

## Harmonization of Trading Partners Between Indonesia–Italy: Empirical Calculations of Selected Agricultural Commodities

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### *Abstract*

Initially, exports were perceived as the prestige and dignity of a nation. However, in terms of terminology, the essence of export flows is complementarity between countries, where each party has advantages, competition and excess production of a particular product to offer. The orientation of this study is to examine the relationship between tobacco exports, coffee exports, and wine exports to GDP growth in Italy–Indonesia. There are key variables which are divided into two case studies including tobacco export volume, FoB on tobacco exports, coffee export volume, FoB on coffee exports, green grape export volume, CIF on green grape exports, red wine export volume, CIF on red wine exports, GDP share of agriculture in Indonesia and Italy. The fundamental difference in wine exports from the two is that Indonesia uses green grapes and for Italy it uses red wine. The method is set through a panel data regression approach and samples for the 2013–2021. The econometric results explain that tobacco exports and coffee exports have a significant effect on the GDP share of agriculture in Indonesia–Italy. Likewise, CIF on exports of green grapes and red wines which have a significant effect on the GDP share of agriculture in both nations. These findings inspire more urgent implications for the topic of agricultural commodity exports and become an integrated whole.

**Keywords:** agricultural commodities; export; GDP share of agriculture; panel data regression; Indonesia–Italy.

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## I. Introduction

### 1.1. Background Analysis

Since the last few decades, Indonesia and Italy as two countries have had a series of cooperation in the fields of politics, defense, economics and security, such as the Bilateral Communication Forum (FKB) as a bilateral dialogue mechanism which was agreed upon through the signing of a Memorandum of Understanding (MoU) in bilateral consultation in 2009 (The Italian Trade and Investment Agency, 2021). In fact, Italy also took part in recognizing Indonesia's independence in 1945 after the Dutch colonial reforms (Wirjopranoto, 1954). Good collaboration between the two is also implied by the history of the Group of Twenty (G21), including Italy and Indonesia joining the group which was formed in 1999 as an intergovernmental forum that systematically brings together advanced economic powers and emerging markets to highlight important issues of global economy (Al-Fadhat, 2022; Berawi, 2022; Singh, 2014).

In the cross-trade context, Indonesia has played a vital role in fulfilling the business framework for several agricultural commodities including coffee, green grapes grown in tropical climates, and tobacco. The Katadata (2022a) reports that Indonesia is in fourth position after Brazil (first rank), Vietnam (second rank), and Colombia (third rank) as a coffee producer in the world in 2021 reaching 774.60 thousand tons. The most famous types of coffee from Indonesia for export are Arabica Gayo–Sumatra, Arabica Kintamani–Bali, Arabica Toraja–South Sulawesi, Arabica Java Ijen Raung–East Java, Liberika Rangsang Meranti–Riau, Arabica Flores Bajawa–East Nusa Tenggara, and Robusta Temanggung–Central Java (Fitriani et al., 2021). Even though the history of coffee from Italy is very striking and is a favorite of coffee lovers in the world, Italy still exports coffee from Indonesia to absorb demand because coffee stocks are also limited. On the other hand, Indonesia has become a regular customer of Italian coffee, where the expansion of coffee from several variations such as: Capuccino, Marocchino, Caffè Latte, Shakerato, Caffè al Ginseng, Caffè d'Orzo, and Macchiato is the best image and choice that drives the interest of Indonesian customers. As an illustration, the existence of Italian coffee is quite progressive as many coffees outlets market it in raw packaging and sell processed products. Nurhasanah & Dewi (2019), Oktafarel et al. (2021), and Purnomo et al. (2021) argue that the popularity of Italian coffee in Indonesia targets various ages, especially millennials.

Furthermore, the popularity of wines from Italy calls attention to the export market (Casini et al., 2009; Colombini, 2015; Corsi et al., 2010; Hertzberg & Malorgio, 2008; Piñeiro & Maffi, 2018; Ponte, 2021). With abundant production of red wine, Italy's status as the second highest supplier of wine after China also produces superior added value for the national economy (The Agriculture News, 2019). In 2019, wine production in Italy reached 7,900,121 tons. With that capacity, each resident produces up to 79,366 kg of grapes and produces 30,594 US\$ (The Atlas Big, 2022). More than 1 million hectares of vineyards are spread across almost the entire region. This was pioneered by the Romans, so to this day Italy is still very skilled at producing wine (The Tanjung Pinang Pos, 2022). But local wisdom explored by Indonesia to develop green grape commodities has been implemented in terms of exports (Fernando et al., 2017; Mariani et al., 2012; Revindo, 2017; Septina, 2020). To fulfill Indonesia's commitment to Italy, the green grapes exported are a unique type that is considered traditional medicine. Apart from being used for medicine, green grapes are also used as a food ingredient, an addition to cooking, desserts, and a mixture in red wine

fermentation combinations. In contrast to the majority of the population in Italy whose hobby is drinking wine, in Indonesia, people consume non-processed wine as a nutritional supplement. Even though there are differences in cultural characteristics, both countries need each other to export and import.

Besides that, tobacco is a commodity that cannot be separated from export and import activities. Even though tobacco which has high levels of nicotine has always been a matter of debate as a universal health issue, the price of tobacco always soars high on the market (Bader et al., 2011). It should be noted that apart from cigarettes, cigars, leaf cigarettes and sliced tobacco, tobacco leaves are also used as raw materials for pharmaceutical and cosmetic products (Niu et al., 2021; Popova et al., 2019). In practice, demand for tobacco always increases (Chaloupka et al., 2012; Huang et al., 2018). By taking advantage of the high demand side, Italy is the target market for tobacco commodities from Indonesia. In Indonesia, cigarettes are seen as a characteristic of ancestral culture in one unit (Ayuningtyas et al., 2021). Generally, people who are classified as active smokers are those who also like to consume coffee (Hartoyo et al., 2022). These two attributes are inseparable. The case study in Italy is actually a dilemma, where the majority of smoking behavior is used to relieve stress (Caponnetto et al., 2020; Garzillo et al., 2022; Munarini et al., 2022). In 2017, importing countries addicted to Indonesian tobacco products included the US: 2,827.3 tons, Sri Lanka: 1,086 tons, Belgium: 992.7 tons, the Netherlands: 871.8 tons, and the Dominican Republic: 753.3 tons (Okezone , 2017). Through guaranteed tobacco quality, Indonesia is able to control world tobacco trade, including the level of demand from Italy. Meanwhile, Indonesia's tobacco export performance in 2018 was the sixth largest. With a production habitat of 136 thousand tonnes or around 1.91% of total global tobacco production, Indonesia is in sixth position after China, Brazil, India, US and Malawi (The Ministry of Health Republic of Indonesia, 2018).

