

Analysis of Factors Driving Farmers in Adopting Beef Cattle Business Insurance in South Sulawesi Province, Indonesia

Sitti Nurani Sirajuddin¹, Syahdar Baba² & Kurnia Nur Islami³

^{1,2}Department of Social Economics, Faculty of Animal Husbandry, Hasanuddin University, Makassar, Indonesia

³Posgraduate of Animal Science and Technology, Faculty of Animal Science, Hasanuddin University, Makassar, Indonesia

Email: sitti.nurani@unhas.ac.id

Abstract

This research aimed to analyze the driving factors for farmers in adopting Cattle Business Insurance in Bone Regency, South Sulawesi Province, Indonesia. This research was carried out in October-December 2023 in Bone Regency. The population in this study was the number of breeders in Kahu District who persisted in adopting Cattle Business Insurance, 34 people, and the number of breeders who had participated in the Cattle Business Insurance program, 34 people, as well as the number of breeders who had never adopted Livestock Business Insurance at all. There were 34 cows, so the total number of respondents was 102 breeders. The data analysis used was the Delphi method and Factor Analysis tools. The results of the research show that the results of the final extraction of the driving factors for farmers in adopting AUTS found 6 variables that followed the analysis process to the end, namely: reducing farmers' concerns in raising livestock (X1), officers being agile in responding to farmers' complaints (X3), affordable premium costs (X5), breeders do not experience difficulties in the registration process (X6), as a risk transfer tool (X7), breeders feel they are given benefits and are grouped into two factors (X8).

Keywords: Insurance, Cattle, Drivers, Adoption

1. Introduction

Developing a beef cattle business certainly cannot be separated from various risks, namely the risk of loss and the risk of death. Cattle Business Insurance (AUTS) is to transfer the risk of business losses due to cattle dying or being lost to other parties through an insurance coverage scheme. The government program, namely Cattle Business Insurance (AUTS) through the Ministry of Agriculture of the Republic of Indonesia, is a form of government support in efforts to protect cattle breeders from the risk of death and loss of cattle. This program is expected to provide protection to cattle breeders in the event of cow illness, childbirth and accidents and/or loss by transferring losses to other parties through insurance coverage and also various parties (Suryaningsih, 2018) and (Mahmud, 2021). Livestock development aims to increase livestock production and population to achieve self-sufficiency in animal protein from livestock while meeting domestic consumption needs, improving community nutrition, increasing farmer income, and opening up new employment opportunities (Pratiwi et al., 2020). Development of beef cattle the impact on the economy in Indonesia is currently quite good with the increasing public demand for animal protein sourced from meat (Riana et al., 2019) and (Haumahu &

Ririmasse, 2020). In its flagship programs, the government strives to continue to increase livestock productivity by strengthening the animal rearing and management system, namely by improving the quality of feed, seedlings, animal health, controlling the slaughter of productive females, post-harvest, processing of animal products, and business management.

2. Literature Review

The agricultural subsector is livestock, where livestock businesses have various risks, both risk of death and risk of loss (Syukur et al., 2021). Based on Law Number 19 of 2013 concerning Protection and Empowerment of Farmers and Minister of Agriculture Regulation Number 40/Permentan/SR.230/7/2015 concerning Agricultural Insurance Facilitation, the Indonesian government, through the Ministry of Agriculture, also launched the Agricultural Insurance Program which was later reduced to Insurance Livestock farming through the Livestock Business Insurance program as well as Decree of the Minister of Agriculture of the Republic of Indonesia Number 12/Kpts/PK.240/B/04/2017 concerning Guidelines for Livestock Business Insurance Premium Assistance which regulates the implementation of cattle farming businesses. insurance (Suryaningsih, 2018). The purpose of Cattle Business Insurance (AUTS) is to divert the risk of business losses if the cow experiences death and or failure to other parties through the insurance coverage scheme. AUTS is expected to protect cows due to illness, childbirth, accidents, and loss (Riana *et al.*, 2019). Cattle insurance that has now been applied is only one ruminant in the cattle business (Suryaningsih, 2018). Therefore, it is necessary to analyse the driving factors for farmers to adopt Cattle Business Insurance

