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An Assessment and Evaluation of Underwriting Factors that Affect Profitability of Crop Insurance: A case Study of the Zimbabwean Insurance Market

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Abstract

This study evaluates the underwriting factors influencing the profitability of crop insurance in Zimbabwe, a sector facing significant viability challenges. Crop insurance worldwide is vulnerable to climate hazards such as hailstorms, strong winds, dry spells, and floods, which are becoming more frequent and severe due to climate change. Zimbabwe has experienced devastating effects from events like Cyclone Idai, leading to substantial claims that threaten the financial stability of insurers. The study's objectives are threefold: to identify and evaluate underwriting factors affecting profitability, to ascertain the relationship between these factors and business profitability, and to propose strategies to enhance the profitability of crop insurers. The research employed a mixed-methods approach, integrating qualitative in-depth interviews with managers of agriculture underwriting departments and quantitative surveys administered to senior-level employees in both claims and underwriting departments. Key factors identified include product pricing, underwriting capacity, and loss assessments. Findings reveal that loss assessments is the most influential factor. Accurate product pricing, underpinned by international models, and enhanced underwriting capacity, supported by reinsurance and government subsidies, are critical for improving profitability. Regression analysis further quantifies these relationships, indicating that improvements in product pricing and underwriting capacity significantly enhance profitability, whereas inaccuracies in loss assessments detract from it. The study concludes that crop insurance in Zimbabwe is largely unprofitable, with most crops and insurance products showing loss ratios exceeding 100%. To improve financial outcomes, the study recommends adopting accurate pricing models, building underwriting capacity, and implementing technological advancements in loss assessments.

Keywords: *Crop insurance, Underwriting factors, Profitability, Climate hazards, Product pricing, underwriting capacity, Loss assessment*

1. Introduction

Crop insurance has encountered obstacles due to viability both globally and in Zimbabwe. Agricultural assets are generally vulnerable to weather fluctuations, according to Wang *et al.* (2024). As the effects of climate change worsen, the impact is predicted to double. Climate threats that could harm agriculture, like hailstorms, strong winds, dry spells, and floods, are expected to grow more frequently. For, example in March 2019, Cyclone Idai devastated Malawi, Zimbabwe, and Mozambique, causing thousands of deaths and damaging property, including crops, Mutasa (2022).

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Serele *et al.*(2023) and Tsikirayi *et al.* (2013) have extensively researched on the low uptake of agriculture insurance products with focus on crop insurance. From the limited policyholders that have been insured, very few, if any, studies have gone deeper to analyse if the risk carriers have remained viable from insuring such products. The Zimbabwean insurance industry has 20 registered short-term insurers as at September 2024, Insurance and Pensions Commission (2024), and of the registered insurers not all them issue crop insurance products. Farming insurance market is dominated by fewer players with its contribution to the total industry insurance revenue in terms of the local ZWG currency being 11%, compared to motor insurance which has a contribution of 43%. For the foreign currency denominated business it had a contribution of 9% with motor insurance contributing 37%, Insurance and Pension Commission (2024). Some explanations have been offered for the poor adoption of insurance products. However, it is intriguing to investigate the profitability of the Zimbabwean crop insurance industry.

Interesting questions include, does crop insurance deter prospective insurers? Are the insurers who underwrite crop insurance making a profit? What can lead to the pulling out of players in the agricultural insurance space in Zimbabwe? Very little scholarly research has been done to examine the factors that lead to the collapse of crop insurers, thus, to make conclusions about the profitability of crop insurance, this study will identify the primary causes of their demise.

Crop insurance has faced viability challenges in Zimbabwe due to various man made as well as natural factors. This is consistent with what has been observed in other countries. For, example more recently there has been a gradual decline in the uptake of insurance products in the Indian sugar cane farming industry, Nivetha *et al.* (2025). In Zimbabwe, even in years with favorable weather patterns, indemnity payouts have significantly outpaced premium revenue, endangering crop insurers' ability to make a profit. Sound underwriting practices are still essential for reducing crop insurance risks, which will increase insurer profitability even in the face of several obstacles. This research study seeks to ascertain the relationship between underwriting factors and business profitability and to find underwriting strategies that can be employed to improve the profitability of crop insurers.

