

MARKET STRUCTURE, CONDUCT AND PERFORMANCE OF SCAD (*Decapterus russeli*) IN KOTA AMBON

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Abstract: This research is aimed to analyze the marketing system of Scad (*Decapterus russeli*) by analyzing the market structure, behavior, and performance. It was conducted in traditional markets: *Mardika* and *Transit Passo*, Ambon from September to December 2014. The method used was survey for 40 of 45 fish traders in these markets, selected in simple random sampling. The analyses used included: 1). Integration of vertical market, 2). Elasticity of price transmission, and 3). Pricing efficiency. The results show: (1) market structure of scad in Ambon is not integrated and leads to oligopoly; (2) change of 1% at the consumers' price level leads to less than 1 % of price change in the fishermen's price level, indicating that scad marketing system is inefficient; and (3) the marketing system of scad in channel 3 is inefficient. The smallest share (89%) was also showed in this channel. Scad market structure was not perfectly integrated for the oligopoly practice by traders. Therefore, dependence of fishermen on traders should be reduced i.e. by giving assistance such as loans with low interest rates especially in no fish season. Communication network should also be expanded so that market information can be transmitted perfectly to all marketing agencies in Ambon. The government should control the price fluctuations by setting the minimum price (floor price) and maximum price (ceiling price) in order to create price stability.

Keywords: conduct market, oligopoly market, performance market, scad structure, fish traders

Abstrak: Penelitian ini dilaksanakan dengan tujuan menganalisis sistem pemasaran ikan layang (*Decapterus russeli*) melalui analisis struktur, perilaku dan keragaan pasar ikan layang di pasar *Mardika* dan *Transit Passo*, Ambon pada September hingga Desember 2014. Metode yang digunakan adalah survey kepada 40 dari 45 pedagang ikan yang dipilih secara acak sederhana (*simple random sampling*) di kedua pasar tersebut. Data yang diperoleh dianalisis menggunakan analisis integrasi pasar vertikal, elastisitas transmisi harga dan efisiensi harga. Hasil analisis menunjukkan: (1) struktur pasar ikan layang di Kota Ambon tidak terintegrasi sempurna dan mengarah pada oligopoli, (2) perubahan harga 1% di tingkat konsumen mengakibatkan perubahan harga kurang dari 1% di tingkat nelayan, mengindikasikan sistem pemasaran ikan layang di Kota Ambon tidak efisien dan (3) sistem pemasaran ikan layang pada saluran 3 berlangsung tidak efisien karena menghasilkan margin pemasaran yang besar. Share nelayan terkecil juga terdapat pada saluran ini yaitu sebesar 89% dikarenakan panjangnya saluran tersebut. Struktur pasar ikan layang tidak terintegrasi sempurna karena adanya praktek oligopoli dari pedagang pengumpul. Ketergantungan nelayan terhadap pedagang pengumpul harus dikurangi, dengan cara pemberian bantuan, agar posisi tawar nelayan meningkat. Jaringan komunikasi perlu diperluas agar informasi pasar dan harga ikan dapat ditransmisi secara sempurna kepada lembaga pemasaran. Pemerintah pun sebaiknya mengontrol fluktuasi harga ikan layang dengan cara menetapkan harga dasar (*floor price*) dan harga maksimum (*ceiling price*) agar tercipta kestabilan harga.

Kata kunci: perilaku pasar, pasar oligopoli, kinerja pasar, struktur scad, pedagang ikan

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INTRODUCTION

As a capital of Maluku Province, Ambon is the center of Regional Government administrative and the center of economy. Being located in Ambon Island with a large population and high purchasing power makes it as a potential market in Maluku Province. The high purchasing power of the community is shown by one of their habits to consume fresh fish. In 2012, Maluku had the highest fish consumption in national level, amounting to 49.19 kg per capita (Tuhuteru, 2013). In 2014, the level of fish consumption in Maluku was 54.12 kg per capita per year and still the highest among 33 provinces in Indonesia (Information on Marine and Fisheries, 2016). Even so, at certain times, the high level of consumption is not comparable to the availability of fresh fish in the market indicating that the demand for fresh fish in Ambon is sometimes imbalanced to the supply.

