

Agrofood Supply Chain Management Performance Does Intermediaries matters?

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Abstract

Agriculture industry contributes 8.2 percent of Malaysia's Gross Domestic Product (GDP), and agro-food sector is one of the main contributors. Empirical finding share consensus that the main challenge for agro-food industry is to ensure agro-foods are delivered from its original source, through intermediaries, and reaches retailers effectively, or namely the management of agro-food supply chain (ASC). The performance of ASC management is dependent on the performance of intermediaries and the number of intermediaries involved along the supply chain network. Hence, this research aims to identify the involvement level of agro-food intermediaries within ASC in Malaysia. The research also aims to assess the impact of agro-food supply source on retailers' supply chain management (SCM) performance. Four categories of intermediaries identified from literature review, which are agent, wholesaler, importer and shipper. Finding from empirical review also reveals that economic and operation performance are the most common measures form SCM performance. The research is quantitative based, focused on argo-food retailers in Malaysia as the targeted population. Self admin questionnaire was distributed to 200 agro-food retailers in Malaysia to collect their demographic detail, to assess the involvement level of intermediaries along the ASC, and to gauge the level of SCM performance. Data gathered from 144 retailers were analysed via descriptive analysis, and independent t-test. Finding from the research reveals that within the context of ASC in Malaysia, the involvement level of "wholesalers" and "importers" are relatively higher than the other intermediaries. Furthermore, most of the retailers are not depending on single source of supply, on top of wholesaler, importer is one of the common alternate sources. Additionally, the source of agro -food supply implies a significant impact on the performance of SCM. Retailers who procure agro -food beyond the local source implies a higher performance versus retailers who only dependent on local sources. Hence, the main

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implication of this study is the improvement of agro-food SCM performance could be enhanced by expanding the source of agro-food supply.

Type of Paper: Empirical

Keywords: Agro-food; Supply Chain Management; Intermediary; Retailer; Food Security.

Introduction

Agricultural industry contributed approximately 8.2% of Malaysia's Gross Domestic Products (GDP) and involved more than 1.6 million of employment (Dardak, 2015). Hence, it is one of the important economy segments for the nation. Studies done by food security experts (Jeremy and Kate, 2013) believed that the earth is capable of feeding everyone, however the bigger challenge in food security is food that available may not reach the people who need it. Hence, more attention should be given on how food is delivered from its original source to retailer or consumer effectively, or namely the management of food supply chain. Hence, on top of putting effort to sustain food's self-sufficiency level (SSL), another big challenge within the context of food security is the management of agro-food supply chain (ASC).

Empirical research shared consensus that the context of supply chain such as the number of intermediaries involved along the entire supply chain, namely the tier levels of the supply chain; as well as retailers' business operations and source of supply are critical to supply chain performance. (Theagarajan and Manohar, 2015). However, extending the general finding from prior study to a specific sector such as agro-food industry is contingent. Hence, this study aim to identify the category of agro-food intermediaries, and their involvement level along the agro-food supply chain in Malaysia. In addition, the study also aim to assess the impact of supply sources (i.e. local source only or local source and imported) toward the retailer's SCM performance. In conjunction with this, two research objectives are developed for this research, which are:

1. To identify the involvement level of agro-food intermediaries within agro-food supply chain in Malaysia.
2. To assess the difference on retailer's supply chain supply performance based on source of agro-food supply.

2. Literature Review

2.1 Agro-food Supply Chain and Agro-food Supply Chain Management

Agro-food supply chain refers to the whole process of supplying agro-food from its place of origin to consumers. The process involves food cultivation, processing, distribution and consumption (Tortorella et. al., 2017). Hence, a food supply chain network system involved numbers of key players ranging from the farmers, intermediaries (such as food collectors, food distributor, shipper, agent, wholesales and retailer) and consumers. Additionally, the management of food supply chain is complicate and it involves 8 important components, which are planning, information management, source management, production, inventory, logistic, location selection and transportation (Marodin et. al., 2016). Due to the complication ASC management, the roles played by intermediaries along the supply chain network are critical to the success of ASC management. (Oguoma et. al, 2011).

