

# Indonesia's International Competitiveness of Cacao Beans and its Derivatives Product in USA Market

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**Abstract:** USA is the second major export destination of Indonesian cacao after Malaysia. Indonesia's export of cacao as one of cacao producer country is consist of several form, such as cacao beans, cacao powder, cacao paste and cacao butter. Indonesia's government is attempt to increase the export of cacao derivatives products and boost the national downstream industry of cacao, hence the value added could be benefit or Indonesia GDP by legalize the new decree of export tax policy Permenkeu No. 67/PMK.011/2010. The objective of this research was to determine the competitiveness of cacao beans and its derivatives products such as cacao powder, paste, and butter in USA market. Used method to analyse the competitiveness would be Revealed Comparative Advantage (RCA), Relative Import Advantage (RMA), Relative Trade Advantage (RTA) and Export Dynamic Product (EPD). The result werein cacao beans has the highest competitiveness relatively while cacao butter has the highest competitiveness than other cacao derivatives products. The quality of Indonesian cacao plant needs to be maintained to keep the quality of cacao beans and cacao butter. Other rapid government policy and support to expand cacao powder and cacao paste industry was suggested.

**Keywords:** Cacao, Cacao Products, Competitiveness, RCA, RMA, RTA, EPD

## 1. Introduction

Agricultural sector has an important role in Indonesia economic and development with mean export rate reach 3%, the highest rate between other non-oil and gas sectors (Ministry of Trade, 2015). One of the agricultural sectors that become focus is plantation sector as the one of the highest contributor for national income of Indonesia from its commodities, that couldn't only led to growth of production

and areal development, but also created various form of employment.

Cacao plant (*Theobroma cacao* L) is considered a strategic commodity as one of the 10 main and potential commodities of Indonesia which consist of textile goods, rubber, palm oil, forestry commodity, electronic, footwear, coffee, automotive, shrimp, and cacao (KEMENDAG, 2015), along as the third highest contributor for Indonesia's National Income from agricultural sector international trading after palm oil and rubber.

**Table 1:** Export Value of Indonesian Plantation Commodity

No	Commodity	Export Value (Million \$)						
		2009	2010	2011	2012	2013	2014	2015
1	Palm Oil	10368	13469	17261	17602	15839	17465	15385
2	Rubber	3050	6943	11209	7524	6610	4540	3515
3	Cacao	1413	1644	1345	1053	1151	1245	1308
4	Coffee	822	812	1035	1244	1166	1031	1190
5	Tea	144	150	136	125	131	107	90
	Total	15798	23017	30987	27548	24898	24387	21487

The cacao demand rate in international market grows to 9.19% per year while the export rate from Indonesia grows to 10.02% per year that indicates Indonesia's cacao potentiality to do market expansion (Trademap.org, 2016). Cacao plantation area at Indonesia in 2004-2013 has increase rate to  $\pm 5\%$  per year while the production of cacao beans rate only at  $\pm 0.7\%$  per year (Kementan 2015 in (Hanafi, 2016). Indonesia is on the third rank widely with  $\pm 11\%$  production of the world of cacao bean. Cacao powder is in the fifth rank widely with 6% market share, cacao paste in the seventh rank with 3% market share, and cacao butter in the sixth rank widely with 5% market share (Hasibuan, et al., 2012). This condition also led Indonesia as one of important cacao supplier in International market while the

downstream industry of cacao has not well developed yet relatively.

USA is the second largest cacao consumers globally with approximately 24% of international demand and absorbed more than 20% of Indonesian cacao with 47% is the bean form and 43% is derivative-butter-from. Indonesian cacao in time frame 2001-2015 has average market share 6.4% of USA import of cacao.

