Cendekia Niaga
Journal of Trade Development and Studies
p-ISSN 2548-3137, e-ISSN 2548-3145

Do Export Promotion Agencies Matter? Evidence from Indonesia's Export to Main and Non-Traditional Markets

Budiono Rahmat[1]

[1)] Directorate of Import, Ministry of Trade Indonesia

Email : budiono.rahmat@kemendag.go.id

Abstrak

Pertumbuhan ekonomi Indonesia menghadapi tantangan yang semakin kompleks, terutama akibat perlambatan pertumbuhan ekspor yang dipengaruhi oleh volatilitas harga komoditas, ketegangan perdagangan global, dan pandemi COVID-19. Sebagai respons, Indonesia memanfaatkan Perwakilan Perdagangan sebagai Badan Promosi Ekspor (*Export Promotion Agencies* atau EPAs) dalam mendukung strategi pertumbuhan berbasis ekspor. Penelitian ini menganalisis efektivitas EPAs dalam meningkatkan ekspor sektor pertanian dan manufaktur Indonesia, khususnya pada pasar utama dan pasar non-tradisional. Penelitian menggunakan data panel terhadap 38 negara mitra selama periode 2000–2021 dengan pendekatan *gravity model* yang diestimasi menggunakan metode *Poisson Pseudo-Maximum Likelihood* (PPML). Analisis juga memasukkan beberapa variabel kontrol, seperti Penanaman Modal Asing (*Foreign Direct Investment*), Produk Domestik Bruto (PDB) negara mitra, nilai tukar riil, jarak geografis, dan Perjanjian Perdagangan Bebas (*Free Trade Agreements* atau FTAs). Hasil penelitian menunjukkan bahwa EPAs secara umum memberikan pengaruh positif dan signifikan terhadap ekspor Indonesia, meskipun besarnya pengaruh berbeda antar sektor dan kelompok tujuan pasar ekspor. Dampak EPAs paling kuat ditemukan pada ekspor pertanian ke pasar utama serta ekspor manufaktur ke pasar non-tradisional. Sementara itu, pengaruh FTAs cenderung lebih terbatas dan kurang konsisten antar spesifikasi model, yang mengindikasikan bahwa mekanisme promosi ekspor secara institusional dapat berperan lebih langsung dalam memfasilitasi akses pasar dan mengurangi hambatan informasi. Sejalan dengan teori *gravity model*, PDB negara mitra berpengaruh positif terhadap ekspor, sedangkan jarak geografis berdampak negatif terhadap arus perdagangan. Secara keseluruhan, temuan ini menegaskan pentingnya EPAs sebagai instrumen strategis dalam diversifikasi ekspor dan perluasan pasar, khususnya di pasar berkembang dan pasar ekspor yang belum mapan. Penelitian ini juga menekankan perlunya kebijakan promosi ekspor yang lebih terarah sesuai karakteristik sektor dan kondisi pasar tujuan.

Kata kunci: Badan Promosi Ekspor, Model gravitasi, Pasar non-tradisional, PPML

Abstract

Indonesia's economic growth faces persistent challenges, particularly due to the slowdown in export growth caused by commodity price volatility, global trade tensions, and the COVID-19 pandemic. In response, Indonesia has utilized Export Promotion Agencies (EPAs) as part of its export-led growth strategy. This study examines the effectiveness of EPAs in promoting Indonesia's agricultural and manufacturing exports, particularly in main and non-traditional export markets. Using a panel dataset covering 38 partner countries over the period 2000–2021, the study employs a gravity model estimated through the Poisson Pseudo-Maximum Likelihood (PPML) approach. The

analysis incorporates several control variables, including Foreign Direct Investment (FDI), partner-country GDP, real exchange rates, geographical distance, and Free Trade Agreements (FTAs). The findings indicate that EPAs generally exert a positive and statistically significant effect on Indonesia's exports, although the magnitude of the effects varies across sectors and market groups. The strongest EPA effects are observed in agricultural exports to main markets and manufacturing exports to non-traditional markets. Meanwhile, the effects of FTAs appear relatively limited and less consistent across model specifications, suggesting that institutional export promotion mechanisms may play a more direct role in facilitating market access and reducing informational barriers. Consistent with the gravity model framework, partner-country GDP positively affects exports, whereas geographical distance negatively influences trade flows. Overall, the results highlight the importance of EPAs as strategic instruments for export diversification and market expansion, particularly in emerging and less-established export markets. The study also emphasizes the need for more targeted export promotion policies tailored to sectoral characteristics and destination-market conditions.

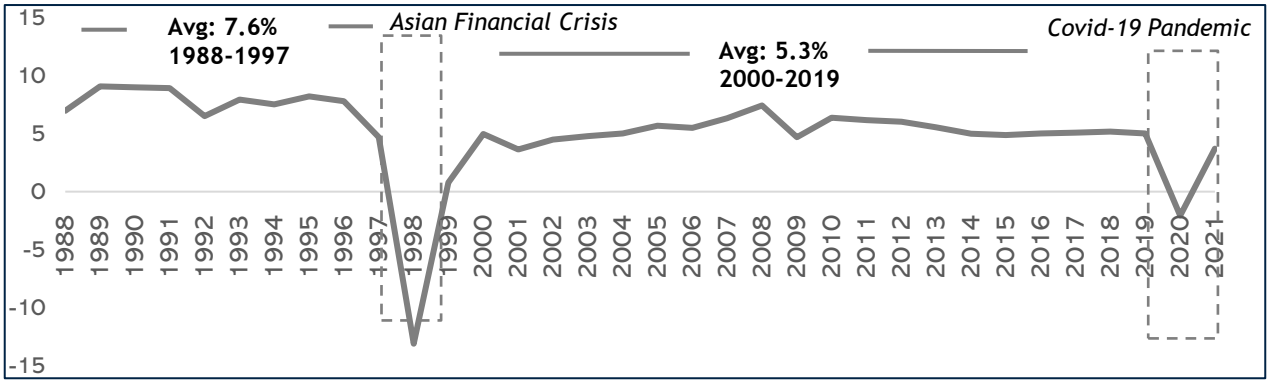
Keywords: Export promotion agencies, Gravity model, Non-traditional market, PPML

INTRODUCTION

Indonesia's current economic growth rate has been slower than the period before the Asian Financial Crisis. The annual growth rate has experienced only 5.0 to 5.5 percent on average in 2000 to 2020 which declined from the pre-Asian Financial Crisis period was 7.6 percent from 1988 to 1997 (see Figure 1). The growth rate remains insufficient for Indonesia to achieve as a high-income status country. The government has continuously maintained policies to accelerate the economic growth through promoting higher export growth. While exports remain as a key driver of economic growth, their growth has shown signs of deceleration over recent years.

