

Factors Affecting the Credit Repayment Period of Small-scaled Beef Cattle Businesses in Donggala Regency, Central Sulawesi Province, Indonesia

R. R. Mashudie^{1,2*} B.Hartono³ Z.Fanani³ B.A.Nugroho³

1.Student at Ph.D Program Faculty of Animal Science, Brawijaya University, Indonesia.

2.Faculty of Animal Science and Fishery, Tadulako University, Indonesia
Palu, Central Sulawesi, 94148 Indonesia

3.Faculty of Animal Science, Brawijaya, University Indonesia
Veteran Street, Malang City 65145 East Java Indonesia

Abstract

The research is carried out in Donggala Regency, Central Sulawesi Province, Indonesia. It employs survey method and aims at examining various factors which affect the credit repayment period of small-scaled beef cattle businesses at the District. 73 farmers receiving credits for beef cattle business are chosen purposively as the samples of the research. They are indeed members of a farmer group possessing and cultivating farmland for crops and plantations. The data analysis, which occupies multiple linear regression technique, show that mortality rate positively influence the period of the farmers' repaying the credit of the small-scaled beef cattle businesses.

Keywords: beef, capital, partnership, revolving

1. Introduction

Beef cattle are a type of ruminant livestock which have the largest contribution as the producer of meat. Beef cattle farming business requires substantial capital to generate optimal beef cattle growth rates (Mayangsari et al 2015). The huge cost is hardly affordable for cattle farmers due to their limited capital (Hadi and Ilham 2000).

Lack of capital is one of the main constraints in agricultural development. The development of credit services in rural areas helps the availability of capital which is often being an obstacle in the management of beef cattle business. The existence of credit becomes important when it is associated with the ability of capital procurement. Credit is considered as one of the capital sources in livestock business, especially in the developing countries.

The government issued various credit schemes to overcome capital constraints and increase the production of beef cattle. It is aimed to increase the ownership of beef cattle which will affect and increase cattle farmers income. The partnership pattern developed by the government involves the government as the provider of credit and cattle farmers as executor. It aims at improving the quality of the partner group resources and the scale of business in order to develop the business capacity of the partner groups (Matatula 2010).

The government has launched a credit program/capital relief to cattle farmers and rural farming business executor called revolving credit system. Revolving credit system is the beef cattle distribution system from the government to the cattle farmers in a certain time which allows the cattle farmers to repay the credit in the form of livestock offspring and it is not valued by money. Ashari (2009) explained that the direct assistance (grant) with the revolving credit system does not explicitly oblige the cattle farmers to repay capital and interest. Cattle farmers are given a full capital without any risk/ burden to pay off the debt. Thereby, farmers/ farmer groups will have a potential for capital formation as well as being independent that they will no longer require capital relief in the future.

Beef cattle distribution undertaken by the government to the cattle farmers through revolving credit system has been implemented in some areas for a long time, particularly for beef cattle farming. Through revolving credit system, the cattle farmers obtain the livestock from the government and the offspring will be further revolved to the other cattle farmers. Paturochman (2001) explained that the repayment pattern for a cow is two offspring. The cattle farmers should repay it within five years. In the real implementation of this system, there are some obstacles faced by the cattle farmers, which are the realization of the repayment, and also the intensity and quality of supervision and monitoring.

Sonbait et al (2011) explained that beef cattle development program, called gaduhan, through a group of independent institutions rooted in the society (LM3) has not reached the target program in general, proven by the low increase of credit livestock population, the selection of the prospective recipient which has not met the requirements, the existence of violation without a strict sanction, less effective field officer and a low number of cattle farmers who repay the credit in time.

Beef cattle businesses in Donggala are still dominated by small-scaled and medium-scaled businesses with an extensive maintenance system which keep relying on the citizen cattle farming business. One of the objectives

in managing their business is to earn profit. In achieving those objectives, cattle farmers are faced with the problem of lack of capital. This problem has an impact on the low ownership of livestock, short working hour for their cattle due to their main job as rice farmers and the low income from beef cattle businesses.

One of the efforts undertaken by the government to development beef cattle businesses is conducting partnership program through the society economic empowerment by providing beef cattle relief for groups of cattle farmers.

Department of Animal Husbandry and Animal Health (the first party) in collaboration with the cattle farmers (the second party) conducted a partnership with grant and are rolling. This system is chance for farmers in order to increase the scale of their business. In the credit pattern revolving of beef cattle, the government gave to the group of cattle farmers and their do not return the money but in the form of livestock that will be rolled out to other farmers. The credit of beef cattle with a rolling pattern is expected to accelerate the increase in beef cattle population.

