RETENTION OF ACADEMIA AT MAKERERE UNIVERSITY : A TIME-TO-EVENT ANALYSIS

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Abstract

The study investigated the dynamics of the service duration of academic staff at Makerere University basing on the administrative records of 1,486 academic staff at the university, recruited in the period 1987–2012. The period from the date of first appointment to the date of exit was adopted as a measure of the service duration at the university. A time-to-event approach in a Cox model was adopted in the analysis. The results, show that the median duration among academic staff who had left the university service by December 2012 (N = 213) is 4.56 years (range, 0.22–23.32). This figure points to a low retention of academia at the university. The rate of exit from the university service reduces significantly with higher academic ranks and increase in age at the time of recruitment. The findings point to a need to scale-up measures in retaining staff particularly those at lower levels.

Keywords: Retention, Academia, Makerere Univrsity, Time-to-event Analysis.

For any organization to thrive, retaining and maintaining staff is essential because they are considered a valuable asset to the organization (Harting, 2010; Tettey, 2010). Undesirable employee turnover is associated with both recruitment and fresher training costs; it also creates an additional burden on the existing staff. Thus, Harting's (2010) argument of inefficiency at work due to undesirable employee turnover is supported. In the literature, retention in academia has been attributed to a combination of factors comprising, although not limited to: (i) benefits (e.g., Giles, 2004; Metcalf, Rolfe, Stevens, & Weale, 2005; Muceke, Iravo, & Namusonge, 2012; Ssesanga & Garrett, 2005); (ii) socio-demographic characteristics of teaching staff (e.g., Luekens, Lyter, & Fox, 2004; Roessler, 2002); (iii) remuneration (e.g., Amutuhaire, 2011; Aswathappa, 2005; Giles, 2004; Kanamwangi, 2005; MUASA, 2003; Roessler, 2002; Tettey, 2010); and (iv) academic qualification and/or rank (Mamdan, 2007). Likewise, motivators such as recognition at work and symbolic rewards play a critical role in enhancing employee intentions to stay (Giles, 2004). Although all employees value money, these non-monetary rewards are a great motivator to ensure retention.

At Makerere University, attracting and retaining staff was listed as a major challenge in its 2008 annual report (Makerere University, 2008, 2009). Evidence from Ssesanga and Garrett (2005), Xiaoyang (2004), as well as Shicherman (2005) does not reveal otherwise with regards to job retention at the university; these studies reveal a setback in job retention among the teaching staff. This evidence does not augur well for the university's vision of being a leading institution for academic excellence and innovation in Africa. In other words, the university's excellence would largely depend upon the people it is able to enlist and retain in its academic units. Persistence of this situation is certain to affect the learning outcomes (NCHE, 2004).

Although related studies on the employee situation at Makerere University point to low job retention, particularly among teaching staff (e.g., Amutuhaire, 2011; Makerere University, 2008; Shicherman, 2005; Ssesanga & Garrett, 2005; Xiaoyang, 2004), these do not provide any statistics to support their allegations. These studies provide no assessment of the duration and pattern of service at the university. In addition, these studies are limited in scope and coverage. Certainly, this leaves a lot unanswered with regard to staff retention, particularly among academic staff at the university. This study provides an assessment of the duration, pattern, and rate of service of the academic staff. The investigations in this study cut across all the academic units at the university.

Data and Methods

The assessment is based on the administrative records of 1,486 academic staff at the university, recruited in the period 1987–2012. The data was extracted from the Integrated Tertiary System (ITS), an information system used by the university at the time of data compilation (December, 2012). In particular, the data was obtained from two main sub-systems of the ITS, namely the Human Resource Information System (HURIS) and the Financial Management Information System (FINIS). For the investigations, the period from the date of first appointment to the date of exit from the university service was adopted as a measure of service duration.

In light of the right-skewed nature of service duration, a time-to-event approach in a Cox-Proportional Hazard model was adopted in the investigation. The analysis was done in three stages: A descriptive summary of the duration and status of service at the university was made using summary statistics and frequency distributions, respectively. Furthermore, the probability of service to the university, which is the persistence function, is determined using the Kaplan-Meier (1958) estimator. Differentials in persistence of academic staff by their characteristics (academic rank, discipline area, marital status, academic qualification, gender,

and age) were investigated using the log-rank chi-square test (Mantel, 1966; Peto, 1972).

