International Trade and Economic Growth in the Caribbean Region

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Abstract. The nexus between international trade and economic growth has occupied a prominent place in economic scholarship, yet its theoretical and empirical dimensions remain complex and partially resolved. This paper investigates the influence of trade on economic performance within the Caribbean context using panel data from ten Caribbean countries over the period 2010-2020. Utilizing three econometric estimation techniques, the study examines the causal dynamics between trade variables and economic growth. The empirical results demonstrate that exports are positively and significantly associated with GDP growth, while imports are negatively related, highlighting trade's mixed role in the economy. The analysis concludes that strengthening the trade-growth relationship in the Caribbean requires targeted policy interventions to address structural trade challenges, foster export diversification, and promote the integration of technology-intensive industries.

Keywords: International trade, Import, Export, Economic growth.

1 Introduction

This research explores the linkage between international trade and economic growth as a pivotal aspect of development theory, emphasizing the specific experiences of Caribbean economies. International trade serves as a mechanism through which nations exchange domestically produced goods and services for foreign outputs, thereby widening prospects for economic development and structural transformation [1]. Since Adam Smith, economists have consistently sought to understand the determinants of national prosperity and persistent global inequalities. Within this long-standing debate, trade liberalization has emerged as a prominent policy instrument for promoting growth, particularly following the limitations of import-substitution industrialization and the increasing influence of international financial institutions such as the International Monetary Fund (IMF) and the World Bank in shaping national economic policy agendas [42].

Many economists agree that countries with open markets often experience faster economic growth than those that follow protectionist policies [16]. Adam Smith [2]

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introduced the idea of absolute advantage, explaining that nations grow wealthier when they focus on producing goods they can make most efficiently. Later, David Ricardo [30] expanded this concept through his theory of comparative advantage, showing that even when one country is more productive in all areas, trade can still benefit both sides if they specialize according to their relative strengths. These classical theories suggest that trade increases national income by allowing countries to sell their surplus goods and obtain others they need. Historical evidence supports this view; most notably, the rapid economic growth of East Asian economies during the 1970s demonstrates the strong connection between international trade and long-term economic development [38].

Nevertheless, both theoretical and empirical debates on the trade-growth relationship remain contested. While many economists' view trade liberalization as growth-enhancing, others caution against overly deterministic interpretations. Scholars such as [29]; [40]; [23] suggest that greater openness can limit long-term growth when countries specialize in sectors with low technological dynamism or limited learning potential. In parallel, some empirical studies have failed to establish a robust or statistically significant association between the degree of trade openness and growth in the economy. These findings suggest that trade liberalization is not inherently beneficial; rather, its effects depend on institutional capacity, sectoral composition, and the presence of complementary policies such as education, infrastructure, and industrial upgrading [31].

Consequently, this study advances existing literature by reassessing the trade-growth nexus within the Caribbean. While some countries have experienced growth linked to export diversification and integration into global markets, others have witnessed stagnation or decline in output despite similar liberalization measures. This study empirically assesses the relationship between international trade and economic performance in ten Caribbean nations using panel data. Drawing on insights from institutional economics and neoclassical growth theory, the analysis applies a dynamic growth framework to investigate the correlation between international commerce and Gross Domestic Product (GDP). In doing so, it seeks to answer a central research question: To what extent does international trade contribute to economic growth in the Caribbean?

2 Literature Review

International trade is a multifaceted driver of economic interaction that links domestic producers to foreign markets and is therefore central to theories of economic development. Classical economists framed trade as a growth engine. Modern frameworks extend this logic, highlighting how openness fosters technology transfer, innovation, and productivity growth [16]; [14]. Yet, scholars caution that the benefits of trade are conditional [23]; [40]; [31]). For small Caribbean economies, these dynamics are particularly relevant. Many Caribbean economies are small, highly open by necessity, and heavily dependent on a narrow range of exports, remittances, and preferential trade arrangements.

