World Journal of Pharmaceutical and Life Sciences
WJPLS

www.wjpls.org

SJIF Impact Factor: 6.129

ANALYSIS OF INDEX MARKET CONNECTION AND MARKET PERFORMANCE IN MARKETING OF BEEF CATTLE IN KUPANG DISTRICT, EAST NUSA TENGGARA, INDONESIA

Matheos Filipus Lalus[1], Solvi Mariana Makandolu[2] and Edwin Jermias Lodowik Lazarus[3]*

[1]Department of Animal Husbandry, Faculty of Animal Husbandry, Marine and Fisheries, University of Nusa Cendana, Jl. Adisucipto Penfui, Kupang 85000, Kupang, Indonesia.
[2,3]Department of Animal Husbandry, Faculty of Animal Husbandry, Marine and Fisheries, University of Nusa Cendana.

Corresponding Author: Edwin Jermias Lodowik Lazarus
Department of Animal Husbandry, Faculty of Animal Husbandry, Marine and Fisheries, University of Nusa Cendana.

Article Received on 14/07/2022 **Article Revised on 04/08/2022** **Article Accepted on 25/08/2022**

ABSTRACT

Intermediary institutions play a very important role in marketing cattle in Kupang District-ENT with various activities they carry out, including: purchasing, transportation, sorting, standardization and grading, and so on. This research was conducted by survey method. The results of this study shows: the IMC between the price of beef cattle at the level of farmers and middlemen was 1.0040; between farmers and inter islands traders 10.048 was 10048; between middlemen traders and inter-island traders 10.714 was 1.0714. This means that in the short term the prices of beef cattle in the three markets level have not been perfectly integrated. Farmer's share has been fair enough, although at various levels the cattle market in this region has not been perfectly integrated. The average farmer's share in the research area was 75.95%. Marketing margin is 62.17%; profit margin was 66.71%. The biggest profit margin received by intermediary traders was 60.70%, inter-island traders was 29.30%. There was disparity in the distribution of marketing margins between inter-island traders and inter-island traders, with 88.57% for inter-island traders and 48.33% for inter-island traders.

KEYWORDS: Index market connection, Farmer’s share, Margin, beef cattle.

INTRODUCTION

Marketing institutions are liaisons between farmers as cattle producers and beef consumers through marketing activities. There are various activities including purchasing, transportation, collection, sorting, standardization and grading and so on.[1;2]

If the involvement of each intermediary institution was seen as a market, it was hoped that if there price was change in the reference market (in this case the receiving wholesaler in Jakarta) it can be transmitted through various institutions involved in marketing the cattle to the farmer level as a perfect cattle producer. The Law of One Price (LOP) can be found in all pairs of co-integrated livestock markets implying that, prices of agricultural products were perfectly transmitted between these markets. Thus, it can be said to be integrated, if there was a 1% change in the price in the reference market, it will be transmitted with the same percentage to the farmer level as beef cattle producers. Thus, it can be assumed that these markets are connected perfectly or imperfectly as the integration takes place. Muwanga and Snyder[3] state that, markets were integrated if there is trading activity between two or more spatially separated markets, then the price in one market is related or correlated with prices in other markets. Price changes in one market are spatially or totally transmitted to other markets, both in the short and long term.

The number of institutions involved in marketing an agricultural product will lead to a larger marketing margin. Because every marketing agency (both individuals and groups or institutions) in marketing activities spends energy, costs and time in implementing various marketing functions; such as purchasing function, sales function and facility function.[4] So the expectation of a profit (marketing profit) is a logical consequence of all the sacrifices that have been made. The larger the marketing margin, the smaller the farmer's share received by farmers.[5] The questions as follow 1) are all market levels in cattle marketing perfectly connected? 2) is the marketing margin distributed proportionally? and 3) Has the farmer's share in the marketing of cattle in thisarea been proportionate?

Research purposes

1. Analyzing index of market connection (IMC) inbeef cattle marketing in Kupang District.
2. Analyzing the distribution of margins in the marketing of beef cattle, starting from the farmer level to inter-island traders.
3. Analyzing farmers' share in beef cattle marketing in Kupang District, ENT.

RESEARCH METHODS

Research sites

This research was located in Kupang District with two sample sub-districts, each is Fatuleu sub-District and Amarasi sub-District. The research location was determined by the multi stage sampling method.[6,7] The location determination is carried out in stages, starting from the sub-district to the village purposively, with the consideration that in Kupang District there are two locations of livestock markets, namely the Lili Livestock Market located in Fatuleu sub-District and Baun Livestock Market in West Amarasi sub-District. The determination of respondents was carried out through simple random sampling 10% of the population of farmers who had sold cattle in the last 3 (three) years, 2018, 2019 and 2020. To determine intermediary traders and inter-island traders, the snow ball sampling method was used.[8]

Data Collection Method

This research was conducted by survey method. Data collection was done through the collection of primary data and secondary data. Primary data was collected directly from farmers and intermediary traders as well as inter- island traders, through interview techniques based on questionaires that had been prepared. Meanwhile, secondary data was collected from offices or agencies related to this research, such as data from statistics beureu office (BPS), both district and provincial.

