

# The Dynamics of Coffee Bean Exports Between Indonesia's Provinces

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**Abstract**—Coffee is one of the main export commodities in Indonesia. Coffee beans play an important role in economic development and poverty alleviation in Indonesia. World coffee production is predicted to increase, although not significantly. World coffee prices in the last 10 years have decreased by up to 30%. The aim of the study was to analyze the dynamics of Indonesian coffee bean exports over a period of 10 years (2010 - 2019). The research data uses secondary data (BPS) time series with the Two Way Fixed Effect Model analysis method approach. The results of the research data show that there are very dynamics condition of all provinces in production and export coffee bean (negative to positive value) and 3 big provinces of coffee export base in Indonesia, namely East Java, North Sumatra and DKI Jakarta. The potential for exports to the 3 base Provinces has a positive value over the past 10 years (stable increasing) and the potential outside the Province is negative (fluctuating). The results of data processing indicate that the export of coffee beans from Indonesia is still wide open to continue to be developed in meeting the growing demand for coffee markets around the world for future.

**Keywords**— coffee beans, two way fixed effect model, 3 base provinces, coffee bean exports

## I. INTRODUCTION

Indonesia is known as one of the largest coffee producers in the world and currently ranks fourth in the world as a coffee exporting country after Brazil, Vietnam and Colombia. The coffee commodity has an important role as a source of income for farmers, a source of foreign exchange, a provider of employment, a provider of industrial raw materials, encouraging the growth of agribusiness areas, and contributing to environmental conservation.

Coffee consumption in Indonesia is still low, although there is an increasing preference for coffee drinking and world coffee consumption shows an increase over time. Domestic coffee production continues to increase in line with the increasing world coffee demand and the difference in price that is favorable if exports abroad are carried out. Various obstacles and constraints from within and outside the country

are related to the export of Indonesian coffee beans and import conditions remain high, thus in 2019 Indonesia is estimated to still experience a deficit in trade.

Based on the aforementioned background, it is necessary to conduct research on the dynamics of coffee bean export between coffee exporting provinces in Indonesia in order to seek and find new policy concepts to overcome problems that exist in coffee commodities in an effort to increase production and export of Indonesian coffee beans.

## II. LITERATURE REVIEW

### A. Demand and Supply

Demand and supply are forces capable of moving the wheels of the economy and will occur if there is a need for goods or services in a certain amount, then to meet consumer needs, the production process is carried out to meet the required demand.

Factors that influence demand are the price of the goods themselves, people's income, intensity of needs, population, tastes and substituted or substituted goods. Factors that influence supply are production costs, technology and future price expectations. By assuming other factors are fixed (*ceteris paribus*), the law of demand states that if the price of a good or service decreases, then the amount of demand for that good or service will increase, and vice versa if the price of the good or service increases, then the amount of goods or services that is asked to be reduced. The law of supply is the opposite of the law of demand.

### B. International Trade

Trade is trade that occurs between two parties from different countries based on mutually agreed agreements. The theoretical basis that underlies international trade is an absolute advantage, namely that international trade will provide benefits if a country can produce goods at a lower price compared to other countries and a comparative advantage, namely international trade will provide benefits if

a country is able to produce the most productive goods and efficient although it does not have an absolute advantage.

The study was also conducted as a follow-up to research on the competitiveness of Indonesian coffee commodities in the international market. Refer simply to the reference number as in [9] [17] [25] [26] [23] [3]. The study was continued to research factors driving world coffee exports. Reference number [27] [28] [19] was conducted to see factors driving influence to world coffee export, factors affecting Indonesia coffee export and to see factors affecting volume export from Indonesia to the United State. The study Analysis of world coffee market exports was also conducted by number [12] [11] [8] [16] [20] [10] [13] [1] [18] [14] [15] to see market prospect of organic coffee, impact of food safety, geographical sector production, affect poverty and income inequality, optimizing coffee cultivation and it's impact on economic growth and export earning country also to research prospect export certified organic coffee

### III. METHOD

This research uses secondary time series (BPS) data for the last 10 years starting from 2010 to 2019 from Aceh to Papua (all Provinces in Indonesia) totaling 34 provinces with 12 months of data collection from January to December. every year and in every province. Analysis of data using the Balanced Two Way Fixed Effect Model Panel Regression with the determination of the least square panel model to estimate the fixed effect cross section model and fixed effect period to obtain the fixed effect diagnostic value. Furthermore, the estimation of the least square cross section fixed effect panel model and the period fixed effect test equation until the final value of the prediction model and used as data for the regression of the balanced two way fixed effect panel.

### IV. RESULTS

The result of data processing with cross section and period fixed effect equation model test the following

TABLE 1. RESULT OF DATA

Var.	Coeffisition	Std. Error	t-statistik	Prob.
C	40984552	20074595	2,041613	0.0413
R- square	0	Mean dependent var		40984552
Adjust R-squa	0	SD dependent var		9,33E + 08
SE reg	9,33E + 08	Akaike info criterion		44,14613
Sum sr	1,88E +21	Schwarz criterion		44.14876
Log likelh	-47676.83	Hannan-Quinn criter		44.1471
DW stat	2.005942			

Source: Independently processed data (2020)

Based on the table above it can be explained that the probability value of the model is 4%, which means that this analysis model has a 96% confidence level of truth in accordance with statistical data modeling rules .