3. Research Method

This research was carried out in October – December 2023 in Kahu District, Bone Regency, South Sulawesi. This location was chosen as a research location because many breeders in the area adopted cattle business insurance. The type of research used in this research is non-hypothetical exploratory descriptive research. The descriptive method is used to examine something as it is (single variable). This information may still be in small quantities or may not even exist at all, in this case exploring and collecting information regarding the analysis of driving factors in adopting cattle business insurance. The population in this study was 245 beef cattle breeders who had participated in the cattle business insurance program in 2020. The sample in the research to look at the driving factors for farmers in adopting cattle business insurance was carried out by means of purposive sampling, namely taking samples deliberately based on consideration of certain objectives, namely 34 people. The types of data used in research are quantitative data, qualitative data. The data sources used in the research are primary data which is data sourced from direct interviews with breeders using questionnaires such as respondent identity data, respondent responses to research variables and secondary data are data obtained from related agencies such as village monograph data and data beef cattle population in Bone Regency, South Sulawesi. The data collection method used in the research is observation, namely data collection carried out through direct observation of the conditions of the research location, as well as various breeder activities, interviews, namely data collection by conducting direct interviews with 45 good respondents who adopted AUTS. The data

analysis used to determine the driving factors for farmers in adopting cattle business insurance is descriptive analysis using the Delphi tool which is then factored using a factor analysis tool. Delphi was used with the aim of finding out the opinions of breeders, in this case breeders who still adopted Cattle Business Insurance during the last 3 years.

4. Finding and Discussion

Factor Analysis. Extraction of variables in research using factor analysis was carried out after grouping answers to statements given to respondents via questionnaires. The grouping of respondents' answers in this study can be seen in Table 1

Table 1. Classification of respondents' answers based on the research scale level for each variable:

No	Variable	Number of people who voted/ Rating Scale (person)				
		1	2	3	4	5
1	Adopting AUTS can reduce farmers' worries in running a livestock business	3	6	6	12	7
2	The conditions for making an insurance claim are not complicated	5	15	8	5	1
3	Officers are agile in responding to farmer complaints	5	7	16	5	1
4	Veterinary health services are satisfactory	2	5	13	12	2
5	Affordable Premi Costs	2	2	3	20	7
6	Breeders do not experience difficulties in the AUTS registration process	2	12	14	3	3
7	As a Risk Transfer Tool	0	6	11	13	3
8	Breeders feel they are being given an advantage	0	15	10	6	3

First Step Output (Variable selection). The first step in determining the variables to be further extracted can be seen from the KMO MSA (Kaiser-Meyer-Olkin Measure of Sampling Adequacy) Chic-Square and Significance values.

The terms and conditions for these values can be seen in Table 2

Table 2. First Step Output (Variable Selection) Based on KMO MSA, Chi-Square and Significance Values

No	Output Langkah Pertama	Nilai Perolehan	Syarat/Ketentuan
1	KMO MSA	0.536	$\geq 0,5$
2	Chi-Square	6	≥ 0.5
3	Signifikasi	0.013	≤ 0.05

In Table 2, it can be seen that the KMO Measure of Sampling Adequacy (MSA) figure is 0.536.

Because the MSA number is above 0.5, this set of variables can be processed further. This is in accordance with the opinion of Mastuti (2011) who states that as a general criterion if the level of significance is <0.05 and the KMO MSA number is > 0.5 , then the factor analysis carried out shows that the sample is suitable for factoring and the factors can be analysed further.

Next, each variable is analysed to find out which ones can be processed further and which ones must be excluded. The same conclusion can also be seen in the KMO and Bartlett's test numbers (which are shown by Chi-Square numbers) of 6 with a significance of 0.013. Bartlett's test is a statistical test that shows the overall level of significance or all correlations between variables. In SPSS, the Kaiser-Meyer-Olkin index is often called the Kaiser Meyer Olkin Measure of Sampling Adequacy (KMO MSA), which is an index used to examine the accuracy of factor analysis (Baroroh, 2013)

Anti-Image Matrices. Anti-image Matrices are useful for knowing and determining which variables are suitable for use in Factor Analysis. After the Anti-Image Correlation value selection process was carried out, all variables met the requirements for further extraction, especially in the (Anti-Image Correlation) section, a number of numbers forming a diagonal, marked (a), which indicated the Measure of Sampling Adequacy (MSA) were visible. a variable with a standard MSA value ≥ 0.5 (Purwaningsih, 2013). As can be seen in the variable that adopting AUTS can reduce worries in running a livestock business (X1) has an MSA value of 0.726, the variable for officers being agile in responding if farmers need a solution to a perceived complaint (X3) has an MSA value of 0.523, the variable for the amount of affordable rummy costs (X5) Has a MSA value of 0.774, the variable does not experience difficulty registration (X6) has a MSA value of 0.680, variable as a risk transfer tool (X7) has a MSA value of 0.677, the breeder variable feels given a profit (X8) has a MSA value of 0.764. With the MSA values of all existing variables meeting the predetermined standards, the extraction process can then be carried out. The variables that do not meet the requirements with an MSA value < 0.5 are the variable that health services provided by veterinarians are deemed satisfactory (X4) has an MSA value of 0.352, the variable that requires an uncomplicated insurance claim (X2) has an MSA value of 0.481 so, it cannot be included in further extraction. So, from the 8 (eight) initial variables analysed with three repetitions of the analysis, 6 (six) variables were selected that met the requirements for the factor analysis extraction process. This is also in accordance with the opinion of Santoso (2012), who states that if the MSA value is > 0.5 then this variable can be analysed further.

