

## **Export Strategies in the Caribbean and Latin America Under Economic Integration**

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**ABSTRACT:-** This study determined factors that have a differential impact on exports in the Caribbean and Latin America, both in the long run and short run. Log-log Regression results indicated that with regards to the Caribbean market size, domestic and direct foreign investment, and the agriculture with a positive sign, and the exchange rate with a negative sign, showed a stronger impact on exports in the Caribbean compared with Latin America. The impact of the Herfindahl Index was greater in the Caribbean, indicating that diversifying the economic base in this region is likely to have a greater positive impact on exports in this region than in Latin America.

In Latin America, access to electricity and service sector performance with positive signs and the inflation rate, the interest rate, and the tax on trade variables with negative sign had a greater impact compared with the Caribbean.

If, in the Caribbean, the income per capita in the market group, literacy, the availability of credit to the private sector and capital per unit labor variables were positive, this would have indicated that the private sector was more involved in exports than in Latin America, but they were not. Instead, with the exception of literacy rate, the impacts of these variables on exports were stronger in Latin America.

**Keywords:-** Caribbean, Latin America, trade, market, trade, productive sectors.

### **I. INTRODUCTION.**

The new era of free trade is characterized by rapid changes, dynamic markets, intense competition, and high level of risk, and countries are forced to meet this challenge, to find a comparative advantage and increase their export, and avoid a trade deficit. In the absence of arbitrage, the solution is a carefully crafted economic policies for production and trade. In the final analysis, the value of exports must be at least equal to the value of imports to avoid a trade deficit. Many Caribbean countries have for prolonged periods been faced with trade deficits, and despite an integrated approach among Caribbean countries to find an instrument that will make each country better off, the challenges have continued to be overwhelming. Recommendation to improve exports in the Caribbean stress heavily on developing appropriate trade policies [ECLAC review, 2023]. In particular, the Caribbean is encouraged to develop policies, not just to increase exports, but to strategically diversify their export policies to foster exports in the region.

Free trade theory promises immense gains to trading partners in the context of a two countries, two traded goods and technology is assumed to be available, but what happened when the countries involved are a heterogeneous group of open island states at different stages of the lower end of economic development, with high susceptibility to economic shocks, to which they are frequently subjected to as a result of their geographic location. For the Caribbean, this is the economic dilemma, and this challenge has increased as trade liberalisation in the external markets becomes more progressive and dynamic.

The new reality of free trade requires countries to reorganize their economies and position themselves to engage in free trade and improve their trade balance.

For the Caribbean, this means, they must break away from the mould of their pre-independence developmental patterns, which emphasized import substitution and trading primary products [such as sugar, bananas and bauxite and oil] for technology, and finance, and develop more flexibility in their system of production and trade to meet the international market. This means revising the groundwork in their productive infrastructure and institutions, including education and manpower development.

This means also that Caribbean countries must find ways to acquire the capital needed for technology, human capital development, and managerial skills, as free trade is practically eliminating tariff revenue, much of the foreign aid, concessions, and preferential markets, which were crucial sources of capital for the Caribbean, which it must compete for against neighboring Latin America.

Many have embarked on programs of direct foreign investments [DFI] and indirect foreign investment [IFI] to help in their development, but it is up to the individual countries to find ways to engage the DFI and IFI meaningfully in their own development and trade programs.

But as far as the international markets are concerned, the problem has become one of developing good and effective trade policies. Consequently, the objective of this paper is to identify strategies that will have a stronger differential impact on Caribbean exports compared with Latin America as both regions are also in competition for the same available markets.

Both long-run and short-run impacts will be examined as the length of the horizon may influence the factors and their relationships with exports and policies developed from them.

## **II. CARIBBEAN TRADE BACKGROUND.**

In 2005, Western Hemisphere countries met to ratify the institutionalization of the FTAA, the Free Trade Association of the Americas [FTAA], the proposed overarching trade and economic integration body in the region. The vision was to integrate the 34 countries of the western hemisphere and progressively eliminate barriers to trade and investment and to establish a free trade area within this body. But no agreement has been reached.

In the Caribbean, economic integration and trade liberalization discussions and procedures began much earlier. Following the Second World War in 1945, many of the developing nation in Caribbean got their independence and from then on held the reigns of their individual economic development. Many of these adopted a strategy import substitution and protected their domestic producers. This was the kind of policies that laid the foundation for economic development.

With the global movement toward trade liberalization, unsatisfactory economic performance in the Caribbean forced these countries to reform and follow more open policies.

International trade in the Caribbean began with the production and exporting of primary products such as sugar, bananas and oil and bauxite and imported manufactured goods and technology, and finance. Eventually profit-making opportunities from abroad lead to foreign investment within the region, and attracted foreign direct investment into production and trade, and finance.

Many countries pursued a self-sufficiency and national identity preserving agenda, which became somewhat of a barrier to wider economic integration and trade and the benefit that could accrue from them to the Caribbean region. To some extent this was understandable as Caribbean countries differ widely in size, natural endowment of raw tradeable natural resources, and it seemed impossible to develop an instrument that would be 'fair' to all involved. This was a huge hinderance to economic integration at the time.

But this did not stop bilateral trade between countries, which eventually led to multilateral trade later on. And out of this, CARIFTA [The Caribbean Free Trade Association] emerged in 1965, as an attempt at economic integration. From this, the present-day vision of economic integration and free trade, the Caribbean Community and Common Market [CARICOM], emerged in 1973. Intraregional 'concessions,' became an equalization instrument in intraregional trade, and CARICOM served as collective bargaining agent for the Caribbean on extra regional trade. CARICOM ran for a while and in 1989 was reformed and upgraded into the Caribbean Single Market and Economy [CSME] and added intraregional factor mobility into its integrating mission.

