

# Factors affecting beef cattle farmers adopt Cattle Business Insurance

*by* S N Sirajuddin

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## Factors affecting beef cattle farmers adopt Cattle Business Insurance

A Riana<sup>1</sup>, S N Sirajuddin<sup>2</sup> and S Baba<sup>2</sup>

<sup>1</sup>Postgraduate Program of Animal Science and Technology, Faculty of Animal Science, Universitas Hasanuddin

<sup>2</sup>Faculty of Animal Science, Universitas Hasanuddin, Makassar, Indonesia

E-mail: sitti.nurani@unhas.ac.id

**Abstract.** This study aimed to determine the factors that influence small holder beef cattle farmer to adopt business insurance for cattle businesses. This research was conducted from February to March 2019, Bungaya sub-district, Gowa regency. The type of research was explanatory. The population in this study was all small holder beef cattle farmer in Bungaya district as many as 4.324 farmers. Samples were 98 farmers who adopted and did not adopt the cattle business insurance program. The data analysis used was logistic regression. The results showed that the factors affecting adoption of beef cattle business insurance, i.e. the number of family members, farmer attitudes, farmer subjective norms, assurance certainty, and dependence on cattle farming has an influence and is significant on the adoption of the cattle business insurance program.

### 4 Introduction

Livestock is one of the agricultural subsectors, which has a strategic role in economic matters in Indonesia [1]. However, livestock faces a lot of risks, which often cause a loss for the livestock business agents, especially the small holder beef cattle farmer. Government programs have developed a lot in the community, so in order to achieve their goals, management control and management need to be done well. Regular evaluations such as whether programs can result in increased production, farmer income and employment are very important to know the level of achievement of goals, because often such programs experience failure in achieving goals. One measure is that a program or project can meet the empowerment target if it meets the technically and financially feasible requirements for farmers, meaning that it is technically feasible and financially beneficial for the farmers [2].

One of the government programs through the Ministry of Agriculture of the Republic of Indonesia is Cattle Business Insurance (so called asuransi usaha ternak sapi, AUTS) is a form of government alignments in an effort to protect cattle farmers from the risk of death and loss of cattle. AUTS is expected to be able to provide protection to cattle farmers if the cattle die due to disease, parturition, and accident and/or loss by transferring losses to other parties through insurance coverage and also the low level of socialization conducted by the district government and the level of small holder beef cattle farmer's adoption of the AUTS program. [3] indicates that the implementation of the AUTS program is still not optimal and not as expected, so it is necessary to know the factors that influence the adoption of the AUTS.

The cattle insurance is one of the important programs to support the agricultural sector, especially animal husbandry, given the important role of livestock insurance not only for farmers but for various

parties such as 1) for small holder beef cattle farmer as a driver of good farm governance, protect against the risk of loss, improve small holder beef cattle farmer's access to financial institutions; 2) for insurance companies as a product to develop their business; 3) for financial institutions as guarantors in granting capital loans to livestock businesses; 4) for the government as an alternative to reducing beef imports and as a supporter of the beef self-sufficiency program. According to the mandate of the law on state-owned companies including insurance to have a special unit for the agricultural sector which includes cattle insurance [3].

The role of stakeholders at the national, provincial, and district levels will determine the success of the program. The level of small holder beef cattle farmer's understanding of interest becomes program membership. The outreach and advocacy work for officials and breeders has begun since the drafting of the AUTS draft to date. This is in accordance with the [4] that the government is carrying out a program, one of its main objectives is to increase the role of human resources. because efforts to increase livestock production involve human resources [5].

### 6 Materials and methods

This research was conducted from February to March 2019 in Bungaya sub-district, Gowa regency. The determination of the research location is based on the consideration that in the sub-district there are farmer-livestock groups that participate in the AUTS. The type of research is explanatory research, i.e. type of research that explains the relationship, examines the influence (cause-effect relationship) between independent variables, namely age, length of formal education, number of family members, business scale, breed experience, breeder's attitude, subjective norms, behavioral control, guarantee certainty, farmer perception, extension intensity, and farmer dependence on cattle business on the dependent variable is the adoption of the AUTS program.