2.2 Agro-food Supply Chain Intermediaries

Hezarkhani et al. (2018) defined "intermediaries" as the economical units that

executing transaction process between the suppliers and the customers. Intermediaries are norm to any supply chain framework, they are the connecting points and storage point for the supply chain transaction (Arya et al., 2015). There are numerous intermediaries identified and defined by prior scholars such as distributors, processors, shippers, producers, agents, wholesalers, importers, contractors and trader. However, some of these intermediaries are similar in term of nature of the function, but have been named differently by prior scholars.

The main focuses for the Malaysia new Argo Food Policy 2.0 is to enhance the operational efficiency of all parties or stockholders invleve in the entire ASC, namely the intermediaries of ASC, such as farmer, agent, shipper, wholesales and retailer. Hence the entire agro food sector value chain will be capitalized under Argo Food Policy 2.0, with the ultimate objective to enable the farmers and agricultural entrepreneurs to access to bigger market and to gain greater economic threshold. In conjunction with this, minimizing number of intermediaries and optimizing the components of supply chain, are the key focus areas for the new Argo Food Policy 2.0. Within the context Malaysia, intermediaries for ASC can be grouped into 4 categories as shown in Figure 1, which are agent, wholesaler, importer and shipper. The categorization of ASC intermediaries is based on the business nature and the function of the intermediaries.