This study evaluates and examines the factors that impact crop insurers' profitability in Zimbabwe. This section explores the study's background, where we looked closely at many study components that helped identify the problem area that needed more analysis. The study formulates the research objectives and

questions that guided the study and specifies the business and research problems. The section also describes the study's purpose, justification, limits, and underlying presumptions. The chapter concluded with the conceptual framework that served as the foundation for the research.

2. Literature Review

2.1 Crop Insurance Defined

Crop insurance is a subset of agricultural insurance which involves transferring financial loss consequences from the insured to the insurer in exchange for a premium. Essentially, crop insurance provides financial protection against reduced crop yields, covering losses incurred due to decreased output, Annan (2024) and Ghosh *et al.* (2021).

Komarek *et al.* (2020) generally described crop loss risk as the likelihood of crop damage or loss resulting from natural hazards like drought, flood, and windstorms. Crop farmers purchase crop insurance to safeguard against crop loss due to natural disasters or revenue decline resulting from decreased agricultural commodity prices, Wang *et al.* (2021).

In the context of the insurance industry, profitability is categorised using two measures: profit performance and investment performance. These measures are typically expressed through various metrics, including net premium earned, underwriting profitability, annual turnover, return on investment, and return on equity, Bharathkumar (2018), Mazviona *et al.* (2017) and Asare *et al.* (2015).

Mwangi (2020) agrees with this definition, detailing how an insurer's profitability is determined by both underwriting performance and investment performance.

2.2 Underwriting Profit

The third quarter report of 2024, Insurance and Pensions Commission (2024), gives guidelines on how insurers come up with underwriting profit, see an illustrative example on table 2.1 below:

Table 2.1: Guidelines on Underwriting Profitability Determination

Item	Description	Value (ZWL)	Formula
1	Gross Premium Written (GPW)	$31 605 720	A
2	Reinsurance Premium	$17 208 262	B

3	**Net Premium Written (NPW)**	**$14 397 459**	**C = A-B**
4	Increase/Decrease in Unearned Premium Reserves (UPR)	($ 668 382)	D
5	**Net Earned Premium**	**$15 065 841**	**E= C-D**
6	Net Incurred Claims	$ 7 767 688	F
7	Net Commission Incurred	$ 1 311 008	G
8	**Technical Result**	**$5 987 145**	H= E-F-G
9	Operating Expenses	$5 294 413	I
10	**Underwriting Profit/Loss**	**$692 732**	**J= H-I**

Source: Insurance and Pensions Commission (2024) Short Term (Non-Life) Insurance Report For The Third Quarter Ended 31 September 2024

According to Soye and Adeyemo (2018) underwriting gain is the residue from the premiums the company collects from farmers together with investment income and the amounts the company spends on claims or indemnities on its policies. Underwriting factors which affect profitability of crop insurance are product pricing, underwriting capacity and loss assessment methods.

2.3 Product Pricing

Background Question- How do insurers come up with crop insurance premiums? Are the premiums adequate to achieve positive profitability?

The insurance premium is the amount charged by insurance companies for providing coverage. Lima Ramos (2017) argues that the insurance premium should consider both the expected claims and additional loadings, applicable to policies, risks, or portfolios.

Lima Ramos (2017) states that the risk rate can be expressed as a function of the units of loss exposure and is often formulated by an actuary using quantitative techniques and the implementation of stochastic models using data on historical losses. For the insurer, the premium calculation needs to satisfy the fundamental insurance equation where the premium (P) is defined as:

$P = Losses + LAE + UWE + UWP$

With *LAE* as the loss adjustment expenses, *UWE* as underwriting expenses and *UWP* as the underwriting profit, Ohlsson and Johansson (2010).

2.3.1Pricing Models on Crop Insurance

Holh (2019) states that the most popular pricing models are experience rating, loss frequency modelling, loss severity modelling, exposure rating and schedule rating**.**

2.4 Loss Adjustments

Leading Questions- Do loss assessments methods and costs affect profitability of crop insurers? Do Zimbabwean crop insurers have standard loss adjustments methods or it's a thump suck game?