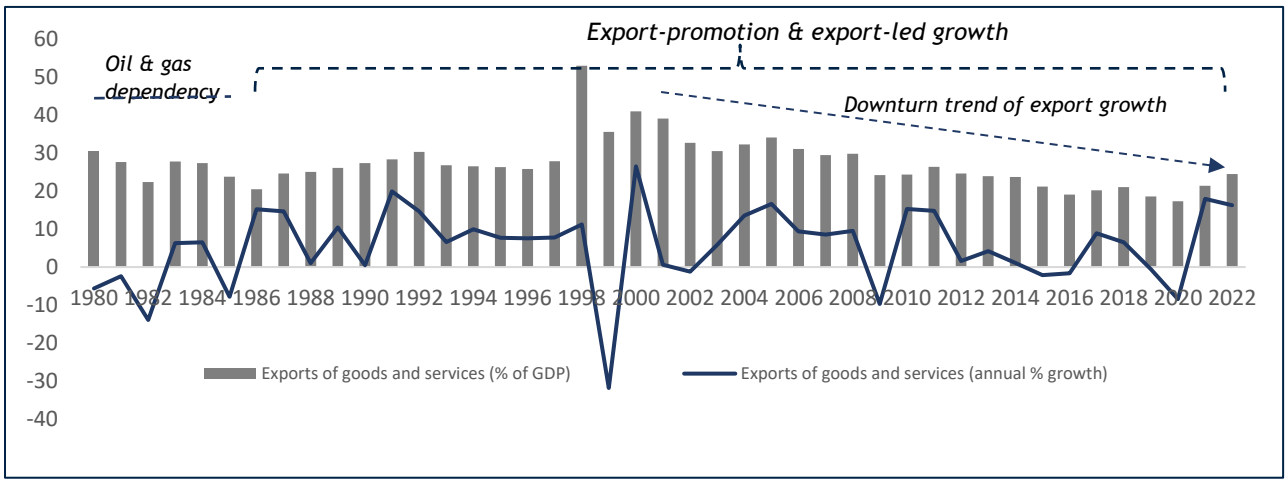
In recent years, Indonesia's share of total export to Gross Domestic Product (GDP) remains high, which indicates that exports continue to serve as one of Indonesia's sources of growth. The share of Indonesia's total export to GDP was about 24.49 percent in 2022 (see Figure 2). However, the export performance has continuously decelerated over the past decade. The export growth has been declining in the last 20 years, from 26.48 percent in 2000 to only 16.38 percent in 2022. The weakening of global commodity prices, trade and geopolitical tensions, and the Covid-19 pandemic have contributed to the slowdown in export performance. Moreover, manufacturing competitiveness and the continued reliance on a narrow range of export commodities have been identified as key contributors to the stagnation of Indonesia's export growth (Bappenas 2020).

Figure 1. The Annual GDP Growth of Indonesia, 1988-2021



Source: Statistics Indonesia (2023)

Figure 2. Trends in Export Growth of Indonesia, 1988-2022

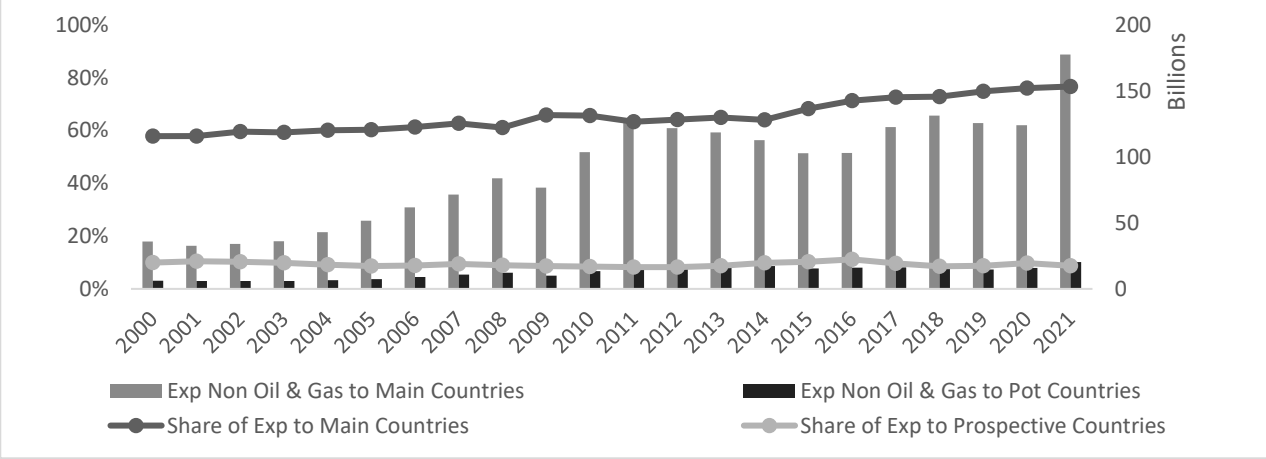


Source: World Bank (2023)

Indonesia's export structure is heavily concentrated in the agriculture and manufacturing sectors. In 2022, these sectors accounted for approximately 94% of total goods exports, with agriculture contributing 2.6% and manufacturing comprising 73.2%, according to data from the Statistics Indonesia (2023). While this represents a slight decline from the 2018 figures, the overall export composition remains dominated by manufacturing, with agriculture continuing to play a significant role. Figure 3 illustrates Indonesia's export shares to both main and non-traditional markets. The substantial disparity between these two groups highlights a significant untapped potential in non-traditional markets.

