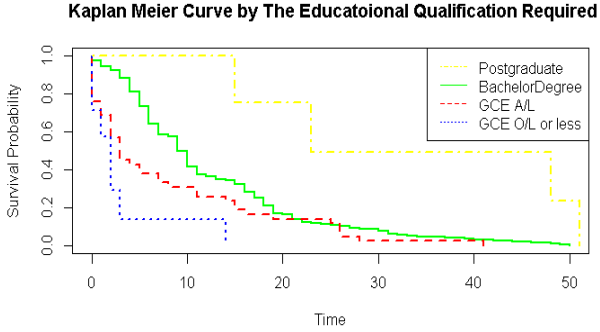

Fig. 6 (a) Kaplan Meier Curve for Educational Qualification Required

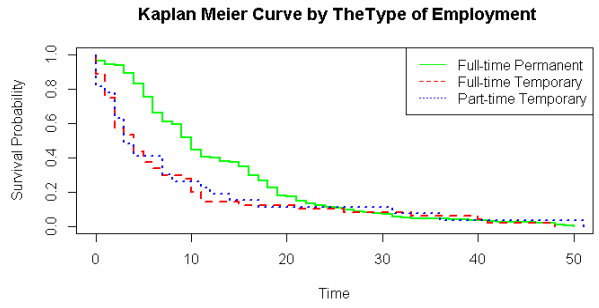

Fig. 6 (b) Kaplan Meier Curve for Type of Employment

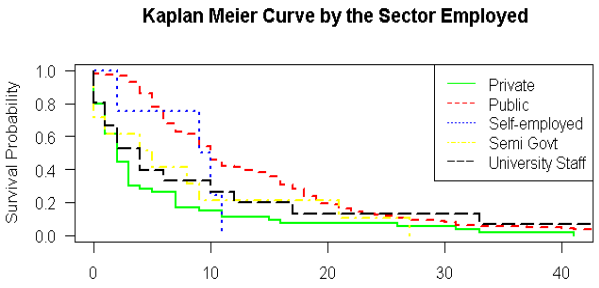

Fig. 7 Kaplan Meier Curve for the Sector of Employment

Next, the log-rank test and Gehan-Wilcoxon test was performed to find significant explanatory variables that were associated with the time to first employment. Both tests were conducted using svylogrank () function in R. Table II shows the value of these test statistics and the corresponding p values. The significant variables at 10% were selected for further analysis. Hence all variables except parents HE and GCEO/L were considered.

TABLE II
VARIABLE DESCRIPTION

Variables	Log-rank / Mantel-Haenszel test		Gehan-Wilcoxon test	
	Test Statistic	P value	Test Statistic	P value
University	56.26	7.0E-09*	122.57	4.0E-22*
Gender	3.00	0.083*	6.69	0.010*
Ethnicity	21.28	2.4E-05*	41.83	8.3E-10*
ParentsHE	6.02	0.198	4.96	0.291
CivilStatusFE	13.88	1.9E-04*	17.35	3.1E-05*
GCEO/L	3.45	0.485	3.42	0.490
GCEA/L	7.38	0.194	10.67	0.058*
Class	11.35	0.010*	13.02	0.005*
Degree	6.51	0.011*	10.20	0.001*
TypeofEMp	7.49	0.024*	24.38	5.1E-06*
Sector	31.64	2.3E-06*	46.37	2.1E-09*
Qualification	16.46	9.1E-04*	20.09	1.6E-04*