An example of a study investigated by Ahsan et al. (2020), Al-Abdulkader et al. (2018), Fatkurrohim et al. (2022), Gizaw et al. (2022), Gunawan et al. (2018), Musona (2016), Murindahabi et al. (2019), Nkhoma et al. (2021), Nugroho & Lakner (2022), Sumner & Alston (1987), and Zuhdi & Yusuf (2022) have an orientation about the balance in exports and imports of wine, coffee and tobacco commodities towards economic growth. So far, dynamic trading blocs have responded to these three products, whose relationship in optimizing the rate of economic growth is significant. In an open economy, aggressive product diversity and diversification dictates intense competition in exports and imports of wine, coffee and tobacco.

Examining each country that has certain competitive strengths, ideally, they should concentrate on importing products in anticipation of weaknesses in the supply of complementary goods, to avoid shortages in the proportion of product stock. Meanwhile, supplier countries strengthen trading partner institutions that function to overcome the scarcity of substitute commodities, so that contributions from exporters create a sustainable cluster chain. The motivation of this work is to evaluate the impact between export partners in wine, coffee and tobacco commodities on Gross Domestic Product (GDP) growth in Indonesia and Italy. The paper is organized into five pillars. Session-1: Introduction discusses the phenomenon and background. Session-2: Theoretical Review outlines the narrative and comparison of the relevance/foundation of the literature. In session-3: Research Methods presents data sets and analysis techniques. Then, session-4: Analysis and Discussion expresses empirical findings and comparisons from previous publications.

Finally, session-5: Conclusions and Suggestions verifies the research points while presenting limitations, policy recommendations, and future study agenda.

The novelty of the study lies in the gaps in past studies dissected by Ahsan et al. (2020), Al-Abdulkader et al. (2018), Fatkurrohim et al. (2022), Gizaw et al. (2022), Gunawan et al. (2018), Musona (2016), Murindahabi et al. (2019), Nkhoma et al. (2021), Nugroho & Lakner (2022), Sumner & Alston (1987), and Zuhdi & Yusuf (2022), where although red wines from Italy are very famous, Indonesian green grapes have also proven to be in demand by the Italian market. Also, trade synergies originating from coffee beans and Indonesian tobacco have promising business opportunities for the global market, especially for Italy and vice versa to be used as raw materials for making cigarettes and several coffee variants with aru aroma according to consumer tastes. As explained at the beginning, what differentiates this study from these publications is the performance of local wisdom which has the potential to be developed, such as green grape products from Indonesia. Even though it specializes in one commodity in several cases and in many countries, the weakness of the existing research is the analysis of traded commodities. So far, few have combined the exports of two different commodities (in this case wine, tobacco and coffee beans) for review. Another originality places or includes elements of Free on Board (FoB) and Cost, Insurance and Freight (CIF) whose causality needs to be considered in influencing agricultural GDP. Talking about exports and imports, these two mechanisms are important in maintaining collaboration between Italy and Indonesia through interrelated, profitable international trade and growing the economy in the agricultural sector. In a different insight, another feature of the research uses agricultural economic growth based on GDP share and not collective GDP, so that the material is deepened based on a more implicit version. In other words, this allows and provides an opening for further diagnosis.

## **1.2. Theoretical Review**

### **1.2.1. GDP of Agricultural**

In a macroeconomic view, Gross Domestic Product (GDP) is reflected in economic growth, where one adds is accumulated by export receipts minus import expenditure (Ahmad, 1978; Roy et al., 2022). When investment realization enters a certain country or region, this indicates that there is a flow of capital that drives the economic structure, be it primary, secondary or tertiary. The complexity of economic empowerment has great potential to absorb labor, improve welfare, reduce disparities such as unemployment and poverty, and revive socio-economic status. For this reason, the development of commodity products triggers an export-import pattern.

Regulations on the trading system represent the identity of producers and consumers in the eyes of the world. If a nation exports more than it imports, it is classified as a developed country, whereas if the value of imports tends to be dominant over exports, then the country is classified as developing (Hummels & Klenow, 2005). In its concept, the agricultural sector is defined as a business field that includes all businesses that are obtained from nature and are objects or biological (living) goods whose results are used to meet one's own subsistence needs or to be sold to other parties. This business includes activities whose main aim is to cover or supplement one's own needs (subsistence) such as in the fields of food crops, forestry, fisheries and plantations (Emam et al., 2021). Explicitly, the share of agricultural GDP is the gross added value of all services and products created or produced from the agricultural sector in a country which arise as a result of various economic activities in a

certain period without regard to whether the production factors are owned by residents or non-residents (Rosyadi et al., 2023). Bosma & Curry-Machado (2012) and Ganeshamurthy et al. (2011) illustrates that tobacco plants, coffee plants and grapes are part of plantation commodities.

### **1.2.2. Theory of Import–Export**

Nowadays, one of the signals of a nation's economic development progress is how big its trading reputation is and its ability to dominate the market (Lin & Rosenblatt, 2012; West, 2018). In reality, there is not a single country in the world that does not need assistance from other countries (Fung et al., 2010). In this regard, connections are built through partnerships that enable comparative mobility between parties, so that each country gains profits. Every nation has superior and limited resources, whether they come from natural or human resources (Goldin, 2019). Thus, a country with certain outstanding resources is definitely not owned by certain countries and conversely, countries that are endowed with certain resources also need help from abroad because of the dimensions of weaknesses that they do not have. For that reason, it makes sense to create interrelated integration from one country to another through an agreement or agreement within a certain period of time (Marinov, 2015; Nguyen, 2019; Surugiu & Surugiu, 2015).

For several decades, product commodities that are traded have not only been distributed in the form of raw materials for services, but are now leading to semi-finished products for industrial use to finished products. However, there are still many of them in the raw product segmentation, where the raw product trading process tends to be dominated by the agricultural sector. In general, developing countries export agricultural products to rich countries with limited land, extreme climates, and no agricultural base (Kuzminov, 2017; Mohan, 2007; Sanjuán & Dawson, 2010; Trostle & Seeley, 2013; Utomo et al., 2023). Referring to market needs, if the intensity of the national demand side increases, but the supply side stagnates or decreases, then the country is obliged to accommodate this demand from abroad. The output is that all transactions will be recorded in the trade balance (Astuti et al., 2016; Ha, 2022). The various volumes of exports traded at the international level and imports entering the domestic market indicate that the country is both a supplier and part of international trade relations. An indication of the success of exports and imports is based on the level of surplus or deficit in the trade balance (Blavasciunaite et al., 2020).

### **1.2.3. FoB and CIF**

Free on Board (FoB) and Cost, Insurance, Freight (CIF) have different meanings. FoB is defined as a situation where the price calculated by the seller (exporter) to the buyer (importer) is based on the value of the goods plus all costs until the goods arrive on the ship (Akande & Iteshi, 2020). At the same time, strengthening logistics aspects as a solution to maintain food security, maintain trade assets, and reduce product shrinkage. The nature of agricultural commodities is very fragile, so distribution must be managed effectively. The problem with shipping routes via airplane transportation can cut time, but is expensive. It is logical that many countries still implement sea access because of cost savings. In this way, ship transportation depends on port infrastructure. Shipping payment methods applicable to international trade are FoB and CIF. These two methods are most commonly used by exporters and importers.