One fresh fish commodity whose demand is not comparable to the supply is Scad (*Decapterus russeli*). At certain times, the availability of Scad in the market is not able to meet consumer needs. This can be seen from the rising prices of the fish in the market, which was previously sold at Rp20,000/stack of seven fish or 0.7 kg, and the number of fish was reduced to four tails or 0.4 kg. Although the price offered tends to be fixed, the reduction of its amount indirectly increases the selling price (Apituley et al. 2013; Tribune Maluku.com, 2014).

Imbalance of Scad production and consumption in Ambon markets requires an efficient marketing system so that its availability is maintained with better quality which can lead to justice in the marketing system. Fisheries product marketing system is said to be fair (efficient) if fishermen or economic actors obtain a price level that is in accordance with the risks faced, and provides prices for consumers according to the quality of fish received without forgetting the meaning and important roles of the institutions involved in the marketing process (Asmarantaka, 2009; Apituley et al. 2012). Dahl and Hammond (1977) suggested that marketing systems can be analyzed through market structural, behavior and performance (Market structure, conduct, performance) approaches. Knowledge of this facilitates innovation and product productivity growth (Nzima et al. 2014), optimizes social welfare

and maximizes the efficiency of the marketing system (Oparinde and Ojo, 2014), as well as maximizes product competitive power factor (Apituley et al. 2013).

Market structure refers to certain market characteristics that influence the nature of competition and price formation (Adeyege and Ditoh, 1985 in Giroh et al. 2010), while Mason (1993) in Rizkyanti (2010) states that the structure of a market will determine how market participants behave, which ultimately determines the diversity or performance of the market. Pomeroy and Trinidad (1995) refer market behavior to commercial behavior patterns arising from market structures, while market performance includes net returns and marketing margins. Before a marketing system is stated to be efficient, its structure, behavior and performance are very important to be examined. This study aims to analyze the marketing system of Scad (*Decapterus russeli*) through its market structure, behavior and performance in Ambon.

METHODS

The method used in this research was survey; an investigation conducted to obtain the facts and existing symptoms, looking for real information both socially and economically, or politically from a group or region by using a questionnaire as the main data collection tool (Sekaran, 2009). The data collected included volume and price of buying and selling of Scad from September to December 2014.

The population in this study was 45 Scad traders in Mardika and Passo Transit Market. The size of sample was determined based on Cochran (1997) in Salakory (2010), as follows:

$$\begin{aligned} n_0 &= \frac{(1,96)^2(0,4)(0,6)}{(0,05)^2} \\ &= 368,76 \\ n &= \frac{368,76}{1 + (368,76-1) / 45} \\ &= 40,02 \end{aligned}$$

From the calculation above, it is known that the minimum sample taken in this study was 40.02 or 40 traders and was selected by using simple random sampling.

The method used to analyze Scad (*Decapterus russeli*) marketing system can be defined as:

Vertical market integration, measured based on the relationship or magnitude of the influence of prices at the producer level with prices at the consumer level (Gujarati, 1999 in Suharyanto et al. 2005). The equation model is as follows: $Pf = \beta_0 + \beta_1 Pr$. Furthermore, the regression coefficient was calculated by using the following equation:

$$\beta_1 = \frac{n \sum Pr Pf - (\sum Pr) (Pf)}{(n \sum Pr^2 - (\sum Pr)^2) (n (\sum Pf^2 - Pf^2))}$$

Pf (Price in producer's level (fishermen) (Rp/Kg)); Pr (Price in consumer's level (Rp/Kg)); β_0 (Intercept (constant)); β_1 (Coefficient regression).

