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## Effect of Globalization on Coffee Exports in Producing Countries: A Dynamic Panel Data Analysis

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### Abstract

The aim of this research is to examine how globalization affects coffee exports in the producing countries. This research used secondary data obtained from the International Coffee Organization, Pen World Table, World Bank, Food and Agricultural Organization, and KoF Globalization Index to achieve its goals. We used secondary data from 1990 to 2018 from various foreign databases. The research used a two-step system GMM (sys-GMM) to analyze the effect of globalization on coffee export in twenty-four producing countries. We found that export lag, gross domestic product (GDP), exchange rate, and the political globalization index (PGI) positively and significantly impact coffee exports. Meanwhile, coffee exports were unaffected by the level of export prices and the human capital index. Surprisingly, the trade globalization index has a negative impact on coffee exports. This demonstrates the unpreparedness of coffee-producing countries to face tough competition in trade globalization. The political globalization index, the final variable, has a positive impact on exports. With the opening up of world politics, it seems that the environment of democracy in producing countries is increasing. As a result, governments in these countries have adopted a policy of aggressively supporting coffee exports.

**Keywords:** Coffee, Economic Globalization, Political Globalization, Producing Countries, Sys-GMM

**JEL Classification Code:** F13, F14, F61, F62

### 1. Introduction

Coffee is an essential economic commodity, and many developing countries rely on it. In Tanzania, coffee employs over 400 000 poor households and contributes more than \$100 million to export earnings (Baffes, 2005). Coffee production has a considerable beneficial influence on household consumption expenditure in Uganda, reducing household poverty (Mbowe et al., 2017). This is the main reason for many countries are increasing their

coffee production. Nowadays, Brazil is the largest coffee producer in the world. Vietnam is in second place, while Colombia is in third place, a long way behind. Indonesia, India, Uganda, Ethiopia, Honduras, Peru, and Guatemala are primary producers. These countries have made several efforts to increase coffee production. Brazil's federal government controls coffee policies and encourages farmers to become more productive. Guatemala uses intensification to maximize its market share by applying fertilizers and increasing the number of coffee trees per Manzana (Johnson, 2010).

However, it turns out that coffee farmers in producing countries are poor, works on a small scale, spends significant time on farming and domestic activities with limited returns, has a low level of education, and lack of support from others to succeed in a global marketplace (Johnson, 2010; Kanyamurwa et al., 2013). In addition, low selling prices are typical among coffee farmers. They are unaware of pricing changes at the consumer level. Then, traders exploit this condition to get big profits (Fafchamps & Hill, 2008). Other problems include the marketing system failing to give the best price, inconsistent quality due to poor drying and processing methods, and the lack of bank finance (Hoang et al., 2013). One of the ways to overcome these problems

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is expanding the market, especially through exporting coffee (Julian et al., 2000).

Nowadays, coffee-producing countries are becoming more internationalized, especially as governments implement market reforms and trade liberalization (Crumley, 2013; Rojas, 2019). Most of the coffee produced in developing countries is exported to developed countries, and less is consumed in developing countries themselves (Abrahám et al., 2021). The welfare implications of liberalization and globalization are favorable for farmers under profitable export trade compared to a situation where all sales are focused on domestic sales only (Narayana, 2004). Then, the dependence of developing countries on coffee exports is very high (Petit, 2007). For example, coffee exports accounted for 42.5% of the overall value of El Salvador's exports during the 1970–1974 period. Even the military in this country held the reins of authority, conceding small reforms when coffee prices were high and resorting to armed repression when the country's coffee lands were threatened (Ripton, 2006).

After that, coffee exports getting a substantial long-term impact on economic growth. Murindahabi et al. (2019) stated a 1% increase in coffee exports results in a 0.0217% GDP growth in the long term. This demonstrates that boosting the amount and quality of coffee exports may help coffee-producing countries strengthen their economies. Agricultural exports also employ many laborers in developing countries (Julian et al., 2000; Nguyen & Vo, 2021; Remeikiene et al., 2018).