Gajić, B., & Radojković, I. (2019) argue that loss assessments are typically conducted for indemnity-based policies, including named peril, calamity-based, and multiperil insurance. However, assessing losses has proven to be a challenging task, especially for field assessors who struggle to accurately quantify damage extent and area in large fields. The physical assessment process is prone to errors and can be influenced by various factors like crop condition, water and nutrient supply, pest and disease outbreaks, and weather conditions.

Glauber (2004) and Ceballos *et al.* (2020) highlights that loss assessment can be costly and imprecise, particularly for traditional agricultural insurance products, especially when dealing with multiple claims from systemic weather events like drought or large, geographically dispersed farms. Individual farm basis loss assessment can result in costs that exceed premium payments, leading to high administration costs that hinder insurance firms from achieving underwriting profits. The high cost of traditional crop insurance assessment poses a significant obstacle to developing agricultural insurance markets, especially in developing countries. For, example, hail damage assessments by insurance adjusters are time-consuming, costly, and subjective.

2.5 Underwriting capacity

Soye and Adeyemo (2018) defined underwriting capacity as the risk assumption and/or retention ability of an insurer, or of the insurance industry, determined by the amount of surplus. It can also be viewed as the maximum amount of money an insurer or reinsurer is willing to risk in a single loss event on a single risk or in each period. The limit of capacity for an insurer or reinsurer may also be imposed by law or regulatory authority. It is important to look at whether Zimbabwean crop insurers have adequate underwriting capacity to underwrite crop insurance but before we do so that it is also key to dwell on what are called systemic and unsystematic risks that have a significant impact on crop insurance profitability.

2.5.1 Systemic and Systemic Risks

According to various scholars, crop insurance programs often fail due to systemic risks, which are defined by Hohl (2019) as large-scale events that affect multiple policyholders simultaneously, causing widespread losses that cannot be mitigated through diversification. Examples of systemic risks include earthquakes, droughts, and frost, which can lead to significant losses and necessitate risk transfer for insurers to reinsurance and capital markets. In contrast, non-systemic risks, such as fires and hail, have a localized impact and only affect a limited number of policyholders. In Zimbabwe, systemic risks include the droughts experienced in 2017-2019 and the frost in 2019, while hail is considered a non-systemic risk. The research will focus on the performance of insurers offering crop insurance products in Zimbabwe, including those that cover hail.

2.6 Effect of Government Subsidies on Crop Insurance

Hohl (2019) has seen a lack of government support as one of the challenges affecting crop insurance in developing countries. In developed countries agricultural insurers have successfully covered systemic risks, largely through the availability of government premium subsidies, catastrophe protection, and the development of specific risk pricing and modelling approaches. In Zimbabwe the government has paid little attention to crop insurance this has largely led to few insurers offering crop insurance, Tsikirayi *et al.* (2013).

2.7 The relationship between pricing and profitability of crop insurance

In Zimbabwe some insurers attributed high loss ratios on weather index due to low and poor pricing on their product. Consequently, some had to withdraw their products from the market.

2.8 Effect of loss assessments on profitability of crop insurers

The timely and accurate adjustment and payment of losses to affected policyholders is a cornerstone of agricultural insurance, as highlighted by Hohl (2019). Efficient loss assessment ensures that farmers are compensated fairly and promptly, maintaining their trust in the insurance system and encouraging wider participation.

Ceballos *et al.* (2020) have critiqued traditional methods of loss assessments, describing them as both time-consuming and labour-intensive. They argue that these conventional approaches are fraught with

numerous disadvantages that impact the profitability and effectiveness of crop insurance. One major issue is the difficulty in providing accurate and reliable analyses since these methods often rely on highly subjective estimation techniques employed by loss assessors. Moreover, there can be significant variations between different assessors, leading to inconsistencies in loss assessments. The physical size of the agricultural areas and access constraints can make it challenging to view the entire field comprehensively. Additionally, factors beyond control, such as adverse weather or logistical issues, can hinder access to the property, complicating the assessment process further. Ensuring the availability of all concerned parties, such as farmers and assessors, can also be problematic, especially when dealing with remote or large areas

A solution to combat the shortcomings of traditional loss assessment is the adoption of remote sensing and geographical information systems (GIS) as alternative techniques for assessing losses, for, example due to hail damage. These technologies offer the potential for expansion into other crops and insurable phenomena, enhancing the overall scope and flexibility of agricultural insurance, Islam *et al.* (2024), Kumar and Parida (2025) and Rabuh *et al.* (2024).

