UNLEASHING THE DRAGON IN THE CARIBBEAN SEA: EXPLORING THE IMPACTS OF INCREASED CHINA-CARIBBEAN TRADE AND INVESTMENT*

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1 Introduction

China's expanding and evolving economic presence in the Caribbean has the potential to significantly impact the Region[1]. China views its engagement with Caribbean countries as primarily economic in nature, and in 2008 it outlined its strategic approach to the Region in its inaugural Policy Paper on Latin America and the Caribbean (The Government of the People's Republic of China, 2008). Beijing sees bilateral cooperation as means by which it can gain access to key markets, as well as to expand its political links with the Caribbean countries and build goodwill in the region. Likewise, in an effort to diversify their trading partner base and explore new markets, Caribbean countries are moving towards forging closer economic ties with non-traditional partners, including China. In particular, the Caribbean Community (CARICOM)[2] countries have recognized the need to strategically engage with emerging and large developing countries such as China given projections by organizations such as the International Monetary Fund and the World Bank that these economies will account for the bulk of the growth in the world economy over the next decade.

Ultimately, China's rise as a global economic powerhouse and its increased importance as a trade and investment partner for Caribbean countries form the basis of the need for greater economic cooperation. China is already a key trading partner for most of the Caribbean countries. It was the second largest supplier of imports for Cuba in 2013, accounting for 19% of the total value of Cuban imports (International Trade Centre, 2014). It was also the second largest source of goods imports for CARICOM countries in 2013, accounting for almost 6% of the total value of CARICOM imports (International Trade Centre, 2014). Increased trade with China is slowly changing the dynamics of the traditional trading environment in the Caribbean, where the United States, Canada and the European Union have been the main bilateral trading partners for many decades. Additionally, the Caribbean Region has become an emerging destination for Chinese foreign direct investment (FDI). Investments to date tend to be focused in key sectors, including the sugar industry in Jamaica, the oil industry in both Trinidad and Tobago and Cuba, the mining industry in Guyana, and the logistics and tourism industries in The Bahamas. However, there are some emerging investment areas of particular interest, perhaps most notably in Jamaica where recent plans by the Government to embark on a Global Logistics Hub Initiative aim to position Jamaica as one of the world's key logistics hubs. This initiative is being viewed with great interest

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[1]There are twenty-seven Caribbean countries under investigation, which include: Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Cayman Islands, Cuba, Dominica, Dominican Republic, Falkland Islands, French Guiana, Grenada, Guyana, Haiti, Jamaica, Montserrat, Netherland Antilles, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, South Georgia and the South Sandwich Islands, Suriname, Trinidad and Tobago, Turks and Caicos Islands, British Virgin Islands, and the United States Virgin Islands.

[2]CARICOM is a regional integration movement in the Caribbean, which currently takes the form of a customs union. It was established in 1973 and has fifteen member states. These are Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname and Trinidad and Tobago.

by Chinese investors. China has long viewed the Caribbean as strategically important by virtue of its proximity to the United States and major maritime routes and infrastructure, such as the Panama Canal and the region's many ports (Campbell and Valette, 2014). While Chinese FDI flows to the Caribbean seem rather miniscule when compared to global FDI flows, Chinese investment has the potential to generate a myriad of economic effects on the economies of these small island developing states, including enhancement of trade, productivity, employment creation, and technological innovation.

The aim of this paper is to explore some potential impacts on the small and vulnerable economies of the Caribbean in their attempts to forge closer trade and investment linkages with the 'Raging Dragon'. This analysis will be carried out using a computable general equilibrium framework using the Global Trade Analysis Project (GTAP) model and its most recent accompanying database. To explore the potential benefits of increased trade integration between China and the Caribbean countries which may be agreed under a free agreement, we simulate the move towards free trade between the two regions. We also explore the potential benefits of increased cooperation in trade facilitation between the regions. Buttressed by proposals for Chinese investment in transportation and logistics infrastructure in Jamaica, we anticipate that there may be significant benefits for trade expansion between the regions due to improvements in trade facilitation. In addition to the direct impacts on Jamaica, we anticipate that there may be similar benefits for other Caribbean countries. The unleashing of the Dragon in the Caribbean Sea will lead to a range of benefits and challenges for the Caribbean region. We analyze overall impacts including on real GDP and labour market opportunities in the region (given that there is currently significant unemployment, particularly of unskilled labour in the region), in addition to anticipated sectoral outcomes.

With the release of the GTAP version 9 database, four Caribbean countries which were not previously available separately were introduced as individual regions. These Caribbean countries are Jamaica, the Dominican Republic, Puerto Rico and Trinidad and Tobago. Being able for the first time to separately analyze these four Caribbean countries within the GTAP framework facilitates much richer and more in-depth analysis than has previously been possible.

2 Motivations for Increased China-Caribbean Trade and Investment

There are stark economic differences between China and Caribbean countries. Caribbean countries are generally categorized as small island developing states (SIDs). SIDs share similar structural characteristics, including small size, high degree of openness, concentration on a few exports, narrow range of resources, remoteness and environmental vulnerability (Bernal, 2012). The majority of countries in the Caribbean have narrow production structures which are centred on the production and export of a few primary products, a production system inherited from the colonial era and exacerbated by long-standing preferential access arrangements with the European Union and North American markets. The Caribbean economies are also heavily dependent on the services sector, particularly tourism, which is the main engine of growth for most of these countries. These countries are constrained by the relatively small size of their economies and limited natural resources, thus economies of scale are difficult to achieve (United States International Trade Commission, 2008). On the contrary, China is often likened to a 'Dragon' for several reasons. Firstly, it has the largest population in the world, with approximately 1.36 billion in 2013, and is the world's largest developing country. Secondly, since its opening up policy in the late 1970s, China has surpassed economic expectations and has consistently maintained high growth rates over the last three decades. Specifically in the last decade, China has maintained average annual growth rates of about 10% (World Bank, 2014). This level of growth was consistent even during the 2008-09 global financial and economic crisis. GDP in 2013 was approximately US$9 trillion. Output grew by 8% in 2013, matching its 2012 growth rate and exceeding the government's 7.5% indicative target (World Bank, 2014). China is now the world's second largest economy and is projected to overtake the United States of America as the world's leading economy in coming years. Table 1 provides an overview of selected economic indicators that compare China with Caribbean countries.

China's expanding and evolving presence has been met with ambivalence in the Caribbean. On the one side, there are those who consider that increased economic cooperation with China may be extremely one-sided due to the differences in economic size and capabilities of both regions. Additionally, given the history of colonialism in the Caribbean, some even view the relationship as one which

Table 1: Selected Economic Indicators (2013): China and Caribbean Aggregation

Country	Population	GDP US$M	Annual GDP Growth (%)	GDP per capita US$	Goods Exports US$M	Goods Imports US$M
China	1357380000	9240270	8	6807	2147530	1795760
Anguilla	14132				13	129
Antigua and Barbuda*	89985	1201	0	13342	33	508
Aruba	102911	2584		25355	5180	5917
Bahamas*	377374	8420	1	22312	811	3365
Barbados*	284644	4225	0	14917	467	1769
Belize*	331900	1624	2	4894	411	931
Cayman Islands	58000	3393		58942	864	2250
Cuba	11265629	68234	3	6051	3073	7014
Dominica*	72003	517	-1	7176	48	208
Dominican Republic	10403761	61164	5	5879	9504	16810
Falkland Islands	3036				193	136
French Guiana	243000					
Grenada*	105897	836	2	7891	47	184
Guyana*	799613	2990	5	3739	1074	1741
Haiti*	10317461	8459	4	820	1024	3571
Jamaica*	2715000	14362	1	5290	1569	6216
Montserrat*	4922	63		12774	6	42
Netherland Antilles	218000	4009		18360	3501	3915
St. Kitts and Nevis*	54191	766	4	14133	106	406
St. Lucia*	182273	1336	0	7328	119	986
St. Vincent and the Grenadines*	109373	709	2	6486	57	459
South Georgia and the South Sandwich Islands						
Suriname*	539276	5299	3	9826	1087	1728
Trinidad and Tobago*	1341151	24641	2	18373	19161	6960
Turks and Caicos Islands	33098				35	268
Virgin Islands British	28000	909		32375	1033	2545
Virgin Islands US	104737					
Caribbean Aggregation	39799466	215741			49416	68058

Countries marked with an asterisk (*) are CARICOM countries. Sources: World Bank Development Indicators Database for population and GDP data. Trade data was retrieved from the International Trade Centre's Trade Map. GDP figures for Aruba, Barbados and Cuba were for the years 2011, 2012, and 2011 respectively. Population and GDP data for Anguilla and the Falkland Islands were retrieved from the United Nations Conference for Trade and Development statistics database (UNCTADSTAT). Population and GDP data for Cayman Islands, French Guiana, Netherland Antilles, and Virgin Islands British were retrieved from the United Nations Statistics database (UNSTAT).

closely resembles that of the colonial era, where trade is limited to the export of cheap raw materials and import of costly manufactured products. On the other side, some view the Chinese presence in the Caribbean through positive lenses. Given the rapid development of the Chinese economy over the last three decades, it is believed that the Chinese can play the role of 'big-brother' on the Caribbean's path to development. In like manner, the Chinese policy of non-interference in the domestic affairs of its bilateral partners is also welcomed. China's involvement in the Caribbean has been increasingly labelled by Caribbean academics and policy-makers as one that thrives on diplomatic and political motivations (Bernal, 2012). However, China has revealed that economic motives, primarily trade, are among its key objectives for increased cooperation in the Latin America and Caribbean Region (The Government of the People's Republic of China, 2008). In the case of CARICOM, economic motivations are revealed to be tantamount, and are the primary driving force behind its relationship with China.

The possible motivations from the Caribbean perspective for increased trade and investment cooperation in a FTA with China include: preferential market access to the to largest and most economically thriving markets in the world, which can ultimately increase the prospects for economic growth and development for the Region; to increase export competitiveness in the global market place; to diversify export markets and decrease dependence on traditional markets such as the United States, Canada, and the European Union; to transition from narrow production structures where the focus is on primary production to secondary, value-added production; to stimulate foreign direct investment in sectors where there are prospects for increased cooperation between Chinese and Caribbean businesses; and to engage the support and assistance of a key player in the international economic arena that is able to recognize the development weaknesses of the small and vulnerable Caribbean economies.

