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The University of the West Indies, Cave Hill Campus

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An Assessment of Caribbean Export Potential

Troy Lorde[a,*], Antonio Alleyne[a], Roger Hosein, and Mu Yifei[c]

[a]The University of the West Indies, Cave Hill Campus, Barbados
[b]The University of the West Indies, St Augustine Campus, Trinidad and Tobago
[c]Dongbei University of Finance and Economics, Dalian, China

Abstract

This study assesses the export potential of East Asia for the Caribbean within the framework of a structural gravity model. Export potential of 30% is estimated to be available to the Caribbean within East Asia. Individual markets with the greatest export potential are Singapore, China, and Japan. Various simulations of a free trade agreement between the two regions suggest the existence of even larger potential. The challenge for the Caribbean is that without significant structural changes, the region will be unable to exploit East Asia's potential. Greater effort at the industry and policy levels will be critical for export expansion.

[*]**Corresponding author**: Troy Lorde, Department of Economics, Cave Hill Campus, The University of the West Indies, P.O. Box 64, Bridgetown, Barbados. Tel: (246) 417-4279; Fax: (246) 438-9104; Email: troy.lorde@cavehill.uwi.edu.

1. Introduction

The importance of trade for development is well-established in the literature (Panagariya 2004). Optimal exports permit developing countries to overcome the limitations of market size (Freund and Weinhold 2004) through exploitation of economies of scale and capacity utilization, reducing the dilemma of operating sub-optimally (Balassa 1987).

For Caribbean countries, a number of critical issues have conflated to reduce their trade performance. On the international front, they have suffered fallout from an erosion of long-standing trade preferences with Europe (Hosein, Gookol, and Lorde 2018; Lorde and Alleyne 2018; Lorde, Alleyne, and Francis 2010), and face increasing competition from across the globe (Lorde, Alleyne, and Francis 2010), poor foreign direct investment inflows (Cannonier, Francis, and Lorde 2007), weak financial market development (Iyare, Lorde, and Francis 2005), and a retreat from multilateralism (Ghibutiu 2018). Domestically, Caribbean countries are plagued by persistent fiscal deficits, ballooning debt, and anemic growth, while policies of austerity to address the former have had mixed results. Kathuria et al. (2005) argue that key reasons for the Caribbean's weak trade performance is decades of dependence on traditional export markets in Europe and the USA, among other things. Even the guarantees provided by preferential arrangements were unable to provide the necessary impetus to improve the region's overall trade performance (Tsikata, Moreira, and Hamilton 2009).

The foregoing strongly suggests that diversification of export markets might be a useful strategy for Caribbean countries to pursue. Export diversification is strongly recommended as a way to improve the terms of trade, lower economic volatility, and boost economic growth (Beverellia,

Neumuellerb, and Teh 2015; Shepherd 2010). In this regard, East Asia, a market with 60% of the world's consumers, has long been identified as a region to which the Caribbean should look to as they seek to diversify their export markets (Girvan 1997). The primary motive for such a strategic move would be alignment of the Caribbean with one the fastest growing regions in the world. A more diversified export market-base would also better insulate the Caribbean from external shocks and aid in economic growth (Francis, Iyare, and Lorde 2007; Francis, Lorde, and Taylor 2007).

Notwithstanding, important questions that should first be answered are: Is East Asia a 'natural trading partner'[1] for the Caribbean and, if so, what is the potential for exporting to this market? Geographic proximity and initial volume of trade have been identified as important criteria for identifying natural trading partners (Wonnacott and Lutz 1989). Indeed, Krugman (1993) notes that there is a strong tendency for countries in geographic proximity to trade more with each other because of the benefits from low transportation and communication costs. These arguments for defining a natural trading partner (initial volume of trade and geographic proximity) were comprehensively rejected by Bhagwati (1993). Empirical evidence refuting the natural trading partner hypothesis on the basis of a high initial volume of trade and geographic proximity was first provided by Krishna (2003).

[1] Proponents of the natural trading partner hypothesis argue that preferential trade agreements (PTAs) are welfare-enhancing if participating countries already trade disproportionately with each other (Deardoff and Stern 1994). Opponents hold the opposite view; welfare gains are greater from PTAs if participating countries trade less with each other (Michaely 1998). Schiff (2001) argues that neither view is correct; specifically, two countries are natural trading partners only in the sense that one country imports what the other exports.