Importantly, by providing a more accurate and reliable assessment, the use of remote sensing and GIS can help eliminate the problem of overpayment or underpayment of claims. As such, there is a lot of support for these modern techniques to replace traditional methods in the loss adjusting industry, highlighting their potential to create a more reliable, effective, and up-to-date assessment process, Islam *et al.* (2024), Kumar and Parida (2025) and Rabuh *et al.* (2024).

3. Research Methodology

3.1 Introduction

This section discusses research philosophy, research design, and target population, sampling methods, sample size and the research instruments that were employed in data collection and analysis. A mixed-method design, which integrates both qualitative and quantitative methods was used, providing a more profound unravelling of the research problem, Creswell *et al.* (2017).

3.2 Research Design

Causal research design was employed to measure the variables and assess the relationship between underwriting factors and profitability, allowing the study to investigate how underwriting factors impact the profitability of crop insurance companies.

3.3 Population

The targeted population comprised of six short-term insurance companies, four reinsurers, two reinsurance brokers, and six insurance brokers in Harare Zimbabwe, Insurance and Pensions Commission (2024) who offer crop insurance products.

3.4 Sampling Technique

The study utilized non-probability sampling methods, specifically judgmental or purposive sampling, to select participants with specialized expertise in crop insurance. This method considered factors like accessibility, availability, and willingness to participate when selecting sample members.

3.5 Sample Size

In their study Saunders *et al.* (2003) went on to suggest that if a census is not practical, a sample size above 30% of the study population is considered adequate to be representative of the entire population.

3.6 Data Sources

The research employed two forms of data, secondary data and primary data to address the research problem.

3.6.1 Secondary data

The secondary data was gathered from academic journals, textbooks, and IPEC reports spanning from January 2014 to December 2024.

3.6.2 Primary Data

Survey questionnaires and interviews were used to collect primary data, as they allowed for the gathering of a substantial amount of information within a limited budget and timeframe.

3.7 Data collection method and Research instruments

This study employed surveys using questionnaires to gather data from claims and underwriting administrators of listed insurers, reinsurers, and brokers.

3.8 Validity and Reliability

3.8.1 Validity of data

Validity refers to whether an indicator or set of indicators that are devised to gauge a concept really measures that concept Sürücü and Maslakci (2020). To ensure validity the study used member checking and statistical tests.

3.8.2 Reliability of data

Reliability can simply be described as the consistency of the measurements. According to Sürücü and Maslakci (2020), reliability refers to the consistency of measure of concept. We ensured reliability of data by using, triangulation, questionnaire simplicity, ethical considerations

3.9 Data Analysis

Various statistical methods, including descriptive statistics and factor analysis, were employed to investigate the relationship between underwriting and profitability.

3.9.1 Data presentation technique

Analysed data was presented in descriptive narrations, graphs, tables, scree plots and pie charts. Most of the information gathered was presented in tabular form before it was analyzed and drawn into graphs.

4. Data Presentation, Analysis and Discussion of Findings

4.1 Introduction

A research population refers to the entire group of individuals, entities, or cases from which a sample is selected. This study focused on insurance players specializing in crop insurance in Zimbabwe. Table 4.1 has data for crop insurance. This data is extracted from the Index Insurance Project Results Dissemination Workshop (2024) report which concerns businesses involved in insuring agricultural businesses.