For China, there are a range of potential motivations for a FTA with the Caribbean, which include: to boost trade cooperation with the Caribbean Region in fulfilment of the policy direction outlined in its 2008 Policy Paper on Latin America and the Caribbean and as agreed to at the Third Plenum of 18th Chinese Communist Party Congress in November 2013; to gain increased market access for Chinese products and investments; to attain food and energy security which is seen as critical for sustaining its economic growth; to promote global geo-strategic interests in the Caribbean Region, which is aimed at facilitating easier access to major North American markets, maritime routes and infrastructure; to promote wider acceptance of its One-China Policy in the Caribbean; and to coordinate with Caribbean countries on key positions of interest in multilateral settings.

3 The 'Caribbean' in the GTAP Database

We utilize the GTAP version 9 database (Narayanan et al., 2015), which has bilateral trade information, transport and protection data for 140 regions and covers 57 GTAP sectors and a benchmark year of 2011. In the GTAP database, some countries are separate individual regions, while others are grouped together as composite regions. The unavailability of economic data for some individual countries makes it difficult for them to be captured separately in the GTAP database. This has been the case for the Caribbean countries, which up until the recent emergence of the GTAP version 9 database, have been included as part of composite regions. In this latest database, there is the inclusion of four Caribbean countries as individual regions: the Dominican Republic, Jamaica, Trinidad and Tobago, and Puerto Rico. All the other Caribbean countries, including those in CARICOM, are spread across three different composite regions, namely the Caribbean (XCB) composite, the Rest of Central America (XCA) composite, and the Rest of South America (XSM) composite. For the purposes of this paper, we refer separately to the individual regions of Jamaica, the Dominican Republic, and Trinidad and Tobago, and a composite grouping consisting of the remaining twenty-four (24) countries, the 'Rest of Caribbean' grouping.

The formation of an economically integrated Caribbean region would be advantageous for the following reasons. Firstly, it promotes the concept of Caribbean convergence. Heavily touted by Caribbean academics and policy-makers for decades, the idea is centred on inclusiveness and equitable development amongst countries in the Caribbean Sea. It seeks to provide new political and economic dynamics to the process of Caribbean integration by reworking the existing frameworks in innovative and flexible ways to cope with changing global realities, and redefining the modalities of execution (Dookeran, 2013). Stemming from this desire for Caribbean convergence, there have been several proposals for the restructuring of the Caribbean Community (CARICOM) to include major Caribbean economies such as Cuba and the Dominican Republic. Secondly, given that CARICOM countries are small and relatively insignificant players in the international economic landscape, pushing for negotiations with other like-

minded Caribbean countries could significantly increase negotiating leverage. Strength in numbers may work well in helping to achieve favourable negotiating outcomes for individual CARICOM countries in a trade deal with China. Additionally, Caribbean convergence is also attractive for increased trade and investment opportunities due to increased market size. For instance, the fifteen-member Caribbean Community (CARICOM) has an estimated market size of 17 million people. However, the market size of the Caribbean aggregation is estimated to be 39 million, which is more than twice the size of CARICOM.

Owing to limitations in the current GTAP database where the majority of Caribbean countries are incorporated as part of composite regions, the Caribbean aggregation includes overseas countries and territories of Britain, the United States of America, France, and The Netherlands. These territories are not permitted to independently enter into free trade negotiations with other countries. There are eleven (11) such countries in the aggregation. Montserrat is a British overseas dependent territory and a Member of the CARICOM. The remaining ten countries are: Anguilla (British), Aruba (Dutch), The Cayman Islands (British), The Netherland Antilles (Dutch), Turks and Caicos Islands (British), Virgin Islands British (British), Virgin Islands US (US), Falkland Islands (English), French Guiana (France), and South Georgia and the South Sandwich Islands (English). However, with the exception of The Cayman Islands, most of these dependent territories are relatively small and have insignificant economies. This is especially the case when they are compared to Cuba, the Dominican Republic, and the more developed countries (MDCs) of CARICOM. (The MDCs of CARICOM are The Bahamas, Barbados, Guyana, Jamaica, Suriname, and Trinidad and Tobago.) Because of their economic size and trade activity, it is expected that trade integration with China will have a greater impact on the economies of Cuba, the Dominican Republic, and the CARICOM MDCs.

3.1 GTAP Data Aggregation

For the purposes of this paper, we utilize an aggregation that covers fifteen (15) regions and twenty-four (24) sectors.

3.1.1 Regional Aggregation

The fifteen regions which are used in the policy simulations include the following: China, the Dominican Republic, Jamaica, Trinidad and Tobago, the Rest of Caribbean composite, USA, Canada, the EU-28 composite, Colombia, Venezuela, the MERCOSUR composite, Japan, Taiwan, Hong Kong, and the Rest of World composite. The five individual regions which are of special interest to this study are China, the Dominican Republic, Jamaica, Trinidad and Tobago, and the Rest of Caribbean composite.

The USA is considered as an individual region in this aggregation given its status as the top trading partner for the Caribbean countries. It is considered as a traditional trading partner because of consistently high levels of trade activity, and its provision of non-reciprocal trade preferences to some Caribbean countries beginning in the 1980s. Along with its close proximity to the Caribbean region, Canada is included as an individual region. Since it represents a traditional trading partner with high levels of trading activity and is geographically close to the Caribbean countries, Canada has offered non-reciprocal trade preferences from 1925 to some Caribbean countries. It is most noted for the provision of the Caribbean-Canada Trade Agreement (CARIBCAN) non-reciprocal trade preferences beginning in 1986. Given the expiration of the WTO waiver governing the provision of these trade preferences, and Canada's refusal to apply for subsequent waivers, negotiations are currently ongoing towards the conclusion of a free trade agreement with the CARICOM countries. The twenty-eight countries that comprise the European Union (EU) are grouped together to form an individual region. The EU is also considered to be a key traditional trading partner for the Caribbean countries, and was its second largest trading partner in 2011. Historically speaking, the majority of Caribbean countries were formally colonies of Spain, the United Kingdom, France, and The Netherlands, who are all Members of the European Union. Owing to this relationship, many Caribbean countries have benefitted from non-reciprocal preferential schemes from the European Union, the most prominent arrangements being the Lomés I to IV which existed between 1975 and 2000, and later the transitional Cotonou Agreement. Currently, CARICOM countries and the Dominican Republic are parties to a reciprocal trade agreement with the European Union, which is known as the CARIFORUM-EC Economic Partnership Agreement (EPA). The EPA was signed on 29 December 2008. Additionally, Colombia and Venezuela are treated as individual

regions as they currently have partial scope trade agreements with CARICOM. The partial scope agreement between CARICOM and Colombia covering tariff liberalization for specific goods entered into force on January 1, 1995. A similar agreement between CARICOM and Venezuela entered into force on January 1, 1993. It is also important to note that CARICOM countries and the Dominican Republic benefit from the Venezuelan Government's PetroCaribe Facility. Initiated in 2005, this arrangement allows Caribbean countries to purchase oil from Venezuela on preferential payment terms. The Southern Community Common Market (MERCOSUR) is included as an individual region as they entered into exploratory discussions with CARICOM towards the conclusion of a free trade agreement. MERCOSUR is a top trading partner for the Caribbean countries, and accounted for 3% of the total value of Caribbean exports and 8% of the total value of Caribbean imports in 2011. Japan is included as an individual region as it is an important Asian trading partner for Caribbean countries. It accounted for 2% of the total value of Caribbean imports in 2011. Taiwan is incorporated as an individual region given the fact that several Caribbean countries have entered into diplomatic relations with Taiwan. These countries are Belize, Haiti, St. Lucia, St. Vincent and the Grenadines, St. Kitts and Nevis, and the Dominican Republic. Hong Kong is also incorporated as an individual region as several Chinese investments in the Caribbean originate from there. All other countries are grouped together in an individual region known as the Rest of World composite. An overview of the fifteen aggregate regions is provided in Appendix Table 12.

3.1.2 Sectoral Aggregation

Twenty-four sectors are utilized in the policy simulations, with details of the sectoral aggregation presented in Appendix Table 13. As a result of prior statistical work conducted using trade indices, three sectors demonstrated high bilateral revealed comparative advantage for the Caribbean in its trade with China. These sectors are forestry, wood products /lumber and gas, and are seen as sectors of interest for Caribbean countries in the Chinese market. It was also found that Chinese exports of heavy manufactures accounted for the majority of exports to the Caribbean. Thus, the heavy manufactures sector in the Caribbean market is considered a major sector of interest for China.

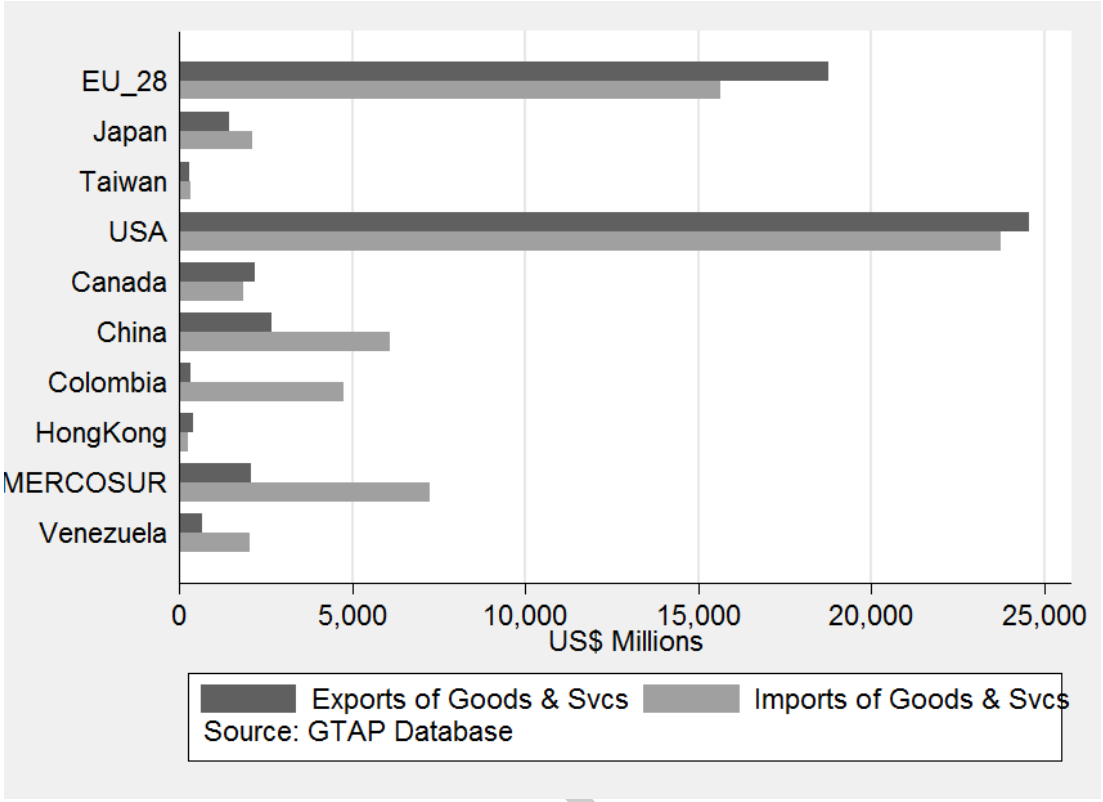
4 Current China-Caribbean Trade and Investment

4.1 Trade Direction

Figure 1 shows the main trading partners of Caribbean countries in 2011, highlighting imports and exports of both goods and services. It was found that Caribbean exports went mainly to the United States, and represented 33% of the total value of exports in 2011. Other top export markets for Caribbean products included the European Union, China, Canada and MERCOSUR. While exports to the European Union represented approximately 25% of the total value of exports, exports to China, Canada, and MERCOSUR accounted for 4%, 3% and 3%, respectively. Overall, these five trading partners accounted for almost 70% of the total value of Caribbean exports in 2011. In like manner, imports into the Caribbean were mainly sourced from the United States, and accounted for 28% of the total value of imports in 2011. This was followed by imports from the European Union (19%), MERCOSUR (9%), China (7%), and Colombia (6%), respectively. Imports from these top five trading partners also represented nearly 70% of the total value of imports in 2011.

