



**IDENTIFYING A SUSTAINABLE RISK MANAGEMENT STRATEGY FOR PRIVATE
STUDENT ACCOMMODATION PROVIDERS IN BLOEMFONTEIN**

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(UFS)

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I, **Simbarashe Musundire**, hereby declare that:

This field study that I herewith submit for the for the qualification Master of Business Administration at the UFS Business School, University of the Free State, is my own independent work, and I have not previously submitted it for a qualification at other institution of higher education. I hereby cede copyright of this work to the University of the Free State.



Simbarashe Musundire

Date: 1 December 2023

To my beloved mother,
Rachel Musundire,
you will be forever remembered and cherished.

DECLARATION	ii
DEDICATION.....	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vii
LIST OF FIGURES	viii
ABSTRACT	ix
CHAPTER 1: BACKGROUND AND MOTIVATION.....	1
1.1 Background	1
1.2 Problem Statement.....	5
1.3 Research Questions	5
1.4 Research Objectives	6
1.4.1 Primary Objective:	6
1.4.2 Secondary Objectives:.....	6
1.5 Study Outline	6
CHAPTER 2: LITERATURE REVIEW.....	7
2.1 Introduction.....	7
2.2 Significance of Private Student Accommodation.....	8
2.2.1 Growth of the student accomodation industry	8
2.3 Nature of Risks Associated With the Private Student Accommodation Industry.....	9
2.3.1 Definition of risk	9
2.3.2 Liquidity risk arising from cash flow mismatch.....	10
2.3.3 Operational risk	10
2.3.4 Financial and default risk.....	11
2.3.5 Facility management risk.....	11

2.3.6	Default risk from NSFAS	12
2.3.7	Changes to funding allowances caps for NSFAS students and international student guidelines.	12
2.3.8	Management of risk	13
2.4	Model for risk assessment and management.....	14
2.4.1	The fuzzy inference model	14
CHAPTER 3: RESEARCH METHODOLOGY		15
3.1	Introduction.....	15
3.2	Research Design	15
3.2.1	Research methodology.....	16
3.2.1.1	Fuzzy model for determining risk and risk factors for renting property private student accommodation	16
3.2.1.2	Fuzzy methodology steps.....	18
3.3	Epistemology.....	19
3.4	Sampling	20
3.4.1	Probability sampling	20
3.5	Data Collection Method	21
3.6	Data Analysis	21
3.7	Ethical Considerations.....	22
3.8	Demarcation of the Study.....	22
CHAPTER 4: DATA ANALYSIS AND INTERPRETATION		25
4.1	Introduction.....	25
4.2	Response Rate.....	25
4.3	Analysis and Interpretation of Biographical Data	25
4.4	Analysis and interpretation of the risk assessment data	33
4.4.1	Prevalent risks for private student accommodation providers in Bloemfontein. ...	33

4.4.2	Fuzzy Inference Model to develop a risk management strategy for private student accommodation providers.	35
4.5	Conclusion.....	43
CHAPTER 5: CONCLUSION AND RECOMMENDATIONS		45
5.1	Introduction.....	45
5.2	Summary of objectives	45
5.3	Recommendations	46
5.3.1	Embed risk management into the business strategy.....	46
5.3.2	Budgeting for rental premiums to curb late payments and high risk tenants.....	47
5.3.3	Managing operational risks at firm level	47
5.3.4	Cash utilisation strategies focused on risk reduction.....	48
5.3.5	Active property management.....	48
5.3.6	Compliance with regulations.....	48
5.4	Limitations of study.....	48
5.5	Conclusion.....	49
REFERENCES.....		51
APPENDIX: RISK QUESTIONNAIRE		55

LIST OF TABLES

Table 4.1: Location of private student accommodation.....	26
Table 4.2: Nature of business	28
Table 4.3: Ownership of private student accommodation	28
Table 4.4: Proximity of student accommodation from universities	30
Table 4.5: Accreditation status of private student accommodation with universities	30
Table 4.6: Total number of tenants	30
Table 4.7: Rental Price.....	31
Table 4.8: Main expense	32
Table 4.9: Student age	32
Table 4.10: Property management trends.....	33

Figure 2.1: International Organization for Standardization (ISO) in ISO 31000 Risk Management-
-Principles and guidelines 13

Figure 3.1: The model for risk assessment using the fuzzy logic approach..... 18

Figure 3.2: Suburbs surrounding UFS that meet the private student accommodation radius
determined by the Minister of education23

Figure 4.1: Student accommodation property types available in each location27

Figure 4.2: Years of private student accommodation operation.....29

Figure 4.3: Industry Knowledge and Expertise 35

Figure 4.4: Membership function plot..... 36

Figure 4.5: Fuzzy inference on industry knowledge and expertise 37

Figure 4.6: Fuzzy Rules on industry knowledge and expertise..... 38

Figure 4.7: Fuzzy inference on industry knowledge and expertise 38

Figure 4.8: Fuzzy logic design on rental income and expenses 39

Figure 4.9: Fuzzy rules on rental income and expenses..... 40

Figure 4.10: Fuzzy rules on rental income and expenses..... 40

Figure 4.11: Fuzzy output on rental income and expenses 41

Figure 4.12 Fuzzy output on cashflow and occupancy 42

Figure 4.13 Fuzzy output on rental income and expenses 42

The research investigated the risks prevalent in the private student accommodation industry in Bloemfontein with the aim of establishing sustainable risk management strategies to improve viability as well as impact knowledge to enable private student accommodation providers to incorporate risk management into their business strategy. The study showed that the majority of private property investors did not conduct due diligence before investing in private student accommodation while overlooking potential risks associated with the growing industry. As a result, students have been subjected to dilapidated living conditions. Properties in Brandwag, Willows and Universitas have been left in dilapidated states as property investors fail to cope with both systematic and un-systematic risks prevailing in the industry. Various risks faced by private student accommodation including cashflow challenges, financial management, liquidity and default risk, were identified as major risks in the private student accommodation sector in Bloemfontein. Focus and emphasis was on identifying and managing the risks to ensure that investors making investments in this sector of the property industry would understand and properly evaluate the risks associated with investments in this sector of the real estate industry. A fuzzy inference system model was used to determine impact of the risks associated with the industry. The findings showed that the majority of private student accommodation providers with a few years operating experience and minimal knowledge of the industry were highly exposed to cashflow, liquidity, regulatory and operational risks. Low rental income as a result of a NSFAS rental ceiling and delayed payments resulted in cashflow mismatches as the majority of the students were NSFAS funded. The research concludes by providing sustainable risk management strategies to address the anomaly of increasing demand and declining supply for private student private student accommodation in Bloemfontein.

Key Words: Private student accommodation, risk management strategies, fuzzy inference model

CHAPTER 1: BACKGROUND AND MOTIVATION

1.1 Background

South African university enrolment has significantly increased, leading to greater student housing demand (Matsolo *et al.*, 2018). Data from the Register of Selection of Private Higher Education Institutions shows that over a million new university students have been accepted for the 2022 academic year. With a growing intake of this magnitude, most tertiary institutions of higher learning have failed to provide or cater to the growing need for on-campus accommodation (Gregory & Rogerson, 2019; Landa *et al.*, 2021). A study conducted by the University of Cape Town (2022) shows that providing safe, affordable, and decent student accommodation in prime locations remains a priority for institutions of higher learning. However, the higher demand for accommodation within the campus or walking proximity to the learning institutions continues to be hampered by the erratic diminished availability of decent accommodation, resulting in higher rental costs. With the increase in enrolment at tertiary institutions, the availability of on-campus and hybrid independent living in off-campus private student housing has diminished.

According to a market assessment done on the student housing landscape by the International Finance Corporation (2022), the South African market continues to be dominated by a few leading private student accommodation companies who, in 2020, only provided 51 844 beds with rentals on the high end of the market ranging from R 5 000.00 to R 8 000.00 per month. The lower and middle-level market, which constitutes the highest composition of university students, are serviced by start-up private accommodation providers. The study also shows that it has posed a liquidity risk to most private student accommodation providers as there tend to be a cash flow and timing mismatch until the bursary pays out. A study by the IFC (2022) shows an estimated 716 000 students were funded by NSFAS, which has since grown to 962 000 in 2023. With allowances for accommodation (ZAR 3 000 – ZAR 4 500), a widened gap has resulted between affordable and midlevel students. Fewer service providers catering for the

affordable segment have resulted in a larger population of NSFAS students continuing to struggle to secure decent private student accommodation.

With an increase in demand for sustainable off-campus student accommodation, a study by Amaniampong *et al.* (2014) indicates that there remains a smaller number of reliable and accredited service providers able to better comprehend and control the various risks/rewards of owning private student accommodation despite the new opportunities that have emerged from the potential growth of the private student accommodation sector. Several factors have been at the highlight of this diminishing supply. Amaniampong *et al.* (2014) emphasise that individual private accommodation providers have not flourished in the industry as they tend to focus on the prospective rewards of higher rental income and thus, at times, lead to them overshadowing the potential risks involved in operating in this industry. Business Live (2021) also notes that because of the higher rental opportunities, most investors converted their private residential properties into private student accommodation with minimum knowledge of the industry and a limited understanding of the perceived risks and how to manage them. As the industry grows into a sector, zoning bylaws in relation to the number of tenants who can take occupancy in a private student accommodation house and accreditation requirements have also been established to preserve neighbourhoods near the university and set guidelines for who can operate such a business. There is, without a doubt, a growing need to further understand and manage the different risks associated with owning a private student accommodation property.

Amongst the challenges faced by private student accommodation providers is the inability to project cashflows in relation to their rental prices. A crucial element for any viable business is the cash flow projections expected from managing a private student accommodation establishment. With private student accommodation providers catering to the lower- and middle-level market segment, they tend to rely more on payments from NSFAS. Timing of cashflows and the time value of money continues to be a factor affecting the growth of private accommodation operators. According to the National Treasury (2022), over thirty-two billion rand was disbursed towards NSFAS for private student accommodation allowances; however, concerns continue to hinge on late

payments, which hamper private student accommodation providers who must service their bond repayments, conduct renovations, and maintain the properties, in a manner to retain the market value. Although there has been an improvement in funding opportunities, the International Finance Corporation (2021) states that there remains a shortfall of affordable private student accommodation with over 300 000 student beds, which both South African universities and private accommodation providers were still failing to meet the demand.

Another factor of concern is the absence of rental income models to ensure long-term rental profitability. Viability, together with profitability, has been a going concern when it comes to managing any private student accommodation property. While student accommodation providers could house more student beds and generate more rental income, it is essential to estimate the economic viability and implement a business model for estimating the rental prices for private student accommodation properties. The cost of maintaining properties occupied by a higher number of residents tends to result in higher maintenance and renovation costs, which sometimes are not sustained due to late bursary disbursements. Another factor to consider is the bond repayments, as most properties are private residential properties rezoned for student accommodation. Without a doubt, private student accommodation providers must consider ways to minimise the risks brought on by a loss of rental income while maximising their earnings. According to Ekhlakov (2023), the essential instrument for striking this equilibrium will also hinge on the cost of rent over some time to offset the potential risks involved. In conclusion, most private accommodation providers fail to meet their short-term obligations without a guaranteed monthly income, which may significantly impact their rental margins.

Higher levels of perceived risk in the growing industry have brought uncertainties regarding both managing and owning private student accommodation properties in South Africa (Kele & Mzilen, 2021; Gbadegesin *et al.*, 2021). In this context, some private owners have not consistently weighed the risks against other general appealing attributes and returns associated with the industry. According to the Institute of Risk Management (2021), it is, crucial for property owners to consider risk and opportunity management as essential to maximise their potential to create value from the investment. Failure to

manage risks can prevent private student accommodation providers from realising performance objectives. It thus may ultimately result in diminished property value or losses. Risk management failures may also impact different stakeholders and result in the underdevelopment of the community where private student dwellings operate.

With NSFAS being the largest funder of private student accommodation, the Parliamentary Monitoring Group (2023) noted that the current low cap of R45 000.00 accommodation allowances will adversely impact the entire student accommodation industry. According to the University of Pretoria (2023), this adjustment from R60 000.00 will mean the financial burden will have to be carried by students already experiencing financial strains. Furthermore, the cap adjustment will negatively impact the liquidity of most private accommodation providers who rely on the fund to pay for the properties' mortgage bonds and service monthly utilities. Irregular cash flows may expose property owners to loss due to the inability to meet short-term obligations promptly and cost-effectively. Most owners consider liquidity risk as their primary obstacle resulting from cash inflows differing from expected monthly cash outflows such as bond repayments and other short-term obligations to sustain the private student accommodation. Therefore, while there are lucrative and higher rental income opportunities in managing private student accommodation, reliance on a single national funder, inconsistent cash flows, and hybrid learning models have brought new risks for private student accommodation providers.

Bloemfontein has been set as the study area and is at the hub of a student accommodation crisis in the Free State and hosts several major universities, including the University of the Free State (UFS), Central University of Technology (CUT), Motheo, and smaller private institutions. The UFS has a student population estimated at over 40 000 (Ackermann & Visser, 2016) and, like other colleges and institutions in the city, has been unable to meet student accommodation requirements over the past decade, providing fewer than 5 000 beds for more than 40 000 students. As a result, students have sought alternative accommodations within walking distance of the university. This growth in student enrolment in Bloemfontein has led to the growth of the private student accommodation industry, with neighbourhoods such as Brandwag and Universitas, which

were mainly single residential neighbourhoods, being rezoned to student houses. The proximity of these neighbourhoods has also led them to become popular and ideal locations for private student houses (Ackermann & Visser, 2016). Due to lucrative rental income per head and increased demand, most properties in Bloemfontein near the UFS and the CUT now operate as private student accommodations.