To conduct a comprehensive and detailed analysis, this study targeted a population comprising six short-term insurance companies, four reinsurers, two reinsurance brokers, and six insurance brokers in Harare. Through the research questions, the study defined the population to be studied. In-depth interviews were conducted with managers from both claims and underwriting departments gathering extensive and in-depth data, which informed the structuring of questionnaires completed by the agriculture underwriting

administrators of the companies under study. The target population comprised of head offices of all players based in Harare as follows:

Table 4.1: Insurance products for crop insurance

Sector	Type of Agriculture Insurance	Number of Players	Available Products
Large scale	Crop insurance	13	• Named Peril Crop ins (Tobacco) • Multi Peril Crop Ins (Maize, Soya bean, Wheat)
Small holder farmers	Crop insurance	10	• Named Peril Crop (Tobacco) • Multi-Peril (Maize, Soybean, Wheat)
Small holder farming sector	Crop Index Insurance	2	• Area Yield Index (Maize, Sorghum, Millet) • Weather Index (Maize and small grains)

Source: IPEC- Index Insurance Project Results Dissemination Workshop (2024)

4.2 Response Rate

Since the number of companies involved in crop insurance is small, 20 in total, due to overlaps where a company is involved in all three crop insurance products, fifteen questionnaires were distributed via email for the study's quantitative component. Thirteen of the fourteen questionnaires that were returned were considered suitable for analysis. 92% of the questionnaires that were returned were completed, and it was deemed that this response rate was sufficient to achieve the study's goals.

Table 4. 2: Response rate

Number of questionnaires		
Sent out	Received	Response rate
15	13	92%

Source: Research Survey, 2024

4.3 Reliability Analysis

The reliability of the questionnaire was tested using Cronbach's alpha. The Cronbach's Alpha values were averaged to 0.8. This is viewed as acceptable based on the findings of George and Mallery (2019). It is also closer to 1.0 denoting greater internal consistency of the elements under consideration. Cronbach's alpha coefficient of over 0.7 which gives an assurance of an instrument's consistency and dependability.

4.4 Demographic Characteristics

The study findings revealed that most of the respondents (46.2%) were aged above 40 years. The same proportion of respondents were also aged between 31 years and 40 years. The minority of the research participants (7.7%) were aged between 21 years and 30 years. This analysis revealed that most of the respondents were within the age bracket of 31 and above. Table 4.3 reveals that 2 (15.4%) of our respondents were Diploma holders, 3 (23.1%) were Degree holders, and 8 (61.5%) were holders of Master's Degrees. The results on Table 4.4 indicate that Crop Insurance companies welcome educational diversity.

Table 4. 3: Level of education

Level of education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diploma	2	15.4	15.4	15.4
	Degree	3	23.1	23.1	38.5
	Masters	8	61.5	61.5	100.0
	Total	13	100.0	100.0	

Source: IBM SPSS Statistic version 21

Table 4. 4: Special Qualifications

Special Qualifications

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agronomist	2	15.4	15.4	15.4
	Insurance & Risk Management	11	84.6	84.6	100.0
	Total	13	100.0	100.0	

Source: IBM SPSS Statistic version 21

Special Educational Qualification: Table 4.4 reveals that 2 (15.4%) of our respondents were Agronomists, 11 (84.6%) were holders of a qualification in Insurance & Risk Management.

Table 4.5: Working experience.

Working experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 5 years	1	7.7	7.7	7.7
	5-10 years	3	23.1	23.1	30.8
	Above 10 years	9	69.2	69.2	100.0
	Total	13	100.0	100.0	

Source: IBM SPSS Statistic version 21

Working experience: Table 4.5 reveals that 1(7.7%) had below 5 years, 3(23.1%) had 5-10 years of experience, and 9 (69.2%) had served for more than 10 eyes.

4.4 Establishing whether Crop Insurance business is Profitable

The study sought to critically examine the overall profitability of crop insurance business in Zimbabwe by explicitly investigating the 5-year (2014-2018) trends in average loss ratios per crop and per product. This is the most recent 5-year period where Zimbabwe had a stable inflation rate which was between -2.4 % and 10.9 %. The following subsections deal with the relative frequency distributions and descriptive statistics concerning 5-year trends in loss ratios for crop insurers in Zimbabwe. Loss ratio method had been greatly adopted by several studies as an appropriate measure of performance for crop insurance companies (Hohl, 2019). A ratio of one indicates that for every dollar of pay-outs or indemnities there was an offsetting dollar of premiums collected. The lower the loss ratio, the more profitable the insurance company, and vice versa. If the loss ratio is above 1, or 100 percent, the insurance company is unprofitable and may be in poor financial health because it is paying out more in claims than it is receiving in premiums. Two questions were posed to inquire from the respondents the average loss ratios per product and per crop over the 5 years between 2014 and 2018 and the results are shown in tables 4.8 a) and 4.8 b) below.