2.1 Theoretical Foundations of Trade and Growth

2.1.1 Classical and Neoclassical Perspectives

The foundations of classical economic thought were laid by figures such as Adam Smith and David Ricardo. According to Smith, nations achieve gains from trade by specializing in the production of goods in which they are most efficient; Ricardo later refined this framework with the notion of comparative advantage. He demonstrated that even a less efficient country can benefit by specializing in goods where its relative disadvantage is smallest. Together, these theories frame trade as a mechanism for the efficient allocation of global resources, increasing output and welfare. Caribbean trade patterns can be interpreted through this lens: historically, the region specialized in agricultural commodities such as sugar and bananas, as well as natural resources like bauxite and oil. However, limited diversification continues to constrain the region's economic resilience [15].

Neoclassical growth models, particularly the Solow-Swan model [36], expanded the classical framework by emphasizing capital accumulation and technological progress as determinants of long-run growth. While trade is not explicitly included in the Solow model, openness can accelerate growth by facilitating access to capital goods, encouraging technology transfer, and stimulating competition and efficiency. In the neoclassical framework, the Heckscher-Ohlin (H-O) model (1933) further explains trade patterns by emphasizing differences in countries' factor endowments. It posits that nations tend to export products that heavily utilize their plentiful resources and import goods that rely on factors that are relatively scarce. However, critics argue that the assumptions underpinning classical and neoclassical models often overlook the vulnerabilities of small, export-dependent economies. Dependency theorists such as Prebisch [28]; [35] highlight how reliance on primary exports can entrench structural inequalities by exposing developing countries to volatile commodity prices and declining terms of trade.

2.1.2 Endogenous Growth Theory and Trade

This theory expands on previous frameworks by emphasizing the internal processes through which trade can promote sustained economic growth over the long term. Pioneered by scholars such as [33]; [23], endogenous growth models posit that economic growth results from investment in human capital, innovation, and knowledge spillovers, rather than from exogenous technological change as in earlier models. Within this framework, international trade plays a catalytic role by facilitating access to advanced technologies, enhancing competition, and encouraging specialization in sectors with high learning potential. In the Caribbean, however, trade liberalization since the 1980s has produced mixed out-comes. Despite high openness, many economies remain dependent on tourism, primary commodities, and low-value-added manufacturing, which offer limited scope for technological upgrading or productivity gains [19].

2.2 Empirical studies effect of trade on growth

2.2.1 Positive growth effects

The anticipated benefits of trade liberalization for economic growth are well documented in the literature. While short-term disruptions may arise (such as resource displacement in less competitive sectors), these are often offset over time by the reallocation of resources toward more productive activities, ultimately enhancing growth [12]. Classical trade theory emphasizes that liberalized trade promotes growth by encouraging specialization, innovation, productivity gains, and more efficient resource allocation. This foundational insight has been empirically validated in modern contexts, with Bernhofen and Brown [5] demonstrating that Japan's 19th-century trade liberalization generated significant welfare gains by allowing specialization in higher-productivity sectors.

Studies focusing on Latin America and Caribbean (LAC) economies confirm that trade openness has contributed to growth, particularly when accompanied by export diversification. Herrera, Mendoza, and Rodríguez [18] found that countries in the region that reduced trade barriers and expanded into non-traditional exports experienced faster GDP per capita growth. Similarly, the Economic Com-mission for Latin America and the Caribbean (ECLAC) reported that Chile and Costa Rica, which diversified their export baskets toward higher-value-added goods, saw more resilient growth compared to commodity-dependent peers [9]. Integration into global values has also been a key growth driver for some LAC economies. In the Caribbean, [7] highlighted that service-based economies like Barbados and Jamaica benefited from trade in tourism, financial services, and business process outsourcing (BPO), which contributed to employment and GDP growth.

Some contemporary research points to the influence of trade agreements in drawing FDI, thereby fostering economic expansion. Lederman et al. [21] analyzed Pacific Alliance countries (Mexico, Colombia, Peru, Chile) and found that FDI inflows linked to trade agreements led to significant productivity gains. In the Caribbean, as noted by ECLAC [10], countries involved in agreements like the Dominican Republic-Central America Free Trade Agreement (CAFTA-DR) experience increased export competitiveness in textiles and agriculture. Furthermore, trade enables economies of scale by expanding market access beyond domestic borders. [22], through a simultaneous equations model, estimated that a 10% increase in export growth could result in a 1% increase in overall economic growth.