Importantly, Figure 1 reveals that of the aforementioned trading partners, China was the third largest importer of Caribbean exports and was the fourth largest source of origin for Caribbean imports in 2011. Total Caribbean exports to China were valued at approximately US$2667 million, while imports from China into the Caribbean were estimated at US$6085 million. In the case of Caribbean exports to China, trade in goods accounted for 59% of the total value, while trade in services accounted for 41%. In the case of Caribbean imports from China, trade in goods accounted for 90% of the total value of Caribbean imports from China, while trade in services accounted for 10%. Overall, it is important to note that the level of Caribbean goods imports from China exceeded the level of Caribbean goods exports to China. On the contrary, the level of Caribbean services exports to China exceeded the level of Caribbean services imports from China.

Figure 1: The Caribbean's Top Trading Partners (2011)



4.2 Trade Patterns: China and the Caribbean

Over the last decade, trade in goods between the Caribbean and China has increased rapidly. Figure 2 shows the trends in trading patterns between the China and CARICOM countries over the period 2004-2013. In the year 2004, China was CARICOM's sixth largest importing partner, accounting for US$588 million worth of imports. By the year 2013, however, China assumed its new position as CARICOM's second largest importing partner, with imports valued at US$2.4 billion. For the majority of years over the period 2004 and 2013, Chinese imports into the CARICOM market trended upwards, showing only minor declines in 2009 and 2013. On the other hand, CARICOM's exports to China remained stable over the period, with the highest overall value of exports being recorded in the 2011 (US$455 million). At the start of the period, CARICOM exported US$278 million worth of goods to China. By 2013, exports were recorded at US$209 million.

Table 2 provides detailed information on trade in goods between individual Caribbean countries and China in 2011. It can be seen that Cuba was the most dominant exporter of all Caribbean countries to the China market. Cuban exports to China as a percentage of total Caribbean exports amounted to 55%, while Cuban imports as a percentage of total Caribbean imports amounted to 21%. Other Caribbean countries that contribute a relatively high share of Caribbean exports to China included Trinidad and Tobago (21%), the Dominican Republic (18%), the Bahamas (4%), and Suriname (1%). Alternatively, other Caribbean countries that exhibited high import shares in their trade with China included the Dominican Republic (19%), Antigua and Barbuda (13%), The Bahamas (11%) and Jamaica (7%).

4.3 Trade Composition

Exports from the Caribbean to China fall mainly into the following GTAP categories in our aggregation: services, metals, processed sugar, heavy manufactures, and other minerals. Services accounted for 41% of the total value of exports. However, the majority of exports were primary commodities. Goods falling under the metals category represented approximately 24% of the total value of exports, while products

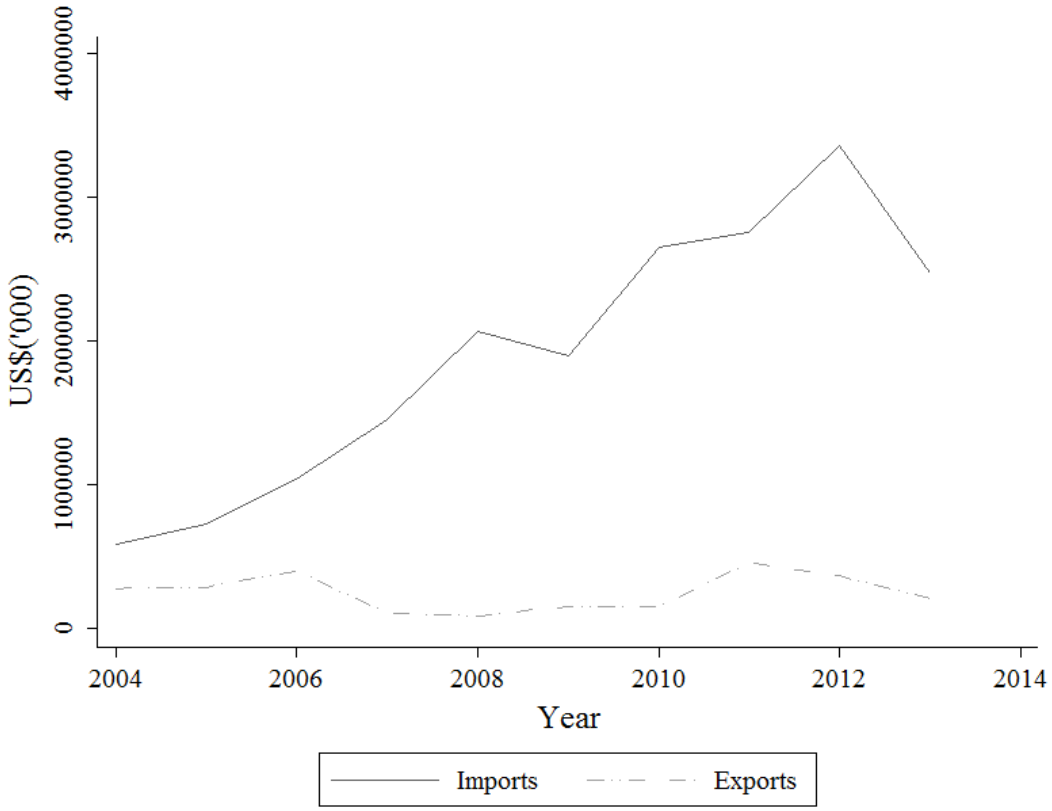


Figure 2: CARICOM's Merchandise Trade with China (2004-2013)
Source: International Trade Centre, Trade Map

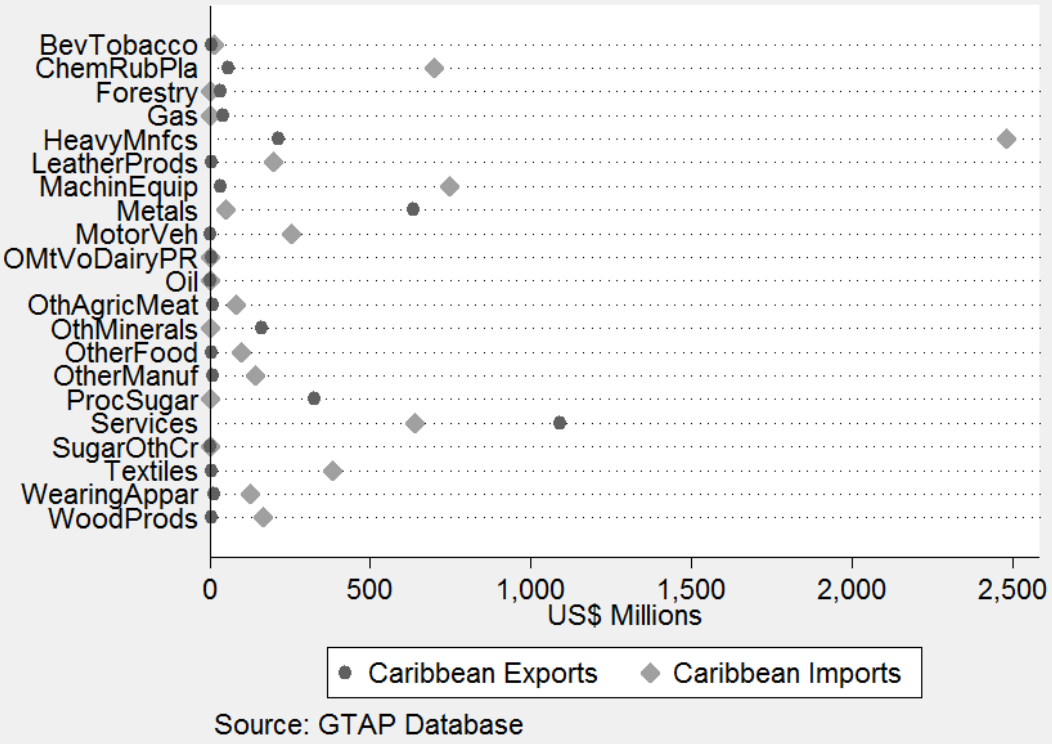
Table 2: Caribbean-China Merchandise Trade (2011)

Country	Exports US$000	Imports US$000	Export Share (%)	Import Share (%)
Anguilla	0	0	0	0
Antigua and Barbuda	51	656772	0	13
Aruba	35	17689	0	0
Bahamas	62901	550137	4	11
Barbados	6708	143863	0	3
Belize	2902	49491	0	1
Cayman Islands	90	29545	0	1
Cuba	904045	1043647	55	21
Dominica	396	26490	0	1
Dominican Republic	292447	967391	18	19
Falkland Islands	0	0	0	0
French Guiana	0	0	0	0
Grenada	1	5912	0	0
Guyana	14528	132625	1	3
Haiti	7368	303639	0	6
Jamaica	3971	370913	0	7
Montserrat	85	18	0	0
Netherland Antilles	204	119644	0	2
St. Kitts and Nevis	476	4385	0	0
St. Lucia	288	10152	0	0
St. Vincent and the Grenadines	24	77939	0	2
South Georgia and the South Sandwich Islands	0	0	0	0
Suriname	15900	136184	1	3
Trinidad and Tobago	340138	286550	21	6
Turks and Caicos Islands	0	400	0	0
Virgin Islands British	26	155440	0	3
Virgin Islands US	0	0	0	0
TOTAL	1652584	5088826	100	100

Source: International Trade Centre, Trade Map

in the processed sugar, heavy manufactures, and other minerals categories represented approximately 12%, 8% and 6% of the total value of exports, respectively. Caribbean imports of goods from China fall mainly in the following categories: heavy manufactures; machinery and equipment; chemical, rubber and plastic products; services; and textiles. Heavy manufactures accounted for the bulk of goods imports and represented approximately 41% of the total value of imports, while imports of machinery and equipment, chemical, rubber and plastic products, services and textiles represented 12%, 11% and 10% and 6% of the total value of imports, respectively. Figure 3 provides a breakdown of the aforementioned categories of products which were traded between the Caribbean countries and China in 2011.