Complete data on the results of cross section fixed effect analysis and Period Fixed Effect for each province are as Table 2.

Based on Table 2. values it can be explained that dynamics of all provinces in Indonesia was very dynamics with value from negative to positive value from each

provinces (Aceh to Papua) and it's mean very dynamics. The negative value is mean the provinces can't defense yield growth every season for over year and the positive value is opposite condition with negative value has shown from three provinces. There are 3 provinces with value positive and we call three bases of coffee bean export areas in Indonesia. East Java Province is the largest export of coffee beans with the highest and positive yield value and 2nd place from North Sumatra Province and 3rd place from DKI Jakarta Province.

TABLE 2. RESULT OF COFFEE EXPORTING PROVINCES

Cross Section Fixed Effect	Period Fixed Effect		Residual
11 ACEH	-40984533.58	01/01/2010	-40984552.38
12 SUMUT	<b>43535939.85</b>	02/01/2010	-40984552.38
13 SUMBAR	-40959092.88	03/01/2010	-40984552.38
14 RIAU	-40980568.83	04/01/2010	-40984552.38
15 JAMBI	-40976185.83	05/01/2010	-40984552.38
16 SUMSEL	-40582531.22	06/01/2010	-40984552, 38
18 LAMPUNG	-19622383.05	07/01/2010	-40984552.38
21 KEPRI	-40984534.54	08/01/2010	-40984552.38
31 DKI JAKARTA	<b>30721548.41</b>	09/01 / 2010	-40984552.38
32 JABAR	-40976995.97	10/01/2010	-40984552.38
33 JATENG	-40438541.56	11/01/2010	-40984552.38
34 DIY	-40984549.43	12/01/2010	-40984552.38
35 JATIM	<b>5 17989043.6</b>	01/01/2011	-40984552.38
51 BALI	-40981951.94	02/01/2011	-40984552.38
53 NTT	-40984550.84	03/01/2011	-40984552.38
65 KALTARA	-40984509.47	04/01/2011	-40984552.38
73 SULSEL	-40821069.53	05/01/2011	-40984552.38
94 PAPUA	-40984533, 15	06/01/2011	-40984552.38

Source: Independently processed data (2020)

### V. DISCUSSION

The Purpose of this study was to analyze the dynamics of Indonesian coffee bean exports between provinces in Indonesia and the results of the research data show that very dynamics for producing coffee bean export in each province of Indonesia from negative value to positive value has different meaning. The negative value is mean the export growth of coffee bean in this province has been negative for the last ten years to fulfill demand export of coffee bean. This condition occur to the province that known as producing specialty coffee such as Toraja coffee from Sulawesi, Gayo from Aceh, Manggarai from NTT and other producing coffee specialty. There are 3 provinces we call the base for exports of Indonesian coffee beans with positive values coffee bean export growth for the last 10 years starting from the year. 2010 to 2019 with first place in East Java Province followed by North Sumatra Province and DKI Jakarta Province.

The growth of positive export value from these three provinces is supported by the results of research on [23] The Analysis of Indonesian Coffee Exports in the International Market which states that Indonesia has a comparative advantage in the international coffee trade, although it is still lower in value when compared to Brazil, Vietnam. and Colombia.

The increase in the volume of coffee exports is currently also supported by the production area spread across the provinces in Indonesia, which increases every year, although not in proportion to the increase in production volume. This condition is supported by research on [14] the analysis of Indonesian coffee production which states that until now the

area, production and productivity of coffee plantations in Indonesia, both robusta and arabica coffee, are still dominated by smallholder plantations (PR) with an area coffee area reached 95.37%. The area of coffee production in Indonesia is estimated at around 1.3 million hectares, which are spread across North Sumatra, Java and Sulawesi. Robusta coffee is generally grown by farmers in South Sumatra, Lampung, and East Java, while Arabica coffee is generally grown by farmers in Aceh, North Sumatra, South Sulawesi, Bali and Flores. Technology is needed for agriculture so that the right technology will increase the income of coffee farmers, so that coffee plantation production will increase and the coffee production costs incurred by farmers will be lower. In addition, the role of the government is needed in helping farmers to be able to access innovations in the use of a better variety of coffee seeds with an educational program in terms of integrated pest management (Integrated Pest Management).

In addition to the results of the analysis of Indonesian coffee exports and analysis of Indonesian coffee production, geographic location also determines the coffee productivity of an area so that coffee production and exports can be maintained and continue to increase every year. This is in accordance with the statement [2] in 2018 which states that coffee-producing areas in Indonesia are spread across South Sumatra Province 22%, Lampung Province 21%, Province Bengkulu 9%, East Java Province 8%, North Sumatra Province 8%, Nangroe Aceh Darussalam Province 6%, South Sulawesi Province 5%, and West Sumatra Province 4% and the others 17% for export needed.