The system implemented in the FoB method is to load goods in one's own country so that goods anomalies are known, whether they are in terms of excess or shortage. From the

level of flexibility, customs administration matters should also be easier to carry out (Chuah, 2007). This document includes the costs that will be borne by the exporter, i.e customs duties or export taxes, transportation costs from the warehouse to the port, loading costs from the port onto the ship, and costs for arranging commodities on the ship. Camisón-Haba & Clemente-Almendros (2020) justify that importers bear costs such as insurance, loading and unloading at the port of destination, and transportation costs until the commodity is brought into the warehouse.

Nugroho (2015) focuses on CIF that exporters have an obligation to cover travel costs until they arrive at the port of the destination country, costs for transporting goods and cargo, and insurance costs for goods. For CIF, the exporter has the obligation to cover travel costs until they arrive at the port of the destination country, cover the costs of transporting the load and cargo, or cover the costs of insurance for the goods (Kariyoto, 2016). The risk of loss and damage is also the responsibility of the exporter. The price that importers must pay is greater because all these prices include the price of the goods (Vogt & Davis, 2020).

Table 1. Data Unit

Variable Name (Abbreviations)	Indicator	Measurement
Indonesia's Gross Domestic Product of Agricultural (IDN GDP_Ag)	Share of agricultural GDP in Indonesia.	%
Italy's Gross Domestic Product of Agricultural (ITA GDP_Ag)	Share of agricultural GDP in Italy.	%
Tobacco Export Volume (TEV)	The value of tobacco leaf exports from Indonesia to Italy and vice versa.	Ton
Free on Board on Tobacco Export (FoB_TE)	Delivery of tobacco leaf export products that have been agreed between Indonesia and Italy.	US\$ (000)
Coffee Export Volume (CEV)	The value of coffee bean exports from Indonesia to Italy and vice versa.	Ton
Free on Board on Coffee Export (FoB_CE)	Delivery of coffee bean export products that have been agreed between Indonesia and Italy.	US\$ (000)
Green Grape Export Volume (GGEV)	The value of green grape exports from Indonesia to Italy and vice versa.	Ton
Cost, Insurance and Freight on Green Grape Exports (CIF_GGE)	Indonesia's obligation to cover the cost of shipping, transportation and insurance for green grape exports to Italy.	US\$ (000)
Red Wine Export Volume (RWEV)	The value of red wine exports from Italy to Indonesia.	Ton
Cost, Insurance, and Freight on Red Wine Exports (CIF_RWE)	Italy's obligation to cover the cost of shipping, transportation and insurance for the export of red wine to Indonesia.	US\$ (000)

**Source:** Global Economy (2022); Central Bureau of Statistics of Indonesia (2022a, b, c); Katadata (2022a, b).

## II. Method

### 2.1. Dataset

Operationally, the research data is panel data type. Panel data is extracted into Ordinary Least Square (OLS). Data was obtained from secondary publications, i.e Global Economy, Katadata, and Central Bureau of Statistics of Indonesia. After the data was collected, it was designed and tabulated into two parts. The first part is a case study in Indonesia and the second part is in Italy. Table 1 summarizes data units based on variable names, explanations, variable abbreviations, units, and data sources.

A series of data characteristics below is an elaboration throughout the 2013–2021 period. Total observations were 126 samples. If divided by two, each for Indonesia and Italy is 63 samples. Coffee and tobacco are durable products, thus adjustments to FoB regulations where the purchase price is below the exemption limit will not be subject to import duties and import taxes. On the other hand, the grade of grapes is vulnerable, so to anticipate expiration, a CIF system has been adopted which not only requires payment of the price of the goods, but is also subject to insurance and shipping costs.

### 2.2. Variables and Analysis

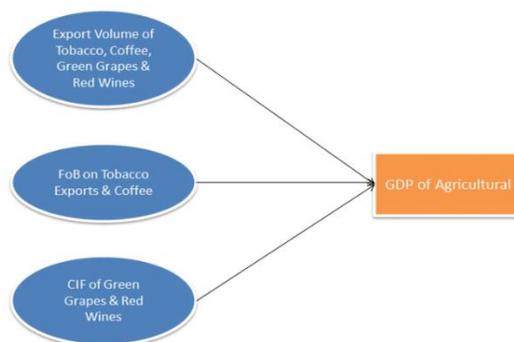
Substantially, the purpose of this paper is that the analytical tool is supported by a panel data regression approach in the OLS scheme. Panel data instruments synchronize time series data and cross section data, where the same cross section units are measured over different time periods (Baltagi, 1998; Doering et al., 2020; Kropko & Kubinec, 2020; Troeger, 2019). In its actualization, panel data is data from several of the same individuals observed over a certain period of time (Holtz-Eakin et al., 1998; Wooldridge, 2009). If using periods, then the formulation is adjusted as follows:

$$t = 1, 2, \dots T \tag{1}$$

$$i = 1, 2, \dots N \tag{2}$$

Where; t = time, T = time period, i = observation, and N = number of individuals.

Referring to the formulation above, with the panel data we have, we get a total of NT observation units. If the number of time units is the same for each individual, then the data is a balanced panel. If the opposite is true, i.e the number of time units is different for each individual, then the status is unbalanced panel.



**Figure 1.** Framework

Source: Own.

The variable components are divided into two models including independent and dependent variables. There are fundamental differences between the two. The dependent variable is positioned as a variable that is influenced by the independent variables. The role of independent variables is to influence the dependent variable (Fitriadi et al., 2020a). Based on the format above, the independent variables are converted into three scopes: (1) Export volume of tobacco, coffee, green grapes and red wine; (2) FoB on tobacco and coffee exports; and (3) CIF of green grapes and red wine. From another lens, the dependent variable is supported by agricultural GDP. Under the academic landscape and practical perspective explained above, the framework below has been prepared (see Figure 1). Then, the projection stages were examined based on three assumptions, including: descriptive statistics and correlation, Analysis of Variance (ANOVA), and partial determination (Fitriadi et al., 2020b). Data interpretation was framed using the Microsoft Excel 2010 program and statistical software, namely Statistical Package for the Social Sciences (SPSS) series 26.