This gap signals an opportunity for Indonesia to broaden its export base by intensifying efforts to penetrate emerging or less-explored markets. Since 1982, Indonesia has shifted its trade strategy toward export promotion and an export-led growth model, marking a shift from the import substitution approach that had become increasingly unsustainable due to falling oil prices and declining revenues from oil and gas exports. As part of this transition, the government established Export Promotion Agencies (EPAs), with one of the earliest examples being the Indonesian Trade Promotion Center (ITPC), which was launched in July 1982 and operates in partner countries with which Indonesia maintains diplomatic or trade relations.

Figure 3. Share of Indonesia's exports to main and non-traditional markets



Source: UN COMTRADE (2023)

These agencies were created to support deeper market access, build networks for international trade cooperation, assist domestic businesses in navigating export processes, and promote Indonesian products abroad. Although the Asian Financial Crisis in 1998 led to a temporary suspension of some ITPC operations, activities resumed in 2000 with the reopening of offices in nine countries. As of August 2023, Indonesia maintains an extensive global trade promotion network consisting of 23 trade attachés and 19 ITPC offices strategically located across 31 key partner countries.

Following the year 2000, Indonesia experienced a steady rise in non-oil and gas export growth until the global financial crisis triggered a sharp contraction in 2009. Between 2010 and 2020, export performance in this sector became increasingly volatile, with a marked deceleration observed from 2012 onward. In response, the Indonesian government has not only intensified export promotion efforts but also placed greater emphasis on diversifying both export products and destination markets. As outlined in the Ministry of Trade's strategic roadmap, these initiatives include the expanding outreach to 20 non-traditional markets classified as prospective markets or outside the main markets.

The persistent decline in Indonesia's export performance particularly between 2010 and 2020 has brought renewed attention to the effectiveness of the country's Export Promotion Agencies (EPAs). This downward trend has been especially evident in key export sectors and main destination markets, often coinciding with falling global commodity prices. Despite these challenges, prior studies such as Hayakawa et al. (2014) suggested that EPAs can significantly enhance export-led growth, with stronger impacts observed for manufactured goods relative to primary commodities. The establishment of overseas representative offices, including EPAs, forms a central component of Indonesia's strategy to facilitate international market access for domestic producers and promoting export. Therefore, this study examines the extent to which Indonesia's EPAs have contributed to export performance in the agriculture and manufacturing sectors, with a particular focus on both main and non-traditional markets export destination.

LITERATURE REVIEW

The establishment of overseas representative offices, commonly referred to as Export Promotion Agencies (EPAs), represents a strategic policy instrument aimed at advancing export-led growth by enhancing export performance and addressing persistent trade balance deficits. Historically, Finland was among the first countries to adopt this approach, setting up foreign trade offices as early as 1919 in response to volatile trade flows. The initiative was part of a broader effort to diversify economic activities and reduce reliance on oil as the primary driver of output, exports, and fiscal revenues. Since then, the model has been widely adopted by various nations seeking similar economic resilience. In the context of Indonesia, empirical evidence from Ajija et al. (2021) indicates that the presence of EPAs, particularly the Indonesian Trade Promotion Centers (ITPCs), has contributed to a 22 percent increase in the value of non-oil and gas exports.

Further support for the effectiveness of EPAs is provided by Hayakawa et al. (2014), who found that the presence of such agencies has a significant positive effect on export performance, with a notably greater impact on manufactured goods compared to non-manufactured ones. The findings also suggested that EPAs may generate export-enhancing effects comparable to certain trade policy instruments, including FTAs, depending on sectoral and market characteristics. A broader body of literature similarly affirms the export-enhancing role of promotional institutions. For instance, Alvarez and Crespi (2000), using plant-level data from Chile, demonstrated that public export promotion tools significantly improve both the value of exports and the diversification of export destinations. Martincus and Carballo (2008), drawing on firm-level data from Peru, also found that engagement in export promotion activities is positively associated with expansion in both markets and product scope. Lederman et al. (2010), through a comprehensive survey spanning 103 developed and developing countries, reaffirmed these findings by showing

a strong and consistent link between EPA operations and export growth. Additionally, Gil-Pareja et al. (2008), employing a gravity model framework, revealed that Spanish regional trade offices abroad contribute more substantially to export growth than traditional diplomatic missions such as embassies and consulates.

The gravity model has become a fundamental framework in international trade analysis, drawing conceptual inspiration from Newton's law of gravity. Originally introduced by Tinbergen (1962), the model substitutes the concept of mass with gross domestic product (GDP) and interprets distance as a proxy for trade costs, including geographic distance between capital cities, tariff barriers, and other frictions influencing trade. This framework effectively captures trade interactions, mirroring the physical forces of attraction between countries.

A growing body of literature has applied the gravity model to examine the effectiveness of export promotion institutions. For example, Martincus et al. (2010) employed a sector-specific gravity model to assess how export promotion agencies influence the extensive margin of exports, conducting the analysis at the 2-digit SITC industry level. This disaggregated approach helps mitigate endogeneity concerns often present in aggregate trade models. One key issue is reverse causality, where countries may choose to establish overseas trade offices in markets where exports are already strong (Rose, 2007). However, such bias is less pronounced in sectoral-level analysis, as it is unlikely that trade promotion agencies would base the decision to open offices abroad on performance in specific industries alone.

Furthermore, Indonesia's Ministry of Trade continues to prioritize export expansion and market diversification as part of its national trade strategy. The Ministry's Strategic Plan 2025–2029, stipulated under Minister of Trade Regulation No. 34/2025, emphasizes the strengthening of export performance, international market expansion, and export diversification to enhance Indonesia's global trade competitiveness.