However, coffee-producing countries must be careful of the coffee prices fluctuations on the world market. When the price of coffee is low, the amount of coffee exported decreases and vice versa (Oko-Isu et al., 2019). In Colombia, coffee price shock resulted in reduced wages and work hours of rural workers and increased violence in coffee municipalities (Dube & Vargas, 2013). Meanwhile, Otero (2001) demonstrated that coffee export booms resulted in external disruptions, jeopardizing the ability of the economic authorities to implement effective monetary policy. Therefore, the International Coffee Agreement was established, limiting the quantity of coffee supplied on the global market to maintain a steady or high price (Jarvis, 2012). There was more integration between foreign and domestic markets during this period due to lower price frictions (Lee & Gómez, 2013).

Another problem in coffee-producing countries related to export is the high cost of logistics. For example, the logistics costs of coffee in Peru and Colombia are higher than 14.1% compared to the Latin American average. This is due to a lack of transportation infrastructure. As a result, coffee's selling price in both countries rises, potentially reducing demand from other countries (Nonalaya et al., 2021). These problems are also exacerbated by climate change which causes a decrease in production. An estimated 40% coffee production loss in eastern Africa is due to the reduction in

suitable areas caused by increasing temperature (Adhikari et al., 2015).

The discussion about globalization's implications on the global coffee market is interesting. Globalization has a positive impact, but on the one hand, it also has a detrimental impact. Thus, this research aims to investigate the effect of globalization on coffee exports in the producing countries. Similar studies have examined the impact of economic globalization components on coffee exports, including price (Bolwig & You, 2007), the exchange rate (Alegwu et al., 2018; Dang et al., 2020; Mehare & Edriss, 2013), and GDP (Jongwanich & Magtibay-Ramos, 2009). However, we try to think of trade globalization as a whole to see its impact more clearly. Meanwhile, we also try to use political globalization as a determinant of exports. This variable has never been used in similar research, but as we know from Whitten et al. (2020), political relationships significantly impact a country's trade flow.

## 2. Literature Review

Globalization of an economy affects the sensitivity and vulnerability of state economies, state economic policy choices, domestic social and economic actors' opportunities and constraints, socioeconomic actors' policy preferences, and incentives to change institutions that support participation in the international economy (Crumley, 2013). One of the crucial activities of globalization is trade in agricultural products. Globalization can remove various trade barriers and increase agricultural trade volume (Ngo-Thi-Ngoc & Nguyen-Viet, 2021; Török & Jámor, 2013). Jongwanich and Magtibay-Ramos (2009) also stated that trade policy openness is a crucial component in the success of processed food exports.

Globalization has a significant impact on boosting agricultural income and employment, enhancing export diversification, speeding up agricultural modernization, widening agricultural markets and value chains, and raising awareness of agrobiodiversity protection. (Vološin, Ssmutka and Selby, 2011; Schwarz and Mathijs, 2017). Globalization has the potential to shift the focus of agricultural commodities in a region or country. The proof is in Brazil's southeast, which has moved from sugar cane to coffee exports (Absell, 2020). Meanwhile, regional market integration, a kind of economic globalization, has proven its ability to develop trade creation in the commodity of coffee (Darmanto et al., 2021).

**H1:** Trade globalization index affects the coffee exports.

**H2:** Politics globalization index has an effect on the coffee exports.

Due to globalization, local products have also developed agricultural markets in both big cities and

abroad. Consumers also find it simple to select various food items in various cultural contexts, which is highly profitable for the food industry (1997). For example, coffee in Guatemala, which has been a domestic commodity since the Mayan civilization. Now, this commodity is available to foreign tourists and coffee drinkers at home and abroad (Steinberg et al., 2014). On the other hand, globalization is blamed for various negative events in agricultural-producing countries. El Salvador’s agrarian resources’ integration into the global economy has contributed to recurring agrarian crises, such as the slaughter of 10,000 peasants in 1932 and the civil war in the 1980s, which killed 75,000 people (Ripton, 2006).

Empirical calculations have revealed that when examining agricultural products in international trade, prices of agricultural products must be considered (price indices) (Remeikiene et al., 2018). Coffee export price has a direct impact not only on export turnover but also on the income of a large number of farmers (Tuyen et al., 2020). In the world coffee trade, the price transmission between export and farm-level prices is symmetrical. Fluctuations in the worldwide coffee price are reflected rapidly in domestic prices paid by exporters and major traders, but not entirely in farm-gate pricing. Farmgate prices respond faster to decreases than increases in export prices when the long-run deviation (Fafchamps & Hill, 2008; Mai et al., 2018; Tamru et al., 2021). In the importing countries, retail prices become more sensitive and adjust faster to shocks in international coffee prices (Lee & Gómez, 2013).