Total Variance Explained. Total Variance Explained explains the amount of variance that can be explained by the factors formed. If the total eigenvalues are >1 , then this factor can explain the indicator well so it needs to be included in forming the indicator. On the other hand, if the eigenvalues are <1 , then the factor cannot explain the indicator well so it is not included in forming the indicator.

There are 6 (six) variables included in the factor analysis. With each variable having a variance of 1, the total variance is 6. The Total Variance Explained value can be seen in Table 3

Tabel 3. Total Variance Explaine

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.341	39.014	39.014	2.341	39.014	39.014	1.881	31.355	31.355
2	1.105	18.415	57.429	1.105	18.415	57.429	1.564	26.074	57.429
3	.803	13.391	70.820						
4	.724	12.060	82.880						
5	.585	9.749	92.628						
6	.442	7.372	100.000						

According to Santoso (2012), determining the formation of the number of factor groups is done by looking at the eigenvalue. After extraction, it appears in the variables above that 2 factors were formed, each of which had eigenvalues of 2,341 and 1,105. According to the definition of eigenvalues, it can be stated that factor 1 consists of 2,341 variables, and factor 2 consists of 1,105 variables. Factors that have eigenvalues <1 mean that they do not have variable members that form factors.

Table 3 shows that there are 6 components (variables) included in the factor analysis with each variable having a variance of 1, so the total variance is $6 \times 1 = 6$

- If 6 variables are extracted into 1 factor then: $2.341/6 \times 100\% = 40\%$
- If 6 variables are extracted into 2 factors then: $1.105/6 \times 100\% = 19.41\%$

This means that if the 6 indicators are used as one factor, this factor is able to explain 40% of the indicator variance. If these indicators are divided into two factors, then these two factors are able to explain 59.41% of the indicator variance, of which 40% is from the first factor and 19.41% from the second factor. Because it has two factors, these two factors are able to explain 59.41% of the total variance of the 6 existing indicators. This figure is quite large because it is able to explain more than 50% of the variance in the 6 existing indicators.

Meanwhile, eigenvalues show the relative importance of each factor in calculating the variance of the nine variables analyzed. Things to note are:

- a. The sum of the eigenvalues for the six variables is the same as the total variance of the six variables or $(2, 341 + 1.105 + 0.803 + 0.724 + 0.585 + 0.442) = 6$
- b. The arrangement of eigenvalues is always ordered from largest to smallest, with the criterion that eigenvalues below 1 are not used in calculating the number of factors formed (Purwaningsih, 2009). Of the six existing components based on eigenvalues, only components 1 (one) and 2 (two) meet the requirements for calculating the number of factors.

Matrix components. Once it is known that there are two factors which are the most optimal number, this matrix component table shows the distribution of the six variables on the two factors formed. Meanwhile, the numbers in the table are loading factors, or the magnitude of the correlation between a variable. Matrix components can be seen in table 4

Table 4. Matrix components

	Component	
	1	2
Reduce farmers' worries in raising livestock	600	380
Officers are agile in responding to farmer complaints	-382	813
Affordable premi costs	614	-080
Livestock do not experience difficulties in the registration process	774	011
As a risk transfer tool	595	488
Breeders feel they are being given an advantage	711	234

Table 4 shows which factor group a variable falls into, so it can be determined by looking at the largest correlation value between the variable and the factor (Component) that is formed. The distribution of variables from the six factors is:

1. Variables reduce farmers' worries about raising livestock. The correlation value of this variable with factor 1 = 600 and factor 2 = 380. Because factor 1 > than factor 2, it is included in factor group 1.
2. Variable ease of obtaining information from officers. The correlation value of this variable with factor 1 = -382 and factor 2 = 813. Because the correlation value of factor 2 is > that of factor 1, it is included in factor 2 group
3. Affordable variable premium costs. The correlation value of this variable with factor 1 = 614 and factor 2 = -080. Because factor 1 > factor 2, it is included in factor group 1.
4. Variable cattle breeders do not experience difficulties in the registration process. The correlation value of this variable with factor 1 = 774 and factor 2 = 011. Because factor 1 > than factor 2, it is included in factor group 1.
5. Variables as a risk transfer tool. The correlation value of this variable with factor 1 = 595 and factor 2 = 488. Because factor 1 > than factor 2, it is included in factor group 1.
6. The farmer variable feels that they are being given an advantage. The correlation value of the variable with factor 1 = -711 and factor 2 = 234. Because the correlation value for factor 1 is > that of factor 2, it is included in factor 1 group.