### 2.3. Econometrics

Econometric specifications are supported by two-way standards that consider the effect of time or include time variables (e.g., Ahn et al., 2013; Austin et al., 2020). The requirements to form a general mathematical function are as follows:

$$Y_{it} = \alpha + \alpha_i + \delta_t + X'_{it}\beta + \varepsilon_{it} \quad (3)$$

Based on the above function, an equation of each variable is formed for the two models (Indonesia–Italy) with the following simulation:

$$IDN \text{ GDP\_Ag}_{it} = \alpha_0 + \beta_1 TEV_{it} + \beta_2 FoB\_TE_{it} + \beta_3 CEV_{it} + \beta_4 FoB\_CE_{it} + \beta_5 GGGEV_{it} + \beta_6 CIF\_GGE_{it} + IDN \varepsilon_{it} \quad (4)$$

$$ITA \text{ GDP\_Ag}_{it} = \alpha_1 + \beta_7 TEV_{it} + \beta_8 FoB\_TE_{it} + \beta_9 CEV_{it} + \beta_{10} FoB\_CE_{it} + \beta_{11} RWEV_{it} + \beta_{12} CIF\_RWE_{it} + ITA \varepsilon_{it} \quad (5)$$

*Symbol description*; IDN = Indonesia, ITA = Italy,  $\alpha_{0,1}$  = constant in the first and second models,  $\beta_1, \dots, \beta_{12}$  = vector of size P x 1 which is the parameter of the estimation result,  $it$  = the  $i$ th observation of the independent variable,  $\alpha_i$  = individual effect that different for each 1<sup>st</sup> individual,  $\varepsilon_{it}$  = regression error for both models.

According to the provisions of the significance level of 1% ( $\rho = 0.01$ ) and 5% ( $\rho = 0.05$ ), then the form of hypothesis testing is denoted below:

$$\text{Hypothesis zero } (H_0) = \text{rejected, while } \rho > 0.01 \text{ or } 0.05 \text{ and } \rho \neq 0.01 \text{ or } 0.05 \quad (6)$$

$$\text{Hypothesis alternative } (H_a) = \text{accepted, while } \rho < 0.01 \text{ or } 0.05 \text{ and } \rho \neq 0.01 \text{ or } 0.05 \quad (7)$$

## III. Results and Discussion

### 3.1. Descriptive Statistics and Correlations

Descriptive statistical method that summarizes a data set in the form of a representation of the entire population or a sample of a particular object. In this case, descriptive statistics are intended to measure variability or dispersion including standard

deviation (S.D.), mean score, Kurtosis, and Skewness. In short, descriptive statistics are useful for describing and understanding the features of a particular data set by providing a brief summary of the sample and data size.

Table 2 displays the position of the five elements in the descriptive statistics. In both Indonesia and Italy, it appears that there are similarities in the highest and lowest scores in the mean and S.D. For Indonesia, the highest mean score is FoB\_CE (M = 63,237.777), while in Italy it is FoB\_CE (M = 210,138.189), while the lowest mean is IDN GDP\_Ag (M = 13.255) and ITA GDP\_Ag (M = 2.013). Likewise for the S.D. score, where of the two the smallest is IDN GDP\_Ag (S.D. = 0.321; S.D. = 0.090), but the highest is FoB\_CE in Indonesia (S.D. = 14,942.694) and FoB\_CE in Italy (S.D. = 66,995.118). The anti-climax is precisely the Skewness and Kurtosis scores. Although ITA GDP\_Ag is the highest (S = 0.732), this is in contrast to IDN GDP\_Ag (S = -0.668) or the lowest. Interestingly, CIF\_GGE in Indonesia is the largest compared to other variables (S = 0.652) and the lowest Skewness score from Italy is TEV (S = -0.242). Turning to the Kurtosis value, the highest was FoB\_TE in Indonesia (K = 1.050), but FoB\_TE in Italy was the lowest (K = -2.216). From the Kurtosis points, the lowest in Indonesia is FoB\_CE (K = -1.284) and for Italy it is FoB\_TE (K = -2.216).

**Table 2.** Descriptive Statistics of all Variables, each N = 63

<i>IDN</i>	Mean	S.D.	Skewness	Kurtosis
IDN GDP_Ag	13.255	0.321	-0.668	-0.231
TEV	3,297.455	1,323.632	-0.401	-0.584
FoB_TE	12,264.556	4,118.198	0.038	1.050
CEV	33,340.333	6,191.012	-0.012	-1.241
FoB_CE	63,237.777	14,942.694	-0.012	-1.284
GGEV	18,879.489	11,911.069	0.846	-1.027
CIF_GGE	17,953.788	9,168.903	0.652	-1.186
<i>ITA</i>	Mean	S.D.	Skewness	Kurtosis
ITA GDP_Ag	2.013	0.090	0.732	-0.868
TEV	291.077	177.321	-0.242	-1.006
FoB_TE	1,564.467	1,076.708	0.077	-2.216
CEV	90,603.011	34,034.274	-0.116	-0.727
FoB_CE	210,138.189	66,995.118	0.170	-1.271
RWEV	41,945.9	7,362.364	-0.239	0.263
CIF_RWE	77,259.233	22,852.914	0.145	-1.372

**Source:** Authors' estimation from compiled data.

The correlation analysis includes association measurement techniques that focus on a group of techniques in bivariate statistics that track the strength of the relationship between two variables. Pearson correlation will check numerical values to determine the degree of relationship between continuous variables numerically. Table 3 demonstrates the close relationship between variables through correlation analysis. Applying 5% probability ( $\rho < 0.05$ ) that there is a close implication between FoB\_CE and FoB\_TE (C = 0.795;  $\rho = 0.010$ ) and CEV to FoB\_TE (C = 0.705;  $\rho = 0.034$ ). Then, there is also a moderate relationship between FoB\_CE and FoB\_TE (C = 0.690;  $\rho = 0.040$ ). For the 1% probability ( $\rho < 0.01$ ), there are four significant relationships, although one relationship is in a close position, i.e. CEV with TEV (C = 0.747;  $\rho = 0.021$ ) and three very close or almost perfect relationships include FoB\_TE to TEV (C = 0.851;  $\rho = 0.004$ ), FoB\_CE with CEV (C = 0.950;  $\rho = 0.000$ ), and CIF\_GGE against GGEV (C = 0.977;  $\rho = 0.000$ ).

**Table 3.** Correlation Analysis in Indonesia

Items	TEV	FoB_TE	CEV	FoB_CE	GGEV	CIF_GGE	IDN GDP_Ag
TEV	1	0.851** (0.004)	0.747** (0.021)	0.795* (0.010)	-0.411 (0.271)	-0.543 (0.131)	0.138 (0.723)
FoB_TE	0.851** (0.004)	1	0.705* (0.034)	0.690* (0.040)	-0.032 (0.935)	-0.178 (0.646)	-0.112 (0.775)
CEV	0.747** (0.021)	0.705* (0.034)	1	0.950** (0.000)	-0.306 (0.423)	-0.407 (0.277)	0.073 (0.851)
FoB_CE	0.795* (0.010)	0.690* (0.040)	0.950** (0.000)	1	-0.418 (0.263)	-0.538 (0.135)	0.067 (0.863)
GGEV	-0.411 (0.271)	-0.032 (0.935)	-0.306 (0.423)	-0.418 (0.263)	1	0.977** (0.000)	-0.652 (0.057)
CIF_GGE	-0.543 (0.131)	-0.178 (0.646)	-0.407 (0.277)	-0.538 (0.135)	0.977** (0.000)	1	-0.580 (0.102)
IDN	0.138	-0.112	0.073	0.067	-0.652	-0.580	1
GDP_Ag	(0.723)	(0.775)	(0.851)	(0.863)	(0.057)	(0.102)	

Note: (\*\*) and (\*) indicate significance at 1% and 5% probability level.

