Evaluation of the economic and social impact of possible trade negotiations between Jamaica and Central America, Mexico and the countries of the Northern Caribbean

INDEX

FIGURES

TABLES

SCHEMES

Executive Summary

This study, an "Evaluation of the economic and social impact of possible trade negotiations between Jamaica and Central America, Mexico and the countries of the Northern Caribbean", was prepared under the United Nations Development Account project "Enhancing the Contribution of Preferential Trade Agreements to Inclusive and Equitable Trade", implemented by the United Nations Regional Commissions for Asia (ESCAP), Africa (ECA) and Latin America and the Caribbean (ECLAC). The project's objective is to facilitate the negotiation of fair and equitable trade agreements that can contribute to a vision of development that combines growth with social inclusion.

The study evaluates the economic and social impacts resulting from the potential increase of commercial relations between Jamaica and Mexico, the Central American countries and those of the Northern Caribbean after signing a Free Trade Agreement (FTA) with each. Jamaica is currently a party to trade agreements with a number of countries in the study through its membership in the Caribbean Community (CARICOM), and the study assesses the potential results from further liberalizing trade with these partners and others in the region. The results of this analysis can be used to inform future trade negotiations and identify specific opportunities for export diversification and expansion.

In a context marked by decades of growth in international trade, Jamaica is not yet fully integrated into the international trading system in all product categories, although foreign trade represents about 74% of GDP. While benefitting from growing sectors such as tourism and the aluminum trade, Jamaica has not managed to strengthen its productive apparatus in order to be competitive in the international context. Thus, the effects of trade have not generated the expected profits in terms of wealth and employment creation, due to the stagnation of its exports and the gradual increase in imports. Supply-side impediments such as high transport and energy costs, among others, have constrained the country's productive dynamism as well.

To analyze the potential impact of deeper trade relations with the partners mentioned above, three complementary approaches are used. First, a set of trade indicators that capture the state of Jamaica's trade pattern with each partner provides information to identify complementarities that have yet to be exploited. The results of this analysis show that significant potential export opportunities exist for Jamaica in the agricultural, agroindustrial, chemical and petrochemical, and selected machinery and equipment sectors with numerous partners.

To better understand the economic and social impacts of FTAs between Jamaica and the partners in the study, Computable General Equilibrium (CGE) models were developed. The results of these models show the effects on the main macroeconomic indicators, including consumption, production and trade, among others. Then, through a microsimulation approach, effects on employment, poverty and income distribution were also derived.

The results show that the greatest effects occur when Jamaica signs trade agreements with Mexico and Central America, in which case GDP increases by 0.01% and 0.02%, respectively, with slight increases in private investment and consumption. The results of the simulations with Caribbean partners the Bahamas, Cuba, the Dominican Republic, and Haiti do not demonstrate a substantial change in the growth path that Jamaica would observe under the status quo.

Signing FTAs with all of the countries in the study would expand both Jamaica's exports and imports of goods and services with a greater absolute impact on the volume of imports. Total exports of goods and services would be expected to grow by 21.8 million US dollars per year during the simulated period (2017-2020) in

comparison to the 2007 baseline while imports of goods and services would be expected to grow by 70.8 million US dollars, with highly differential impacts by trade partner and sector (Figure A).

Figure A – Net absolute annual impact of FTAs on bilateral trade balances
(in millions of US dollars)
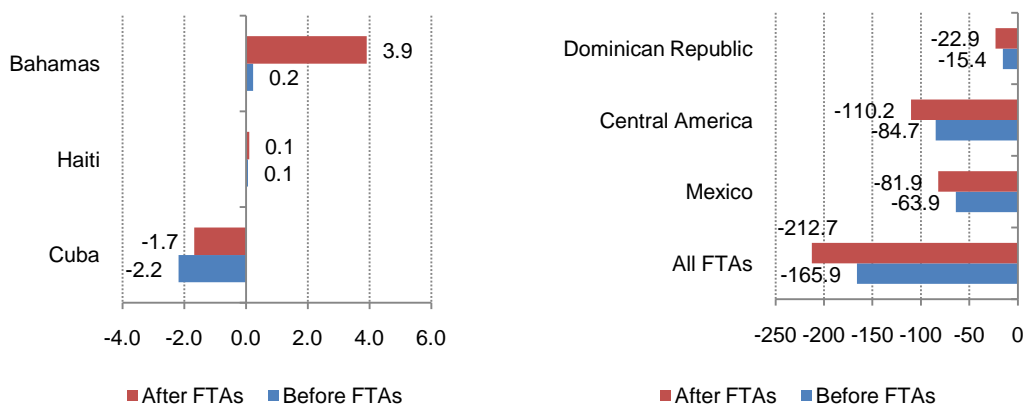
Source: ECLAC, based on simulations of CGE model calibrated for Jamaica.

On a bilateral basis, the percentage growth in both exports and imports of goods and services is anticipated to be greatest in the case of a free trade agreement with Mexico. The percentage growth in exports with respect to the baseline is expected to be greater than the growth in imports in the case of the Bahamas as well, but for the other countries in the study, the percentage growth in imports is anticipated to outweigh export growth (Figure B).