The research aims at describing and analyzing various factors which affect the time of credit repayment from a small-scale beef cattle business in Donggala, Central Sulawesi Province, Indonesia.

2. Research Methods

2.1 Research Area

Sub district of Damsol, Donggala Regency, Central Sulawesi Province—was selected as the study area by purposive sampling method. This area was selected because of two reasons; (a) Damsol District is an area with the highest number of beef cattle population compared with the other area in Donggala Regency; and (b) Damsol District is the area with the highest number of cattle farmers receiving the highest amount of beef cattle revolving credit assistance.

2.2 Population and sampling

Respondents are cattle farmers receiving beef cattle revolving credit assistance in Damsol, Donggala District, Central Sulawesi Province. The sampling technique applied was purposive sampling with the total sample of 73 cattle farmers who are the recipient of beef cattle revolving credit assistance as well as the members of farmer group, possess and cultivate farmland (crops and plantations).

2.3 Data Analysis

The data were analysed using: (a) descriptive analysis to describe the characteristics of cattle farmers; and (b) multiple linear regression analysis to examine numerous factors affecting beef cattle credit repayment.

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + e$$

Information:

Y = credit repayment time (years)

X₁ = age of the respondents (years)

X₂ = level of education (years)

X₃ = farming experience (years)

X₄ = number of household members (people)

X₅ = number of livestock (AU)

X₆ = mortality (%)

X₇ = calving interval (months)

a = intercept

b₁- b₆ = regression coefficient

e = error

3. Result and Discussion

3.1 Characteristics of the respondents

Characteristic of the respondents in this study covers the age of the respondents, level education, number of household members, farming experience, number of livestock and the land area. The total number of respondents was 73 cattle farmers. Characteristics of the respondents are described in Table 1.

3.2 Age of the respondents

The mean age of the respondents was 44 years. It shows that the respondents are in productive age and can be employed for farming the beef cattle. The opportunity of a cattle farmer to use a credit follows the pattern of a better spark of life at the productive age. At the productive age, a cattle farmer is considered to be relatively strong and able to carry out farming activities. Age is related to the physical ability of the cattle farmers to raise their livestock. When the cattle farmers becomes older, it decreases their abilities to raise the beef cattle. Hartono and Rohaeni (2014) explained that the productive age is the age when the farmers are able to carry out

productive activities efficiently so that they can generate income. Adinata et al (2012) described that farmers still have a prime power at the productive age that they can develop their businesses and lent themselves to improve cultivation knowledge and methods related to cattle farming business.

Table 1. Characteristics of the Respondents

No	Characteristics	Total	%
1	Age of respondents (years)		
	a. 20-64 (productive)	71	97
	b. > 64 (destructive)	2	3
	Total	73	100
2	Level of education		
	a. elementary School	37	51
	b. Junior high school	25	34
	c. Senior High School	11	15
Total	73	100	
3	Farming experience (years)		
	a. 1 – 10	53	73
	b. 11- 20	17	23
	c. > 20	3	4
Total	73	100	
4	Number of household members (people)		
	a. 1 - 2	33	45
	b. 3 - 4	37	51
	c. > 4	3	4
Total	73	100	
5	Number of livestock (Animal Unit)		
	a. 1 - 2	34	47
	b. 3 - 4	25	34
	c. > 4	14	19
Total	73	100	
6	Land area (Ha)		
	a. < 1	24	33
	b. 1 – 2	41	56
	c. > 2	8	11
Total	73	100	

3.3 Level of education

Cattle farmers' level of education in Donggala is relatively low. Therefore, to improve their knowledge about animal husbandry, they need a non-formal education through workshop or counseling. The low level of education inevitably directs into the low managerial ability to raise the beef cattle. As the result, the productivity of beef cattle is getting low and the credit repayment of beef cattle will take longer time. Education has significant influence on cattle farmers to adopt the technology and business management skills in managing livestock. The higher the education level is, the more rational their mindset is. Cattle farmers who have higher education level are supported by insightful idea on their animal husbandry and respond faster to the changes, compared with cattle farmers who have lower educational background. Sodiq (2011) explained that formal education is directly or indirectly influences the performance of cattle farmers in relation to the way of thinking and employment systems. The level of formal education is significantly correlated with the ability to develop the husbandry. In addition, a non-formal education can also help to improve the way of thinking as well as the technical skills.