Matrix Transformation Components. The transformation matrix component aims to determine the factors that most influence farmers in encouraging farmers to adopt Cattle Business Insurance in Kahu District, Bone Regency. The matrix transformation components can be seen in table 5

Table 5. Total Component Transformation Matrix

Component	1	2
1	.793	-.610
2	.610	.793

Based on Table 5, it can be seen that the Component Transformation Matrix data shows that both factor 1 (Component) and factor 2 have a correlation of 0.793, which means that the influence is very strong because $0.793 > 0.5$. Thus, factor 1 is that officers are agile in responding if farmers need a solution to a perceived complaint, 2 is that farmers do not experience difficulties in the registration process. It can be said that it is appropriate to summarize or describe the 6 variables that motivate farmers to adopt Cattle Business Insurance.

According to the results of the analysis, an explanation has been obtained that interprets what factors have the most influence on the drivers for adopting AUTS. In fact, based on the analysis, there are two eigenvalues that are greater than 1, so that the component factors formed are two, which shows that the most influential driving factor is that breeders do not experience difficulties in the registration process and are agile in responding if breeders need solutions to complaints. This is felt. This means that these factors are interconnected with each other so that they greatly influence the drivers of farmers in adopting Cattle Business Insurance.

Grouping of Driving Factors. The factors that most encourage farmers to adopt Cattle Business Insurance in Kahu District, Bone Regency can be seen in table 6

Table 6. Driving Factors for Farmers in Adopting AUTS

No	Component	1	2
1	Reduce farmers' worries in raising livestock	0.600	0.380
2	Officers are agile in responding to farmer complaints	-0.382	0.813
3	Affordable premium costs	0.614	-0.080
4	Breeders do not experience difficulties in the registration process	0.774	0.011
5	As a risk transfer tool	0.595	0.488
6	Breeders are being given an advantage	0.711	0.234

Based on Table 6, it can be seen that after carrying out the initial extraction process, the 8 (eight) selected variables became 6 variables which followed the factor analysis process until the end and these six factors can be categorized as factors that influence the driving factors for farmers in adopting Cattle Business Insurance. The results of the total variance test explain that the factors formed from the test results are 2 factors with each having eigenvalues of 2,341 and 1,105. This is in accordance with the definition of eigenvalues. If the total eigenvalues are >1 , then these factors can explain the indicator well so it needs to be included in the formation of indicators.

The results of grouping variables included in factor 1 (one), namely: adopting can reduce farmers' concerns in running a livestock business (X1), affordable premium costs (X5), farmers do not experience difficulties in the AUTS registration process, (X6), as a transfer tool risk (X7), breeders feel they are given benefits (X8). The variables included in factor 2 (two): officers are agile in responding if farmers need a solution to a perceived complaint (X3).

Next, the process of giving names to the factors that have been formed is carried out. Giving a special name to factor group 1 (one) refers to the members of the variables in factor group 1,

namely: X1, X5, X6, reducing worries about raising livestock, affordable premium costs, easy registration, risk transfer, and breeders feel that they are given benefits. To represent these five factors, a new name was given specifically for factor group 1, namely: Insurance Benefits, one of the main factors that encourage a person's sustainability. In the adoption of innovation, it is the benefits or advantages obtained from the innovation and its suitability to the needs and resources owned.

This is also in accordance with the statement of Annisa, et al., (2015) which states that the benefits of Cattle Business Insurance provide benefits for farmers including: 1). Get peace and quiet in running your livestock business. 2). Increase farmer income from business success which is of course sustainable. 3). Providing protection in the form of compensation to the farmer if the cattle insured by the farmer experience undesirable things such as: the death of the cow due to disease, giving birth in an accident or being lost due to being stolen. 4). Risk transfer in business can be transferred to the insurance company.

The results of Indraningsih's (2011) research stated that farmers/breeders will accept new technological innovations if they obtain benefits and favorable expectations. For adopter farmers/breeders, the relative profit factor is a priority assessment in making decisions about adopting technology, so that economic profit factors and costs are considered low, reduced discomfort/anxiety in doing business, social prestige, saving time and energy, as well as immediate rewards are considerations in decision making to adopt technology.