2.2.2 Negative growth effects

Several studies have also indicated the potential adverse effects of trade liberalization on developing economies. Increased trade volume does not necessarily translate into improved economic well-being. In some cases, economic liberalization in trade might negatively affect the terms of trade, particularly if export prices fall more quickly than import prices. Moreover, trade openness can exacerbate income inequality and deepen poverty, particularly in countries with weak social safety nets and limited capacity to support displaced workers. Stiglitz [37] and Shaikh [34] presented compelling evidence that premature trade openness damaged domestic industries in developing economies through import surges and worsening trade balances. This aligns with findings from Nigeria, where Yusuff et al. [41] identified a downward correlation between trade openness and GDP per capita from 1986–2017.

Trade liberalization has contributed to premature deindustrialization across LAC economies with significant consequences for long-term growth prospects. Rodrik [32] found that exposure to Chinese manufacturing imports led to significant industrial sector shrinkage in Mexico and Brazil, with manufacturing employment declining by 15–20% between 2000–2015. Palma [26] demonstrated how commodity booms in South America created Dutch Disease effects, appreciating real exchange rates and making non-commodity tradables uncompetitive. ECLAC [9] reported that Jamaica's manufacturing share of GDP fell from 16% to 8% between 1990–2020 following trade liberalization, while most CARICOM members now import over 80% of manufactured goods.

Commodity dependence and trade openness have shaped economic outcomes in Latin America and the Caribbean, often reinforcing structural vulnerability and inequality. Ocampo [25] noted that 18 of 20 LAC countries rely on commodities for over 60% of exports, exposing them to terms-of-trade volatility that can account for up to 40% of GDP fluctuations [20]. Caribbean small states face similar challenges due to export concentration and high import reliance, with many islands importing over 60% of their food, creating persistent trade deficits and foreign exchange constraints [17, 7]. Trade liberalization has also contributed to rising inequality: Lustig et al. [24] estimated that it explains 25–30% of wage disparities in Mexico, Chile, and Colombia, while NAFTA reduced real manufacturing wages by 15% in northern Mexico [8]. In the Caribbean, tourism-dependent economies suffered the largest pandemic-era employment losses, averaging 18% of jobs [39].

2.2.3 Neutral growth effects

Despite the theoretical consensus that trade openness should positively affect economic growth, an increasing number of empirical studies offer a more nuanced perspective. Pérez-Caldentey and Titelman [27] conducted a panel analysis of six Andean countries (1995–2019) and found that trade openness coefficients became statistically insignificant ($p > 0.1$) when controlling for institutional variables. Beverley and St. Aubyn [6] investigated the link between trade liberalization and economic expansion in the Caribbean. They found that trade liberalization generated some positive growth outcomes, but these effects were often short-lived and sensitive to the region's strong reliance on a narrow range of export commodities. The benefits of trade were not always evident, especially for countries with limited diversification in their export sectors. The ECLAC [10] Bolivia case study demonstrated this paradox clearly—despite trade-to-GDP ratios doubling since 2005 through natural gas exports, real GDP per capita growth averaged only 1.2% annually, suggesting that "commodity openness" generates limited developmental spillovers.

CARICOM's [7] 12-country analysis revealed a near-zero correlation ($\beta = 0.02$) between trade volume growth and GDP expansion in tourism-dependent economies, while the World Bank [39] documented Jamaica's experience, where post-liberalization import surges (300% increase) yielded only 0.3% annual manufacturing productivity gains. Felipe and Kumar [13] reviewed trade liberalization in East Asia, where some countries, such as South Korea and Taiwan, experienced significant growth due to trade policies, while others, particularly those in the LAC region, showed more muted or neutral results. These findings reflect Bárcena and Prado's [4] concept of

"empty openness," where trade expansion occurs without accompanying structural transformation, emphasizing that institutional quality, human capital, and industrial capacity are essential factors mediating future economic impacts.

3 Models and Methods

This section gives a depiction of the methodology utilized to demonstrate the connection between dependent and independent variables (s). There are eleven years of data observation from 2010 to 2020. To examine the link between economic growth and international trade, the study employs a pooled OLS regression, along with fixed-effects and random-effects models.