3.4 Farming experience

Farming experience becomes the basis for the progress of beef cattle business, especially in handling the production and reproduction. The longer experience of farming will enhance the ability to make decisions. Cattle farmers' experience in operating animal husbandry will improve the skills and abilities of beef cattle credit usage. Wibowo and Haryadi (2006) stated that the experience of cattle farmers in animal husbandry might influence the level of success in developing their business. In addition, it will improve the level of skills and knowledge of cattle farmers in implementing the technology. Suresti and Wati (2012) explained that the longer cattle farmers run their business, the more experience they have gained to be the guidelines in dealing with problems occurring in running the business of beef cattle.

3.5 Number of household members

Household members can be involved in farming activities. Usually, the respondents utilize female household members (mother or wife) to help the farming business. Children are not involved in this activity since they go to school from morning to afternoon. Household members assist in conducting production activities to fulfill the daily need and become the potential source of energy for maintaining the beef cattle. The area of this research is in agricultural and plantations land. Therefore, the number of family members who are involved in the beef cattle business is relatively small causing limited human resource to manage the cattle. Ilham et al (2007) explained that the results of the agricultural census in 2003 shows the majority of 45-85% of families have 3-4 members of the household. This fact indicates the cattle farmers have to limit the quantity of their family toward the better quality of life. Hartono (2011) stated that the number of members in the beef cattle farmers' family is 3.33 people on fattening husbandry and 3.37 people in cattle breeding.

3.6 Number of livestock

Respondents' beef cattle consist of the calf, virgin, and adult. The number of animals keeps relatively small which are 1-2 cows (47%) due to the lack of capital factor. The existence of the credit does not significantly increase the number of livestock ownership for the deaths of livestock breed from the government. The number of beef cattle does not influence the payback period of the small-scaled beef cattle credit due to the low quality of livestock breed that makes the productivity low. Ibrahim et al (2013) stated that the higher productivity of livestock breed will increase the result of revolving calves; on the contrary, the lower productivity of livestock breed will result in the lower revolving calves.

Winarso (2004) stated that the pattern of farming 2-3 animals is more preferable by the societies with the reason that the high number of animals will spend high cost and long time. Therefore, partnership is an effort to address the shortage of capital for cattle farmers. Mukson et al (2014) acknowledged that each household beef cattle business in Central Java raise approximately 2.19 cows. This number is still relatively small since there are various hampering factors existing undergone by farmers, such as capital, business skills, and business motives by which they have limited knowledge. The results reported Hartono (2011) in Donggala exposed that the average number of beef cattle ownership for breeding patterns is 3.85 ST/respondent while for fattening patterns belongs to 3.68 ST/respondents.

3.7 Land area

Land is the significant physical natural resource in farming. The result shows that the land area which is over 1 ha belongs to 77% cattle farmers and the land area which is less than 1 ha belongs to 33% cattle farmers. Cultivation of land is relatively limited and narrow so that the low income is insufficient to meet the basic needs of the family. The land is designated for food crops and plantations. The land for plantation is integrated with the land for beef cattle farming. Maintenance of livestock in the fields is done throughout the year without providing additional feed. Ndebele et al (2007) stated that all households reported that their cattle graze on communal rangelands throughout the year with little or no supplement of stover and urea blocks. Most households (65%) in communal and small scale areas do not have a fence.

3.8 Factors affecting the credit repayment period of small-scaled beef cattle businesses in Donggala

To recognize the factors influencing the credit repayment period of small-scaled beef cattle, the test employing multiple linear regression analysis is conducted. It can be seen in the following Table 2.

Table 2. Multiple Linear Regression Analysis

Variable	Coefficient	Sig
Constant	5,054	,000
Age of respondents (X1)	-,008	,145
Level of education (X2)	,003	,891
Farming experience (X3)	-,001	,860
Number of household members (X4)	-,038	,535
Number of livestock (X5)	,029	,348
Mortality (X6)	-,047	,000***
Calving interval (X7)	,013	,871

$$R^2 = 0,913$$

$$F = 96,989$$

The result shows that the credit repayment period of small-scaled beef cattle is influenced by several factors such as the age of respondents (X1), level of education (X2) farming experience (X3), number of household members (X4), number of livestock (X5), mortality (X6) and calving interval (X7).

The results of multiple linear regression analysis shows that a significant effect ($P < 0.001$) toward credit repayment period of small-scaled beef cattle is mortality, whereas the insignificant effect is the age of respondent,

level of education, farming experience, number of household members, number of livestock, and calving interval.