The Cox PH Regression was adopted to investigate the rate of exit from university service. The time-variant aspect of some variables in the investigation was addressed by splitting the duration of service whenever there was an exit (Cleves, Gould, Gutierrez, & Marchenko, 2010). However, only variables that yielded a small probability value (0.25 or less) in the analysis, which employed the log-rank test, were considered for further investigation in a multivariate Cox PH model (Hosmer, Lemeshow, & May, 2008).

Results

The academic staff examined were predominantly male (72.9%), recruited into science disciplines (65.3%), and married (61.2%). The highest proportion of the staff at recruitment was of assistant lecturers (36.9%), followed by lecturers (28.3%), senior lectures (12.6%), and teaching assistants (11.9%), while the rest were associate professors and professors. Regarding academic qualifications, slightly more than half (53.0%) had a master's degree at the time of recruitment; the rest had either a doctorate (28.4%) or a bachelor's degree (18.6%). The vast majority (85.7%) were recruited into the university service below the age of 40.

Duration of Service-In light of the skewed nature of the service duration, the assumed normality of the variable would be unrealistic. All the same, the variable does not span the entire real line. Thus, the variable was subjected to the Shapiro-Wilk non-normality test (Shapiro & Wilk, 1965). The normality assumption was violated in the assessment of the entire dataset (N = 1,486; p < 0.01) and the analysis based on academic staff who had left the university's service at the time of the study (N = 213; p < 0.01). The evidence certainly disqualifies the application of OLS following a linear regression to analyze such data, despite the fact that it can be used to deal with right-censoring – censored normal. In other words, the application of a time-to-event approach in the analysis is highly supported. To this end, Tables 1 and 2 present a descriptive summary of the duration and pattern of service, respectively. Of the 1,486 staff recruited during the period 1987–2012, a total of 213 had left the service by the time of the study, representing a 14.3% attrition rate. According to Table 2, the one-year attrition rate of the university staff is 3% (N = 44); the two-year and three-year rates are 4.6% (N = 68) and 5.5% (N = 81), respectively. Based on the total number of academic staff who had left the university by the time of the study (N = 213), the median duration of service is 4.56 years (range, 0.22–23.32). The findings point to a low retention of academia at the university.

Rate of Exit from the University Service-As stated earlier, the rate of exit from the university was modeled in a multivariate analysis using a Cox-PH regression. Although the variables discipline area, marital status, and gender yielded large probability values during the log-rank test (p > 0.25), these variables were incorporated in the analysis at the

multivariate stage because of their relative importance in the literature. Table 3 represents an assessment of the rate of exit from university service based on the Cox PH regression.

Regression Diagnostics-Three diagnostic tests were run. First, the proportionality assumption of the hazards using the Schoenfeld and scaled Schoenfeld residuals and log-log plots were satisfied; the parallel line of the log-log plots suggested that the variables did not violate the proportionality assumption of the Cox model. Second, the specification errors of the link function (log hazard) indicate that the log-hazard function was well-specified, as predicted by the hat statistic (_hat: p < 0.05). The hat-square statistic (_hatsq) reveals that no additional variables were significant (p > 0.05), as shown in Table 4. Third, the goodness of fit was evaluated using the Cox-Snell residuals. According to Figure 1, the cumulative hazard function closely followed the 45° line. Thus, the final model fitted the data relatively well.

Summary of the Findings-The results presented in Table 2 indicate that rank, academic qualification and age were significantly associated with the duration of service (p < 0.05). These findings are summarized below:

The rate of exit from university service reduces with higher academic ranks at the time of recruitment. This rate was the highest among academic staff at the rank of teaching assistant (HR = 17.2) and lowest among the lecturers (HR = 1.7), as compared to staff at the rank of associate professor and above.; Academic staff with a bachelor's degree at the time of recruitment had a 32% reduced rate of exit from university service compared to those with a doctorate (HR = 0.67).; The rate of exit from university service reduces with an increase in age at the time recruitment. The rate was the highest among academic staff below the age of 29 (HR = 11.9) and lowest in the category 33–39 (HR = 1.6), as compared to those above 40 years of age.

Conversely, gender, marital status, and discipline area did not vary significantly by duration of service (p > 0.05). In other words, the duration of service of academic staff at the university did not vary significantly by these variables.