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4.4.1 Average loss ratios per crop

The respondents were instructed to pick one from amongst the six mutually exclusive and collectively exhaustive ordinal-scaled response categories which contain their respective average loss ratio (for the 5-year period). These categories and their corresponding numerical arbitrary codes are shown below on Table 4.6.

Table 4. 6: Ordinal scaled categories

	Response category					
	0%-30%	31% -50%	51% - 70%	71% -100%	101% -200%	Above 200%
Arbitrary code *(Ordinal scaled)*	1	2	3	4	5	6

Source: Research questionnaire

If the overall mean response for a particular crop range between 0 and 4, it implies that the company was profitable on that crop while all values higher than 4 are indicative of unprofitable crop. An unprofitable crop implies that the Insurance Company was paying out more in claims than it was receiving in premiums for that crop.

Table 4. 7: Descriptive statistics for average loss ratio per crop

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Response Category	Profitability
Average loss ratio for Tobacco (past 5 years)	13	1	6	4.69	0.377	101% -200%	*Unprofitable crop*
Average loss ratio for Wheat/Barley (past 5 years)	13	4	6	4.62	0.768	101% -200%	*Unprofitable crop*
Average loss ratio for Maize (past 5 years)	13	5	6	5.69	0.48	Above 200%	*Unprofitable crop*
Average loss ratio for Soya (past 5 years)	13	4	6	4.77	0.725	101% -200%	*Unprofitable crop*
Average loss ratio for Sugarcane (past 5 years)	13	1	2	0.38	0.65	0%-30%	*Profitable crop*
Average loss ratio for Horticulture (past 5 years)	13	4	6	4.92	0.76	101% -200%	*Unprofitable crop*
Average loss ratio for Other crops (past 5 years)	13	1	2	0.46	0.66	0%-30%	*Profitable crop*
Overall	**13**			**4.69**	**0.631429**	**101% -200%**	***Unprofitable crop***
Valid N (listwise)	13						

Source: Author's compilation from IBM SPSS Statistic version 21

Findings shown in Table 4.7 above show that there is 71% (5 per every 7 crops) chance that a crop being insured will be unprofitable. This is evident by average loss ratios of 5 crops which were all above 100%.

The amount paid out in claims for these crops exceeds the premiums received. Based on the average loss ratios sugar cane and other crops were the only profitable crops.

4.4.2 Assessing profitability per product.

Five products that are sold by crop insurance firms were assessed for profitability and these are Named Peril Crop Insurance (NPCI), Calamity Based Crop Insurance (CBCI), Multi-Peril Crop Insurance (MPCI), Revenue & Income Insurance (RII), Area Yield Index Insurance (AYII), and Weather Index Insurance (WII).

Table 4. 8: Descriptive statistics for average loss ratio per product

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Response Category	Profitability
Average loss ratio for Named Peril (past 5 years)	13	5	6	5.46	0.52	101% -200%	*Unprofitable Product*
Average loss ratio for Calamity Based (past 5 years)	13	0	5	1.85	2.44	31% -50%	*Profitable Product*
Average loss ratio for Multi-Peril (past 5 years)	13	5	6	5.77	0.44	Above 200%	*Unprofitable Product*
Average loss ratio for Income & Revenue Insurance (past 5 years)	13	0	3	0.23	0.83	0%-30%	*Profitable Product*
Average loss ratio for Area Index (past 5 years)	13	0	0	0.00	0.00	0%-30%	*Profitable Product*
Average loss ratio for Weather Index (past 5 years)	13	0	5	1.46	2.11	31% -50%	*Profitable Product*
Overall Profitability	**13**			**1.66**	**1.06**	**101% -200%**	***Profitable***
Valid N (listwise)	13						

Source: Authors' compilation from IBM SPSS version 21

4.4.3 Profitability status of NPCI

The average loss ratio for Named Peril Crop Insurance was found to be between 101% and 200%. Selling this product proved to be unprofitable since it resulted in the crop insurance company paying out more in claims than it had received in premiums. This is also the case for the multi-peril product that had a loss ratio of 200% which indicates unprofitability.

