Inter-regional Trade Mapping In Stock Management, Transport, Infrastructure and Distribution of Strategic Food Commodities Toward Province of Bangka Belitung Island, Indonesia

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ABSTRACT

This study has the primary purpose of mapping examine inter-regional trade on stock management, transportation, infrastructure and distribution of strategic food commodities. Descriptive analysis approach to stock management, transportation, infrastructure and distribution to the survey results emphasized the traders, especially Regional Wholesaler because of the previous research in Pangkalpinang market structure is an oligopoly. In the quantitative analysis oriented, Nearest Neighbor Analysis to explain the distribution pattern of the merchants on the island of Bangka Belitung Province. These studies draw on the field survey conducted by the survey team of students who are competent to carry out the task. The field survey of nearly 200 respondents which include Regional Wholesaler, Local Wholesaler, Main Market Retailers, Traditional Market Retailers and Modern Market Retailers spread across 6 districts and 1 municipality. The study also focused on several commodities including Rice, Sugar and Cooking Oil which not only as the primary needs of Bangka Belitung Islands but also its impact on inflation and general economic welfare. The analysis above is expected to contribute to the literature review which is concerned in the field of economics and policymakers in Province of Bangka Belitung Islands.
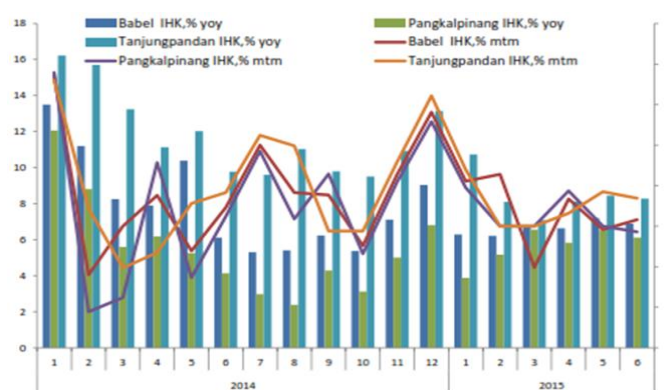
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INTRODUCTION

Bangka Belitung Province before it became its own province which is part of South Sumatra, Indonesia. Bangka Belitung Province in the second quarter of 2015, only a slight increase from 6.73% year-on-year against the first quarter of 2015 to 6.90% year-on-year (Table 1). Inflation in the second quarter going against the core group together with the demand of the fasting month of Ramadan and the depreciation of the exchange rate. Inflation on administered prices owing to rising air freight rates and household fuel. Meanwhile, the volatile foods' category experienced deflation due to increasing food supplies in terms of production and distribution is a factor retaining inflation. Anticipating a decline in consumer purchasing power and the increase in inflation is needed to support the economic growth of the Bangka Belitung Islands community.

Table 1. Inflation development in the islands of Bangka Belitung province

Source: Bank Indonesia, 2015

Therefore, one way that can be achieved is by eliminating or decreasing the disparity/economic barriers that exist in Bangka Belitung. By reflecting on the theory of the law of one price (LOP) or purchase power parity in the context of the disparity between regions, basically, these differences can be eliminated in the event of market integration between regions, especially through trade relations. LOP theory states further removal of trade barriers would encourage goods markets to become more integrated, and in turn, will lead to price convergence. Thus, the integration of the domestic economy, particularly through trade, could promote the welfare of society. Bangka Belitung food commodities are generally obtained from outside the area Bangka Belitung. While its own consumption spread throughout the municipality/district and the relatively volatile throughout the year.

This study uses spatial analysis that will determine the pattern of trade and also explored in more detail about factors distribution, transportation, and behavior of traders in the management of the stock.

LITERATURE REVIEW

Theoretical viewpoints
A study from Suhardi and Echo (2013) shows clearly that the market structure throughout the commodity becomes the object of his research indicated as a market with high

concentration levels. Suhardi & Echo (2013) proved that the supply of agricultural commodities products, industry and farm level are concentrated Regional Wholesaler/ Local Wholesaler remember when viewed from the side number of actors, a fewer number of Regional Wholesaler. These conditions indicate, Regional Wholesaler and Local Wholesaler behavior have an influence on the supply and price in the market.

Inter-regional trade

Inter-regional trade is the exchange activities between residents of a region to the other residents. Trade between regions is an important factor to stimulate economic growth. Inter-regional trade increase the consumption capacity of a country, increasing the output of the world, as well as provide access to resources are scarce and international markets is the potential for a wide range of products that result is the main stock which, if not available, poor countries will not be able to develop activities and national economic life. Inter-regional trade help all citizens in running their development efforts through the promotion and preference of the economic sectors that contain a comparative advantage (Todaro, 2000).

