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A value chain analysis of sweet potato commodity marketing

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A B S T R A K

Analisis tentang daya tawar petani sangat penting karena karakteristik unik produk pertanian yang membuat posisi petani lebih rentan. Terkait hal itu, penelitian ini menganalisis daya tawar petani dan kondisi pasar produk pertanian (ubi jalar) dengan memakai pendekatan rantai nilai dan SCP (structure, conduct, performance). Penelitian ini dilakukan di Kecamatan Bergas, Kabupaten Semarang karena lokasi ini memiliki potensi hasil ubi jalar yang tinggi. Sampel penelitian ini adalah petani, lembaga pemasaran, dan pemerintah yang diambil dengan metode purposive sampling dan snowball sampling. Hasil penelitian ini menunjukkan bahwa pemasaran ubi jalar memiliki empat macam saluran pemasaran dan struktur pasar bersifat oligopoli. Hasil perhitungan Concentration Ratio (CR4) sebesar 0,52 menunjukan bahwa pasar dalam kondisi konsentrasi lemah dengan nilai Minimum Efficiency Scale (MES) sebesar 65%, yang berarti ada hambatan pesaing baru dalam memasuki sistem pasar. Kinerja pemasaran mempunyai sistem pemasaran yang efisien terdapat pada saluran pemasaran keempat dengan marjin pemasaran Rp. 1500/kg dan pangsa petani 57,14%. Hasil penelitian ini menyarankan bahwa petani harus memilih rantai pemasaran yang pendek untuk dijual kepada konsumen akhir.

A B S T R A C T

A thorough analysis of farmers' purchasing power is very important because of agricultural products' unique characteristics that likely position farmers more vulnerably. In this respect, we seek to anayze farmers' purchasing power and market conditions of an agricultural product (sweet potatoes) by using the value chain and SCP (structure, conduct, performance) analyses. This study is administered in Bergas Sub-district, Semarang Regency that exhibit high potentials of sweet potato products. Our research sample are farmers, marketing institutions, and governments that are selected

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with the purposive sampling and snowball sampling methods. The results show that sweet potatoes marketing in this sub-district has four marketing channels and the market structure is oligopoly. The concentration ratio (CR4) of 0.52 indicates that the market has weak concentration with the Minimum Efficiency Scale (MES) score of 65%, implying that new competitors are obstructed to enter the market. Further, the fourth market channel has efficient marketing system performance with the marketing margin of Rp 1,500/ kg and farmers' market share of 57.14%. Overall, our results suggest that farmers have to select short marketing chains and sell their products to final consumers.

INTRODUCTION

The agricultural sector has contributed significantly to GDP, employment level, food provision, foreign exchange, and per capita income improvement. In 2017, the agricultural sector contributed 12.68 percent of the total GDP (BPS-Statistics Indonesia, 2017). This sector also helps the government set food regulations, regulate market food demands, and support national development (Widayati et al., 2019). One of the various strategic agricultural commodities is sweet potato. Sweet potato is prospective in meeting market demands and belongs to cultivated plants because parts of its roots offer high carbohydrate contents (Arwati & Syarif, 2016).

In this respect, Semarang Regency is a regency in Central Java Province that exhibits huge sweet potato productivity potentials. In 2015, this regency produced 24,812 tons of sweet potatoes with the harvested area of 981 ha (BPS-Statistics of Jawa Tengah Province, 2017). Bergas sub-district is a sub-district in this regency that produces sweet potatoes, and many of its inhabitants earn their living as farmers. However, sweet potato farmers often lack information on their products' market selling prices because they obtain price information only from middle persons (*tengkulak*). Consequently, consumers' price differs greatly from farmers' price. In particular, consumers have to pay Rp 8,000/kg while farmers sell their sweet potato products at Rp 2,000/kg. Hence, farmers only receive low values from their products and generate low profits. In this respect, farmers have lower bargaining positions that they cannot negotiate prices effectively because they only have price information from middle persons. Differences between sweet potatoes' prices between farmers and consumers are affected by SCP (Structure-Conduct-Performance) in the market.