The United States of America [US] and Europe, now mostly referred to as the European Union [EU] have always been engaged in Caribbean trade and economic development, and this relationship grew under CARICOM and both the US and EU became major players in Caribbean economic integration and foreign trade, with the US DFI accounting for 3 % [production, finance, trade] and imports over more than 0.33 % of \$3350 billion. XXXXX

In 1975, the Caribbean Development and Cooperation Committee [CDCC], a more linguistically and politically inclusive economic integration than CARICOM was formed and all CARICOM countries being part of it. Integration into the CDCC did not performs well and export declined the early part of the 1990s.

In the meanwhile, in 1989, through the formation of the Organization of Eastern Caribbean States (OECS), a set of small and opened island countries that were highly prone to natural disaster integrated into an economic and trade union and allowed for factor mobility within the union. All protocol member states were also members of the larger groupings, CARICOM and CSME.

In 1983 through the Caribbean Basin Economic Recovery Act (CBERA), the Caribbean Basin Initiative [CBI] was launched between the US and the Caribbean to facilitate economic development in the Caribbean through trade. This was followed by a series of amendments to deepen the trade relationship between the US and the Caribbean. In 1984, the Caribbean Basin Economic Recovery Act (CBERA) was implemented and replaced the CBI, to facilitate trade and economic development, by further reducing tariff, and included the reduction of non-tariff barriers. This resulted in deeper trade relation between the US and the Caribbean, arising from which the Caribbean increased its imports from the United States of America. The Trade and Development

Act in Year 2000 allowed CBI countries trade similar trade benefits at the North American Free Trade Agreement (NAFTA).

The Caribbean-Canada Trade Agreement known as ("CARIBCAN") was established in 1986 to promote trade, investment and provide industrial cooperation through preferential access to duty-free goods from Commonwealth-Caribbean countries to the Canadian market.

The proposed Free Trade Agreement of the Americas [FTAA]'s mission was to expand free trade throughout the entire Western Hemisphere, and promote economic integration, by the gradual eliminating of trade barriers and facilitating investment.

Leaders of Western Hemisphere countries had agreed to negotiate a Free Trade Area of the Americas (FTAA) agreement by 2005. At the time, it was expected that if an agreement were reached, free trade in the hemisphere could occur by 2020. But there were problems.

Many countries disagreed with the proposal as it was and argued that the FTAA does not put forward a comprehensive enough plan that guarantee equality in the benefits to be derived from economic integration and free trade following from it. Some countries found it to be invasive.

Under FTAA, among other restrictions noted, all preferential treatments countries previously received would be abandoned. For many countries involved, tariff reduction would mean a loss of fiscal revenues, and the protective quotas and other non-tariff barriers that were already in place would eventually be eliminated on many products.

Many countries, including countries of the Caribbean, that were prepared to take part in the FTAA needed provisions that would allow them to develop well enough to compete, such as technical assistance in technology adaptation, marketing and human resource development. The also needed some amount of preferential trading arrangements.

Many, including those with the above stated requirement, also pointed out other disadvantages arguing along the line that some countries were already better prepared, with diversified economies and well-established infrastructure, and are much more economically resilience than they were and would more likely be the big gainers from the free trade proposed, and wanted a more playing field.

The conclusion was that the FTAA would inevitably lead to asymmetries in the distribution of gains. The FTAA did not move forward as planned and the status quo in the Western Hemisphere remained.

### III. TRADE THEORIES

*The Heckscher-Ohlin [HO]* mathematical model of international trade, which itself was built on David Ricardo's theory of comparative advantage, some of the earlier insight in international trade. It showed that the patterns of commerce and production, based on the factor endowments in trading regions, could be predicted, [Branko, 1999] and proved useful in predicting trade patterns.

But in order to understand the foundation of trade theory, it is necessary to go back to Adam Smith in 1776 [Fleischacker, 2004] who created the groundwork for trade with his theory of Division of Labor and Specialization. He showed that an individual may specialize in an activity based on his ability and by acquiring tools and the skills to use them effectively, have an advantage in the production of a good and may engage in trade in that good. By the same argument, an organization may specialize by acquiring specialized equipment and hiring and training skilled operators and have accrued onto them an advantage in the production of goods.

Richardo [1817] developed the idea of factor endowment and comparative advantage by showing that countries can specialize in producing goods in which they are better endowed with the necessary factor of production and so can produce more efficiently. These countries can then trade with each other and each would be better off. Common in these theories were the assumption of perfect competition and cross-border factor immobility.

*Factor Price Equalization Theory.* This theorem [Samuelson, 1948] argues that if the price of a product increases, the returns to the factor of production used most intensively in the production of that product will likewise increase, and for the substitute of that product, whose price will decrease, the returns to the factor of production that is used most intensively will likewise decrease. The implication of this theorem as it applies to production and trade of goods is that there will be losses and gains in free trade.

*Product Life Cycle Theory.* Raymond Vernon [Vernon, 1966 ] developed the product life cycle theory. The theory proposed that a product life cycle has three distinct stages: new product, mature product, and standardized product stages. The theory proposed that trade will be motivated in the mature stage of the cycle and when excess production will be exported from the home country. Later, in the standardized stage, production will shift to a less developed country, with a less costly production process, and from there it will be exported to more developed countries.