Data Analysis Method

The method used to analyze the data in this research is the analysis of market connectivity: starting from farmers, village/sub-district traders, interinsulair traders in Kupang-ENT. Quantitative data analysis is carried out through the Index of Market Connection Analysis approach to explain the price connectivity between markets, both in the short term and in the long term. Analysis of market performance was carried out through analyzing farmer's share, marketing margins and profit share distribution among marketing institutions involved in marketing of beef cattle in the area.

The approach used in market integration for the long term is the autoregression model, which is a dynamic approach to price changes in a market. The general model of autoregression (AR)[9] and Timmer (1987) cited by Anonymous[10] can be expressed by Pft (farm-level price) which is a linear function of the lag value of self-esteem expressed in the form of an equation mathematically as follows.

Pft = a1Pft-1 + a2Pft-2 + ….. + asPft-s + Et…...(1)
Or it can be simplified to be.
Pft = ∑ ai Pft-s + εt……..(2)Or (1 – a1β)Pft = εt

Ravallion (1986) states that price changes in a market are a function of several independent variables.
Pft = f(Pft-s, Prt, Prt-1, Prt-j, Xj)……..……(3)
Where
Pft = Year t local market pricePft-s = Self-esteem lag
Prt = Reference market price (consumer prices. prices for inter-island traders)
Prt-j = Price lag in the reference market Xj = Other external variables
s = Length of price lag at time t-sj = Length of reference price lag
The functional equation above equation (2) is rewritten in the form of an autoregression vector as follows.
Pft = aisPft-s + bijPrt-j + ciXit + et……..(4)
Where : s = 1, 2, 3
j = 0, 1, 2, 3
If bij = 0 (j = 1,2,…., n) it means that the price in the reference market does not affect the price in the local market.

1. If $b_i0 = 1$, then ais = bij = 0 (j = 1,2,….., n) means that the price increase in the reference market will soon be channeled perfectly to the price in the local market, so it is said that in the second short run, perfectly integrated market.
2. If ais + bij = 1 (j = 0.1,2,……, n) it means that in the long run the prices in the reference market and the local market are perfectly integrated.

According to Ravallion[9] that by applying the autoregression vector above, a serious multicollinearity problem will be found among the regressors in the model used, which will lead to biased estimation results. There are so many multicollinearities that must be avoided so that it requires a complicated process. Furthermore, to overcome the problem of multicollinearity in the Ravallion model, he and Timmer (1987) cited by Anonymous[10] simplified the model as follows.
(Pft – Pft-1) = (b1 – 1)(Prt-1 – Pft-1) + (b1 + b0 + a1 – 1) Pft-1 + CtXt + et (1)
or it can be simplified to:
Pft = (1 + d1) Pft-1 + d2 (Prt – Pft-1) + (d3 – d1)Prt-1 + d4Xt + et (5)
Where : d1 = (b1 – 1) d3 = b1 + b0 + a1 – 1d2 = b0 d4 = c

According to Timmer (1987) cited by Anonymous[10], the coefficients (1 + d1) and (d3 – d1) describe the contribution of prices to farmers and consumers in the past to the formation of farmers' prices at this time. Market integration in the short term is measured through the Index of Market Connection (IMC).

$$IMC = \frac{(1+d1)}{(d3-d1)} \quad \text{.....(6)}$$

If the IMC value is close to zero (IMC 0), it means that the market is increasingly integrated in the short term. This means that supply and demand conditions in the

reference market are effectively transmitted to the local market and affect prices in the local market. Integration in the long run is indicated by the coefficient d2 because this parameter shows how much changes in prices at the consumer level can affect prices at the farmer level at this time. If (Pft – Prt-1) = 0, then d2 is removed from the equation, which means the consumer market price is stable. If d2 is close to 1 (d2~ 1), the two markets are increasingly integrated in the long run.

Many researchers have used the model developed by Ravallion above, including Timmer (1987), the Research Team of the Surakarta Perheppi Commissariat (1996). In this study, to determine the long-term vertical integration of prices, the autoregression model is used.

$$P_{f.i.t} = \alpha_{oi} + \alpha_{1i}(P_{f.i.t-1}) + \alpha_{2i}(P_{r.j.t} - P_{r.j.t-1}) + \alpha_{3i}(P_{r.j.t-1}) + e_t \quad \text{.....(7)}$$

Where : Pf.i.t = Price of cattle at the ith breeder level in month t (IDR/head)
Pf.i.t-1 = Price of cattle at the level of breeder to-i month t-1 (IDR/head)
Pr.j.t = Price of cattle at the level of the i-th trader in month t (IDR/head)
Pr.j.t-1 = Price of cattle at the i-th trader level in month t - 1 (IDR/head)
Where : Pf.i.t = Price of cattle at the ith breeder level in month t (IDR/head)
Pf.i.t-1 = Price of cattle at the level of breeder to-i month t-1 (IDR/head)
Pr.j.t = Price of cattle at the level of the i-th trader in month t (IDR/head)
Pr.j.t-1 = Price of cattle at the i-th trader level in month t - 1 (IDR/head)