Assessment criteria: If $\beta_1 < 1$, then the market structure is oligopoly due to an increase of one unit price at the consumer level which will be followed by an increase of less than one unit price at the producer level (fishermen), and this condition describes an inefficient marketing system; If $\beta_1 = 1$, the market structure is perfect competition which means the formation of inter-markets prices is more integrated with the unit. In other words, one unit increasing price at the consumer level will be followed by one unit increasing price at the producer level (fishermen), and this condition illustrates an efficient marketing system; If $\beta_1 > 1$, then the market structure is monopoly, because one unit price increase at the consumer level is followed by more than one unit price increase at the producer level (fishermen), and this condition shows an inefficient marketing system.

Price transmission elasticity is used to determine market behavior (market conduct). Price transmission elasticity is a ratio of average price changes at the consumer level and the average price ratio at the producer level (Azzaino, 1982 in Kruniasih, 1999). Price transmission elasticity can be formulated as follows:

$$Et = \frac{\partial Pf}{\partial Pr} \frac{Pf}{Pr}$$

To facilitate the estimation of Et, the equation 3 is transformed into:

$$Et = \beta \frac{Pf}{Pr}$$

where: Pf (Price in fishermen's level (Rp/Kg)); Pr (Price in consumers' level (Rp/Kg)); Et (Price transmission elasticity); β (Regression Coefficient); ∂Pf (Changing price in fishermen's level); ∂Pr (Changing price in consumers' level).

Assesment criteria: $Et < 1$ means that 1% price change at the consumer level will result in less than 1% price change at the fisherman level, and this indicates that the marketing system is inefficient; $Et = 1$ means that 1% price change at the consumer level will result in 1% change at the fisherman level, and this indicates that the marketing system is efficient; $Et > 1$ means that 1% price change at the consumer level will result in more than 1% price change at the fisherman level, and this indicates that the marketing system is inefficient.

Pricing Efficiency is used to measure market performance based on marketing margins or percentage shares received by fishermen (fisherman's share) (Sayaka, 2003).

Marketing margin

Marketing margin is the difference between the price at the consumer level and the price at the fisherman level. The equation model is as follows: $MP = Pr - Pf$, where: MP (Marketing margin); Pf (Price in fishermen's level (Rp/Kg)); Pr (Price in consumers' level (Rp/Kg)).

Fisherman's share

Fisherman's share is the percentage of the portion received by fishermen. The equation model is as follows:

$$Fs = \frac{Pf}{Pr} \times 100\%$$

where: Fs (Percentage received by fishermen (fisherman's share)); Pf (Price in fishermen's level (Rp/Kg)); Pr (Price in consumers' level (Rp/Kg)).

Assesment criteria: The higher the marketing margin, the smaller the portion fishermen receive, which indicates that the marketing system is inefficient. Conversely, the lower the marketing margin, the greater the portion fishermen receive, and this indicates an efficient marketing system; If fisherman's share is

more than 50%, it can be concluded that the marketing system is efficient. However, if fisherman's share is less than 50%, the marketing system is inefficient.

This research was located in two markets in Ambon, and they have similar characteristics: (1) Scad (*Decapterus russeli*) is traded in both markets on the same day, and generally, they are similar in size; (2) capital of retailers is generally similar; and (3) traders communicate among them to find out market conditions. Based on these assumptions, these two markets can be treated as a large market, and the analysis of Scad (*Decapterus russeli*) marketing system is applied to one market in Ambon which is a combination of the two markets.

RESULTS

A marketing system is described as a sequence or function in distributing products from producers to the end consumers (Kohls and Uhl, 2005). Dahl and Hammond (1977) in Ramadhani et al. (2012) stated that the marketing system can be analyzed through market structure, conduct and performance approach. Nzima et al. (2014) stated that knowledge of market structure, behavior and performance can provide further information on innovation and productivity growth of a product.

1. Market structure of Scad

Market structure is a set of market characteristics and indicates the economic environment in which a company operates (Thomas and Maurice, 2011). It is determined by four basic characteristics of the industry: (1). Number and size of distribution of active buyers and sellers and prospective buyers, (2). Degree of product differentiation, (3). Amount and cost of information on price and product quality, and (4). Entry and exit conditions (Hirschey and Pappas, 1993).