Source: Authors' estimation from compiled data.

**Table 4.** Correlation Analysis in Italy

Items	TIV	FoB_TE	CEV	FoB_CE	RWEV	CIF_RWE	ITA GDP_Ag
TEV	1	0.817** (0.007)	-0.077 (0.843)	0.103 (0.793)	-0.118 (0.763)	-0.148 (0.703)	-0.366 (0.333)
FoB_TE	0.817** (0.007)	1	-0.038 (0.922)	0.053 (0.891)	0.093 (0.812)	0.110 (0.779)	-0.320 (0.401)
CEV	-0.077 (0.843)	-0.038 (0.922)	1	0.974** (0.000)	-0.470 (0.202)	-0.527 (0.145)	0.606 (0.084)
FoB_CE	0.103 (0.793)	0.053 (0.891)	0.974** (0.000)	1	-0.518 (0.153)	-0.577 (0.104)	0.496 (0.174)
RWEV	-0.118 (0.763)	0.093 (0.812)	-0.470 (0.202)	-0.518 (0.153)	1	0.946** (0.000)	-0.137 (0.725)
CIF_RWE	-0.148 (0.703)	0.110 (0.779)	-0.527 (0.145)	-0.577 (0.104)	0.946** (0.000)	1	-0.208 (0.591)
ITA	-0.366	-0.320	0.606	0.496	-0.137	-0.208	1
GDP_Ag	(0.333)	(0.401)	(0.084)	(0.174)	(0.725)	(0.591)	

Note: (\*\*) and (\*) indicate significance at 1% and 5% probability level.

Source: Authors' estimation from compiled data.

Only the correlation profile in Italy has a 1% probability ( $\rho < 0.01$ ). Table 4 concludes that there are two very close (near perfect) relationships, such as the relationship between FoB\_CE and CIV ( $C = 0.974$ ;  $\rho = 0.000$ ) and RWEV to CIF\_RWE ( $C = 0.946$ ;  $\rho = 0.000$ ). In the relationship between FoB\_TE and TEV ( $C = 0.817$ ;  $\rho = 0.007$ ), it is in a close correlation.

### 3.2. Simultaneous Distribution (F Test) and Partial Distribution (T Test)

The ANOVA test is used to compare population means and identify significant differences between two or more data groups. In this paper, a two-way ANOVA is applied, which aims to analyse an experiment that has six independent variables that affect the condition of the dependent variable. Table 5 explains that the Sum of Squares (SS) score in Indonesia is higher than in Italy, where the SS in Indonesia reaches 0.826, while the SS in

Italy reaches 0.065. The degrees of freedom (df) for both models is 62. Meanwhile, the F-count for the IDN and ITA models is 2.26 and the F-statistics are 5.414 and 7.651. ANOVA results prove that all independent variables have a simultaneous effect on IDN GDP\_Ag ( $F = 5.414 > 2.26$ ;  $\rho = 0.038$ ) and ITA GDP\_Ag ( $F = 7.651 > 2.26$ ;  $\rho = 0.019$ ).

Comprehensively, the panel data regression method will provide an estimation result that is Best Linear Unbiased Estimation (BLUE), if all Gauss Markov assumptions are met and one of them is non-autocorrelation. Two advantages of panel data regression analysis are that it provides large observations, increases the degree of freedom, where data variability reduces collinearity between explanatory variables, resulting in efficient econometric estimates. Then, the completion rate is better in the inference of dynamic changes in the partial test. In principle, this test is implemented to notice the significance of the partial regression coefficient.

**Table 5.** Compiled of ANOVA

<i>IDN</i>	SS	df	F	Sig.
Regression	0.826	6	5.414	0.038
Residual	0.368	56		
Total	0.826	62		
<i>ITA</i>	SS	df	F	Sig.
Regression	0.044	6	7.651	0.019
Residual	0.021	56		
Total	0.065	62		

Note: Dependent variable is IDN GDP\_Ag and ITA GDP\_Ag.

**Source:** Authors' estimation from compiled data.

Using a sample of 63 units in each model, a partial estimate was obtained to validate the panel regression approach. The results in the first model (IDN), it is known that during 2013–2021, the constant ( $\alpha$ ) is 13.523. The positive sign on the coefficient indicates a unidirectional effect between the independent variable and the dependent variable. If TEV, FoB\_TE, CEV, FoB\_CE, GGEV, and CIF\_GGE do not change or remain, then the value of IDN GDP\_Ag increases to 13.523. The R<sup>2</sup> score is 0.774 which indicates that IDN GDP\_Ag is influenced by the six independent variables reaching 77.4% and the confounding factor is 22.6%. Furthermore, the Adjusted R<sup>2</sup> of 0.783 implies that the ability of the independent variables in this study to affect the dependent variable reaches 78.3%, while the remaining 21.7% is another indicator outside the first model.

Based on the six factors that influence IDN GDP\_Ag, only three hypotheses are accepted and the other three hypotheses are rejected. The variables were FoB\_TE ( $\rho = 0.029 < 0.05$ ), CEV ( $\rho = 0.007 < 0.01$ ), and CIF\_GGE ( $\rho = 0.048 < 0.05$ ). CEV, FoB\_CE, and CIF\_GGE as variables that have no significant effect on IDN GDP\_Ag. Standard Error (SE) in the first model, which shows that the average standard deviation is 1.494. In line with the first model, Table 6 also understands that in the second model (ITA), three hypotheses are rejected, and three hypotheses are accepted. The variables that have a significant effect on ITA GDP\_Ag include TEV ( $\rho = 0.015 < 0.05$ ), CEV ( $\rho = 0.045 < 0.05$ ), and CIF\_RWE ( $\rho = 0.001 < 0.01$ ). On the one hand, FoB\_TE, FoB\_CE, and RWEV are variables that have no significant effect on ITA GDP\_Ag. With an SE score of 0.386, the second model obtained an R<sup>2</sup> of 0.825 and an Adjusted R<sup>2</sup> of 0.277. This indicates that ITA GDP\_Ag is influenced by independent variables by 82.5% and confounding factors by 17.5%. Meanwhile, the

Adjusted R<sup>2</sup> score implies the ability of the independent variables in the second model to influence the dependent variable reaching 27.7% and the remaining 72.3% are other indicators outside the discussion. The score of 1.914 confirms that there is a positive effect of the independent variables (TEV, FoB\_TE, CEV, FoB\_CE, RWEV, and CIF\_RWE), where when the six independent variables increase in one unit, the ITA GDP\_Ag increases or *ceteris paribus*.