## 2. Research Problem

Cacao demand in international market is relatively high and stable. International cacao demand in international market has growth rate that achieve  $\pm 9\%$  per year and that demand

fulfilled by several cacao producer country such as Ivory Coast and Ghana, with Indonesia as the third biggest cacao producer country that supplied  $\pm 11\%$  of cacao beans demand (International Cacao Organization ICCO, 2012). However, the  $\pm 9\%$  growth rate of International cacao demand not simultaneously followed by similar growth rate of International cacao supply (Rubiyo&Siswanto, 2012) due to several factor, such as plantation area and productivity. The equilibrium of International demand and supply would result to International price of cacao.

Indonesia's largest cacao market destinations in 2004-2013 are Malaysia, USA, Germany, China, and Australia with the majority of cacao exported to Malaysia ( $\pm 44\%$ ) and USA ( $\pm 26\%$ ) in cacao beans form (Trademap.org, 2016) while Europe Union (EU) market prefer derivatives products (Hanafi, 2016). The more complicated process to produce derivatives products and the higher the demand of particular product would increase the value and the price of the products. Furthermore, derivatives products of agriculture commodities could lower its risk of damage from natural cause as pest and infection along with the decrease of volume needed to be distribution. Indonesia has experience as the cacao beans exporter and tries to increase its derivatives products. Therefore, from the explanation of the importance of cacao beans along with cacao derivatives products and its position in USA market for Indonesia, the research questions are:

- 1) How is the competitiveness of Indonesian cacao beans in USA market?
- 2) How is the additional process of Indonesian cacao beans take effect on its competitiveness in USA market?

### 3. Research Method

Research about international market, supply, and demand of agricultural commodity considerably plenty relatively. The differences in agricultural commodity nature such as the land character requirement, the ideal climate, the seasonal nature, and planting session until it could be harvested make the international trade pattern relatively influenced. Particular agriculture commodity could have a particular trade system that has special case of socio-economy side, but some of the commodity could be analyzed relatively similar with another with several indicators, including economy indicators.

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Revealed Comparative Advantage known for the estimator for the demand side. Therefore, there is another estimator that also known with the similar concept form RCA, Relative Import Advantage (RMA). RMA could give the

relative position of a country that trading particular commodity (Gopal, et al., 2009). Vollrath in (Ferto& LJ, 2002) also propose some derivative from RCA analyses to enhance the interpretation of international competitiveness such RTA. There could be biased that caused by external reason such as international policy or government intervention overtime. However, the analyses could still be used to give consideration basis.

### Revealed Comparative Advantage

In this paper, the author will use the RCA, RMA, RTA, and EPD Analysis to determine the potential of Indonesia's derivative product of cacao competitiveness in the USA market. The data needed for the analysis are the value of country's export of the commodity, the total value of country's export, the value of world's export of the commodity, and the total value of world's export. The data span will be from 2001-2015 and all of the data could be gathered from Indonesian Bureau Statistics, International Cocoa Organization, Trade Map, and International Trade Statistics.

Research in (Arifin, 2013) said that a country which possesses a comparative advantage in producing a particular commodity over another country means that this country produces the product at lower opportunity costs than the other country. Balassa suggests the revealed comparative advantage (RCA) in measuring the comparative advantage since the trade pattern reflected or revealed the comparative advantage. The formula is as follows:

$$RCA = \frac{X_{ij}/X_i}{X_{wj}/X_w}$$

Where  $X_{ij}$ , the value of country i's export of commodity j;  $X_i$ , the value of country i's total exports;  $X_{wj}$ , the value of world exports of commodity j;  $X_w$ , the value of world exports.

The RCA index shows the extent of commodity specialization in a country's exports relative to the share of that commodity in world exports. A high value indicates the comparative advantage of a country in the production of a particular good. When the RCA index of a country is greater than 1, this means that the share of that commodity in the country's exports is higher than the world's average and the country has a comparative advantage on the product. Meanwhile, when the RCA is less than 1, it means that the country has no comparative advantage on the product (Arifin, 2013).