In constructing the country classification used in this study, the operational categorization of main and non-traditional export markets refers to the Ministry of Trade Strategic Plan 2020–2024 under Minister of Trade Regulation No. 46/2020, which explicitly identified priority export destination countries. The framework classified main markets as countries with the highest non-oil and gas export values, while non-traditional markets comprised countries outside the main-market category selected using a composite index based on indicators such as partner-country import values, import growth trends, Indonesia's historical export performance, product contribution shares, and Indonesia's market share trends during the 2014–2018 period. The use of this classification remains consistent with the broader export expansion and market diversification objectives maintained in the updated 2025–2029 Strategic Plan.

DATA AND METHODOLOGY

This study investigates the effect of establishing Export Promotion Agencies (EPAs) on Indonesia's agricultural and manufacturing exports, with a particular focus on both main and non-traditional export destination markets. The analysis utilizes a panel dataset covering a 22-year period from 2000 to 2021. It includes 38 countries, comprising 18 main export markets and 20 non-traditional markets, as identified in the Ministry of Trade's strategic planning framework. The selection of these countries is guided by export policy priorities, focusing on markets with significant trade volumes and growth potential, based on export and import performance indicators between 2014 and 2018.

The export data used in this study excludes oil and gas commodities, specifically crude oil (SITC 333), refined petroleum products (SITC 334 and 335), and natural gas (SITC 34). The dataset consists of Indonesia's non-oil and gas exports, disaggregated at the 3-digit level of the Standard International Trade Classification (SITC), allowing for a more detailed sectoral analysis. To maintain consistency and focus, the core analysis draws on data from 2000 to 2021 across the selected countries, incorporating key explanatory variables drawn from previous literature.

A summary of the country sample and variable specifications is presented in Table 1.

This study employs the gravity model of trade using the Poisson Pseudo-Maximum Likelihood (PPML) estimation technique to assess the impact of Export Promotion Agencies (EPAs) on Indonesia's agricultural and manufacturing exports. The selection of PPML is guided by its methodological advantages, as highlighted by Shepherd et al. (2006), who recommended it for policy-oriented gravity model applications due to its robustness and interpretability. The PPML estimator offers several desirable properties. Notably, it remains consistent in the presence of high-dimensional fixed effects, which is essential for gravity models that require controlling unobserved heterogeneity across exporters and importers. Another key advantage is its ability to retain zero trade observations, a common feature in disaggregated trade datasets, thereby avoiding the sample selection bias that can arise when such values are excluded, as in traditional OLS estimations. Furthermore, the interpretation of coefficients remains intuitive: variables expressed in logarithmic form yield elasticities, while those in levels yield semi-elasticities, much like in linear models.

These features make PPML particularly well-suited for examining bilateral trade flows in a theoretically consistent and empirically robust manner, especially when analyzing both extensive and intensive margins of trade.
The variables such as the value of agricultural and manufacturing exports, Foreign Direct Investment (FDI), and the nominal GDP of partner countries are expressed in U.S. dollars. To ensure consistency and reduce heteroskedasticity, these variables, along with real exchange rates and geographical distance, are transformed using the natural logarithm. A summary of the variable definitions and their descriptive statistics is presented in Table 2 and Table 3, respectively.

The logarithmic transformation of the data in Table 3 reveals that, on average, Indonesia's exports of agricultural and manufacturing products are higher to main export destinations compared to non-traditional markets. Furthermore, the descriptive statistics highlight a notable disparity in FDI inflows from non-traditional markets, suggesting a significant investment gap between main and non-traditional trading partners.

Table 1. List of observation countries

Main Destination Markets		Non-Traditional Markets	
EPA Accreditation	Non-EPA	EPA Accreditation	Non-EPA
Australia	Bangladesh	Belgium	Algeria
China	Pakistan	Brazil	Argentina
Germany		Canada	Myanmar
India		Chile	Poland
Italy		Egypt	Sweden
Japan		France	
Malaysia		Hungary	
Netherland		Mexico	
Philippines		Nigeria	
Saudi Arabia		Russian Federation	
Singapore		South Africa	
South Korea		Switzerland	
Spain		Turkey	
Thailand		Uni Arab Emirate	
United States		United Kingdom	
Vietnam			

Source: The Strategic Planning Document, Ministry of Trade Indonesia

Table 2. Variable names and definitions

Variable Names	Definition	Source
Aggregate, Agriculture and Manufacturing Exports	the total value of Indonesia's agricultural and manufacturing exports to partner countries, excluding oil and gas commodities (SITC 333, SITC 334, SITC 335, SITC 34)	UN COMTRADE
Foreign Direct Investment	FDI inflows from Indonesia's export partner countries.	Ministry of Investment Indonesia
GDP Nominal	The Gross Domestic Product (GDP) of each export destination country, representing the market value of all final goods and services produced within their economies.	World Bank
Real Exchange Rate	The real bilateral exchange rate is constructed by multiplying Indonesia's nominal exchange rate against each export destination country by the partner country's Consumer Price Index (CPI), and then dividing by Indonesia's CPI.	International Financial Statistic IMF
Geographical Distance	Distance distance between the capital cities of Indonesia and each export partner country.	CEPII
Free Trade Agreements	Free Trade Agreement (FTA) between Indonesia and each export destination country (signed and in effect).	ADB
Export Promotion Agencies (EPAs)	The export promotion agencies of abroad which consists of Indonesia Trade Promotion Center (ITPC) and Trade Attache Office.	Ministry of Trade Indonesia

Despite the relatively low FDI inflows from non-traditional markets, the average GDP of these countries is considerably high, suggesting substantial market potential for Indonesia's export products. This indicates that, in terms of market size, these economies represent viable targets for export expansion. However, one notable challenge is that the average geographical distance to these non-traditional markets is greater than that to Indonesia's main export destinations, potentially increasing trade costs and logistical barriers.