Such shortcomings paved the way for Schiff (2001) to redefine the natural trading partner hypothesis in terms of trade complementarity. Schiff asserted that trading partners are natural if their trading structure is characterized by complementarity, and developed a theoretical model to establish that a free trade agreement (FTA) between countries with strong and improving complementary trade structures is likely to be welfare enhancing. In this regard, trade complementarity appears to be critical for defining a country's real natural trade partner. Several studies support the need for trade complementarity among members or prospective members of an FTA (Trebilock and Howse 2005; Yang and Gupta 2007).

This study, thus, has two objectives. It assesses the natural trading relationship between the Caribbean and East Asia,[2] and estimates the former's export potential for the latter. In this study, the Caribbean is represented by the Caribbean Community (CARICOM) group of countries,[3] while East Asia refers to the Association of Southeast Asian Nations (ASEAN) bloc,[4] plus China, the Republic of Korea, and Japan (henceforth referred to as EA13). To achieve the first objective, the study constructs indices of trade complementarity between CARICOM and EA13. Countries characterized by a strong degree of trade complementarity are greater beneficiaries of free trade agreements (Schiff 2001). Trade complementarity indices are also useful in evaluating prospective bilateral or regional trade agreements (Drysdale 1967). The second objective,

[2] Khadan and Hosein (2013) show that trade complementarity is low between CARICOM and the EU and North America, respectively.
[3] CARICOM includes: Antigua and Barbuda, Bahamas (The), Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago.
[4] ASEAN includes: Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam.

estimating CARICOM's export potential, is addressed within the framework of the structural gravity model. Findings provide evidence of the gains from exporting to non-traditional markets. They also add to the scarce literature concerning trade in small states.

2. Methods and Data

2.1 Trade Complementarity

Drysdale and Garnaut (1982) contend that Drysdale's (1967) measurement of trade complementarity provides an appropriate measure to capture the trade structure of countries as it compares the trade structure of partnering countries in relation to world trade. This article employs Drysdale's (1967) formulation of trade complementarity:[5]

$$tci_{ij}^{s} = \sum_{k}^{s} \left(\frac{X_{w}^{k}}{X_{w}^{s}} * \frac{X_{iw}^{k}/X_{iw}^{s}}{X_{ww}^{k}/X_{ww}^{s}} * \frac{M_{jw}^{k}/M_{jw}^{s}}{M_{ww}^{k}/M_{ww}^{s}} \right) \quad (1)$$

where tci_{ij}^{s} is a measure of trade complementarity between country *i* and partner *j* in sector *s*; $\frac{X_{w}^{k}}{X_{w}^{s}}$ is the export share of product k in sector *s* in the world *w*; $\frac{X_{iw}^{k}/X_{iw}^{s}}{X_{ww}^{k}/X_{ww}^{s}}$ is the export share of product *k* in sector *s* in country *i* relative to the world's share *w*; and $\frac{M_{jw}^{k}/M_{jw}^{s}}{M_{ww}^{k}/M_{ww}^{s}}$ is the import share of product k in sector *s* with partner *j* relative to the world's share *w*. The trade complementarity index indicates to what extent the export profile of country *i* matches or complements the import profile of partner *j*. A value of $tci_{ij}^{s} > 1$ implies that trade complementarity between products

[5] Various estimates of trade potential have relied primarily on the utilization of statistical indices (Colley 2015; De Castro 2012; Khadan and Hosein 2013), which permit only partial inferences and do not account for factors that impact the flow of trade.

from sector *s* exported from country *i* and imported by country *j* is above average, suggesting there are potential gains from greater trade; the higher the index, the stronger the complementarity and the greater the potential gains. A value of $tci_{ij}^{s} < 1$ implies weak trade complementarity. A higher tci_{ij}^{s} also implies greater gains from a potential free trade agreement (Michaely 1998; Yeats 1998).

2.2 Export Potential

The approach to estimating export potential is based on the structured gravity model, which examines factors of exports and permits export projections. The model, after various manipulations and in log form, can be expressed as:

$$ln(TE_{ijkt}) = \alpha_0 + \beta_1 tariff_{ijkt} + \varphi_1 fe_{ikt} + \varphi_2 fe_{jkt} + \varphi_3 fe_{ijk} + u_{ijkt} \quad (2)$$

where TE_{ijkt} is exports of good k from country i to country j at time t; $tariff_{ijkt}$ represents importer *j's* average tariff on good k from exporter i; fe_{ikt}, fe_{jkt}, and fe_{ijk} are fixed effects that represent all forms of multilateral resistance (Anderson and van Wincoop 2003) that may affect export flows; and u_{ijkt} is a normally distributed error that accounts for the unexplained variation in bilateral exports of good k between country i and country j.