Market structure is defined as a relationship (correlation) of buyers and sellers strategically influencing the pricing and organization of Scad market. An approach used to determine the structure of Scad market is vertical market integration analysis proposed by Gujarati (1999) in Suharyanto et al. (2005). Based on SPSS analysis, the regression equation model was obtained as follows:

$$Pf = 1.062 + 0.860 Pr$$

Furthermore, the results of vertical market integration analysis of Scad in Ambon can be seen in the following Table 1.

Table 1. Integration of the Scad vertical market in Ambon

Coefficient	Value	Information
Determination Coefficient/ Adjusted R2	0.137	Significant at 95% confidence level
Fcalculate	7.166	
Tcalculate	2.677	
P-value	0.011	
β_0	1.062	
β_1	0.86	

Table 1 shows that the adjusted R2 (coefficient of determination) for this model is 0.137, which means that 13.7% of the price variation at fisherman's level (Pf) can be explained by the price at the consumers level (Pr). The remaining 86.3% is explained by other variables outside the model.

Table 1 also shows that the fcalculate value for this model is 7.166 with p-value is 0.011. Even though the fcalculate value is relatively small, but because the p-value is smaller than 0.05 (95% confidence level), then this model can be used to explain the dependent variable (price at the fishermen level/Pf).

The results of individual significance test can be seen from the tcalculate 2.677 with p-value is 0.011. Because p-value is smaller than 0.05, then Ho which states that price at the consumer level (Pr) has no significant influence on prices at the level of fishermen (Pf) is rejected. Therefore, prices at the consumer level (Pr) have significantly influenced the prices at the fisherman's level (Pf).

Coefficient β_0 1.062 means if the price at consumer level is 0, then the price at the fisherman level is Rp1.062. The regression coefficient β_1 +0.860 indicates that if the price at the consumer level (Pr) increases by Rp 1, then the price at fisherman's level (Pf) will increase by Rp0.860. Positive sign (+) at the consumer level (Pr) indicates that there is a positive relation between prices of Scad at the consumer level (Pr) and fisherman's level (Pf) in Ambon.

The regression coefficient β_1 indicates that market structure of Scad in Ambon is imperfectly integrated and leads to oligopoly because the regression coefficient

(β_1) is less than 1 (0.860). According to Gujarati (1999) in Suharyanto et al. (2005), if $\beta_1 < 1$, the market structure is an oligopoly which means when price at the consumer level increases by one unit, the price at the fishermen (producer) level will also increase, but if it is less than one unit, it indicates that the marketing system of Scad in Ambon inefficient.

Market Conduct of Scad

Market conduct of Scad is a behavior pattern of institutions involved in Scad marketing. The market conduct of Scad in Ambon is analysed by price transmission elasticity analysis which was developed by Azzaino (1982) in Kruniasih (1999). The results can be seen in the following table.

Table 2 shows that the value of price transmission elasticity (E_t) of Scad is 0.776, which indicates that 1% price change at the consumer level (P_r) will result in 0.776% price change at the fisherman's level (P_f).

Table 2. Price transmission elasticity of scad in Ambon

Coefficient	Value	Information
P_f	22.368	-
P_r	24.749	
β	0.860	
E_t	0.776	

Market Performance of Scad

Market performance is a condition of structure and conduct of Scad market. It is measured based on marketing margins and share percentage received by fishermen. The results of marketing margin analysis and fisherman's share of Scad in Ambon are shown in Tables 3 and 4.

Table 3 shows that the last (third) marketing channel has the largest margin which is due to the length of the channel. Long channel is formed as a result of numbers of institutions involved in the marketing of Scad in Ambon. Margin of each marketing agency varies, and the biggest one is owned by retailers i.e. Rp2,381/kg. This is due to the high marketing costs that must be borne by retailers, such as transportation, price of Scad and ice cubes to maintain the quality and freshness of fish; as a result, they are trying to increase their profits.

Table 4 shows that the largest Scad fishermen's share is in marketing channel I i.e. 100%, and this is because the channel only involves two (2) marketing institutions, namely, fishermen and consumers. The smallest fishermen's share is in channel III 89%, due to the length of the channel.