*Country Similarity Theory.* The Swedish economist Steffan Linder developed the country similarity theory in 1961 [ Fajgelbaum, 2011]. and proposed a theory of intra-industry trade. Linder's theory proposed that consumers in countries that are in the same or similar stage of development with similar per capita income will

have similar preferences and will more likely trade goods with each other. This theory is often most useful in understanding trade in goods where brand names and product reputations are crucial factors in the buyers' decision-making and purchasing processes.

**New trade theory.** New trade theory (NTT) is a collection of economic models in international trade theory which focuses on the role of increasing returns to scale and network effects, which were originally developed in the late 1970s and early 1980s [Pettinger, T., 2017]. The main motivation for the development of NTT was that contrary to what traditional trade models would suggest, the majority of world trade takes place between countries that are similar in terms of development, structure, and factor endowments.

**Global Strategic Rivalry Theory.** Krugman and Lancaster in the 1980s proposed that firms may seek comparative advantage by developing firm specific advantages through research and development and protecting their techniques through intellectual property rights and would gain a comparative advantage in the export of goods they have exclusive rights to produce [Jha, 2019].

**Porter's National Competitive Advantage Theory.** Porter [1990] proposes that a comparative advantage may come from creativity and innovativeness of the firm at the firm level, input level, product market level and industry level.

**The Gravity model.** Gravity trade Model [ Chaney, 2013] states that bilateral trade is a function of the sizes of countries and the distance between them, in which the volume of trade is directly related to the sizes of the countries and inversely related to the distance between them. The theory has been found to have application where geography and spatiality applies and transportation cost and relative factor abundance.

**Many Countries, Many Goods.** Coming out of foundational work done by Dornbusch, Fischer, and Samuelson [1977], Eaton and Kortum [2024] expanded the Ricardian model to incorporate trade of intermediate goods. The model assumes that technology is the same across countries and within a country the input bundles are the same. The model lacked predictability in analyzing global food chains.

**The New Theory of International Values [a.k.a. Global Value Chain Theory].** Shiozawa [2007] adopted the Ricardian model to include many countries, many commodities, with choice of input goods and production techniques [unlike the HO model]. The model predicts that wages depend on the productivity of a country, which makes it more suited in analysis between developed and developing countries.

#### IV. THE VARIABLES AND MODELS.

In this study, the relationships between 16 variables in 8 categories are examined. And this is done with regards to both long-run and short-run exports models. A summary of the variables used, their definitions and hypothesized relationships with the export variable, together with the rationale for including them are presented in Table 1.

##### Market Related Variables

Two variables fall into this group, the exporter market size [GDP], and income per capita [GDP/C], and these are supposed to reflect the reliability of the exporting market to the importer.

Table 1: The variables, their description, their expected relationship and rationale.

	Variables	Description	Acronym	Ho	Rationale
<b>Market Related variables</b>					
	Market size	GDP [100M]	MARKET	+	Increased market size means a more viable economy.
	Income/year	\$	GDP/C	+ or –	Higher income level means more prosperous/higher wage rate also.
<b>Human Capital/Private sector related variables</b>					
	Expenditure on Education	\$/Cap.	EDU	+	Higher education means higher productivity/higher export
	Credit	\$/Cap.	CR	+	Higher credit to private sectors means likely to be involved in exports
<b>Infrastructure Variables</b>					
	Fixed Capital formation	\$/Labor	CAPL	+	greater capital formation means better productive infrastructure, higher production/export
	Electricity	% of pop. with access to elect.	ELEC	+	more access to power means more likely to be involved in production/exports

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<b>Monetary/Fiscal Policy Variables</b>					
	Inflation Rate	%	INF	-	higher cost, lower production/ lower export
	Real Interest Rate.	%	R	-	Higher R mean higher cost of money, lower export
<b>Trade Policy Variable</b>					
	Exchange Rate		ER	+ or -	Higher/lower exchange rate means higher/lower cost of goods
	Tax on trade	%	TTr	-	Tax on trade mean higher cost of goods
<b>Investment related variables</b>					
	Domestic	\$/Cap.	DI	+	Likely to increase exports.
	Direct Foreign	\$/Cap.	DFI	+	Likely to increase exports.
<b>Production sector related variables</b>					
	Agriculture	% GDP	Agri	+	Likely to increase exports
	Manufacturing	% GDP	Man	+	Likely to increase exports
	Service	% GDP	Serv	+	Likely to increase exports
	Other	% GDP	Other	+	Likely to increase exports
<b>Economic base diversification variables.</b>					
	Herfindahl Index		HERF	+ or -	May be more, or less, diversified

Both the Country Similarity Theory [Fajgelbaum, 2011] and the Gravity model [Chaney, 2013] show a relationship between the size of GDP and export. While product price is usually the best signal on the market to buy, the gross domestic product [GDP] shows the economic strength and dependability of the exporting country and might capability to deliver to importers. Much research [including Olarreaga and Sperlich, 2019] showed a one-way causative relationship between the value of exports and GDP, in that an increase in exports can lead to an increase in GDP, resulting in a positive relationship. The reverse may also be true if the buyer perceives the GDP to represent the strength of the export country market, and the correlation could be positive with a higher GDP represent a more reliable supplier. In this study, the expected relationship between GDP and exports is a positive one, and as the GDP increases, export increases as well. Cuccia, et. al. [2018] found a positive relationship between GNP and trade, using the Gravity model.

Per capita GDP represents the income level in an exporting country. Since income and usually directly correlated with wage rate, it might also represent cost. Some have found a negative correlation between export and GDP/Capita. Naudé and Rossouw [2008] and Rehman et. al. [2020] for a positive relationship. GDP per capita may be positively or negatively correlated with exports depending on whether importer sees it as positively as representing a strong reliable market or as a cost.