* Significant. At 10%

TABLE III
PH ASSUMPTION VALIDATION FOR COVARIATES

Covariates	Chisq	P	PH Assumption Holds?
GenderMale	15.4205	0.000	No
UniversityEUSL	4.0971	0.043	No
UniversityJFN	3.2939	0.070	Yes
UniversityKLN	45.0508	0.000	No
UniversityPDN	0.8657	0.352	Yes
UniversityRHN	6.1102	0.013	Yes
UniversityRUSL	0.5265	0.468	Yes
UniversitySEUSL	0.5702	0.450	Yes
UniversitySJP	8.3585	0.004	No
UniversitySUSL	4.0543	0.044	No
ALEnglishAbsent	12.8532	0.000	No
ALEnglishB	14.6397	0.000	No
ALEnglishC	33.0543	0.000	No
ALEnglishF/W	12.2805	0.000	No
ALEnglishS	11.6128	0.001	No
civilStatusAtFESingle	9.1105	0.003	No
ClassGeneral	0.6343	0.426	Yes
ClassSecondL	0.0679	0.794	Yes
ClassSecondU	10.4056	0.001	No
DegreeTypeSpecial	12.9833	0.000	No
QualificationGCEA/L	12.8652	0.000	No
QualificationGCEO/L	9.9914	0.002	No
QualificationPostgrad	0.4613	0.497	Yes
TypeofEMpFullTemporary	18.278	0.000	No
TypeofEMpPTemporary	10.6766	0.001	No
SectorPublic	48.1818	0.000	No
SectorSelf-employed	69.1135	0.000	No
SectorSemi Government	3.8198	0.051	Yes
SectorUniversity staff	8.5915	0.003	No
GLOBAL	242.0729	0.000	No

B. Cox PH Model

Cox PH model was fitted for the waiting time of first employment with the 10 variables selected using, log-rank test and Gehan-Wilcoxon test. Coxph function in the Survival package was used to fit the model. The final model was selected using stepAIC function in R to carry out the stepwise selection method. The model with the lowest AIC was selected as the best model. However, the survey design needed to be

incorporated into the model. Thus svycoxph function in Survey package was used with the variables in the best model since AIC is not computed in the Survey package. That is, Ethnicity and the type of employment were not selected in the best model. While Schoenfeld residuals were used to check the PH assumption, cox.zph function in R was used to check the PH assumption for each covariate. Table III shows the results of the test. As shown in Table III, most of the covariates are significant rejecting the PH assumption. Also, the overall test shown as GLOBAL, is also significant at 5%, implying that the PH assumption is not met. In addition, Schoenfeld residuals were plotted to check whether the covariates are independent of time. These plots also showed a non-random pattern against time which is evidence of a violation of the PH assumption (Fig. 8 shows Schoenfeld residuals for gender). Estimated values were not included since the PH assumption was violated. However, as a remedy stratification and adding a covariate*time interaction will not work here since most of the covariates violated the PH assumption. Hence, an AFT model was constructed to model the waiting time.

C.AFT Model

1. Identification of the Distribution

As mentioned in (5), the initial step of fitting an AFT model was to find the distribution of response variable in order to find the distribution of ε_i. Therefore, fitdistrplus Package in R [16] was used to find the best distribution since it allows for censored observations as well. Fitdistcens function in R uses maximum likelihood estimations. A summary of the findings are given in Table IV. Both the log likelihood and AIC values suggest the use of the lognormal distribution. Furthermore, the graphical methods (Fig. 9) and CDF plot (Fig. 10) provided justify the use of the lognormal distribution as well.

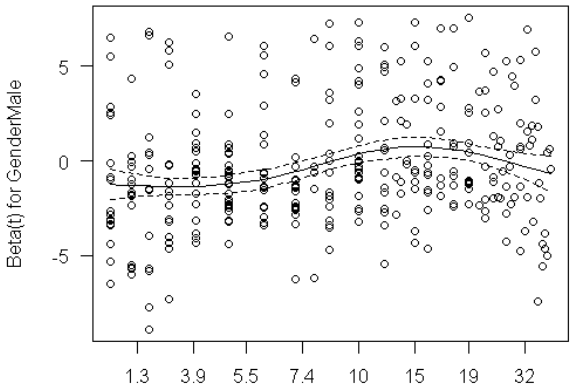

Fig. 8 Schoenfeld Residuals for Gender

TABLE IV
FITTED DISTRIBUTIONS

Distribution	Log likelihood	AIC
Lognormal	-1479	2961.1
Gamma	-1495	2994.8
Weibull	-1501	3006.4
Exponential	-1507	3015.7
logistics	-1628	3259.8

