MODELING THE DETERMINANTS OF INTERNSHIP-TO-JOB RETENTION AMONG SECOND-YEAR STUDENTS AT MAKERERE UNIVERSITY: A BINARY LOGISTIC REGRESSION APPROACH

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DECLARATION

I **Julie Patience Naziri** declare that this research study is my original work and has not been published anywhere or submitted to any University/Institution of higher learning for award of any academic qualification by anyone. It's now being presented as a partial fulfilment requirement of the award of Bachelor of Statistics, Makerere University, Kampala.

Signature:..... **Date:** 14th Aug 2025

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APPROVAL

This dissertation has been fully done and submitted by **Julie Patience Naziri** for examination with my approval.

..... **Date:** 14th AUG 2025

Ambrose Serunjogi

University Supervisor

DEDICATION

I dedicate this research work first to the Almighty God, whose grace and providence enabled me to complete this journey in good time. I also dedicate this report, with profound honor and respect, to my beloved parents, Mrs. Lydia Namuleme and Mr. Fred Semuwemba. Their selfless financial, spiritual, and emotional support has been the cornerstone of my academic success.

I extend my deepest gratitude to my supervisor, Mr. Ambrose Serunjogi. His tireless dedication, patient guidance, and constant encouragement have been invaluable; he is truly the kind of mentor every student hopes to encounter. Finally, my sincere thanks go to my colleagues and classmates at Makerere University for their academic fellowship and support. May the Almighty God bless you all abundantly.

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ACRONYMS AND ABBREVIATION

Acronym/Abbreviation	Full Description
AIC	Akaike Information Criterion
AUC	Area Under the Curve
BQE	Bachelor of Science in Quantitative Economics
BSTAT	Bachelor of Statistics
CGPA	Cumulative Grade Point Average
CI	Confidence Interval
GLM	Generalized Linear Model
H-L	Hosmer-Lemeshow Test
LR	Likelihood Ratio
MAK	Makerere University
NGO	Non-Governmental Organization
OR	Odds Ratio
ROC	Receiver Operating Characteristic

Acronym/Abbreviation	Full Description
SME	Small and Medium-sized Enterprise
SSP	School of Statistics and Planning
UBOS	Uganda Bureau of Statistics
VIF	Variance Inflation Factor

ABSTRACT

The transition from academic internships to permanent employment represents a critical milestone in the school-to-work transition for statistics and economics students. This study aimed to model the determinants of internship-to-job retention among second-year students at the School of Statistics and Planning (SSP), Makerere University. Utilizing a cross-sectional research design, primary data was collected from a sample of 240 respondents using structured questionnaires. The study employed univariate, bivariate (Pearson's Chi-square), and multivariate (Binary Logistic Regression) analysis techniques to identify significant predictors of retention.

The results revealed a retention rate of 30.4% among the sampled students. Bivariate analysis indicated that while academic performance (CGPA) and supervision quality showed associations with retention, they were not statistically significant at the 5% level. However, the Binary Logistic Regression model, which demonstrated high predictive accuracy (AUC = 0.8126), identified several key significant determinants. Age was found to have a positive influence on retention (OR = 1.135, p = 0.032), suggesting that maturity is highly valued by employers. In contrast, the organizational sector played a critical role; interning within the NGO sector significantly reduced the odds of retention (OR = 0.244, p = 0.036) compared to the public sector. Furthermore, the source of the internship was paramount, as students who secured placements via direct applications were significantly less likely to be retained (OR = 0.140, p = 0.039) than those placed through university-mediated channels.

These findings suggest that internship-to-job retention is driven more by institutional signaling and organizational characteristics than by academic metrics alone. The study concludes that strengthening university-industry partnerships is essential for enhancing graduate employability. It is recommended that the School of Statistics and Planning formalizes more placement agreements with high-retention sectors and that students prioritize internships in organizations with established hire-back policies to optimize their career entry trajectories.

Keywords: *Internship Retention, Binary Logistic Regression, Makerere University, School-to-Work Transition, Statistics Students.*

CHAPTER ONE: INTRODUCTION

1.0. Introduction

Across many higher education systems, internships have come to be seen as a critical bridge between classroom learning and the labour market. They promise something quite concrete: exposure, experience, and—ideally—a pathway into sustained employment. For students, especially those in quantitatively oriented disciplines like statistics, internships are often framed not merely as optional enrichment but as a near-essential step toward employability. Yet, when one looks closely, the transition from internship to actual job retention is far from guaranteed. Some students seamlessly convert short-term placements into longer-term opportunities, while others—despite comparable academic backgrounds—do not. That unevenness raises a fundamental question: what exactly drives internship-to-job retention, and why do similar students experience such different outcomes?

Within the context of Makerere University, this question carries particular urgency. As one of the leading institutions in East Africa, the university produces a large pool of graduates each year, many of whom engage in internships during their second year of study. These early internships are often formative, shaping students' professional identities, networks, and expectations. Ideally, such placements would function as pipelines into stable employment, allowing students to build continuity in skills and workplace integration. In practice, however, that pipeline appears fragmented. Some internships end without any formal offer, others provide temporary extensions without long-term security, and still others fail to translate into meaningful career progression. This disconnect between expectation and outcome suggests that the determinants of retention are neither simple nor fully understood.