Human capital/Private sector related variables

Two variables are included in this group, the percent of GDP expended on education and the amount of credit, as a percent of GDP, available to the private sector.

The level of education and technical skills of an exporting country's labour force reflects education, the literacy rate, EDU, and is likely to be an important consideration in the DFI decision making process, especially for manufacturing and high technology firms and as such in the exporting of such products. Becker [1975] and Shultz [1961] found a direct correlation between education investment and worker's productivity. Contractor and Mudambi [2008] found a positive correlation between literacy and the export of goods. In this study a positive relationship is expected between EDU and exports.

As it were, domestic credit to the private sector [CR] reflects the extent to which the private sector is encouraged to participate in economic development through private investment. If the level of CR is low, participation in domestic investment is low, and it is more likely to be substituted for by DFI [ceteris paribus]. However, in the case of the Caribbean domestic credit to the private sector, if available, is usually used for less

capital-intensive small-scale production. A positive relationship between CR and exports reflects that the private sector is at least using the credit in export related activities and are engaged in exporting.

Felbermayr and Yalcin, [2013]; Hur and Yoon [2022] found a positive correlation between financial assistance and export. It is expected that the correlation between CR and exports will be positive.  
Infrastructure related variables.

Two variables are examined in this group, the capital/labor ratio [CapL], in which capital is measured as the gross capital formation as a percent of GDP, and the other was ELEC which expresses the percent of the population in a country with access to electricity. These variables are supposed to reflect the level of technology infrastructure [such as roads, bridges, telecommunication, etc., in the productive environment in the exporting country. Since physical infrastructure positively influences productive efficiency [Lall, e. al., 1997], the exporting country, it is more likely to result in increased export compared with countries with poorly developed productive infrastructures.

Nguea et. al. [2022] found a positive correlation between the percent of the population with access to electricity and DFI [involved in export]. Faheem et. Al. [2020] found positive correlation between export and the exporting country infrastructure. Consequently, both variables, CapL and ELEC, are expected to have a positive correlation with exports.

**Monetary/Fiscal Policy Variables.** In the monetary policy related group, two variables are used, the inflation rate [INF] and the real interest rate [R] and these are supposed to reflect the price and the price risk involved in trade with a country. In the case of INF, a high value reflects economic weakness, and volatility in a country's economy. A high interest rate would reflect a high price for export goods and a higher cost to importers.

**Inflation rate.** The response of export to inflation is not clear-cut; it depends on the level of inflation. Predictable low inflation rates in the export market represent low investment risk and cheaper exports and are likely to attract importers. On the other hand, high and unpredictable levels of inflation might induce skepticism about risk and are likely to discourage imports. Without a clear cut of what the relationship is likely to be in the Caribbean, INF is likely to have a negative or positive correlation with exports in the Caribbean. Ball et al. [1988] and Khan et al. [2007] found a negative correlation between inflation and exports.

In terms of R, the interest rate determines the investment climate. For investment to take place the returns from investment must be greater than the returns from saving, and both activities are determined by the interest rate.

At higher interest rate, the cost of production increases and exports become more expensive, and vice versa. Government spending also responds to the interest rate and the same rules. Both, Sen [2019] and Hassan [2022], for a negative correlation between interest rate and exports. Solleder [2013] and Beckman [2018] found export tax to have a reducing effect on exports leading to excess domestic supply. Since both of these variables are expected to represent cost, both are likely to have a reducing effect on exports.

**Trade Policy Variables.** In the trade related group, two variables are investigated, the exchange rate [ER] and tax on trade [TTr], and these are supposed to reflect cost of export products to an importer and revenue to an exporter.

Aliber [1970] observed that trade is associated with the relative value of currency [EXR] between the exporting country and the importing countries. When, for example, the currency of the exporting country depreciates, it becomes more expensive for firms of that country to import from another country with higher value currencies, but it cheaper for that country to buy from the country with lower value currency. Thus, goods outflow tends to decrease in countries where the value of the exporting country's currency is relatively high and to increase in countries where it is relatively low. Rehman and Noman 2020, Bhat and Bhat [2020] lower exchange rate improves trade deficit Nyahokwe and Nwadi (2013) a negative relationship between exchange rates and exports. Thus, this variable is expected to have a negative relationship with exports.

In terms of taxes on trade, the purpose of free trade is to encourage more trading between countries. Trade theory however suggests that restrictive domestic trade policies, such as export tariffs, is like to discourage export. However, given the current moves towards trade liberalization, tariff levels are expected to diminish in importance in determining patterns of imports or exports. Solleder [2013] and Beckman [2018] found that export tax leads to a reduction in export. TTr is expected to be negatively correlated with the value of exports.

Investment related variables

In the investment related group, two variables were used, private investment [PI] measures ad gross domestic capital formation as a percentage of GDP, and direct foreign investment [DFI], also measures as a percentage of GDP, to reflect the relative importance of each mode of investment in export promotion. Domestic investment under the control of the state and may cover production directly or indirectly through business, health and education, information, revenue collection, defense and other activities that enhance the performance of the state. The state of domestic investment would affect each of these sectors and activities conducted within. Thus, there is a link between the activities of the state and exports.

Wang et. al. [2007] found a positive correlation between domestic investment and exports. Leichenko and Erickson [1997] found that domestic investments enhance exports. Thus, it is expected that there will be a direct correlation between domestic investment [DI] and EXP.

In terms of DFI, they usually engage a foreign country with the goal of making profit. Thus, they may be involved in capital investment, may establish infrastructure, management, technology, finance, and be involved in export and import directly or indirectly.