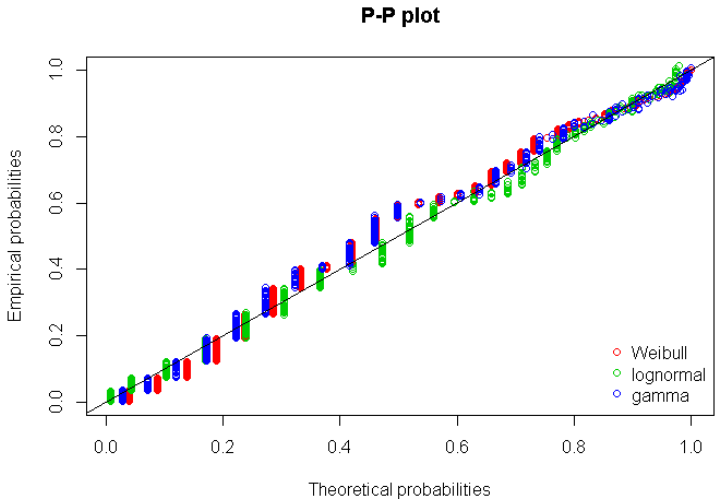

Fig. 9 P-P Plot for the Waiting Time for the First Employment

2. Model Estimations

As specified in [4], if T follows a log normal distribution ε_i follows a normal distribution. Using survreg function in the Survival package, a lognormal AFT model was constructed. The stepAIC function was used to obtain the final model by carrying out the stepwise selection method. The best model was chosen to have the lowest AIC. The same variables that were significant in the Cox proportional model were chosen in the AFT model as well. Next, in order to incorporate the survey design into the model, the svysurvreg function in Survey package was used only with the variables in the best model. These parameter estimates are shown in Table V. The p-values indicate that gender, GCE Advanced level English grade, civil status, university, the class received, degree type, sector of first employment and the educational qualification required for the first employment were associated with the

waiting time for the first employment.

TABLE V
ESTIMATED PARAMETERS IN THE FINAL LOG NORMAL AFT

Covariates	Value	Exp(vale)	Std. Error	z	p
(Intercept)	0.53	1.7	0.31	1.68	0.09
GenderMale	0.34	1.4	0.10	3.52	4.26E-04
ALEnglishAbsent	0.53	1.7	0.31	1.69	0.09
ALEnglishB	0.42	1.52	0.35	1.21	0.23
ALEnglishC	0.71	2.03	0.30	2.33	0.02
ALEnglishF/W	0.55	1.73	0.27	2.06	0.04
ALEnglishS	0.66	1.93	0.28	2.39	0.02
ClassGeneral	0.73	2.08	0.19	3.83	1.29E-04
ClassSecondL	0.63	1.88	0.16	4.07	4.61E-05
ClassSecondU	0.72	2.05	0.15	4.90	9.69E-07
DegreeTypeSpecial	-0.22	0.8	0.10	-2.09	0.037
QualificationGCEA/L	-0.12	0.89	0.20	-0.58	0.561
QualificationGCEO/L	-0.64	0.53	0.31	-2.07	0.039
QualificationPostgrad	0.91	2.48	0.52	1.73	0.084
SectorPublic	1.01	2.75	0.18	5.60	2.19E-08
SectorSelf-employed	0.55	1.73	0.37	1.47	0.142
SectorSemiGovt	0.37	1.45	0.46	0.80	0.422
SectorUniversityStaff	0.51	1.67	0.29	1.78	0.075
civilStatusAtFESingle	-0.21	0.81	0.10	-2.12	0.034
UniversityEUSL	-0.08	0.92	0.19	-0.41	0.679
UniversityJFN	-0.06	0.94	0.23	-0.25	0.805
UniversityKLN	-0.32	0.73	0.15	-2.10	0.035
UniversityPDN	-0.30	0.74	0.14	-2.10	0.036
UniversityRHN	-0.41	0.66	0.18	-2.35	0.019
UniversityRUSL	0.03	1.03	0.21	0.16	0.874
UniversitySEUSL	0.60	1.82	0.18	3.37	7.57E-04
UniversitySJP	-0.33	0.72	0.15	-2.25	0.025
UniversitySUSL	0.02	1.02	0.31	0.07	0.943
Log(scale)	-0.35	0.7	0.04	-8.10	5.31E-16