1.2 Problem Statement

Although there has been an increase in demand for private student accommodation, there has been an increasingly diminishing supply of sustainable private student accommodation within Bloemfontein. Private student accommodation providers have not expanded their property portfolios, citing cash flow and liquidity mismatches that hamper viability and profitability in the industry. Risk management aspects have also emerged from the absence of implementation of rental price models to determine risk premiums to rental rates, as most operators rely on NSFAS funding. As a result, many private student accommodation houses in Bloemfontein have been left to deteriorate as property investors fail to cope with systematic and unsystematic risks prevailing in the industry, with liquidity and operational risks at the forefront of their challenges. The study, therefore, seeks to create a sustainable risk management strategy to address the mismatch of why an increase in demand would result in a diminishing supply of off-campus private student accommodation.

1.3 Research Questions

- What are the risks prevalent for private student accommodation owners in Bloemfontein?
- What are the factors influencing the diminishing supply of private student accommodation in Bloemfontein?
- Why private student accommodation in Bloemfontein continue to remain unprofitable in the long term?
- What model could be used to assess the risks affecting private student accommodation providers?

1.4 Research Objectives

1.4.1 Primary Objective:

- To develop a risk management strategy to mitigate the risks associated with owning a private student accommodation property.

1.4.2 Secondary Objectives:

- To establish the prevalent risks for private student accommodation providers in Bloemfontein.
- To use the Fuzzy Inference Model to assess the risks and impact on private student accommodation providers.

1.5 Study Outline

The thesis is organised into five main chapters. The first chapter presents the background of the study as well as the reasons why managing risks associated with the private student accommodation industry is relevant. This background was used to create the problem statement, which helped the researcher define the study's objectives. Chapter 2 reviews the trends in the private student accommodation industry leading to the growth of the private student accommodation sector. After that, a discussion of the prevailing risks affecting the industry and how these risks can be mitigated theoretically. Chapter 3, the methodology discusses the Fuzzy Inference System and the data sources. The researcher's results and conclusions from the investigation are presented in Chapter 4. Finally, the summary and recommendations based on the research's findings are laid out in Chapter 5.

2.1 Introduction

Private student housing is a crucial component of university infrastructure and has attracted more institutional investor interest globally in recent years. According to Newell & Marzuki (2018), limited research has been done on risk management strategies for managing university student accommodation. According to Marzuki (2018), problems with student satisfaction have been the focus of most studies on private student housing. Ong *et al.*, (2013) assessed the significance of demand determinants for student housing in a US university setting, looking at student housing from a property perspective. The literature reviewed was identified from different sources that focused on private student accommodation trends, student housing satisfaction surveys conducted in Bloemfontein, and sources relating to risks associated with private student accommodation and how to manage them.

Most studies conducted in South Africa that assessed private student accommodation in higher learning institutions have paid more attention to student satisfaction and the increasing demand for student housing, with minimal research available on the risk factors private student accommodation owners face. For instance, most studies have assessed safety measures, transport challenges, students' preferences, and perspectives in relation to students' accommodation (Gopal & Van Niekerk, 2018; Edwards, 2019; Ofentse *et al.*, 2020). Others have focused on new models of rental housing development and the commodification of private student accommodation, as well as the need to rezone certain areas as drivers of urban change (Ackermann & Visser, 2016; Kinton *et al.*, 2018; Gregory & Rogerson, 2019; Todes & Robinson, 2020). There is less information on the risks of managing private student accommodation investments. Therefore, this study aims to understand such risks by highlighting the contemporary challenges and potential solutions for private students' accommodation in Bloemfontein, South Africa. A combination of risk management strategies relating to private student

accommodation had minimal coverage, with the closest papers focusing on a risk management analysis of the student hostel environment (Attakora-Amaniampong *et al.*, (2014) as well as a Market Assessment of the Student Housing Landscape in South Africa by the International Finance Corporation (2021). The literature reviewed intended to assess the significance of the risks affecting the performance of a student accommodation portfolio in Bloemfontein.

2.2 Significance of Private Student Accommodation

According to Marzuki (2018), private student accommodation has become necessary from a tertiary institution's infrastructure perspective. Traditionally, on-campus student accommodation has been provided by higher learning institutions and, in some cases, using accredited or verified professional student accommodation providers. Today, private investors, property trust funds and pension funds provide accommodation to meet shortfalls. The environment of university student housing has significantly changed in recent years in terms of participants and investors, and there is an increased emphasis on purpose-built student housing (PBSA, 2021).

2.2.1 Growth of the student accommodation industry

According to Gbadegesin (2022), there has been a global increase in student numbers over the past decades, with universities ill-equipped to cater for growth. South Africa is no exception and has over one million students registered across universities. The increase in enrolment at tertiary institutions has also resulted in a short supply of independent living at off-campus accommodation. The current shortfall of student accommodation at public and private tertiary institutions has created opportunities for private investors to invest in student accommodation, with over R32.6 billion allocated towards NSFAS for student accommodation allowances (National Treasury, 2022). The UFS, under study, was designed for 8 000 students but currently accommodates over 32,000 students. With over 42 000 students enrolled at the institution's main campus, over 10 000 students have failed to secure on-campus accommodation and rely solely on

private student accommodation providers (IFC, 2021). Gbadegesin (2022) shared more relevant literature on student satisfaction regarding on-campus and off-campus residence. The research showed that private student accommodation providers played an equal role as they accommodated similar enrolment numbers. However, an unanswered, worrying gap showed 78% of the student population at UFS without information about their place of residence.

2.3 Nature of Risks Associated with the Private Student Accommodation Industry

2.3.1 Definition of risk

According to Karimpour (2016), there are many ways to describe risk, but simply, it is the potential for loss arising in a project. Risk is typically understood as the prospect of suffering a loss or the possibility that the future may be better or worse than anticipated. Despite varying definitions, consistent aspects describe risk as an unpredictable situation or occurrence that, if occurring, could impact a project's circumstances, operations or goals. According to Weaver (2008), risk can also be considered potential loss from an unfavourable future event. A risk must have an unplanned impact, repercussions, losses or effects; its likelihood ranges from 0% to 100%. Thus, risk can be defined as underlying uncertainties in systems impacting project objectives and reducing success owing to unforeseen and unplanned probabilities and possibilities. It also elevates risk to a measurable factor by analysing probabilities and possibilities. Applying this probabilistic approach to risk assessment will also be helpful in this study.

Understanding risk in the student accommodation industry is fundamental for any business as it helps develop risk management. If this occurs, an uncertain event or condition will negatively impact objective achievement. Given that risk poses a significant danger to property investment, real estate investors should consider the potential for better-than-expected performance and downside risk. According to Attakora-Amaniampong *et al.* (2014), most research in the United Kingdom, parts of Canada and Ghana flagged management issues and know-how as the highest risk, with

environmental, inflation, legislative, liquidity, interest rate and financial risks also experienced. While this held true for established European markets, little data existed for South Africa. Limited research covered Bloemfontein's property market, the Free State's economic hub, prompting exploration of further literature regarding Bloemfontein's property market. While the need grows to address South Africa's student accommodation shortage, understanding industry risks grows for investors.

2.3.2 Liquidity risk arising from cash flow mismatch.

According to the Council of Europe Development Bank (2020), liquidity risk is the risk of suffering a loss due to an inability to make payments on time and in full as they become due. Most owners have often noted liquidity risk as their primary obstacle resulting from cash inflows, which differ from the expected monthly cash outflows such as servicing bond repayments and other short-term obligations to sustain private student accommodation. Therefore, whilst there are lucrative and higher rental income opportunities for managing private student accommodation, reliance on a single national funder, inconsistent cash flows and hybrid learning models have introduced new risks to the private student accommodation sector in South Africa.

2.3.3 Operational risk

According to Vicente (2023), operational risk is the possibility of suffering loss due to internal procedures, personnel, systems, or outside factors that could disrupt normal business operations. Losses can have a direct or indirect financial impact on the business. People risk is the first factor to consider, as most private student accommodation providers are homeowners who have since converted private properties into student accommodation facilities. With minimal industry knowledge, they are exposed to operational risk arising from insufficient internal processes and measures to manage cash flows and the inability to design rental premium models enabling effective cash flow management in the event of bursary disbursement delays.

Process risk is another risk factor to consider under operational risk. According to the Risk Management Initiative (2020), process risk refers to the possibility of monetary losses or poor social performance resulting from failed internal company procedures. For private student accommodation providers, this may include internal renovation and building management failures and challenges in rezoning their properties. Legal and compliance risks also arise as the industry grows; property owners must familiarize themselves with new bylaws and accreditation requirements established to preserve neighbourhoods near universities and set guidelines on operating such businesses. There is a growing need to further understand and manage the risks of owning private student accommodation property.

2.3.4 Financial and default risk

As with private property owners in Bloemfontein, they face financial risk from uncontrollable factors, especially from the students they service. For new entrants, new customers and improved occupancy may imply higher income; however, it also entails conducting first-time business with someone potentially lacking credit history, bearing significantly on debt servicing ability. While default risk may be a prime concern, most private accommodation providers accept minimal financing options in South Africa to fund private student accommodation projects. Track Capital (2022) states that most lending institutions consider it a high-risk asset class. Most private student accommodation providers are sole proprietors with minimal security who have converted private homes to meet growing private student accommodation needs.

2.3.5 Facility management risk

Orbitt (2020) notes that the demand for affordable student accommodation has brought high volatility in the market. Competition has resulted in demand for fully furnished and serviced units where students can seamlessly check in and out without buying or selling furniture, creating a greater need to safeguard occupancy levels and ensure adequate facilities management services retain the asset and installed appliance value like

microwaves and televisions. Established providers like CampusKey, Unilofts and Resrepublica have dedicated onsite property and facilities teams. However, many start-up property owners must manage and supervise independently. Whereas most accredited service providers maintain control over students' well-being through community guidelines, regular facility inspections are required to retain asset value over its life cycle—failure to do so results in dilapidated properties, utility mismanagement, and property valuation drops. With the growing number of students per bed, constant renovations and maintenance require adequate rental cash inflow or properties risk becoming dilapidated.

2.3.6 Default risk from NSFAS

Most property owners house students financed by NSFAS, as most come from disadvantaged families with poor credit and limited means to fund the university. The NSFAS allowance provides relief to many. Most property owners make agreements expecting NSFAS to settle student rentals; however, default risk arises as the allowance may fail to materialize, leaving students unable to meet debt obligations. Per the International Finance Corporation (2021), NSFAS provided approximately ZAR 28 billion to university students and ZAR 6.5 billion to Technical and Vocational Education and Training (TVET) college students. Nevertheless, uncertainty persists around NSFAS rental determinations as each university can charge applicable on-campus rates until private accommodation costs must not exceed (Western Cape Government, 2019).

2.3.7 Changes to funding allowances caps for NSFAS students and international student guidelines.

Any policy changes related to student funding can significantly impact private student accommodation providers, as NSFAS and the Treasury are the primary funders. With most students NSFAS-funded, changes to the government's budget allocation directly impact the Treasury's ability to allocate grants towards student accommodation. Another critical risk factor is changes to international student policies (Marzuki & Newell, 2018).

Alterations to visa requirements, tuition fees and grant policies could further dent industry performance. In the UK, Brexit implications for EU students and significant international student tuition fee increases in recent years (CBRE, 2016) demonstrate such policy impacts. For international students, currency fluctuations can also considerably affect university enrolment and, thus, international student numbers.

2.3.8 Management of risk

According to IBM (2023), the risk management process requires organizations to follow steps to identify, assess and control threats that may impact company strategy and intent. Risks or threats may arise from financial uncertainty, legal liabilities, strategic errors, accidents, and natural disasters. For private student accommodation providers, as depicted below, risk management is an iterative daily process due to the growing industry's constant changes.

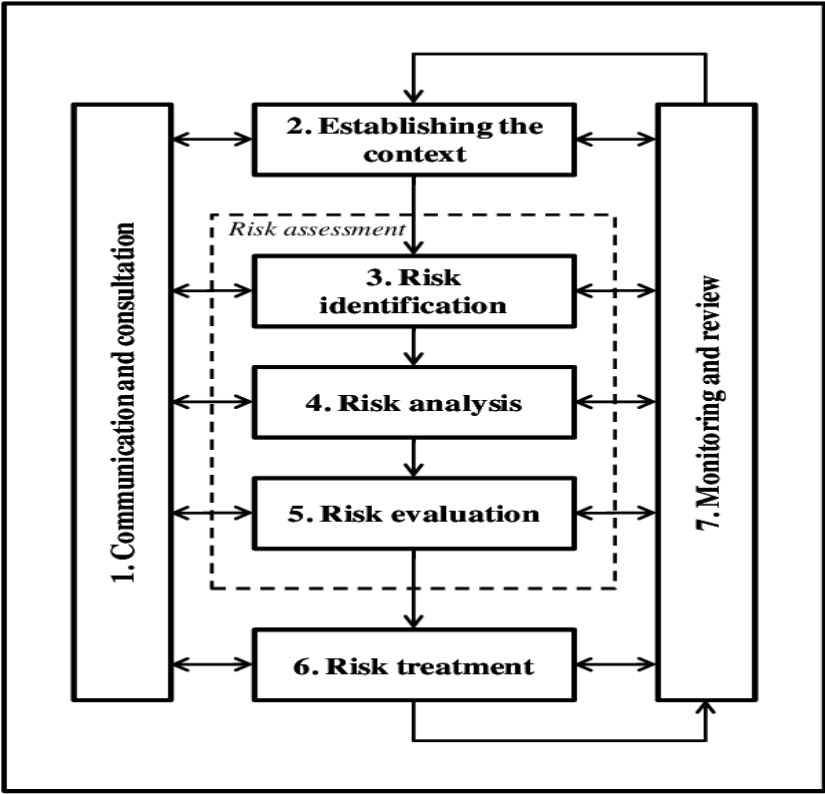


Figure 2.1: International Organization for Standardization (ISO) in ISO 31000 Risk Management--Principles and guidelines

Source: Oehmen et al., 2010

2.4 Model for risk assessment and management

Risks must be handled through a Risk Management Process to avoid unintended, undesirable impacts throughout projects and control risk levels (Naderi, 2008). Risk management procedures include phases, actions, and directions like risk sources and aspects. Commonly, risk management encompasses risk assessment, mitigation, acceptance, and communication (API, 2008). According to Darbra *et al.* (2008a), risk assessment is the most crucial risk management step, including hazard identification, frequency analysis and consequence appraisal. Pokoradi (2002) developed the initial risk assessment foundation using possibility approaches and fuzzy inference logic. Bowles and Pelaez (1995) pioneered the use of fuzzy arithmetic and linguistic variables for system reliability characterization in risk assessments.