**Table 6.** Factors Affecting GDP Share of Agriculture in Indonesia and Italy

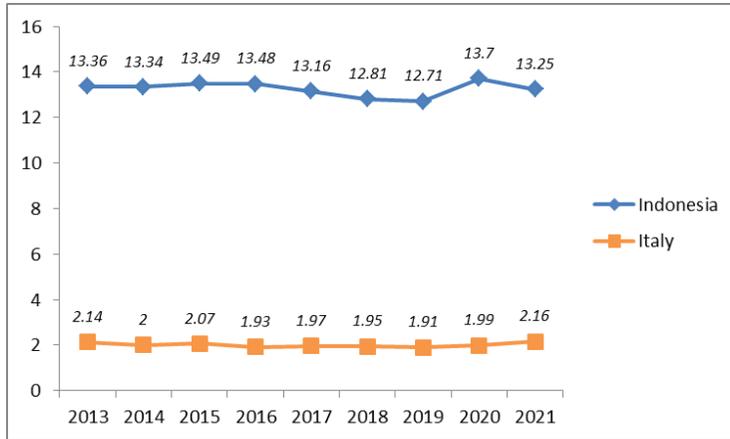
<i>IDN</i>	Sign of expectation	T-test	Coefficient	Prob.	SE
C		9.053	13.523	0.012*	1.494
TEV	+	2.110	0.155	0.029*	0.000
FoB_TE	-	-0.007	-0.008	0.995	0.000
CEV	+	1.391	0.745	0.007**	0.000
FoB_CE	-	-0.463	-1.000	0.689	0.000
GGEV	-	-0.392	-1.407	0.733	0.000
CIF_GGE	+	4.163	0.643	0.048*	0.000
R <sup>2</sup> = 0.744; Adj. R <sup>2</sup> = 0.783					
<i>ITA</i>	Sign of expectation	T-test	Coefficient	Prob.	SE
C		4.954	1.914	0.038*	0.386
TEV	+	3.814	1.394	0.015*	0.001
FoB_TE	-	-0.887	-1.049	0.469	0.000
CEV	+	1.198	5.196	0.045*	0.000
FoB_CE	-	-1.059	-4.502	0.401	0.000
RWEV	-	-0.069	-0.095	0.951	0.000
CIF_RWE	+	5.222	0.346	0.001*	0.000
R <sup>2</sup> = 0.825; Adj. R <sup>2</sup> = 0.277					

Note: (\*\*) and (\*) indicate significance at 1% and 5% probability level.

Source: Authors' estimation from compiled data.

### 3.3. Existing Situation

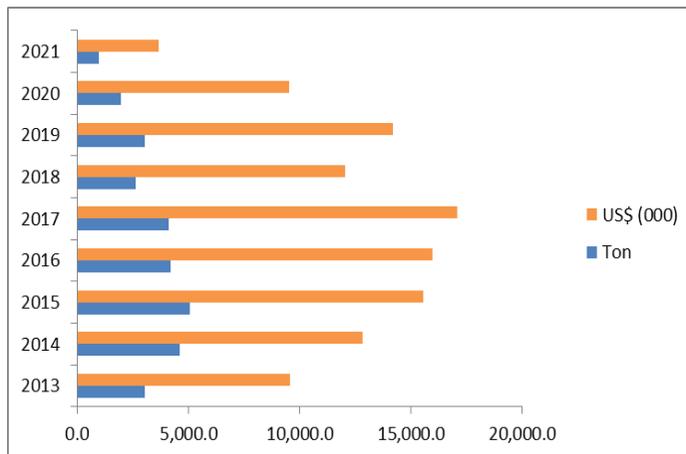
It can be seen that the growth of agricultural GDP in Indonesia tends to be higher than in Italy. Throughout 9 periods, the average growth of agricultural GDP in Indonesia is in a very high trend, reaching 13.26%. The agricultural sector is the basis in Indonesia because it has a large area of agricultural land when compared to Italy. Moreover, the routine work of the Indonesian population mostly relies on agriculture. Therefore, the agricultural sector also absorbs a large workforce than other sectors. Many sub-sectors are used as livelihoods and generate economic opportunities. In fact, Indonesia still relies on primary structures, such as agriculture. In Italy, the average agricultural GDP growth was 2.16% (see Figure 2). Yet, Italy is focused on only a few sub-sectors or a few agricultural commodities compared to Indonesia. Too, many agricultural products that have bright prospects are transformed into secondary and tertiary structures such as coffee and wine processing industries, and are also used as agricultural tourism which has attracted the attention of visitors from many other countries to be studied, cultivated, and developed.



**Figure 2.** Value Added in the Agricultural Sector as Percent of GDP

Source: Global Economy (2022).

At that moment, the highest agricultural GDP growth in Indonesia was 13.7% (2013), while the lowest was in 2019 at 12.71%. The performance of agricultural GDP growth in Italy was the largest in 2021 (2.16%) and 1.91% was the smallest trend in 2019. The recession in agricultural GDP growth was caused by the Coronavirus disease 2019 (COVID-19) which prompted the government to impose surveillance of mobility of mass crowds and tightening of regulation of workers, including those who work as farmers and farm labourers (e.g. Aday & Aday, 2020; Couch et al., 2020; Eck & Hatz, 2020; Mogues, 2020). The decline in several agricultural sub-sectors has also resulted from shifts in demand to other sectors such as health services, education services, finance and insurance, and information and communication services.



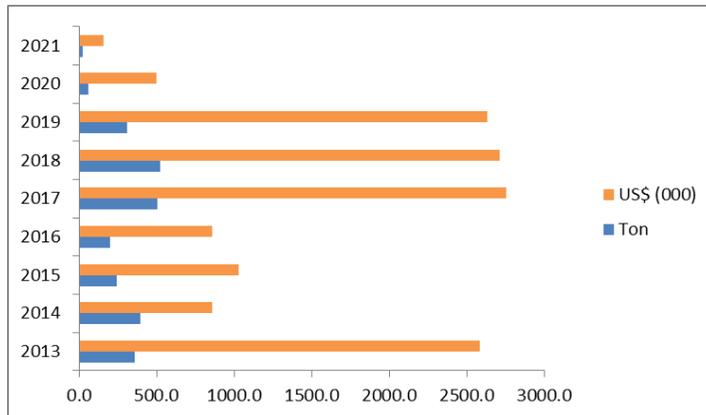
**Figure 3.** Tobacco Export Quantity and Value on FoB from Indonesia to Italy

Source: Central Bureau of Statistics of Indonesia (2022a).

In Figure 3, it represents the volume of tobacco exports from Indonesia to Italy, which fluctuates from period to period. During 2013–2021, the largest tobacco export in 2015 reached 5,082.3 tons, while the smallest export quantity in 2021 was 992.7 tons. When

viewed based on growth, the trend of the highest export volume of tobacco from 2013 to 2014 reached 51.5%. The lowest growth trend in tobacco exports to Italy occurred in 2020 to 2021 up to -49.5%. For the performance of tobacco exports from Indonesia to Italy, 2017 as the largest FoB period reached 17,084.3 thousand US\$ and the smallest among other years was in 2021 which only reached 3,653.6 thousand US\$ or the lowest percentage was -61.7 % which was allegedly due to the weakening of the Rupiah (IDR) exchange rate. The most prominent growth trend was from 2013 to 2014 (33.7%).