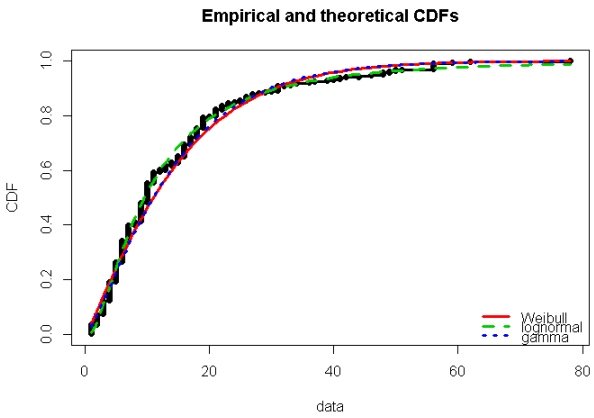

Fig. 10 Empirical and Theoretical CDFs for the Waiting Time for the First Employment

3. Model Adequacy

It is essential to check the adequacy of the fitted model. Cox-Snell residuals plot can be used as a graphical method to measure the overall fit of the model. It basically estimated the values for cumulative hazard function for a given time to an event. If the Cox-Snell residuals appear at approximately as a straight line with unity slope and zero intercept, then the fitted model is adequate. According to Fig. 11, the residuals appear approximately in a straight line with slight deviations at the beginning and the end. Hence, it can be concluded that the model fits well overall. Then the deviance residuals were plotted to discern potential outlier observations. Fig. 12 shows a few positive and negative outliers that have a Deviance residual of more than ±3. However, the residuals are distributed as random noise indicating the adequacy of the model.

4. Model Interpretation

According to estimations, the acceleration factor for males to female graduates is exp(0.34) =1.4. Therefore, the median waiting time for males is 1.4 times higher than that of females. Next, the accelerated factors for English grade received for GCE advanced level were compared. It was found that compared to A grade receivers, C graders have to wait 2.03 times, and S graders have to wait 1.93 times, while failed graduates have to wait 1.73 times longer. When comparing married graduates to those who are single, those with partners had to wait only 0.81 times to find their first job.

When considering the class received, it is clear that the general class, second lowers and second uppers have to wait 2.08, 1.88 and 2.05 times longer, respectively, than first class

holders to find their first employment. Further, it was noted that the accelerated factor for special graduates over general graduates is 0.8. Hence, the special degree graduates had found employment prior to general degree graduates. It is vital to distinguish the waiting time for first employment by the university. Only KLN, PDN, RHN, SJP and SEUSL coefficient were significant with respect to CMB. Median waiting times for all universities, except SEUSL, were lower than CMB. While median waiting time for SEUSL is 1.82 times that of CMB, it is 0.73, 0.74, 0.66 and 0.72 times for that of KLN, PDN, RHN and SJP, respectively.