Mortality positively effects on credit repayment period of small-scaled beef cattle with negative coefficient (-0.047), indicating that the lower mortality increases the productivity of beef cattle. It automatically causes the sooner period of credit repayment. Conversely, the high mortality causes the low productivity of beef cattle. Therefore, the farmers will take longer time to repay the credit. Tanari et al (2011) explained that the average death rate of beef cattle is relatively low, which is 2.7% per year, consisting of the death of young and adult cattle by 0.9% or 0.6% of the population and the percentage of calf deaths against the birth by 10.09% and 3% against the population.

Age of the respondents shows negative regression coefficient which means that age is associated with the physical ability of cattle farmers to keep their livestock. The older age of cattle farmers will decrease the ability to work in maintaining beef cattle. It automatically leads to the longer period of credit repayment. On the contrary, the young cattle farmers will more readily accept an innovation allowing them to develop their business that they can soon repay the credit. Adinata et al (2012) described the productive age becomes the power for cattle farmers to develop their business by gaining more knowledge and methods of cultivation in the business of beef cattle.

Farming experience shows negative regression coefficient which indicates that the experience of a cattle farmer is not accommodated with the upgrading of knowledge and skills in raising the livestock. The longer the farming experience is, the faster the repayment of credit will be, and vice versa. Mayangsari et al (2015) explained that the longer experience on farming will provide the farmers with more knowledge and innovation on raising livestock to avoid the arrears in loan repayment.

Number of household members is negative regression coefficient, indicating that the number of household members involved in cattle production is relatively small leading to the limited ability to manage cattle and longer period to repay the credit of beef cattle. On the contrary, involving household members in managing beef cattle makes the period of credit repayment faster. Sonbait et al (2011) explained that the number of family dependents have no effect on the repayment of credit since the land area of the present research is an agricultural area and oil palm plantations, which means not all family members are involved in the cattle business.

The level of education shows positive regression coefficient, indicating that the increase in education can improve the managerial capacity of the cattle farmers in the beef cattle business. It implies that the higher the education level is, the faster the credit repayment period of small-scaled beef cattle will be.

Number of animals shows positive regression coefficient. It means that the higher number of livestock will accelerate the repayment time due to the good quality of the breed input received by cattle farmers which directs into high productivity. Ibrahim et al (2013) explained that the higher productivity of cattle farmers increase the result of revolving calf. Conversely, the low productivity of beef cattle breed will lead into lower results of revolving calf.

Calving interval shows positive regression coefficient, which means that the calving interval has no effect on the business credit payback time of small-scale cattle production. This is due to the longer distance of the birth, the longer the loan repayment period. Land ownership for the development of livestock and forage areas is relatively limited thus affecting the availability of fodder. Feed factor has an important role in the achievement of sexual maturity. Low quality nutrition will extend the involution of the uterus so that calving interval time becomes longer. Ridha et al (2007) explained that the efficiency of calving interval space of Bali cattle can be achieved by shortening the life of the weaning and mating distance after giving birth.

Table 2 shows the value of the coefficient of determination is 0.913, meaning that the variables of age, education, farming experience, household members, number of livestock, mortality, and calving interval in the model can explain the variable of credit repayment period of small-scaled beef cattle as 91.3% and the remaining 8.7% becomes variation of variables excluded in the regression model.

The value of F_{count} obtained is 96.989 ($P < 0.001$), suggesting that all variations of the independent variables ($X_1, X_2, X_3, X_4, X_5, X_6, X_7$) together influence the credit repayment period of small-scaled beef cattle.

4. Conclusion

The results of data analysis show

- All variables, covering age of the respondents, level of education, farming experience, number of household members, number of livestock, and calving interval, do not significantly influence the credit repayment period of small-scaled beef cattle.
- The mortality significantly influence ($P > 0.001$) the period of the farmers' repaying credit of their small-scaled beef cattle businesses.

References

Adinata K I, Sari AI dan Rahayu E T. 2012. Strategi pengembangan usaha sapi potong di Kecamatan Mojolaban Kabupaten Sukoharjo. *Jurnal Tropical Animal Husbandry*. Vol 1 No 1: 24-32.