### Relative Import Advantage

Revealed Comparative advantage method is known also as Relative Export Advantage (RXA) forasmuch export as a basis. Another concept that similar with RCA/RXA is Relative Import Advantages (RMA) that use import as basis of calculation, given by Vollrath and calculated as:

$$RMA = \frac{M_{ij}/M_i}{M_{wj}/M_w}$$

Where  $M_{ij}$ , the value of country  $i$ 's import of commodity  $j$ ;  $M_i$ , the value of country  $i$ 's total import;  $M_{wj}$ , the value of world import of commodity  $j$ ;  $M_w$ , the value of world import respectively. The interpretation of RMA is reversed of RCA, where a value of unity is a sign of competitive disadvantage and value below that indicates a competitive advantage.

The differences of RCA and RMA by Vollrath indicator analyses that known as Relative Trade Advantage (RTA). RTA put the export side and import side into account to estimate the competitiveness in international market.

$$RTA = RCA - RMA$$

RTA value higher than zero means there are relative trade advantage of the particular commodity in international market while the value beyond zero would implies to trade disadvantage in international market.

International competitiveness indicators such as Revealed Comparative Advantage (RCA) and Relative Import Advantage are used to estimate the competitiveness of particular commodity from particular country in the international market. International market that used in the analysis usually is aggregation of the trade partner of the estimated country, not the particular or specific destination market of the estimated country. However, using the same concept of the international analysis, estimating international competitiveness of particular commodity from particular country in specific destination market is could be possibly done.

### Export Dynamic Product

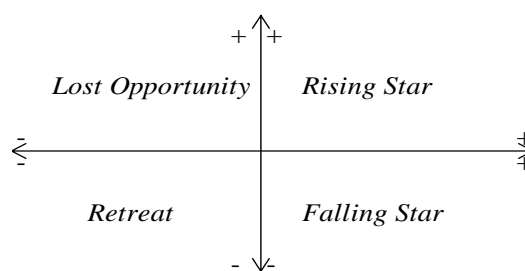
Export Product Dynamics (EPD) is an analysis method that used to analyse and identified the highest competitiveness and growth rate of products or commodity in countries export flow. This competitiveness indicator could be used for measuring the dynamism of particular product in market. (Hasibuan, et al., 2012). In this indicator, the analyzed product would be placed in matrix with four categories (Tabel 1). The performance of the product could be measured by its dynamicity and its depth of the competitiveness (Pradipta, 2014).

**Table 1:** Competitiveness Matrix of Export Dynamic Product (EPD) Estimator

Share of Country's Export in World Trade	Share of Product in World Trade	
	Rising (Dynamic)	Falling (Stagnan)
Rising (Competitive)	Rising Star	Falling Star
Falling (Non-Competitive)	Lost Opportunity	Retreat

Source: (Estherhuizen, 2006)

Competitiveness measurement with EPD indicator would put the calculated product attribute into a Cartesian diagram. The axis X of the diagram represents the growth of market share or the business strength of the product. The ordinate Y of the diagram represents the growth of share of export commodity or the market attractiveness of the product. The diagram could be illustrated by figure 8.



**Figure 8:** Matrix of Export Product Dynamic

And the description on figure 8 is:

Axis (X): the growth rate of market share or the business strength of the product (percentage)

Ordinate (Y): the growth rate export commodity or the market attractiveness (percentage)

Source: (Estherhuizen, 2006)

Matrix EPD in the picture 8 showed that there are four part of product dynamism, which is Rising Star, Lost Opportunity, Falling Star, And Retreat. Rising Star represent the most ideal market position. Lost Opportunity part of the matrix represent the unexpected market position that want to be avoided by countries because this market position means that there is decrease in the growth rate in product market share. The decrease of the growth rate in product market share makes the countries to lose the opportunity of market share or export scope for product in international market.