Based on Figure 4, the volume of tobacco exports from Italy to Indonesia is also in a less consistent corridor. The highest export quantity in tobacco commodities was in 2017 (507.1 tons), while the lowest was in 2021 (24.6 tons). The growth trend of tobacco exports from Italy, which jumped high from 2016 to 2017 (157%). Surprisingly, from 2019 to 2020 it decreased drastically to -80.7%. The implications also have an impact on the value of FoB. The largest in 2018 (2,708.4 thousand US\$) and the smallest in 2021 (158.5 thousand US\$). The dynamics of FoB growth were also displayed when from 2016 to 2017 it was 220.6%, but instead fluctuated down to -80.9% (2019 to 2020).



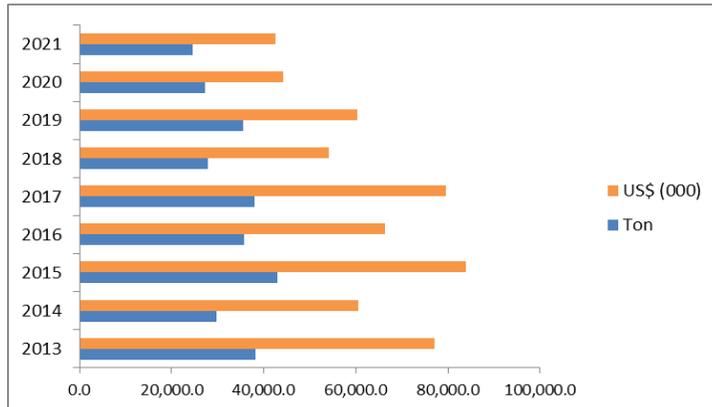
**Figure 4.** Tobacco Export Quantity and Value on FoB from Italy to Indonesia

**Source:** Central Bureau of Statistics of Indonesia (2022a).

Mabeta et al. (2015), Nasim & Gunawijaya (2021), and Shelina & Sasana (2022) are of the opinion that in the long term, tobacco exports encourage economic growth in Zambia and Indonesia. In some countries, smoking is one of the things that is deeply rooted in the culture, adopted from the ancestors since centuries (Mishra & Mishra, 2013). About this topic, due to lack of tobacco production capacity, they export tobacco from other countries. Ahsan et al. (2020) and Galinato et al. (2017) examines the ratification of abundant tobacco imports in Mozambique, Zimbabwe, Bangladesh, and Pakistan from exporting countries such as Indonesia which creates a relative double effect on welfare. Although there were external shocks such as the fall in prices of several world market commodities due to COVID-19, they did not have much impact on the tobacco trade mechanism and instead tobacco export productivity increased GDP (Clancy et al., 2020; Monge & Lazcano, 2022; Sheth et al., 2022; Yang & Ma, 2021).

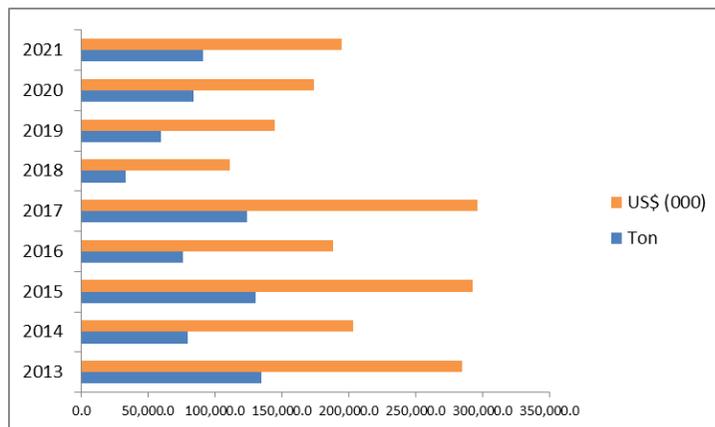
Figure 5 discusses the volume of coffee exports and the value on FoB from Indonesia to Italy from year to year (y.o.y). Throughout 2013–2021, the quantity of coffee exports has a positive slope. The consistency of Indonesian coffee exports to Italy was proven to be high

in 2015 reaching 43,048.3 tons, so that during that period, the growth trend was 44.7% or the highest among other periods. The smallest export achievement to Italy in 2021 (24,590 tons) and uncontrolled or worsening growth reaching -26.7% in 2018. Overall, the effect of coffee exports also had an impact on the FoB value, where in 2015 was the most dominant period reaching 84,005 0.4 thousand US\$ (38.5%) and the lowest is at 42,662.9 thousand US\$ for 2021. The lowest FoB trend for coffee exports is in 2018 (-32.2%).



**Figure 5.** Coffee Export Quantity and Value on FoB from Indonesia to Italy

Source: Katadata (2022b).



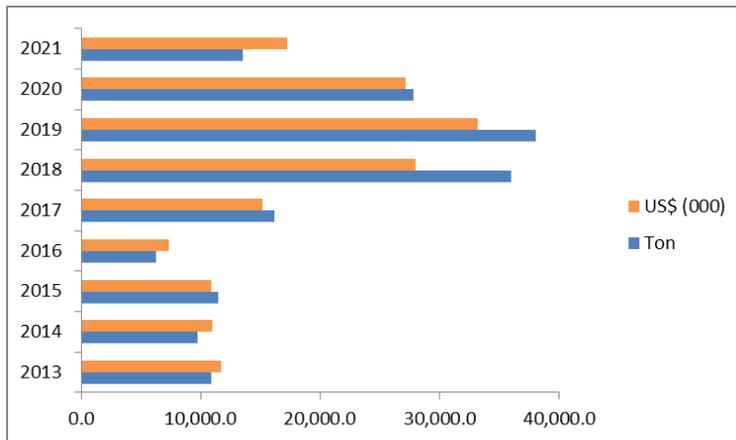
**Figure 6.** Coffee Export Quantity and Value on FoB from Italy to Indonesia

Source: Katadata (2022b).

Figure 6 reflects that Italy has succeeded in seeing opportunities due to the crisis in Indonesia's quality coffee stock, so that the competence of trading in coffee commodities is quite enthusiastic in the market. With the factor of famous coffee brands from Italy, the intensity of demand is quite high. In 2013, Indonesia imported 135,204 tons of Italian coffee beans. This is the highest number of coffee exports from Italy to Indonesia. However, in 2018, coffee exports had decreased to 33,650 tons. From 2018 to 2019, the largest coffee export period grew 77.4%, while the lowest trend was in 2017 to 2018 at -72.9%. The results of the FoB achievement of Italian coffee exports to Indonesia were the largest in 2017

(296,047 thousand US\$), but the growth in the FoB value was 56.9% (2016 to 2017) and the smallest FoB in 2018 (111,402.4 thousand US\$) with a growth of -62.4%.