If α2i = 1, in the long run the price of cattle at the i-th farmer level is perfectly integrated with the j-th trader's price, which means that if there is a 1% change in the price of wholesalers in Jakarta, it will cause a price change at the farmer level. farmers by 1% too, if α2i < 1. In the long run the price of cattle at the i-th farmer level is not perfectly integrated with the price at the j-th trader level so that if there is a 1% change in prices at the wholesaler level in Jakarta, it will causes price changes at the farmer level < 1% and if α1> 1, it means that the market was not perfectly integrated, so that if there is 1% change in prices at the wholesaler level in Jakarta, it will cause price changes at the farmer level > 1%. Furthermore, by using the model equation (7) it can also be seen the state of integration in the short term. From this equation, the Index of Market Connection (IMC) value can be found.

$$IMC = \frac{\alpha 1i}{\alpha 3i} \quad \text{..... (8)}$$

If IMC = 0, it means that in the short term the price at the farmer level is perfectly integrated with the price at the receiving wholesaler in Jakarta. If IMC > 0, it means that in the short term the price at the farmer level is not perfectly integrated with the price at the beneficiary wholesaler level in Jakarta. If IMC = 0, it means that in the short term the price at the farmer level is perfectly integrated with the price at the beneficiary wholesaler level. in Jakarta. If IMC > 0, it means that in the short term the price at the farmer level is not perfectly integrated with the price at the wholesaler level receiving it in Jakarta.

RESULTS AND DISCUSSION

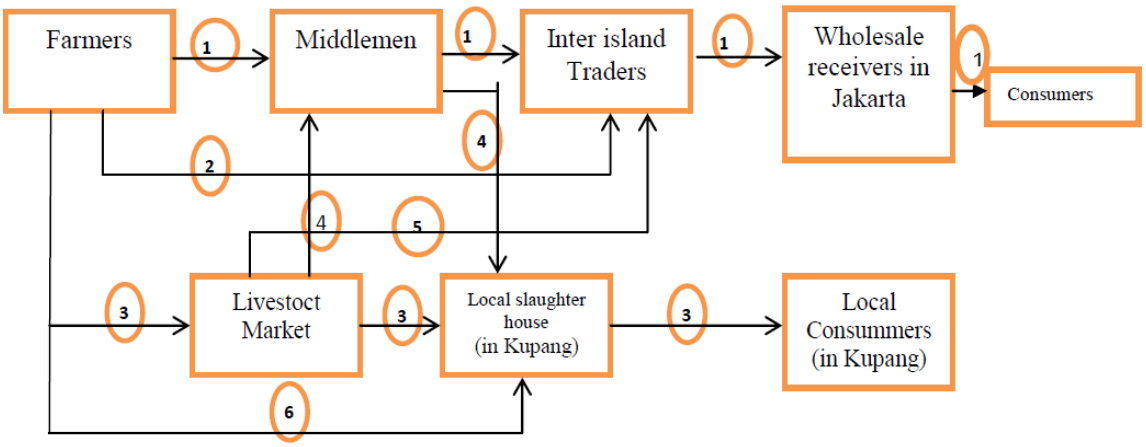
Cattle Marketing and Pricing System

In general, farmers in the research area sell their cattle through intermediary traders (72%%) and only 28% sell directly to inter-island traders. The reasons for selling cattle through intermediary traders are 1) they already know each other so that if farmers have an urgent need, they can ask for help or loans from intermediary traders and guarantee that their cows will not be sold to other parties, 2) if they sell directly to inter-island traders, the determination the price is based on live body weight, 3) livestock must be brought to a cattle weighing station which is generally in the animal market; 4) the consequence of being far away from the weighing site is that if an accident occurs and the livestock is injured and has a broken leg, the livestock will be rejected, 5) the price of rejected cattle can drop by half or even lower than the normal price. The results of this study are relatively the same as the results of a previous study conducted by Lalus[11], where 74% of farmers sold their cattle through village traders who life at the same settlement with them.

The average price of cattle was IDR 8,765,677,97 if the determination of the price based on live weight was IDR 8.142.857,14.- Thus there is a price difference between the two methods of determining the price was IDR 622,820,82.- or it can be said that if farmers do not sell directly to inter-island traders but sell through village middlemen, they will lose 7.65% of their income.

An overview of the marketing channels for beef cattle in Kupang District from the farmer level to the receiving wholesaler in Jakarta is as follows.

a. The first channel; farmers (Pf) sell to intermediary traders with an average price was IDR 7,134,984.90 per animal unit; then from inter-island traders (Pp) to inter-island traders (Pap) with an average price was IDR 9,247,076.90 per animal unit, then interisland traders (Pap) to wholesalers receivers (Wsr) in Jakarta with an average price was IDR 12,090,880,96 per animal unit and from wholesalers receiving it in Jakarta.
b. Second channel; farmers (Pf) directly sell to inter-island traders (Pap) with an average price was IDR 9,247,076.90 per animal unit, then inter-island traders sell to wholesalers receivers in Jakarta with an average price was IDR 12,090,880,96 per animal unit and from wholesalers recievers in Jakarta its sold to slaughterhouse and finally arrive in hand ofbeef consumers.