Wang et. al. [2007] found a positive correlation between DFI and the export of labor-intensive goods. Leichenko and Erickson [1997] found a positive correlation between DFI and export of certain commodities, not all. Popovici and Călin [2017] found indications that DFI is positively correlated with export [and import]. In this study, there is expected to be a positive correlation between DFI and exports. In this study, there is expected to be a positive correlation between DFI and EXP.

The production sector related variables.

In this group are four variables, [AGRI], manufacturing [MAN], service [SERV] and other [OTHER], which includes mining, which mineral mining, quarries, drilling; and construction, each expressed as a percentage of GDP. Each is expected to reflect whether the sector contributes to the value of exports. In estimating the model, since the four variables added up to one hundred percent, OTHER was dropped to avoid multicollinearity in the model. The caveat in interpreting the result was noted; the coefficient of each variable is interpreted relative to that of OTHER.

It is important in terms of domestic policies to determine the sector that is more directly correlated with exports, as this would determine how investment is utilized. There is no a priori expectation on which sector is more correlated with export overall, but each sector is emphasized, some in one country than the others.

Economic base diversification related variables

Under this group, there is one variable, the Herfindahl Index [HERF]. This variable [Hyman, 1989] is an index that measures the level of diversification in the activities of a firm, or in this case a country. The index is calculated as the sum of squares of each sectoral [agriculture, manufacturing, service and other sector] share of GDP expressed in percent terms. A higher value for the index in a country means a less diversified economic base. A country with a higher diversified base [lower index] is like to be more ready to respond to changes in the market, on account of its diversified economic base and variety of product traded. In a dynamic trade system such as exist in the Western Hemisphere in the current free trade system, countries must be ready to exploit market opportunities through product diversification and differentiation. Thus, a country with a more diversified economic base can more easily switch from one export product than one with a lower diversification base [higher index value]. Such as country would have less reflex in engaging dynamic markets head-on, and in dealing with rapid changes in trade policies, and would be forced to step back and recollect become they could get moving again.

Agosin [2009] and Sannasse, et. al. [2014] found that economic diversification stabilizes export revenue. In this study, a negative relationship, which means greater diversification, is expected between the HERF and exports.

## V. THE EXPORT VARIABLES AND THE MODEL

The long run Export Model variables is modelled as EXPLR, and the short run variables as EXPSR expressed in percent of GDP.

The data used in this study span Years 2009 to 2022. Table 2 shows the mean of each variable and their standard deviation, in both the Caribbean and Latin America.

The general form of the model used to examine the relationships between policy factors and export is as follows: Model 1 represent the long run relationship and Model 2, which shows the change interannual change in the variables, represent the short run relationship.

$$lEXPL_{ij} = \alpha_0 + \alpha_1 lGDP_{ij} + \alpha_2 lGDP/C_{ij} + \alpha_3 lEDU_{ij} + \alpha_4 lCR + \alpha_5 lCAPL_{ij} + \alpha_6 lELEC_{ij} + \alpha_7 lINF_{ij} + \alpha_8 lR_{ij} + \alpha_9 lTTR_{ij} + \alpha_{10} lDI_{ij} + \alpha_{11} lDFI_{ij} + \alpha_{12} lAgri_{ij} + \alpha_{13} lMan_{ij} + \alpha_{14} lSer_{ij} + \alpha_{15} lHERF_{ij} + e_{ij} \dots \dots \dots (1)$$

$$\Delta lEXPL_{ij} = \alpha_0 + \alpha_1 \Delta lGDP_{ij} + \alpha_2 \Delta lGDP/C_{ij} + \alpha_3 \Delta lEDU_{ij} + \alpha_4 \Delta lCR + \alpha_5 \Delta lCAPL_{ij} + \alpha_6 \Delta lELEC_{ij} + \alpha_7 \Delta lINF_{ij} + \alpha_8 \Delta lR_{ij} + \alpha_9 \Delta lTTR_{ij} + \alpha_{10} \Delta lDI_{ij} + \alpha_{11} \Delta lDFI_{ij} + \alpha_{12} \Delta lAgri_{ij} + \alpha_{13} \Delta lMan_{ij} + \alpha_{14} \Delta lSer_{ij} + \alpha_{15} \Delta lHERF_{ij} + e_{ij} \dots \dots \dots (2)$$

where: i and j are the country and year, respectively;  $EXPL_{ij}$  is the variable representing long run exports and  $\Delta EXPL$ , short run exports (i.e.,  $EXPLR$  or  $\Delta EXLSR$ ), each expressed as percent of GDP; the other variables are as defined in earlier discussion and in Table 1; and  $e_{ij}$ , represents unexplained random errors. In Model 2, the symbol,  $\Delta$ , represent the first order change in the variables [i.e. years  $t_i - t_{i-1}$ ]. To facilitate expressing the

coefficients to be expressed in percent terms each model was estimated in its log form, indicated by the letter ‘l’ in front of each variable.

### VI. DATA AND ESTIMATION PROCEDURE

The data for all the variables (2009-20022) were obtained from the Database of World Development Indicator of the World Bank [internet source, World Bank Open Data, 2024].

The analysis was confined to countries for which complete data were available. These included 9 Caribbean countries (i.e., Belize, Guyana, the Bahamas, Barbados, Jamaica, Trinidad and Tobago, Saint Lucia and Saint Vincent and the Dominican Republic) and 11 Latin American countries (i.e., Argentina, Brazil, Bolivia, Chile, Columbia, Ecuador, Uruguay, Mexico, Costa Rica, Honduras and Nicaragua), thus resulting in pooled data of 126 and 154 observations for the Caribbean and Latin America, respectively. The means and standard deviations of each of the variables for the Caribbean and Latin America data set are shown in Table 2.