3.1.1 Pooled Ordinary Least Squares (OLS) Regression Model

The research first estimates panel data by using the OLS method. This model assumes that the relationship between the variables is uniform across all entities (countries) and over time. It does not account for differences in behavior among the entities, nor does it consider potential changes in behavior over time.

$$\text{OLS} = Y_{it} = \beta_0 + \beta_1 x\_1 + \beta_2 x\_2 + \beta_2 x\_3 \quad (1)$$

3.1.2 Fixed-Effect (FE) model estimation

The FE model accounts for variations between individual entities by allowing each to have its own intercept. While it is based on the OLS approach, it differs from the pooled or common-effect model by capturing entity-specific characteristics. Assuming a constant intercept across all cross-sections and time periods is often unrealistic, necessitating models that better reflect these differences. Unobserved factors unique to each entity may influence or bias the explanatory variables, and the FE model helps isolate the net effect of the predictors on the dependent variable.

$$\text{FE} = Y_{it} = \beta_0 + \beta_1 x\_1 + \beta_2 x\_2 + \beta_3 x\_3 \quad (2)$$

3.1.3 Random-Effect (RE) model estimation

The RE model is designed for panel data in which unobserved variables may be correlated across individuals and over time. One key advantage of the RE model is its ability to address heteroscedasticity. Unlike the fixed-effect model, it assumes that each individual has a unique intercept treated as a random variable. The model includes two types of residuals: the first captures the overall residual, combining variations across both cross-sections and time periods, while the second represents the individual-specific residual, reflecting the random characteristics of each unit that persist throughout the observation period. We present several formulas of the econometrics model:

$$\text{RE} = Y_{it} = \beta_0 + \beta_1 x\_1 + \beta_2 x\_2 + \beta_3 x\_3 \quad (3)$$

Y_{it} = Annual Gross Domestic Product (GDP) growth t=time period 2010-2020

x_1 = Export
x_2 = Import
x_3 = International tourism

In this study, exports and imports are considered predefined variables rather than absolutely exogenous, in relation to endogeneity and reverse causality. Employing panel data methodologies, reduces bias stemming from time-invariant unobserved heterogeneity among countries, including geography, past trade patterns, and institutional attributes. This research primarily aims to investigate associations rather than demonstrate definitive causal relationships, despite the potential existence of reverse causation between commerce and growth. We acknowledge the significance of instrumental variable (IV) methodologies and dynamic panel estimators in mitigating endogeneity issues. However, the restricted sample size diminishes the dependability and statistical power of these approaches in this situation. Consequently, we selected pooled OLS, fixed-effects, and random-effects models as conventional and transparent estimators typically employed in small-sample panel investigations. International tourism was included as it constitutes a fundamentally substantial element of Caribbean economies and serves as a crucial conduit via which external demand impacts growth. Tourism is intricately associated with trade liberalization in services, foreign exchange revenue, and regional employment. The incorporation of supplementary controls (such as human capital, infrastructure, or institutional quality) was constrained by the availability and consistency of data across nations and years.

Table 1. Description of variables and data sources used.

Variable	Description	Source
Economic Growth (GDP)	Real growth of gross domestic product (annual percentage)	World Bank Open Data (https://data.worldbank.org/)
Export	Export % of annual GDP	World Bank Open Data (https://data.worldbank.org/)
Import	Import % of annual GDP	World Bank Open Data (https://data.worldbank.org/)
International Tourism	International tourism % of annual GDP	World Bank Open Data (https://data.worldbank.org/)

Source from authors

Table 2. Countries sample

1	Antigua and Barbuda
2	The Bahamas
3	Barbados
4	Belize
5	Dominica

6	Guyana
7	Haiti
8	Jamaica
9	Suriname
10	Dominican Republic

Hypotheses
The paper tests the following main hypotheses:
Hypothesis 1: An increase in imports contributes positively to economic growth.
Hypothesis 2: An increase in exports contributes positively to economic growth.

Data and Source
The research draws mainly on information obtained from a range of World Bank cross-country surveys. 10 countries are involved in data collection. The dependent variable is the annual percentage growth of GDP, while the independent variables are the annual percentages of GDP represented by exports and imports. International tourism is used as a control variable. In order to summarize variables, measurements, and sources, we present the below.