Figure 3: Caribbean Sectoral Trade with China (2011)



In 2011, it was found that the Caribbean countries had a strong competitive advantage in the export of processed sugar into the Chinese market. Caribbean exports accounted for 15.3% of the total value of Chinese processed sugar imports in that year. The main global supplier of processed sugar into the Chinese market was the Southern Community Common Market (MERCOSUR). Exports from MERCOSUR accounted for approximately 64.1% of the total value of sugar imports into the Chinese market.

On the other hand, it was revealed that China has a strong competitive advantage in the export of wood products, textiles, wearing apparel and leather products to the Caribbean Region. In 2011, imports of Chinese wood products in Jamaica accounted for 23% of the total value of global wood product imports. In like manner, imports of Chinese wood products in Trinidad and Tobago, and in the Dominican Republic represented 16% of the total value of global wood products imports in each of the respective countries. Chinese textiles also represented 42%, 38% and 20% of the total value of textile imports in the Jamaican, Trinidadian and Rest of Caribbean markets, respectively. Imports of Chinese wearing apparel represented 50%, 32% and 13% of the total value of global imports of wearing apparel in the Jamaican, Trinidadian and Dominican markets, respectively. Chinese leather products also represented 53%, 32%, 27% and 18% of the total value of global leather imports into the Jamaican, Trinidadian, Rest of Caribbean, and Dominican markets, respectively.

4.4 Trade Complementarity Index: CARICOM and China

In this section, we investigate the extent of trade complementarity between CARICOM and China.[3] According to Hosein and Khadan (2011), the level of trade complementarity between two countries measures the export performance of a country in relation to the import requirements of its trading partner. In this regard, the Trade Complementarity Index (TCI) investigates how the export set of industries from the source country matches with the import set of industries from a destination country (De Castro, 2012). Introduced by Michaely (1996), the index determines whether prospective trading partners are in fact 'natural trading partners' (World Trade Organization, and United Nations Conference on Trade and Development, 2012). Trade economists (Schiff, 2001), (Michaely, 1996), and (Yeats, 1998) argue that the higher the value of the trade complementarity index, the more favourable the outcome of a proposed FTA will be for its potential members.

The TCI is calculated as follows:

$$TCI_{ij} = 100[1 - \sum_{k=1}^{m} |m_k^i - x_k^j|/2] \tag{1}$$

where m_k^i represents sector *k's* share in country *i's* total imports from world partners, and x_k^j represents sector *k's* share in country *j's* total exports to world partners.

Trade complementarity indices can be calculated from both an import perspective and an export perspective (World Trade Organization, and United Nations Conference on Trade and Development, 2012). A trade complementarity index on the import side approximates the adequacy of country *j's* export supply to meet country *i's* import demand. On the other hand, TCIs on the export side look on the adequacy of country *i's* export supply to meet import demand in country *j*. Perfect correlation between sectoral shares results in an index of one hundred, whereas a perfect negative correlation results in an index of zero.

Figure 4 shows the TCIs for some of CARICOM's traditional and non-traditional partners. TCIs are calculated on the import side and focus on the adequacy of a partner's export supply to meet CARICOM's import demand. The graph on the right hand side depicts the TCIs for non-traditional partners, namely China, Japan and Colombia. It can be seen that China's TCI ranged from approximately 96 and 98.5 over the period, with the lowest TCI value being recorded in 2013. Japan also proved to be an efficient exporter of products to meet CARICOM's demands, towering above China consistently after 2008. However, Colombia had the highest TCI values of all the non-traditional exporters, rising from very low levels in 2010 to near perfect correlation. An assessment of the TCIs for traditional partners (depicted in the graph on the left-hand side) reveals that Canada was the most efficient exporter at meeting CARICOM's import demand. The United States, which is currently CARICOM's main trading partner, was the least efficient in satisfying such demand. With TCI values ranging from 60 to 80 over the period 2004 to 2013, the United States was far away from matching its Canadian counterpart, which maintained a fairly stable TCI value of 98. Overall, CARICOM's non-traditional partners demonstrated a better ability to supply products to meet CARICOM's import demand compared to that of its traditional trading partners.

Figure 5 shows TCIs for CARICOM's traditional and non-traditional partners on the export side. The left hand graph depicts the TCIs for traditional partners. Of all the traditional partners, trade complementarity on the export side is greatest for the European Union. Over the period 2004-2013, TCIs ranged from approximately 91 to 97, and were relatively consistent. This means that CARICOM's exports were integral in satisfying importers' demand in the European Union in this period. Trade complementarity indices between CARICOM and Canada in this regard are also high. They remained relatively stable around 90 and 91. However, CARICOM's export supply was not as essential in fulfilling import demand in the United States. TCIs ranged from approximately 70 to 80. The right-hand graph shows TCIs for China, Japan and Colombia. It can be seen that Colombia's TCI fluctuated greatly over the period, moving from a low of 40 in 2009 to a high of 90 by 2013. On the other hand, not only did Japan and China display very similar TCIs, but they demonstrated near perfect correlation throughout the years. The TCIs altogether reveal that CARICOM's exports are in greater demand in non-traditional markets compared to traditional markets.

[3] We utilize a subset of countries in the Caribbean aggregation due to the ease of access to pertinent information required for this analysis. It is also believed that the performance of the CARICOM countries is highly representative of that of the remaining Caribbean countries.