Scheme 1: Beef Cattle Marketing Channels in Kupang District.

c. Third channel: farmers (Pf) bring their cattle to the livestoct market and sold to slaughterhouse traders and finally sold to consumers in the form of beef. The average price of livestock sold through this channel was IDR 6,105,263.16
d. Fourth channel: farmers bring their cattle to the livestoct market and are bought by middlemen and then sold to local abattoir traders for an average price was IDR 6,105,263.16 and finally sold to local beef consumers.
e. Fifth channel: farmers bring their cattle to the livestoct market and sell them directly to inter-island traders with an average price was IDR 9,247,076.90 per animal unit and then sold to wholesalers receivers it in Jakarta.
f. The sixth channel: farmers sell their cattle directly to the abattoir traders with an average price was IDR 6,105,263.16 and in the end it is sold to consumers in the beef form. In this channel, abattoir traders generally come to farmers directly. Generally, the cattle sold are abandoned or unproductive beef; as well as those that were still productive, depend on the farmers' need for cash, even pregnant cows also be sold. Krova et al.[12] stated that the above occurred because the actual management and institutions at the farmer level had not played an optimal role in controlling the slaughter of productive cow. The average price of female cattle sold by farmers was IDR 6,105,263.16.

The marketing chain of beef cattle agribusiness organizations as stated in the research of Widitananto et al.[13] describes the construction of natural phenomena of cattle marketing activities through studies that aim to build a more appropriate marketing structure, especially for small-scale farmers in the Kediri District; so that the meaning of the marketing process carried out is able to provide: 1) a better level of welfare, especially for farmers; 2) the meaning of marketing that is more in favor of farmers, so that it stimulates interest in raising beef cattle which can be pursued as a main effort as well as a supported effort priority. When trying to support the success of government policies for self-sufficiency which, although not yet successful, in terms of multiple effects also provide strategic opportunities that raising beef cattle can provide an opportunity to improve the quality of life of farmers' households both in meeting primary, secondary and other productive rational needs. The results of research by Muslim and Darwis[14] stated that in addition to supply and demand factors, factors that affect agricultural prices at the farm level are the low efficiency of marketing channels. The low price received by farmers can be caused, among other things, by the poor existing transportation system, so that part of the price that should be enjoyed by farmers is used to finance inefficient transportation. The poor transportation infrastructure as mentioned above is also found in Kupang District; where this situation causes several things as follows: 1) transportation costs become expensive (both for farmers who intend to sell their cattle to the cattle market, as well as transportation costs that will be incurred by traders); b) the selling price of cattle at the farmer's residence becomes low; c) farmers are reluctant to sell their cattle to the market because transportation costs are expensive, as a result the bargaining position of farmers in determining the selling price of livestock is weak.

The cattle traded in Kupang District come from farmers scattered in various villages, then other farmers buy directly from the owner farmers at the farmer's residence or can also be purchased at the animal market. Next, fattening is carried out and then sold through inter-village traders or traders. intermediaries and so on are sold to inter-island traders or sold to abattoirs for local consumer purposes for the people of Kupang city and its surroundings. In Kupang District, there are two animal markets, each the Lili Livestoct Market in Camplong I Village, Fatuleu sub-District and the Baun Livestoct Market in West Amarasi sub-District.

Asmarantaka[5] states that theoretically, efficient marketing only occurs in a perfectly competitive market. This market structure will not be found in reality. The measure of efficiency is the satisfaction of consumers, producers and institutions involved in flowing goods

from producers to consumers; this measure to determine satisfaction is difficult and very relative, (Raju and Oppen 1992; Kohls and Uhl, 2002) cited by Asmarantaka.[5] Therefore, most experts use indicators of operational efficiency and price efficiency. Marketing efficiency of beef cattle in Kupang-NTT can be done through a market structure market conduct, market performance (S-C-P), especially to be done through analysis of index market conection.[9;10;15]

Market Structure

The market structure provides an overview of the market participants for a product, which in this case is beef cattle. Market participants consist of farmers as cattle producers, intermediary institutions (intermediary traders and inter-island traders) and beef cattle consumers (receiving wholesalers in Jakarta including traders in Jakarta abatoir) and finally beef consumers. The population of each market participant is described as follows: farmers are the largest after beef consumers; while intermediary institutions are the least in number compared to other market participants. If based on the population, the few intermediary institutions are thought to have a stronger bargaining position than producers and consumers.

One of the analytical tools to determine market structure is the concentration ratio and price transmission elasticity.[16] Concentration ratio is intended as the number of beef cattle purchased by certain traders compared to the number of beef cattle traded in the market. In this study there were 10 intermediary traders who bought beef cattle from farmers with transaction volumes ranging from 36 - 105 heads or ranging from 6.23% - 17.21% per trader of the market purchase volume.

If we look at the intermediary traders, which are only 10 people compared to the number of farmers who are 100 people, then the structure of the beef cattle market in Kupang District, ENT has a tendency towards oligopsony competition. Furthermore, when viewed from the concentration ratio where four traders only control 53.44% of the transaction volume in the market, in this case it is still far from the minimum requirement of 80%, even if viewed from the number of transactions from 8 traders only reaching 87.87%, the structure of the beef cattle market in this region tends to oligopsony competition with moderate concentration.