The Poisson pseudo-maximum likelihood (PPML) is used to estimate Equation (2), which is the preferred estimation method to handle the zeroes that are recorded in trade flows and the issue of logarithm transformation (Santos Silva and Tenreyro 2006). The PPML estimator can handle various issues associated with the flow of cross-border trade data. First, Poisson estimation takes account of observed heterogeneity. Therefore, it is consistent with a pseudo-maximum likelihood estimator regardless of how the data are distributed. Second, the PPML estimator

with fixed effects[6] gives a natural way to deal with zeroes (making it most appropriate for the countries under investigation in this study)[7] because of its multiplicative form. This avoids the concern of under-prediction in large trade flows by generating estimates of the nominal flows and not the logged form of the value. The Poisson estimator performs consistently even in datasets with large numbers of zeroes and over-dispersion, and gives the lowest bias among available estimators (Santos Silva and Tenreyro 2011). This study adopts the PPML estimator with high dimensional fixed effects by Larch et al. (2019) to estimate Equation (2).

Export potential is estimated as the ratio of projected exports determined from the estimate of Equation (2) to actual exports. Projected exports represent exports attainable at current capacity and resource constraints. Export potential is estimated as:

$$PE_{ijkt} = \frac{\widehat{TE_{ijkt}} - TE_{ijkt}}{TE_{ijkt}} \quad (3)$$

where PE_{ijkt} is potential exports of good k from country i to country j at time t; TE_{ijkt} is actual exports of good k from country i to country j at time t; and $\widehat{TE_{ijkt}}$ is estimated exports from country i to country j at time t. $PE_{ijkt} > 0$ implies that country i has the availability to increase exports to country j; and $PE_{ijkt} < 0$ represents a trading environment that is overly concentrated, indicative of an unsustainable export relationship.

[6] The inclusion of both time variant and invariant effects has become common in gravity modeling, mainly due to the heteroskedastic nature of trade data which affects the efficiency and consistency of parameters (Egger and Nelson 2011).

[7] For various reasons, CARICOM countries do not exchange a large variation of products, which results in zero bilateral trade activity. As such, the level of disaggregated data used in this analysis expectedly captures a significant number of zeroes. More specifically, 51.9% of the available bilateral observations are zero (1,950,319 instances out of the 3,758,784 data points).

Traditional trade models typically analyze the relationship between each pair of countries in isolation (Chaney 2014). Thus, for a pair of countries *i* and *j*, they ignore the effects that other countries' trade relationship may have on the trade relationship between *i* and *j*, that is, network effects. The model takes these effects into account by including trade among the top trade partners of each CARICOM and EA13 country. The effectiveness of this method is that it provides more accuracy than the point estimates of gravity.

2.3 Data Sources

Annual exports for the years 2001 to 2015 are obtained from the United Nations (UN) Comtrade database at the Harmonized System (HS) two-digit level. The sample of countries employed in the study are the top 25 trade partners of each CARICOM and EA13 country.[8] Data for geographic distance, contiguity, and common official language are taken from the CEPII online database. Observations on import tariffs are acquired through the World Trade Organization (WTO) Tariff Download Facility. Trade agreements are taken from the WTO Regional Trade Agreement database: currency unions (cu), economic integration agreements (eia), partial scope agreements (ps), and free trade agreements (fta), all in dichotomous form. A dichotomous variable to capture the relationship between CARICOM and EA13 countries is included. Since

[8] These include: Argentina, Antigua & Barbuda, Australia, Belgium, Bahamas (The), Belize, Brazil, Barbados, Brunei Darussalam, Cambodia, Canada, Chile, China, Colombia, Costa Rica, Germany, Dominica, Dominican Republic, France, Gabon, Grenada, Guyana, Hong Kong, Haiti, Indonesia, India, Italy, Jamaica, Japan, Korea (Republic of), Laos, Liberia, Mexico, Myanmar, Montserrat, Malaysia, Mauritius, Netherlands (The), Norway, Panama, Philippines (The), Portugal, Singapore, Spain, Suriname, St. Kitts & Nevis, St. Lucia, St. Vincent & the Grenadines, Switzerland, Thailand, UK, United Arab Emirates, USA, Venezuela, and Vietnam.

no formal trade agreements exist, the variable takes a value of one if a CARICOM country exports to an EA13 country or vice versa.