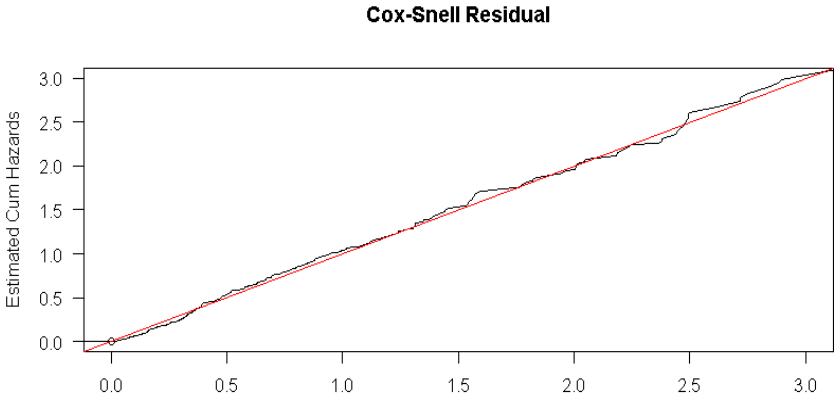

Fig. 11 Cox-Snell Residuals for final AFT model

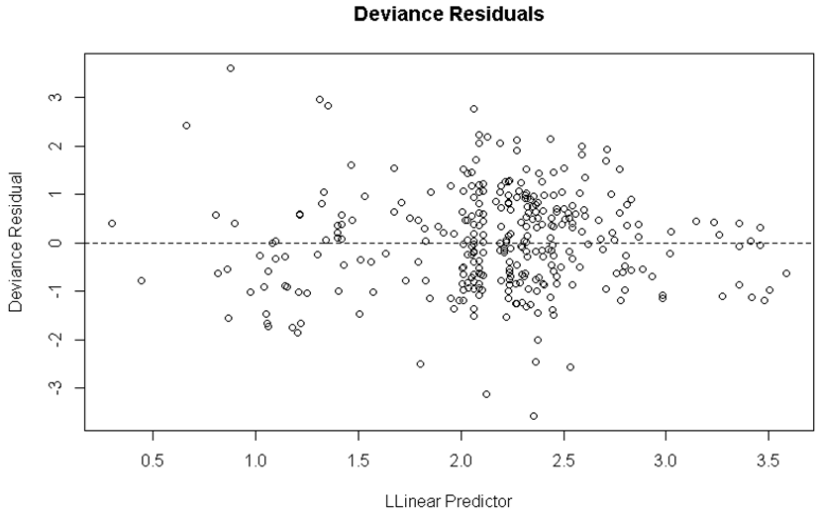

Fig. 12 Deviance Residuals for final AFT model

Next, the characteristics of the first employment were compared. Only the educational qualifications required and the sector of employment were significant in the model. The median waiting time for jobs that required only GCE ordinary level is 0.53 times that of job that requires a bachelor's degree. In contrast, the waiting time for a job that required postgraduate qualification is 2.48 times that of a bachelor degree. When considering the sector it was noted that compared to private sector employed graduates the median waiting time is higher for all other sectors. This is indicated by the accelerated factors for the public sector, self-employed and the university staff is 2.75, 1.73 and 1.67, respectively.

VI. Discussion and Conclusions

The main objective of this study was to identify prominent factors associated with the waiting time for the first employment. Since this referred to time to an occurrence of an event, survival analysis was carried out using three approaches. For the non-parametric approach, Kaplan Meier curve estimates and log rank tests were performed. It depicts the univariate analysis, specifying how each of the explanatory variables is related to the response variable solely. In all, 10 variables were significant at 10%. Then as a multivariate approach, Cox PH model was carried out. However since the PH assumption was violated, an AFT model was fitted to identify the prominent covariates. The main drawback in AFT is the consideration of the limited number of distributions.

However, lognormal AFT was the best-fitted model. Even though, Cox-Snell residuals indicate a somewhat of a good overall fit, there were some outlier observations. But, there were no common characteristics among them.

The main challenge faced was handling negative waiting time observations because usually, T is defined only for positive values. Therefore, only left truncated observations were considered ignoring these negative values. Also, it was noticed that due to no response for covariates some observations were removed. Additionally, interactions were also not considered due to the complexity and sparseness of the data. Despite all these considerations, gender, GCE Advanced level English grade, civil status, university, the class received, degree type, Sector of first employment, and the educational qualification required for the first employment were the significant factors associated with the waiting time for the first employment.

Compared to [5], in addition to gender and degree field, more variables were significant in this study. But ethnicity was not selected for the final AFT model in this study even though it was significant in the univariate non-parametric method. In contrast to this study, in [5], waiting time is higher for females than that of males. The percentage of males in this study was only 20%. Also, the majority of the males in this study had received general passes and second lowers. Furthermore, most of the males have obtained lower grades for GCE advanced level English as well. These might be a reason for the contrasting finding. All the other results relating to other explanatory variables tally with common social norms. That is, graduates with a good class, special degree, and having better English skills would be able to find a job sooner compared to others. Also if students are capable of acquiring proper private sector employment first then will be less of a burden to the government. Hence, the authorities could focus on enhancing the student's English literacy skills and thus conduct awareness workshops that provide knowledge about employment opportunities in the private sector and job market at the beginning of university life for all undergraduates. This could in turn bring about a change in attitudes among Arts graduates in general.

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