The naming of factor group 2 (two) refers to the single variable member in factor group 2, namely: Officers are agile in responding when farmers need a solution, in these variable farmers feel cared for, as evidenced by the speed of officers in responding to farmer complaints so they can provide a solution. solutions to problems faced by farmers. For this reason, giving a special name to factor group 2 (two), namely: insurance services, breeders' trust in the performance of livestock officers is very important considering that this is a form of service to breeders. Trust can show a positive bond of feelings between breeders and livestock officers. Trust also indicates the match between a person's expectations and the rewards the job provides. The positive thing that can be seen from trust is that farmers do not feel doubts about the performance of livestock officers in carrying out the insurance program.

This is in accordance with Junaidi statement (2022) that someone will feel satisfied with the service provided by officers if they feel that the quality of service, they receive can meet expectations and is also in accordance with the opinion of Ramadhana and Subekti (2021) that the purpose of counseling is to make it easier for breeders to get information. relevant to the problems they face so that they are able to find solutions to overcome them as well as increase knowledge and change the mindset of breeders, and become one of the attractions for breeders to adopt an innovation

5. Conclusion

The results of testing the analysis of factors driving breeders found 6 variables that followed the analysis process to the end, namely: reducing breeders' concerns in raising livestock (X1),

officers being agile in responding to breeders' complaints (X3), affordable premium costs (X5), breeders not experiencing difficulties in the registration process (X6), as a risk transfer tool (X7), farmers feel they are given benefits and are grouped into two factors (X8). The factors formed for the driving factor analysis are based on the results of testing the total variance explained of 2 factors. The variables included in factor 1 (one), namely variables: X1, X5, X6. The variables included in factor 2 are: For this reason, group 2 (two) factors are given a special name, namely: insurance services

References

- An-nisa, N. S., R. Syarief, dan G. Suprayitno. 2015. Strategi pengembangan asuransi ternak sapi. *Jurnal Manajemen & Agribisnis*. 12(1): 27-35
- Baroroh, A. 2013. Analisis Multivariat dan Time Series dengan SPSS 21. PT Gramedia, Jakarta
- D. Utami Suryaningsih, "Tinjauan Yuridis Asuransi Usaha Ternak Sapi dalam Mena," *J. Ilm. Univ. Mataram*, 1–17, (2018).
- M. Mahmud, "Motivasi Peternak Dalam Mengikuti Program Asuransi Usaha Ternak Sapi (AUTS)," *Tarjih Agribus. Dev. J.*, 1, 18–25, (2021)
- Indraningsih, K. S. 2011b. Pengaruh penyuluhan terhadap keputusan petani dalam adopsi inovasi teknologi usahatani terpadu. *Agro ekonomi*, 29(1), 1–24. <https://doi.org/10.21082/jae.v29n1.2011.1-24>
- Mastuti, E. 2011. Analisis Faktor. Universitas Airlangga. Jakarta
- Pratiwi, N. A., Sirajuddin, S. N., & Asnawi, A. 2020. *Obstacles in the application of beef cattle insurance in Gowa Regency, South Sulawesi*
- Purwaningsih, A. 2009. Penentuan Rotasi yang sesuai dalam Analisis Faktor Bidang Komputasi P2TIK-BATAN
- Ramadhana, J., Dwi, Y., F., & Subekti, S. 2021. Pemanfaatan Metode Penyuluhan Pertanian oleh Petani Cabai Merah. *Jurnal Kirana*, 2(2), 113–133.
- Riana, I. A., Baba, S., & Sirajuddin, S. N. 2019. *Differences in characteristics of farmers who adopt and who do not adopt a cattle business insurance program. Hasanuddin Journal of Animal Science (HAJAS)*, 15-21
- Santoso, S. 2012. Aplikasi SPSS pada Statistik Multivariat. PT, Elex Media Komputindo, Jakarta
- Suryaningsih, D.U. 2018. Tinjauan Yuridis asuransi Usaha Ternak Sapi dalam Menanggulangi Resiko. Universitas Mataram.
- Syukur, S., Musdalipah, M., Sirajuddin, S. N., & Fitriani, N. 2021. Faktor-Faktor Eksternal Pada Peternak Sapi Potong Yang Mengikuti Program Aut Di Kabupaten Sinjai, Propinsi Sulawesi Selatan: (*Journal Of Tropical Animal And Veterinary Science*), 11(1), 12

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