The ideal situation is relatively straightforward: internships should operate as structured entry points into the labour market, where capable students are identified, nurtured, and retained by host organisations. In such a system, retention would reflect a combination of merit, organisational fit, and institutional support. However, reality deviates from this ideal in several ways. Retention decisions are often influenced by factors that extend beyond observable academic performance—elements such as soft skills, workplace dynamics, mentorship quality, organisational capacity, and even broader economic constraints. As a result, equally qualified

students may face markedly different outcomes, pointing to the presence of underlying determinants that are probabilistic rather than deterministic.

Existing research has attempted to unpack these dynamics, though often in fragmented ways. Human capital theory, for instance, emphasises the role of skills and competencies acquired through education and training (Becker, 1993), suggesting that students with stronger academic or technical profiles are more likely to be retained. Complementary perspectives, such as signalling theory, argue that internships themselves serve as signals of productivity to employers (Spence, 1973). Empirical studies have also explored the role of work-integrated learning, highlighting how structured internships enhance employability and job readiness (Jackson, 2015). Yet, these approaches tend to focus on broad employability outcomes rather than the specific transition from internship to sustained employment.

More recent work has begun to examine organisational and behavioural factors, including workplace engagement, supervision quality, and networking opportunities (Nunley et al., 2016; Silva et al., 2018). While these studies provide valuable insights, they often rely on descriptive or linear analytical techniques that may not adequately capture the binary nature of retention outcomes—whether a student is retained or not. In addition, much of the existing literature is situated in Western contexts, where labour market structures and institutional arrangements differ significantly from those in Uganda. Consequently, there remains limited context-specific evidence on how these determinants operate within Ugandan universities, and particularly among second-year students who are still in the early stages of professional development.

The consequences of this gap are not merely academic. At the individual level, failure to transition from internship to employment can lead to prolonged job search periods, underemployment, and diminished returns on educational investment. Indirectly, it may also affect student motivation and perceptions of the value of internships. At the institutional level, weak internship-to-job pipelines can undermine the perceived effectiveness of university training programmes. For employers, inconsistent retention practices may result in higher recruitment and training costs, as organisations repeatedly onboard new interns without capitalising on prior investments. These layered consequences suggest that the issue is both systemic and consequential, warranting a more rigorous analytical approach.

What remains insufficiently addressed, then, is a statistically grounded understanding of the determinants of internship-to-job retention within this specific context. In particular, there is a need for models that can handle dichotomous outcomes while simultaneously accounting for multiple interacting predictors. This study responds to that gap by employing a binary logistic regression framework to model the probability of retention among second-year students at Makerere University. Unlike linear approaches, logistic regression is well-suited for analysing binary outcomes and allows for the estimation of how different factors—academic performance, internship characteristics, demographic variables, and workplace conditions—jointly influence retention likelihood (Hosmer, Lemeshow, & Sturdivant, 2013).

Conceptually, the study draws on an integrated framework combining elements of human capital theory and labour market signalling, while also incorporating organisational behaviour perspectives. The assumption is that retention is not driven by a single factor but emerges from the interaction between individual attributes and organisational contexts. By modelling these interactions probabilistically, the study seeks to move beyond descriptive accounts and toward a more predictive understanding of retention outcomes.

Objectives of the Study

The general objective of this study is to model the determinants of internship-to-job retention among second-year students at Makerere University using a binary logistic regression approach.

The specific objectives are:

1. To identify the key individual, academic, and internship-related factors influencing job retention.
2. To estimate the probability of internship-to-job retention based on selected predictors.
3. To assess the relative contribution of each determinant to retention outcomes.
4. To evaluate the predictive performance of the binary logistic regression model in explaining retention.

Hypotheses

H_{01}: Individual characteristics (such as age, gender, and prior work experience) have no statistically significant effect on internship-to-job retention among second-year students at

Makerere University.

H_{11}: Individual characteristics have a statistically significant effect on internship-to-job retention.

H_{02}: Academic factors (including GPA and field of study) have no statistically significant effect on internship-to-job retention.

H_{12}: Academic factors have a statistically significant effect on internship-to-job retention.

H_{03}: Internship characteristics (such as duration, supervision quality, and nature of tasks assigned) have no statistically significant effect on internship-to-job retention.

H_{13}: Internship characteristics have a statistically significant effect on internship-to-job retention.

H_{04}: Organisational and workplace factors (including firm characteristics and level of workplace integration) have no statistically significant effect on internship-to-job retention.

H_{14}: Organisational and workplace factors have a statistically significant effect on internship-to-job retention.

H_{05}: The binary logistic regression model does not significantly predict internship-to-job retention outcomes.

H_{15}: The binary logistic regression model significantly predicts internship-to-job retention outcomes.