Seeing the empirical facts from the results of this study indicate that the consistency of the 3 Provinces in carrying out coffee bean export activities needs to be appreciated by the whole community because these 3 Provinces (especially East Java) have succeeded in carrying out continuous export activities to carry out the function of international trade so that they can provide value of benefits for actors in international trade.

This condition can occur apart from the condition of the geographical location which is suitable for coffee cultivation with the support of the community as a business actor and is supported by adequate infrastructure, also due to government policies in supporting and the success of the coffee export program abroad, especially the policy of the East Java Province government to increase value of export volume, especially coffee commodity exports.

The policy referred to increasing coffee production, especially in East Java, is contained in number [24] year 2015 - 2019, which states that the East Java Provincial Government will increase economic development that is inclusive, independent, and competitive based on agribusiness / agro-industry and industrialization with current strategic issues of plantation development. There are 6 (six) strategic issues in plantation development, namely 1) Low productivity and quality; 2) Limited fertile land for plantation cultivation; 3) Low soil organic matter; 4) Limited plantation infrastructure; 5) The high rate of pest and disease attacks and business disturbances in plantation commodities; and 6) Low institutional capacity of farmers in access to technology, market information, capital and partnerships. Another reason for the achievement of East Java province to become the

province with the highest value in production and exports is refer to number [29] that producers continue to meet the challenge, including increasing costs of production, floor prices, and declining yield. Institutional reforms within the supply chain and greater support from the government are necessary to ensure a better functioning market.

One of the three provinces where the coffee bean export base has become a question mark and a new finding is DKI Jakarta Province which according to the data does not have land for coffee cultivation and is in fact one of the three provinces for coffee bean export bases from Indonesia. This can happen at this time because of the influence of globalization factors and technology that have become a necessity so that even with little or no agricultural land, they are still able to export coffee beans because they have sufficient infrastructure and are even superior to other provinces in infrastructure and supply chain management. The factor else to make DKI Jakarta become three base of coffee export in Indonesia is simply reference to number [31] that states International trade has a huge impact on the level country well-being. Globalization and international cooperation have a favorable impact on the market economy. The consequences of these processes are the further integration of countries into international trade, which continues to take an increasingly important role in the economies of developed countries.

TABLE 3. THREE BASE OF COFFEE EXPORTING PROVINCES

Cross Section Fixed Effect	Period Fixed Effect		Residual
35 JATIM	<b>517989043.6</b>	01/01/2011	-40984552.38
12 SUMUT	<b>43535939.85</b>	02/01/2010	-40,984,552.38
31 DKI JAKARTA	<b>30721548.41</b>	09/01/2010	-40984552.38

Source: Independently processed data (2020)

Jakarta with all kinds of facilities owned by allowing it to play a role and strategy as part of the supply chain management (SCM) to become one of the many suppliers with the main objective of harmonizing supply and demand as effectively and efficiently as possible in export coffee commodities and in accordance with the results of research conducted by [4] states that management supply chain can be seen from two perspectives (1) Efficiency in the emphasis is on minimizing transaction costs associated with interactions between companies, (2) Strategic the goal is to increase the competitive advantage of each company in the supply chain. So that in the perspective of producers, coffee exporters will be more efficient by selling directly to the market through existing market networks and can provide a lot of convenience in transactions even if not through marketing channels in their own territory.

Besides being able to play a supply chain management role, DKI Jakarta Province is also able to become a mediator in the case of coffee exports, especially when Indonesian coffee exports are faced with ochratoxin and carbaril regulations in Japan. Reference [20] states that ochratoxin derived from fungi and carbaril is widely used in agriculture to exterminate pests and insects in fruits and other plants which are carcinogenic in humans and can cause harm to the environment, such conditions can only be resolved by a bilateral relationship between Japan and Indonesia through

bilateral negotiations which can be carried out in DKI Jakarta (Indonesia) or in Japan.

## VI. CONCLUSION

The results of data analysis show that there are very dynamics condition of coffee bean export between Indonesia's Province in every season with a negative value and positive value. There are 3 Provinces for the export base of Indonesian coffee beans with positive value for the last ten years, namely East Java Province, North Sumatra Province and DKI Jakarta Province. East Java Province has the highest positive value followed by North Sumatra Province and DKI Jakarta Province.

The export opportunities for Indonesian coffee beans are still wide open to continue to be developed for future. Especially for the Province of Sulawesi and Sumatra Province as well as other provinces as coffee-producing areas are provinces that are potential and very dynamic and have the same opportunities as other Provinces in increasing coffee production for coffee export purposes because they are included in all potential categories in this study.

There are three base Provinces in Indonesia coffee bean export (East Java province. North Sumatera Province. DKI Jakarta), and it's new *invention or novelty* for mapping area coffee bean export that need maintenance for sustainable coffee bean export in Indonesia.

## ACKNOWLEDGMENT

Thanks to the research team who have supported the smooth running of this research till finish, especially to Dr Evita Soliha Hani, Prof Dr Yuli Hariyati, Dr Ketut Anom Wijaya and Ahmad Fatikhul Khasan, MP.

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