Market Structure of Scad

The regression coefficient (β_1) indicates that market structure of Scad in Ambon is imperfectly integrated and leads to oligopoly, due to its regression coefficient (β) of 0.860 or less than 1. According to Gujarati (1999) in Suharyanto et al. (2005), if $\beta_1 < 1$, the market structure is an oligopoly, indicating that an increasing price of one unit at the consumer level will be followed by less than one unit increasing price at the fisherman (producer) level, thus it can be said that Scad marketing system in Ambon is inefficient. Apituley (2013) stated that the fresh fish market in Central Maluku Region in 2011 was almost concentrated, and the market structure approached was oligopoly. In a such market structure, fishermen acted as price takers, and collectors acted as price makers.

Market structure of Scad in Ambon is oligopoly with some characteristics:

1. Number and size of sellers and buyers

In the market where this study was undertaken (Mardika and Transit Passo), there are approximately 45 traders who function as intermediaries. Five to eight intermediaries handle more than four nets with an average production of 30–40 buckets/net/day in fish season. This condition brings an understanding that number of Scad fishermen is relatively larger than that of the traders (collectors and retailers); therefore, this creates a dependency of fishermen on collectors that may weaken their bargaining position. Even though the fish belongs to the fishermen, but they do not have full rights of price determination, and when there are negotiations, the collectors dominate the process more. During the process of dropping fish from cars, collectors pay close attention to market conditions in order to determine fish prices properly.

The existence of collectors' oligopoly power results in their ability to control prices at the fisherman's level and coordinate the selling of fish to retailers. Purwanti and Hayati (2008) stated that oligopoly power is formed in

several ways: (1) existence of collaboration/ collusion among traders in determining prices at the producer level, (2) creation of barriers for other traders to involve in marketing and (3) creation of producers' dependence on collectors so that they will only sell their catches to certain traders; for example, assistance in fishing gear repairment, purchasing production equipment, and lending some money to the fishermen to sustain their life during the dry season.

Product Differentiation

In general, Scad fish in the market is similar in quality, and there is no product differentiation so that its price is relatively similar for one kilogram of fish even though the size is different. Scad fish sold in the market is still in fresh condition and does not have any special treatment. Lilimantik (2011) stated that fish sold at the fishermen or collectors levels has almost the same quality; therefore, there is no difference in product yield. At the retailers' level, they usually put ice to maintain the quality which makes the price stable.

Barriers to enter and exit the market

The oligopoly practices carried out by collectors result in barriers for fishermen to enter the market. Fishermen

can only sell their catches to certain traders who become their customers, and it makes difficult for other traders to buy fish directly from fishermen. Almost all of the purse seine, pole and line and other fishing gears have had certain traders in the market, and among them there is an agreement that when fishermen take their catches to the market, the certain traders (collectors) will sell them to retailers, either within-season fish abundance or fish lacking. Among the fishermen and collectors, there has been a bond of cooperation for decades. This is an obstacle for other traders to be involved in the Scad marketing. Lilimantik (2011) stated that in the fish marketing, each fisherman has a collector and this cooperative relationship is maintained together, so it is not easy for other collectors to buy fish from his non-subscribers and vice versa.

Knowledge of prices and cost structures among market participants

Lack of information on market conditions causes bargaining position of fishermen to be weak. This is certainly an opportunity for collectors to suppress prices paid to fishermen as low as possible to form an oligopoly market. In principle, collectors have more information on prices, costs and market conditions compared to fishermen, for they act as price makers.