The empirical analysis in this study is structured into three main parts, encompassing a total of seven gravity model estimations. The first set of models examines trade flows between Indonesia and all 38 observed countries, covering both agriculture and manufacturing exports. The second set focuses specifically on 18 main export destination countries, while the third analyzes Indonesia's trade performance with 20 non-traditional markets. Descriptive statistics related to the binary variables for Free Trade Agreements (FTA) and Export Promotion Agencies (EPAs) are presented in Table 4. Among the 38 countries analyzed, only 10 (approximately 26%) share an active FTA with Indonesia, while the remaining 28 countries (74%) do not. In contrast, Indonesia maintains EPAs in 31 countries (82%), with only 7 countries (18%) lacking such representation. Within the subset of main export destinations, 8 countries (44%) have FTAs with Indonesia, whereas in the non-traditional markets group, only 2 country (10%) holds an FTA. Regarding EPAs, 16 out of the 18 main markets (89%) host Indonesian EPAs, while 15 out of 20 non-traditional markets (75%) are covered by Indonesia's trade promotion offices.

The empirical model applied in this study builds upon the frameworks developed by Ajija (2021) and Hayakawa et al. (2014), both of which utilize gravity models with panel data disaggregated at the sectoral level. This research extends their approach by employing the Poisson Pseudo-Maximum Likelihood (PPML) estimator, as recommended by Silva and Tenreyro (2006), to effectively handle zero trade flows and correct for heteroscedasticity, common issues in trade data analysis.

Table 3. The variables descriptive statistics

Variable	Units Variable	n	Mean	Min	Max	Std. Dev
All Countries						
All Non-Oil and Gas Exports	USD Million	836	2,715.87	21.10	50,049.65	4,443.01
Agriculture Exports	USD Million	836	207.42	0.28	3,504.90	398.95
Manufacturing Exports	USD Million	836	2,508.45	20.50	46,871.52	4,113.40
Distance	Kilo meter	836	8,952.41	886.14	16,863.46	4,475.09
Foreign Direct Investment	USD Million	836	350.92	0.00	9,779.11	1,106.18
GDP	USD Billion	836	1,489.98	6.11	23,315.10	2,978.66
Real Exchange Rate	-	836	611.41	0.29	25,438.37	3,236.02
Export Promotion Agency	Dummy [0,1]	836	0.82	0.00	1.00	0.39
FTA	Dummy [0,1]	836	0.03	0.00	1.00	0.16
Main Countries						
Agriculture Exports	USD Million	396	387.35	1.52	3,504.90	521.95
Manufacturing Exports	USD Million	396	4,657.03	101.87	46,871.52	5,168.28
Distance	Kilo meter	396	6,400.74	886.14	16,371.12	4,151.31
Foreign Direct Investment	USD Million	396	683.46	0	9,779.11	521.95
GDP	USD Billion	396	2,310.10	31.17	23,315.10	4,097.67
Real Exchange Rate	-	396	1,180.90	0.61	25,438.37	4,631.53
Export Promotion Agency	Dummy [0,1]	396	0.89	0	1.00	0.31
FTA	Dummy [0,1]	396	0.05	0	1.00	0.21
Non-Traditional Countries						
Agriculture Exports	USD Million	440	45.48	0.28	205.92	45.99
Manufacturing Exports	USD Million	440	574.74	20.50	2,419.91	486.72
Distance	Kilo meter	440	11,248.92	2,803.96	16,863.46	3,380.22
Foreign Direct Investment	USD Million	440	51.63	0.00	2,505.42	195.42
GDP	USD Billion	440	751.88	6.11	3,122.48	784.28
Real Exchange Rate	-	440	98.87	0.29	1,689.05	247.01
Export Promotion Agency	Dummy [0,1]	440	0.75	0.00	1.00	0.43
FTA	Dummy [0,1]	440	0.01	0.00	1.00	0.08

Source: Author's calculations

Table 4. The dummy variables descriptive statistics

Variable	Frequency 1		Frequency 0	
	Frequency	Percentage	Frequency	Percentage
All Countries				
Free Trade Agreement	10	26%	28	74%
Indonesia EPAs	31	82%	7	18%
Main Countries				
Free Trade Agreement	8	44%	10	56%
Indonesia EPAs	16	89%	2	11%
Non-Traditional Countries				
Free Trade Agreement	2	10%	18	90%
Indonesia EPAs	15	75%	5	25%

Source: Author's calculations. The reported frequencies reflect the number of partner countries covered by EPAs and FTAs within the sample.

Moreover, the use of sector-specific export data serves to mitigate potential endogeneity bias, particularly reverse causality, where countries might be more inclined to establish EPAs in markets with already substantial aggregate export volumes. As noted by Martincus et al. (2010), estimating trade flows at the sectoral level reduces the likelihood of such bias, as decisions to establish trade offices are

less likely to be based on exports of specific sectors.

Accordingly, the empirical model specification employed in this study is as follows:

$$exp_{ijt} = \beta_0 + \beta_1 epa_{establish_{ijt-1}} + \beta_2 lndist_{ij} + \beta_3 lnfdi_{jit} + \beta_4 lngdp_{jt} + \beta_5 lnrer_{ijt} + \beta_6 fta_{ijt-1} + \varepsilon_{ijt} \quad (1)$$

Equation (1) presents the main model specification employed in this study, where the dependent variable, exp_{ijt}, denotes the value of Indonesia's exports to partner country j in year t, disaggregated into sector i (agriculture and manufacturing). Export data are classified according to the Standard International Trade Classification (SITC), with exports grouped into agricultural and manufacturing sectors, excluding oil and gas commodities (SITC 333, 334, 335, and 34).

The key explanatory variable of interest is $epa_{establish_{ijt-1}}$ a binary indicator equal to 1 if Indonesia has established an Export Promotion Agency (EPA) in partner country j during year t, and 0 otherwise. The variable is lagged by one period to account for the delayed effect of export promotion activities, as the impact of institutional support and market facilitation may not be immediately reflected in export performance. The model also includes standard gravity variables such as $lndist_{ij}$, the logarithm of the bilateral distance between Indonesia and country j and $lngdp_{jt}$, the logarithm of the nominal GDP of the partner country in year t. Additional control variables include $lnfdi_{jit}$, representing the logarithm of Foreign Direct Investment inflows from country j to Indonesia in year t, $lnrer_{ijt}$ denoting the logarithm of the real bilateral exchange rate between Indonesia and country j, and fta_{ijt-1} , a dummy variable indicating the presence of a trade agreement between Indonesia and country j, assigned a value of 1 if the agreement has been signed and entered into force, and 0 otherwise. The FTA variable is lagged by one period to capture the delayed trade effects of agreement implementation, as adjustments in trade flows may require time following the enactment of trade agreements. The model also includes an error term ε_t.

