Factors Determine Thailand's Processed Pineapple Export Competitiveness

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Abstract: *This study aims to estimate the factors influence competitiveness of Thailand's processed pineapple export. The processed pineapple consists of canned pineapple (HS200820) and pineapple juice (HS200949). The competitiveness of both products is defined as the market share in each major partners. These factors contain with processed pineapple price in average from partners, GDP per capita and exchange rate. The data used was panel data from 2013 to 2017 of 10 partners. The empirical result shows that there is significantly negative effect of price on the market share of both products. Moreover, there is positively effect from GDP per capitaon the pineapple market share and positively effect from exchange rate on canned pineapple market share. In addition, Thailand pineapple juice market share is less price sensitive than the canned pineapple market. The stable price and competitive price is necessary condition contribute to accelerate sustainable export competitiveness in the intense competition era. The effective exchange rate management implementation is crucial supporting mechanism to achieve this target.*

Keywords: *Processed Pineapple, Pineapple Juice, Canned Pineapple, Market Share, Export Competitiveness*

1. INTRODUCTION

Processed foods become a part of many people lives in present days. Almost kitchens have a canned food such as fruit juice. Many people have some bread for breakfast while someone eat bacon or cereal and milk. It means that the processed foods has more important for our lives. Furthermore, many people try to improve better taste, longer lifetime and higher nutrient. There is less barrier to entry in the markets particularly for developing countries to export. Consequently, it is very interesting to examine whether this export industry is highly competition as well as import markets are intense competition.

Pineapple is one of the popular agricultural goods compare to others which can be processed and distributed to all the part of the world. The origin of pineapple is in South America. The plant was spread to the other region in South America by native southern Brazilian and Paraguay before across to the Caribbean, Central America and Mexico by Mayas and the Aztec. In 1493, Columbus brought it to Spain (Suzanne Raga, 2015). This is a beginning of the long journey of pineapple to the world.

Additionally, pineapple is an essential ingredient of many foods. The increasing demand for pineapple in some countries is more than the domestic production. As a result, many countries must import this product from others to fill the domestic demand. Fresh pineapple can be produced various choices in terms of canned or processed to be a juice before export to the partners for long lifetime to store and convenient to transfer.

More than 70 percent of canned pineapple canned export value from the South East Asia countries since 2001 to 2017 (Trade Map, 2019). Top exporters of the pineapple canned are Thailand, Philippines and Indonesia. Canned pineapple which exported from Thailand was around 46.76 percent while Philippines and Indonesia was around 16.14 and 12.34 percent in 2013.Philippines and Indonesia increased the market share obviously in the world market in 2017. Philippines market share

of canned pineapple was around 20.97 percent that was higher than the last five years was about 4.83 percent while Indonesia export was around 14.95 percent. In contrary, Thailand market share decreased gradually to 43.36 percent or reduced about 3.4 percent (Table 1).This situation reflected the sign of market share changing of leader in world market.

Table1: *Market share of the top 3 partners in the canned pineapple market*

Year	Thailand	Philippines	Indonesia
2013	46.76%	16.14%	12.34%
2014	46.19%	16.50%	15.03%
2015	41.62%	24.87%	14.19%
2016	43.22%	25.00%	11.16%
2017	43.36%	20.97%	14.95%

Source: Trade Map (2019)

The top pineapple juice exporters are Thailand, Netherlands and the Philippines. There was 70 percent of market share which came from the export value of the top 3 countries since 2002 to 2018 (Trade map, 2019). Thailand export value of the pineapple juice was about 36.50 percent in that period while Philippines was about 21.07 percent and Philippines was about 12.40 percent. Thailand is a leader in the world market. Nevertheless, the market share of Thailand in the world market decreased from 32.78 percent in 2013 to 27.01 percent in 2017.Philippines entered to the world market in 2010 increased rapidly from 14.06 percent in 2013 to 19.02 percent in 2017. Moreover, the market share of Netherlands export which dropped a little around 2.21in 2013 to 18.83 percent in 2017 (Table 2).

Table2: *Market share of the top 3 partners in the pineapple juice market*

Year	Thailand	Netherlands	Philippines
2013	32.71%	21.04%	14.06%
2014	28.45%	21.98%	15.80%
2015	25.82%	20.94%	9.92%
2016	26.79%	22.35%	13.23%
2017	27.01%	18.83%	19.02%

Source: Trade Map. (2019)

From the above, it can be reflected that the competitiveness of both products exported from Thailand during 2013 to 2017decreased massively especially in the pineapple juice market. The quality export of Thailand's canned pineapple and pineapple juice in the important partner countries from 2013 to 2017 decreased which reflected by continually dropped market in each important major partners. The export of canned pineapple market share decreased around 6.48 percent from 2013 to 2017 particularly for Australia. Furthermore, the export market share of Italy and Japan also dropped obviously about 30 %. (Table 3)

Table3: *Market share of canned pineapple export in top 10 Thailand's partners*

Partners	2013	2017	Difference
Netherlands	41.94%	31.96%	-9.99%
United States of America	47.95%	37.98%	-9.97%
Australia	82.91%	60.19%	-22.72%
Islamic Republic of Iran	71.72%	63.85%	-7.88%
Italy	49.40%	16.98%	-32.41%
Spain	27.24%	32.10%	4.86%
Korea, Republic of	39.07%	24.21%	-14.86%
Japan	54.80%	23.63%	-31.17%
United Kingdom	26.32%	14.96%	-11.35%
Taiwan	15.30%	21.36%	6.07%
Average			-12.94%

Source: Trade Map (2019)

In the pineapple juice market, market share of quantity export drops around 11.76 percent from 2013 to 2017 particularly for Russia which significantly decreased about 20.61 percent (Table 4).