4.5 Respondents' opinions on overall Profitability of Crop insurance business

A question was posed to the respondents to show whether the crop insurance business in Zimbabwe is profitable. The question was closed with the following options to choose from; Yes, No, Breakeven, Not Sure. The results are shown below on table 4.9.

Table 4.9: Crop Insurance Profitability

Crop Insurance Profitability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	3	23.1	23.1	23.1
	No	8	61.5	61.5	84.6
	Breakeven	2	15.4	15.4	100.0
	Total	13	100.0	100.0	

Source: Authors' compilation from IBM SPSS version 21

Findings shown in the frequency distribution table reveal that most of the respondents (61.5%) were of the assertion that the crop insurance is not profitable in Zimbabwe. Those who cited that the crop insurance business is unprofitable were 23.1%; while only a meagre 15.4%, were of the view that the crop insurance business is operating at break even.

4.6 Underwriting strategies affecting Profitability of crop insurers

4.6.1 Effect Estimation

The study adopted Multiple Linear regression analysis to identify and quantify the impact of each underwriting factor on profitability. The data was collected from question responses to our survey questionnaires.

4.6.2 Regression Model

Regression analysis was carried out on the data to quantify the linear relationship each factor has on profitability. The results presented in table 4.10 present the goodness-of-fitness of model the linear regression model to the data. The independent variables (product pricing, underwriting capacity and loss assessments) were found to explain 87.2% of the variations in profitability. This results further means that the model applied to link the relationship of the variables was satisfactory. These underwriting factors have a significant impact on profitability.

Table 4.10: Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.872[a]	.761	.681	.38212

a. Predictors: (Constant), Loss Assessments, Underwriting Capacity, Product Pricing

Source: Authors' compilation from IBM SPSS Statistic version 21

Table 4.11 shows the ANOVA results. The null hypothesis is that there is no linear relationship between the variables (in other words $R^2 = 0$). The F-statistics are highly significant; thus, we can assume that there is a linear relationship between the variables in our model. The overall model was significant with an F statistic of 9.527. Table 4.11 shows that variations in profitability can be explained by the model to the extent of 4.173 out of 5.488 or 87.2% while other variables not captured by this model can explain of the 12.8% (24.173 out of 5.488) of the variations in Buying Inclination. The F value of the model produces a p-value of 0.004 which is significantly the same as zero. A p-value of 0.004 is less than the set level of significance of 0.05 for a normally distributed data. This means that the model is highly significant in explaining influence of independent variables on profitability.

Table 4.11: Analysis of Variance

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.173	3	1.391	9.527	.004[b]
	Residual	1.314	9	.146		
	Total	5.488	12			

a. Dependent Variable: Profitability

b. Predictors: (Constant), Loss Assessments, Underwriting Capacity, Product Pricing

Source: Authors' compilation from IBM SPSS Statistic version 21

The regression model in table 4.12 indicates that a unit change in product pricing causes an increase in profitability by 1.136 units on average. This indicates that product pricing has a significant influence on profitability. A unit change in underwriting capacity leads to an increase in profit by 1.167 units on average. A unit increase in loss assessments decreases profitability by an average of 1.154 units. The results thus reveal that loss assessments are inversely proportional to profitability for a crop insurance firm.

Table 4.12: Regression Model Results

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.501	1.204		-.416	.687
	Product Pricing	1.136	.317	.780	3.588	.006
	Underwriting Capacity	1.167	.287	.787	4.066	.003
	Loss Assessments	-1.154	.235	-1.213	-4.900	.001

a. Dependent Variable: Profitability

Source: Authors' compilation from IBM SPSS Statistic version 21

From the research results it can be clearly seen that product pricing is a significant key driver of profitability in cash insurance business. Underwriting capacity was also identified to have positive impact on profitability. However, it had been found that current loss assessments methods result in lower profits and poor financial health for crop insurers as they are made to pay more in terms of claims relative to premium payments.