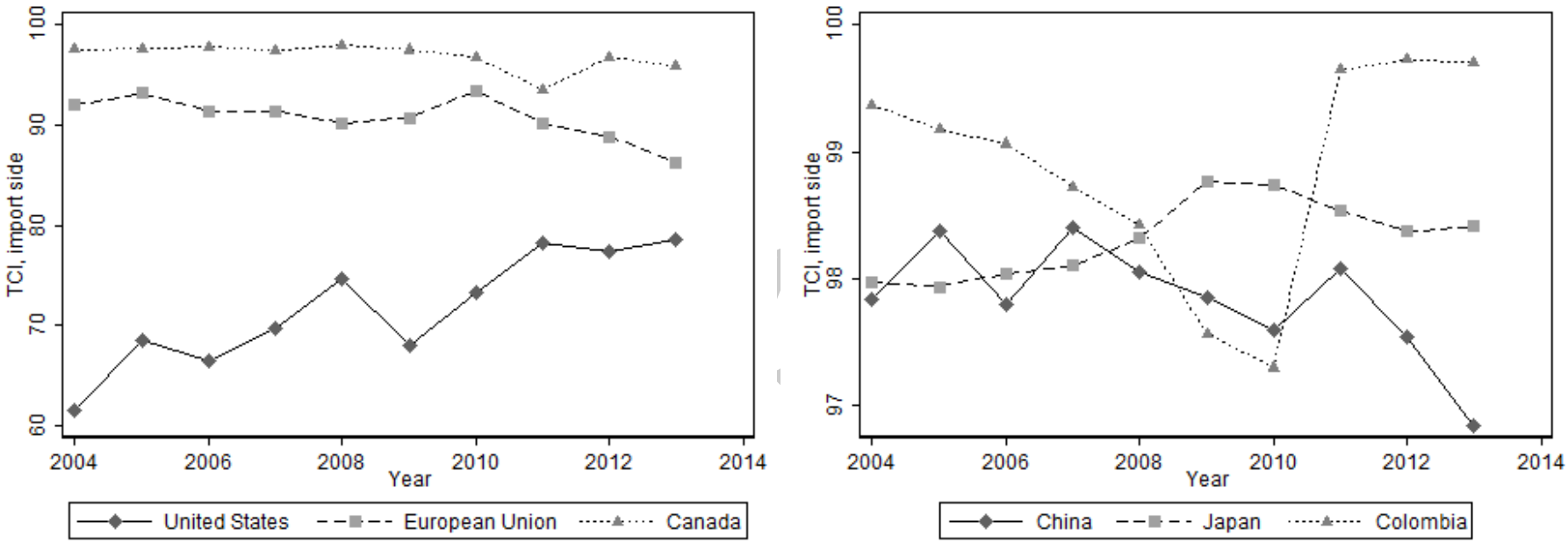


Figure 4: CARICOM Bilateral Trade Complementarity Index, Import Side

Source: Authors' Calculations

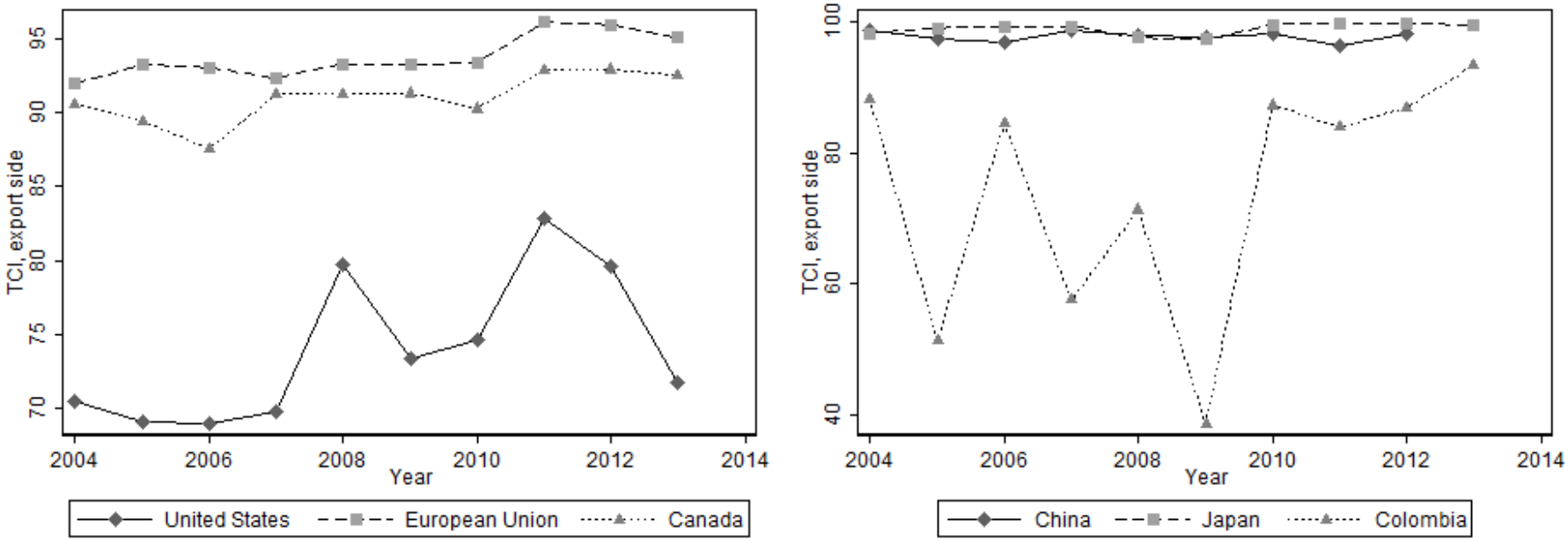


Figure 5: CARICOM Bilateral Trade Complementarity Index, Export Side

Source: Authors' Calculations

4.5 Current Trends in Chinese Investment in the Caribbean

The Caribbean Region has become an emerging destination for Chinese foreign direct investment (FDI) (Bernal, 2013). Investments to date tend to be focused in key sectors, including the sugar industry in Jamaica, the oil industry in both Trinidad and Tobago and Cuba, the mining industry in Guyana, and the logistics and tourism industries in The Bahamas. However, there are some emerging investment areas of particular interest, perhaps most notably in Jamaica where recent plans by the Government to embark on a Global Logistics Hub Initiative (GLHI) aim to position Jamaica as one of the world's key logistics hubs. If the proposed plans become a success, Jamaica will be the fourth global logistics node, joining Singapore, Dubai and Rotterdam. This initiative is being viewed with great interest by Chinese investors as they seek to capitalize on the trade and business opportunities which are likely to emerge from the GLHI (JAMPRO: Trade and Investment Jamaica, 2014a). China has long viewed the Caribbean as strategically important by virtue of its proximity to the United States and major maritime routes and infrastructure, such as the Panama Canal and the region's many ports (Campbell and Valette, 2014). In addition to becoming better equipped to handle increased volumes of transshipped cargo through the development of port infrastructure, there are also plans to institute an economic zone which will facilitate the expansion of the country's manufacturing sector, as well as to develop Jamaica's maritime, aviation, road and rail and logistics infrastructure which will position the country as a leading logistics destination (JAMPRO: Trade and Investment Jamaica, 2014b). The Global Logistics Hub Initiative also promises a reduction in transaction costs and upgrading to more efficient customs system. In 2013, China Harbour Engineering announced a US$1.350 billion project to build a new port on Goat Islands. The China Communications Construction plans on investing in the Kingston Harbour Channel upgrading project, a long-term concession for the Kingston Container Terminal, as well as works at the Portland Bight Industry Park. These are all in relation to the development of the global logistics hub project. There have also been expressions of interest from Chinese Company, ZPMC, to establish a crane assembly plant, and another Chinese company to develop a Special Economic Zone and transshipment port.

4.5.1 Jamaica's Logistics Performance

Jamaica is progressing well with its domestic policies in logistics, which is evidenced by its mobility in global logistics rankings. According to the World Bank's Logistics Performance Index[4] 2014, Jamaica assumed seventieth (70th) position in global logistics performance out of a total of 160 countries. This represents a major improvement in its ranking from one-hundred and twenty-fourth (124th) position in 2012, and one-hundred and eighth (108th) position in 2010, out of a total of 155 countries. The areas of improvement in 2014 were in customs, infrastructure, logistics quality and competence, tracking and tracing, and timeliness. Table 3 reveals the trends in Jamaica's logistics performance over the period 2010-2014.

The Global Enabling Trade Report (2014),which assesses the quality of institutions, policies, and services facilitating the free flow of goods over borders and their destinations, has revealed that Jamaica is one of the leading countries in the Caribbean in logistics performance (World Economic Forum, 2014). The Report cites Jamaica as one of the only countries in the Latin American and the Caribbean Region where the pace of improvement in logistics has led to improvements in logistics rankings. Of all the countries in the Caribbean, the Dominican Republic and the Bahamas are the only Caribbean countries that currently outperform Jamaica in terms of logistics performance.[5] The Global Enabling Trade Report (2014) also highlights that the poor logistics performance of the Caribbean as a region is primarily driven by the low logistics performance index (LPI) scores of Cuba, Guyana, and Haiti. Table 4 reveals that of the selected Caribbean countries, Jamaica excelled in the following logistics pillars: availability and quality of infrastructure transport, and the availability and quality of transport services.

[4]The Logistics Performance Index is a tool designed to assess the overall performance of a country's logistics services and infrastructure (Arvis et al., 2014). The Index ranges from 1 for weak performance to 5 for very strong performance.

[5]The Logistics Performance Index 2014 reveals that the Bahamas was the highest logistics performer of all the Caribbean countries (66th position of 160 countries), followed by the Dominican Republic (69th position of 160 countries).

Table 3: World Bank's Logistics Performance Index: Jamaica

		2010	*2012*	*2014*
Overall Rank		108/155	124/155	70/160
Customs	score	2.00	2.22	2.88
	rank	140	123	54
Infrastructure	score	2.07	2.27	2.84
	rank	121	119	61
International Shipments	score	2.82	2.43	2.79
	rank	81	121	86
Quality Logistics Services	score	2.32	2.21	2.72
	rank	112	132	84
Tracking and Tracing	score	3.07	2.43	2.72
	rank	59	117	89
Timeliness	score	2.82	2.91	3.14
	rank	134	107	83

Sources: (Arvis et al., 2010),(Arvis et al., 2012),(Arvis et al., 2014).

5 Tariff Barriers

5.1 Chinese Tariffs on Caribbean Imports

The tariffs applicable on Caribbean exports in the Chinese market in 2011 and their product shares are presented in Table 5. The tariffs which were applicable to the Dominican Republic, Jamaica and Trinidad and Tobago are presented individually, as well as the aggregate tariffs for the Rest of Caribbean grouping. Bilateral tariffs at the GTAP level of aggregation are constructed by aggregating applied tariff rates from the tariff lines to the GTAP sectors using bilateral import value weights (Source: GTAP Book, Chapter 2). Hence, bilateral weighted average tariffs are the average of effectively applied rates weighed by the product import shares of each partner country.

The tariffs applied by China to imports from the Dominican Republic range from 0-19%. Tariffs are highest on imports in the beverages and tobacco (19%), and in the wearing apparel sectors (16%). Exports from the Dominican Republic to China were mainly concentrated in the heavy manufactures sector, and accounted for over 23% of the total value of Dominican exports to China in 2011. However, tariffs on these goods are very low (1%). Similarly, Dominican exports that fell in the other minerals category, which accounted for 22% of the total value of Dominican exports to China, entered the Chinese market at duty-free rates.

The tariffs applied by China to imports from Jamaica range from 0-19%. Tariffs are highest on imports in the other food (19%) and wearing apparel sectors (16%). In 2011, the majority of Jamaican goods exported to China were concentrated in the metals sector. However, these exports attracted duty-free rates. Similarly, exports that fell in the heavy manufactures sector, which accounted for 3% of the total value of Jamaican exports to China, attracted very low rates of duty.

The tariffs applied by China to imports from Trinidad and Tobago range from 0-17%. Tariffs are highest on imports in the other manufacturing sector. There were no exports from Trinidad and Tobago to China in this category in 2011. The majority of exports emanated from the gas sector; however, these exports did not attract duties. Other top exports from Trinidad and Tobago fell in the chemicals, rubber and plastics products category in 2011. Tariffs on these exports are approximately 6%.

The tariffs applied by China to imports from the Rest of Caribbean countries range from 0-72%. Tariffs are highest on imports that fall in the beverages and tobacco sector (72%), which is followed by the tariffs on motor vehicles (58%) and processed sugar (50%), respectively. In 2011, the majority of goods exported from the Rest of Caribbean countries were concentrated in the metals sector. These goods accounted for 30% of the total value of exports from the Rest of Caribbean countries to China in that year; however, they did not attract duties at the Chinese border. On the other hand, processed sugar exports which accounted for 17% of the total value of exports attracted tariffs of 50%.

Table 4: Global Enabling Trade Report (2014): Caribbean Countries

		Jamaica	Guyana	Haiti	Dominican Republic
Enabling Trade Index	Rank	80	104	125	79
	Score	3.87	3.55	3.11	3.89
Domestic Market Access	Rank	93	111	103	78
	Score	4.36	3.84	4.12	4.74
Foreign Market Access	Rank	45	40	22	70
	Score	3.2	3.33	3.72	2.49
Efficiency and Transparency of Border Administration	Rank	76	88	126	63
	Score	4.18	3.93	3.06	4.55
Availability and quality of infrastructure transport	Rank	46	118	135	53
	Score	3.86	2.39	1.94	3.72
Availability and quality of transport services	Rank	81	109	138	85
	Score	3.85	3.52	2.72	3.8
Availability and use of ICTs	Rank	91	108	133	83
	Score	3.4	2.77	1.91	3.71
Operating Environment	Rank	92	91	131	110
	Score	3.79	3.81	3.28	3.63

Source: Global Enabling Trade Report(2014), World Economic Forum

Table 5: Tariffs and Product Shares of Caribbean Exports to the Chinese Market

	Tariffs(%)[a]				Product Shares (% of Total Exports)			
Product	DOM[b]	JAM	TTO	ROC	DOM	JAM	TTO	ROC
SugarOthCr	8	8	0	9	0	1	0	0
OthAgricMeat	0	0	0	17	0	1	0	0
ProcSugar	0	0	0	50	0	0	0	17
BevTobacco	19	10	0	72	0	0	0	0
OMtVoDairyPR	0	0	0	19	0	0	0	0
OtherFood	10	19	0	16	0	1	0	0
Forestry	10	0	0	0	0	0	0	2
WoodProds	0	0	0	5	0	0	0	0
Oil	0	0	0	0	0	0	0	0
Gas	0	0	0	0	0	0	29	0
OthMinerals	0	0	1	0	22	0	10	2
Textiles	14	0	0	32	0	0	0	0
WearingAppar	16	16	0	19	0	0	0	1
LeatherProds	9	0	0	23	0	0	0	0
MachinEquip	4	6	6	24	3	0	0	1
ChemRubPla	6	7	6	25	1	0	24	1
MotorVeh	11	0	0	58	0	0	0	0
HeavyMnfcs	1	0	1	19	23	3	1	5
OtherManuf	0	0	17	19	0	0	0	0
Metals	0	0	0	0	9	11	5	30

[a]Source: GTAP Database

[b]Note: DOM represents the Dominican Republic; JAM represents Jamaica; TTO represents Trinidad and Tobago; and ROC represents the 'Rest of Caribbean' composite.