Table4: *Market share of pineapple juice export in top 10 Thailand's partners*

Partner	2013	2017	Difference
United States of America	48.25	42.88	-5.37
Germany	50.82	54.68	3.86
Russian Federation	85.48	64.87	-20.61
China	50.86	37.66	-13.20
Japan	56.29	43.59	-12.70
Canada	75.79	64.72	-11.08
Islamic Republic of Iran	92.10	99.34	7.23
Netherlands	43.07	38.50	-4.56
United Kingdom	49.22	42.52	-6.70
Spain	28.56	26.83	-1.73
Average			-6.48

Source: Trade Map (2019)

The decreasing of market shares can contribute to the import situation changing of major partners. Khiyavi K, Moghaddasi T and Yazdani, S (2013) found the effect of the growth of market size in the partner country on agricultural trading in the side of exporting and importing in developing country while income per capita was the positive direction on the trade flow value (2013). ÖZTÜRK. M (2012) found, export, GDP and real effective exchange rate had positive directional on the Turkey import. Wiranthi, Puspi, Mubarok and Faizul (2017) found the influence factor which effect on the canned pineapple market share of the partners exported from Indonesia. There was significantly negative effect of export price on the export. There was significantly positive effect of real GDP and population on the export. Furthermore, the advantage of exporter in the market can be described and implied by RCA index Konstantins Benkovskin and Julia Wörz (2018) found the higher effect of non-price as taste and quality on market share than relative price.

This study aims to analyse the influence factors on export competitiveness of processed pineapple consists of canned pineapple and pineapple juice from Thailand including estimates by using panel regression and focus on the period during 2013 to 2017. The market share of both export products decreased considerably during that period.

2. RESEARCH METHODOLOGY

This study separates the model estimation to be two market as pineapple canned market and pineapple juice market. The competitiveness of Thailand export in both markets is defined as the market share of Thailand export into each market. The influence factors are average price of both goods which export into partner countries, GDP per capita of partners and exchange rate (partner currency per bath currency).

Market share of both products is calculated by the product quantity import (tons) of partners from Thailand per total import of the product quantity (tons) of partners from world market which are collected from Trade map (2019). Average price (US per tons) are collected from Trade Map Database (2019). GDP per capitain US dollar of constant price of 2010 of each partner countries was collected from the World Bank (2019) as well as exchange rate was collected from the World Bank (2019). All collected data was panel data from 2013 to 2017of 10 Thailand's important partners. The canned pineapple market partners consist of the United States of America, Germany, Russian Federation, China, Japan, Canada, Islamic Republic of Iran, Netherlands, United Kingdom and Spain. The pineapple juice markets combine with the Netherlands, the United States of America, Australia, Islamic Republic of Iran, Italy, Spain, Republic of Korea, Japan, United Kingdom and Taiwan.

Both markets were estimated by using panel regression models as pool OLS regression model incorporated with fix effect least square dummy variable model(FE-LSDF)and random effect model (REM). These estimation models consider the model optimization by Hausman test. Pool OLS Regression model is the model which estimated panel data by simple progress with ordinary least square (OLS) and ignore the individual effect and time effect which may disturb the error term property. The model probably biases if there are both effects in the estimation results. The model estimation is more appropriate compare to other models. The estimated model can be written as the following equation:

$$S_{ij} = \beta_{ij} + \beta_{1ij} P_{ij} + \beta_{2ij} GDP_{ij} + \beta_{3ij} Ex_{ij} + \mu_{ij}$$

When S_{ij} is market share of Thailand in each market in i country and j time,P_{ij} is the average price of each export product to I country and j time, GDP_{ij} is the GDP per capita of i country and j time and

Ex_{ij} is the exchange rate in term of i country currency per Thai Bath currency in j time. β_{ij} to β_{3ij} are the parameters and μ_{ij} is the error term.

There are many suitable methods can be applied to solve the problem of pool OLS regression model. The solution has to be able to delete the disturbance effect error term. The cross-section data must be individual intercept to fix this problem. The fix effect of individual or relation of time can be deployed by incorporating appropriate dummy variables. This concept is known as fix effect least square dummy variable (LSDV). The estimated model can be shown as the following equation:

$$S_{ij} = \beta_{1ij} + \beta_{2ij} P_{ij} + \beta_{3ij} GDP_{ij} + \beta_{4ij} Ex_{ij} + \sum_{k=1}^{n} \alpha_{kij} D_{kij} + \mu_{ij}$$

When $\sum_{k=1}^{n} \alpha_{kij} D_{kij}$ is the individual effect of each partner and n is the number of partners. $D_{kij} = 1$ if i=k and $D_{kij} = 0$ if i $\neq$ k.