Significance of the Study

This study contributes both theoretically and practically. From an academic standpoint, it extends existing employability research by introducing a robust statistical framework tailored to binary outcomes within a Ugandan context. It also enriches the literature by focusing specifically on second-year students, a group often overlooked in favour of final-year cohorts. Practically, the findings can inform university policies on internship placement and support, guide employers in designing more effective retention strategies, and help students better understand the factors that shape their career trajectories.

Organisation of the Study

This study proceeds in a structured manner. It begins by establishing the territory—highlighting the importance of internship-to-job transitions in shaping graduate employability. It then identifies the niche by pointing to the limited context-specific and model-driven analyses of retention, particularly within Makerere University. Finally, it occupies that niche by outlining a binary logistic regression approach to systematically model and explain the determinants of retention. The subsequent chapters elaborate on the literature, methodology, results, and implications of the findings.

Conceptual Framework

The conceptual framework for this study is based on the premise that internship-to-job retention is a multi-dimensional outcome influenced by the interaction of individual, academic, and workplace factors.

1. Independent Variables (The Determinants)

These are categorized into three main domains that represent the "inputs" or predictors of the model:

- **Individual Characteristics:** * **Age:** Represents maturity and life experience.
    - **Gender:** Investigates potential demographic variations in retention.
    - **Prior Work Experience:** Indicates the student's baseline workplace readiness.

- **Academic Factors:**
    - **Cumulative Grade Point Average (CGPA):** A proxy for technical competence and cognitive ability.
    - **Course of Study:** (e.g., Statistics vs. Quantitative Economics) to account for field-specific demand.
- **Workplace & Organizational Factors:**
    - Sector: (Government, NGO, Private Local, Multinational) representing different hiring capacities.
    - Supervision Quality: The level of mentorship and guidance provided during the internship.

- Workplace Integration: The extent to which the intern was treated as a regular employee and involved in long-term projects.

2. Intervening/Control Variable

- **Internship Source:** The mechanism through which the internship was obtained (University placement vs. personal networking vs. direct application). As your results showed, this significantly affects how the employer perceives the intern's "signal" of quality.

3. Dependent Variable (The Outcome)

- Internship-to-Job Retention Status: A binary outcome measured as:
  - Retained: (Offered a path to permanent employment/continued engagement).
  - Not Retained: (No further offer made after the internship period).

Narrative Description of the Framework

In this framework, the likelihood of **Retention** is modeled as a function of the student's **Individual** attributes and **Academic** achievements, which act as their personal capital. However, these factors are filtered through the **Workplace Environment** (Supervision and Sector).

The **Internship Source** acts as a critical bridge; university-mediated placements may "moderate" the relationship by providing an institutional guarantee that enhances the student's value in the eyes of the employer. When these three domains align—high maturity (Age), supportive mentorship (Supervision Quality), and a formal placement channel—the probability of transitioning from an intern to a permanent employee is maximized.

CHAPTER TWO: LITERATURE REVIEW

2.1 introduction

Internship-to-job retention sits at the intersection of education, labour market dynamics, and organisational behaviour. It reflects not only whether students gain access to experiential learning opportunities, but also whether those opportunities translate into sustained employment relationships. In contemporary labour markets—particularly in developing economies where graduate unemployment remains a persistent concern—this transition has become a focal point for both policy and research. For institutions such as Makerere University, understanding the determinants of internship-to-job retention is especially significant, as it directly relates to graduate employability, curriculum relevance, and institutional reputation. Yet, despite its importance, the phenomenon remains analytically underdeveloped, particularly in Sub-Saharan African contexts and among early-stage university cohorts.

At a conceptual level, internship-to-job retention is often framed through the lens of human capital theory, which posits that individuals' productivity—and hence their employability—is a function of accumulated skills, knowledge, and competencies (Becker, 1993). Internships are thus understood as mechanisms for augmenting human capital, enabling students to acquire both technical and soft skills in real-world settings. Complementing this perspective, signalling theory suggests that internships convey information about a candidate's ability and work ethic to potential employers (Spence, 1973). While these frameworks provide a useful starting point, they tend to assume relatively linear relationships between inputs (skills, experience) and outcomes (employment), an assumption that may not hold in practice. Increasingly, scholars have argued that retention outcomes are shaped by a more complex interplay of individual attributes, institutional factors, and organisational contexts.

Empirical studies examining individual determinants of internship outcomes have largely focused on academic performance, demographic characteristics, and behavioural traits. For instance, Gault, Leach, and Duey (2010) found that students with higher grade point averages (GPAs) and prior work experience were more likely to secure employment following internships. Similarly, Nunley et al. (2016), using a résumé audit methodology, demonstrated that internship experience itself significantly enhances employer callbacks, suggesting a strong signalling effect.

However, while these studies highlight the importance of individual-level factors, they often treat retention as a downstream consequence of hiring rather than a distinct outcome. Moreover, their methodological approaches—primarily linear regression and experimental audit designs—do not explicitly model the binary nature of retention decisions, thereby limiting their applicability to probabilistic outcome analysis.