3. Results and Discussion

Table 1 presents trade complementarity indices for each industry and year under study. For each industry, the range of values (min, max) for trade complementarity between CARICOM and all EA13 countries is shown, along with the country with the largest index. All indices are larger than one, strongly suggesting that the two regions are natural trading partners. For virtually all goods, there is a relatively high variation over time in the countries with the highest complementarity. Exceptions are agriculture, plastics and rubber, wood, textiles, and stone and glass. Trade complementarity is highest among all goods in the mineral industry.

Table 2A presents results from the gravity model (Equation 2). All variables are highly significant when including time-invariant factors (distance, contiguity, common language, CARICOM_EA13 relationship) in the model (Column 1). Robustness checks are undertaken through various iterations of the model in Columns 3 to 8.

The specification in Column 8 is used to estimate CARICOM's export potential to EA13, as time-invariant effects in other variants are captured by the country-pair effects (Anderson and van Wincoop 2003). All variables show consistency when comparing FTA effects between CARICOM and the rest of its world partners. FTA effects which exclude CARICOM are significant and positive (0.055), whereas no significant impact for CARICOM is found. The latter may be as a result of CARICOM countries' weak level of competitiveness, which could

reduce the effectiveness of trade agreements. It also suggests that CARICOM may not be maximizing the potential of their current trade agreements. Partial scope agreements, *ps*, have a positive impact on exports (0.205). As previously mentioned, CARICOM's trade dependence and concomitant weak trade performance has been attributed to such agreements. CARICOM's trade complementarity with the EA13 is positive and highly significant. This is further evidence to support the existence of a natural trading partner relationship between CARICOM and EA13. However, the relatively small coefficient of 0.007 suggests that there is scope for improving the depth of the trading relationship between both regions.

Robustness Checks

To ensure the robustness of the results, estimation of the model is repeated using the ordinary least squares (OLS) approach adopted by Guimaraes and Portugal (2010), which facilitates a high volume of multilateral effects, allowing for the proposed estimation model to be validated within and across techniques. OLS estimation provides a comparative assessment of sensitivity to the missing and zero trade flows. Unlike the PPML estimator, all zero trade flows are excluded from the computation of results. In Table 2B, the quality of estimates from the policy variables coupled with the multilateral resistance effects are consistent with those in Table 2A. More specifically, the average effect of FTAs is positive for exporting industries, with border tariffs being the largest deterrent to exporting.

EA13 Market Potential for CARICOM Exporters

Table 3 reveals that, overall, CARICOM's commodity exports into EA13 can expand by another 30%. This potential arises primarily from China, Indonesia, the Republic of Korea, and

Singapore with export potentials of 10%, 20%, 20%, and 300%, respectively. Table 3 also shows that there is significant potential for individual goods, even for countries that show no potential on an overall basis; for example, Brunei Darussalam, Japan, the Philippines, and Thailand. No potential was found for Cambodia, Laos, and Myanmar. Overall, the potential for expansion of exports to EA13 is valued at $251 mn in revenues. Goods of greatest potential to the region as a whole are *Agriculture*, *Footwear*, *Machinery and Electrical*, and *Minerals and Transportation*. On an individual country basis, countries may or may not hold export potential in these goods; for example, Singapore in *Leather Hide* and *Metals*.

Export Potential from a CARICOM-EA13 FTA

To assess the potential from a CARICOM FTA with East Asia, three scenarios are used to simulate the effects of trade agreements with EA13 countries. Each scenario is based primarily on various FTA impacts across different regions taken from within the sample under study. A regression of bilateral exports on various types of trade agreements is undertaken and the coefficients on the FTA variables are used to construct the scenarios regarding hypothetical effects of an FTA between CARICOM and EA13 (results available upon request). Scenario I assumes an impact equal to 50% of an EU FTA (which is the largest), and is considered the extreme scenario. Scenario II is equivalent to the impact of an ASEAN plus six FTA, the moderate scenario.[9] Scenario III assumes a minimal impact on exports of 1%.[10]

[9] ASEAN countries were listed in Footnote 2. The "plus six" countries include Australia, China, India, Japan, South Korea, and New Zealand.