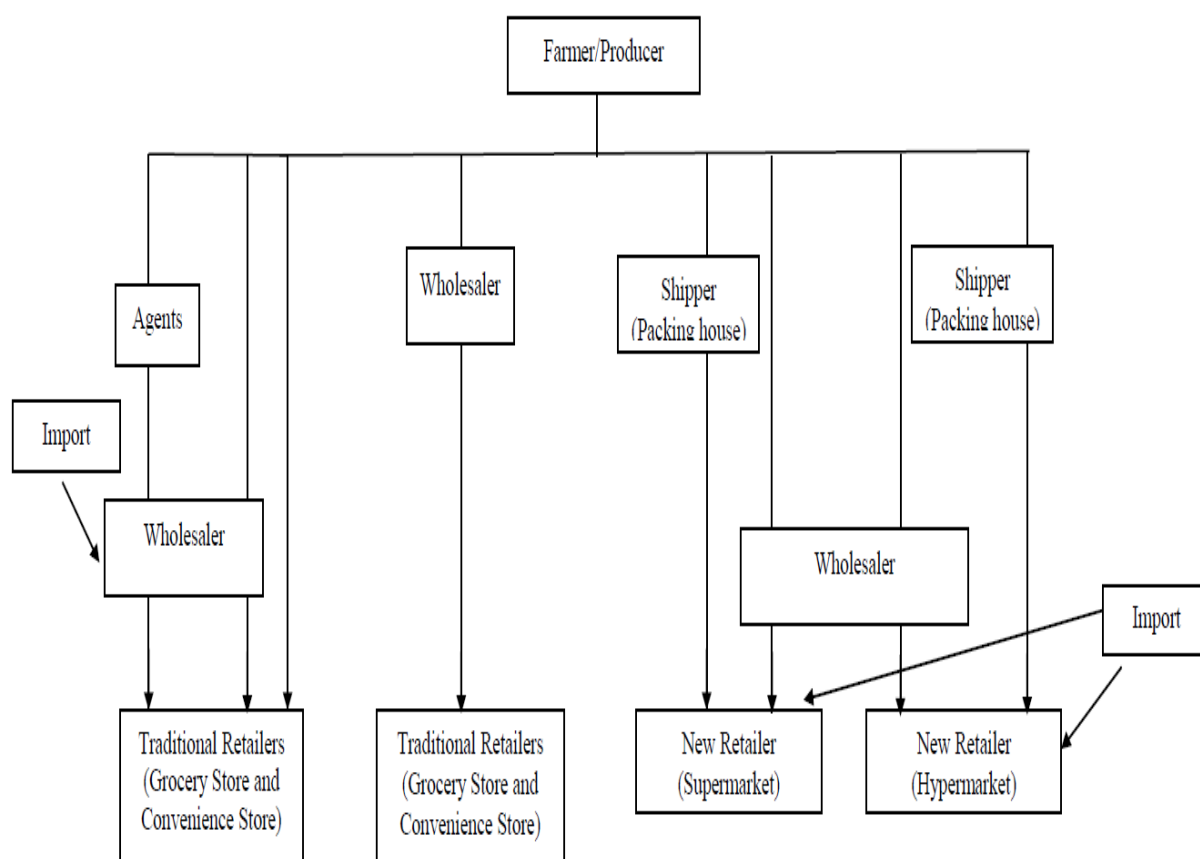


Figure 1. Agro-food Supply Chain in Malaysia

2.2.1 Agent

Agent is defined as an individual or company who does not own and hold any of the agro-food products, however they are conversant with the market and the demand of the agro-food. Hence, agent execute the marketing function for the agro-food producer, and become the sole buyer for the agro-food producer, they gain the returns of commissions for the services of

buying the agro-food produced by producers and sell in bulk to other intermediaries such as wholesalers (Vetrivel & Prasanth, 2017).

2.2.2 Wholesaler

Wholesaler and agent shared the commonality in term of their knowledge and understanding on the demand and market of agro-food, however, unlike agent, wholesaler might not the sole buyer for the agro-food producers. Instead, wholesaler secure the agro-foods supply from varies sources, such as from few agro-food producers, from the agent or another wholesaler, and resell the agro-food in large quantities to the retailer (Vetrivel & Prasanth, 2017; Arshad 2012).

2.2.3 Shipper

To gain a greater economic threshold, some agro-food producers expanded their operational function and start involve themselves on the upstream activity of supply chain, either by setting-up their own retail point or partnering with retailer to sell the argo-foods directly to the consumers (Agarwal, 2017). In the traditional supply chain that involved agent and wholesaler, the transportation and storage of agro-food from producer to retailer are taken care by the agent or wholesaler. With the exclusion of agent or/and wholesaler from the supply chain network, the role of transportation and storage are taking over by shipper. The role of shipper might go beyond the traditional transportation function, but also involves packing or repackaging of agro-food based on customer needs (Arshad, 2012).

2.2.4 Importer

To maintain business sustainability and compete with wholesaler, some agent expand the requisition of agro-food supply by go beyond the geographical constraint and expanded the role in the agro-food supply chain from an agent to be an importer. Importer surpass wholesaler by diversifying the types and the supply of agro-foods by bring in agro-foods from other states within Malaysia or neighboring countries, with the ultimate aim to meet the local market demands (Teimoury et al., 2013). Within the context of this study, an intermediary who acquired agro-food supply from state of Johor to fulfill the demand of Johor market is viewed as agent; while an intermediary who secured agro-food supply beyond Johor state, such as from Cameron Highland or from Vietnam and China is regarded as importer.

2.3 Agro-food Retailers in Malaysia

The Department of Agriculture's Foreign Agricultural Service (2018) categorized the retailers in Malaysia into four (4) categories mainly based on the business model and demographic of the retailers, which are supermarkets, hypermarkets, convenience store and traditional stores. Supermarkets and hypermarkets refer to the large agro-food retail stores which are usually located in the major and urban cities in Malaysia, such as Tesco Malaysia, Aeon Malaysia, and Village Grocer Holdings Sdn. Bhd. Convenience stores those retailers that found in the flourishing cities, towns and even the along the Malaysia's highway, for instance 7-eleven, Family Mart. These stores normally offer a narrow range of goods as compares to supermarkets or hypermarkets. While traditional stores refer to retailers that normally run as a small family business. Traditional stores constituted a huge number of agro-food retailers in Malaysia and are generally found across the country, regardless in rural or urban area within Malaysia (Man et. al, 2009).