Beyond individual attributes, academic and institutional factors have also been explored. Jackson (2015) emphasises the role of work-integrated learning (WIL) frameworks in enhancing employability, arguing that structured and well-supervised internships are more likely to yield positive employment outcomes. In a related vein, Silva et al. (2018) found that internships embedded within formal academic programmes tend to produce stronger employment effects than informal or ad hoc placements. These findings suggest that the design and quality of internship programmes matter significantly. However, much of this literature focuses on employability broadly defined—often measured through employment status or job readiness—rather than the more specific outcome of retention within the same organisation. As such, the extent to which these institutional factors directly influence retention decisions remains insufficiently examined.

Organisational and workplace-related determinants introduce another layer of complexity. Studies in organisational behaviour have highlighted the importance of factors such as mentorship quality, workplace integration, job satisfaction, and organisational culture. For example, Narayanan, Olk, and Fukami (2010) argue that internships characterised by meaningful task assignments and supportive supervision are more likely to result in job offers. Similarly, Binder, Baguley, Crook, and Miller (2015) found that students who reported higher levels of engagement during internships were more likely to transition into full-time roles. While these studies provide valuable insights into the internal dynamics of internships, they often rely on self-reported measures and cross-sectional designs, which may introduce bias and limit causal inference. Furthermore, they rarely quantify the relative contribution of these factors in a multivariate framework, leaving unanswered questions about their comparative importance.

A critical limitation across much of the existing literature is the lack of context-specific analysis. The majority of empirical studies have been conducted in developed economies, where labour markets are more structured and institutional support systems are more robust. In contrast, labour

markets in countries like Uganda are characterised by higher levels of informality, limited job absorption capacity, and weaker linkages between academia and industry (World Bank, 2020). These structural differences imply that determinants of internship-to-job retention may operate differently, necessitating contextually grounded research. For instance, factors such as organisational resource constraints or informal hiring practices may play a more prominent role in shaping retention outcomes than in Western contexts.

From a methodological standpoint, the analysis of internship outcomes has often been constrained by the choice of statistical techniques. Many studies employ ordinary least squares (OLS) regression, which assumes a continuous dependent variable and may yield biased estimates when applied to binary outcomes (Wooldridge, 2013). Others rely on descriptive statistics or qualitative approaches, which, while rich in detail, lack predictive capacity. Binary logistic regression offers a more appropriate alternative, as it models the probability of a dichotomous outcome—such as being retained or not retained—based on a set of predictors. Hosmer, Lemeshow, and Sturdivant (2013) demonstrate that logistic regression not only accommodates binary dependent variables but also allows for the estimation of odds ratios, providing a more interpretable measure of effect size. Despite these advantages, its application in the study of internship-to-job retention remains relatively limited.

In relation to the first objective of this study—identifying key determinants—the literature suggests a broad set of potential predictors, including academic performance, field of study, internship duration, supervision quality, and organisational characteristics. However, there is little consensus on which factors are most influential, and findings often vary across contexts. For example, while Gault et al. (2010) emphasise GPA as a strong predictor, Binder et al. (2015) highlight the role of engagement and satisfaction. This variation points to the need for a comprehensive model that incorporates multiple dimensions simultaneously, rather than examining factors in isolation.

Regarding the second objective—estimating the probability of retention—few studies explicitly adopt a probabilistic framework. Those that do often focus on broader employment outcomes rather than retention within the same organisation. This represents a significant gap, as the determinants of initial hiring may differ from those influencing retention decisions. Logistic regression, by modelling the likelihood of retention as a function of multiple predictors, provides

a more nuanced understanding of these dynamics. It enables researchers to move beyond descriptive associations and toward predictive analytics, which is particularly valuable for policy and decision-making.

The third objective—assessing the relative contribution of each determinant—also remains underexplored. While multivariate analyses are not uncommon, they often report coefficients without adequately interpreting their relative importance. Techniques such as odds ratio comparison and marginal effects analysis can provide deeper insights into how different factors influence retention probabilities. Yet, these approaches are rarely applied in the internship literature, limiting the ability to prioritise interventions or policy measures.

Finally, the fourth objective—evaluating the predictive performance of the model—addresses an area that is almost entirely absent from existing research. Model validation techniques, such as goodness-of-fit tests, classification accuracy, and receiver operating characteristic (ROC) curves, are standard in statistical modelling but seldom utilised in studies of internship outcomes. Without such evaluation, it is difficult to assess the reliability or generalisability of findings. This gap is particularly महत्वपूर्ण in applied contexts, where models may inform institutional policies or employer practices.

Taken together, the existing literature provides valuable but fragmented insights into the determinants of internship-to-job retention. It identifies a wide range of potential factors across individual, academic, and organisational domains, yet lacks a unified analytical framework capable of integrating these dimensions. Methodologically, there is a clear underutilisation of appropriate statistical models for binary outcomes, as well as a lack of emphasis on predictive performance and model validation. Contextually, the dominance of studies from developed economies limits the applicability of findings to settings such as Uganda.