The international competition for agricultural products would increase the competitiveness, value-added, and the most beneficial pricing of domestic agricultural products. Domestic producers will have to improve their competitiveness and value-added to win against such imported products (Vološin et al., 2011; Yakovenko et al., 2018; Anggadini et al., 2021;). Furthermore, competitiveness and value-added can increase exports of agricultural products (Nitescu & Murgu, 2020; Pohlová et al., 2018; Török & Jámor, 2013).

**H3:** Price has an effect on the coffee exports.

**H4:** Human capital has an effect on the coffee exports.

Furthermore, exports and GDP have a reciprocal relationship. An increase in exports will increase a country’s GDP (Mahmood & Munir, 2018). However, Gulzar and Hui (2009) and Abdulrahman (2021) claim that GDP growth will increase exports volume and continuity. The bigger a country’s GDP, the more stable it will be in exporting in the long run. Phiri et al. (2021) show that an increase in GDP can shorten the export duration. Rising GDP would raise domestic demand for agricultural products while lowering a country’s export capability.

**H5:** Gross domestic product has an effect on the coffee exports.

Globalization has also affected financial markets, particularly currency exchange rates. The implications of a country’s currency instability might cause fluctuations in agricultural product demand on the international market throughout time (Emenyonu et al., 2020). The exchange rate harms exports of agricultural products. The number of exports will fall if the currency appreciates because exporters’ revenue would be lower (Abdulrahman, 2021). Meanwhile, the global financial crisis of 2008 had a negative effect on coffee exports. The crisis caused price fluctuations have been aggravated and a low-income elasticity of demand from coffee importing countries. The crisis also worsened coffee producers’ position in the global value chain, reducing their coffee exports even further (Abafita & Tadesse, 2021).

**H6:** Exchange rate has an effect on the coffee exports.

### 3. Research Methodology

#### 3.1. Data Source

To attain the aims, this research used secondary data were collected from the International Coffee Organization, Pen World Table, World Bank, Food and Agricultural Organization, and KoF Globalization Index. This research has one dependent variable and six independent variables. The types and sources of data used in this research are presented in Table 1.

**Table 1:** Types and Sources of Data in this Research

Variables	Symbol	Source	Expected Sign
<b>Dependent</b>			
Coffee green exports (In thousand 60kg bags)	EXP	ICO	
<b>Independent</b>			
Price level of export, the price level of USA GDPo in 2017 = 1	PRI	PWT	–
Gross domestic product	GDP	World Bank	+
Exchange rate	EXR	FAO	+
Human Capital Index	HCI	PWT	–
Trade globalization index	TGI	KoF	+
Political globalization index	PGI	KoF	+

Based on the availability of data, a sample of 24 coffee-producing countries was used in this research for the period 1990–2018, and this will form panel data with a total observation of 676. The twenty-four coffee-producing countries include Brazil, Burundi, Cameroon, Colombia, Costa Rica, Côte d'Ivoire, Democratic Republic of Congo, Ecuador, El Salvador, Ethiopia, Guatemala, Honduras, India, Indonesia, Kenya, Lao PDR, Mexico, Nicaragua, Peru, Rwanda, Tanzania, Thailand, Uganda, and Viet Nam. These countries were chosen because they have continuously exported large quantities of coffee since 1990.

### 3.2. Empirical Model

There are three static panel models: pooled ordinary last squared, fixed effects, and random effects. But panel data estimation has serial correlation and heteroscedasticity issues that lead to biased and inconsistent estimates, commonly known as endogeneity problems (Baltagi, 2005). Then, Arellano and Bover (1995) recommend the GMM may handle serial correlation and heteroscedasticity issues. The GMM produce estimator optimally exploits all the linear moment restrictions arising from the assumption of no serial correlation in the errors, lagged dependent variables, and no strictly exogenous variables (Arellano & Bond, 1991). But, the GMM estimator has a weak instrument, namely inefficient if the finite sample size (Blundell & Bond, 1998).