The lower part of the matrix that also wants to be avoided is the Falling Star. Falling Star means that there is not only growth rate in export market share but also decrease in the growth rate of product market share. The most unideal market position that describe by EPD indicator is Retreat position. Retreat represents the condition that the product is already become undesirable in international market.

The analysis of market and products dynamism in EPD indicator work qualitatively. Mathematically, the share of export total for the axis formulated by,

$$\frac{\sum_{t=1}^n \left( \frac{X_t}{W_t} \right) \times 100\% - \sum_{t=1}^n \left( \frac{X_t}{W_t} \right)_{t-1} \times 100\%}{T}$$

Whereas the share of export commodity for the ordinate Y formulated by,

$$\frac{\sum_{t=1}^n \left( \frac{X_t}{W_t} \right) \times 100\% - \sum_{t=1}^n \left( \frac{X_t}{W_t} \right)_{t-1} \times 100\%}{T}$$

With:

$X_i$  : Export value of cacao (bean/derivative) from Indonesia to market.

$W_i$  : Export value of cacao (beans/derivative) from world to market.

$X_t$  : Total export value from Indonesia to market.

$W_t$  : Total export value from world to market.

$t$  : Year  $t$ .

$T$  : Total year of analysis.

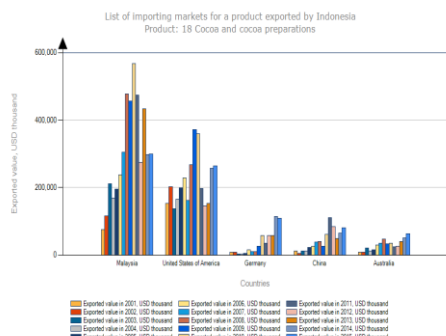
## 4. Discussion

Cacao production central in Indonesia scattered on Sumatera, Java, and Sulawesi. Cacao plantation contributing to the national economy and labour absorption (USAID, 2006); (Said, 2009) and in addition to its importance, cacao

bean is one of Indonesia's comparative advantages commodities. Indonesia's cacao production has reached 440.000 ton in 2012 and approximately 39% of it traded raw in the international market. However, there is a major decrease of cacao production from 2010 (figure 7) because one of the government policies, Program GerakanRevitalisasiKakaoNasional (Gernas Pro Cacao), which replants some of the cacao old plant that makes Cacao harvest period, delayed.

The raw form of cacao is the harvested bean that dried and sold immediately without further process while each processing stage extends cacao price than raw bean form (Hasibuan, 2002); (USAID, 2006). The first stage of cacao derivative products is fermented process. Raw cacao beans would be mixed by some fermentation agent and stored in some organic box from bamboo or wood for several days. The fermented cacao beans then dried to be sold in market. This process could increase the quality and aroma of cacao beans. Further process of cacao derivatives products sold in international market as the immediate processing industry produce cacao powder, cacao paste, and cacao butter.

Indonesia as the cacao producer country exported the Indonesian cacao beans, powder, paste, and butter to the international market. Based on the data from (Trademap.org, 2016), there are several country that became the biggest importer that buy Indonesian cacao beans, paste, powder, and butter, with USA as the second largest market. The highest value of trade from exporting Indonesian cacao beans, paste, powder, and butter, the top market for Indonesian cacao could be seen in figure 2.



**Figure 11: Top Importing Market for Indonesian Cacao in Value**

Source: (Trademap.org, 2016)

Revealed Comparative Advantage (RCA) destination specific value for Indonesian cacao beans, powder, paste, and butter with USA market showed in table 2. From the value on the table, in the beginning of analyses time frame Indonesian cacao beans has the highest RCA value and followed by Indonesian cacao butter. However in towards the recent years, RCA of Indonesian cacao beans tend to decline while the RCA of Indonesian cacao butter tends to incline. Table 2 would show the RCA for USA market.