[10] According to the findings of Baier and Bergstrand (2007), the average treatment of trade agreements is 0.70 – suggesting doubling of trade between parties. The inherent limitations facing these smaller Caribbean countries, from endowment to production (technology and finances), are expected to constrain the potential

Table 4 presents the projected FTA impacts in nominal and percentage terms under the three scenarios. Export potential and the ratio of projected exports to current (2015) exports are reported. Scenario I (extreme impact) suggests a large increase in exports, almost 300% higher than current levels, and the potential for additional gains of approximately 200%. Scenario II (moderate impact) is perhaps a more likely outcome given CARICOM's pattern of exports. Exports to East Asia are projected to grow by 36.4% under an FTA, with the potential to grow by an additional 5.7%. Projections under Scenario III (low impact) imply growth in CARICOM's exports by 30.3%, in line with results found if CARICOM exported to its full potential without an FTA (see Table 3).[11]

4. Conclusion

This study assessed the potential of exports available to CARICOM within the East Asian market. Trade complementarity indices and a structured gravity model were used to evaluate export patterns, estimate export potential, and make projections of exports under the hypothetical of an FTA. The article estimates an overall export potential gap of 30% available to CARICOM within EA13. Additionally, projections based on the hypothetical impact of an FTA between the two regions indicate the potential for even greater CARICOM exports. A greater effort at industry and policy levels will be critical to export expansion into such non-traditional markets. It would be prudent for the region to capitalize on the immediately available

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of any well (balanced) negotiated trade agreement. The estimated coefficients employed seek to replicate real-world experiences of other regions for practicality.

[11] This is in line with Whalley's (1998) rational expectations on FTAs.

opportunities. This would facilitate an increase in competitiveness at the international level, improve trade performance, and brighten prospects for economic growth.

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Table 1: Trade Complementarity between CARICOM and EA13