SCP identifies market forms in agricultural commodities. In particular, market structure identifies market types, market conduct identifies marketing functions performed by market participants, and market performance identifies the mutual relationships due to market structure and behavior. SCP only focuses on how markets are formed due to marketing practices. According to Asmarantaka et al. (2017), the SCP approach refers to all approaches that analyze all aspects of market systems where institutions play in the market formation. In this respect, value chain analysis helps market analysis expand the perspectives by explaining how marketing activities

operate from production, distribution, and consumption.

The value chain analysis is a systematic approach to investigate producers' activities and interactions between marketing institutions. Kusumawati & Santosa (2013) explain that interactions in marketing activities create values to consumers by analyzing each activity's contributions. Maddeppungeng & Suryani (2015) also explain that value chain analysis explains performance quality to control competing marketing factors. The value chain concept illustrates how market actors utilize their abilities to strengthen their marketing strategies. The concept can also describe marketing with different views by highlighting the internal and external relationships between marketing institutions through their power to influence the markets.

Arwati & Syarif (2016) have used value chain analysis of sweet potatoes in Polongbangkeng Utara sub-district, Takalar Regency. They find that most farmers have lower bargaining positions in the price determination of sweet potato commodities because they only refer to middle persons' prices. Lack of governmental support in maintaining price stability causes farmers to have lower bargaining positions. Another study uses the SCP approach in the sweet potato marketing system in Lampung Tengah Regency (Pradika et al., 2013). The findings indicate the oligopsony sweet potato market.

Sweet potato commodity marketing has been studied extensively before. Prior studies largely rely on the SCP approach to identify sweet potato marketing. Thus, this study adds the SCP analysis with the value chain approach by analyzing how activities are formed due to the structure-conduct-performance (SCP) formation of sweet potatoes in Bergas sub-district, Semarang Regency. Sweet potato commodities are easily cultivated and exhibit great opportunities as basic materials in the food industry. Hence this study analyzes food marketing conditions in Bergas sub-district, Semarang Regency through the SCP approach and examines how value chain activities occur. In particular, this study seeks to: 1) investigate how sweet potato commodity marketing in Bergas sub-district, Semarang Regency exhibit its structure, behavior, and performance, and 2) engage in a value chain analysis of sweet potato commodities in this district.

This study informs farmers about selecting effective and efficient marketing channels and distribution networks to improve their profitability. Further, this study also helps the Semarang Regency government create effective policies to improve farmers' wealth through price control.

LITERATURE REVIEW

Value Chain

Value chain refers to a series of activities performed by individuals or organizations to produce certain outputs (ACIAR, 2012). Activities within a value

chain from producers to consumers can be divided into two main activities, namely primary and supporting activities (Julianto & Darwanto, 2016). Primary activities represent organizations' main activities that include: (1) inbound logistics: provision of inputs of the production process, (2) operations: processing raw materials or production inputs, (3) outbound logistics: the distribution process of production outputs through existing marketing channels, and (4) marketing and sales: activities related to introducing products and services to consumers. Meanwhile, supporting activities refer to additional activities within the value chain that include: (1) procurement: activities related to input acquisition, (2) technology development: use of technology to improve revenues or profits, (3) human resource management: activities to manage employees to enhance efficiency, and (4) firm infrastructure: all activities related to information management.

Value chain analysis seeks to investigate how producers engage in activity steps to deliver values to consumers. In this respect, organizations or individuals increase values or reduce costs to compete in the market (Hidayatulloh et al., 2015). Witjaksono (2017) demonstrates that agricultural products' value chain is ineffective because of numerous marketing institutions' involvement in marketing channels.

Marketing concepts play a crucial role in goods/ service sales and illustrate how organizations survive and develop. Marketing refers to all activities to understand consumers' needs and supply their needs of goods and services (Kai et al., 2016). These activities start from production, offerings, and exchanges of production outputs with similar values. Besides, these activities also include product promotion, distribution, price information, and services to obtain certain profit levels. Marketing is crucial in the value chain because it likely affects the relationship between producers, consumers, and other institutions within the product development and post-development stages (Susilowati & Kirana, 2018).