5.2 Caribbean Tariffs on Chinese Imports

There are twenty-seven individual Caribbean countries and the tariff regime differs in each national jurisdiction. None of these countries have preferential or unilateral trade agreements with China; hence MFN rates are applicable to Chinese products in Caribbean markets. Given that the majority of countries in the Caribbean aggregation are CARICOM countries, it is important to reiterate the common external tariff (CET) that exists on imports from third-party countries. Presently, the general tariff ceiling for the CARICOM CET is 20% for industrial goods, and 40% for agricultural goods. However, the CET is currently not being uniformly applied in all CARICOM countries. The GTAP version 9 database provides weighted average tariffs applied by Caribbean countries to Chinese imports. The tariffs applicable on Chinese imports in the Caribbean market and their product shares are presented in Table 6.

The tariffs applied by the Dominican Republic on imports from China range from 0-24%. Tariffs are highest on other agriculture and meat products. In 2011, the majority of Chinese imports from the Caribbean were concentrated in the heavy manufactures sector, which accounted for 27 % of the total value of Chinese imports in the Dominican market. Imports in the heavy manufactures category attract a 12% duty. Chinese exports of chemical, rubber and plastic products also accounted for 18% of the total value of Chinese exports to the Dominican market in 2011. These exports attract an 8% duty.

The tariffs applied by Jamaica on imports from China range from 0-32%. Tariffs are highest on imports in the raw sugar cane and other crops category, although there were no imports from China in this sector in 2011. The majority of Chinese imports in this year were in the heavy manufactures sector, which accounted for 25% of the total value of Chinese imports in the Jamaican market. Imports in the heavy manufactures category attract an 8% duty. Chinese exports of chemical, rubber and plastic products also accounted for 17% of the total value of Chinese exports to the Jamaican market in 2011. These exports attract a 13% duty.

The tariffs applied by Trinidad and Tobago on imports from China range from 0-21%. Tariffs are highest on imports in the beverages and tobacco sector. In 2011, the majority of Chinese exports to Trinidad and Tobago were concentrated in the heavy manufactures sector, which accounted for 32% of the total value of exports in the Trinidadian market. Imports in the heavy manufactures sector attract a 4% tariff. Other top Chinese exports to Trinidad and Tobago in 2011 were in the machinery and equipment sector. Exports that fall in this category attract a 7% tariff.

The tariffs applied by the Rest of Caribbean countries on imports from China range from 0-239%. Tariffs are highest on imports in the beverages and tobacco sector; however, there were no exports from China to the Rest of Caribbean countries in this category in 2011. The majority of Chinese exports to the Rest of Caribbean countries in this year were concentrated in the heavy manufactures sector. These exports accounted for 47% of the total value of Chinese exports in the Rest of Caribbean market. Exports that fall in this category attract a 7% tariff. Other top Chinese exports to the Rest of Caribbean market in 2011 were in the machinery and equipment sector. Exports that fall in this category attract a 12% tariff.

6 Non-Tariff Barriers

There is a paucity of information on the impact and extent of the non-tariff barriers (NTBs) on Caribbean-China trade. This is primarily due to the fact that NTBs are difficult to measure and are less transparent than tariff barriers. An Inter-American Development Bank (IDB) study on the evolution of trade and investment patterns between China and countries in the Latin America and Caribbean Region over a ten-year period is the most comprehensive study to have investigated NTBs between the regions to date (Inter-American Development Bank, 2010). It was reported that on the Chinese side, since its accession to the World Trade Organization (WTO) in 2001, there has been the removal of several trade-restrictive import requirements. However, the Chinese Government still applies tariff rate quotas (TRQs) to some agricultural products. These agricultural products include wheat, corn, cotton, and sugar. It is important to note that processed sugar exports to the Chinese market are of particular interest to the Caribbean countries. Such exports accounted for 12% of the total value of Caribbean exports in 2011. It is reported that the 2010 quota for sugar in the Chinese market is 1945 thousand metric tons, of which seventy per cent is subject to state trading. Sugar imports above the quota are charged at a higher tariff rate of 50%. Other reported NTBs include inconsistencies in the customs classification of products into tariff categories, improper use of reference pricing for customs valuation; and very restrictive government

Table 6: Tariffs and Product Shares of Chinese Exports to the Caribbean Market

	Tariffs (%)[a]				Product Shares (% of Total Exports)			
Product	DOM[b]	JAM	TTO	ROC	DOM	JAM	TTO	ROC
SugarOthCr	3	32	6	23	0	0	0	0
OthAgricMeat	24	4	4	7	2	1	2	1
ProcSugar	15	0	0	0	0	0	0	0
BevTobacco	2	20	21	239	0	1	1	0
OMtVoDairyPR	13	15	18	17	0	0	0	0
OtherFood	14	18	18	19	3	1	3	1
Forestry	8	0	0	6	0	0	0	0
WoodProds	15	17	16	21	4	8	5	2
Oil	0	0	0	0	0	0	0	0
Gas	0	0	0	0	0	0	0	0
OthMinerals	4	2	1	5	0	0	0	0
Textiles	6	10	10	11	12	8	9	4
WearingAppar	20	20	20	21	2	8	4	1
LeatherProds	18	19	19	14	5	7	2	3
MachinEquip	8	8	7	12	16	11	17	11
ChemRubPla	8	13	13	12	18	17	15	9
MotorVeh	11	10	10	12	3	2	3	5
HeavyMnfcs	12	8	4	7	27	25	32	47
OtherManuf	19	18	17	18	4	4	3	2
Metals	4	11	6	9	3	0	1	0

[a]Source: GTAP Database

[b]Note: DOM represents the Dominican Republic; JAM represents Jamaica; TTO represents Trinidad and Tobago; and ROC represents the 'Rest of Caribbean' composite.

procurement rules for foreign suppliers. Additionally, high transport costs are reported as a significant impediment to trade between China and the Caribbean countries, and may actually be more trade restrictive than tariffs. Whilst the distance between the regions significantly impacts transportation costs, the composition of the region's exports, which include heavy, high weight-to-value natural resources, whose freight costs are a significant part of the overall cost, insurance, and freight (CIF) price. Overall, the results of the study indicate that high trade costs are curtailing business opportunities between China and the region. The report goes on to make a recommendation that policy-makers should join forces to cut tariffs, transportation costs and other barriers to diversify the composition of the bilateral trade between China and the region.

7 Modelling Approach

7.1 Simulation Description

We simulate the move towards a free trade agreement between China and the Caribbean countries using three different policy experiments: a full tariff liberalization; a full tariff liberalization which also models improvements in trade facilitation between the regions; and a partial tariff liberalization experiment.

In the first policy experiment, tariffs are completely removed from the products traded between Caribbean countries and China. Tariffs are also removed on products traded within the Caribbean countries to reflect greater intra-regional trade cooperation. It is important to recall a provision incorporated in the Chinese Government's 2008 Policy Paper on Latin America and the Caribbean which states that "China will on the basis of mutual benefit and win-win cooperation, give positive consideration to concluding free trade agreements with Latin American and Caribbean countries or regional integration organizations". It is against this backdrop that the effects of full tariff liberalization on both regions will be explored.

In the second policy experiment, we simulate the move towards complete inter-and intra-regional tariff liberalization, as well as the move towards increased inter- and intra-regional cooperation in trade facilitation. A similar approach is taken to Hertel at al (2001)and Stone et al (2012) where the impact of lower non-tariff trade costs in a free trade agreement was simulated (Hertel et al., 2001),(Scott et al., 2012). According to research undertaken by the Organization of Economic Cooperation and Development (2013) on the potential impact of trade facilitation on developing countries' trade, it was found the combined effect of improvements in specific trade and border procedures could lead to a 13.2% reduction in trade costs for upper middle-income developing countries, including Jamaica and that is what we model here (Moise and Sorescu, 2013). Sixteen trade facilitation indicators were utilized in this analysis and include: information availability; involvement of the trade community; advance rulings; appeal procedures; fees and charges; formalities-documents; formalities- automation; formalities- procedures; cooperation- internal; cooperation- external; consularization; governance and impartiality; transit fees and charges; transit formalities; transit guarantees; and transit agreements and cooperation.

In the third policy experiment, tariffs are removed from specific products, while recognizing certain sectors as sensitive, for which there is no reduction in tariffs modelled. In order to determine which products may be considered as sensitive products by both partners in actual FTA negotiations, we investigate both the Caribbean and Chinese approach to constructing exclusions lists in previous trade agreements. The most comprehensive trade agreement that has been jointly negotiated by a group of Caribbean countries with a third-party region is the CARIFORUM-EC Economic Partnership Agreement (EPA) in 2008. CARICOM countries together with the Dominican Republic, collectively known as the Caribbean Forum of States (CARIFORUM), collaboratively negotiated a free trade agreement with the European Union. The CARIFORUM exclusions list used in this EPA will be explored as a reference point for a possible list of sensitive products for the Caribbean countries. According to Bernal (2012), the China-Costa Rica FTA which was concluded in 2011 could become a template for Chinese FTAs with other SIDS, including those in the Caribbean. This is the most comprehensive FTA that has been negotiated between China and a country in the Latin America and Caribbean Region. Hence, the Chinese exclusions list in the China-Costa Rica FTA will be explored as a reference point for a possible list of sensitive products for China in negotiations with Caribbean countries.

In all of the above policy experiments, there is a deviation from the standard closure in the GTAP model framework to reflect unskilled unemployment in the Caribbean countries. While the typical closure used in the GTAP is that of full labour market clearing, this is not appropriate for the Caribbean

region, with large pools of unemployed unskilled labour available. According to the World Bank's World Development Indicators database, unemployment in the Caribbean in 2013 was highest in Jamaica, where estimates stood at 15% of the total labour force in 2013. This was followed by Belize (14.6%), The Bahamas (13.6%), and Barbados (12.2%). Cuba recorded the lowest level of unemployment in 2013, an estimated 3.2%.

7.1.1 Modelling Sensitive Products

Of the top 150 products imported from China into the CARICOM market in 2013, twenty-eight products were found on the CARIFORUM-EC EPA exclusions list. These products which were classified at the HS-6 digit level were mapped to the relevant GTAP sectors. An analysis was carried out on the relative importance of these products in overall CARICOM imports from China. An exclusions list was, therefore, formulated based on the imports which demonstrated greater importance in the CARICOM market. We utilize this exclusions list as the Caribbean exclusions list in the partial tariff liberalization scenario. The following GTAP sectors are excluded from liberalization: Food products not elsewhere classified (25); Manufactures not elsewhere classified (42); Chemical, Rubber and Plastics Products (33); Machinery and Equipment not elsewhere classified (41); Wood Products (30); Beverages and tobacco (26); and Metal products (37).