Inventory

Rangkuti (2007) stated that inventories are materials, supplied parts and materials in the process contained in the company's production process, and finished goods or products supplied to meet demand from consumers or customers every time. Baroto (in Riggs, 1976) stating that inventories are raw materials, work in process, finished goods, supplies, supplementary materials, components stored in anticipation of demand. Starr and Miller (1997) stated that inventory is theory hardly inquires education and inventory immediately bring to mind a stock of some kind of physical commodity.

Infrastructure

Infrastructure according to Grigg (2000) is a physical system that provides transportation, irrigation, drainage, buildings and other public facilities, which are required to meet basic human needs both the needs of social and economic needs. The availability of infrastructure has an impact on the social system and the economic system in the community. Therefore, the infrastructure needs to be understood as basics in using the policy (Kodoatie, 2005).

METHODOLOGY

Research Method

Analysis of the data for this mapping using administrative map of Bangka Belitung Province which equipped with primary data in the field survey and secondary data obtained from the Department of Trade and Industry Bangka Belitung Province. This mapping using descriptive analysis and quantitative analysis such as Nearest Neighbor Analysis to determine the pattern of distribution of commodities.

Sampling

Commodities survey consisted of rice, sugar, and cooking oil. The main criteria for the selection of strategic commodities are a significant contribution to the formation of inflation (prices), commodities tend to show the high volatility of prices periodically, and

commodities consumed or purchased regularly by the public (staple food). Regional wholesaler would have taken a sample of 10 traders and Local Wholesaler consist of 30 traders, cultivated all Regional Wholesaler and Local Wholesaler can be surveyed. Most Regional Wholesaler is in the area Pangkalpinang. While, Local Wholesaler spread throughout the territory object of research. A sampling of the Main Market Retailer will be carried on the main market located in Pangkalpinang with 60 traders. Traditional Market Retailer sampled a number of 94 traders by the spread of the study area is one Municipality and 6 districts. Modern Market Retailer taken samples of 6 traders scattered in the Municipality Pangkalpinang.

Nearest Neighbor Analysis

Nearest Neighbor Analysis is one of analysis used to explain the distribution pattern of dots location whereby using a calculation that considers the distance, the number of points the location and area. This analysis has the end result in the form of an index (T), the index value of the nearest neighbor deployment itself obtained by the formula:

$$T = \frac{Ju}{Jh} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Information:
T = Index deployment nearest neighbors
Ju = Average distance measured between one point by the nearest neighbor
Jh = Average distance obtained suppose all points have random pattern

The formula used to find the value of Jh , namely:

$$Jh = \frac{1}{2\sqrt{P}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Information:
Jh = Average distance obtained suppose all points have random pattern
P = Population density or density of the dots in square kilometers

Meanwhile, to get the value of P must first be found using the following formula:

$$P = \frac{N}{A} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Information:
P = Population density or density of the dots in square kilometers
N = Number of points
A = Total area in square kilometers

In analyzing the nearest neighbors, keep in mind some important stages as follows:
a. Determine the boundaries to be studied.
b. Changing distribution patterns in the observation unit topographic maps into a pattern of spots inside.
c. Giving a sequence number to each point, to simplify the analysis.
d. Measure the shortest distance in a straight line from one point to another point which is closest neighbors.
e. Calculate the parameters of the nearest neighbors.

Category Index Distribution (T) :

I = Rated T from 0 to 0.7 is grouped or clustered pattern
II = value of 0.7 -1.4 T is a random pattern or scattered unevenly
III = value T of 1.4 to 2.1491 is a uniform pattern or spread uniformly

DATA ANALYSIS AND DISCUSSION

Rice

Bangka Belitung Province is an archipelago that dependence rice supply from other areas outside the province. Rice production centers in Java and Sumatra become the main supplier for rice commodity for Bangka Belitung province. Bangka Belitung Province has a low production yield as much as 23.480 tons of milled rice is generated only enough for as much as 12.18 percent of consumption (Department of Trade and Industry Bangka Belitung Province, 2015). Bangka Belitung has red rice production is usually produced to meet the needs of their own household only. Just a bit of brown rice farmers in Bangka Belitung sell red rice crops to market. Rice traders sample areas include five districts and one municipality with 16.84% have 1-3 years of selling rice, 12.24% had 3-5 years of selling rice and 70.92% have more than 5 years selling rice. The turnover of traders in 2015 range from less than Rp 250 million (68.57%), 250 million s.d. Rp 500 million (22.86%), and greater than Rp 500 million (8.57%). Regional Wholesaler sampled researchers in 2015 to buy stock in certain areas outside the Bangka Belitung Province region as much as 2179.2 tons of rice. Jakarta (Java) province as one of the centers of rice contributed to the Bangka Belitung Province of 2169.6 tons of rice, while the Palembang (Sumatra) province contributes only 9.6 tons of rice alone.