Marketing institutions represent organizations or individuals who engage in marketing activities. Marketing institutions exist because consumers need products with specific timing, places, and forms to fulfill their demands. Marketing institutions engage in various activities, including product distribution from consumers to producers through existing distribution networks and marketing channels. Pradika et al. (2013) explain that advanced economies boast well-established marketing institutions that run numerous functions in distributing products from producers to consumers. Kai et al. (2016) identify marketing channel institutions into the following:

Source: Kai et al. (2016)

Figure 1
Marketing Distribution Channel

Structure, Conduct, and Performance (SCP) Analysis of Agricultural Products

SCP analysis aims to analyze the simultaneous relationships between structure, conduct, and performance. In particular, this approach argues that performance affects conduct, behavior affects structure, and market structure likely affects performance. Marketing structure, conduct, and performance represent certain goods or commodities' marketing processes that indicate the marketing process's efficiency. The SCP analysis also illustrates agricultural problems, including high marketing margins, high price differences between consumers and producers, agricultural products that are inherently more perishable, limited marketing facilities, and further processing of agricultural products.

Sinaga & Dewi (2016) use the SCP approach in pineapple marketing activities. They find an imperfect pineapple market condition that causes lower farmers' bargaining position not to influence market prices. A likely explanation of this finding is that traders have asymmetric power to set prices. Besides, farmers lack price information that weakens their bargaining positions.

Arwati & Syarif (2016) also apply the SCP approach in explaining that longer sweet potato commodity marketing channels reduce farmers' profits because marketing institutions capture the lion share of the profits in the distribution channels of this commodity. Besides, sweet potatoes have limited access to market and market information that they find it difficult to make market penetration.

The main problems of agricultural products' marketing lie in farmers' weaker positions in price determination and marketing practices. The SCP analysis illustrates clearly how market actors determine prices, total costs, profits, and product distribution. The value chain analysis also informs how marketing processes run efficiently by not considering marketing margins and farmers' share.

The Relationship between the SCP and Value Chain Analyses of Agricultural Products

The SCP approach is used to analyze how marketing activities form markets. This analysis explains the whole marketing aspects through systemic, functional, and organizational involvement aspects in marketing systems (Sinaga & Dewi, 2016). The SCP analysis in agricultural products determines how market actors behave due to market structures. Market structure explains farmers' bargaining positions and competitions between agricultural products' marketing institutions. Market conduct illustrates how marketing functions are performed, from the exchange, physical, and facility functions. Marketing performance underscores marketing institutions' profits and marketing systems' efficiency. In this respect, the value chain analysis expands the SCP approach's market analysis by explaining how marketing institutions perform activities to deliver product values to consumers.

The value chain analysis is a part of marketing analysis that investigates

supporting actors' involvements in marketing systems. This analysis focuses on business sustainability by highlighting interactions between marketing institutions. The value chain analysis also examines how marketing institutions perform business processes (production and marketing). According to Asmarantaka et al. (2017), marketing institutions with market shares of more than 60 percent indicate dominated market structure. Conversely, marketing institutions with lower market shares imply that perfectly competitive markets. Thus, the analysis will arguably strengthen the SCP analysis in marketing agricultural products.

RESEARCH METHOD

Research Location

This study was administered in Bergas sub-district, Semarang Regency, Central Java. As suggested by Sugito Sutoto, the head of Bergas Agricultural Extension Agency (*BPP – Balai Penyuluh Pertanian*), Bergas sub-district, especially Pagersari and Bergas Kidul villages, are the production centers of sweet potatoes. Pagersari village has three sweet potato production centers in Krajan, Siluwah, and Segeni hamlets. Meanwhile, Srumbung hamlet is the sweet potato production center in Bergas Kidul village. Hence, we selected these two villages as the research location and generated our data from these villages.

Sample Selection

Table 1 displays the usable population number. The sample was selected with two methods. Initially, the study used the purposive sampling method to select the sweet potato farmer sample.