Then, the system GMM (sys-GMM) estimator was created to address a weakness in the GMM estimator. Their Monte Carlo simulations revealed that the system estimator is the most efficient. Sys-GMM employs two methods. First, it imposes an additional constraint on the starting conditions process, allowing a linear GMM estimator in a system of first-differenced and levels equations to make use of all possible moment conditions. Second, under specific conditions, the observed beginning values provide a system that can be estimated consistently using error components GLS (Blundell & Bond, 1998). The sys-GMM estimator is valid when there is no serial correlation of second-order (AR2 statistics) and the instruments used are valid (Sargan test) (Baltagi, 2005).

The first step of our research was testing the data's variable characteristics. It is important because the data has both cross-sectional and time-series characteristics. This research examined the variable characteristics of one outcome and six explanatory variables, and the results are presented in Table 1. There are two types of tests used to evaluate the stationarity of the variables, including Levin Lin Chu and the Augmented Dickey-Fuller unit root test method (Choi, 2001; Levin et al., 2002).

The function estimates the statistical relationship between coffee exports and the following economic and political conditions:

$$\text{EXP} = f(\text{PRI}, \text{GDP}, \text{EXR}, \text{HCI}, \text{TGI}, \text{PGI}) \quad (1)$$

where: EXP = coffee export (ton), PRI = Price level of export, GDP = Gross domestic product (millions of US\$), EXR = Exchange rate, HCI = Human capital index, TGI = Trade Globalization Index, PGI = Politic Globalization Index.

Then, we formulated into:

the static panel models

$$\text{EXP}_{it} = \beta_0 + \beta_1 \text{PRI}_{it} + \beta_2 \text{GDP}_{it} + \beta_3 \text{EXR}_{it} + \beta_4 \text{HCI}_{it} + \beta_5 \text{TGI}_{it} + \beta_6 \text{PGI}_{it} + \varepsilon_{it} \quad (2)$$

and dynamic panel model

$$\text{EXP}_{it} = \beta_0 + \beta_1 \text{EXP}_{it-1} + \beta_2 \text{PRI}_{it} + \beta_3 \text{GDP}_{it} + \beta_4 \text{EXR}_{it} + \beta_5 \text{HCI}_{it} + \beta_6 \text{TGI}_{it} + \beta_7 \text{PGI}_{it} + \varepsilon_{it} \quad (3)$$

$\beta_0$  = the constant term

$\beta_{1-7}$  = the coefficients for each variable

$\varepsilon_{it}$  = the error term is expressed

$i$  = countries

$t$  = time period (1985, 1986, ..., 2018)

In this research, we used two steps of sys-GMM analysis (Im et al., 2003). Two periods and three periods lagged values of the outcome variables as instrumental variables are used to avoid the correlation between  $\Delta \text{EXP}_{it-1}$  and  $\Delta \varepsilon_{it}$ , and this leads to the higher efficiency of estimates

$$\Delta \text{EXP}_{it} = \beta_0 + \beta_1 \text{EXP}_{it-1} + \beta_2 \Delta \text{PRI}_{it} + \beta_3 \Delta \text{GDP}_{it} + \beta_4 \Delta \text{EXR}_{it} + \beta_5 \Delta \text{HCI}_{it} + \beta_6 \Delta \text{TGI}_{it} + \beta_7 \Delta \text{PGI}_{it} + \varepsilon_{it} \quad (4)$$

## 4. Results and Discussion

According to Gujarati (2003), there are two hypotheses for unit root test;  $H_0$  denotes the presence of a unit root, whereas  $H_1$  denotes stationarity (no unit root). Based on the LLC and ADF unit root test method, exports quantity, price level of exports, gross domestic product, human capital index, trade globalization index, and politic globalization index were stationary variables at a level. But the remaining variable, exchange rate, was stationary at the first difference, as presented in Table 2. The existence of non-stationary variables can cause the phenomenon of spurious regression.

**Table 2:** Levin Lin Chu and Augmented Dickey-Fuller Unit Root Test Results for All Variables in the Model

Variables	LLC		ADF	
	At Level	At 1 <sup>st</sup> Dif	At Level	At 1 <sup>st</sup> Dif
EXP	-15.014*	–	-9.084*	–
PRI	-10.625**	–	-10.030***	–
GDP	-8.556**	–	-5.327***	–
EXR	0.466	-9.105***	3.404	-6.197***
HCI	-3.552*	–	-4.632***	–
TGI	-5.455**	–	-6.371***	–
PGI	-7.407**	–	-5.736***	–

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1.