Discussion and Conclusions

The overall turnover rate of academic staff (14.0%) in the results points to a low retention of academia at the university. The figure presented for the one-year turnover rate of staff at the university (3%) does not show otherwise. However, the one-year turnover rate of staff at the university compares favorably with estimates reported among selected universities in the developed countries. Harrigan (1999) reports the following one-year turnover rates among universities in the United States of American in 1996: 4.9% at Cornell University, 4% at University of Iowa, 5.4% at University of Minnesota, 5.5% at Ohio State University, and 5.9% at University of Wisconsin-Madison. In the United Kingdom, Metcalf, Rolfe, Stevens, and Weale (2005) report an annual turnover ranging between 2.8 and 5.3 percent. An assessment of the duration of service for academic staff who had left the university by the time of the study (N= 213) does not reveal otherwise with regards to job retention at the

university. In the results, the median duration of service is 4.56 years (range, 0.22–23.32). The situation is made worse by the academic staff shortfall of 41% reported in the university's Strategic Plan 2000/01–2004/5 (Makerere University, 2009). Recent evidence published by The Independent presents a staff deficit of 49% according to findings by the office of the auditor general (Asinja, 2012). In affirming the magnitude of staffing problems at Makerere University, Tettey (2006, 2010) reports deficits of 54%, 57%, 62%, and 62% in the School of Public Health, Medical School, East African School of Library and Information Science, and Institute of Psychology, respectively. These deficits demonstrate a large gap in the university's human resource capacity and consequently point to a low ability of the existing academic staff to carry out research and teaching responsibilities (Tettey, 2010). In light of the staffing capacity deficit in the university's academic units, Mugimu et al.'s (2009) argument of a heavy teaching and supervisory workload for teaching staff at the university is highly supported. In other words, academic staff growth has not matched student enrollment growth at the university (Tettey, 2010). Likewise, many African Universities have experienced a significant growth in student enrollment over the past decade (Tettey, 2010). Certainly, it would not be a surprise to find that the academic staff in these institutions are facing a heavy teaching and supervisory workload as well. Nevertheless, Wamala and Ssembatya (2013) are justified in attributing the low scholarly productivity of academia in Uganda to the heavy teaching and supervisory workload. A similar explanation is likely to hold for the low scholarly productivity of academia in many other African institutions of higher learning.

In the multivariate assessment, the rate of exit from the university service was significantly higher for staff with lower academic ranks and ages at the time of recruitment. The lower academic ranks of exiting staff points to an undesirable withdrawal of these individuals from university service. From the short duration of service (4.56 years) estimated in the results, it is clear that a large number of staff exiting from the university are young academic staff. These findings are in line with Amutuhaire's (2011) study that suggested a reduced rate of leaving university service among academic staff with higher ranks. The fact that salary scales are based on one's academic rank lends credence to the argument of poor remuneration being a key factor for staff turnover at the university (e.g., Tettey, 2008; Mugimu, Nakabugo, & Katunguka, 2007). The situation with regards to remuneration and/or welfare is likely to be much worse for staff at the lower ranks. It is no surprise that the results of this study reveal higher rates of exit from the university among academic staff at the lower ranks and those younger in age at the time of recruitment.

With regards to gender, the results of this study revealed no significant variations in the rate of exit from the university's service ($p > 0.05$). A related assessment of intentions to stay in service among academic staff at Makerere University

(Amutuhaire, 2011) supports these findings; no significant difference in intentions to continue lecturing between male and female academic staff at the university. However, the findings run counter to the evidence provided by Luekens et al. (2004), Boyd et al. (2002), and Ingersoll (2001) that identified gender as a predictor of time spent in teaching service. These studies reveal a higher likelihood of staying in service for the males compared to the females. With regards to age, the consensus is that the rate of exit from service increases with age (e.g., Hanushek, Kain & Rivkin, 2004; Ingersoll, 2001). The assessment by Murnane et al. (1991) regarding gender and age revealed that female teachers over the age of 30 were more likely to stay than the younger teachers of either gender.

In summary, the findings of this study point to a need to step-up measures to retain academic staff at the lower levels. This is because academic staff at the lower ranks constitutes a pool from which the future generation of academics will be drawn. In other words, retaining staff at the lower ranks is important for the university in achieving its goal of becoming a leading institution for academic excellence and innovation.