**Table 2: RCA Destination Specific of Indonesian Cacao Beans, Powder, Paste, and Butter with USA Market**

Year	Beans	Powder	Paste	Butter
2001	584.315	8.335	3.023	54.288
2002	476.641	16.933	4.302	40.158
2003	266.038	9.273	0.599	56.981
2004	219.848	14.368	3.739	51.588
2005	297.370	15.300	3.176	56.054
2006	288.390	21.457	2.617	60.719
2007	156.681	23.838	3.111	68.855
2008	308.844	7.077	3.190	125.366
2009	1063.309	5.696	0.801	77.474
2010	312.305	7.300	1.588	87.413
2011	87.837	6.629	31.555	106.066
2012	1.851	7.475	57.488	90.466
2013	41.545	3.674	15.279	162.650
2014	0.780	2.160	15.522	168.761
2015	13.635	3.215	19.207	220.905

Source: Author calculation based on (Trademap.org, 2016).

For the past fifteen years, the means RCA value of the Indonesian cacao beans, powder, paste, and butter are approximately 275, 10.2, 11, and 95. Therefore, in the USA market, the highest RCA value is on Indonesian cacao beans while the inclined trend RCA value over years is on Indonesian cacao butter.

The RCA value of Indonesian cacao powder and paste relatively similar while the trend of Indonesian cacao powder RCA is decline and the trend of Indonesian cacao paste are inclining in recent years at USA market.

RMA index has a different way of interpretation in compare of RCA index. The value of unity or 1 point and higher shows competitive disadvantage and the value below unity show the competitive advantage. Relative Import Advantage (RMA) value of Indonesian cacao beans, powder, paste, and butter are shown in table 4. In this table, the RMA value of cacao paste from the USA market is zero. This could happen because there is no imported cacao paste from the USA market that sold in Indonesian market.

**Table 4: RMA Destination Specific of Indonesian Cacao Beans, Powder, Paste, and Butter with USA Market**

Year	Beans	Powder	Paste	Butter
2001	0.000	0.015	0.000	0.000
2002	0.000	0.266	0.000	0.000
2003	0.001	0.245	0.000	0.000
2004	0.000	0.014	0.000	0.000
2005	0.001	0.000	0.000	0.000
2006	0.000	0.000	0.000	0.000
2007	0.000	0.144	0.000	0.000
2008	0.000	0.175	0.000	0.000
2009	0.001	0.000	0.000	0.000
2010	0.001	0.000	0.000	0.007
2011	0.001	0.000	0.000	0.043
2012	0.000	0.000	0.000	0.000
2013	0.000	0.000	0.000	0.012
2014	0.001	0.000	0.000	0.001
2015	0.001	0.000	0.000	0.000
mean	0.00052	0.05736	0	0.00421

Source: Author calculation based on (Trademap.org, 2016).



RTA value of Indonesian cacao beans, powder, paste, and butter in USA market (table 5) are proportionate with the RCA value of Indonesian cacao beans, paste, powder, and butter in USA market (table 2). This also implies that there are reveal comparative advantage for Indonesian cacao in USA.

**Table 5:** RTA Value of Indonesian cacao in USA Market

Year	Beans	Powder	Paste	Butter
2001	584.314	8.320	3.023	54.288
2002	476.640	16.667	4.302	40.158
2003	266.037	9.027	0.599	56.981
2004	219.847	14.354	3.739	51.588
2005	297.369	15.300	3.176	56.054
2006	288.389	21.457	2.617	60.719
2007	156.681	23.693	3.111	68.855
2008	308.843	6.901	3.190	125.366
2009	1063.308	5.696	0.801	77.474
2010	312.305	7.300	1.588	87.406
2011	87.837	6.629	31.555	106.023
2012	1.851	7.475	57.488	90.466
2013	41.545	3.674	15.279	162.638
2014	0.780	2.160	15.522	168.760
2015	13.635	3.215	19.207	220.905
mean	274.625	10.1246	11.0131	95.1788

Source: Author calculation based on (Trademap.org, 2016).