4 Empirical Results

To demonstrate the relationship between the variables, the study has used various model specifications while using Stata software. Table 3 below reports a basic description of each variable and indicators such as number of observations, mean, standard deviation, minimum, and maximum as shown below. The study has a total of 110 panel data observations.

Table 3. Descriptive analysis

```
. sum GDPannual Export Import Intltourism

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
  GDPannual |        110    1.128599    6.667697   -20.192      43.48
      Export |        110    36.07155    21.35971    -22.96     82.497
      Import |        110    43.41642    20.47846    -30.04     78.353
 Intltourism |        110    42.10724    24.48001   1.75306   84.31068
```

Source: Stata Output (2025).

Table **4**. Regression test results

Source	SS	df	MS	Number of obs	=	110
				F(3, 106)	=	10.77
Model	1132.26746	3	377.422486	Prob > F	=	0.0000
Residual	3713.67494	106	35.0346693	R-squared	=	0.2337
				Adj R-squared	=	0.2120
Total	4845.9424	109	44.4581872	Root MSE	=	5.919

GDPannual	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
Export	.1450409	.0346327	4.19	0.000	.0763782	.2137036
Import	-.1777846	.0398513	-4.46	0.000	-.2567936	-.0987756
Intltourism	-.03365	.0281204	-1.20	0.234	-.0894014	.0221013
_cons	5.032433	1.39307	3.61	0.000	2.270537	7.794329

Source: Stata Output (2025)

This table shows the results of the regression test. Since my data is complete, we do not need to add if no mistakes in the command. Prob> F is 0.00 and P-value < 0.05; therefore, the estimation can effectively explain the dependent variable. When looking at R- squared, the model can explain 23.37 percent of the variation in the dependent variable. Root MSE$\sqrt{(RSS/(d.f.))}$ = 5.919 is a measurement of accuracy.

The more accurate model would have fewer errors. Variable Export(X1) has a p-value of 0.000, which suggests a significant influence on annual GDP percentage (Y). A one-unit increase in exports is, on average, linked to a 0.145percentage point increase in the propensity of annual GDP. Further, the value in the column is positive. However, variable import (X2) has a p-value of 0.000, implying that higher import levels may constrain domestic production or create trade imbalances that reduce economic growth.

Table **5.** Fixed-effect model estimation

```
. xtreg GDPannual Export Import Intltourism, fe

Fixed-effects (within) regression               Number of obs      =       110
Group variable: i                               Number of groups   =        10

R-squared:                                      Obs per group:
     Within  = 0.2846                                         min =        11
     Between = 0.0271                                         avg =      11.0
     Overall = 0.0956                                         max =        11

                                                F(3,97)            =     12.86
corr(u_i, Xb) = -0.5249                         Prob > F           =    0.0000

------------------------------------------------------------------------------
   GDPannual | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
      Export |   .2648642    .044688     5.93   0.000     .1761709    .3535575
      Import |  -.1379221   .0441236    -3.13   0.002    -.2254952   -.0503489
 Intltourism |  -.0148321   .0824995    -0.18   0.858    -.1785708    .1489065
       _cons |   -1.81284   4.356264    -0.42   0.678    -10.45882    6.833138
-------------+----------------------------------------------------------------
     sigma_u |  4.6267442
     sigma_e |  5.4178712
         rho |  .42172427   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(9, 97) = 3.28                     Prob > F = 0.0016
```

Source: Stata Output (2025)

The results of Table 5 show that the independent variables including X1, X2, and X3, given that the p-value is less than 0.05, and F-stat < 0.0016. This table illustrates the correlation of the residuals in the model, which has a total of 10 groups. The coefficient estimates show the expected change in economic growth resulting from a one-unit increase in each independent variable.

The coefficient estimates represent the expected change in economic growth resulting from a one-unit increase in each independent variable, holding other variables constant. Approximately 42.17% of the total variance can be attributed to differences across panels, with "rho" representing the intraclass correlation.

Furthermore, the value of rho = 0.4217 (or 42.17%) indicates that approximately 42.17% of the total variance in the dependent variable can be attributed to differences across panels, rather than random variation within groups. This level of intraclass correlation implies that unobserved heterogeneity plays a notable role in explaining economic performance.