Table 1 - Descriptive Summary of the Duration of Service (Years)

N	Min	Max	Median	Std. Err	95% CI (Median)	
					Lower	Upper
213	0.22	23.32	4.56	0.75	3.61	6.66

Note: Summary statistics are based on staff who had left the university for reasons other than retirement or death

Table 2 - Pattern of Persistence of Academic Staff

Interval (Years)		Total [a]	Leaving [b]	Censored [c]	Persistence Function	Std. Error
0	1	1,486	44	103	0.9693	0.0046
1	2	1,339	24	68	0.9515	0.0057
2	3	1,247	13	89	0.9412	0.0063
3	4	1,145	13	83	0.9301	0.0070
4	5	1,049	15	139	0.9159	0.0078
5	6	895	8	58	0.9074	0.0083
6	7	829	5	134	0.9015	0.0086
7	8	690	11	54	0.8865	0.0096
8	9	625	9	51	0.8732	0.0104
9	10	565	6	25	0.8637	0.0110
10	11	534	7	51	0.8518	0.0117
11	12	476	10	38	0.8332	0.0129
12	13	428	4	49	0.8249	0.0134
13	14	375	7	46	0.8085	0.0145
14	15	322	9	16	0.7854	0.0160
15	16	297	7	11	0.7665	0.0171
16	17	279	4	36	0.7547	0.0178
17	18	239	7	42	0.7305	0.0195
18	19	190	4	25	0.7140	0.0207
19	20	161	2	33	0.7042	0.0216
20	21	126	1	30	0.6978	0.0223
21	22	95	1	29	0.6892	0.0236
22	23	65	1	21	0.6765	0.0264
23	24	43	1	17	0.6569	0.0321
24	25	25	0	13	0.6569	0.0321
25	26	12	0	12	0.6569	0.0321

[a] Denotes academic staff recruited in the period 1987–2012
[b] Denotes academic staff leaving university service for reasons other than retirement or death
[c] Denotes existing academic staff at the university

Table 3 - Rate of Exit from University Service

Staff Characteristics	β	HR(95% CI) [a]	Std. Err	p-value
Rank				
Associate Professor and above[†]	.	1	.	.
Senior Lecturer	0.644	1.903 (1.102-3.286)	0.530	0.021
Lecturer	0.548	1.729 (1.012-2.956)	0.473	0.045
Assistant Lecturer	1.234	3.435 (1.769-6.670)	1.163	0.000
Teaching Assistant	2.847	17.229 (7.005-42.375)	7.911	0.000
Discipline				
Sciences[†]	.	1	.	.
Arts	-0.208	0.812 (0.588-1.121)	0.134	0.206
Gender				
Male[†]	.	1	.	.
Female	0.012	1.012 (0.712-1.438)	0.181	0.947
Marital Status				
Married[†]	.	1	.	.
Not Married	-0.235	0.791 (0.553-1.130)	0.144	0.198
Academic Qualification				
Doctor of Philosophy[†]	.	1	.	.
Masters	-0.184	0.832 (0.560-1.235)	0.168	0.361
Bachelors	-0.390	0.677 (0.310-1.478)	0.270	0.032
Age				
40 Years and above[†]	.	1	.	.
33–39 Years	0.492	1.635 (1.010-2.647)	0.402	0.046
29–32 Years	0.836	2.308 (1.378-3.866)	0.609	0.001
Below 29 Years	2.480	11.941 (7.233-19.172)	0.054	0.000

Note: Likelihood Ratio (LR) chi-square = 140.18, p < 0.001, N = 1,443

[†] Reference category

[a] HR (95% CI) represents hazard ratio and corresponding Confidence Interval

Table 4 - Specification Errors of Link Function

Log Hazard Function	Coefficient	Std. Err	P-value
_hat [a]	1.4861	0.4002	0.000
_hatsq [b]	–0.1316	0.1055	0.212

Note: Specification errors of Cox PH model in Table 2.
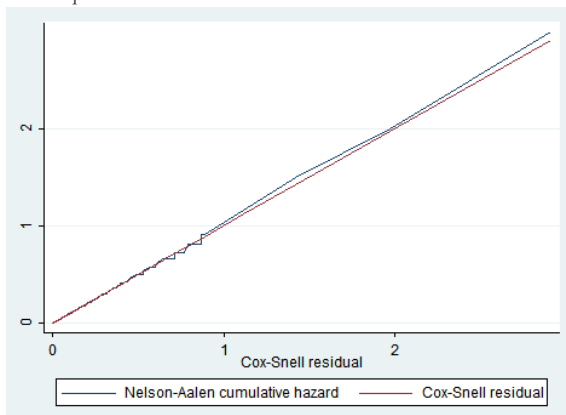[a] Hat Statistic
[b] Hat-square Statistic

Figure 1: Goodness of Fit of Cox PH Model in Table 3

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