Table 1
The Number of Sweet Potato Farmers in Bergas Kidul and Pagersari Villages

Village	Hamlet	Farmer Group	Population	Sample
	Krajan	Semi Mulyo	71	(71/328) x77 = 17
Pagersari	Siluwah	Semi Rahayu	100	(100/328) x 77 = 23
	Segeni	Semi Makmur	64	(64/328) x 77 = 15
Bergas Kidul	Srumbung	Sido Subur	93	(93/328) x 77 = 22
Total			328	77

Source: Primary data, processed (2019)

This study only selected sweet potato farmers who belong to farmer groups (*kelompok tani)* in these two villages as the sample to facilitate better administration. The following Slovin formula was used to determine the sample number:

$$n = \frac{N}{(N(d^2+1))} \quad \text{.....1}$$

where
n = sample number
N = population number
d^2 = margin of error (10%)

The second sampling technique was the snowball sampling method to select the marketing institution sample based on these villages' sweet potato marketing channels. The channel starts from farmers to retailers. As demonstrated by Table 2, based on the method, we selected 18 marketing institutions.

Table 2
Sample – Marketing Institutions

No	Criteria	Number (Persons)
1	*Penebas* Trader	6
2	Wholesaler	4
3	Retailer	8
	Total	18

Source: Primary data, processed (2019)

Data Source and Data Analysis

Primary data was generated through interviews and distributing questionnaires to farmers and marketing organizations/ institutions that belonged to the sweet potato distribution channels. Meanwhile, the secondary data was generated from various government institutions (Statistics Indonesia of Semarang Regency Office, *BPP* of Beras sub-district) and prior studies to complement primary data.

This study described market structure to identify product distribution channels and marketing institutions involved in the marketing systems. We also analyzed market structure quantitatively by measuring market share, concentration ratio, and market entry barriers. Market share identification indicates how marketing institutions dominate the markets by using the following formula (Dewi et al., 2018):

$$MSI = \frac{S_i}{S_{total}} \times 100\% \quad \text{..... 2}$$

where MSI represented the market share of a marketing institution (percentage), S_i referred to the sales of i^{th} marketing institution (Rp), S_{total} was the total sales of all marketing institutions (Rp).

Referring to Baladina (2012), the concentration ratio was measured with the following Concentration Four (CR4) formula:

$$CR4 = Kr\_1 + \cdots + Kr\_4 \frac{Kr\_4}{Kr\_total} \quad \text{..... 3}$$

CR4 < 0.4 indicated that the market structure tend to a perfectly competitive, 0.4 < CR4 < 0.8 referred to an oligopoly/oligosopny market, and CR4 > 0.8 represented to a monopoly/ monopsony market.

Market entry barriers represent factors that constrain new market entrants. We

measured market entry barriers by using the Minimum Efficiency Scale (MES). An MES score of more than 10 percent indicated high market entry barriers for new entrants (Anggraini et al., 2018). The following formula measured MES:

MES = sweet potato sales of marketing institutions/ total sweet potatoes available in the market

$$MES = \frac{\text{sweet potato sales of marketing institutions}}{\text{total sweet potatoes available in the market}} \quad \text{..... 4}$$

The descriptive analysis explained market behavior by highlighting marketing function activities that could be categorized into three functions (practices): exchange, physical, and facility function. Marketing functions indicated commercial exchanges performed by sellers and buyers, post-production processing practices, and available facilities to achieve marketing efficiency.

Next, market performance was analyzed quantitatively by using the marketing margin and farmer's share. Marketing margin referred to price changes due to distribution activities from farmers to final consumers. The following systematically illustrates the marketing margin computation:

$$MP = Pr - Pf \quad \text{..... 5}$$

MP was the margin of sweet potato marketing activities (Rp/Kg), Pr represented sweet potato prices at the consumer level (Rp/Kg), and Pf was sweet potato prices from farmers (Rp/ Kg).

Meanwhile, farmer's share indicated farmers' margin by comparing farmers' selling prices and prices at the final consumer level. Mathematically, the following is the formula to calculate farmer's share:

$$Fs = \frac{Pf}{Pr} \times 100\% \quad \text{..... 6}$$

where Fs was farmer's share, Pf was farmers' offered selling price, and Pr was the final consumers' price.