Publications highlighting the effects of coffee exports on economic growth have been reviewed. In Ethiopia, the source of income for the population is agriculture, where coffee production is increased under incentive schemes and retention schemes. Besides, the country also relies on coffee exports, which have a positive relationship to the level of GDP (Yifru, 2015). In the long term, coffee export commodities are able to boost economic growth in Lampung-Indonesia Province (Aprianto et al., 2022). During 1986–2019, coffee exports from North Sumatra–Indonesia to three destination countries (Japan, US, and Malaysia). As a result, coffee yield and FoB value have a partially significant effect on GDP growth (Sihombing et al., 2021). Apart from consumers, Italy is also the second-largest exporter and producer of roasted coffee in the European Union, after Germany. Cardoso et al. (2016) confirm that the lack of domestic coffee production, consumer quality demands and coffee drinking traditions affect Italian coffee imports, thereby stimulating GDP. The evolution of agricultural exports determines coffee exports in Togo's small open economy (Tchalim, 2016).



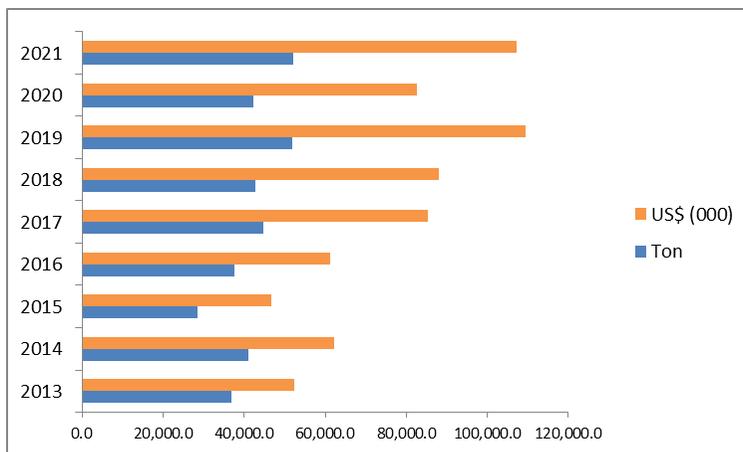
**Figure 7.** Wine Export Quantity and Value at CIF From Indonesia to Italy

**Source:** Central Bureau of Statistics of Indonesia (2022b).

Data on the volume of wine exports and the value of CIF from Indonesia to Italy and Italy to Indonesia are inversely related. Indonesian wine exports to Italy are less than Italian wine exports to Indonesia. In detail, the CIF value is smaller than the quantity of Indonesian exports, so that the revenue from these exports is below the Italian average. Italy's CIF tends to be above the average volume of wine exports. Most recently, Indonesia's export volume was the largest in 2019 (38,041.3 tons), but the trend for the highest export growth was from 2016 to 2017 reaching 156.9%. From this, it is also concluded that the lowest volume of Indonesian wine exports occurred in 2016 (6,285.8 tons) and the smallest export growth compared to other periods was from 2020 to 2021 reaching -51.4% (see Figure 7). The highest wine export results represented by CIF were in 2019 at 33,149.8 thousand US\$ and the lowest was 7,371.2 thousand US\$. Growth over the 9 periods was also volatile, with the largest CIF trend for 2016 to 2017 (106.1%), while the lowest was from 2015 to 2016 (-32.2%).

In Italy, wine production dates back to the second century BC. Wine production techniques were initiated by the Romans (Dodd, 2022; Geçer & Yerlikaya, 2018). Grapes are produced in large quantities with innovative wine storage solutions (Bandinelli et al., 2020; Maicas & Mateo, 2020; Pomarici et al., 2021). These steps include bottling (packaging) and wine making. In fact, agricultural food supply decisions, forced the consortium to protect the uncertainty of strategic primary sectors such as tobacco and wine in collective institutions (Ciliberti et al., 2019).

Collectively, Figure 8 displays the highest volume of Italian wine exports in 2021 (52,104.1 tonnes) and the biggest growth trend from 2015 to 2016 up to 31.2%. Next to that, the lowest export level was in 2015 (28,578.5 tons) or the lowest contribution from 2014 to 2015 at the level of -24.9%. The biggest CIF achievement was in 2019 (109,400.9 thousand US\$), while the highest growth trend was in 2016 to 2017 at around 39.7%. Interestingly, this gain was not matched by the CIF value in 2015 (46,745.3 thousand US\$) as well as the worst period of CIF growth of -24.9%.



**Figure 8.** Wine Export Quantity and Value at CIF From Italy to Indonesia

**Source:** Central Bureau of Statistics of Indonesia (2022b).

Anderson (2018) analyzes the production of Australian wines exported during 1975–1985 that are internationally competitive. Ayuda et al. (2020) opens the horizon about trade liberalization having the impact of wine exports affecting the increase in alcohol consumption. The linkage motive between wine exports and income is highlighted by Dascal et al. (2022). Empirical literature in the heterogeneity of the commodity wine increases GDP per capita. Free trade agreements in the East Asia region have seen increases in wine imports to China, South Korea and Japan for 1990–2016 (Harada & Nishitatenno, 2021). Macroeconomic performance on the surplus level of Portuguese Douro wines assimilated affects the export of wines from the best category of wines to several international markets (Macedo et al., 2019). Pinilla & Ayuda (2002) clarified that the expansion of ordinary table wine products produced by Spain in the period 1890–1935 caused several countries in the Americas to suffer serious losses, so that trade policies tended to be discriminatory towards market penetration. In 2011–2019, labour, land area and quality of fertilizers have revitalized vineyards in Moldova (Darma et al., 2022).

#### IV. Conclusion and Recommendation

This paper commits to investigate the effects of tobacco, coffee and wine exports on GDP growth of Indonesia and Italy over the period 2013–2021. Scenario analysis using panel data regression. The results prove that of the six variables in each country, three hypotheses are accepted and the other three hypotheses are rejected. The analysis output also concludes that the variables TEV, CEV, CIF\_GGE, and CIF\_RWE significantly affect IDN GDP\_Ag and ITA GDP\_Ag. From another perspective, FoB\_TE, FoB\_CE, GGEV, and RWEV actually have no significant impact on IDN GDP\_Ag and ITA GDP\_Ag.

Regardless of the findings that have deviated, policy recommendations must adjust every export regulation related to transportation infrastructure which is a practical strategy, protect consumers, prepare preventive steps to increase investment, prevent unfair export tariffs which are at times inelastic through domestic creativity in the productivity of agricultural commodities, simplifying international trade legal channels, removing complicated systems in negotiations and trade transactions, and involving several elements in parallel not only by policy makers, but farmers, business actors (exporters), consumers and other interested parties.

Finally, from this paper, relevant academic novelty is obtained to improve the economic literature in discussing research outcomes. Future agendas also need to seriously think about the implications, adding variable components, or simply extending the time-lag, so that constructive urgency is considered.

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