Therefore, non-stationary variables at the level must be transformed into a stationary series through first differencing.

After the stationary test, we used a two-step of sys-GMM to analyze the data. The results of the sys-GMM analysis were reflected in Table 3. The results of the Sargan test analysis showed significance for two-step sys-GMM or the model was valid. Furthermore, the results of the Arellano–Bond test for AR (2) test showed an insignificant value, indicating that the two-step sys-GMM model experienced no serial correlation or the model was consistent.

The result of the two-step sys-GMM revealed that coffee export in producing countries was found to be positively and significantly affected by one period lagged of coffee export, gross domestic product, exchange rate, and political globalization index. However, coffee export in producing countries was negatively and significantly affected by the trade globalization index. Meanwhile, the price level of export and the human capital index has no significant effect on the dependent variable.

The coefficient of one period lagged export volume has a positive and significant effect on export volume in the following year. This result is not surprising, as previous research has shown that the lag dependent variable can explain a significant portion of the variation in the dependent variable. Eshetu and Mehare (2020) also revealed that the one-period lagged of a country’s coffee export has a positive and significant impact on its export. This indicates that the previous year’s coffee export growth in producing countries positively affected the current year’s performance. The implication is that a large number of coffee exports to trade partners in the previous year would increase the relationship and the producing country’s export performance in the future (Bekele & Mersha, 2019). Furthermore, coffee consumers in the world have habits that are slow to change. They are coffee drinkers by habit; thus, demand is unlikely to change in the short term, and every change will take some time to exert influences on export (Kohler & Ferjani, 2018).

**Table 3:** Regression Results of the Two-step Sys-GMM Estimation

Variables	Two-Step Sys-GMM	
	Coef.	Std Error
EXP <sub><i>it-1</i></sub>	0.892*** (11.177)	0.079
PRI	-0.166 (-0.972)	0.170
GDP	0.151** (2.660)	0.057
EXR	0.243** (2.949)	0.082
HCI	-0.020 (-0.217)	0.093
TGI	-0.713* (-2.178)	0.327
PGI	0.608* (2.180)	0.279
Constant	–	–
N	696	
Adj. R-Squared	–	
F-statistic:	–	
Arellano–Bond test for AR (1)	-1.972*	
Arellano–Bond test for AR (2)	0.959	
Sargan test	14.469***	

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1.

The coefficient of GDP was positive and statistically significant at a 1% level of significance as can be seen from the two-step GMM estimation result. The positive relationship between GDP and food export is also found in Jongwanich and Magtibay-Ramos (2009). Bekele and Mersha (2019) also noted that an increase in GDP might help a country’s coffee exports perform better. According to Abafita and Tadesse (2021), the higher the GDP of the producing country, the bigger the ability to produce/provide

coffee, and hence the higher the amount of trade or exports. Another reason is high GDP values are frequently used to provide subsidies to local industries in developing countries (all producing countries in this study are developing countries), including coffee. For example, export subsidies are given to coffee businesses in Kenya. A 10% export subsidy has much larger production impacts on coffee, which could reach around 26.3% in the short term. The policy option of export subsidies could lead to a substantial response to coffee exports, whether green (32.3% or more) or roasted (7.9% or more) (Aragie, 2018). Finally, although this is occurring in the energy sector, research findings from Jiang and Khan (2017) about the relationship between GDP and exports can also occur in the coffee industry. A rise in GDP will result in higher employee salaries and, as a result, higher labor productivity. This will eventually boost coffee's production and exports.

The influence of exchange rates on export is always a concern for agricultural commodity-exporting countries (Dang et al., 2020; Mehare & Edriss, 2013). According to this research, an increase in the exchange rate would boost coffee exports in producing countries and vice versa. This is because a currency depreciation will reduce the relative price of exports, encouraging producers to increase the volume of coffee exports (Alegwu et al., 2018). Another reason is that this makes domestic goods relatively cheaper, resulting in increased exports due to higher foreign demand. At the same time, producing countries will try to export as much coffee as possible to get a lot of foreign exchange revenues for government finance (Barros et al., 2019). On the other hand, when the exchange rate falls, most coffee farmers in producing countries stop producing, resulting in a significant reduction in coffee exports.