	2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015	
	min	**max**	**min**	**max**	**min**	**max**	**min**	**max**	**min**	**max**	**min**	**max**	**min**	**max**	**min**	**max**	**min**	**max**	**min**	**max**	**min**	**max**	**min**	**max**	**min**	**max**	**min**	**max**	**min**	**max**
Agriculture	13.6	26.6	15.4	26.4	13.9	29.6	13.1	30.3	13.5	32.3	15.2	29.7	17.9	36.9	17.7	35.9	20.0	31.0	20.9	33.1	16.9	39.4	20.2	42.0	21.2	32.0	18.9	30.5	18.0	35.0
	Singapore		Singapore		Singapore		Japan		Japan		Singapore		Singapore		Japan		Singapore		Japan		Singapore		Japan		Singapore		Rep. of Korea		Rep. of Korea	
Chemicals	20.0	27.2	15.5	24.1	18.0	25.6	17.2	32.7	19.1	28.4	20.4	28.9	20.8	26.0	19.6	29.0	19.8	30.3	22.3	41.5	18.4	31.3	17.8	28.5	18.7	29.4	21.0	34.0	20.2	32.2
	Thailand		Japan		Malaysia		Malaysia		Malaysia		Malaysia		Philippines		Japan		Japan		Rep. of Korea		Rep. of Korea		Cambodia		Rep. of Korea		Rep. of Korea		Rep. of Korea	
Food Products	10.9	27.9	13.9	27.7	10.9	30.7	10.4	24.0	11.7	25.6	12.4	24.2	16.1	29.1	15.0	31.7	13.0	32.4	12.8	33.2	13.4	33.5	10.3	37.1	7.9	37.8	10.1	37.0	13.0	30.4
	Brunei		China		China		Philippines		Philippines		China		Philippines		Philippines		Philippines		Rep. of Korea		Philippines		Philippines		Philippines		Philippines		Philippines	
Footwear	16.2	21.6	7.9	22.0	13.2	28.2	7.3	20.1	11.0	32.9	14.9	24.4	11.9	25.9	18.8	29.4	12.2	19.2	16.8	36.4	16.7	21.6	17.7	27.6	11.0	16.7	12.5	30.1	15.6	21.9
	Indonesia		Indonesia		Japan		China		Japan		China		Japan		Brunei		Indonesia		Japan		Rep. of Korea		Rep. of Korea		Rep. of Korea		Rep. of Korea		Rep. of Korea	
Leather Hide	9.3	25.1	14.6	21.2	8.8	22.1	10.2	19.4	10.7	17.6	10.3	18.8	9.8	18.8	8.7	26.3	12.9	18.8	8.3	20.3	12.6	15.9	14.5	24.6	12.7	22.0	14.7	19.7	7.1	23.7
	Indonesia		Indonesia		Indonesia		Indonesia		Indonesia		Indonesia		Indonesia		Indonesia		Philippines		Rep. of Korea		Rep. of Korea		Philippines		Philippines		Japan		Philippines	
Machinery & Electrical	18.2	21.6	15.9	24.3	17.7	22.8	19.3	23.4	15.0	25.1	15.1	22.7	16.4	25.6	17.8	22.0	15.3	17.5	18.0	21.7	15.8	20.9	17.7	21.6	18.6	20.4	14.6	23.2	16.4	23.3
	Malaysia		Malaysia		Malaysia		Malaysia		Malaysia		Malaysia		Malaysia		Malaysia		Malaysia		Myanmar		Myanmar		Myanmar		Brunei		Myanmar		Brunei	
Metals	16.6	21.9	18.6	28.4	16.3	22.2	16.1	21.1	17.8	24.3	17.7	22.8	16.1	23.8	16.6	25.1	16.6	24.5	17.5	27.8	13.9	32.2	19.2	31.7	20.1	28.1	17.6	31.4	16.2	29.8
	Japan		Philippines		China		China		China		Japan		China		Indonesia		China		Laos		Laos		Laos		Laos		Laos		Laos	
Minerals	11.7	40.1	11.2	38.6	10.4	35.7	9.8	51.1	10.4	60.0	10.1	72.5	10.0	76.5	10.8	65.1	8.2	63.0	9.7	111.9	8.9	91.2	10.0	114.3	10.8	94.2	8.7	83.8	10.9	58.8
	Japan		Japan		Japan		Japan		Thailand		Japan		Japan		Japan		Philippines		Laos		Laos		Rep. of Korea		Japan		Japan		Japan	
Plastics & Rubber	19.6	21.0	21.6	22.6	21.8	22.2	20.0	23.3	16.8	19.7	18.7	22.5	20.2	23.4	19.7	22.5	17.0	21.2	17.7	24.5	19.9	26.8	21.8	28.5	15.8	24.7	17.1	22.1	20.5	23.8
	Brunei		Brunei		Malaysia		Malaysia		Malaysia		Malaysia		Malaysia		Malaysia		Malaysia		Malaysia		Malaysia		Malaysia		Thailand		Malaysia		Thailand	
Stone & Glass	17.1	39.9	18.1	35.9	17.3	40.6	17.6	38.3	15.3	41.2	13.2	43.1	14.3	53.4	15.8	44.7	14.9	39.3	16.2	47.0	15.5	44.4	19.6	69.6	17.4	55.6	18.8	51.9	16.3	38.7
	China		China		China		China		China		China		China		China		China		Laos		Laos		China		China		China		Thailand	
Textiles	8.9	28.8	9.7	25.2	5.2	29.7	9.6	26.8	8.5	30.1	6.9	25.9	5.5	25.9	7.4	28.4	6.4	25.9	3.9	28.4	7.0	25.4	8.9	28.4	6.0	25.4	6.6	28.1	7.3	21.1
	Indonesia		Indonesia		Indonesia		Indonesia		Indonesia		Indonesia		Indonesia		Indonesia		Indonesia		Indonesia		Indonesia		Indonesia		Myanmar		Indonesia		Indonesia	
Transportation	11.7	52.9	14.4	34.9	9.4	30.0	10.2	24.0	11.9	23.0	8.4	47.0	14.5	34.6	15.1	28.2	9.7	24.6	15.1	34.4	12.0	17.4	15.8	27.2	10.7	31.9	11.0	19.8	13.3	24.2
	China		China		Myanmar		Myanmar		Cambodia		China		Myanmar		Philippines		Cambodia		Laos		Laos		Philippines		Laos		China		Laos	
Wood	11.0	24.7	10.5	24.6	10.6	25.3	10.4	23.5	11.3	23.2	12.8	23.7	12.6	27.3	12.3	26.3	11.9	24.3	13.8	28.3	14.5	25.5	15.5	29.8	16.4	25.7	18.7	26.7	21.6	24.1
	Philippines		Philippines		Indonesia		Indonesia		Japan		Indonesia		Indonesia		Indonesia		Indonesia		Indonesia		Indonesia		Indonesia		Indonesia		Japan		Brunei	
Miscellaneous	14.0	84.9	11.5	40.4	7.3	63.8	8.2	80.6	5.6	30.8	7.1	27.7	12.7	44.5	14.3	58.6	8.4	22.3	11.1	22.6	14.3	33.3	14.5	25.0	15.6	23.2	12.6	24.7	12.8	17.5
	Japan		Japan		Japan		Japan		Thailand		Japan		Japan		Japan		Indonesia		Japan		China		Laos		Laos		China		Philippines	

Source: Authors estimates.

Note: Exports are classified by industry according to UNCTAD. Values in each cell show the range of trade complementarities (min and max) between CARICOM and EA13 countries by year and industry. The country in each cell is the country that exhibited the highest trade complementarity with CARICOM by year and industry.