2.4 Supply Chain Performance of Agro-food Retailer

Empirical research (Agami et. al. 2012; Ruiz-Benítez et al. 2018) underlined an "adequate" supply chain performance measures was hard to identify because of the intricacy

of the supply chain systems. Adopt a single measurement for supply chain performance may neglect “some” important elements within the supply chain, while using too much of measurement made the assessment process lengthy and costly. Hence, based on the nature of the population, this research adopts SCM performance measure developed by Ruiz et. al. (2018) to assess supply chain of Agro-food retailer. The measurement model focuses on assessing supply chain performance from economic and operation perspective as shown in Table 1.

Table 1. *Retailers Supply Chain Performance*

Economic performance measurement	Operational performance measurement
<ul style="list-style-type: none"> • Decrease in cost for materials purchasing • Decrease in cost for energy consumption • Decrease in transportation cost 	<ul style="list-style-type: none"> • Increase in goods delivered on time • Decrease in inventory levels • Decrease in scarp rate • Increase in product quality • Increase in customer satisfaction

3. Research Methodology

This research is quantitative based, the following sections summarize the research methodology adopted in this study.

3.1 Population and Sampling

The targeted respondents for this study are retailers of agro-food product in Malaysia. The population included all the 4 categories of retailers discussed in literature review. Sample size is defined based on the 10-times-rule of Hair et.al. (2010). According to Hair et.al. (2010), sample size should be greater than 10 times of the maximum number of inner model links. Since there are 8 performance attributes or measures that identified in literature review, the minimum sample size for the study should be 10 X 8, which is 80. However, by taking into consideration the average response rate in Malaysia manufacturing sector is approximately 40% (Tan et.al, 2019), the targeted sample size for this study is $80/0.4 = 200$. Hence, this research aim to distribute the questionnaire to 200 retailers based on stratified sampling method to ensure the survey covered all the 4 categories of retailers.

3.2 Research Instrument

The questionnaire used in the research consist of three sections. Section A to collect the respondent demographic information including the source of agro-food supply. Section B assessing the level of involvement for the 4 intermediaries (i.e. agent, wholesalers, shipper and importer) throughout the supply chain of agro-food in Malaysia. While Section C measuring the supply chain performance perceived by agro-food retailers. The assessment was done via 5-points scales from “1” representing “Strongly disagree” to “5” indicating “Strongly agreed”.

3.3 Analysis Tool

The normality and reliability of data collected from sections C of the questionnaire are assessed via Skewness & Kurtosis value and Cronbach Alpha test respectively. Skewness & Kurtosis range of +/- 3 represents data is normally distributed. Meantime, Cronbach Alpha reliability value of greater than 0.0 is suggested to be adequate for testing the reliability of

factors (Roscoe 1975; Tan et. al. 2016)

Descriptive analysis in term of frequency is used in this study to addressed research objective 1. While two samples independent t-Test is applied to address research objective 2 (and the hypothesis), i.e. to explore is there any significant difference on the mean supply chain performance of retailers based on the source of agro-food's supply. The t-test is done at the significant level of 0.05.

4. Analysis Results and Discussion

A total of 200 questionnaires were distributed with 151 responded. However, 7 of the questionnaires were incomplete or missing value. As such there are 144 useable response.

4.1 Normality and Reliability Test.

Data collected from section C was analyzed to generate the Skewness, Kurtosis, Cronbach alpha value. The Skewness and Kurtosis value for all data are between +/- 3, and the Cronbach alpha value of higher than 0.7 suggested that the data collected is normally distributed and reliable, hence, could be used for further analysis.

4.2 Addressing ROI

To address research objective 1, i.e. to identify the involvement level of agro-food intermediaries in agro-food supply chain within Malaysia. Section 1 of the questionnaire required agro-food retailers to select intermediary or intermediaries that involved in the supply chain of agro-food between the source of agro-food (e.g. farmers) and the respondents (i.e. agro-food retailers). The total number of time (i.e. frequency) of each intermediary that was selected by the respondents is summarized in Table 2. The frequency represents the involvement level of Agro-food intermediaries throughout the agro-food supply chain within Malaysia.