Lastly, the value chain was analyzed descriptively by investigating the activities of a business. In this respect, we grouped the processes into two categories: primary and secondary activities. Primary activities referred to all activities that encompassed all producers' activities reflected by production, marketing, and selling. Besides, supporting activities provided infrastructures or inputs for primary activities.

RESULTS AND DISCUSSION

Respondents' Profiles

The respondents consisted of farmers, *penebas* traders, wholesalers, and retailers. All farmers were from the Bergas sub-district, while all marketing institutions were from Semarang Regency. We generated the data in July-August 2019.

Most sweet potato farmers (58 persons) were in productive ages (40-63 years). However, many of them (19 persons) were already in unproductive ages (above 65 years old).

Education levels are also crucial in enhancing sweet potato production and marketing because more educated farmers likely reduce risks in producing and marketing their products. Nine farmers did not complete their elementary school, 40 farmers who had elementary education, followed by those who had completed junior high school, senior high school, and bachelor degrees (25 persons, two persons, and one person, respectively). Hence, our farmers arguably had low education levels.

Sweet potato productivity is closely related to land areas owned. Almost half of the respondents (49 persons) only had land areas below 0.5 hectares. Next, 25 farmers had land areas of 0.5-1 hectare, and only three farmers had land areas of more than one hectare. Further, most farmers do not have their own lands because most lands are village-owned (*bengkok*). They shared agricultural products during the harvests.

Penebas traders represent an institution that determines prices. Price mechanisms depend on sweet potato qualities. Besides, *penebas* traders also participated in the distribution process to the markets. Of six *penebas* trader respondents, two of them were between 50-60 years old and graduated from elementary school, while three and one of them had junior and senior secondary graduates, respectively. Besides, two of them sold sweet potatoes to a sausage factory in Kendal Regency. Four of them sold sweet potatoes to the Ngasem main market (Jetis Agricultural Sub-terminal), Sumowono, and Jimbaran.

Five wholesalers were located at the main markets. Wholesalers sold not only fresh sweet potatoes but also other vegetable commodities. Wholesalers distributed sweet potatoes to other markets in Semarang Regency and other cities. Two of them only graduated from elementary school, one junior high school, and one senior high school.

Lastly, the eight retailer respondents were the main markets' customers. In general, they were 45-55 years old and had junior high school (five persons) and elementary school (three persons) education.

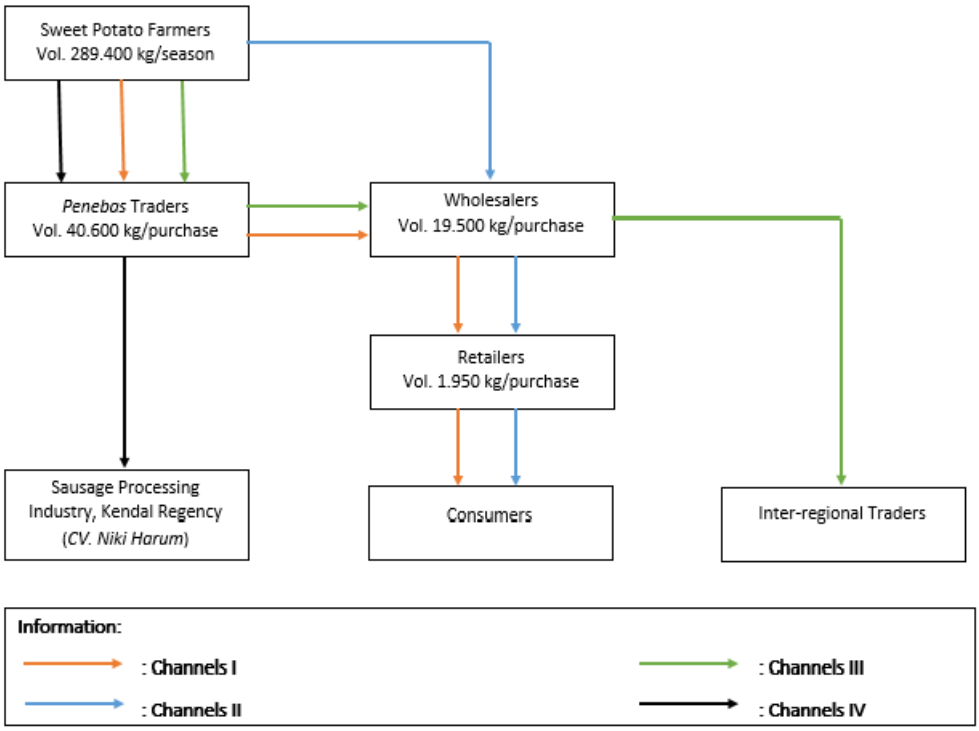
Structure, Conduct, and Performance Analysis of Sweet Potato Marketing