Table 2A: PPMLsg Estimates of Trade Costs for CARICOM-EA13 Exports

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Distance (Natural log)	-0.154***							
	(0.0052)							
Contiguity	0.379***							
	(0.0110)							
Share Common Official Language	0.289***							
	(0.0091)							
CARICOM-EA13 Relationship Indicator	-0.373***							
	(0.0317)							
Avg Border Tariff (MFN weighted)	-0.647***	-0.592***	-0.580***	-0.579***	-0.577***	-0.715***	-0.714***	-0.580***
	(0.0045)	*(0.0181)*	*(0.0181)*	*(0.0182)*	*(0.0182)*	*(0.0187)*	*(0.0187)*	*(0.0181)*
CARICOM-EA13 Trade Complementarity Index	-0.0197***	0.00648*	0.00668*	0.00669*	0.00669*	0.00522**	0.00522**	0.00668*
	(0.0057)	*(0.0026)*	*(0.0027)*	*(0.0027)*	*(0.0027)*	*(0.0020)*	*(0.0020)*	*(0.0027)*
Currency Union (*cu*)	0.440***	0.0813**	0.0546**	0.0329	0.0405**	0.0329*		
	(0.0191)	*(0.0305)*	*(0.0209)*	*(0.0207)*	*(0.0138)*	*(0.0133)*		
Free Trade Agreement (*fta*)	0.751***	2.280*	2.854*	2.842*	2.847*			2.854*
	(0.0355)	*(1.1450)*	*(1.3060)*	*(1.3130)*	*(1.3130)*			*(1.3060)*
Economic Integration Agreement (*eia*)	0.0445*	-0.0197	-0.0192	0.00924				-0.0192
	(0.0189)	*(0.0225)*	*(0.0188)*	*(0.0185)*				*(0.0189)*
Partial Scope Agreement (*ps*)	0.0266	0.194***	0.205***					0.205***
	(0.0137)	*(0.0505)*	*(0.0486)*					*(0.0486)*
cu plus *eia*	-0.383***	0.657*						
	(0.0413)	*(0.3330)*						
fta plus *eia*	-0.147***	-0.0320						
	(0.0302)	*(0.0396)*						
CARICOM f*ta*								0.0587
								(0.0567)
fta excl. CARICOM								0.0546**
								(0.0209)
Number of Observations	1,622,754	1,622,754	1,622,754	1,622,754	1,622,754	1,622,754	1,622,754	1,622,754
R-squared	0.946	0.997	0.997	0.997	0.997	0.998	0.998	0.997
Exporter-Industry-Time Effects	YES	YES	YES	YES	YES	YES	YES	YES
Importer-Industry-Time Effects	YES	YES	YES	YES	YES	YES	YES	YES
Exporter-Importer-Industry Effects	NO	YES	YES	YES	YES	YES	YES	YES

Source: Authors' estimates.

Notes: Standard errors in parentheses, *** p<0.001, ** p<0.01, and * p<0.05. Inclusion of export-importer-industry effects absorbs all time invariant costs (Models 2 to 8). Various forms of trade agreements can be found at http://rtais.wto.org/UserGuide/User%20Guide_Eng.pdf.

Table 2B. OLS Estimates of Trade Costs for CARICOM-EA13 Exports (robustness checks)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Distance (Natural log)	-0.327***						
	(0.00132)						
Contiguity	0.199***						
	(0.00469)						
Shared Common Official Language	0.392***						
	(0.00232)						
CARICOM-EA13 Relationship Indicator	-0.177***						
	(0.00521)						
Avg. Border Tariff (MFN weighted)	-0.815***	-0.892***	-0.892***	-0.892***	-0.892***	-0.892***	-0.892***
	(0.000284)	*(0.000218)*	*(0.000218)*	*(0.000219)*	*(0.000219)*	*(0.000215)*	*(0.000215)*
CARICOM-EA13 export structure (tci)	0.000626	0.00265***	0.00259***	0.00259***	0.00259***	0.00256***	0.00259***
	(0.00142)	*(0.000398)*	*(0.000398)*	*(0.000398)*	*(0.000398)*	*(0.000398)*	*(0.000398)*
Free Trade Agreement (fta)	0.370***	-0.0107***	-0.0204***	-0.0193***	-0.0145***	-0.0154***	
	(0.00512)	*(0.00218)*	*(0.00183)*	*(0.00181)*	*(0.00124)*	*(0.00122)*	
Currency Union (cu)	0.259***	-0.0297***	0.0659***	0.0666***	0.0696***		
	(0.00845)	*(0.00476)*	*(0.00221)*	*(0.00222)*	*(0.00114)*		
Economic Integration Agreement (eia)	-0.0303***	0.00897**	0.00743***	0.00602**			
	(0.00698)	*(0.00277)*	*(0.00203)*	*(0.00203)*			
Partial Scope Agreement (ps)	-0.0109***	-0.0181***	-0.0157***				
	(0.00238)	*(0.00114)*	*(0.00109)*				
cu plus eia	-0.114***	0.122***					
	(0.0110)	*(0.00564)*					
fta plus eia	-0.202***	-0.0128***					
	(0.00928)	*(0.00382)*					
Constant	25.35***	23.58***	23.58***	23.58***	23.58***	23.59***	23.58***
	(0.0116)	*(0.00281)*	*(0.00282)*	*(0.00282)*	*(0.00281)*	*(0.00273)*	*(0.00273)*
Number of Observations	1,622,754	1,622,754	1,622,754	1,622,754	1,622,754	1,622,754	1,622,754
R-squared	0.931	0.981	0.981	0.981	0.981	0.981	0.981
Exporter-Industry-Time Effects	YES	YES	YES	YES	YES	YES	YES
Importer-Industry-Time Effects	YES	YES	YES	YES	YES	YES	YES
Exporter-Importer-Industry Effects	NO	YES	YES	YES	YES	YES	YES