2.4.1 The fuzzy inference model.

This research employs a Fuzzy Risk Assessment Model to quantify private student accommodation providers' risk exposure. Per Markowski *et al.* (2009b), fuzzy logic methods determine project safety while classical risk methods address safety absolutes. Fuzzy inference systems use human knowledge as fuzzy IF-THEN rules, making them knowledge or rule-based. Fuzzy system theory enables systematic knowledge base conversion into a non-linear mapping. Fuzzy logic systems have four components: fuzzy rule establishment, a fuzzy inference engine, a fuzzifier and a defuzzifier. Per Darbra *et al.* (2008a), fuzzy logic suits risk assessment and analysis by expressing outcome possibility, whereas traditional, classical methods estimate outcome likelihood. Blair *et al.* (2001) also stated fuzzy logic system input and output functions are determined by logical rule sets rather than equations, simplifying risk quantification. Risk assessment outputs are also easy to understand and precise, simplifying decision-making.

3.1 Introduction

The chapter firstly outlines the research design, which includes the study's methodology. The fuzzy model is discussed to determine the risks and risk factors for renting private student accommodation property. Thereafter, the epistemology of the study is discussed, followed by the presentation of the sampling technique, data collection method and ethical considerations. Lastly, the study area is discussed.

3.2 Research Design

The researcher will use a quantitative research method to conduct the study as there is a need to collect quantifiable data from respondents. This data will then be analysed using a Fuzzy Inference System, a fuzzy model that uses fuzzy rules to quantify and predict risk. Fuzzy inference systems use human knowledge as fuzzy IF-THEN rules, making them knowledge or rule-based. Fuzzy system theory enables systematic knowledge base conversion into a non-linear mapping. Fuzzy logic systems have four components: fuzzy rule establishment, a fuzzy inference engine, a fuzzifier and a defuzzifier. The research design will enable the researcher to establish prevailing risks, as well as the probability and impact of managing private student accommodation in Bloemfontein. The research design is suitable as the researcher will be able to gather quantifiable data from participants and then use statistical tools to analyse the information in an unbiased and objective manner. A fuzzy model tolerates imprecise data and ambiguous information collected from the questionnaire. The model uses a flexible structure to combine qualitative and quantitative information, making the results more objective and accurate to the field of study. With the research design, a higher sample size can be reached as there are no current and accurate trends on how many private student accommodation providers are operating within the radius of the university. Information will also be

collected faster through questionnaires, focusing solely on facts or series of information. Anonymity is crucial as it forms part of the research's ethical considerations.

3.2.1 Research methodology

The research methodology uses a Fuzzy Inference System (FIS) in MATLAB (R2023b maci64 version), to determine the risks associated with the industry. A FIS is a fuzzy model that employs fuzzy rules to generate predictions. The fuzzy rules are commonly expressed in an IF-THEN format, relating the fuzzy sets of inputs to the fuzzy sets of outputs. Fuzzy sets must be considered to develop a FIS for rental prices in student accommodation; for example, the location of the accommodation (e.g., Brandwag, Willows, Universitas), accommodation type, size (e.g. studio, one-bedroom, two-bedroom), and amenities (furnished, unfurnished, utilities included, parking). An FIS is also helpful as it determines risk and risk-forming factors in renting out as a private student accommodation provider. Within this study's framework, the model will be employed to develop an algorithm enabling landlords to establish price differentiation for students based on associated risk.

3.2.1.1 Fuzzy model for determining risk and risk factors for renting property private student accommodation.

The key risk for each landlord is a lack of stable rental income for each lease period due to tenant behavioural characteristics. According to Ekhlakov (2023), the risk probability can be defined based on the following tenant parameters: reliability, solvency, conflict potential, legality of stay, and interest in the long-term lease. Ekhlakov (2023) states that the fuzzy model seeks to quantify risk-forming factors (probability of presence) using Mamdani's fuzzy inference algorithm. In cases where reliable statistical data about the enterprise is unavailable or when risks cannot be expressed quantitatively (e.g., interaction experience), the characteristics of risk factors are formed by surveying a large number of experts who use both qualitative and quantitative scales for evaluation. However, in certain situations, the expert may be unable to distinguish precisely between

chosen qualitative assessments, resulting in overlap between quantitative assessment scales.

The input and output values of the model are formulated as fuzzy variables. A fuzzy variable is a tuple of the form $\langle \alpha, X, A \rangle$, where α is the name of a fuzzy variable, X is the area in which the fuzzy variable is defined, and A is a fuzzy set on the universal X . A linguistic variable is the tuple $\langle \alpha, T, X, M \rangle$, where α is the name of a linguistic variable, T is a set of values (terms) of a linguistic variable, X is a universe of fuzzy variables, and M is a semantic procedure that forms fuzzy sets for each term of a given linguistic variable. A fuzzy statement is formulated as follows: “the name of a linguistic variable” is “one of the terms used within the universe”.

Given the above definitions, the output variables of the model are defined as $SP_{er} + SP_{ef} + SP_{lp}$ (the sought coefficients of the risk surcharge), which can be explained in the following form.

Assessing the likelihood that risk factors will manifest - defaults on payments, property damage, and late payments”; $x | 0 < x < 1$; $A = \{x, (x)\}_i$; R —the probability of manifestation of risk-forming factors of “default”, “repairs”, and “late payments”; TR —{“Slow”, “Medium-Slow”, “Medium”, “High”, “Maximum”}; $X_1 = [0; 1]$; M_1 —setting procedure on the universal $X = [0; 1]$ values of a linguistic variable, i.e., terms from the set TR .

3.2.1.2 Fuzzy methodology steps

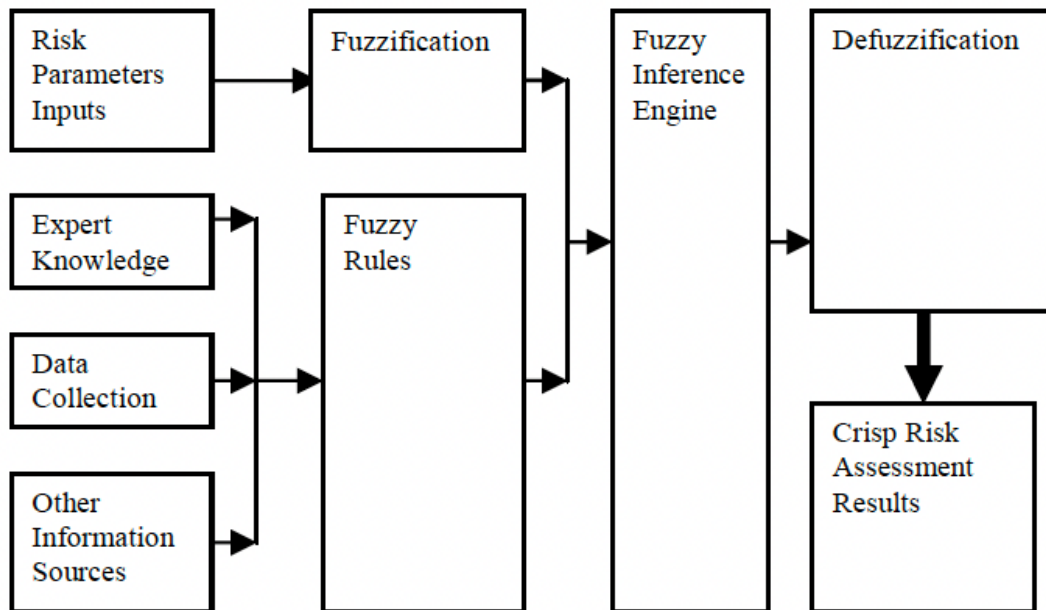


Figure 3.1: The model for risk assessment using the fuzzy logic approach.

Source: Bukh and Dickstein (2010)

From the questionnaire, set variables were considered and integrated into the Fuzzy Model using MATLAB to assess the identified risks:

- **IF** the property owner has minimal property management experience, risk expertise and business model (sole proprietor, company, partnership), **THEN** the risk exposure is high.
- **IF** the location, financing (mortgaged/fully paid), or accreditation status of the property, **THEN** the rental price is high.
- **IF** the units are above a set square meterage, or the size of the accommodation (e.g. studio, one-bedroom, two-bedroom), and the amenities included (furnished, unfurnished, utilities included, parking) **THEN** this will have a positive influence on tenant behaviour and influence payment trends.
- **IF** the rental pricing includes premiums for bursary students, late penalty fees and interest **THEN** the risk factors are minimal.

- **IF** lease terms and nature of lease agreements factor identified risks, **THEN** the risk exposure is low.
- **IF** property management systems are used to manage cash flows, facilities, and debtors, **THEN** the risk is low, and the price may be high to sustain the business model.

Tenant traits to be included in determining the risk premium.

- **IF** the tenant is a bursary student, **THEN** the rental is high, or **IF** the student is a full-paying student who pays in advance, **THEN** chance of default is low.
- Student demographics: How gender, age, and level of education (undergraduate or postgraduate) influences their payment behaviour and upkeep of the property.

Among the key reasons for using the model was to assist private landlords in establishing a sustainable rental risk premium to help manage risks associated with default, damages to the property, liquidity issues, and cash flow challenges arising from late rental payments during the lease period. The questionnaire was designed to identify payment characteristics, certain behavioural factors, and risk probabilities, which were also considered in the Fuzzy Algorithm to determine rent.

3.3 Epistemology

A quantitative research method and the Fuzzy Model are used to determine the risk to off-campus accommodation rentals and explain theoretical assertions concerning risk management. The research design will enable the researcher to collect data that will help quantify the risks; the analysis will assess numeric values to help assess the risk level and potential losses. With the research design, the researcher can clearly distinguish elements such as threat frequency and the level of uncertainty to be managed. Qualitative risk analysis was not considered for the research as it tends to be scenario-based and subjective. Limitations to the Fuzzy Model, relate to setting accurate fuzzy guidelines, if the data is imprecise then the user will not be able to infer the knowledge. To mitigate this affecting the results, MATLAB was used to do numerical computation, data visualisation

as well as to develop an algorithm. However despite MATLAB having the above competitive advantages its main limitation was in relation to licensing to be able to utilise the fully functionality.

3.4 Sampling

The study location will focus on private student accommodation in Universitas, Brandwag and Willows areas, where most private student accommodation establishments are domiciled in Bloemfontein. The UFS and CUT databases currently show over 200 registered providers; however, neither institution could confirm the validity in terms of the actual population size. No current and actual statistics are available on the population size of private student accommodation providers as most service providers are not registered on the UFS database. For the research, probability sampling techniques will be applied to the population under study.

3.4.1 Probability sampling

Probability sampling will be used whereby the researcher will set out simple random sampling selection criteria and then randomly choose private student accommodation property owners from the population. The sampling technique was selected as it has a higher level of reliability to the research as well as being accurate for a sampling error estimation. The sample population has an equal chance, thus minimizing bias. Compared to non-random sampling techniques, a simple random sample will be used to represent the population size. The technique will also provide a more accurate assumption from the sample of private student accommodation providers under investigation. According to the UFS website, the list of private service providers is not up to date, so the researcher will have to rely on private student accommodation associations for members to participate in the research freely. However, limitations to using probability sampling is the higher cost of developing such a sample as the UFS had accredited 4 478 off-campus private accommodation beds in 2022.

3.5 Data Collection Method

The researcher will use questionnaires as the primary data collection strategy. The focus will be private student accommodation providers operating within the Universitas, Brandwag, and Willows areas surrounding Bloemfontein's main UFS and CUT campuses.

The study will examine:

- Inception of risk assumptions, established through questionnaires.
- Diagnosis of risks, based on data collected through questionnaires and observations.
- Solutions and recommendations to mitigate risks.

Data collection tools:

- Questionnaires completed by private student accommodation owners in Bloemfontein.
- Self-administered questionnaires comprising open- and closed-ended questions. These will be emailed to the target population with hard copies printed where needed to establish risks faced by providers and elicit detailed explanations to inform recommendations.

3.6 Data Analysis

Statistical techniques and methodologies relating to descriptive statistics and empirical models will be utilised to achieve the research objective. Descriptive statistics will be analysed using Statistical Package for Social Sciences (SPSS) computer software, while the empirical model will be implemented in MATLAB Fuzzy Logic Toolbox. MATLAB provided a comprehensive set of tools for data visualization and plotting which would be beneficial in providing clearer data analysis for the researcher. Its rich plotting capabilities allowed the researcher to create a variety of 2D and 3D plots, customise visualisations, and add interactive elements. This facilitated the clear and concise representation of data, aiding in data analysis and result communication.

3.7 Ethical Considerations

The research will adhere to ethical considerations, guidelines, norms of acceptable behaviour, and data privacy regulations for quantitative research. According to Franco (2021), objectivity and analytical transparency are required when presenting any information to ensure that results are not misleading. Bell & Bryman (2007) assert that studies must involve voluntary participation, and participants must not be misled. Kaiser (2019) states that academic values seeking true knowledge, honesty, and integrity protection should be considered and applied in research. Information received from participants will be treated confidentially, and individual anonymity protected. The private student accommodation provider's name was withheld; instead, it was referred to as "a private student accommodation" to preserve anonymity. Participants' privacy will not be invaded, and each respondent will be treated sensitively. The questionnaire will be submitted for ethical clearance from the UFS Ethics Committee. According to Bryman and Bell (2007), the above can be achieved by allowing participants to withdraw and ensuring participation remains voluntary.