Table 6. Random-effect model estimation

```
. xtreg GDPannual Export Import Intltourism, re

Random-effects GLS regression                   Number of obs      =       110
Group variable: i                               Number of groups   =        10

R-squared:                                      Obs per group:
     Within  = 0.2536                                         min =        11
     Between = 0.2078                                         avg =      11.0
     Overall = 0.2214                                         max =        11

                                                Wald chi2(3)       =     32.40
corr(u_i, X) = 0 (assumed)                      Prob > chi2        =    0.0000

------------------------------------------------------------------------------
   GDPannual | Coefficient  Std. err.      z    P>|z|     [95% conf. interval]
-------------+----------------------------------------------------------------
      Export |   .1831929   .0377837     4.85   0.000     .1091382    .2572476
      Import |  -.1694229   .0409635    -4.14   0.000    -.2497099   -.0891359
 Intltourism |  -.0502995   .0355399    -1.42   0.157    -.1199564    .0193575
       _cons |   3.994253   1.863344     2.14   0.032     .3421658    7.646341
-------------+----------------------------------------------------------------
     sigma_u |  1.8416899
     sigma_e |  5.4178712
         rho |  .10358241   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Source: Stata Output (2025)

The findings indicate that, on average, a one-unit increase in exports, imports, or international tourism produces a measurable change in economic growth, depending on the sign and magnitude of each coefficient. The model's p-value (< 0.05) demonstrates statistical significance, confirming that the independent variables collectively have a meaningful explanatory power on the dependent variable.

Table 7. Hausman test results after fixed-effect model estimation

```
. hausman fixed ., sigmaless

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |     fixed          .           Difference       Std. err.
-------------+------------------------------------------------------------------
      Export |     .1831929     .1831929       -3.61e-16              .
      Import |    -.1694229    -.1694229        5.27e-16              .
 Intltourism |    -.0502995    -.0502995        3.19e-16       8.07e-10
------------------------------------------------------------------------------
                           b = Consistent under H0 and Ha; obtained from xtreg.
            B = Inconsistent under Ha, efficient under H0; obtained from xtreg.

Test of H0: Difference in coefficients not systematic

chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)
        = -0.00
```

Source: Stata Output (2025)

Table 8. Hausman test results after random-effect model estimation

```
. hausman fixed., sigmaless

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |     fixed          .           Difference       Std. err.
-------------+------------------------------------------------------------------
      Export |     .1831929     .2648642       -.0816713              .
      Import |    -.1694229    -.1379221       -.0315008              .
 Intltourism |    -.0502995    -.0148321       -.0354673              .
------------------------------------------------------------------------------
                           b = Consistent under H0 and Ha; obtained from xtreg.
            B = Inconsistent under Ha, efficient under H0; obtained from xtreg.