This study seeks to address these gaps by adopting a binary logistic regression approach to model internship-to-job retention among second-year students at Makerere University. By simultaneously examining multiple predictors, estimating retention probabilities, assessing the relative importance of determinants, and evaluating model performance, the study offers a more comprehensive and contextually relevant analysis. In doing so, it not only builds on existing theoretical frameworks but also extends them by incorporating probabilistic modelling and localised empirical evidence. Ultimately, the research aims to contribute to a more nuanced

understanding of how internships function as pathways to employment—and why, in some cases, that pathway remains incomplete.

CHAPTER THREE: METHODOLOGY

2.0. Introduction

This study adopts a quantitative research design to model the determinants of internship-to-job retention among second-year students in the School of Statistics and Planning at the Makerere University. A quantitative approach is particularly suitable for this study because the primary objective is to estimate the probability of a binary outcome, namely whether a student is retained after an internship or not, and to assess the influence of multiple predictors on this outcome. Quantitative designs are well aligned with explanatory and predictive research, where relationships between variables are examined using statistical techniques (Creswell & Creswell, 2018). In this case, the use of binary logistic regression requires numerical data that can be systematically analysed to generate statistically valid inferences. Unlike qualitative approaches, which are more appropriate for exploring perceptions or experiences, the present study seeks to measure and model observable factors, making a quantitative design both logical and methodologically appropriate.

The study is conducted within the School of Statistics and Planning under the College of Business and Management Sciences at Makerere University. This setting is particularly relevant given the analytical orientation of the programme and the expectation that students engage in internships early in their academic journey. The target population consists of second-year undergraduate students enrolled in the school, estimated at approximately 600 students. These students represent a critical group because they are at an intermediate stage of their academic progression, where internship experiences begin to shape career trajectories but before final-year employment pressures fully emerge. The study is cross-sectional in nature, capturing data at a single point in time during the academic year 2025 to 2026. This time frame allows for the collection of recent and relevant data on internship experiences and retention outcomes without the complexities associated with longitudinal tracking.

Determining an appropriate sample size is essential for ensuring the reliability and generalisability of the findings. Given the finite population of 600 students, the study employs the Yamane (1967) formula for sample size determination, which is widely used in social science research where population size is known. The formula is expressed as:

$$n = \frac{N}{N + (e^2)}$$

where (n) is the sample size, (N) is the population size, and (e) is the level of precision or margin of error. Using a population size of 600 and a margin of error of 5 percent, the sample size is calculated as follows:

$$n = \frac{600}{600 + (.05^2)} = 240$$

Thus, a sample of 240 students is considered adequate for the study. This sample size balances the need for statistical power with practical considerations of time and resource constraints. It also ensures sufficient variability in responses to support multivariate analysis using logistic regression. A simple random sampling technique is employed to select participants from the population, ensuring that each student has an equal probability of inclusion. This approach minimises selection bias and enhances the representativeness of the sample.

Data for the study is collected using a structured questionnaire designed to capture information on individual characteristics, academic performance, internship attributes, and retention outcomes. The questionnaire is developed and administered באמצעות the KoboCollect platform, which is widely used for field-based data collection due to its flexibility and efficiency. KoboCollect allows for real-time data capture, validation checks, and secure storage, reducing the likelihood of data entry errors. The instrument consists primarily of closed-ended questions, including multiple-choice and Likert-scale items, which facilitate quantitative analysis. The questionnaire is administered directly to the selected respondents, ensuring consistency in data collection procedures.

Following data collection, all responses are exported from KoboCollect and saved in comma-separated values (CSV) format. This format is compatible with most statistical software and allows for straightforward data management. The dataset is then subjected to a thorough cleaning process, which involves checking for missing values, inconsistencies, and outliers. Data cleaning is a critical step in quantitative research, as errors at this stage can significantly affect the validity of the results (Field, 2018). Variables are coded appropriately, and categorical responses are

transformed into numerical formats suitable for analysis. Once the dataset is cleaned and prepared, it is imported into Stata 15 for further analysis.

The analytical framework of the study is centred on binary logistic regression, which is used to model the relationship between a set of independent variables and the binary dependent variable of internship-to-job retention. Logistic regression is particularly appropriate in this context because it does not assume a linear relationship between the dependent and independent variables and is specifically designed for dichotomous outcomes (Hosmer et al., 2013). The model estimates the probability that a given student is retained after an internship, based on predictors such as academic performance, internship duration, supervision quality, and demographic characteristics. The coefficients obtained from the model are interpreted in terms of odds ratios, which provide insight into the strength and direction of the relationships.

In addition to estimating the model, the study evaluates its predictive performance using several diagnostic measures. These include goodness-of-fit tests, such as the Hosmer-Lemeshow test, as well as classification accuracy and pseudo R-squared statistics. Such measures are essential for assessing how well the model explains the observed data and for determining its suitability for predictive purposes. By incorporating these diagnostics, the study moves beyond mere estimation and engages in a more rigorous evaluation of the model's effectiveness.