Source: Authors' estimates.

Standard errors in parentheses, *** p<0.001, ** p<0.01, and * p<0.05. Inclusion of export-importer-industry effects absorbs all time invariant costs (Models 2 to 7). Various forms of trade agreements can be found at http://rtais.wto.org/UserGuide/User%20Guide_Eng.pdf.

Table 3: CARICOM Export Potential for EA13

	Brunei	Cambodia	China	Indonesia	Japan	Laos	Malaysia	Myanmar	Philippines	Rep. of Korea	Singapore	Thailand	Vietnam	EA13
Agriculture	0.7	0.0	**1.1**	-	**1.2**	-	0.0	0.0	1.0	0.7	**1.4**	**1.1**	-	**1.1**
Chemicals	-	-	**1.2**	1	0.6	-	0.0	0.0	1.0	0.8	1.0	**3.2**	-	0.9
Food Products	**1.3**	0.0	**1.1**	0.9	**1.1**	-	0.0	0.0	1.0	1.0	0.7	0.1	-	0.5
Footwear	-	0.0	**1.5**	-	**1.7**	-	0.0	0.0	0.8	**2.6**	0.9	**2.1**	-	**1.4**
Leather Hide	-	-	0.6	1	0.8	-	0.0	-	1.0	1.0	**13.2**	**1.8**	-	0.7
Machinery & Electrical	1.0	0.0	0.9	**1.2**	**7.0**	-	0.0	0.0	0.9	0.9	**1.7**	**2.2**	-	**1.1**
Metals	-	-	**1.1**	**2.2**	0.7	-	0.0	0.0	**2.8**	1.1	**2.1**	1.0	-	1.0
Minerals	-	-	**1.2**	-	**1.1**	0.0	0.0	0.0	-	**1.6**	**4.3**	-	-	**1.9**
Plastics & Rubber	1.0	-	1	1	**1.7**	-	0.0	0.0	1.1	1.2	0.8	1.0	-	0.9
Textiles	1.0	0.0	**1.4**	1	0.8	-	0.0	0.0	1.5	0.8	0.8	1.0	-	0.9
Transportation	0.9	0.0	1.0	0.9	0.8	-	0.0	0.0	0.8	**1.3**	**9.8**	**2.3**	-	**1.2**
Wood	-	0.0	1.0	1.1	0.9	-	0.0	0.0	1.0	0.9	0.7	1.0	-	1.0
Miscellaneous	-	-	**1.1**	**2.7**	0.9	-	0.0	0.0	1.0	1.0	**1.2**	**1.1**	-	1.0
All Exports	0.9	0.0	**1.1**	**1.2**	1.0	0.0	0.0	0.0	0.9	**1.2**	**4.0**	1.0	-	**1.3**

Source: Authors' estimates.
Note: Bolded numbers indicate options with positive trade potential.

Table 4. Projections from Hypothetical FTAs between CARICOM and EA13

	Growth in Exports to EA13		Growth in Potential Exports to EA13	
Scenario I: *Extreme Impact*	$1,855.1 mn	275.9%	$1,660.1 mn	+191.4%
Scenario II: *Moderate Impact*	$244.7 mn	36.4%	$49.8 mn	+5.7%
Scenario III: *Low Impact*	$203.7 mn	30.3%	$8.7 mn	+1.0%

Source: Authors' estimates.