Regarding the coefficient of the Trade Globalization Index (TGI), the estimation result revealed the existence of a negative and significant association between TGI and the coffee export of the producing countries. The negative coefficient is certainly surprising because participation in economic globalization actually reduces coffee exports. Yet we expected the opposite and contrary to research about a positive impact of trade openness on Nigerian coffee export by Oko-Isu et al. (2019) and Ethiopian coffee export by Bekele and Mersha (2019). Likewise, trade agreements have proven to increase coffee exports. The EU-Mercosur FTA can increase Brazilian and Colombian coffee exports to the EU (Borchers et al., 2021; Cubillos et al., 2021). However, this can be explained by the fact that economic globalization increases rivalry among countries and can make coffee supply increase and causes prices to drop drastically. Finally, the ICO through the International Coffee Agreement (ICA) limits the coffee export volume of its member to keep prices artificially high (Jarvis, 2012). But at the same time, TGI and this agreement have led to the emergence of new producing

countries, especially in Africa, expanding their coffee globally and reducing the share of other countries' exports (Crumley, 2013). Countries such as Burundi and Rwanda only started to enter the world coffee market in the early '90s.

Another reason is the increase in product standards in importing countries after the implementation of TGI. The standards frequently have a direct impact on potential and existing exporters. The regulations can also influence consumers' tastes and preferences in the importing countries. However, this standard becomes trade-inhibitive at both the extensive and intensive margins of exports, indicating that the compliance level is inadequate and making market access difficult (Kareem, 2016). This is the reason why exports are being rejected at the importing country's borders to reduce coffee exports after the implementation of the TGI.

Furthermore, the type of coffee used in this research as the dependent variable is raw coffee. Meanwhile, several coffee-producing countries presently export high-quality, organic, and processed coffee to meet consumer demand in other countries (Johnson, 2010; Li & Sakamoto, 2021; Petit, 2007). For example, in 2006, the market for specialty coffees accounted for 14% of total Peruvian exports, a far higher percentage than is typical in coffee-growing countries (Tulet, 2010). Consumers are more concerned with high-quality coffee and are willing to pay more for products that guarantee quality (Lanfranchi et al., 2016). This is why, after the TGI, raw coffee exports (the dependent variable in this study) cannot compete in international markets and have decreased (Mahmood & Munir, 2018).

In contrast to TGI, the PGI coefficient was positive and significant to coffee export of the producing countries. PGI appears to have risen the world's attention to governance in producing countries. Then, these countries will develop a democratic atmosphere in which governments are less likely to impose additional taxes and control programs on agriculture to stimulate exports and appeal to farmers (Laiprakobsup, 2014). For example, despite the militaristic appearance of being, the Guatemalan government still respects local indigenous farmers – some of whom planted coffee – so that exports of this product can grow (Carey, 2019). In addition, coffee exports have benefited from political agreements between producing countries and other countries. For example, as a form of collaboration between the Peruvian government and France, the Solidarité avec l'Amérique Latine pour le Développement Autonome des Communautés (SALDAC) helps farmers in Peru. One of SALDAC's objectives is to help farmers on the margins of the coffee supply chain by encouraging exports to France. SALDAC guarantees the price and selling of already committed amounts and funding a part of the harvest (Tulet, 2010).

Coffee exports in producing countries were unaffected by price changes. Three factors contribute to this. First, during the liberalization period, farmers were encouraged to continue

exporting even as coffee prices dropped. Despite the depressed world coffee market, countries like Uganda continue to produce and export large quantities of robusta coffee (Bolwig & You, 2007). Meanwhile, transnational firms are starting to invest massively in coffee-producing countries. They take over the farmers' tasks and continue to produce, regardless of the price in the international market (Crumley, 2013). Second, some farmers in producing countries have obtained Fair Trade certificates or export standards set by importing countries. The demand for this type of coffee will not be disturbed even though coffee prices on the global market fluctuate (Ut-Tha et al., 2021). For example, Fair Trade certified coffee farmers and cooperatives in Nicaragua can sell their products at the same price. If the world coffee market price drop, they will be protected from price depression through the FLO standard for minimum prices (Dragusanu et al., 2014; Valkila & Nygren, 2010). Certification also helps farmers to gain social and environmental benefits (Kangile et al., 2021). Last, coffee demand in other countries is typically steady and changes income levels in consumer countries. They consider coffee as an essential element of their life (Utama et al., 2021). For example, in Messina (Italy), coffee drinkers are still willing to spend more than 10 euros a month for their favorite coffee quality during the European economic crisis (Lanfranchi et al., 2016). The global economy has improved steadily in recent decades. Many coffee drinkers are experiencing a rise in their income. This encourages them to purchase coffee, despite its higher cost (Gonzalez-Perez & Gutierrez-Viana, 2012).