3.8 Demarcation of the Study

The study falls within the academic discipline of risk management and focuses on establishing sustainable risk management strategies for private student accommodation providers in Bloemfontein. Individually owned private student accommodation establishments and established accredited student housing service providers were considered for the study. The target population comprises private student accommodation providers within the suburbs of Universitas, Brandwag and Willows, where most off-campus private student accommodation establishments are located, given their proximity to the University of the Free State (UFS). As shown in Figure 3, Universitas has the most significant residential capacity, while Brandwag and Willows have smaller capacities. The researcher can access the respondents (private student accommodation providers) via e-mail and telephone to schedule meetings, as their contact information is publicly

available and includes the university website's list of accredited providers and platforms for private student accommodation associations.

Figure 3: Suburbs surrounding UFS that meet the private student accommodation radius determined by the Minister of Education.

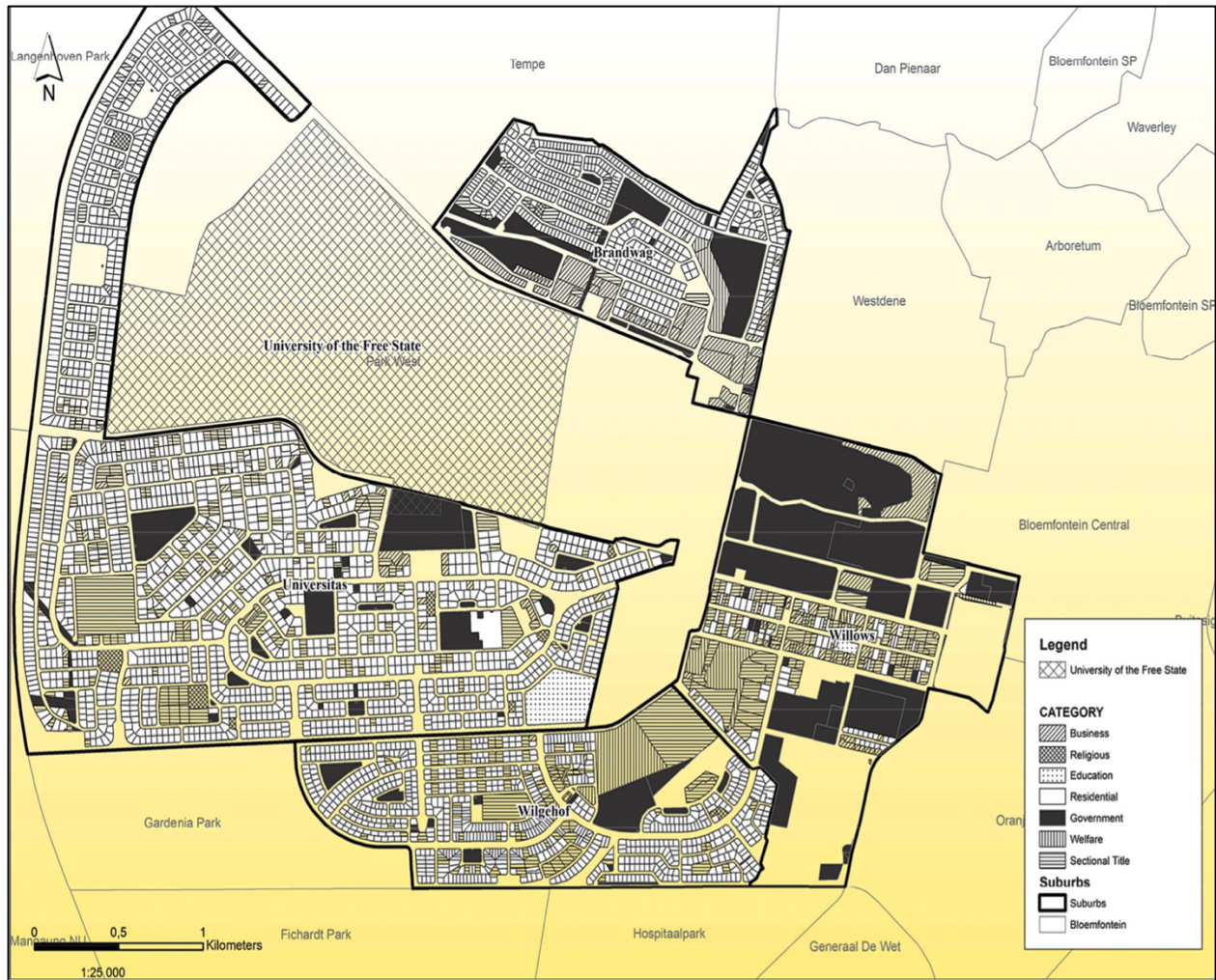


Figure 3.2: Suburbs surrounding UFS that meet the private student accommodation radius determined by the Minister of education.

Source: Donaldson et al., 2014

Using the 2022 specifications for on-campus student accommodation, the Minister of Education, in conjunction with the NSFAS task team, noted that housing sites must be within a radius of no more than 20 kilometres of the university campus. If there are new university-owned or rented student residences being developed outside of this radius, they must be submitted to the DHET for approval. Private sector stakeholders indicated

that this restriction could limit new development and could stand to be revisited, especially given the location of many campuses within densely built-up urban areas with limited available land for development, as portrayed in Figure 3.

CHAPTER 4: DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

Chapter 4 presents an analysis and interpretation of the study results. It begins by discussing the data collection response rate. Then, it analyses and interprets the demographic data. Lastly, it analyses and interprets the risk assessment data and provides results from the fuzzy inference model.

4.2 Response Rate

A total of 120 questionnaires were randomly distributed to private student accommodation providers in Bloemfontein who own properties in Universitas, Willows and Brandwag, of which 73 were returned. Of these, 69 respondents were included in the analysis as four questionnaires were incomplete, representing a satisfactory response rate of 57.5%.

4.3 Analysis and Interpretation of Biographical Data

This section describes respondents' demographic factors, including business type, property type, proximity to the university, and accommodation accreditation status. This information was collected to establish connections between property location, ownership, accreditation status, and risks associated with Bloemfontein's private student accommodation providers. Determining if risks associated with accreditation status, as unaccredited providers, may not meet minimum requirements or comply with regulations was of interest. **IF-THEN** rules considered qualitative aspects like likelihood and impact. From the rules and results the researcher could establish the implications of each rule on the risk factors affecting private student accommodation providers.

- **Location of private student accommodation**

Table 4.1 presents the distribution of private student accommodation across the three focus areas, showing the frequency and percentage for each location.

Table 4.1: Location of private student accommodation

Location	Frequency	Percent
Willows	7	10.2
Brandwag	13	18.8
Universitas	49	71.0
Total	69	100

Source: Field survey

Table 4.1 shows that most (71%) of private student accommodation is in Universitas. This spatial distribution can be attributed to Universitas still being considered a single residential neighbourhood with larger and more spacious properties that allow owners to maximize square meterage fully. Universitas properties additionally conform to the minimum design of residence expectations, which included a maximum of two students per room, with a minimum size of 8 sqm and 14 sqm for single and double rooms, respectively, at least one water basin per four students, a shower cubicle per seven students and one lavatory for every five students. Moreover, a minimum of 1.5 sqm per student for the first 100 students and 1 sqm per student thereafter is mandated for communal spaces. The larger property sizes in Universitas enable private student accommodation owners to house more students, as size is a critical factor influencing development costs - generally, the larger the building or development, the lower the cost per bed.

While the above holds true that most private student accommodation residences are in Universitas, there are still several properties in Brandwag. However, they are older structures with smaller ERF sizes, which has confined most property owners to consider limited space for expansion. Thus, most houses have since been converted to offices. Besides the densely built-up structures, several small businesses and government facilities, such as schools and hospitals, are also found in Willows. With the increase in demand for space in Universitas and also within a 1-2 km radius, spaces in the area have become high-demand prime locations where smaller private student accommodation providers have to compete with premium established organizations like CampusKey,

Unilofts, and Resrepublica. Property prices in the area range from R 1.5 million to R6 million, translating to bond repayments in the region of R 13 000 - R 60 000.

It also proved an essential factor, as bond repayments must align with rental income, and higher repo rates had to correlate with incremental rental margins.

- **Type of property**

Figure 4.1 shows that private student accommodation is mostly in the form of houses, which are mainly situated in Universitas. Of the 69 respondents, 43 (62%) comprise houses, while 22 (32%) are flats. Only 4 (6%) of the total private accommodation was indicated to be townhouses. Respondents indicated no block of flats.

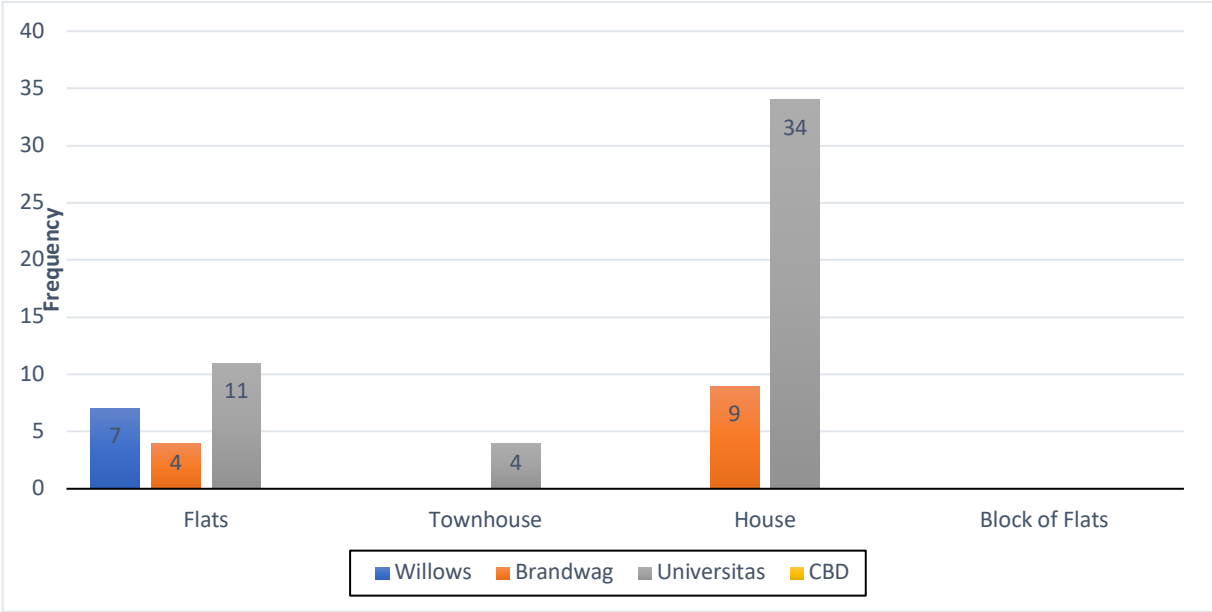


Figure 4.1: Student accommodation property types available in each location

Source: Field Survey

Most student houses in Universitas were formerly large family homes, which offer owners room to house many students and maximize returns, in contrast to flats and townhouses. Unlike Universitas and Brandwag, most homes in Willows are flats in an apartment block setup, which explains why only flats were indicated as the type of private student accommodation available in Willows.

- **Nature of business**

Table 4.2 indicates that 73.9% of private student accommodation is operated as a sole proprietorship. Only 17.4% and 8.7% are operated by a company or partnership. The prevalence of sole proprietorships in private student accommodation can be attributed to their easy formation and minimum registration requirements. Respondents also indicated that the properties were a second income source. Evidence from the study highlighted that about 87% of providers invested in student housing to earn an income subsidy. Sole proprietorships also provide higher returns. Respondents noted challenges in obtaining financing for start-ups, as most operated for less than five years, so they opted to purchase properties personally based on affordability.

Table 4.2: Nature of business

Ownership	Frequency	Percent
Sole proprietorship	51	73.9
Partnership	6	8.7
Company	12	17.4
Total	69	100

Source: Field Survey

- **Ownership**

Table 4.3 indicates that most (92.8%) private student accommodation is financed through debt. Respondents noted facing challenges to finance properties beyond debt financing. Most individuals also elected to purchase via debt instruments due to the nature of South Africa's economy. The ownership status also introduced elements of uncertainty relating to interest rates and future debt instruments for the South African property industry.

Table 4.3: Ownership of private student accommodation

Ownership	Frequency	Percent
Bond	64	92.8
Paid	4	5.8
Family Trust	1	1.4
Total	69	100

Source: Field Survey

- **Years of operation**

Due to expanded enrolment capacities in South African universities meeting rising higher education demand, the need for private student housing has grown. As Figure 4.2 shows, 42% of private accommodations have operated for 0-2 years and 42% for 2-5 years (Du Plessis *et al.*, 2022). Only 13% and 3% of private student accommodation highlighted operating for 5-10 years and over ten years, respectively. The lower percentages of longer-term operations can be attributed to on-campus accommodation previously housing most students but failing to meet increased enrolment. Years of operation also influenced the ability of the service providers to mitigate any operational risks that they would encounter.

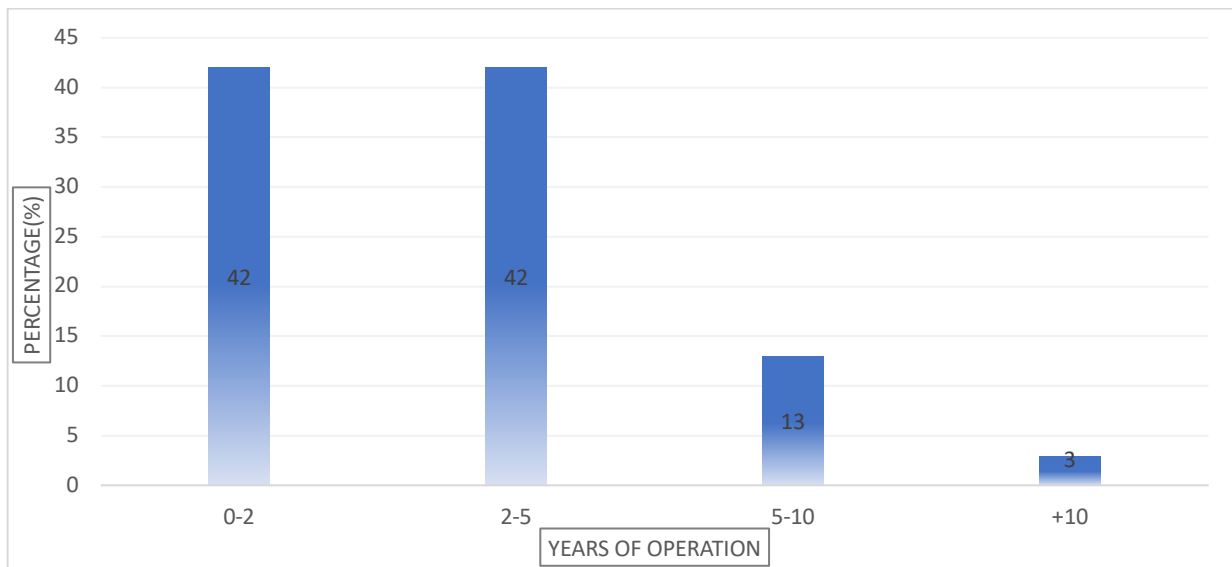


Figure 4.2: Years of private student accommodation operation

Source: Field Survey

- **Proximity**

Proximity is a crucial factor students consider when securing off-campus accommodation. Most (89.9%) private accommodations are within 2km of the universities they target, with only 10.1% within 2-5km. Despite the convenient proximity, only 7% of respondents offer transport to tenants. This also influenced the cap to which landlords could charge a rental premium and limited on their profitability.