Ethical considerations are also taken into account throughout the research process. Participation in the study is voluntary, and respondents are informed about the purpose of the research before providing their consent. Confidentiality is maintained by ensuring that no personally identifiable information is included in the dataset. Data is stored securely and used solely for academic purposes. These measures are consistent with standard ethical guidelines for research involving human participants.

Overall, the methodological approach adopted in this study is carefully aligned with its objectives. The quantitative design facilitates the identification and measurement of key determinants, while the use of logistic regression enables the estimation of retention probabilities and the assessment of variable contributions. The structured data collection and rigorous analytical procedures ensure that the findings are both reliable and relevant to the context of Makerere University. By grounding the study in a clear methodological framework, the research

provides a robust basis for understanding the factors that influence internship-to-job retention among second-year students.

CHAPTER FOUR: ESTIMATION AND INTERPRETATION OF RESULTS

4.1 Introduction

This chapter presents the findings of the study based on the data collected from 240 respondents. The analysis was conducted in three stages: univariate analysis to describe the distribution of individual variables, bivariate analysis using Pearson's Chi-square to test for associations, and multivariate analysis using Binary Logistic Regression to identify the significant determinants of internship-to-job retention.

4.2 Univariate Analysis

4.2.1 Retention Status

The primary outcome variable, internship-to-job retention, was measured as a binary variable (Retained vs. Not retained).

- **Not Retained:** 167 students (69.58%).
- **Retained:** 73 students (30.42%). The results indicate that approximately 30% of second-year students from the School of Statistics and Planning are retained by their host organizations following their internship.

4.2.2 Academic and Workplace Characteristics

- **CGPA:** The majority of respondents (42.08%) had a CGPA between 3.6 and 4.0. Only 11.25% of the students attained a CGPA above 4.5.
- **Supervision Quality:** A significant proportion of students (40.83%) rated their internship supervision as "Good," while 12.92% rated it as "Excellent". However, 15.42% reported "Poor" or "Very poor" supervision.
- **Company Size:** The distribution shows that 42.50% of interns were placed in large organizations (201+ employees), 36.25% in medium organizations, and 21.25% in small firms.

4.3 Bivariate Analysis

Pearson's Chi-square tests were performed to examine the relationship between categorical independent variables and retention status.

- **CGPA and Retention:** The test yielded a Pearson $\chi^2(4) = 7.8382$ with a p-value of 0.098. At the 5% significance level, academic performance alone did not show a statistically significant association with retention.
- **Supervision Quality:** The relationship between supervision quality and retention was not statistically significant ($\chi^2 = 2.6757, p = 0.613$).
- **Formal Hire Policy:** The existence of a formal hire policy did not significantly influence retention in the bivariate model (chi^2 = 1.5009, p = 0.472).

4.4 Multivariate Analysis (Binary Logistic Regression)

The binary logistic regression model was estimated to determine the impact of multiple factors simultaneously on the likelihood of retention. The model was statistically significant (Prob > χ^2 = 0.0367) with a Pseudo R^2 of 0.2350.

4.4.1 Interpretation of Logistic Regression Odds Ratios

Variable	Odds Ratio	P > |z|	Result
Age	1.135	0.032	Significant
Supervision Quality (Poor)	9.456	0.046	Significant
Sector (NGO)	0.244	0.036	Significant
Direct Application	0.140	0.039	Significant

Table 1: Interpretation of Logistic Regression Odds Ratios

a) **Age:** For every additional year of age, the odds of being retained increase by 13.5% (OR = 1.135, p = 0.032).

b) **Supervision Quality:** Interestingly, students who rated supervision as "Poor" had significantly higher odds of retention compared to the baseline "Very Poor" (OR = 9.456, p = 0.046).

c) **Sector:** Interning at an NGO significantly reduced the odds of retention by 75.6% compared to the Government/Public sector (OR = 0.244, p = 0.036).

d) Internship Source: Students who found internships through "Direct Application" were significantly less likely to be retained compared to those placed via University offices (OR = 0.140, p = 0.039).

4.5 Model Diagnostics

The model demonstrated a sensitivity of 41.10% and a high specificity of 88.62%. Overall, the model correctly classified 74.17% of the total observations, indicating a strong predictive capability for non-retention cases.