The use of panel data in gravity model estimations often introduces econometric challenges such as heteroskedasticity and autocorrelation. Heteroskedasticity arises when the variance of the error terms differs across cross-sectional units or changes over time, while autocorrelation occurs when the residuals are correlated across time periods within the same unit due to the time-series structure of the data. If left uncorrected, these issues can lead to biased standard errors, undermining the validity of hypothesis testing and reducing the reliability of coefficient estimates. As a result, conventional estimation methods such as Ordinary Least Squares (OLS) are no longer suitable in this context (Wooldridge, 2013).

While it is possible to apply robust standard errors to mitigate heteroskedasticity in OLS models, this adjustment does not fully resolve the problem. Bertrand et al. (2004) argue that, although coefficient estimates may remain unbiased, their statistical significance can be severely distorted. Hansen (2007) further cautions that fixed effects (FE) estimators may be biased in the presence of serial correlation and group-level dynamics. Similarly, Hausman and Kuersteiner (2008) note that neither fixed effects estimators nor difference-in-differences approaches adequately correct for autocorrelation in panel settings. These concerns reinforce the importance of adopting more robust estimation techniques, such as Poisson Pseudo-Maximum Likelihood (PPML), which are better suited to address these data complexities in gravity model applications. Standard errors are clustered at the country level to account for heteroskedasticity and within-country serial correlation, thereby improving the reliability of statistical inference.

Preliminary diagnostic tests reveal that the panel data used in this study exhibit both heteroskedasticity and autocorrelation. The Wald test for heteroskedasticity yields a p-value of 0.0000, and the Wooldridge test for

autocorrelation also returns a p-value of 0.0000, both of which are below the 1% significance threshold. These results confirm the presence of econometric issues that violate the assumptions underlying Ordinary Least Squares (OLS) regression. Accordingly, the study adopts the Poisson Pseudo-Maximum Likelihood (PPML) estimation method, which is well-suited for addressing heteroskedasticity, accommodating zero trade flows, and providing consistent estimates under the structural characteristics of gravity models.

To assess the robustness of the findings, alternative estimation methods, including Ordinary Least Squares (OLS), Fixed Effects (FE), and the Hausman–Taylor estimator, were also examined. The results indicate that OLS estimation suffers from several econometric limitations, including heteroskedasticity and autocorrelation, which may undermine statistical inference. Meanwhile, the FE specification leads to the omission of time-invariant variables due to collinearity issues, while the Hausman–Taylor estimator is less suitable in the presence of zero trade flows commonly observed in non-traditional markets. These considerations support the use of the PPML approach as the main estimation method in this study.

RESULT AND DISCUSSION

The results of the gravity model estimations using the Poisson Pseudo-Maximum Likelihood (PPML) approach are presented in Table 5. Overall, the presence of Export Promotion Agencies (EPAs) exhibits a positive effect on Indonesia's non-oil and gas exports across most model specifications, although the magnitude and statistical significance vary across sectors and market groups. In the full sample of 38 countries, the establishment of an EPA is associated with an increase of approximately 20% in total exports. The estimated EPA effects are particularly pronounced in agriculture exports to main markets and manufacturing exports to non-traditional markets, suggesting that export promotion activities may contribute differently depending on sectoral and market characteristics. When disaggregated by sector, the estimated EPA effects remain positive for both agriculture and manufacturing exports, although the magnitude differs across market groups. In the full sample, the presence of an EPA is associated with approximately 33% higher agricultural exports and 19% higher manufacturing exports.

The strongest EPA effects are observed in agriculture exports to main markets and manufacturing exports to non-traditional markets, suggesting that export promotion activities may be particularly effective in supporting sector-specific market expansion strategies. However, the EPA coefficient for agriculture exports to non-traditional markets is not statistically significant, indicating that the effectiveness of export promotion may vary depending on market characteristics and sectoral conditions. Regarding the control variables, FDI inflows from partner countries generally exhibit a positive coefficient with Indonesia's exports, although the significance levels vary across specifications. This finding suggests the presence of complementarities between foreign investment and trade activities. The real exchange rate also demonstrates heterogeneous effects across sectors and market groups, implying differing degrees of export responsiveness to currency movements.

Meanwhile, the impact of FTAs appears relatively limited and inconsistent across specifications. While FTAs show a positive effect in several models, statistically significant effects are observed only in agriculture exports to main markets. This finding may indicate that formal trade agreements alone are insufficient to uniformly stimulate export growth across sectors and destinations. Consistent with the gravity model framework, distance exerts a negative and statistically significant effect on exports, reflecting the role of transportation and transaction costs in international trade.

Conversely, the GDP of partner countries consistently shows a positive influence, highlighting the importance of market size and purchasing power in driving Indonesia's export

performance. Overall, these findings are broadly aligned with previous studies, including Kang, Gil-Pareja, and Mijiyawa, which emphasize the importance of trade facilitation and market access in supporting export growth.

In the subset of main export destination countries, the presence of Export Promotion Agencies (EPAs) continues to demonstrate a positive effect on Indonesia's exports, particularly in the agricultural sector. The estimation results indicate that the establishment of an EPA is associated with approximately 41% higher agricultural exports to main markets. EPAs also exhibit a positive and statistically significant effect on manufacturing exports in these destinations, increasing export values by around 27%. These findings suggest that export promotion activities remain relevant even in established markets, where EPAs may contribute through market intelligence, business facilitation, trade networking, and the strengthening of long-term commercial relationships.