The population in this study are all farmers in Bungaya as many as 4,324 farmers. Because the population is quite large, it is necessary to draw a sample. To determine the size of the sample using the Slovin formula according to [6], it can be seen that the sample size is 98 respondents consisting of 65 farmers who adopted the AUTS program and 35 people who did not adopt the AUTS program. The type of data used in this study is quantitative data which is quantitative by using the data scale of each research variable. The data source used in this study is primary data that is data obtained from direct interviews with farmers who participated in the AUTS program and who did not participate in the AUTS program which included age, length of formal education, number of family members, business scale, experience of raising livestock farmers, subjective norms, behavioral control, assurance of security, small holder beef cattle farmer's perceptions, intensity of counseling, and dependence on cattle farming and secondary data, that is data obtained from related parties or agencies such as data in the Department of Animal Husbandry and Plantation, Gowa regency, Central Statistics Agency of Gowa include the number of livestock populations and a general description of the research location. The method used in collecting data in current study was interviews and observations. Data analysis was logistic regression by the SPSS program. The mathematical model of logistic regression can be formulation as follows [7]:

$$\text{Log} \left( \frac{p}{1-p} \right) = \beta_0 + \beta_1 X_1 + \dots + \beta_{12} X_{12}$$

### 3. Results and discussion

The analysis was performed using logistic regression analysis because the dependent variable (Y) is categorical, i.e. adopting the AUTS (1) program and not adopting the AUTS (0) program. The variables that are thought to have an influence on the level of adoption are age, length of formal education, number of family members, business scale, the experience of raising livestock, attitudes, subjective norms, behavioral control, assurance of security, perception, the intensity of counseling, and dependence on cattle farming. This is in accordance with the opinion of [8] that one of the determining factors in adopting a program is the characteristics of farmers. The partial effect of the independent variable on the dependent variable is presented in table 1.

**Table 1.** Variables in the equation.

Independent variables	B	S.E.	Wald	Df	Sig.	Exp (B)	95% C.I. for Exp (B)	
							Lower	Upper
X1	-.213	.249	.733	1	.392	.808	.496	1.316
X2	-.330	.261	1.600	1	.206	.719	.431	1.199
X3	.528	.266	3.925	1	.048	1.695	1.006	2.858
X4	.376	.321	1.373	1	.241	1.456	.777	2.731
X5	.193	.239	.651	1	.420	1.212	.759	1.936
X6	-.521	.233	4.992	1	.025	.594	.376	.938
Step 1 <sup>a</sup>	.253	.105	5.792	1	.016	1.288	1.048	1.584
X8	.184	.242	.582	1	.446	1.203	.749	1.932
X9	.385	.152	6.412	1	.011	1.469	1.091	1.978
X10	-.221	.193	1.315	1	.252	.802	.550	1.169
X11	-.161	.149	1.175	1	.278	.851	.636	1.139
X12	.207	.098	4.505	1	.034	1.230	1.016	1.490
Constant	-2.406	3.113	.598	1	.440	.090		

The age variable (X1) shows a significant value of 0.392, this value is greater than the value of  $\alpha = 0.05$  ( $0.392 > 0.05$ ), so it can be interpreted that the age variable has no effect on the adoption of the AUTS program. The age factor has no effect on the adoption of the AUTS program because based on the results of the study it was found that there was no difference in the age of the breeders who adopted and did not adopt. There are small holder beef cattle farmer who are still young but have adopted, and there are also those who have just adopted the old age. Generally, at a young age, the farmers have a high enthusiasm for adoption compared to older people who prioritize long-standing traditions. According to [9] that the older a person is usually slower to adopt innovation and tends to only carry out activities that are commonly applied by local residents.