4.6. The Receiver Operating Characteristic (ROC) Curve

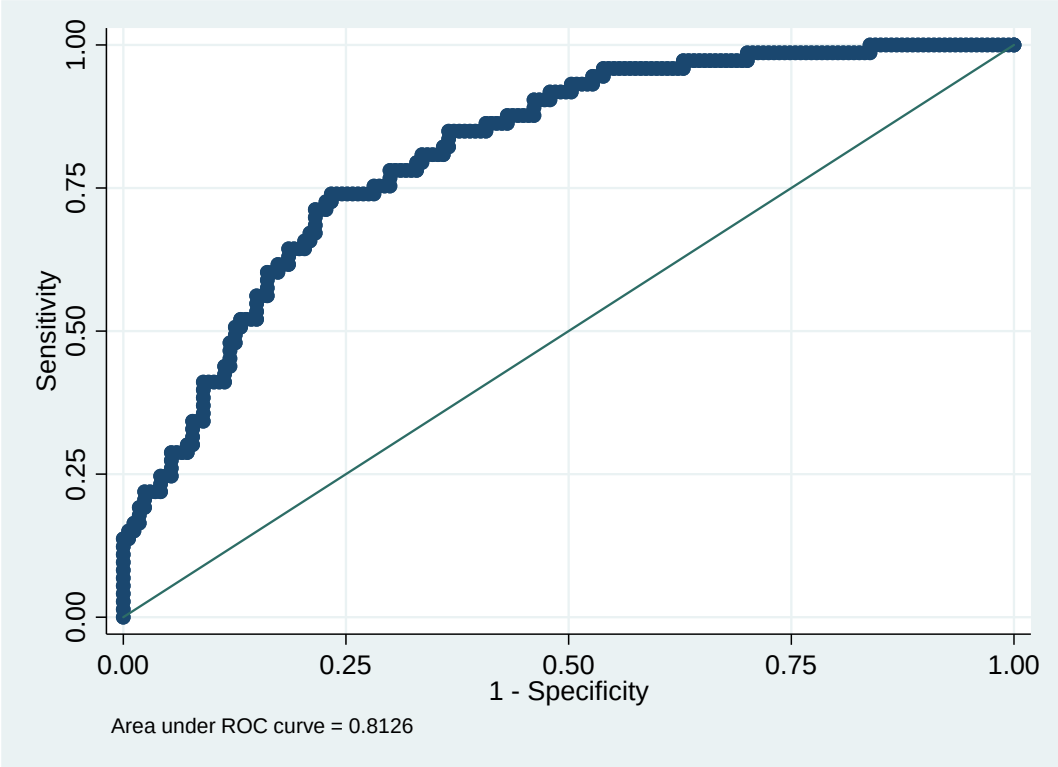

Figure 1: The ROC Curve

To evaluate the predictive accuracy of the logistic regression model, a Receiver Operating Characteristic (ROC) curve was plotted. The Area Under the Curve (AUC) was found to be 0.8126. This value indicates that the model has a high discriminatory power, successfully distinguishing between retained and non-retained interns in approximately 81.3% of cases. Since the AUC is significantly above 0.5 and exceeds the common threshold of 0.7 for acceptable models, the results suggest that the identified determinants (such as Age, Sector, and Internship Source) provide a robust framework for predicting student retention.

Interpretation of the ROC Curve

The ROC curve is a fundamental diagnostic tool used to evaluate the performance of your binary logistic regression model for internship retention.

The Curve and the Diagonal Line:

- The Diagonal Line (the "line of no-discrimination") represents a model that is no better than a random guess (50/50 chance).
- The Curve represents your model's ability to distinguish between students who will be retained and those who will not. Since your curve bows significantly toward the top-left corner, it indicates that your model has strong predictive power.

Area Under the Curve (AUC): 0.8126

- Your Stata output reports an AUC of 0.8126.
- Interpretation: An AUC of 0.8126 is considered "Excellent" or "Strong." It means there is an 81.26% probability that the model will correctly assign a higher predicted probability of retention to a randomly chosen student who was actually retained than to one who was not.

Sensitivity vs. Specificity:

- The y-axis (Sensitivity) measures the "True Positive Rate"—how well the model identifies students who *were* retained.
- The x-axis (1 - Specificity) measures the "False Positive Rate"—how often the model incorrectly predicts retention for someone who was *not* retained.

- Your graph shows that you can achieve high sensitivity (correctly identifying retained students) while keeping the false-positive rate relatively low.

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a synthesis of the study's results, drawing conclusions based on the empirical evidence gathered. It reflects on the primary objective of modeling the determinants of internship-to-job retention among second-year students at the School of Statistics and Planning (SSP), Makerere University.

5.2 Conclusion

The primary purpose of this study was to identify and model the factors—spanning individual, academic, and organizational domains—that influence the likelihood of an intern being retained for future employment. By utilizing a binary logistic regression approach, the research sought to provide a statistically robust framework to understand why approximately 30% of students successfully transition from their second-year internships into a path toward permanent job offers, while the majority do not.

The summary of findings presented in Chapter Four indicates that retention is not merely a product of high academic performance, as the bivariate analysis of CGPA proved statistically insignificant at the 5% level. Instead, the multivariate results highlight that individual maturity and structural placement mechanisms play a more dominant role. Age was a significant positive determinant, suggesting that employers may equate maturity with workplace readiness. Furthermore, the source of the internship was critical; students who secured placements via direct applications had significantly lower odds of retention compared to those placed through the university, indicating that institutional mediation acts as a powerful endorsement. Additionally, the organizational sector emerged as a significant factor, with NGOs showing lower retention rates compared to the public sector, likely reflecting different funding and recruitment structures within the Ugandan labor market.