Table 4.4: Proximity of student accommodation from universities

Proximity (km)	Frequency	Percent
0-2	62	89.9
2-5	7	10.1
5-10	0	0
Total	69	100

Source: Field Survey

- **Accreditation status**

Student accommodation accreditation was recently introduced to ensure that private accommodations meet student living standards. While each university has its process, NSFAS only provides allowances for accredited accommodation. The survey shows that most (92.8%) private student accommodation is accredited by the UFS, CUT, or both.

Table 4.5: Accreditation status of private student accommodation with universities

Accreditation status	Frequency	Percent
Yes	64	92.8
No	5	7.2
Total	69	100

Source: Field Survey

- **Total tenants**

Considering most private student accommodation comprises houses, 62.3% of respondents indicated a capacity of 11-20 students (Table 4.5). Respondents with 1-5 student capacity (23.2%) mainly own flats. Capacity differences would later influence risk versus portfolio size.

Table 4.6: Total number of tenants

	Frequency	Percent
1-5	16	23.2
6-10	8	11.6
11-20	43	62.3

+20	2	2.9
Total	69	100

Source: Field Survey

- **Rental amount**

Table 4.2 indicates the rental amounts charged for private student accommodation. Most (81.2%) of respondents charged a rental between R3 000 and R5 000. This rental range was mainly applicable to houses. The rental amount of up to R2 999 (18.8%) mainly applied to flats and shared accommodation.

Table 4.7: Rental Price

Rental (R)	Frequency	Percent
Up to 2999	13	18.8
3000-5000	56	81.2
5000+	0	0
Total	69	100

Source: Field Survey

About 83% of private student accommodation providers indicated that water and electricity costs are included in the rental amount. Approximately 65% of respondents indicated that the rental amount also includes extras such as DSTV, uncapped Wi-Fi, and laundry facilities.

Reliance on financial support for private accommodation rentals has increased over the years, as evident with the increased budget for private accommodation funding by the NSFAS (National Student Financial Aid Scheme). The survey shows that about 81.2% of respondents indicated that at least 60% of their students were funded by bursaries, mainly through NSFAS. While NSFAS is the largest funder of student accommodation in South Africa, it comes with both benefits and drawbacks. With government funding through NSFAS, the chance of default is minimal. However, the main risk is cash flow challenges from when the lease is signed to when the bursary pays out. The results also show that approximately 70% of respondents with NSFAS-funded students highlighted that the bursary amount was insufficient to cover the entire rental, as a total rental amount is still charged for these students. Students need to make monthly top-ups to cover the shortfall,

which could increase the chances of default for students solely reliant on bursaries for income. All respondents (100%) indicated that they allowed such students, as well as cash-paying students, to make payment arrangements.

- **Main expenses**

Table 4.7 shows that 87% of respondents indicated that interest on bond repayments constituted the main expense. Interest rate increases by the Reserve Bank have been a leading contributor, forcing private student accommodation providers to incur further expenses even after a fixed-term lease has already been signed. The increasing trend in interest rates currently being experienced in South Africa presents further uncertainty regarding the viability and sustainability of the industry.

Table 4.8: Main expense

Ownership	Frequency	Percent
Interest on Bond Repayment	60	87
Municipal	9	13
Operational	0	0
Maintenance	0	0
Total	69	100

Source: Field Survey

- **Student gender, age, and year of study**

Regarding the gender of students residing in private student accommodation, approximately 70% of respondents indicated that their tenants were primarily female, while 30% had mostly male students. This gender distribution is expected given that most students enrolling in South African higher education institutions are female. Table 4.9 shows the age range of students residing in private student accommodation from the survey.

Table 4.9: Student age

Ownership	Frequency	Percent
18-20	44	63.8
21-24	20	29
26-30	4	5.8
30+	1	1.4
Total	69	100

Source: Field Survey

Table 4.9 shows that most students (63.9%) in private accommodations are 18-20 years old, and 29% are 21-24, aligning with higher education enrolment in South Africa. Of these students, approximately 65% study towards bachelor's degrees, 25% honours, and 10% master's degrees (North West University, 2023).

- **Property management**

Table 4.10 indicates property management trends. 69% of respondents noted not managing the properties full-time, with only 40% having a dedicated full-time management team for property management, repairs, and maintenance. Concerningly, only 10% conducted tenant background checks, which is also related to why most landlords cited high default rates among full-paying students.

Table 4.10: Property management trends

	Manage fulltime		Active management team		Property management system		Background Checks	
	Freq	%	Freq	%	Freq	%	Freq	%
Yes	21	30.4	28	40.6	29	42	7	10.1
No	48	69.6	41	59.4	40	58	62	89.9
Total	69	100	69	100	69	100		100

Source: Field Survey

4.4 Analysis and interpretation of the risk assessment data

4.4.1 Prevalent risks for private student accommodation providers in Bloemfontein.

The risk rating matrix below shows event probability, impact, and severity/consequences for the most identified risks requiring strategic decisions based on risk impact. For instance, low-risk aspects like university date changes were considered acceptable, while intolerable risks ranged from NSFAS payment defaults to interest rate risks.

Table 4.11: Risk Rating Matrix

RISK RATING KEY			
LOW	MEDIUM	HIGH	EXTREME
0 - ACCEPTABLE	1 - AS LOW AS REASONABLY PRACTICEABLE	2 - GENERALLY UNACCEPTABLE	3 - INTOLERABLE
OK TO PROCEED	TAKE MITIGATION EFFORTS	SEEK SUPPORT	PLACE EVENT ON HOLD

		SEVERITY			
		ACCEPTABLE LITTLE TO NO EFFECT ON EVENT	TOLERABLE EFFECTS ARE FELT, BUT NOT CRITICAL TO OUTCOME	UNDESIRABLE SERIOUS IMPACT TO THE COURSE OF ACTION AND OUTCOME	INTOLERABLE COULD RESULT IN DISASTER
LIKELIHOOD	IMPROBABLE RISK IS UNLIKELY TO OCCUR	LOW - Transport requirements for all off campus -	MEDIUM - Online Learning-	MEDIUM - Changes in Zoning Requirements -	HIGH - NSFAS Default in Payment -
	POSSIBLE RISK WILL LIKELY OCCUR	LOW - Changes to semester dates-	MEDIUM - Student Behaviour -	HIGH - Student Default Payments -	EXTREME - Liquidity Risk -
	PROBABLE RISK WILL OCCUR	MEDIUM - New Competitors -	HIGH - Maintenance Student Damages -	HIGH - Increase in Municipal Tariffs-	EXTREME - interest Rate Risk -

Source: Field Survey

From the results obtained, most risks were financial, with 90% indicating that interest rate risks were the most common uncertainties which severely affected their operations. A rental pricing model is required to factor in any delay in rental payment by bursaries as

the majority of NSFAS payments take between 1-6 months before they are processed to the landlord; the delay in payment also entails that the landlords stand to lose the time value of money due to the delay.

4.4.2 Fuzzy Inference Model to develop a risk management strategy for private student accommodation providers.

Figure 4.3 are results from a Fuzzy Logic Inference System run in MATLAB R2023b where qualitative and quantitative variables were captured as inputs into the fuzzy logic system.

Rules: Industry knowledge and years' experience

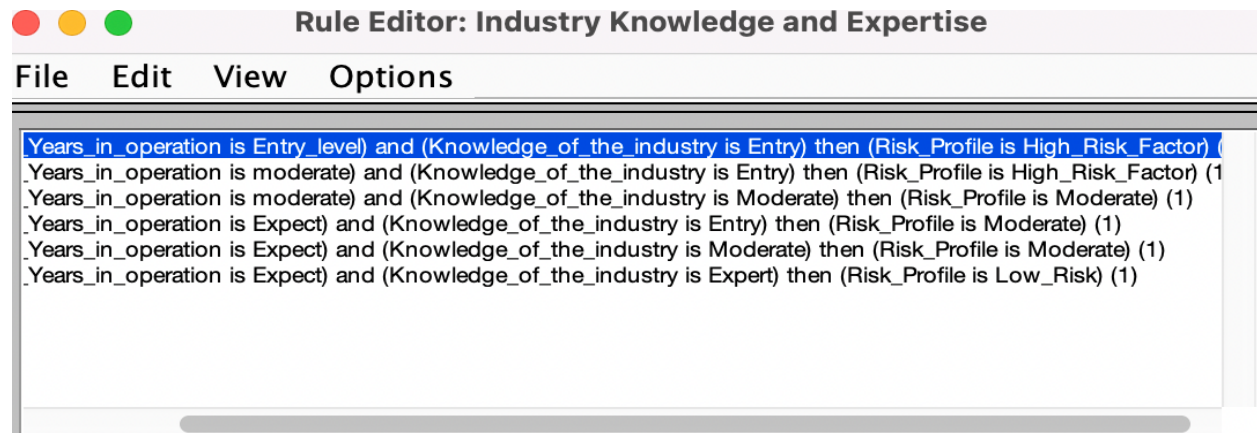


Figure 4.3: Industry Knowledge and Expertise

[Input1]

Name='Number_of_Years_in_operation'

Range=[0 10]

NumMFs=3

MF1='Entry_level':gaussmf,[1.77 -0.08327]

MF2='moderate':gaussmf,[1.77 3]

MF3='Expect':pimf,[5.596 10.72 39.18 44.3]

[Input2]

Name='Knowledge_of_the_industry'

Range=[0 1]

NumMFs=3

MF1='Entry':'gbellmf',[0.2083 3.125 0]

MF2='Moderate':'gbellmf',[0.2083 2.5 0.5]

MF3='Expert':'gbellmf',[0.2083 2.5 1]

By factoring input indicators relating to knowledge of the industry, number of years in operation the following rules were set in the fuzzy logic system and represented by three fuzzy membership functions: “Low“, “Middle“, and “High”. The input variables are assessed in the interval [0, 10] using trapezoid membership functions. The fuzzy logic system output (complex risk assessment) is described by three fuzzy membership functions: “Low Impact”, “Moderate” and “High Risk Factor”. The risk is assessed in the interval [0, 10] using triangular membership functions. The input and output membership functions are shown below.

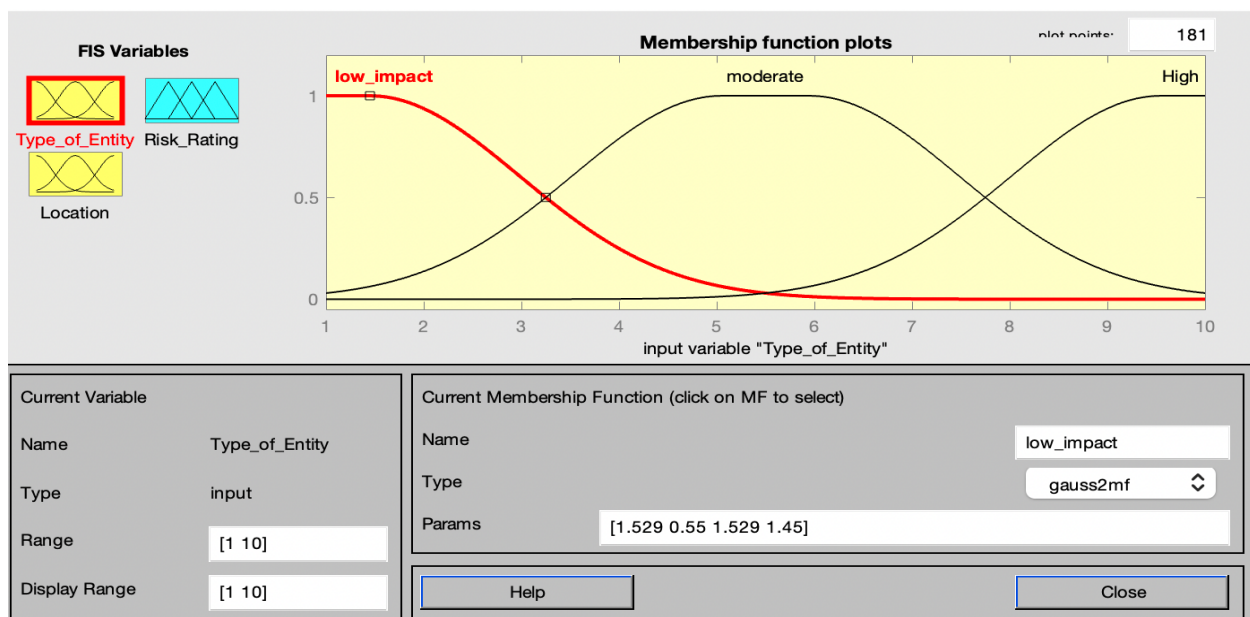


Figure 4.4: Membership function plot

Name='Industry Knowledge and Expertise'

[Output1]

Name='Risk Profile'

Range=[0 10]