When viewed from the inter-island traders, there are only 4 people, the structure of the beef cattle market in Kupang District, ENT has a tendency towards oligopsony competition. Meanwhile, the results of the concentration ratio analysis show that two inter-island traders who control the volume of market transactions are 57.39%, it's mean that the beef cattle market structure in ENT has a tendency towards oligopoly competition with moderate concentration. Bain (1959) cited by Erlinda et al.[17] stated that, after understanding the level of market concentration, market characteristics can be identified whether monopoly, oligopoly, monopolistic or perfect competition.

To find out the market structure of beef cattle in Kupang District, it can be done through simple linear regression analysis. This analysis was conducted to determine the price response at the farmer level as a result of price increases that occurred at the inter-island trader level. The regression coefficient (b = 0.9534) for the market level between farmers and intermediary traders (Table 1) means, if there is a 1% change in prices at the intermediary level imposed by inter-island traders, then the price changes will be transmitted to farmers only by as much as 1%. 0.95%, so it can be said that the price transmission between middlemen and farmers is not running perfectly; so it is mean the market structure between intermediary traders and farmers was imperfectly competitive.

Table 1: Results of Regression Coefficient Estimation (Vertical Market Integration) in the Short Term based Market Level of Beef Cattle in Kupang District, ENT.

Variable	Market Level		
	Pf - Pp	Pf – Pap	PP – Pap
Constanta (b0i)	0.4963	-1.5875	-1.9498
Prj(t)(b1i)	0.9534	1.0653	1.1029
Se (b1i)	0.0444	0.0549	0.0288
t_{hitung}	21.464	19.4096	38.3514
$t_{0.01/2;100}$	2.167	2.167	2.167
F_{hitung} R^2	460.72 0.8246	376,73 0.7936	1470.83 0.9375

For the market level between farmers and inter-island traders, the regression coefficient (b=1.0653) indicates that if there was 1% change in price at the inter-island trader level, the change will be also transmitted to the farmers 1%, which means the price transmission between inter-island traders and farmers was perfectly competitive.

Market Conduct

Market conduct analysis was done to determine the practice of determining prices in the market, both qualitatively and quantitatively. Qualitative pricing practices are described descriptively. While quantitative analysis can be explained with the help of vertical market integration analysis, starting from the level of farmers to

farmers to inter-island traders. Market integration analysis used a simple linear regression model for the short and long term.

1) income-oriented, 2) capacity-oriented and 3) customers-oriented.

b. Free to enter and out of the market. If a farmer raises cattle and eventually sells them (because it's time to sell or forced to sell to meet urgent needs) is the free will of the farmer concerned. This means that there is no obligation from anyone to forced farmers to raise cattle. Raising cattle is the will of the farmer himself, because of the social and economic considerations of the farmer himself as well as what has been heard and received from other else regarding the benefits of raising cattle.

c. Integration Analysis. Vertical market integration aims to analyze market linkages in one market with markets below or above it. In general, inter-island traders have complete records on a weekly or monthly basis regarding the purchase price and selling price of beef cattle that have been successfully delivered to islands for three years, from 2018 to 2020, cattle prices tend to vary.

The average price of beef cattle at various market levels at the farmer level in 2018 was IDR 8,826,532.99, in 2019 the price rose 9.07% to IDR 9,626,992.76 then the price increased quite large (46.915%) to IDR 14,142,973.15 in 2020, or in the period 2018 to 2020 there was an average price increase of 28%.

Beef Cattle Market Integration in Kupang District

The integration of beef cattle prices in the short term between farmers and intermediary traders in Kupang District is shown by the regression coefficient (b11=0.6921). The results of the statistical test, the regression coefficients found were very significantly different ($P < 0.01$). This means that if there was 1% increase in prices at the intermediary level, the price increase will only be transmitted to farmers by 0.69%. This means that the percentage increase in prices imposed by intermediary traders to farmers is smaller than the price increase received by intermediary traders themselves. Thus it can be said that the price of beef cattle at the farmer level is not perfectly integrated with the price at the intermediary level.[20]

The integration of beef cattle prices in the short term between farmers and inter-island traders in Kupang District is shown by the regression coefficient (b12 = 0.6596). The results of the statistical test, the regression coefficients were found to be very different ($P < 0.01$). This means that if there is an increase in prices at the level of inter-island traders by 1%, then the increase in prices will be transmitted to farmers only by 0.66%. This means that the percentage increase in prices imposed by inter-island traders to farmers is not the same as the price increase received by inter-island traders from traders in Jakarta. Thus it can be said that the price of beef cattle at the farmer level has not been perfectly integrated with prices at inter-island traders. Goodwin and Piggot[21] state that market integration has important implications for price discovery and market continuity since there is a deviation from integration which may indirectly reduce the risk and profit opportunities for traders across space.