Table 2. *Involvement level of Agro-food Intermediaries*

Agro-food Intermediary	Frequency	Rank
Agents	32	3
Wholesalers	113	1
Shippers	21	4
Importers	53	2

As refer to Table 2, wholesaler is suggested by respondents as the most common intermediary used by retailer to secure agro-food supply within the agro-food supply chain in Malaysia. While shipper's involvement is the lowest among the four intermediaries, whereby only 21 out of the 144 retailers involved shipper directly as part of supply chain partner. Wholesaler and shipper shared a commonality in term of roles of transporting, storage, repackaging agro-food based on retailers' requirement (Arshad, 2012). However, shipper does not involve on the securement of agro-food supply, instead only responsible to pick-up agro-foods from the sources and location that specified by retailer (Vanichchinchai, 2019). While wholesalers accountable for sourcing and securing the supply of agro-food. Perhaps, due to most of the agro-food retailers within Malaysia are micro or small entrepreneur-based company with insufficient demand to deal with the producers of agro-food which normally required a bulk purchase, and limited resource to manage the transaction of agro-food. As such dealing with wholesalers is the preferred option.

There are 53 retailers engaged with importer on securing agro-food supply. This made importer ranked as the second highest intermediary in term of involvement in agro-food supply chain within Malaysia. However, the interesting finding from the survey is, none of the retailer purely depend on importer to secure agro-food supply. Importer is used by all the 53 retailers on top of “wholesaler”, i.e. the 53 retailers engaged both wholesaler and importer as their supply chain partners. Meanwhile, 32 of the retailers recognized that their wholesalers are getting agro-food supply from both producers and agents.

4.2 Addressing RO2

In conjunction with the finding from RO 1, this research explore further is there any difference on retailer’s SCM performance based on the source of supply, namely local only or local and imported. To address RO2, data collected from Section C of questionnaire is proceed with 2 samples independent t-test with demographic data “source of agro-food supply” as categorical variable. Result of analysis is shown in Table 3.

Table 3. Analysis result of t-test

Hypothesis	Groups	Significant	Mean Difference	Result
There is difference on retailer’s SCM performance based on source of agro-food supply.	Group 1: Local source Group 2: Local source and imported	0.046(<0.05)	-0.430147	Supported

As refer to Table 3, the significant value for the two samples independent t-test is 0.046, which is less than 0.05 suggested that there is significant difference on retailer’s SCM performance based on source of agro-food supply. Hence, hypotheses is supported. Further analysis on mean reveals that the SCM performance for retailers who secure agro-food supply from both local and imported source is higher than those purely dependent on local agro-food producer as single source of supply, with the difference of 0.43 (out of 5 points scale).

Expanding products’ range is widely recognized by prior scholar as the useful straregy for busniess growth and diversification (Shin, 2016; Agarwal, 2017; Oladimeji and Udosen, 2019). As such, for the case of agro-food retailers, diversification offers more products’ variety and option for customers, and also reduce the risk of depending on single supply source. As such, diversification on source of agro-food is an effective strategy to boost retailer SCM performace. Perhaps, this is the reason that explained why retailers who secure source agro-food supply from local and imported performed better tha those that dependent purely on local source.

5. Conclusion and Future Research

In summary, due to the scale of business for most of the retailers are either small or micro, they are yet to explore the route of getting agro-food directly from the producer due to limited demand and limited resource. Instead, wholesaler is the main intermediary that agro-food retailers in Malaysia dependent on to secure agro-food supply and to management the transaction of agro-food. The transaction process involves transportation, storage and repackaging. Moreover, most of the retailers are not depending on single source of supply, on top of wholesaler, importer is one of the common alternate source of agro-food supply. The subsequent finding from the research reveals that retailers who secure agro-food supply beyond local source are performed better than those retailers who just dealing with agro-food from local source. The main implication of this study is the improvement of agro-food SCM

performance could be enhanced by expanding the source of agro-food supply beyond local source. Hence, future research could be conducted to investigate the demographic impact agro-food suppliers on SCM performance. Additional, to complement the current research, qualitative based research to explore how both SCM performance could be further improve.

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