NumMFs=3

MF1='High_Risk_Factor': 'trimf', [-4.167 0 4.167]

MF2='Moderate': 'trimf', [0.8333 5 9.167]

MF3='Low_Risk': 'trimf', [5.833 10 14.17]

[Rules]

1 1, 1 (1) : 1

2 1, 1 (1) : 1

2 2, 2 (1) : 1

3 1, 2 (1) : 1

3 2, 2 (1) : 1

3 3, 3 (1) : 1

After running the inputs in the Fuzzy logic inference system, the Risk Profile is shown as the output;

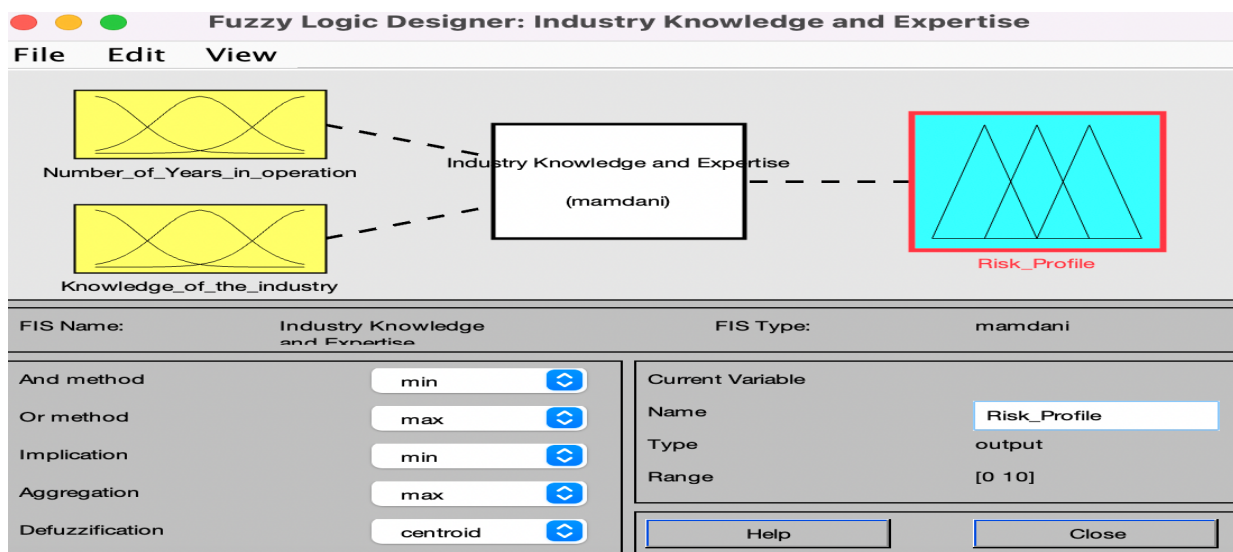


Figure 4.5: Fuzzy inference on industry knowledge and expertise

The below results show that operators with a low number of years operating in the industry also had moderate understanding of the risks, regulatory environment and where exposed to a greater number of risks.

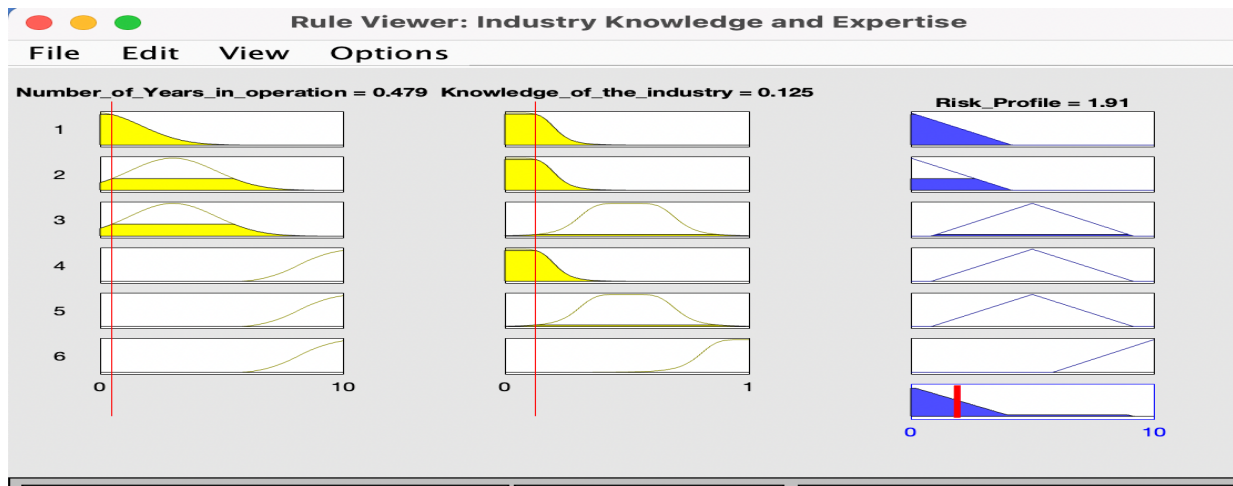


Figure 4.6: Fuzzy Rule Viewer on industry knowledge and expertise

The results depicted in the Table 4.7, show that private student accommodation providers in operation for less than 5 years who also showed minimal knowledge to the industry from the Likert Scale questionnaire where highly exposed to a greater number of risks relating to operational, financial and regulatory requirements. Findings also show a positive correlation between knowledge of the risks inherent to the industry based on the number of years in operations which then better equipped private student accommodation providers on strategic action plans to mitigate the risks.

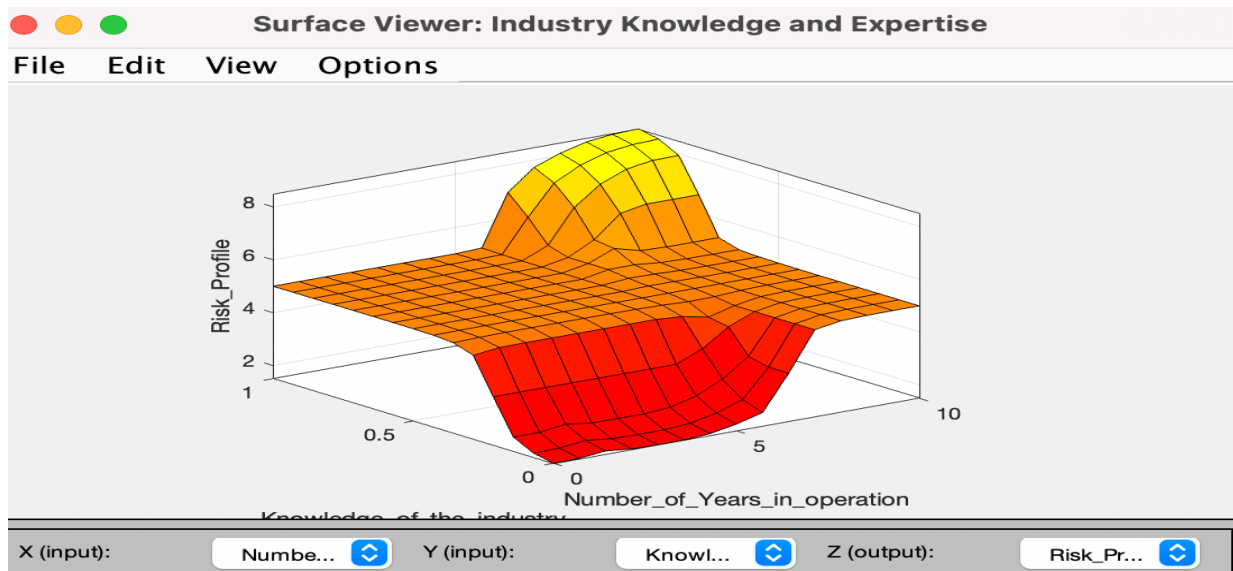


Figure 4.7: Fuzzy inference surface viewer on industry knowledge and expertise

The second set of Fuzzy Rules applied 4 Input functions: the Rental Amount paid by the students, Occupancy Levels, Expenses incurred per student and Cash inflows.

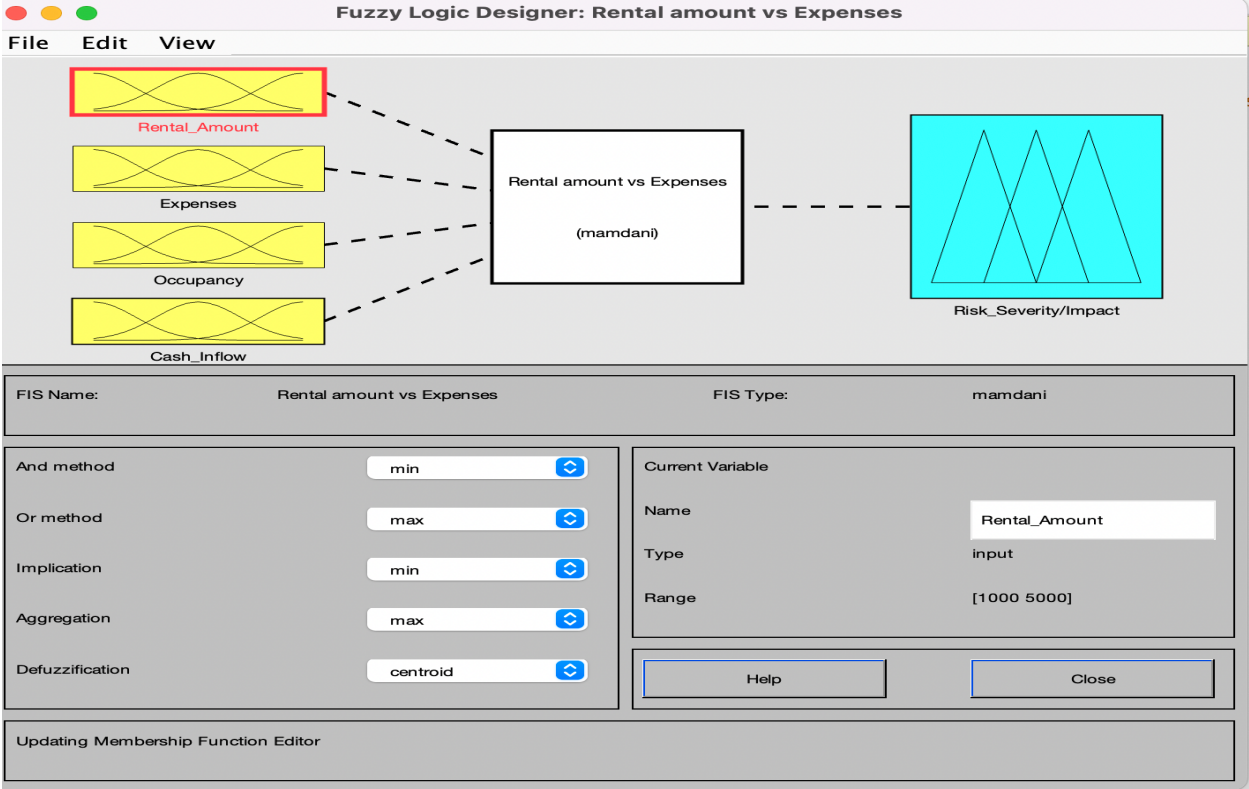


Figure 4.8: Fuzzy logic designer on rental income and expenses

The Fuzzy rules for the risk elements and levels of risk (low, moderate, and high) were used. The fuzzy logic system output (complex risk assessment) is described by three fuzzy membership functions: “Low Impact”, “Moderate” and “High Risk Factor”. The risk is assessed in the interval [0, 10] using triangular membership functions. The fuzzy logic system used the Mamdani technique, and the rules were defined as shown below.

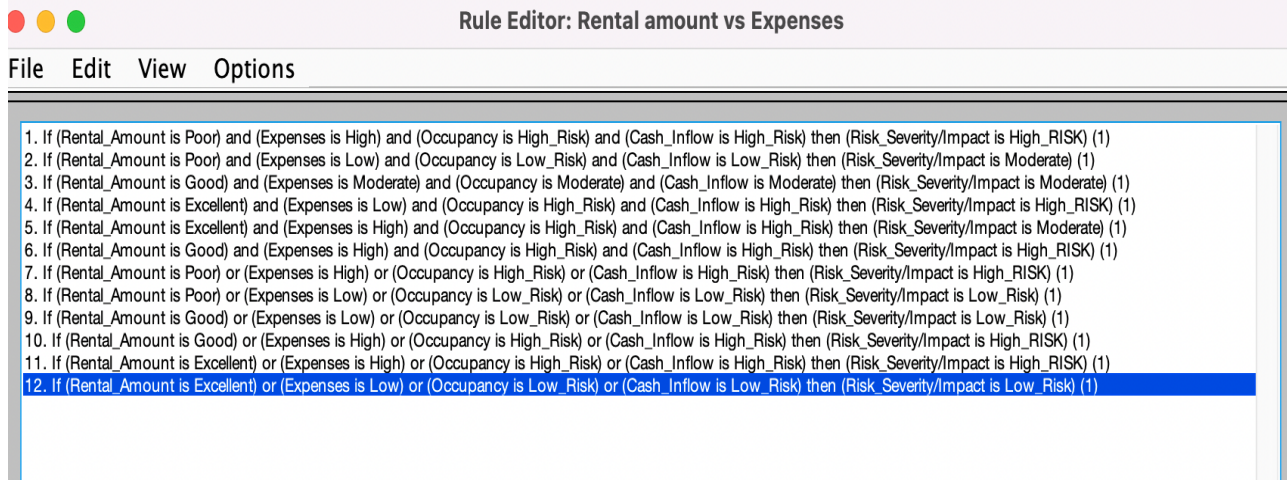


Figure 4.9: Fuzzy rules on rental income and expenses

Rules set to the rental income vs expenses incurred by private student accommodation providers.

The four Input functions included in the model were derived from the major risks inherent to private student accommodation providers in Bloemfontein. The following input functions were considered, the Rental Amount paid by the students in relation to the Expenses incurred per student, the Occupancy Levels, as well as the Cashflows considering when the landlord would also receive their payment in a 12 month period.