- Ashari .2009. Policy optimazation of credit program for agricultural sector in Indonesia. Analisis Kebijakan Pertanian. Vol 7 No1: 21-42. <http://pse.litbang.pertanian.go.id/ind/pdf/ART7-1b.pdf>
- Hartono B and Rohaeni E S.2014. Contribution to income of traditional beef cattle farmer households in Tanah Laut Regency, South Kalimantan, Indonesia. *Livestock Research for Rural Development* 20(8). <http://www.lrrd.org/lrrd26/8/hart26141.htm>
- Hartono B. 2011. Analisis ekonomi rumahtangga peternak sapi potong di Kecamatan Damsol Kabupaten Donggala Provinsi Sulawesi Tengah. *Jurnal Ternak Tropika* Vol 12 No. 1.pp. 60-70. <http://ternaktropika.ub.ac.id/index.php/tropika/article/viewFile/114/110>
- Ibrahim J T, Sutawi dan Jayus. 2013. Analisa kinerja program pengembangan usaha sapi potong pola gaduhan sistem revolving (Studi di Distrik Bomberay Kabupaten Fakfak Provinsi Papua Barat). *Agrise*. Vol 13 No.2. <http://agrise.ub.ac.id/index.php/agrise/article/view/103>
- Ilham N, Suradisastra K, Pranadji T, Agustian A, Hardono G S dan Hastuti E L. 2007. Analisis profil petani dan pertanian Indonesia. http://pse.litbang.pertanian.go.id/ind/pdf/FILES/LHP_NYK_2007.pdf
- Matatula M J. 2010. Analisis finansial usaha peternakan sapi potong pola gaduhan di Kecamatan Kairatu Kabupaten Seram Bagian Barat. *Jurnal Agroferesti*. Vol V No 3. <https://jurnalee.wordpress.com/2012/04/21>
- Mayang D, Prasetyo E and Mukson. 2015. Evaluation on beef cattle credit in Grobogan Regency. *Jurnal unismu*. Vol 11 No. 1. <http://jurnal.unimus.ac.id/index.php/vadded/article/view/1668/1720>
- Mukson, Roessali W dan Setiyawan H. 2014. Analisis wilayah pengembangan sapi potong dalam mendukung swasembada daging di Jawa Tengah. *Jurnal Peternakan Indonesia* 16(1). <http://jpi.faterna.unand.ac.id/index.php/jpi/article/view/30>
- Ndebele JJ, Muchenje V, Mapiye C, Chimonyo M, Musemwa L and Ndlovu T. 2007. Cattle breeding management practices in the Gwayi smallholder farming area of South-Western Zimbabwe. <http://www.lrrd.org/lrrd19/12/ndeb19183.htm>
- Paturochman M.2006. Studi perbandingan sistem kredit ternak domba dan kerbau di Kabupaten Sumedang dan Taksimalaya. *Bandung Lembaga Penelitian Universitas Padjadjaran bekerja sama dengan Dinas Peternakan Propinsi Jawa Barat. Jurnal Sosiohumaniora* Vol 8 No 3. <http://jurnal.unpad.ac.id/sosiohumaniora/article/view/5561>
- Ridha M, Hidayati and Adelina T. 2007. Analisis faktor-faktor yang mempengaruhi jarak beranak (calving interval) sapi bali di Kecamatan Bangkinang Kabupaten Kampar. *Jurnal Peternakan* Vol 4 No 2:65 -69. <http://ejournal.uinsuska.ac.id/index.php/peternakan/article/view/273/256>
- Sodiq A. 2011. Analysis of livestock estate of village breeding centre (VBC) and village fattening centre (VFC) for beef cattle based on local resources to support national program of cattle meat self-sufficiency. *Jurnal Agripet*. Vol 11 No 1: 22-28. <http://jurnal.unsyiah.ac.id/agripet/article/viewFile/650/558>
- Sonbait L K, Santoso K A and Panjono. 2011. Evaluation of cattle sharing system in the development of cattle farming for the farmer groups under lembaga mandiri yang mngakar di masyarakat in Manokwari Regency west Papua. *Buletin Peternakan* 35(3): 208-217. <http://journal.ugm.ac.id/buletinpeternakan/article/view/1095>
- Suresti A and R. Wati . 2012. Bussiness development strategis of beef cattle in Pesisir Selatan. *Jurnal Peternakan Indonesia*. Vol 14 No. 1. <http://jpi.faterna.unand.ac.id/index.php/jpi/article/view/5>
- Tanari M, Duma Y, Rusiyantono Y, Mangun M.2011. Dinamika populasi sapi potong di Kecamatan Pamona Utara Kabupaten Poso. *Jurnal Agrisains*. Vol 12 No. 1: 24-29.
- Wibowo S A dan Haryadi F T. 2006. Faktor karakteristik peternak yang mempengaruhi sikap terhadap program kredit sapi potong di kelompok peternak Andiniharjo Kabupaten Sleman. *Media Peternakan*. Vol 29 No. 3 Pp.176-186. <http://medpet.journal.ipb.ac.id/index.php/mediapeternakan/article/view/840>
- Winarso B. 2004. Prospek pengembangan usaha dan pemasaran ternak sapi potong di Kalimantan Timur. *Jurnal Ilmiah Kesatuan*. Vol. 6 No. 1.