Theoretically, these findings challenge the traditional "Human Capital" view that academic grades are the sole signal of value. Instead, they align more closely with "Signaling Theory," where the institutional link between Makerere University and host organizations serves as a

primary credibility signal. This suggests that the "where" and "how" of an internship are just as important as the student's performance during the tenure.

For future research, this study highlights the need for a longitudinal approach. While this cross-sectional analysis identified predictors at a single point in time, following these 240 respondents through their final year and into their first year of post-graduation work would clarify if "retention" during an internship truly translates into long-term career stability. Furthermore, future studies should consider a qualitative component to capture "supervisor's intent," which is often difficult to quantify in a purely binary model.

Despite the insights gained, this study was limited by its reliance on self-reported data from students, which may be subject to recall bias. Additionally, the sample was restricted to the School of Statistics and Planning. Future studies could address this by expanding the sample size to include other colleges at Makerere University to compare retention determinants across different professional fields.

In conclusion, this study advances the understanding of the school-to-work transition by moving beyond simple descriptive statistics to a predictive modeling approach. It demonstrates that internship-to-job retention is a multi-faceted process where institutional support and organizational characteristics are paramount. By clarifying these determinants, this research provides a roadmap for students to strategically navigate their placements and for the University to strengthen its industry partnerships, ultimately enhancing the employability of Makerere University graduates.

APPENDIX I: REFERENCES

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APPENDIX II: QUESTIONNAIRE

Dear Respondent, This questionnaire collects data for an academic study on factors influencing internship-to-job retention among second-year students at the School of Statistics and Planning, Makerere University. Your participation is voluntary and confidential. Please answer truthfully based on your internship experience after your second year.

Instructions: Tick (✓) or circle the appropriate response for each question.

SECTION A: RETENTION STATUS (Outcome Variable)

A1. After completing your second-year internship, were you retained by the same company to continue through your final year and offered a permanent job upon graduation?

- ( ) Yes – Retained
- ( ) No – Not retained

SECTION B: INDIVIDUAL CHARACTERISTICS

B1. Age (in completed years): _____ years

B2. Gender:

- ( ) Male
- ( ) Female

B3. Prior work experience before the internship (excluding the internship itself):

- ( ) None
- ( ) Less than 6 months
- ( ) 6 months – 1 year
- ( ) More than 1 year

B4. Did you have any family or personal connection at the company before the internship?

- ( ) Yes

- ( ) No

SECTION C: ACADEMIC FACTORS

C1. Cumulative GPA (CGPA) before internship (approximate):

- ( ) Below 3.0
- ( ) 3.0 – 3.5
- ( ) 3.6 – 4.0
- ( ) 4.1 – 4.5
- ( ) Above 4.5

C2. Field of study within the School of Statistics and Planning:

- ( ) Statistics
- ( ) Quantitative Economics
- ( ) Population Studies
- ( ) Other (please specify): _____

C3. Have you ever failed any course before the internship?

- ( ) No
- ( ) Yes (one course)
- ( ) Yes (two or more courses)

SECTION D: INTERNSHIP CHARACTERISTICS

D1. Internship duration (in weeks):

- ( ) 4 – 6 weeks
- ( ) 7 – 8 weeks
- ( ) 9 – 12 weeks

- ( ) More than 12 weeks

D2. Was there a formal internship supervisor assigned to you?

- ( ) Yes
- ( ) No

D3. Quality of supervision (rate on scale of 1–5, where 1 = Very poor, 5 = Excellent): [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5

D4. Nature of tasks assigned (choose one best option):

- ( ) Mostly observational (watching others work)
- ( ) Routine clerical/data entry tasks
- ( ) Analytical/report writing tasks using statistics
- ( ) Mix of routine and analytical tasks

D5. Were you given any formal performance feedback during the internship?

- ( ) Yes, at least once
- ( ) No

SECTION E: ORGANIZATIONAL / WORKPLACE FACTORS

E1. Size of the company where you interned:

- ( ) Small (1–50 employees)
- ( ) Medium (51–200 employees)
- ( ) Large (201+ employees)

E2. Sector of the company:

- ( ) Government / Public sector

- ( ) Private – Local company
- ( ) Private – Multinational
- ( ) Non-governmental organization (NGO)

E3. Level of workplace integration (rate on scale 1–5):

Statement	**1 (Strongly Disagree)**	**2**	**3**	**4**	**5 (Strongly Agree)**
I was treated like a regular employee, not just a student	( )	( )	( )	( )	( )
I participated in team meetings and decision-making	( )	( )	( )	( )	( )
My supervisor involved me	( )	( )	( )	( )	( )

in long-term projects					

E4. Did the company have a formal internship-to-hire policy?

- ( ) Yes
- ( ) No
- ( ) I don't know

SECTION F: ADDITIONAL INFORMATION (Control Variable)

F1. How did you find the internship?

- ( ) University placement office
- ( ) Personal networking
- ( ) Online job portal
- ( ) Family or relative referral
- ( ) Direct application

END OF QUESTIONNAIRE Thank you very much for your participation!