**Table 2: Means and standard deviations of variables for the Caribbean and Latin America.**

		Caribbean		Latin America	
		Mean	Variance	Mean	Variance
<b>Dependent variable</b>					
	EXPORT [% GDP]	25.721	19.464	28.931	10.792
<b>Independent variables</b>					
<b>Market Related Variables</b>					
	GDP [100M]	155	229	4526	6778
	GDPC	11672	7625	8509	4866
<b>Human Capital/Private sector related variables</b>					
	EDU	5.144	5.739	5.390	1.103
	CR	48.499	19.507	47.425	25.769
<b>Infrastructure related variables</b>					
	CAPL	4627	3225	3761	2167
	ELEC	94.622	13.820	96.074	5.859
<b>Monetary policy related variables</b>					
	INF	2.372	5.797	7.867	10.245
	R	7.797	7.127	7.134	9.222
<b>Trade policy related variables</b>					
	EXR	42.866	69.019	369.179	818.512
	TTr	2.756	2.088	2.138	3.499
<b>Investment related variables</b>					
	DI	12.069	11.334	21.576	4.009
	DFI	6.180	6.240	3.901	2.650
<b>Production sector related variables</b>					
	AGRI	0.071	0.151	0.081	0.059
	MAN	0.113	0.373	0.145	0.041
	SERV	0.719	1.578	0.595	0.121
	OTHER	0.270	0.681	0.218	0.064
<b>Economic base diversification variables.</b>					
	HERF	36654	354332	4531	1628



The estimation procedure used was the generalized least squares, enabling adjustments to be made for the effect of heteroscedasticity, with each variable being weighted by the standard deviation of the error as suggested by Ramanathan (1989). No evidence of multicollinearity was found in the data, in which four models were estimated. Separate models were estimated for Caribbean and non-Caribbean (i.e., Latin American) countries.

## VII. RESULTS AND DISCUSSION

The results obtained for the long run exports and short run export models for the Caribbean, Latin America and the combined sample of countries are shown in Tables 3 and 4. In interpreting the results, each coefficient is expressed in percent terms, as in logs. Comparison of variables across the two regions are based on statistical differences using the ‘P’ scores and a significance level of at least 0.05.

### 7.1 Long run results.

Market related variables: There are two variables in this group, GDP and GDPC and they are supposed to reflect confidence place on the exporting country by the importing country. Both variables are significant in both the Caribbean and Latin America. GDPC, on the other hand, is negative in both regions. The coefficients for GDP, the size of the economy, was 1.142 in the Caribbean, indicating that a 1 % increase in GDP would result in a 1.142 percent increase in exports in this region.

Cuccia, et. al. [2018] found a similar relationship between GNP and trade, using the Gravity model. In Latin America, the coefficient was 0.208, which represents a positive, but smaller impact for GDP than in the Caribbean.

**Table 3: Long run regression results for the Caribbean and Latin America.**

		Caribbean			Latin America		
		Coefficients	P-value		Coefficients	P-value	
<b>Market Related Variables</b>							
	GDP	1.142	0.000	***	0.208	0.000	***
	GDP/Cap	-0.104	0.045	**	-0.766	0.002	***
<b>Human Capital/Private sector variables</b>							
	EDU	-1.702	0.523		-0.338	0.263	
	CR	-0.311	0.374		0.274	0.000	**
<b>Infrastructure related variables</b>							
	CAPL	0.216	0.099		0.647	0.002	***
	ELEC	6.742	0.001	***	-1.314	0.019	**
<b>Monetary policy related variables</b>							
	INF	-0.001	0.027	**	-0.070	0.007	***
	R	-0.007	0.028	**	-0.069	0.000	***
<b>Trade policy related variables</b>							
	EXR	-0.407	0.001	***	-0.028	0.007	***
	TTr	-0.305	0.039	**	-0.025	0.040	**
<b>Investment related variables</b>							
	DI	0.751	0.000	***	0.659	0.001	***
	DFI	0.171	0.002	**	0.099	0.003	***
<b>Production sector related variables</b>							
	AGRI	0.435	0.008	***	-0.426	0.208	
	MAN	-0.297	0.413		0.533	0.001	***
	SERV	0.022	0.021	**	0.548	0.037	**
<b>Economic base diversification variables.</b>							
	HERF	-0.250	0.000	***	-0.339	0.351	
<b>Constant</b>	Intercept	-1.097	0.006	***	6.796	0.000	***
<b>R Square</b>		0.781			0.681		

\*\* , \*\*\* means significant at the 95 and 99 % CI.

With regards to GDPC, the income per capita, the unexpected negative correlation observed, -0.104 and - 0.776 in the Caribbean and Latin America, is possibly due to the fact that while it reflects the income level, it also reflects the wage rate, as a cost variable. Based on the coefficients, the impact was more detrimental in Latin America. Naudé and Rossouw [2008] and Rehman and Noman [2020] for a positive relationship between this variable and exports.

In the Human capital/private sector category, there were two variables, EDU, which reflected the literacy rate in the exporting country and CR which reflected the opportunity for the private sector to participate in export related production or in exports itself. EDU was not significant in either region; whatever level the literacy rate in either region was, it did not appear to influence export activities.

Becker, 1975; and Shultz, 1961; found a direct correlation between education investment and worker's productivity. Contractor and Mudambi [2008] also found a positive correlation between literacy and export of goods. With regards to CR, Felbermayr and Yalcin, 2013, and Hur and Yoon, 2022, found a positive correlation between financial assistance and export. This variable, CR, was also not significant in the Caribbean, CR was, however, significant, and positive in Latin America, suggesting exports are likely to increase by 0.274 % per unit increase of credit offered to the private sector.