Table 3. Marketing Margin of Scad in Ambon

Channel	Fishermen (Rp/Kg)	Collectors (Rp/Kg)	Retailers (Rp/Kg)	Consumers (Rp/Kg)	Total
Channel I					
Buying Price	-	-	-	22,368	-
Selling Price	22,368	-	-	-	-
Marketing Margin	-	-	-	-	0
Channel II					
Buying Price	-	-	22,368	24,749	-
Selling Price	22,368	-	24,749	-	-
Marketing Margin	-	-	2,381	-	2,381
Channel III					
Buying Price	-	22,144	22,368	24,749	-
Selling Price	22,144	22,368	24,749	-	-
Marketing Margin	-	224	2,381	-	2,605

Table 4. Scad Fishermen's Share in Ambon

Channel	Pf (Rp/Kg)	Pr (Rp/Kg)	Fisherman's share (%)
I	22,368	22,368	100
II	22,638	24,749	90
III	22,144	24,749	89

Market Conduct of Scad in Ambon

Based on the results, it is known that the price transmission elasticity value (E_t) is <1 . Azzaino (1982) in Kruniasih (1999) states E_t is <1 means 1% price changes at the consumer level will result in less than 1% price change in fisherman level. This indicates that Scad marketing system in Ambon is not efficient.

Parwanti and Hayati (2008) suggested that several factors causing the value of price transmission elasticity less than 1 are as follows:

The existence of oligopoly power is a result of collaboration/collusion among several collectors in determining prices so as to control price at producer level. This condition occurs in the marketing of fish in Ambon. In some fish landing sites such as Tulehu, Waai and Hitu villages, fish marketing must go through collectors based on the rules established at the location. This means, the collectors are fully responsible for both quality and price of Scad. In the marketing of Scad, the collectors act as price makers where the Scad price is determined by considering the market condition.

A long marketing chain leads to the increasing accumulation of price transmission bias. Scad marketing in Ambon involves four institutions, and this leads to high prices that must be paid by consumers. Problem of imperfect transmission of prices and market information causes inequality in bargaining position, especially among fishermen and collectors.

Market Performance of Scad in Ambon

In Scad marketing in Ambon, channel III is the longest with a large margin value, indicating that the system is inefficient. Sayaka (2003) states that the higher the marketing margin, the smaller the portion received by producers (fishermen), and it indicates that the system is inefficient. Conversely, the lower the marketing margin, the greater the portion received by the fishermen, which indicates an efficient marketing system. Apituley et al. (2013) states that the more intermediary traders involved in the marketing channels, the bigger the marketing costs spent and conversely. However, fishery products are widely produced in scattered areas and far from consumers. This condition results in involving many intermediary traders at different levels of marketing process.

Although channel III has a large margin, share received by fishermen is more than 50% which indicates that it is efficient. Sayaka (2003) states that if fisherman's share is more than 50%, the marketing system is classified as efficient.

Managerial Implications

Improvements in marketing support facilities such as increasing the effectiveness function of fish landing site, providing ice factories with low prices to maintain fish quality during production, providing distribution and marketing processes, and increasing Cold Storage capacity are very important so that the fish availability is guaranteed all the times at a stable price. Improvements in communication and transportation facilities and infrastructure are also important in creating the efficiency of marketing system.

Market integration can lead to an efficient and effective marketing system; therefore, every element in the system earns income in line with the business conducted. Integration of market can also guarantee the availability of fish in the market at all times with a stable price. In addition, an integrated market can reduce the dominance of a collecting trader both for fishermen and retailers and the dominance of retailers towards consumers. An integrated market will also reduce the problem of over fishing and disposal of fish into the sea.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The market structure of Scad in Ambon is not perfectly integrated and leads to an oligopoly, while its market conduct shows that 1% price change at the consumer level will result in a price change of less than 1% at the fisherman level and indicates that the marketing system is inefficient. Market performance of Scad in Ambon shows that the marketing system of is efficient, because it produces more than 50% fisherman share.

Recommendations

The dependence of fishermen on collectors must be reduced through provision of the government assistance such as low interest loans, especially in non-fish seasons, to improve the bargaining position

of the fishermen. Communication network needs to be expanded so the market information, and fish prices can be transmitted perfectly to all institutions involved. Fluctuations of Scad price must be controlled through the determination of floor prices and ceiling prices in order to create price stability. To shorten the marketing channel requires the building a fish landing site in the marketing area.

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