Section 5: Summary, conclusions and recommendations

5. Loss Ratios for Crops and Products

The study sought to critically assess the profitability of the crop insurance business in Zimbabwe from data obtained between 2014 to 2018 by analysing trends in average loss ratios per crop and product. This was achieved through a comprehensive examination of relative frequency distributions and descriptive statistics over the specified period. The loss ratio method, widely recognized for evaluating insurance performance (Hohl, 2019), was used as the principal measure. A loss ratio of one indicates that the premiums collected are equivalent to the claims paid out, with ratios above one signalling unprofitability due to higher claims relative to premiums.

The comprehensive analysis of loss ratios indicates that the crop insurance business in Zimbabwe is predominantly unprofitable. Most crops and products analysed have loss ratios exceeding 100%, suggesting that insurers are often paying out more in claims than they receive in premiums. This highlights a critical need for improved loss assessment practices and potential restructuring of premium pricing to enhance the financial sustainability of crop insurance in Zimbabwe. This is consistent with literature see, for, example Hazell (1992) and Benami *et al.* (2021).

5.1 Effect of underwriting factors on profitability of crop insurers

A key objective of the study was to evaluate the critical underwriting factors affecting the profitability of crop insurers in Zimbabwe. Three key factors were identified: pricing of crop insurance (product pricing), capacity to underwrite crop insurance (underwriting capacity), and loss assessments. Respondents were asked to rate these factors on a Likert scale ranging from 'Strongly Disagree' to 'Strongly Agree,' with their responses providing insights into how these factors impact profitability.

Firstly, the significance of these underwriting factors was established. Results indicated that loss assessments were the most influential factor, with a mean score of 3.911, followed by underwriting capacity (mean = 3.778) and product pricing (mean = 3.680). This highlights that thorough and accurate loss assessments are crucial for profitability, as they help minimize the loss ratio by ensuring that claims paid out do not exceed the premiums collected.

Overall, the findings indicate that thorough loss assessments are essential for aligning claims with premiums, thus enhancing profitability. Accurate product pricing, informed by international models, and strengthened underwriting capacity, supported by reinsurance and government subsidies, are critical for improving the financial health of crop insurance companies in Zimbabwe. The multiple response analysis further corroborated these findings, with most respondents emphasizing the importance of these factors in driving profitability.

The regression model used in the study demonstrates a high R-square value of 0.872, indicating that it effectively captures the relationship between underwriting factors and profitability. This high R-square value suggests that the model accounts for a significant portion of the variability in profitability based on the underwriting factors included. Further supporting the model's robustness are the ANOVA results, which show a significant F-statistic of 9.527 with a p-value of 0.004. This confirms the presence of a significant linear relationship between the independent variables (underwriting factors) and profitability, validating the overall fit of the regression model. Delving into the impact of individual factors, product pricing emerges as a crucial element. A unit change in product pricing leads to an average increase in profitability of 1.136 units. This highlights the critical importance of implementing accurate and competitive pricing strategies. Insurers must align their pricing models with international standards to ensure that premiums are both competitive and adequate to cover risks. Underwriting capacity is also vital,

with a unit change resulting in an average increase in profitability of 1.167 units. This underscores the necessity for insurers to have sufficient capacity to manage risks effectively. Enhancing underwriting capacity can be achieved through reinsurance support and government subsidies, which provide a safety net and additional resources for insurers.

Conversely, loss assessments have a negative impact on profitability. A unit increase in loss assessments leads to an average decrease in profitability by 1.154 units. This finding points to the detrimental effects of inaccurate and inefficient loss assessments. To address this issue, insurers should incorporate technological advancements, such as remote sensing and GIS, and employ skilled assessors to ensure precise evaluations. The study concludes that the profitability of crop insurance in Zimbabwe is predominantly challenged by high loss ratios, inadequate pricing, and insufficient underwriting capacity. To improve their financial outcomes, crop insurers must adopt accurate pricing models, enhance underwriting capacity through reinsurance and government support, and improve loss assessments with advanced technology and skilled personnel. These strategies are essential to address the current unprofitability and enhance the financial sustainability of crop insurance in Zimbabwe.

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