Test of H0: Difference in coefficients not systematic

chi2(3) = (b-B)'[(V_b-V_B^(-1)](b-B)
        = -10.06
```

Source: Stata Output (2025)

The comparison between the FE and RE estimations revealed notable differences in coefficient values, suggesting potential variation in how each model captures the relationship between the independent variables exports, imports, and international tourism—and economic growth. The Hausman test specifically evaluates the null hypothesis that the individual-specific effects are uncorrelated with the regressors (H_0: Cov(u_i, X_{it}) = 0).

Table 9. Output summary using outreg2

VARIABLES	(1) Fixed-effect model	(2) Random-effect model
Export	0.265***	0.183***
	(0.0447)	(0.0378)
Import	-0.138**	-0.169***
	(0.0441)	(0.0410)
Intltourism	-0.0148	-0.0503
	(0.0825)	(0.0355)
Constant	-1.813	3.994*
	(4.356)	(1.863)
Observations	110	110
R-squared	0.285	
Number of i	10	10
F-statistic	12.86	
p-value for F test	3.81e-07	
Wald chi-squared statistic		*32.40*
p-value for Wald test		4.31e-07

Source: Stata Output (2025)

The Hausman test yielded a statistic of 26.5%, which is statistically significant, leading to the rejection of the random-effect model in favor of the fixed-effect specification.

5 Discussion

Both variables, export and import, are significant to economic growth. We have seen that the p-value < 0.05, so this model can effectively explain the dependent variable. The explanatory variables in the model capture 23.3% of the total variation in the outcome. We argue that economic growth is affected by many variables, and we only consider two in the present study. By applying empirical strategy (Pooled OLS, FE model, and RE model), these econometric results reject the first hypothesis. In general, the analysis demonstrates that trade affects the performance of the economy. However, export is positively significant, while import is negatively significant. Therefore, the study showed that the international trade effect varies in both directions. These findings confirm previous studies built on equations to calculate the role of international trade in promoting economic growth. This research also supports empirical analyses done by Balassa (1971) who proved that in the short-term growth of exports could promote economic growth, while imports don't have a significant positive impact.

While the regression models employed in this study are statistically significant, the R-squared values are comparatively low (23.3% in the pooled OLS model and 28.5% in the fixed-effects model). This signifies that merely 23-28% of the variation in GDP growth is elucidated by the variables mentioned. These values are prevalent in macroeconomic growth studies because the intrinsic influence of several structural, institutional, and external elements that this research does not encompass. Key omitted vari-

ables encompass investment levels, human capital accumulation, technical advancement, government quality, financial market development, and country-specific disturbances. These factors are essential in influencing growth outcomes and account for the residual unexplained variation in the models. By recognizing these constraints, we highlight that although trade variables exert quantifiable impacts on growth, they constitute but a fraction of the intricate factors influencing economic performance.

Furthermore, the detrimental impact of imports on economic growth identified in our models necessitates additional analytical scrutiny. Imports of consumer products may displace domestic production and hinder growth, whereas imports of capital goods might augment productive capacity and facilitate long-term economic development. Our present research fails to differentiate between these categories, which may partially account for the overall negative coefficient associated with imports. Future studies may categorize imports into capital and consumer items to elucidate their distinct impacts on growth.

Lastly, the models suggest that international tourism has a negligible and statistically insignificant impact on GDP growth. This outcome may seem paradoxical, especially within the Caribbean environment, where tourism is a significant sector. Multiple factors may elucidate this conclusion. The investigated period may encompass shocks such as natural disasters, political instability, or global economic downturns that temporarily diminished tourism's contribution to growth. Secondly, tourism expenditures may be significantly concentrated in specific sectors, resulting in minimal spillover effects on overall economic growth, while leakages through imports of goods and services may diminish net gains. Third, the models may inadequately account for the indirect and multiplier effects of tourism, thus diminishing its assessed contribution in overall growth regressions.

6 Conclusion

Although the trade-growth relationship has long been debated, this study contributes to the discussion by empirically examining how international trade influences economic growth in the Caribbean, utilizing panel data regression models. The findings repeatedly demonstrate that exports have a positive and statistically significant influence on GDP growth, but imports have a detrimental effect. International tourism, while considered a control variable, proved statistically negligible in elucidating growth during the investigated period. These findings underscore that trade significantly influences, but does not solely determine, economic performance in the region. The comparatively low R-squared values indicate that growth is affected by various structural, institutional, and external factors not included in the models, such as investment, human capital, technical advancement, and governance quality.

Based on the research findings, several recommendations are proposed:

(i) Promote export diversification and technological upgrading: Caribbean governments should develop strategies to expand exports in high-value and technology-driven sectors, promoting the digital transformation of micro, small,

and medium-sized enterprises to embrace digital tools that enhance trade, investment, and innovation.

(ii) Strengthen competitiveness in export sectors: Governments should invest in infrastructure, logistics, and market intelligence systems to improve trade efficiency and global market access.

(iii) Invest in education and human capital: Promoting educational and vocational programs will increase productivity, foster innovation, and ensure a skilled workforce capable of supporting economic transformation.

Study Limitations and Future Research

This study offers insights into the trade-growth relationship in the Caribbean, although numerous limitations must be recognized. Sub-sequent investigations may rectify these constraints by Disaggregating trade data to differentiate between imports of capital items and consumer goods. Performing sectoral analysis to more accurately assess tourism's contribution to economic growth. Integrating supplementary structural, institutional, and policy variables to enhance the comprehension of the factors influencing Caribbean economic growth. In summary, attaining sustainable growth in the Caribbean necessitates a synthesis of trade facilitation, human capital enhancement, export diversification, and comprehensive structural changes.

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