Likewise under the China-Costa Rica FTA, there were several products which the Chinese opted to exclude altogether from tariff liberalization in the FTA with Costa Rica. There were also several products which did not receive immediate duty-free treatment, and were subject to longer phase-in periods for tariff liberalization. After reviewing these lists, a few of these products were found to be among the products exported from the Caribbean to China. These products were mapped to the following GTAP sectors: Vegetables, fruits and nuts (4); Crops not elsewhere (8); Chemical, Rubber and Plastics Products (33); Food products not elsewhere classified (25); Textiles (27); Wearing Apparel (28); Leather products (29).

8 The Dragon in the Caribbean: Impacts of Trade Liberalization

8.1 Impacts on Welfare

Of the three policy experiments it is not surprising that the China-Caribbean FTA which includes significant trade facilitation (the second policy experiment), reveals the highest potential welfare gains for the Caribbean countries. Table 7 reveals that the static welfare gains for the Caribbean countries under this policy experiment are estimated to be US$5521 million. This represents over seven times the increased welfare that may be realized under the tariff only liberalization experiments. It is interesting to note that in all the policy experiments, the welfare gains which accrue to the Caribbean countries are greater than the welfare gains which accrue to China. Of all the Caribbean countries modelled, the countries incorporated in the Rest of Caribbean composite stand to gain the most. The welfare gains which accrue to the Rest of Caribbean countries in the second policy experiment represent over 50% of the total gains to all the Caribbean countries. There are also significant gains for the Dominican Republic; however, there are relatively minor gains for both Jamaica and Trinidad and Tobago. Of all the countries not included in the liberalization, the USA, which is the Caribbean's main trading partner, stands to lose the most. This is especially the case when the second policy experiment is simulated. Countries in MERCOSUR and the European Union also experience welfare losses as a result of the move towards a China-Caribbean FTA.

Table 8 decomposes welfare gains that accrue to China and the Caribbean countries in the second, most ambitious policy experiment. For both FTA partners, it is revealed that trade facilitation gains contribute more to over significantly to overall welfare gains. Trade facilitation gains for China represent over 60% of total welfare gains, while in the case of the Caribbean countries, trade facilitation gains represent over 80% of the total welfare gains. Countries in the Rest of Caribbean composite and the Dominican Republic stand to benefit significantly from increased cooperation in trade facilitation under this experiment. Additionally, the table reveals that the majority of welfare gains for the Caribbean countries stem from trade facilitation and endowment efficiency gains, while the majority of Chinese welfare gains emanate from improvements in its terms of trade.

Table 7: Welfare Gains in a China-Caribbean FTA, US$millions

Region	Policy Experiment 1	Policy Experiment 2	Policy Experiment 3
China	702	2602	239
Caribbean Aggregation	748	5521	679
Individual Caribbean Countries:			
Dominican Republic	261	1499	161
Jamaica	23	615	5
Trinidad and Tobago	20	438	6
Rest of Caribbean	444	2969	507
Other:			
Canada	4	1	-8
USA	-420	-1398	-117
Columbia	-6	-21	-7
Venezuela	-6	-32	-12
MERCOSUR	-178	-327	-151
EU	-124	-316	-46
HongKong	-2	-20	3
Japan	-20	-30	-14
Taiwan	6	16	1

Table 8: Welfare Decomposition in a China-Caribbean FTA- Second Policy Experiment, US$millions

	China	Caribbean	Dominican Republic	Jamaica	Trinidad and Tobago	Rest of Caribbean
Equivalent Variation:	2602	5521	1499	615	438	2969
Tariff Liberalization Effects	936	911	315	33	25	539
Trade Facilitation Effects	1666	4610	1185	582	413	2430
Allocative Efficiency Effects	588	645	285	90	41	229
Endowment Efficiency Effects	0	1680	357	220	90	1013
Trade Facilitation Efficiency Effects	623	2154	399	241	105	1409
Terms of Trade Effects	1469	1049	362	52	156	479

8.2 Impacts on Gross Domestic Product and Output

Table 9 shows the changes in real GDP expected within a China-Caribbean FTA in terms of monetary and percentage changes. In all three policy experiments, there are positive changes in real GDP for all the Caribbean countries. Importantly, in both the first and the third policy experiments, the percentage changes in real GDP are highest for the Dominican Republic. However, in the second policy experiment, which takes into account increased trade facilitation cooperation, percentage changes in real GDP are highest for Jamaica. Overall, in all of the three policy experiments, the Caribbean countries realize greater gains in real GDP in both monetary and percentage terms than is the case with China.

Table 9: Changes in Real GDP in a China-Caribbean FTA from 2011 Baseline (% and US$millions)

Region	Policy Experiment 1		Policy Experiment 2		Policy Experiment 3	
	US$M	%	US$M	%	US$M	%
China	207.5	0.00	1211.5	0.02	107	0.00
Caribbean Aggregation	510.86	0.24	4472.11	2.07	334.32	0.15
Individual Caribbean Countries:						
Dominican Republic	173.8	0.31	1037.43	1.87	107.42	0.19
Jamaica	37.71	0.26	550.35	3.81	15.7	0.11
Trinidad and Tobago	5.56	0.02	235.08	0.99	4.8	0.02
Rest of Caribbean	293.79	0.24	2649.25	2.16	206.4	0.17

Table 10 reveals the expected changes in real output following both tariff liberalization and trade facilitation cooperation as simulated in the second policy experiment. Changes in real output are recorded in both monetary and percentage changes. In the Dominican Republic, real output increases by US$10 million in the textiles sector and by US$6 million in the metals sector. While the percentage change of output in the services sector increases by 749%, the value of this output increase is only US$1 million. In Jamaica, the value of output remains the same or declines for the majority of sectors. The sectors which record increases in real output are the chemical, rubber and plastics sector (US$6 million), the metals sector (US$4 million), and the services sector (US$3 million). In the case of Trinidad and Tobago, the highest increase in output is in the metals sector (US$38 million). This is followed by increases in the

wood products and other food sectors, where increases by US$7 million and US$4 million, respectively. For the Rest of Caribbean countries, there is a significant percentage increase in the production of processed sugar (1603%), which is estimated at US$73 million. This sector accounts for the majority of gains in real output in the Rest of Caribbean countries. There were also significant output gains in the sugar cane sector (US$58 million) and in the metals sector (US$19 million).

8.3 Impacts on Trade

Figure 6 shows the changes in real exports from the Caribbean to China under the three policy experiments. It is revealed that exports increase significantly under the second policy experiment. Exports under the two alternative experiments, in most cases, reflect similar outcomes. In the second policy experiment, Caribbean exports of gas, metals, other heavy manufactures, processed sugar and services all increase. The most significant increase in exports is in the processed sugar sector. It is also important to note that under the second policy experiment, exports increase significantly in the gas, metals and services sectors when compared to the alternative policy experiments.

Figure 6: Caribbean Exports to China in an FTA, US$millions

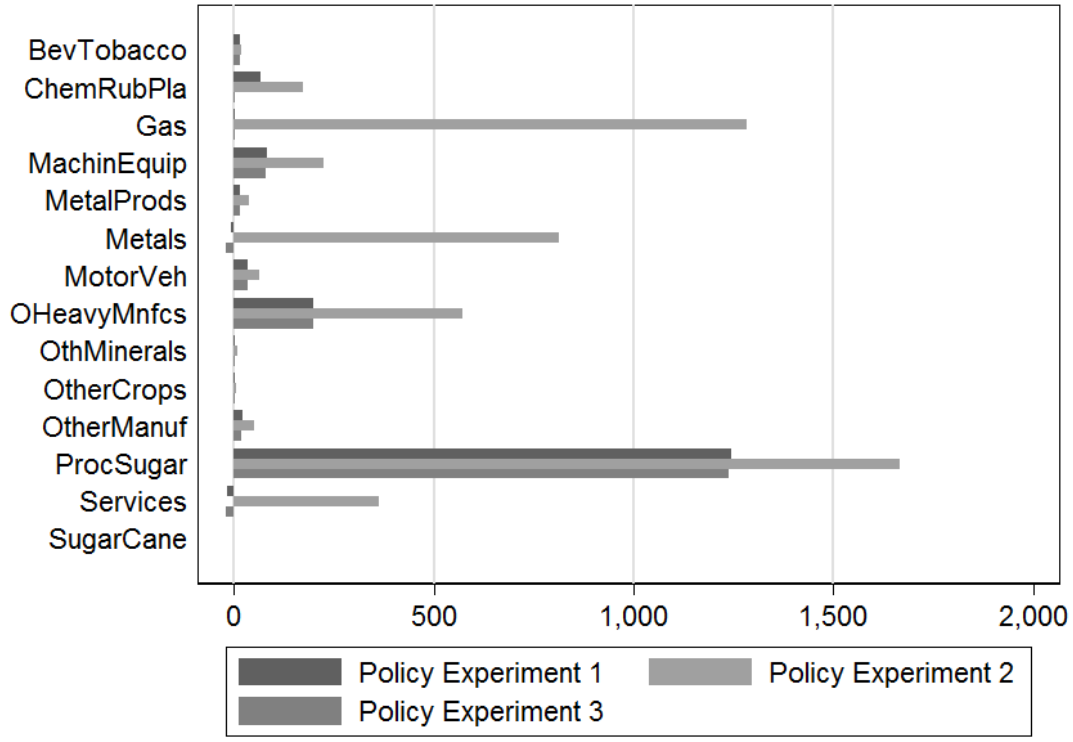
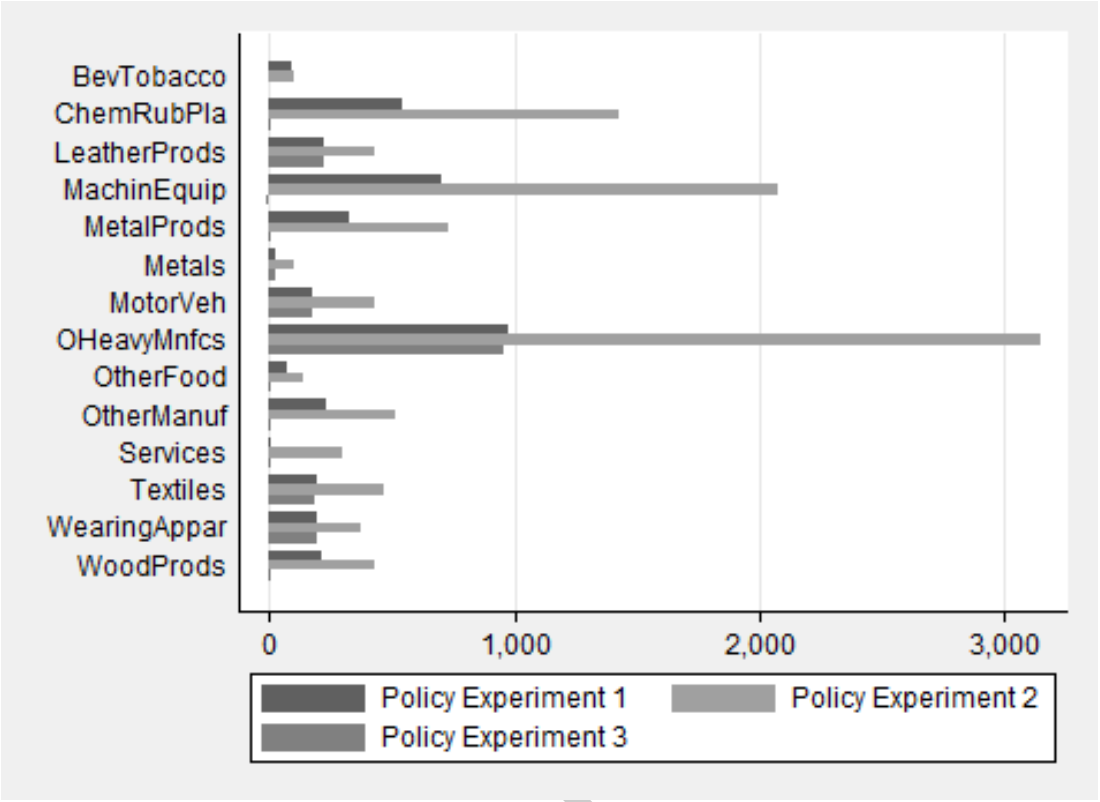