In the infrastructure group, there were two variables, one was the capital/labor ratio [CAPL], which expressed the amount of capital available per unit labor, and the other was ELEC, which expresses the percent of the population in a country with access to electricity. These variables were supposed to reflect the state of preparedness of the exporting country in general and specifically, of the private sector, to engage in trade or trade-related activities. Mbiankeu e. al. [2022] found a positive correlation between the percent of the population with access to electricity and DFI. Rehman and Noman 2020 found positive correlation between export and the exporting country level of infrastructure.

CAPL was found to be insignificant in the Caribbean, but ELEC was significant and positive [6.742], indicating that exports is likely to increase as access to electricity increases. In Latin America the coefficient for CAPL is 0.647 indicating as more capital become available to labour, exports are likely to increase. ELEC was significant, but contrary to expectation, it was negative in Latin America [-1.214], suggesting an increase in the availability of electricity is detrimental to exports. Perhaps making electricity available to the population is expensive and is subtracting from capital that could otherwise have gone into trade.

In the monetary policy related group, two variables were used, the inflation rate [INF] and the real interest rate [R] and these are supposed to reflect the price and the cost of capital involved in trade with a country. As was found by Ball et al. (1988) and Khan et al. (2007) with respect to inflation, and Sen [2019] and Hassan [2022] with respect to real interest rate, both the INF and R variables were significant and negative in both the Caribbean and Latin America [-0.001 & -0.007; -0.070 & -0.069]. The coefficients suggest that there would be a greater loss of exports on account of each variable in Latin America compared with the Caribbean.

In the trade related group, the variables used were the exchange rate [ER] and tax on trade [TTr] and these were supposed to reflect cost of export products to an importer and revenue to an exporter. ER was significant and negative in the Caribbean [-0.407] as it was in Latin America [-0.028], indicating that exports in both regions are likely to decrease as ER increases. This result was supported by both Rehman and Noman [2020] and Bhat and Bhat [2020], as well as and Nyahokwe and Ncwadi (2013).

The tax on trade [TTr] was significant and negative in both regions, -0.305 and -0.025 in the Caribbean and Latin America, respectively, indicating that an increase on taxes on trade is likely to decrease export in particular in both regions, this negative relationship between trade tax and exports was also found in Solleder [2013] and Beckman [2018]. But in both cases, the impact is likely to be greater in the Caribbean compared with Latin America.

In the investment related group, the two variables investigated were domestic investment [DI] and direct foreign investment [DFI], to reflect the relative importance of each mode of investment in export promotion in the regions.

Popovici and Călin [2017] found no evidence that domestic investment influence export [or imports]. Wang et. al. [2007] and Leichenko and Erickson [1997] found positive correlation between domestic investment and export in that domestic investment enhances export.

In this study, both variables were found to be significant and positive. In the Caribbean, the coefficient for DI was 0.751 and that of DFI was 0.171, and in Latin America the coefficients were 0.659 and 0.099 for DI and DFI, respectively. These results indicate that in the Caribbean, DI as well as DFI were more important in exports compared with Latin America.

In terms of the sectoral related group, there are four variables [AGRI], manufacturing [MAN], service [SERV] and other OTHER [which includes mining, construction, etc.], each expressed as a percentage of GDP. Each is expected to reflect whether the sector contributes to the value of exports and to what extent it is relative to the other sector.

The result shows that AGRI and SERV were significant and positive in the Caribbean. For AGRI, the result shows that for every one percent increase in AGRI, export is likely to increase by 0.043 percent greater

than what it would be in the OTHER sector, and in the service sector, export is likely to increase by 0.022 % greater than what it would be in the OTHER sector.

In Latin America, MAN and SERV were significant and positive, and exports is likely in increase by 0.533 and 0.548 percents greater than what it would be in the other sector, for a one percent increase in each sector. For SERV, which was significant in bother regions, Latin America is likely to outperform the Caribbean by a one percent increase in this variable in both regions.

In terms of diversification, one variable is included, the Herfindahl Index. The variable was supposed to reflect whether having a diversified economic base contributed more to exports or not. The variable was found to be significant and negative in the Caribbean [-0.250], but insignificant in Latin America. Where, historically, Caribbean countries tended to concentrate on and became overdependent on one sector, the indication here is that with an increase in diversification in this region, exports are likely to increase, and based on the results, faster than in Latin America.

### 7.2 Short run results

In the Short Run models, seven variables in six groups were significant in the Caribbean and the groups includes the market related groups, the infrastructure group, the monetary group, the investment group, the productive sector group, and the diversification group. No variable was significant in the human capital/private sector related group and the trade related group. Six variables in four groups were significant in Latin America, and the groups involved were the same as in the Caribbean except the diversification group and the infrastructure group in which this region had no significant variables.

In the market related group, GDP [market size] was significant in both the Caribbean and Latin America [[0.442 & 1.913] suggesting the and increase in GDP is associated with increased exports, perhaps indicating that an increase in the GDP as a result of production would result in an increase in export or through a greater amount of business with other countries, as suggested by the Gravity model. GDPC was not significant. In the human capital/private sector related variables group, neither EDU nor CR was significant in either the Caribbean or Latin America.

In the infrastructure related category, CAPL was the only significant variable in the Caribbean, and it was positive [0.143], indicating that improvement in capital expenditure in the short run is likely to have a positive impact on exports. Neither CAPL nor ELEC was significant in Latin America.