The integration of beef cattle prices in the short term between intermediary traders and inter-island traders in Kupang District is shown by the regression coefficient (b13=0.9868). The results of the statistical test, the coefficients found were very very different ($P < 0.01$). This means that if there is an increase in prices at the inter-island trader level by 1%, the price increase will be transmitted to farmers by 0.99% (rounded up to 1%). This means that the percentage increase in prices imposed by inter-island traders to intermediary traders is the same as the price increase received by inter-island traders from traders in Jakarta. Thus it can be said that the price of beef cattle at the inter-island trader level is perfectly integrated with the price at the inter-island trader level. . The results of the statistical test, the coefficients found were very different ($P < 0.01$). This means that if there is an increase in prices at the inter-island trader level by 1%, the price increase will be transmitted to the farmers by 0.99% (1%). This means that the percentage increase in prices imposed by inter-island traders to intermediary traders is the same as the price increase received by inter-island traders from traders in Jakarta. Thus it can be said that the price of beef cattle at the intermediary level is perfectly integrated with the price at the inter-island trader level.

Analysis Index of Market Connection (IMC)

Another approach used to determine the integration of beef cattle prices in the short term in Kupang District is the Index of Market Connection (IMC). From the results of the analysis, it is obtained that the IMC between the price of beef cattle at the level of farmers, and intermediaries was 1.0040; between farmer and inter island traders was 1.0048; between intermediary traders and inter-island traders is 1.0714. It appears that the IMC coefficient > 0 at the three levels of the beef cattle market in Kupang District. This means that in the short term beef cattle prices in the three markets were not perfectly integrated, because price changes that occur at higher market levels were not transmitted perfectly to lower market levels. In other words, if the price was change imposed by wholesalers in Jakarta to traders inter islands traders, then the price change was not effectively transmitted to middlemen or to farmers, this is not in accordance with the opinion of Eronmown et al.[22] which states that The state of not being spatially integrated between two or more markets was caused by one of the factors, namely information asymmetry.

The estimation results of the regression coefficients to show market integration in the long term vertically at various market levels are as listed in Table 2. The results of statistical tests on the regression coefficients show that the long-term integration of prices at the farmer and

intermediary level is indicated by the regression coefficient (α2.1 = 0.0062 <1), $t_{stat}>t_{table}$ 4.6278 > 0.5661 between inter-island traders and traders (α2.2 =0.0056<1) $t_{stat}> t_{table}$ 4.6655 > 1.4873 and between farmers and inter-island traders (α2.3 = 0.0063 <1). where $t_{stat}> t_{table}$ = 4.5918 > 0.9015).

The results of statistical tests on the regression coefficients show that price integration at the farmer and intermediary level in the long term is indicated by the regression coefficient (α2.1 = 0.0062 <1), $t_{stat}>t_{table}$ 4.6278 > 0.5661 between intermediary traders and inter-island traders (α2. 2 = 0.0056<1) $t_{stat}> t_{table}$ 4.6655 > 1.4873 and between farmers and inter-island traders (α2.3 = 0.0063<1). where $t_{stat}> t_{table}$ = 4.5918 > 0.9015).

The results of statistical tests on the regression coefficient (α2.1 = 0.0062) which describe the integration of prices at the farmer level with prices at the intermediary level were not significantly different at the 95% confidence level (P>0.05); where $t_{stat}> t_{table}$ = 4.6278>0.5661), meaning that in the long run, prices at the farmer level and at the intermediary level were not perfectly integrated. This means that in the long term, if there is a 1% increase in prices at the intermediary level, then the price increase will only be transmitted to farmers by 0.0062% or not transmitted at all. This means that the percentage increase in prices experienced by intermediary traders in the long term was not transmitted at all to farmers, as is the price increase received by inter-island traders. Between intermediary traders and inter-island traders, the regression coefficient (α2.2 = 0.0056) explains that if in the long term there is an increase in prices at the inter-island trader level by 1%, then the increase is only transmitted to intermediary traders by 0.0056% or not transmitted at all, which means that there is no price integration between intermediary traders and inter-island traders. Finally, between farmers and inter-island traders, a regression coefficient (α2.3 = 0.0063) explains that if in the long run there was a price increase at the between islands traders was 1%, then the increase is only transmitted to farmer by 0.0063% or not transmitted at all, which means that there is no price integration between farmers and inter islands traders.

Tabel 2: Results of Regression Coefficient Estimation (Vertical Market Integration) in the Long Term and IMC Analysis, According to the Level of Beef Cattle Livestock Market in Kupang District, ENT.

Variable	Pf - Pp	Pp – Pap	Pf – Pap
Constanta (α0.i)	4.32407	4.9679	3.0459
Pfi(t-1) (α1.i)	0.4493	0.0743	0.5119
Se (α1.i)	0.1074	0.3856	0.1719
tstat	4.1830	0.0834	2.9773
[Prjt – Prj(t-1) (α2.i)]	0.0021	0.0056	0.0063
Se(α2.i)	0.0012	0.0012	0.0014
tstat	1.7544	4.6655	4.5918
Prjt (α3.i)	0.1548	0.7926	0.2886
Se(α3.i) tstat	0.2734	0.5329	0.3201
F_{stat} R^2	0.5661	1.4873	0.9015
	10.81	7.95	11.15
	0.5194	0.4430	0.5271
IMC [(α1i)/(α3.i)]	0.5764	0.0651	0.5512

It turns out that in the long term, the three levels of the cattle market in Kupang District were not integrated, thus the transmission of prices is also imperfectly. The beef cattle market is not integrated in this area, because in the long term there is uncertainty in prices, in products and seasons which have a direct and indirect effect on the beef cattle marketing.