Sugar

Bangka Belitung Province as well as the rice commodity dependence 100% commodity sugar on the island of Java and Sumatra. On the commodity sugar, there is no local production produced so heavily dependent on Regional Wholesaler to provide these commodities. Regional Wholesaler distributes the stock of sugar in 2015 as much as 1230 tons. Jakarta province as the dominant supplier of sugar amounted to 1218 tons and the remaining 12 tons came from the province of Palembang. Traders sugar covers five districts and one municipality with 18.45% have 1-3 years of selling sugar, 13.72% had 3-5 years of selling sugar and 67.74% have more than 5 years selling sugar. Turnover of sugar trader in 2015 range from less than Rp 250 million (79.03%), 250 million s.d. Rp 500 million (19.35%), and more than Rp 500 million (1.62%).

Cooking oil

In commodity cooking oil there is no local production of materials produced so heavily dependent on Regional Wholesaler to provide these commodities. Oil Palm in Bangka Belitung likely contributes to the cooking oil products produced in the region of Palembang, for example, cooking oil brand "Fortune". Regional Wholesaler distributes cooking oil stocks in 2015 as much as 876 tons. Jakarta province as the dominant supplier of sugar amounted to 871.2 tons and the remaining 4.8 tons came from the province of Palembang. Traders cooking oil covers five districts and one municipality with 17.19% have 1-3 years of selling cooking oil, 12.5% had 3-5 years of selling cooking oil and 70.31% have more than 5 years selling cooking oil. Turnover of cooking oil trader in

2015 range from less than Rp 250 million (79.69%), 250 million s.d. Rp 500 million (15.63%), and more than Rp 500 million (4.68%).

Inter-regional Trade Flow
Based on the results of the field survey, the Main Market in Pangkalpinang has become a barometer of pricing local rice (referenced market). It has implications for the distribution factor which is a very important factor in pricing. Areas that have limited infrastructure as areas in Lepar Pongok, South Bangka, tend to pay a price that is relatively higher than the price of other areas in Bangka Belitung relatively which have better infrastructure. As for the areas in the East Belitung, traders magnitude has the same pattern on Bangka Island, which takes its rice supply from Java and Sumatra.

Distribution
Based on the survey results, there are five factors that impede the distribution of three major commodities to other areas, namely the supply of goods fluctuated as seasonal effects, natural factors such as weather conditions, damage to infrastructure, high transportation costs, the limited amount of freight and extortion. The survey results of research for commodities as rice, sugar and cooking oil, the issue of goods supply factors fluctuated due to the weather and damage to infrastructure (road damage) the major factor inhibiting trade distribution, which reached 72.96% of the total respondents, followed by damage 11.7 % of infrastructure, high transport costs by 8.2%, the limited number of buses 6.6 % and 0.5 % illegal fees.

Infrastructure and Transportation
From the survey results in this study, is generally described conditions bottlenecks in transport and infrastructure, such as road damage is still occurring in the city and several districts in the Bangka Belitung Province and the fleet is used to perform the activity of commodity distribution. According to the survey, the perception of traders in Bangka (21.43%), the City of Pangkalpinang (13.46%), South Bangka (22.22%) and East Belitung (8.33%) who had a response to the lack of infrastructure facilities such as damaged roads. But few respondents traders respond to the lack of infrastructure, ensuring the infrastructure conditions in Bangka Belitung in good condition. In the aspect of transportation found that traders using land transport modes by 91% (motorcycle/car/pickup/truck) and river/sea by 9% (Motorboat and Ship). The use of sea transport mode is only used by Regional Wholesaler to take commodities outside of Bangka Belitung Island, while land transport modes used by all categories of traders.