Market Structure

Marketing channels refer to product distribution routes or networks from

farmers to final consumers. Efficient marketing channels are crucial to ensure the effectiveness of product distribution. In our study, there were four sweet potato marketing channels. Figure 2 explains the four marketing channels of sweet potato commodity distribution, namely:

a. Marketing channel pattern I
   Farmers → *Penebas* traders → Wholesalers → Retailers → Consumers
b. Marketing channel pattern II
   Farmers → Wholesalers → Retailers → Consumers
c. Marketing channel pattern III
   Farmers → *Penebas* traders → Wholesalers → Inter-region traders
d. Marketing channel pattern IV
   Farmers → *Penebas* traders → Sausage processing industry (CV Niki Harum)



Source: Primary data, processed (2019)

Figure 2
Marketing Channels Map

Table 3 illustrates the sweet potato marketing channels. Most farmers (36 respondents or 46.75 percent of total farmers) relied on marketing channel I by selling sweet potatoes directly to *penebas* traders. Meanwhile, marketing channels II, III, and IV were used by 12.99 percent, 16.88 percent, and 23.38 percent of total farmers, respectively.

Table 3
Percentage of Marketing Channels Used by Farmers

Marketing Channel	Number of Farmers	Percentage
Channel I	36	46.75
Channel II	10	12.99
Channel III	13	16.88
Channel IV	18	23.38
Total	77	100

Source: Primary data, processed (2019)

Concentration value and barriers to market entry in sweet potato marketing indicate sweet potato markets. Table 4 shows the CR4 value of 0.52, implying that the market structure was oligopsony. Specifically, the market had many *penebas* traders that competed with each other to sell to consumers. Consequently, *penebas* traders did not control all sweet potato supplies. The finding is similar to Baladina (2012) who documents that traditional markets have an oligopsony market structure.

Table 4
CR4 and MES Computation

Trader Name	Position	Amount (ton)	Intensity (times/ year)	Total Sales (ton/year)
Samri	Wholesaler	8	180	1,440
Jasman	Wholesaler	7	144	1,008
Winarno	Wholesaler	6.5	120	780
Sariyo	Wholesaler	7.5	130	975
Gunadi	Wholesaler	6	90	540
Jamal	Wholesaler	5.6	90	504
Total Sales of Four Largest *Penebas* Traders				4,203
Market Share 32.5%				8,072.68
Minimum Efficiency Scale (MES)				65%
CR 4				0.521

Source: Primary data, processed (2019)

The Minimum Efficiency Scale (MES) analysis method produces the score of 65%, implying significant entry barriers for new entrants because of existing *penebas* traders' power for the following reasons: 1) sufficient capital, 2) better connectivity between farmers and wholesalers in the main market, 3) higher trusts from farmers, 4) longer business age, and 5) better information.

Market Conduct

Market conduct is closely related to market structure and performance. Cooperation between marketing institutions was crucial in enhancing the efficiency of fresh sweet potato distribution during harvesting time. Farmers used existing distribution channels to sell their sweet potato products, namely through *penebas* traders and wholesalers. Further, farmers and marketing institutions relied on mutual trusts when engaging in marketing activities. They also used sweet potatoes' qualities

and prices as the indicators to cooperate. We also analyzed market conduct through marketing function practices: (1) exchange and purchases; (2) transportation, storage, and processing. Table 5 presents our findings related to marketing functions more clearly.