Figure 4.10: Fuzzy rule viewer on rental income and expenses

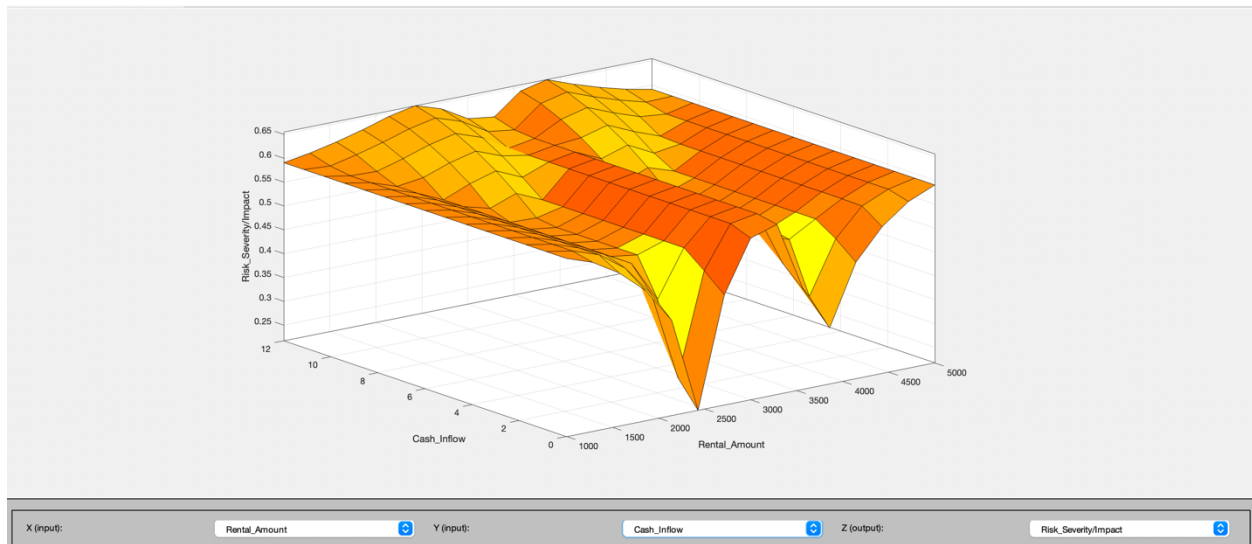


Figure 4.11: Fuzzy output on rental income and expenses

From the results in Figure 4.11, any rental payments within 2 months posed minimal to low risks for private student accommodation providers, with some indicating that they received in certain instances advance payments for up to 5 months hence $MF1='Low_Risk':\text{'trimf'},[-5\ 0\ 2]$

There was moderate cash and liquidity risk for payments within the period category of $MF2='Moderate':\text{'trimf'},[1\ 3\ 6]$.

$MF3='High_Risk':\text{'trimf'},[6\ 12\ 18]$ posed high risk as it would adversely influence the ability of private student accommodation providers the ability to service most of their bond repayments as well as the ability to service short to medium term obligations.

The output based on severity shows that there was minimal to low risk in the region $MF1='Low_Risk':\text{'gauss2mf'},[0.09684\ 0.0337\ 0.02684\ 0.0437]$ and Moderate risk for $MF2='Moderate':\text{'gaussmf'},[0.1769\ 0.2]$ and $MF3='High_RISK':\text{'gaussmf'},[0.469\ 1]$ $M3 = High\ Risk$, posed high risk and severe consequences severe should there be a delay in rental payments.

Figure 4.12 below compared Input functions relating to occupancy and cash inflow.

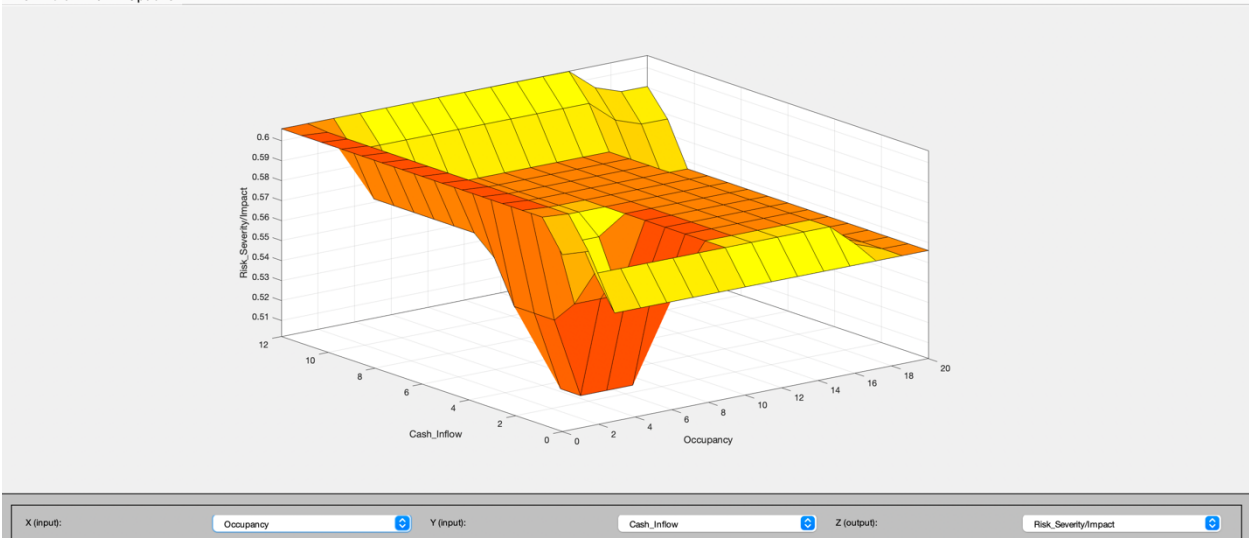


Figure 4.12 Fuzzy output on cashflow and occupancy

```
[Output1]
Name='Risk_Severity/Impact'
Range=[0 1]
NumMFs=3
MF1='Low_Risk': 'gauss2mf', [0.09684 0.0337 0.02684 0.0437]
MF2='Moderate': 'gaussmf', [0.1769 0.2]
MF3='High_RISK': 'gaussmf', [0.469 1]
```

IF 100% occupancy levels were achieved, with timely cash inflows THEN the Liquidity risk factor is assessed as “Low Risk”.

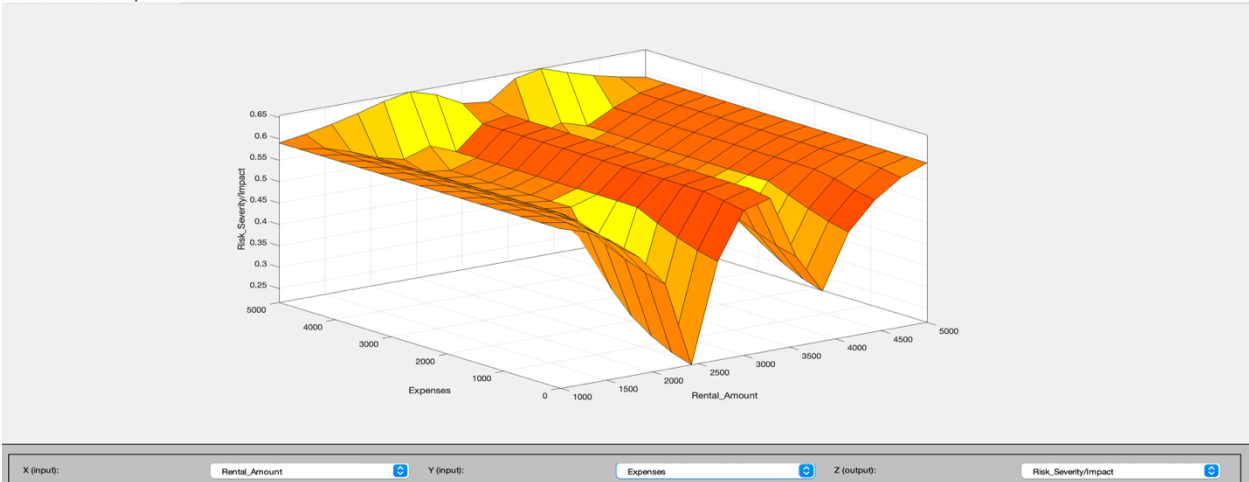


Figure 4.13 Fuzzy output on rental income and expenses

Lastly, the property owners cited expenses per bed as a major determining factor to sustainability of their operations. From the above, the property owners who levied rentals below R 3 000.00 excluded the majority of inclusive offerings such as water, electricity, DSTV and uncapped Wi-Fi and thus managed to cap their cost per bed at a minimum. However, for service providers levying rentals within the region of R 3 000.00 – R 4 000.00 had more expenses. NSFAS funding was capped to R 39 000.00 for 2023 which meant that the majority of private student accommodation providers had to compete for students in this category. To offer competitiveness, the private student accommodation providers included more inclusive offerings such as water, electricity, DSTV and uncapped Wi-Fi and this in turn increased their operating expenses. Majority of the providers in the range had higher risks of not being able to sustain their operations in the long term due to the minimal profit margins.

4.5 Conclusion

This chapter's objective was to analyse feedback from the respondents randomly sampled for the study. A total of 120 questionnaires were randomly distributed to private student accommodation providers in Bloemfontein who own private student accommodation properties in Universitas, Willows and Brandwag, of which 73 were received back. A response rate of 57.5% was achieved, and the chapter's findings were presented based on this. Of the 69 respondents, 43 (62%) comprised houses, while 22 (32%) were flats. Only 4 (6%) of the total private accommodation was indicated to be townhouses. The findings indicate that most private student accommodation dwellings are houses in Universitas, mainly due to the proximity to the university and the size of the properties, allowing the owners to accommodate 15–20 students. Findings from the questionnaire also proved that NSFAS funded the majority of students staying off campus. Results from the risk Matrix identified interest rate risk as the major risk, followed by cash flow and liquidity risks. Adequate risk management strategies discussed in Chapter 5 could thus be established from the Risk Assessment Matrix. Results from MATLAB, the fuzzy inference system showed that the operational risks faced by private student accommodation providers were mainly attributed to their knowledge in the

industry as well as the years of experience operating as private student accommodation providers. Cashflows, occupancy levels, expenses relating to the students (utilities, Wi-Fi, DSTV, maintenance) and more importantly the rental amount charged by the private student accommodation provider had a larger influence on the risks relating to liquidity, default and cashflows. The model based on fuzzy logic, integrated both a qualitative and quantitative approach, for risk assessment.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The scope of the study was to investigate the risks prevalent in the private student accommodation industry in Bloemfontein to establish sustainable risk management strategies to improve the viability and impact knowledge to enable private student accommodation providers to incorporate risks into their business strategy. The study showed that most private property investors did not conduct due diligence before investing in private student accommodation while overlooking potential risks associated with the Bloemfontein market. As a result, students have been subjected to dilapidated living conditions, and properties have been left in damaged states as property investors fail to cope with systematic and unsystematic risks prevailing in the industry. Various risks faced by private student accommodation, including cash flow challenges, financial management, liquidity, and default risk, were identified as major threats to property owners. The focus and emphasis were on identifying and managing the risks to ensure that investors in the property industry would conduct thorough due diligence before making investments. A fuzzy inference system model was used to determine the risks associated with the industry. The research concludes by providing sustainable risk management strategies to address the mismatch between the increase in demand for private student accommodation versus the diminishing supply of off-campus private student accommodation.

5.2 Summary of objectives

The study focused on developing sustainable risk management strategies to mitigate risks associated with private student accommodation. Through questionnaires, the researcher established prevalent risks in managing private student accommodation properties in the focus areas of Universitas, Willows and Brandwag in Bloemfontein. A

Fuzzy Risk Assessment Model was used to quantify the risk exposure faced by private student accommodation providers.

The research questionnaire was designed to answer the following research questions:

- What are the prevalent risks for private student accommodation providers in Bloemfontein.
- How a Fuzzy Inference Model can assess the impact of identified risks for private student accommodation providers in Bloemfontein.

5.3 Recommendations

The identified risks expose each private student accommodation owner to systematic and unsystematic risks. How these are managed depends on the organization's size, risk appetite, and risk tolerance. These factors relate to portfolio size, individual factors, and economic factors beyond organizational control. The risk management strategies and recommendations are unique to the study area, with risks rated by each provider according to their risk recognition and tolerance.

5.3.1 Embed risk management into the business strategy.

From the findings, start up private student accommodation provider's failure directly stems from a lack of planning and a need for risk identification and mitigation. Private student accommodation providers in Bloemfontein can leverage Enterprise Risk Management to improve decision-making and guide organisations in selecting the best investment opportunities. Although respondents had a basic understanding of risk, they did not fully grasp the risks moderately or severely impacting their businesses. Participants emphasized business uncertainty and needing ERM techniques to either leverage or mitigate risks. Private student accommodation providers in Bloemfontein must emphasize preparation for uncertainty rather than avoiding or removing it.

5.3.2 Budgeting for rental premiums to curb late payments and high-risk tenants.

The use of rental premium strategies may be an effective way to address the risks identified. Though this strategy is not common in South Africa, Seemann et al., (2020) states that rental premiums are an effective strategy used to curb losses resulting from having fixed rental amounts versus fluctuating interest rates, inflation, and a ballooning repo rate. Strategies including rental premiums may contribute to real estate growth and curb losses resulting from changes in the macroeconomic environment. Benefits that rental owners can obtain by implementing budgeting strategies for sustainable profit include the capacity to manage market risks and take advantage of opportunities, well-maintained assets, and sustainable income. Literature indicates that research efforts from America, Australia, and Europe have not developed a viable solution allowing landlords to make steady profits while avoiding rapid rent increments. While rental increments have been proposed to offset costs, this could hinder sustainability through gentrification, tenant turnover, and legislation. To achieve sustainable profit, rental owners must incorporate risk premium strategies into day-to-day budgeting.