In the monetary policy related variables group, the inflation rate variable [INF] was significant and negative in both the Caribbean and Latin America [-0.016 & -0.018] signaling that exports are likely to decrease as INF increases, quite likely through a perception of a cost increase. With regards to the interest rate, R, the variable was also significant and negative in both regions, indicating that exports are likely to decrease as R increases. The impact is likely to be less detrimental in the Caribbean with a coefficient of -0.003 compared with Latin America with a coefficient of -0.006.

**Table 4: Short run regression results for the Caribbean and Latin America.**

		Caribbean			Latin America		
		<i>Coefficients</i>	<i>P-value</i>		<i>Coefficients</i>	<i>P-value</i>	
<b>Market Realted Variables</b>							
	GDP	0.442	0.029	**	1.913	0.022	**
	GDPL	0.943	0.771		1.944	0.215	
<b>Human Capital/Private sector related variables</b>							
	EDU	0.268	0.201		0.246	0.138	
	CR	0.157	0.684		-0.220	0.054	
<b>Infrastructure related variables</b>							
	CAPL	0.143	0.002	***	0.040	0.726	
	ELEC	1.443	0.560		0.188	0.734	
<b>Monetary policy related variables</b>							
	INF	-0.016	0.010	**	-0.018	0.016	**
	R	-0.003	0.032	**	-0.006	0.024	**
<b>Trade policy related variables</b>							
	EXR	-0.383	0.650		-0.043	0.607	
	TTr	-0.407	0.231		-0.006	0.750	
<b>Investment related variables</b>							
	DI	0.361	0.013	**	0.057	0.603	
	DFI	0.002	0.946		0.033	0.023	**

<b>Production sector related variables</b>							
	AGRI	0.288	0.305		-0.146	0.080	
	MAN	-0.058	0.380		0.289	0.030	**
	SERV	0.551	0.000	***	2.458	0.000	***
<b>Economic base diversification variables.</b>							
	HERF	-0.302	0.039	**	-1.166	0.127	
<b>Constant</b>	Intercept	-0.024	0.167		0.013	0.146	
<b>R Square</b>		0.3644			0.4866		

\*\*, \*\*\* means significant at the 95 and 99 % CI

In the trade policy related group, neither exchange rate [EXR] nor the tax on trade variable, TTr, was significant in the Caribbean or Latin America.

In the investment related variables category, in the Caribbean, domestic investment [DI] was significant and positive [0.361], suggesting that domestic investment translates efficiently into exports in the short run. DI was not significant in Latin America, but foreign direct investment [FDI] was, and it was positive [0.033], indicating that DFI is effective even in the short run in increasing export. DFI was not significant in the Caribbean.

In the production sector related group, AGRI, the agriculture sector, and SERV, the service sector is both significant and positive [0.288 & 0.551] indicating that production in these sectors is reflected in a greater increase in exports, over the OTHER sector, and should be fostered. Manufacturing [MAN] was not significant. In Latin America only MAN and SERV were significant and had positive coefficients [0.289 & 2.458] showing that MAN and SERV were doing better than the OTHER sector. Again, the service sector in Latin America did better than that in the Caribbean.

The diversification variable was significant and negative [-0.302] in the Caribbean, signaling a potential to positively impact exports in this region. The variable was not significant in Latin America.

### VIII. SUMMARY.

The objective of this study was to determine factors that have a differential impact on exports in the Caribbean and Latin America, both in the long run and short run. The variables considered fell into one of several categories, market, human capital/private sector, productive infrastructure, monetary policy, trade related policy, investment, productive sector, and economic base diversification. The impacts of the variables were determined, both in the long run and short run.

In the Caribbean, among the variables that were significant and positive were the market size, in the market related category, the percent of population with access to electricity in the infrastructure category, and both domestic and direct foreign investments in the investment category. The income per capita variable in the market category, inflation rate, and the real interest rate in the monetary policy group, and the exchange rate and tax on trade in the trade related group were found to be negative.

In the productive sector group, the agriculture and service sector variables were positive, indicating that these sectors contributed more to export than the other group [which includes mining and construction]. The Herfindahl index in the economic base diversification group had a negative sign indicating that with an increase in the diversification of the economic base in the Caribbean, exports are likely to increase.

With regards to the relative impacts, in the Caribbean compared with Latin America, market size and domestic and direct foreign investment, and the agriculture with a positive sign along with the exchange rate and diversification variables, with a negative sign, each showed a stronger impact on export in the Caribbean than in Latin America.

The widespread access to electricity and service sectors was also positive, but their impacts were less strong compared with Latin America.

The inflation rate, the interest rate and the tax on trade variables had the expected negative sign, which means any increase in these variables would likely result in export value reduction. The impact of each variable was more detrimental in Latin America compared with the Caribbean.

In the Caribbean, the income per capita in the market group was negative, and although other research also found this to be the case, it was expected that this variable with a positive sign would signal greater confidence in the export market. Perhaps, it simply signaled higher costs, as income per capita is directly correlated with wage rates unless wage rate is fixed by government. It was also expected that if, as in other research, variable such as literacy, and the availability of credit to the private sector and capital per unit labor variables had been significant, this would have indicated that the private sector was more involve in trade and economic development. Instead, with the exception of literacy, these variables were significant and had a stronger impact in Latin America.

In the Caribbean, policies aimed at economic base diversification, and markets expansion, expansion in the agriculture sector, and making the service sector more competitive are likely to result in increased exports as they show up and indicated a stronger impact in the short run model as well. Improving strategies to increase the capital to labor ratio and decreasing the inflation rate, which would also impact the real interest rate, might positively impact exports in this region.

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