Variable length of formal education (X2) has significant value of 0.206. When compared with  $\alpha = 0.05$ , the value of significant greater than the value of  $\alpha$  ( $0.206 > 0.05$ ). The significant value for the X2 variable can be interpreted that as the old variable of formal education has no effect on the variable adoption of the AUTS program. The formal education variable is not significant due to small holder beef cattle farmer's education in Bungaya, most of them are only graduated from elementary school, although there are those who study up to tertiary institutions, but that is not enough to encourage farmers to adopt the AUTS program. The level of education received by farmers does not guarantee that they will adopt innovations because there is no difference between farmers who adopt and those who do not adopt in terms of education. The low education received by farmers is influenced by the lack of educational facilities in the area. According to [9] that farmers who have higher education are relatively quick to implement the adoption of innovations than those with less education.

The variable number of family members (X3) has significant value of 0.048. This value is smaller than  $\alpha = 0.05$  ( $0.048 < 0.05$ ), meaning that the variable number of family members affects the variable adoption of the AUTS program. Odds ratio (Exp. B) value of 1.695 means that farmers who have a large number of members tend to adopt AUTS 1.695 times better. The number of family members has a significant relationship with the adoption of the AUTS program. The results showed that in Bungaya, most of the small holder beef cattle farmer had family members of 4-6 people, the condition is large enough to be borne by the farmers. The more number of family members, then makes the farmer

increasingly wants to advance the farm business he has by utilizing the amount of family labor he has in order to get better results to meet all the needs of his family members. However, it does not affect farmers to adopt the AUTS program. According to [11] that the number of family members will influence farmers in making decisions, because the more the number of family dependents, the more the burden of life that must be borne by a farmer who can encourage him to adopt innovations.

Business scale variable (X4) has significant value of 0.241. This value is greater than  $\alpha = 0.05$  ( $0.241 > 0.05$ ), meaning that the business scale variable has no effect on the variable adoption of the AUTS program. The business scale does not have a significant relationship with the adoption of the AUTS program. The results showed that in Bungaya, most of the farmers owned cattle from 1-7 cattle that were traditionally raised with food crops. Livestock raising has traditionally been characterized by a small business scale, simple technology, simple feed, and a part-time business so that the productivity of beef cattle is still low. In the opinion of [12] and [13], raising cattle in Indonesia is managed by various forms of business. Generally, cattle are owned and managed by the people on a small scale. Farming is difficult to develop into a profitable cattle farm because it is a part-time business, when farmers need cash then the cattle will be cashed so that the bargaining position of farmers is very weak.

Variable experience (X5) has a significant value of 0.420. When compared to  $\alpha = 0.05$ , the value of significant greater than the value of  $\alpha$  ( $0.420 > 0.05$ ), meaning that the experience variable does not affect the variable adoption of the AUTS program. The absence of the influence of the X5 variable on the Y variable indicates that the length of time a person does not determine whether they will adopt the AUTS program. The experience of breeding from farmers in the Bungaya is mostly between 10-23 years. This is because most of the farmers prioritize the tradition that they are living for a long time in raising beef cattle. It is difficult for farmers to leave behind their traditions and accept innovations. For a long time or not a farmer in the livestock business does not guarantee that the farmer will adopt the innovations offered. According to [8] that the experience of raising cattle is long enough, beef cattle small holder beef cattle farmer will be more careful in trying and can fix the deficiencies in the past.

Variable attitudes of farmers (X6) have significant value of 0.025. When compared with  $\alpha = 0.05$ , the value of significant smaller than the value of  $\alpha$  ( $0.025 < 0.05$ ), meaning that the attitude of the farmers influences the variable adoption of the AUTS program. The farmer attitude variable which has a negative sign (-) indicates that the larger size of farmer attitudes results in the farmer having a tendency to not adopt the AUTS program. Odds ratio (Exp. B) value of 0.594 means that someone who has a good attitude towards the cattle business carried out tends to adopt AUTS 0.594 times better than farmers who have a less good business attitude for their farming business.