Besides, there is the concept use to explain the difference of intercept effect can be the random variable. Therefore, the disturbances of the random variable on error term are also be random. As a consequence, these disturbances can be included in the estimated model without estimation bias by using OLS. This concept is known as random effect model. However, the individual is possibly effect on other independent variable which be a cause of error leads to inconsistent. As a result, the property of individual on the concept must be considered. The estimated model can be presented as following equations:

$$S_{ij} = \beta_{1ij} + \beta_{2ij} P_{ij} + \beta_{3ij} GDP_{ij} + \beta_{4ij} Ex_{ij} + w_{ij}$$

and $\quad w_{ij} = \mu_{ij} + \varepsilon_{ij}$

When w_{ij} iserror term, μ_{ij} is S_{ij}-specific random effect and ε_{ij} is individual specific random effect. If the ε_{ij} is the random, thus the random effect model is optimized.

Hausman test is the very popular hypothesis testing which can be applied to test the relationship between the error term in random effect model (w_{ij}) and the independent variable and time invariant. The null hypothesis is that there is no relationship between w_{ij} and independent variable or time invariant. The alternative hypothesis is that there is relationship between them. Random effect model is optimizing if the null hypothesis is accepted. Fix effect is chosen if the hypothesis is rejected.

3. MODEL ESTIMATION RESULTS AND DISCUSSION

From the empirical results, there are significantly negative directional from average price to the market share in pool OLS model, fix effect model and random effect model. Moreover, in the fix effect model, GDP per capita and exchange rate are significantly positive effect on the market share. In the other hand, there is no significantly effect from both factor on the market share in pool OLS model and random effect model. The Hausman test result can be used to reject null hypothesis thus the fix effect model is optimizing (Table 5).

Table5: *Canned pineapple market share model estimation results*

Independent Variable	Co-efficient		
	Pool OSL	Fix Effect	Random Effect
P	-0.0810	-0.0324	-0.0232
	-5.0204***	-3.6285***	-3.3725***
GDP	-0.0002	0.0023	-0.0003
	-1.0602	2.1517**	-1.1816
Ex	0.1861	0.7787	0.1714
	0.9367	1.8798*	0.6545
Intercept	148.8936	-8.8722	86.3454
	8.8782***	-0.2500	7.5449***
Diagnostic Statistics			
R^2	0.4601	0.9574	0.2356
Adjusted R^2	0.4248	0.9435	0.1857
F-stat	13.0648***	69.2257***	4.7258***
DW stat	0.3832	2.0058	1.2549
Hausman test			
Chi-Sq. Statistic		17.7678***	

Source: From the model estimation results

Notes: * has 90% level of significance.

**** has 95% level of significance.

***** has 95% level of significance.

There are significant negative directional effect from average price to the market share of pineapple juice in fix effect model and random effect model. Moreover, GDP per capita has effect on the market share in negative directional way in fix effect model. The Hausman test result rejects the null hypothesis thus the fix effect model is optimizing (Table 6).

Table6: *Pineapple juice market share model estimation results*

Independent Variable	Co-efficient		
	Pool OSL	**Fix Effect**	**Random Effect**
P	-0.004290	-0.005328	-0.006977
	-1.019566	-2.457507**	-3.505489***
GDP	0.000213	-0.003316	-0.000110
	1.260358	-2.702458**	-0.287429
Ex	-0.020056	-0.470823	0.022284
	-0.113657	-0.755274	0.063823
Intercept	39.21133	185.9515	55.01209
	3.650650***	3.569914***	3.218530***
Diagnostic Statistics			
R^2	0.054186	0.871512	0.213096
Adjusted R^2	-0.007498	0.829840	0.161777
F-stat	0.878447	20.91364***	4.152321***
DW stat	0.336498	2.401442	1.917400
Hausman test			
Chi-Sq. Statistic		8.014093**	

Source: From the model estimation results

Notes: * has 90% level of significance.

**** has 95% level of significance.

***** has 99% level of significance.

The model estimation results conform to the basic demand theory. The increasing of price effect on the quantity import of the partner country and link to the market share as the effect of the increasing of GDP per capita which like the increasing income. The devaluation of bath currency increase the quantity import form the partners. This situation similarly ÖZTÜRK. M (2012) and Wiranthi, Puspi & Mubarok, Faizul. (2017).However, negative directional of GDP per capita on the market share of pineapple juice is different. The increasing of income of partners leads to more choice of import. Furthermore, Thailand pineapple juice market share is less price sensitive than the canned pineapple market.

4. CONCLUSION

It can be affirmed that the important factors which effect on Thailand pineapple market share in both markets are average price which are negative effect. GDP per capita which be positive directional in canned pineapple market and negative directional in pineapple juice market. Exchange rate are positive direction on the partner market share only the pineapple juice market. Therefore, the stable and competitive price including exchange rate are crucial factors have to be controlled effectively to enhance the sustainable competitiveness of processed pineapple from Thailand not only in the major partners but also world market.

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