Indonesian cacao beans, powder, paste, and butter in USA market have comparative advantage, competitive advantage, and international relative competitiveness in USA market based on table 6. The highest comparative and competitive advantage is Indonesian cacao beans. The highest comparative and competitive advantage of Indonesian cacao derivatives form is in cacao butter form. The relative competitiveness of Indonesian cacao powder, paste, and butter in USA market could not be calculated because in some years, there is no import of following commodity to Indonesia from USA market.

**Table 6:** Mean of RCA, LnRCA, RMA, RTA, and Value of Indonesian Cacao

	Mean				
	RCA	Ln RCA	RMA	RTA	RC
Advantage if	>1	>0	<1	>0	>0
Cacao Beans	275.0*	4.60*	0	274.63*	12.22*
Cacao Powder	10.2	2.1	0	10.12	-
Cacao Paste	11	1.6	0	11.01	-
Cacao Butter	95.00**	4.40**	0	95.18**	-

Source: Author calculation based on (Trademap.org, 2016).

\*means the highest mean value in market

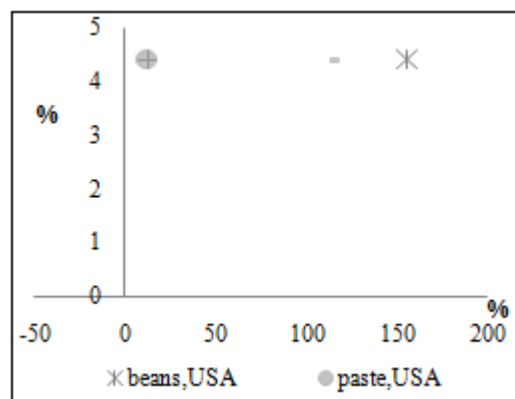
\*\*means the second highest mean value in market

The position of Indonesian cacao beans, paste, powder, and butter are on the rising star position. This position shows that the Indonesian cacao beans, paste, powder, and butter have positive growth rate on the commodity market share and market power in USA market. The rising star position indicates that Indonesian cacao beans, powder, paste, and butter in USA market are dynamic in trade and competitive.

**Table 7:** EPD Estimation of Indonesian Cacao Beans, Paste, Powder, and Butter

Commodity	Market		
	x	y	Position
Cacao Beans	155.70%	4.40%	Rising star
Cacao paste	11.80%		Rising star
Cacao powder	12.30%		Rising star
Cacao Butter	112.80%		Rising star

The growth of USA market attractiveness is in 4% with the highest product growth was for Indonesian cacao beans with 115.7% and followed by Indonesian cacao butter with 113%. Growth of Indonesian cacao powder and paste was relatively similar with 12% and could be charted in figure 3.



**Figure 3:** EPD Estimation of Indonesian Cacao Butter in USA Market

Source: Author calculation based on (Trademap.org, 2016).

To increase the overall competitiveness of Indonesian cacao and its derivatives products, maintaining the competitive goods and increasing the less competitive goods is needed. Indonesia as naturally cacao producer country need to maintain its plantation area, the quality of seed, to make sure the quality of cacao beans along with characteristic of cacao butter indirectly. Government rapid and continuous intervention such as policy, promotion, and financing scheme also needed to support the downstream industry for cacao powder and cacao paste.

## 5. Summary

Indonesian cacao beans, powder, paste, and butter in USA market have comparative advantage, competitive advantage, and international relative competitiveness in USA market. The highest comparative and competitive advantage is Indonesian cacao beans. The highest comparative and competitive advantage of Indonesian cacao derivatives form is in cacao butter form. Indonesian cacao butter in USA market is relatively higher than another form of Indonesian cacao derivatives products such as cacao powder and cacao butter in USA market with approximately reach 113%. Government rapid intervention such as policy, promotion, and financing scheme also needed to support the downstream industry for cacao powder and cacao paste.

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