Table 5
Marketing Functions

Marketing Institutions	Physical Functions				
	Collection	Packaging	Transportation	Storage	Processing
Farmers	*	*	*	*	*
Penebas Traders	√	√	√	√	*
Wholesalers	*	√/*	√	√/*	*
Retailers	*	√/*	√	*	*

Explanation: √ perform, * do not perform, √/* sometimes perform
Source: Primary data, processed (2019)

Farmers sold their products before harvesting time to *penebas.* Hence, *penebas* traders harvested sweet potatoes and sent the products to wholesalers with transportation costs of Rp 150/kg – Rp 200/kg, depending on the ease of access. Most wholesalers bought fresh sweet potatoes from *penebas* traders at the prices of Rp 3,000/kg – Rp. 3,500/kg and transportation costs of Rp 4,500/kg – Rp. 5,000/kg. They then sold directly to consumers at the prices of Rp 8,000/kg - Rp. 8,500/kg and an average transportation cost of Rp 10,000/quintal.

Market Performance

Market performance refers to the condition in which marketing systems change due to market structure and conduct. Market performance can be analyzed from marketing margin and farmer's share.

Table 6
Marketing Performance

Marketing Channel	Price at Farmer Level (Rp/Kg)	Price at Final Consumers (Rp/Kg)	Cost (Rp/Kg)	Profit (Rp/Kg)	Total Margin (Rp/Kg)	Farmer's Share (%)
I	1,800	8,000	894	5,106	5,500	22.5
II	3,000	8,000	473	4,527	4,300	37.5
III	2,000	7,500	419	2,081	4,800	26.67
IV	2,000	3,500	375	1,125	1,500	57.14

Source: Primary data, processed (2019)

Table 6 explains that the first marketing channel had the highest total margin of Rp 5,500/kg because of more extensive marketing institutions in marketing sweet potatoes. The second channel had a margin of Rp 4,300/kg, with the sweet potato marketing was through wholesalers and retailers. The third marketing channel had the margin value of Rp 4,800/kg with the marketing channel that consisted of *penebas*

traders, wholesalers, and local traders. The fourth channel had the lowest margin of Rp 1,500/kg because it was the shortest marketing. In particular, it had only farmers, *penebas* traders, and consumers. Hence, marketing channel IV had the lowest costs to market sweet potatoes from the four existing marketing channels. Marketing margin differences led to different final prices for consumers and indicated the channel's number of marketing institutions.

Farmer's share is the ratio between the price at the farmer level and price at final consumers. Farmer's share value is inversely proportional to the marketing margin. The first marketing channel had the farmer's share value of 22.50 percent, while the second marketing channel had the farmer's share value of 37.5 percent. Meanwhile, the farmer's share values of the third and fourth marketing channels were 26.6 percent and 57.14 percent, respectively. More (fewer) marketing institutions involved in the sweet potato marketing process would reduce (increase) farmers' share.

Marketing channel IV was an efficient marketing channel because it had a low margin and a high farmer's share. This marketing channel had fewer marketing institutions that constrained costs to engage in marketing activities. Thus, fewer marketing institutions involved in marketing channels will increase farmers' profits.

Value Chain Analysis

Activities within value chain within value chains can be classified as main and supporting activities. The following sections explain the value chain of sweet potato marketing activities in Bergas sub-district, Semarang Regency.

Main activities

Farmers as fresh sweet potato producers obtained seeds from nurseries by buying from other parties or retained prior harvest products (derived seeds). Other farmers also asked for seeds from other harvesting farmers, especially stems. Farmers bought seeds at Rp 25,000-Rp. 30,000/sack with each sack consisted of 50 kg. Farmers performed a series of activities, starting from land processing, creating beds, planting seeds, using herbicides, weeding, to harvesting. Only farmers who did not sell their harvests to *penebas* traders harvested their products directly. Meanwhile, farmers did not pack their products and sold their sweet potatoes with unlabeled sacks. Thus, farmers only engaged in sales and purchases (exchange functions) and did not perform physical and facilities-related functions (Arwati & Syarif, 2016)

Penebas traders bought fresh sweet potatoes after offering bargains before harvest time. They had to incur harvesting and packaging costs. They also sorted fresh sweet potatoes by classifying the products based on their size. Marketing activities were performed days and nights, depending on wholesalers' demands. Wholesalers paid *penebas* traders after the unloading activities have been completed. *Penebas* traders distributed the products only by land with trucks.