5.3.3 Managing operational risks at firm level

The business operational risks were common for most private student accommodation providers, and solutions need to be developed and implemented in an iterative manner. Private student accommodation providers should consider retaining operational risks and closely monitor them. Of the operational risks identified, they also present opportunities to enhance competitive advantages which if addressed, could strengthen companies. Options to control or optimize unconventional risks should be applied. Occupancy-related risks could be managed by optimizing and enhancing the current offering for example, including uncapped Wi-Fi and DSTV services to improve attractiveness. If fully employed, this could become a strategy to mitigate the risk of lack of competitiveness and justify the rental price. Agile companies dominate industries and remain sustainable by leveraging their portfolio sizes to improve risk management flexibility. Lastly, utilizing risk management software, conducting credit checks, and using property management

software such as TPN, Red Rabbit, and Vantage may assist property owners in better selecting tenants who will preserve the asset's value.

5.3.4 Cash utilisation strategies focused on risk reduction.

Private accommodation providers approaching retirement could reduce risk through cash utilization strategies such as improving property offerings to increase rentals, setting aside emergency funds in cash, and paying off debts. Private student accommodation providers focusing on increasing wealth and leveraged business debt could consider strategies such as acquiring property using a conventional mortgage, repairing, and upgrading the property over time, and watching for potential investment opportunities. Once markets offer opportunities, refinancing could be considered, with earned cash used to invest in a new conventional mortgage property. However, the amount of leveraged debt must be carefully considered.

5.3.5 Active property management

Private student accommodation providers should consider active property management a key risk management strategy. A property management system could simplify maintenance monitoring, invoicing, payment, and occupancy management. Additionally, active property management allows for setting competitive, market-comparable rental prices for sustainable profits.

5.3.6 Compliance with regulations

Compliance with regulations like university accreditations and rezoning is crucial for private student accommodation providers to achieve sustainable profitability. Learning and adhering to regulations avoids hefty fines that can substantially impact reputation and cash flow.

5.4 Limitations of study

- Portfolio managers for larger companies providing private student accommodation in the form of blocks of flats did not participate in the study. Risk management strategies

applicable to providers accommodating at least 20 students differ from those providing accommodation to over 200 students.

- Other stakeholders, such as financiers, NSFAS officials, students, municipal regulators, and university accreditation officers, did not participate in the study to provide independent assessments. Information from these stakeholders could better inform risk management strategies for private student accommodation providers.
- There is limited literature on risks associated with managing private student accommodation, which could result in other risks being overlooked.

5.5 Conclusion

The study determined specific and practical solutions for how private student accommodation providers can use risk management strategies and rental pricing models to create viable, sustainable, and profitable businesses within Universitas, Brandwag, and Willows. According to the study, risk must be handled through a risk management process to avoid unintended and undesirable impacts of risk throughout projects and control its level (Naderi, 2008). The study also showed that despite changes to regulations, zoning, accreditation requirements, and bursary price ceilings, private student accommodation providers can still achieve sustainable profitability in uncertain environments characterised by high-interest rates, liquidity challenges, property damage, and high probabilities of student default from lease agreements without credit history.

Information gathered from respondents showed that uncertainty and risk existed in the industry. While perspectives are uncertain and based on assumptions, leading indicators provide insight into upcoming uncertain phases of cycles. Using a fuzzy inference system, the researcher determined industry risks and scenarios requiring rental premiums considering risk surcharges. Evidence also showed that private student accommodation providers preferred empowering themselves to manage rather than prevent risks. As a result, predictive tools or systematic risk management strategies were considered less important.

Key risk management models for private student accommodation providers showed the need to:

- incorporate risk identification, response, and monitoring into company strategies.
- cultivate effective risk management networks enabling mitigation.
- respond to industry regulations, and
- create positive social change impacts.

Applying these and fuzzy rental pricing models enables identifying, assessing, and monitoring risk according to business goals and risk tolerance. There is a greater need to fully utilise rental pricing models to manage cash flows, allow risk premiums for defaulting students, and for businesses to shape the growing industry through collaboration, stakeholders, and positive social change using risk management strategies. Further research can consider expanding the sample of the study to give robustness to the data.

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Identifying A Sustainable Risk Management Strategy for Private Student Accommodation Providers in Bloemfontein

Service Provider	
Organisation/Department's name	
Province/ Place Name	
Focal Point contact details	
Questionnaire No. (N.B. For Office Use Only)	
Function/Designation	
Component/Work-stream	
Email	
Telephone	
Cell Number	

For more information, please contact the following:

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SarpongPK@ufs.ac.za

The information to be captured in this questionnaire is strictly confidential and will be used for research purposes by staff and students at the University of the Free State. It is meant to identify sustainable risk management strategies to be used by private student accommodation providers in Bloemfontein. The study also intends to better the viability of the sector as well as student well-being. There are no wrong or right answers to these questions. You are free to be or not part of this survey.

CONSENT STATEMENT:

I have read (or has been explained to me) and understood the study as explained in the information sheet. I have sufficient opportunity to ask questions and are prepared to participate in the study. I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable). I am aware that the findings of this study will be anonymously processed into a research report, journal publications and/or conference proceedings. I agree to the recording of the insert specific data collection method. I have received a signed copy of the informed consent agreement. All the information shall be treated with strict confidentiality and for research study purposes only. The Student Researcher will adhere to the POPIA Act No. 4 of 2018 and Ethical Research Principles

Statement	1	2	3	4
a. Nature of business	<i>Sole Proprietor</i>	<i>Partnership</i>	<i>Company</i>	
b. Location of student accommodation	<i>Willows</i>	<i>Brandwag</i>	<i>Universitas</i>	<i>CBD</i>
c. Property Type	<i>Flat</i>	<i>Townhouse</i>	<i>House</i>	<i>Block of flats</i>
d. Years of Operation	<i>0-2 years</i>	<i>+2 – 5 years</i>	<i>+5 – 10 years</i>	<i>+10 years</i>
e. Property Financing and Ownership	<i>Finance/Bond</i>	<i>Paid Up</i>	<i>Inherited/Family Trust</i>	
f. Proximity to university	<i>0-2kms</i>	<i>2-5kms</i>	<i>5-10kms</i>	<i>+10kms</i>
g. Accreditation status with a tertiary institution	<i>Accredited (0-2 years)</i>	<i>Accredited (3-5 years)</i>	<i>Accredited (+5 years)</i>	<i>Not accredited</i>
h. Total number of tenants	<i>1-5</i>	<i>6-10</i>	<i>10-20</i>	<i>+20</i>
i. Number of bursary students	<i>0-5</i>	<i>6-10</i>	<i>10-20</i>	<i>+20</i>
j. Number of self-funded students	<i>1-5</i>	<i>6-10</i>	<i>10-20</i>	<i>+20</i>
k. Rental Price	<i>R0 – R3 000</i>	<i>+R3 000 – R 5 000</i>	<i>+R5 000</i>	
l. Does the NSFAS allowance cover the total rental cost	<i>YES</i>	<i>NO</i>		

Statement	1	2	3	4
m. What are your main expenses	<i>Municipal Utilities</i>	<i>Operational</i>	<i>Maintenance</i>	<i>Interest + Bond Repayments</i>
n. What is your reason for investing in property	<i>Demand of student rentals</i>	<i>Income subsidy</i>	<i>Lifestyle/wealth generation</i>	<i>Retirement Savings Goal</i>
o. Student demographics – gender	<i>Majority Male</i>	<i>Majority female students</i>	<i>Other</i>	
p. Student demographics – age	<i>18 – 20</i>	<i>21 – 23</i>	<i>24 - 25</i>	<i>26-27</i>
q. Student demographics – study	<i>Diploma)</i>	<i>Degree</i>	<i>Honors</i>	<i>Masters - Above</i>

Private Student Accommodation Offering

ASSESSMENT	Yes	No	N/A
Do you manage the property(ies) as a full time/part time job?			
Do you have an active team to manage the tenant relationship/protect the asset/collect rentals?			
Do you include water and electricity in your rental amount?			
Do you have add-ons like DSTV, Uncapped Wi-Fi, Laundry facilities?			

Do you provide transport for your students to campus?			
Do you accept payment arrangements and accommodate late payments?			
Do you have an active property management system to manage your cashflows?			
Do you have access to credit facilities for your business and does this have an impact on sustainability of your operations?			
Do full paying and bursary students pay the same rental amount?			
Do you conduct any background checks on your tenants?			

According to your own observation, to what extent do you agree with the following statements *1 = Strongly agree 2 = Agree 3 = Not sure 4 = Disagree 5 = Strongly disagree

Statement	Response*
a. I have an understanding of the term risk and is included in our business strategy	
b. I have an understanding of the student accommodation industry and the risks associated with the sector	

Statement	Response*
c. Successful properties manage the risks associated with the student accommodation industry	
d. I have an up to date lease agreement for all my tenants	
e. I charge late penalty fees for any late payments for both bursary and non-bursary students	
f. Risk management practices increase property income and property value	
g. Risk management practices are difficult to sustain	
h. Over the past 3 years I have engaged with a risk management professional to better how I manage the private student accommodation portfolio.	
i. Private student accommodation providers and other professionals in the Bloemfontein industry have adequate knowledge of the growing sector.	
j. There are adequate finance structures to grow private student property management in Bloemfontein	
k. The private student accommodation industry is a viable and profitable sector in Bloemfontein	
l. I use property management software and risk management models to determine rental pricing and rental premiums	
m. There is adequate demand for private student accommodation in Bloemfontein	
n. There is an adequate number of private student accommodation providers in Bloemfontein	

Statement	Response*
o. Most students residing at your property are funded by NSFAS	
p. All the properties under our portfolio have 100% tenant occupancies	
q. Reaching our occupancy goal is not a challenge on an annual basis	
r. Student behaviour is determined by the level of study (e.g. Undergraduate and postgraduate)	
s. The business has been in existence for longer than 2 years	
t. Our tenants adhere to the lease agreement and pay their monthly rental on time.	
u. Most of our tenants' care for the property and give notice before vacating the property	

What determining factors did you consider before establishing a private student accommodation dwelling?
.....
.....
.....
.....

According to your opinion is there adequate number of service providers offering private student accommodation in Bloemfontein?

.....
.....
.....
.....

What determining factors do you consider before establishing a rental price for private student accommodation?

.....
.....
.....
.....

According to your opinion what could be done to improve long term viability and sustainability of private student accommodation in Bloemfontein

.....
.....

Risk Assessment

#	RISK ASSESSMENT DESCRIPTION	RISK RATING	COMMENTS	RISK RATING KEY
---	-----------------------------	-------------	----------	-----------------

1	Failure to conduct property risk assessment before setting private student accommodation		
2	No rental price differentiation model for NSFAS/Full Paying Students		
3	Failure to settle short term obligations		
4	Late payments from Bursaries		
5	Damages from tenants		
6	Chance of default from tenants		
7	Security breach concerns		
8	Interest Rate Risk		
9	Knowledge of the property industry		
10	Failure to timely maintain and do repairs to properties		
11	Lack of Lease Agreements		
12	Lack of compliance and ethics policy adherence		
13	Failure to conduct credit checks on new residents		
14	Inadequate property management systems		
15	Failure to implement utility management systems		

LOW
MEDIUM
HIGH
N/A

16	Failure to comply with City by-laws		
17	Use of properties financed as residential properties		
18	Minimal business acumen		
19	Capital constraints		
20	Size and location of property vs rental income		

Risk Management Challenges & Strategies Used

Business risk

Demand for student housing fluctuation []

operating costs fluctuation []

interest rate risks []

Economic risk

property price fluctuation []

competitiveness []

Student accommodation trends & expectation []

Financial risk

inflation []

liquidity []

credit & loan availability []

Strategies

- A Avoidance
- B Adjust, change
- C Cancel
- D Consultation
- E Diversification
- F Due diligence
- G Hedging
- H Insurance
- I Monitoring Margin
- J protection
- K Postponement
- L Refinance
- —
- _____
- _____

Mortgage bond interest rate []

[]

Physical risk

[]

location preferences []

Room type trend []

Communal spaces []

construction defects []

damages/ disasters []

Regulatory Risk

[]

Building Zoning

[]

Management risk

[]

Contractor conditions

[]

negotiation & bargaining
power

[]

communication

[]

achievement of targets

[]

Risk rating

This is your evaluation of the potential impact and likelihood of the risk affecting sustainability of your operations.

Risk rating	Action required
<p>High For example,</p> <ul style="list-style-type: none">• Bank liquidation possible to one or more individuals however infrequent• Mortgage judgements occurring frequently• likelihood of long-term property valuation problems affecting significant numbers of service providers.	<p>Immediate action required.</p>
<p>Medium For example,</p> <ul style="list-style-type: none">• Damages to property occurring infrequently• likelihood of long term muscular-skeletal problems affecting some staff.	<p>Requires attention as soon as possible.</p>
<p>Low For example, minor injury occurring infrequently to few staff.</p>	<p>Not a priority, may need attention if not as low as reasonably practicable.</p>

PROBABILITY LEVEL KEY

1	Highly Unlikely
2	Unlikely
3	Possible
4	Likely
5	Highly Likely

IMPACT LEVEL KEY

1	Negligible
2	Minor
3	Moderate
4	Significant
5	Severe

RATING MATRIX

5	5	10	15	20	25
4	4	8	12	16	20
3	3	6	9	12	15
2	2	4	6	8	10
1	1	2	3	4	5
	1	2	3	4	5

RATING_NO RATING_NAME

1	LOWEST
2	VERY LOW
3	LOW
4	LOW
5	MEDIUM LOW
6	MEDIUM LOW
8	MEDIUM
9	MEDIUM
10	MEDIUM HIGH
12	MEDIUM HIGH
15	HIGH
16	HIGH
20	VERY HIGH
25	EXTREME

RISK CATEGORY / NAME	RISK SOURCE	POTENTIAL IMPACT	PROBABILITY LEVEL	IMPACT LEVEL	RISK LEVEL	RATING	CURRENT CONTROL MEASURES	FURTHER ACTION NEEDED? Y / N	ACTIONS TO IMPLEMENT
Liquidity Risk									

Operational Risk								
People Risk								
Process Risk								
Default Risk								
Financial Management Risk								
OTHER								