Uncertainty in the product in this case cattle, because farmers in raising cattle were not their main job, raising cattle is still traditional and only as a supported raise. Such raising conditions, in the long term, cannot be expected to be able to supply cattle continuously; the farmers will sell their livestock if there is an urgent need. Another factor that also influences the marketing of cattle in Kupang District is the behavior of village traders or who in this study are also referred to as intermediary traders, who will hold livestock at the farmer level and do not notify inter-island traders. If the intermediary trader holds the livestock, it was because it was still in the hands of the farmer. This can happen, because good relations have been established between village traders and farmers. The existence of this good relationship will cause difficulties for other village traders to get livestock.

The behavior of inter-island traders also greatly affects prices, because they have an enough market power to influence the market. Although the power possessed by inter-island traders is not like in a monopoly market, this is partly because cattle are living creatures, so if they were left in the shelter for too long, the cost of the shelter will be very large so that it will affect the price at the farmers level.

Another obstacle is the occurrence of unhealthy trade among inter-island traders in every district in East Nusa Tenggara; because ENT delivery beef cattle every year to Java (Jakarta) approximately 60,000 heads of cattle,

which is allocated to several districts that have the potential to produce Bali cattle. Based on the quota for each district, it was also allocated to inter-island traders in the district concerned. There is also the practice of buying and selling allotments between inter-island traders within regencies and between regencies, which in turn will lead to cartels that can harm producers (farmers) and consumers.

Price integration at the farmer and intermediary level in the long run is indicated by the regression coefficient ($\alpha 2.1 = 0.5537 < 1$), between intermediary traders and intermediate traders ($\alpha 2.2 = 0.9278 < 1$) and between farmers and inter-island traders ($\alpha 2.3 = 0.4420 < 1$), meaning that in the long run, prices at the level of farmers and intermediary traders, inter-island traders and traders as well as between farmers and inter-island traders tend to be integrated.

Market Performance

Performance or market appearance on the marketing of beef cattle in Kupang District, can be seen from.

a. Farmers share is part of the price that farmers receive from the price paid by inter-island traders. The results of the analysis show that the average price of beef cattle per head in Kupang District paid by inter-island traders in 2018, 2019 and 2020 was IDR 10,616,008,20; IDR 12,338,872.41 and IDR 12,691,833.33 while the average price received by farmers was IDR 8,409,344.26; IDR 8,519,827.59 and IDR 9,424,074.07. Thus, the share of prices received by farmers (farmer's share) in Kupang District is66.65%, respectively; 71.31% and 75.73% of thepriceprice paid by inter-island traders. The average farmer's share in Kupang District is 75.95%. The results of the farmer's share analysis above mean that livestock marketing has been fairly fair, although at various levels the cattle market in this region has not been perfectly integrated. This may be due to the cattle trading system in this area where inter-island traders directly buy livestock from farmers, so the price received is the same as the price received by inter-island traders.

b. Marketing Margins in this study is the price difference at the inter-island trader level with the price at the farmer level. Margin analysis was carried out for all market levels traversed by beef cattle from farmers to traders in Jakarta. The marketing margin for beef cattle in Kupang District is 62.17% still quite high.

c. Share Merchant Profits. The distribution of margins and profits is uneven among marketing agencies involved in marketing beef cattle in Kupang District. This can be seen in the ratio of profit and margin, where for intermediary traders was 88.57% and inter-island traders only 48.33%. The ratio of total profit to marketing margin is 66.71%. This approach also supports the previous approach that the marketing of beef cattle in Kupang District has not been efficient yet.

One component of the cost that is classified as large enough was the reduction in body weight of livestock during transportation which reaches 15.40% of the total marketing costs. The high weight loss of cattle is due to the introduction of beef cattle from this area to Java (Jakarta) still using cargo ships, not using ships specially designed for this purpose. Meanwhile, the high profit of intermediary traders compared to inter-island traders is due to the fact that the cost components in terms of amount and value of money issued by intermediary traders is not as much as that incurred by inter-island traders.

CONCLUSION

1. IMC between the price of beef cattle at the farmer level and intermediary traders is 1.0040; between farmers and traders between islands 1.0048; and between intermediary traders and inter-island traders by 1.0714. This means that in the short run the prices of beef cattle in the three markets were not perfectly integrated. In the long run, prices at the level of farmers and intermediary traders, inter-island traders and intermediary traders as well as between farmers and inter-island traders tend to be integrated.
2. Farmer's share in the marketing of cattle in Kupang District has been carried out proportionally, although at various levels the cattle market in this region has not been perfectly integrated. The average farmer's share is 75.95%.
3. Marketing margin 62.17%; profit margin 66.71%. The largest profit margin is received by intermediary traders was 60.70%, inter-island traders was 29.30%. There was disparity in the distribution of margins and profits among marketing agencies involved in marketing beef cattle in Kupang district.