Stock Management
From the results of a survey of traders, it appears that the Pangkalpinang area has a stock of rice by 61.32%, sugar 80.66% and 49.49% stock of cooking oil, followed by Central Bangka has rice stock of 19.07%, sugar (7.80%) and cooking oil (36.02%), then West Bangka has stock of rice (2.52%), sugar (3.35%) and cooking oil (2.70%), and the South Bangka has stock of rice (3.54%), sugar (2.37%) and cooking oil (1.46%), then Bangka has stock of rice (3.11%), sugar (4.31%) and cooking oil (1.46%), then the last East Belitung has stock of rice (10.44%), sugar (1.51%) and cooking oil (7.41%). The behavior of the stock is the highest for all commodities is Pangkalpinang area compared to another

area in the province of Bangka Belitung Islands. This is reasonable because the dominant Regional Wholesaler located in the city of Pangkalpinang. The pattern of behavior of the stock in Bangka Belitung is influenced not only the distance alone but there is also the effect of the power of capital. Capital power held by Regional Wholesaler compared with other trader categories so that high stocking behavior located in the region of Regional Wholesaler transaction activities. Results of research conducted Shiue (2002) directly or indirectly show that the regions whose frequency trade with other regions is relatively low, warehouse functions are becoming increasingly important. The low frequency of trading, when viewed from the geographical conditions Bangka Belitung, is relatively far from the production center then becomes very importance of a functioning stock for backup supply in the precautionary measure of uncertainty.

Nearest Neighbour Analysis
By measuring the shortest distance in a straight line from one point to another point which is the closest neighbors, based on data obtained from field survey data and aided by means of mapping and measuring the distance actually by a Navigation Tool Google Maps, the obtained data which are: 86 traditional markets point, 21 point measurement data, the closest distance 100.96 Km and area of the island of Bangka Belitung at 16424.14 Km. The following is a calculation using the Nearest Neighbor Analysis.

The number of traditional markets (N) = 86
Area of Bangka Belitung Island (A) = 16424.14 Km
The number of points closest distance = 100.96 Km
Total measurement data = 21
Asked T = ...?
completion:

$$Ju = \frac{100,96}{21}$$

$$Ju = 4,81$$

$$Jh = \frac{1}{2\sqrt{P}}, \ P = \frac{N}{A} = \frac{86}{16.424,14} = 0,005$$

$$Jh = \frac{1}{2\sqrt{0,005}}$$

$$Jh = 7,14$$

$$T = \frac{4,81}{7,14}$$

$$T = 0,67$$

Based on the above calculation of the index values obtained dispersion (T) is 0.67. It can be concluded that the distribution of traditional markets in Bangka Belitung Islands have clumped or clustered pattern on a range of numbers from 0 to 0.7.

CONCLUSIONS

Trading patterns in Province of Bangka Belitung Islands in accordance with the nearest neighbor analysis classified in the form of clustered or clustered pattern. These results are consistent with the geographical situation which is owned by the Bangka Belitung Province region where development is not spread evenly, still a lot of empty lands that has not been maximized for better development. Trading patterns of rice, sugar and cooking oil are still relying on supplies from outside the Province of Bangka Belitung, evident from the results of research in which Pangkalpinang area is a storage place or the biggest stock compared to other areas. From the survey results, there is lack of information which is no data available about the source of the merchandise from local farmers of rice, while data on Department of Trade and Industry Bangka Belitung Province (2015) declare their production of local farmers who distributed to the traditional markets in accordance the location of the rice production. Distribution of commodities such as rice, sugar and cooking oil predominantly come from outside the province of Bangka Belitung. The province of D.K.I Jakarta and Palembang Province became the main target region of Bangka Belitung Islands in the purchase of the commodity. Modes of transportation are widely used by traders of various categories are modes of land transportation, marine transportation modes while only used by Regional Wholesaler. Marine transportation modes become very significant because if there is a change in the oceans of bad weather, it will cause interruptions in the supply of commodities to Province of Bangka Belitung Islands. Interruptions in the supply of commodities will directly lead to speculative price increases are temporary.

The need for special attention to the local government of Bangka Belitung Province for strategic food crops regularly and sustainable to form a totality in anticipation of a "supply shortage" that have an impact on the price and the amount of consumption of Bangka Belitung. Food security located in Bangka Belitung Islands would be better if the government strengthens the upstream sector, which is the upstream sector including nursery management business premises, provision of production inputs and means of production are accompanied by adequate Appropriate Technology. Future studies are recommended to analyze aspects of production and distribution of local rice farmers where there is still "lack of information". Aspects of production and distribution of local rice becomes interesting because it fits the food security program of national strategic and empowerment of local farmers who are in the transmigration areas that exist in the islands of Bangka Belitung Province be a strong indicator for the increase in local rice production as well as the "knowledge transfer to acquisition" for local farmers.

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