The human capital index in coffee-producing countries did not appear to have an impact on exports. At the same time, the development of farmer education and its organizations is a critical aspect to boost agricultural livelihoods, enhance the skills and knowledge of workers, and modernize the smallholder farming system in international trade and social development investment (Hussen & Geleta, 2021; Nitescu & Murgu, 2020; Prieto & Castañeda Guzmán, 2019; Sanida et al., 2016). The education gap in coffee-producing countries appears to be very wide. Good education is only available in urban areas, ensuring the population has a high quality of human capital. Meanwhile, most coffee farmers live in rural areas and find it difficult to access good education (Hoffmann et al., 2019; Kanyamurwa et al., 2013). Hence, they are uneducated and challenging to innovate (Tsai et al., 2010). This results in a high failure rate of counseling education, low development of agricultural practices, and ineffective agriculture institutions (Poole & Donovan, 2014; Singh & Hensel, 2014). Finally, education in coffee-producing countries as a whole has no impact on exports.

## 5. Conclusion and Limitation

We investigated the effects of globalization on coffee exports in 24 producing countries in this research.

The findings revealed that these countries' coffee exports were boosted by lagged exports, GDP, and exchange rates. Meanwhile, neither the price level of exports nor the human capital index did not significantly impact. Surprisingly, the trade globalization index has a negative impact on coffee exports. This demonstrates the unpreparedness of coffee-producing countries to face tough competition in trade globalization. The last variable, the political globalization index, has a positive impact on exports. It seems that the atmosphere of democracy in producing countries is increasing along with the opening up of world politics. As a result, governments in these countries issued a policy to support coffee exports aggressively.

As noted in our results, we propose that, **First**, it is crucial to have a farm policy to boost farmers' income and standard of life (Lee, 2020). One of them is joining an international coffee organization. Being a member of the ICO, which brings together exporting and importing countries to solve difficulties in the global coffee industry, would be beneficial for lobbying and international collaboration (Murindahabi et al., 2019). Producers will also benefit from participating in an international coffee organization, at least getting higher prices and moving into more profitable markets. This is an incentive that motivates them to improve their outcomes (Coe, 2006). The ICO successfully decreased coffee overproduction, stopped price declines, and implemented diversification and technology (Johnson, 2010). In addition, domestic support policies are required, such as using GDP to build a good logistical infrastructure (just in time), easy access to financing and credit, and research and development; and strengthening collaboration between farmers, government, supply chain partners, and third sector organizations to make long-term contracts and technical support (Gonzalez-Perez & Gutierrez-Viana, 2012; Lemeilleur et al., 2020; Petit, 2007; Poole & Donovan, 2014; Wahyuningsih et al., 2020). **Second**, exporters must ensure or hedge against the risk of exchange rates fluctuation. Forward-looking market trading has evolved in recent years. This has proven to give producers pricing certainty and help them avoid huge losses due to market fluctuations. Babu and Muniyappa (2021) showed co-integration between coffee futures and spot markets, implying that both markets have a common stochastic factor and react to the same set of market shocks. **Third**, coffee-producing countries must prepare themselves to face economic globalization by building strong farmer organizations. Members of these institutions must be given various forms of education and counseling, especially good agricultural practice and technology. Farmers must be encouraged to plant high-quality coffee and ensure its consistency (Petit, 2007). Farmers should also be taught counseling about sustainable systems for coffee production

(Boddey et al., 2003). Technology must also be used by farmers in product processing and packaging, as well as vertical integration (Donovan et al., 2019; Jongwanich & Magtibay-Ramos, 2009).

As researchers, we believe that this research still has many limitations. This study did not include many social variables as determinant factors of coffee exports. Governments and international organizations can fail to implement various programs and policies due to a lack of understanding of social characteristics. Further research needs to involve many researchers from various fields to better understand the globalization perspective. According to our findings, trade globalization has a negative impact on coffee exports, but political globalization has a beneficial impact. However, this finding differs from previous research that used smaller country samples.

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