Disclosure of Conflict of Interest

The authors declare no conflict of interest

REFERENCES

1. Dahl DC, Hammond JW. *Market and Price Analysis.The Agricultural Industries.* Mc-Graw Hill Company Book, New York, 1977.
2. Djoko Susilo, B. Market Integration and Economic Efficiency of Beef Cattle Business in South Sulawesi, Central Sulawesi and East Kalimantan. Dissertation. 2012. Gajah Mada University.
3. Muwanga GS, Snyder DS. Market Integration and the Law of One Price : Case Study of Selected Feeders Cattle Markets. Utah State University. 1997. Digital Commons@USU. Economic Research Institute Study Papers.
4. Lalus MF, Fanani Z, Nugroho BA, Utami HD. Analysis of beef cattle marketing in Kupang District, East Nusa Tenggara Province, Indonesia. Asian Academic Research Journal Of Multidisciplinary (AARJMD), 2018; 5(5): 2319 – 2801. http://www.asian academicresearch.org/maymd2018.html.

5. Asmarantaka RW. Marketing of Agricultural Products. Potpourri of Agribusiness Marketing Series. Publisher of the Department of Agribusiness, Faculty of Economics and Management, Bogor Agricultural University: 2009.
6. Benu FL, Benu AS. Quantitative Research Methodology (Economics, Sociology, Communication, Administration, Agriculture, and others). Publisher PRENADAMEDIA GROUP Devisi Kencana, 2019.
7. Bungin B. Quantitative Research Methodology. Communication, Economics and Public Policy and Other Social Sciences. Publisher Kencana Prenada Media Group, 2014.
8. Silalahi U. Social Research Methods. Refika Aditama. Bandung, 2010; 518 p.
9. Ravallion M. Testing Market Integration. American Journal of Agricultural Economic Association, 1986; 72(3).
10. Anonymous. The Study of Market Integration Analysis in Strategic Food Commodity Marketing System. Cooperation between the Office of the State Minister for Food Affairs and the Center for Food and Nutrition Policy Studies; 1996. Bogor Agricultural University, Research Institute.
11. Lalus MF. Strategies for Increasing of Traditional Farmers' Revenue in Marketing Beef Cattle in Kupang District, East Nusa Tenggara. Research Report; 2010. Faculty of Animal Husbandry, The University of Nusa Cendana, Kupang.
12. Krova M, Sogen JG, Lalus MF, De Rosari PE, Nendissa DR. Aletrnative Policies for Saving Productive Baliness Cows For Controlling Cuts. RJOAS, September 2019; 9(93). DOI 10.18551/rjoas 2019-09.07.
13. Widitananto A, Sihombing G, Sari A. The analysis of marketing of beef cattle in Playen district, Gunungkidul regency. Tropical Animal Husbandry, 2012; 1(1): 59-66.
14. Muslim C, Darwis V. Keragaan kedelai nasional dan analisis farmer share serta efisiensi saluran pemasaran kedelai di Kabupaten Cianjur. Journal SEPA, 2012; 9(1): 1-11.
15. Pendell DL, Schroeder TC. Impact of Mandatory Price Reporting on Fed Cattle Market Integration. Journal of Agricultural and Resource Economics, 2006; 31(3): 568-579.
16. Anindita R, Baladina N. Marketing of Agricultural Products. ANDI Yogyakarta Publisher, 2017.
17. Erlinda M, Vivi Evertina dan Rahmat Nurcahyo. Structure, Conduct, and Performance Analysis in Palm Cooking Oil Industry in Indonesia Using Structure, Conduct Performance Paradigm (SCP). *Proceeding*, International Seminar on Industrial Engineering and Management Santika Hotel Jakarta, October 25th, 2008. ISSN 1978-774X. Download April 25th 2016 http://citeseerx.ist.psu.edu/viewdoc/download? Doi=10.1.1.663.4113&rep=rep1&type=pdf.
18. Tiku NE, Olukosi JO, Omolehin RA, Oniah MO. The Structure, Conduct and Performance of Palm Oil Marketing in Cross River State, Nigeria. Journal of Agricultural Extension and Rural Development, 4(20): 569-573, December 2012. Available online at http://www.academicjournals.org/JAERD.DOI : 10.5897/JAERD12.151 ISSN 1990-3839 © 2012 Academic Journals.
19. Kurniawan AR. Total Marketing. Penerbit Kobis; 2014. Jl Imogiri Barat RT 5 no 95 Bangunharjo Sewon Bantul Yogyakarta 55187.
20. Sexton RJ, King CL, Carman HF. Market Integration, Efficiency of Arbitrage and Imperfect Competition. Methodology and application to U.S Celery. American Journal of Agricultural Economics, 1991; Vol. 73 Number 3.
21. Goodwin BK, Piggott NE. Spatial Market Integration, in the Presence of Threshold Effects. American Journal of Agricultural Economics Association, 2001; 83(2): 302-6017.
22. Eronmown I, Alufohai GO, ADA-Okungbowa CI). Structure, Conduct and Performance of Plantain Marketing in Edo State Nigeria. J. Appl. Sci. Environt. Manage, 2014; Vol.18(3) 437-440. www.ajol.info and www.bioline org.br/ja. Jasem ISSN 1119-8362.