Farmer subjective norm variable (X7) has significant value of 0.016. When compared with  $\alpha = 0.05$ , the value of significant smaller than the value of  $\alpha$  ( $0.016 < 0.05$ ), meaning that the subjective norm variable of the farmer influences the variable adoption of the AUTS program. The odds ratio (Exp. B) value of 1.288 means that people who have social pressure in their position as farmers will tend to adopt AUTS 1.288 times better than farmers who have low social pressure positions.

Farmer behavior control variable (X8) shows a significant value of 0.446. This value is greater than the value of  $\alpha = 0.05$  ( $0.446 > 0.05$ ), meaning that the farmer behavior control variable does not affect the adoption of the AUTS program, meaning that there is no difference in adoption ability between small holder beef cattle farmer who are able to control good behavior compared to bad behavior.

Guarantee certainty variable (X9) has significant value of 0.011. When compared to  $\alpha = 0.05$ , the value of significant smaller than the value of  $\alpha$  ( $0.011 < 0.05$ ), meaning that the assurance variable has an effect on the variable adoption of the AUTS program. Odds value ratio (Exp. B) 1.469 means that farmers will tend to adopt a higher value of 1.469 times compared to farmers who say that AUTS has guaranteed certainty.

Farmer perception variable (X10) shows a significant value of 0.252. This value is greater than the value of  $\alpha = 0.05$  ( $0.252 > 0.05$ ), meaning that the farmer perception variable does not affect the adoption of the AUTS program means that the adoption of AUTS is not determined by farmers' perceptions of their farming business.

The education intensity variable (X11) shows a significant value of 0.278, this value is greater than the value of  $\alpha = 0.05$  ( $0.278 > 0.05$ ), meaning that the education intensity variable does not affect the adoption of the AUTS program meaning that although farmers often get counseling about AUTS, farmers have no tendency to adopt AUTS.

The livestock business dependency variable (X12) has significant value of 0.034. When compared to  $\alpha = 0.05$ , the value of significant smaller than the value of  $\alpha$  ( $0.034 > 0.05$ ), meaning that the livestock business dependent variable influences the variable adoption of the AUTS program. Odds value ratio (Exp. B) of 1.230 means that farmers will tend to adopt a higher rate of 1.230 times better than farmers who do not have a dependency on their farming business.

So that the binary logistic regression equation is variable X which has a significant effect (X3, X6, X7, X9, and X12) on the adoption of the AUTS program with a logit model that can be formed as follows:

$$Y = -2,406 + 0,528X_3 - 0,521X_6 + 0,253X_7 + 0,385X_9 + 0,207X_{12}$$

Partial parameter testing with Wald test will produce variable X which significantly affects Y if the Wald test value is greater than the Z table value ( $Z (0.05/2) = 1.645$ ) or if the significance value is smaller than the real level. There are three variables X which significantly influence Y variable at a real level of 5%, i.e. the number of family members (X3), small holder beef cattle farmer attitudes (X6), subjective norms (X7), security assurance (X9), and dependency on cattle business (X12).

The farmer's attitude towards AUTS determines the adoption of AUTS. If the farmer feels confident that the AUTS will provide a guarantee of the safety of the parent, mainly guarantee that the dead insured mother will be replaced by the insurance that follows, then they will adopt AUTS. Conversely, the more farmers feel that insurance does not guarantee the safety of their livestock, the farmer will not adopt AUTS.

#### 4. Conclusion

The number of family members, the attitude of the small holder beef cattle farmer, the subjective norms of the small holder beef cattle farmer, the certainty of guarantees, and the dependency on cattle farming have an influence and are significant on the adoption of the AUTS program, while age, length of formal education, business scale, experience of small holder beef cattle farmer, behavioral control, small holder beef cattle farmer's perceptions, and intensity of the counseling followed by the farmers had no effect and was not significant in adopting the AUTS program.

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