Compared to manufacturing products, agricultural commodities generally face higher market entry barriers, including sanitary and phytosanitary (SPS) measures, technical regulations, quality certification requirements, traceability standards, and stricter customs and inspection procedures. In this context, EPAs may play an important role in reducing information asymmetries, facilitating compliance with import regulations, connecting exporters with foreign buyers and distributors, and assisting firms in navigating destination-market requirements. Consequently, institutional export promotion support may generate a more substantial impact on agricultural exports, particularly in major markets characterized by intense competition and stringent import standards.

The results further indicate that FDI generally maintains a positive relationship with Indonesia's exports, although the level of statistical significance varies across sectors. The estimated coefficients suggest that higher FDI inflows from partner countries tend to complement trade activities through increased production capacity, technology transfer, and stronger international business linkages. The effect of the real exchange rate appears more heterogeneous across sectors, with manufacturing exports generally exhibiting greater responsiveness to exchange rate movements than agricultural exports, reflecting differences in price competitiveness and market structure. In contrast, the impact of Free Trade Agreements (FTAs) appears relatively limited across the main export destination countries. Although the estimated FTA coefficients are positive in both agriculture and manufacturing sectors, statistical significance is observed only in agricultural exports.

Table 5. Gravity model with PPML estimation results

Variable Independent	Dependent Variable: exp_{ijt}						
	All Observation Countries			Main Countries		Non-Traditional Countries	
	(1)	(2)	(3)	(1)	(2)	(1)	(2)
$Constant$	9.30***	4.35	9.37***	5.58	10.12***	8.95**	18.83***
	(0.106)	(4.152)	(1.740)	(3.523)	(1.446)	(3.632)	(3.414)
$lndist_{ij}$	-1.00***	-0.80***	-1.02***	-0.49*	-0.80***	-0.81	-0.83***
	(0.138)	(0.241)	(0.131)	(0.265)	(0.151)	(0.366)	(0.310)
$lnfdi_{jit}$	0.02**	0.01	0.02	-0.01	0.02	0.01	0.01
	(0.012)	(0.023)	(0.012)	(0.032)	(0.012)	(0.012)	(0.009)
$lngdp_{jt}$	0.74***	0.77***	0.74***	0.64	0.65***	0.58***	0.32***
	(0.088)	(0.153)	(0.082)	(0.138)	(0.081)	(0.180)	(0.125)
$lnrer_{ijt}$	0.06**	0.01	0.06	-0.02	0.05	0.07	-0.10
	(0.028)	(0.062)	(0.026)	(0.057)	(0.026)	(0.074)	(0.044)

fta_{ijt-1}	0.10 (0.158)	0.51 (0.349)	0.07 (0.157)	0.53* (0.333)	0.04 (0.137)	-0.08 (0.471)	0.50 (0.419)
$epa_{establish_{ijt-1}}$	0.20** (0.106)	0.33** (0.164)	0.19** (0.112)	0 .41*** (0.154)	0.27** (0.117)	0.45 (0.226)	0.50*** (0.144)
Observations	798	798	798	378	378	420	420

Notes: Robust standard errors clustered at the country level are reported in parentheses.
*** p<0.01, ** p<0.05, * p<0.1. In the All Observation Countries category, columns (1)–(3) represent total exports, agriculture exports, and manufacturing exports, respectively. In the Main Countries and Non-Traditional Countries categories, columns (1) and (2) represent agriculture and manufacturing exports, respectively.

This finding may suggest that formal trade agreements alone are not sufficient to uniformly stimulate export growth, particularly in markets where trade relationships and market access are already relatively well established. Meanwhile, the traditional gravity variables behave as expected.

Distance, as a proxy for transportation and transaction costs, exerts a negative and statistically significant effect on exports, while the GDP of partner countries consistently shows a positive influence, highlighting the importance of market size and purchasing power in driving Indonesia's export performance.

In the case of non-traditional markets, the presence of EPAs also demonstrates a positive contribution to Indonesia's export performance, particularly in the manufacturing sector. The estimation results indicate that manufacturing exports are approximately 50% higher in countries where Indonesia maintains EPAs compared to destinations without such representation. These findings are also broadly consistent with the study by Hayakawa et al. (2014), who found that the establishment of EPAs significantly increases exports and that the estimated magnitude of EPAs effects ranges from approximately 32% to 59% depending on model specifications. The magnitude obtained in this study therefore remains economically reasonable and supports the argument that institutional export promotion mechanisms can substantially reduce market-entry and transaction costs in international trade.

Meanwhile, although the EPA coefficient for agricultural exports is also positive, the effect is not statistically significant. These findings suggest that export promotion activities may be especially important for supporting manufacturing penetration into less-established markets, where informational barriers, business matching constraints, and limited trade networks tend to be more pronounced.

The stronger EPA effect observed in manufacturing exports is also consistent with the argument that manufactured products are generally more differentiated and market-specific than primary agricultural commodities. As noted by Hayakawa et al. (2014), export promotion agencies tend to generate larger effects in manufacturing sectors due to the greater importance of market information, product differentiation, and business networking in facilitating international trade. In non-traditional markets, where institutional familiarity and commercial linkages are still relatively limited, EPAs may therefore play a critical role in reducing uncertainty and facilitating exporters' market entry. Regarding the control variables, FDI continues to exhibit a positive relationship with exports, although the statistical significance differs across sectors. Exchange rate effects also vary between agriculture and manufacturing exports, indicating differing levels of price responsiveness and market adjustment dynamics.

In contrast to the results for main export destinations, FTAs do not demonstrate statistically significant effects in non-traditional markets for either sector. This finding may imply that formal trade agreements alone are insufficient to immediately stimulate export growth in emerging markets, where institutional support, market facilitation, and trade

promotion activities may play a more substantial role in reducing market-entry barriers. This outcome may also reflect the fact that the existence of trade agreements does not automatically eliminate non-tariff barriers, information constraints, or market access difficulties faced by exporters, particularly in emerging and less-established markets. Consistent with the gravity model framework, distance continues to exert a negative effect on exports, while the GDP of partner countries positively influences trade performance, reflecting the importance of transportation costs and market size in shaping Indonesia's export flows.