Figure 7 shows the changes in real exports from China to the Caribbean under the three policy experiments. It is revealed that the Caribbean imports increase more significantly from China under the second policy experiment compared with the alternative experiments. Imports increase significantly in the chemical, rubber and plastics sector, in the machinery and equipment sector, and in the other heavy manufactures sector. However, the highest recorded increase in imports in the second policy experiment is in the other heavy manufactures sector. It is important to note that whereas services imports remain almost stagnant under the first and third policy experiments, there is a significant increase in these imports under the second policy experiment. This is because there are no (significant) tariffs on services in the GTAP database, therefore tariff reduction scenarios have little impact on trade in these sectors. However, in the second simulation which includes increased trade facilitation, we assume this occurs for services as well as merchandise trade.

Table 10: Changes in Real Output in a China-Caribbean FTA-Second Policy Experiment, 2011 Baseline (% and US$millions)

Sector	Dominican Republic		Jamaica		Trinidad and Tobago		Rest of Caribbean	
	US$M	%	US$M	%	US$M	%	US$M	%
SugarCane	0	-2	-6	-4	-2	-1	58	407
ProcSugar	-4	-15	-6	-5	-2	-2	73	1603
BevTobacco	-1	-20	0	3	2	13	0	-20
OtherFood	2	79	0	3	4	36	-4	-377
Forestry	0	1	-1	0	-2	0	1	9
WoodProds	1	2	-12	-15	7	3	-7	-150
Oil	-1	0	-2	0	0	0	-1	-22
Gas	0	0	-3	0	0	2	-6	-3
OthMinerals	1	3	3	4	0	-2	4	39
Textiles	10	116	-24	-3	-1	0	-10	-386
WearingAppar	3	29	-35	-6	-18	-12	-2	-60
LeatherProds	-10	-47	-29	-4	-30	-4	-12	-134
ChemRubPla	-5	-139	6	9	-3	-150	-5	-698
Metals	6	22	4	26	38	9	19	571
Services	1	749	3	549	1	161	2	2530

Figure 7: Caribbean Imports from China in an FTA, US$millions



Given that there are significant increases in real exports under the second policy experiment, Table 11 shows the changes in sectoral exports from specific Caribbean countries. In the case of Jamaica, the results reveal increased exports of services and metals in the amounts of US$ 30 million and US$ 18 million, respectively. In the case of the Dominican Republic, real exports increase significantly in the other heavy manufactures (US$85 million), metals (US$51 million) and services (US$ 44 million). In Trinidad and Tobago, there is a significant increase in exports of gas. Gas exports increase by 3022%, which is estimated at US$1281 million. There are also increases in exports of chemical, rubber and plastics products (US$54 million), as well as services (US$16 million). For the Rest of Caribbean countries, export increases are concentrated in the processed sugar sector. Exports of processed sugar increase by 551%, which is valued at US$1667 million. Exports also increase significantly in the metals sector (US$735 million), and in the other heavy manufactures sector (US$483 million).

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Table 11: Changes in Real Exports in a Caribbean-China FTA- Second Policy Experiment, 2011 Baseline (% and US$millions)

Sectors	Jamaica		Dominican Republic		Trinidad and Tobago		Rest of Caribbean	
	US$M	%	US$M	%	US$M	%	US$M	%
SugarCane	0	58	0	47	0	60	0	-15
OtherCrops	2	192	0	193	0	79	2	175
ProcSugar	0	-15	0	-22	0	-12	1667	551
BevTobacco	0	44	1	60	0	17	17	298
OtherFood	2	186	1	84	0	43	6	150
Forestry	0	47	0	108	0	66	19	59
WoodProds	0	121	0	115	0	109	11	164
Oil	0	263	0	210	0	179	0	208
Gas	0	19673	0	25277	1281	3022	1	74736
OthMinerals	0	14	6	5	1	10	2	5
Textiles	0	115	3	455	0	116	37	1567
WearingAppar	0	508	6	563	0	130	88	650
LeatherProds	0	200	7	339	0	165	45	1127
MachinEquip	0	267	26	187	0	246	197	1163
ChemRubPla	1	220	7	145	54	171	111	705
MotorVeh	0	74	0	193	0	76	62	2128
MetalProds	0	131	0	301	0	116	36	2304
OHeavyMnfcs	3	97	85	93	2	107	483	532
OtherManuf	0	125	0	115	1	646	49	628
Metals	18	152	51	125	9	128	735	130
Services	30	32	44	23	16	37	273	36

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Appendix

Table 12: GTAP Regional Aggregation

	Grouping	Description	Number of GTAP Regions
1	China	China	1
2	Dominican Republic	Dominican Republic	1
3	Jamaica	Jamaica	1
4	Trinidad and Tobago	Trinidad and Tobago	1
5	Rest of Caribbean	**Caribbean (18 countries)** : Anguilla, Antigua and Barbuda, Aruba, The Bahamas, Barbados, Cayman Islands, Cuba, Dominica, Grenada, Haiti, Montserrat, The Netherland Antilles, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Turks and Caicos Islands, Virgin Islands British, Virgin Islands US. **Rest of Central America (1 country)**: Belize. **Rest of South America (5 countries)**: Falkland Islands, French Guiana, Guyana, South Georgia and the South Sandwich Islands, and Suriname	3
6	USA	United States of America	1
7	Canada	Canada	1
8	EU-28	European Union Members: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, United Kingdom, Bulgaria, Croatia, Romania	28
9	Colombia	Colombia	1
10	Venezuela	Venezuela	1
11	MERCOSUR	Southern Community Common Market Members except Venezuela: Argentina, Paraguay, Uruguay and Brazil	4
12	Japan	Japan	1
13	Taiwan	Taiwan	1
14	Hong Kong	Hong Kong	1
15	Rest of World	Australia, New Zealand, Rest of Oceania, Korea, Mongolia, Rest of East Asia, Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Philippines, Singapore, Thailand, Vietnam, Rest of South-East Asia, Bangladesh, India, Nepal, Pakistan, Sri Lanka, Rest of South Asia, Mexico, Rest of North America, Bolivia, Chile, Ecuador, Peru, Costa Rica, Guatemala, Honduras, Nicaragua, Panama, El, Salvador, Puerto Rico, Switzerland, Norway, Rest of EFTA, Albania, Belarus, Russian, Federation, Ukraine, Rest of Eastern Europe, Rest of Europe, Kazakhstan, Kyrgyzstan, Rest of Former Soviet Union, Armenia, Azerbaijan, Georgia, Bahrain, Iran Islamic Republic of Israel, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, Turkey, United Arab Emirates, Rest of Western Asia, Egypt, Morocco, Tunisia, Rest of North Africa, Benin, Burkina Faso, Cameroon, Cote d'Ivoire, Ghana, Guinea, Nigeria, Senegal, Togo, Rest of Western Africa, Central Africa, South Central Africa, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Tanzania, Uganda, Zambia, Zimbabwe, Rest of Eastern Africa, Botswana, Namibia, South Africa, Rest of South African Customs, Rest of the World	94

Table 13: GTAP Sectoral Aggregation

	Sector Name	Sector Description
1	SugarCane	Sugar cane, sugar beet
2	VegFrNuts	Vegetables, fruit, nuts
3	OtherCrops	Crops not elsewhere classified
4	OthAgricMeat	Paddy rice, wheat, cereal grains not elsewhere classified, oil seeds, plant-based fibers, cattle, sheep, goats, horses, animal products not elsewhere classified, raw milk, wool, silk-worm cocoons, fishing, meat: cattle, sheep, goats, horse
5	ProcSugar	Sugar
6	BevTobacco	Beverages and tobacco product
7	OMtVoDairyPR	Meat products not elsewhere classified, vegetable oils and fats, dairy products, processed
8	OtherFood	Food products not elsewhere classified
9	Forestry	Forestry
10	WoodProds	Wood Products
11	Oil	Oil
12	Gas	Gas
13	OthMinerals	Minerals not elsewhere classified
14	Textiles	Textiles
15	WearingAppar	Wearing apparel
16	LeatherProds	Leather products
17	MachinEquip	Machinery and Equipment not elsewhere classified
18	ChemRubPla	Chemical, rubber, and plastic products
19	MotorVeh	Motor vehicles and parts
20	MetalProds	Metal products
21	OHeavyMnfcs	Coal, petroleum, coal products, mineral products not elsewhere classified, ferrous metals, paper products publishing, transport equipment not elsewhere classified, electronic equipment
22	OtherManuf	Manufactures not elsewhere classified
23	Metals	Metals not elsewhere classified
24	Services	Electricity, Gas manufacture, distribution, Water, Construction, Trade, Transport not elsewhere classified, Sea transport, Air transport, Communication, Financial services not elsewhere classified, Insurance, Business services not elsewhere classified, Recreation and other services, PubAdmin,Defence,Health,Education, Dwellings