Wholesalers performed logistical activities by buying sweet potatoes directly

from farmers or from *penebas* traders. They did not convert sweet potatoes into processed products but only distributed fresh sweet potatoes. Furthermore, wholesalers sorted worth-selling sweet potatoes and arranged selling places. They only employed daily transport workers to help them distribute the products.

Retailers engaged in logistical activities by buying sweet potatoes from *penebas* traders at the main markets. They usually bought the products weighing 100-450 kg and did not perform operational activities. The marketing process was performed through their stalls with the selling prices of Rp 8,000/kg-Rp 8,500/kg. Similar to wholesalers, retailers operated by considering their stall conditions and sorting activities.

Supporting Activities

Purchases of seeds, organic/non-organic fertilizers, and other production facilities supported agricultural activities. Farmers bought fertilizers and herbicides from the nearest kiosks in the Bergas sub-district. They hired laborers from neighbors or family members on a flat-wage or daily basis. The daily wages for daily workers were between Rp 35,000/day-Rp 50,000/day. Meanwhile, the fat-wage contracts were based on activities performed, such as land processing time, depending on land areas. Laborers were mostly needed when farmers prepared for agricultural lands and seed planting. Farmers employed laborers based on their needs, not based on workers' skills.

Penebas traders obtained fresh sweet potato supplies directly from farmers by buying the products before harvesting time. They had only trucks, scales, and storages to support their purchasing and sales activities. They did not use the latest technologies because they considered that purchasing such equipment would increase costs. Besides, they only acted as distributors by directly distributing fresh sweet potatoes to other marketing institutions to generate profits. Further, workers (only drivers and porters) were only hired during harvesting and marketing activities and paid when harvesting activities ended. Laborers received wages of Rp 200/kg - Rp 300/kg. *Penebas* traders' assets were roughly equal to wholesalers.

Wholesalers received sweet potato supplies from *penebas* traders and buying directly from farmers. They have assets of shops, scales, and some had trucks. Wholesalers only employed porters to unload the products at the markets. Workers received wages of Rp 10,000/quintal. Wholesalers did not recruit or train their workers.

Overall, retailers performed similar activities to wholesalers. They only had scales and stalls. They bought sweet potatoes directly at the main markets (Jetis Agribusiness Sub-Terminal). When buying the products, retailers paid porters with various wages to carry their products to the stalls. They only hired their families or relatives and did not involve outside workers.

CONCLUSIONS, LIMITATIONS, AND SUGGESTIONS

Our study concludes that the sweet potato marketing channels in Bergas sub-district, Semarang Regency, exhibited imperfectly competitive or oligopoly market characteristics. Next, marketing channel 4 was the most efficient because it offered the lowest marketing margin and highest farmer's share (Rp 1,500/kg and 57,14%, respectively). Fewer marketing institutions involved in marketing channels will increase farmers' profits.

Value chain analysis examines both main and supporting activities. Main activities consist of inbound logistics, outbound logistics, marketing, and services. Marketing institutions did not perform operational activities because they only distributed the products. Meanwhile, marketing institutions only performed several secondary activities, including general administration and purchases. They did not engage in human resource management and buy the latest technologies due to cost concerns.

This study suggests that farmers initiate direct marketing to consumers to reduce distribution costs by cooperating with farmer groups. These actions will arguably help farmers their marketing channels and strengthen their bargaining positions. Farmers also need to maintain the continuity between farmers and marketing institutions to enhance marketing performance by planning production results. This study only used few farmer and marketing institution respondents and did not include stakeholders who offered policy recommendations insights. Hence, we suggest future studies to add respondents to mitigate biased results. Scholars can also incorporate other factors that likely affect the sweet potato value chain because most sweet potato farmers also plant other commodities such as rice.

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