Overall, the findings suggest that Export Promotion Agencies (EPAs) constitute an important institutional instrument in supporting Indonesia's export expansion across different sectors and market groups. Compared to FTAs, whose estimated effects appear more limited and heterogeneous across specifications, EPAs exhibit relatively more consistent export-enhancing effects, particularly in agricultural exports to main markets and manufacturing exports to non-traditional destinations. These results highlight the importance of market facilitation, business networking, and information support in reducing trade barriers and strengthening export competitiveness.

CONCLUSIONS AND IMPLICATIONS

While exports have consistently contributed to Indonesia's economic growth, export performance experienced a gradual deceleration during the 2000–2021 period. In response, the government adopted an export-led growth strategy emphasizing the diversification of export products and market destinations. One of the key policy instruments implemented under this strategy was the establishment of Export Promotion Agencies (EPAs) in selected partner countries. Nevertheless, the continued slowdown in export growth has raised questions regarding the extent to which EPAs effectively support Indonesia's export expansion.

This study evaluates the impact of Export Promotion Agencies (EPAs) on Indonesia's agricultural and manufacturing exports within the non-oil and gas sector. The empirical findings indicate that the presence of EPAs generally exerts a positive and statistically significant effect on Indonesia's export performance across most model specifications. The estimated effects, however, vary across sectors and market groups, with stronger impacts observed in agricultural exports to main markets and manufacturing exports to non-traditional markets. These results suggest that the effectiveness of export promotion activities is influenced by sectoral characteristics and destination-market conditions.

More specifically, the results show that EPAs generate particularly strong effects on agricultural exports to main markets and manufacturing exports to non-traditional markets. Nevertheless, positive EPA effects are also observed in manufacturing exports to main destination countries, indicating that export promotion activities remain relevant even in relatively established markets.

The findings further suggest that the effectiveness of EPAs differs across sectors and market groups, reflecting variations in market-entry barriers, product characteristics, and institutional conditions.

The estimated effects of the gravity variables generally conform to theoretical expectations. Partner-country GDP consistently demonstrates a positive influence on export performance, while geographic distance, as a proxy for transportation and transaction costs, exerts a negative effect on trade flows. Meanwhile, the impacts of FDI and exchange rates vary across sectors and market groups, indicating heterogeneous trade dynamics within Indonesia's export structure. Overall, these findings reinforce the importance of EPAs as an institutional instrument for supporting export expansion, particularly through market facilitation, information provision, and business networking in both established and emerging export destinations.

This study provides several important policy implications for strengthening Indonesia's export performance. First, the empirical findings confirm that Export Promotion Agencies (EPAs) play an important role in supporting Indonesia's export expansion across different sectors and market groups. The consistently positive EPA effects suggest that institutional trade promotion mechanisms remain relevant in reducing informational barriers, facilitating business matching, and improving exporters' access to foreign markets. Accordingly, the government may consider strengthening the capacity and international coverage of EPAs, particularly in strategic destinations with strong export potential.

Second, the results indicate that the effectiveness of EPAs differs across sectors and destination markets. The strongest effects are observed in agricultural exports to main markets and manufacturing exports to non-traditional markets. This finding implies that export promotion policies should be designed more selectively and strategically according to sectoral characteristics and market conditions. For agricultural exports, EPAs may play a crucial role in helping exporters comply with international standards, certification requirements, and technical regulations in highly competitive markets. Meanwhile, in non-traditional markets, EPA support appears particularly important for manufacturing exports, where informational constraints, limited trade networks, and market-entry barriers remain substantial.

Third, compared to EPAs, the effects of Free Trade Agreements (FTAs) appear relatively limited and less consistent across sectors and market groups. This finding suggests that formal trade agreements alone may not be sufficient to immediately stimulate export expansion, especially in less-established export destinations. In such contexts, institutional support mechanisms provided through EPAs may offer more direct and practical assistance for exporters by facilitating market access, trade networking, and business promotion activities. Therefore, EPAs should not merely be viewed as complementary institutions, but also as an integral component of Indonesia's broader export development strategy.

Overall, these findings highlight the importance of adopting a more adaptive and market-oriented export promotion strategy, where institutional support, market facilitation, and strategic trade promotion are strengthened alongside broader trade and investment policies to enhance Indonesia's competitiveness in the global market.

CAVEATS

Despite addressing several econometric concerns through the PPML estimation approach and the use of clustered standard errors, this study remains subject to certain limitations. In particular, the potential issue of endogeneity may persist, especially regarding the possibility of reverse causality between export performance and the establishment of Export Promotion Agencies (EPAs). Countries with stronger trade prospects or expanding export relationships may be more likely to receive EPA representation, which may complicate the identification of purely causal effects.

In addition, this study employs relatively aggregated sectoral classifications for agriculture and manufacturing exports. While this approach is useful for capturing broader export patterns, it may conceal substantial heterogeneity across products and industries. Future research could therefore adopt a more disaggregated commodity-level analysis to better examine how EPAs influence specific export products with differing levels of competitiveness, market barriers, and trade potential.

Another limitation relates to the measurement of the EPA variable itself. The current study uses a binary indicator reflecting the presence of Indonesian EPAs in partner countries, without accounting for differences in operational scale, institutional capacity, staffing, budget allocation, or the duration of EPA establishment. Future studies may therefore conduct a deeper examination of the historical development and

operational characteristics of Indonesian trade representative offices, including the timing of their establishment, expansion, restructuring, or closure, to better capture the intensity and effectiveness of export promotion activities over time.

Furthermore, future research may explore country-specific or product-specific dynamics within Indonesia's main and non-traditional export markets, particularly given the varying institutional, regulatory, and market conditions across partner countries. Additional studies could also reassess the classification of export destination markets using updated trade potential indicators and market intelligence to better reflect evolving patterns in global trade and Indonesia's export priorities.

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