Figure B - Changes in Bilateral Exports and Imports by Partner from FTAs
(percentage changes with respect to the baseline scenario)
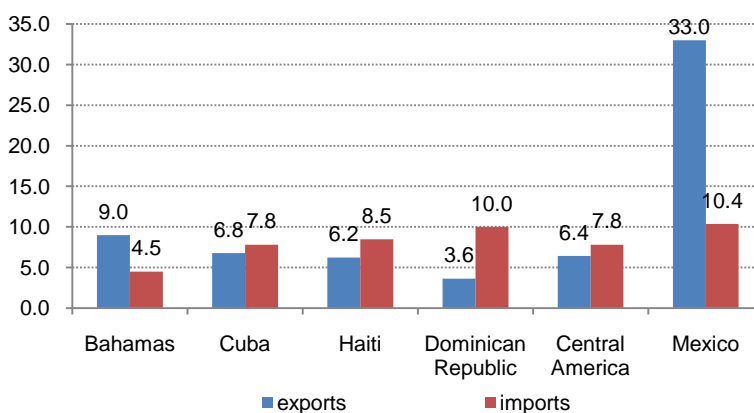
Source: ECLAC, based on simulations of CGE model calibrated for Jamaica.

Reduced trade barriers with Central America shows the greatest number of winning sectors in terms of value added. In each case, these sectors include primary products or manufactures of agricultural origin. A detailed review of all sectors for which there are increases in value added, shows that about a dozen sectors in which

Jamaica has a positive revealed comparative advantage (sugarcane, coffee and cocoa, bauxite and alumina, animal feed, sugar, leather, petrochemical, as well as all service sectors) experience increases. Many of these increases in value added translate into an increase of total exports. Deepening trade relationships with Central American partners with whom Jamaica currently has very little trade, could likely lead to an interesting expansion in the set of products exported by Jamaica. Though the aggregate effects on exports are not large for other bilateral trade relationships analyzed here, particular sectors often stand to gain substantially from reduced barriers to trade such as beverage exports to Mexico and machinery and equipment exports to Cuba.

In addition, there is a group of sectors that also register increases in their imports from Central America, especially in manufacturing, and benefit from lower prices after liberalization with Jamaica. Cheaper imports from Mexico and Central America could help Jamaica improve its competitive position in exports to other destination markets including Central America, other Caribbean countries (mainly fellow CARICOM member countries, including Haiti), as well as Cuba and the Dominican Republic.

The services sector also stands to gain from deeper trade relationships with the partners in the study, largely through its linkages to the provision of goods for export (Figure C). Transport services, real estate activities, leasing of real estate, vehicles, and machinery and equipment, as well as the use of telecommunications services, are particularly important in this regard.

Figure C – Changes in Exports and Imports by Sector from FTAs
(percentage changes with respect to the baseline scenario)
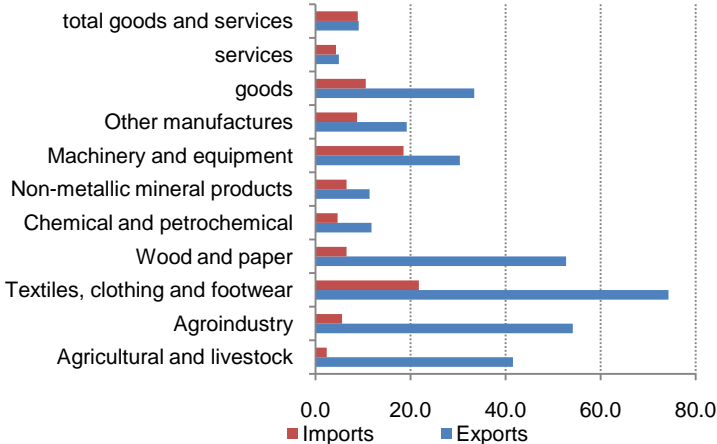
Source: ECLAC, based on simulations of CGE model calibrated for Jamaica.

In terms of the social effects of FTAs, the proposed opening of Jamaica to Central America, Mexico, and the countries of the North Caribbean would produce small but negative changes in the level of household expenditure due to the increase in the prices of some products, in particular food, that are not compensated for by the decrease in the prices of other products (in particular textiles). The prevalence of this increase may translate into a loss of well-being by households, in particular in the top quintiles of the population, if they are

not accompanied by similar increases in income as a result of the agreements. At the margin, the only agreement that is beneficial in terms of an increase in the level of spending is an FTA with Mexico.

In order to harness the potential opportunities highlighted in this study, a number of supportive policies and actions should be considered. These include measures to:

- Increase the technical capacities and export market knowledge of the main actors involved in the provision of services, in such a way that each sector clearly knows the characteristics of their respective sectors in terms of supply capacity, regulatory standards, and above all common challenges to address;

- Expand the promotion of Jamaican exports in the region through activities that enhance awareness of Jamaican producers with a specific focus on product categories in which Jamaica enjoys a competitive advantage.

- Strengthen the institutional capacity of public agencies linked to trade;

- Focus public and private actions on the identification of specific needs that favor the increase of sectoral competitiveness. For example, retaining high-skilled human capital by reducing the migration of technicians, promoting partnerships of tourism-related service providers to promote approaches such as all-inclusive, ecotourism, etc.;

- Encourage coordination between public bodies to ensure the coherence of development policies to be promoted;

- Take advantage of flexibility in rules of origin requirements to support the development of intra-regional value chains. Though Jamaica's trade relationship with other CARICOM partners is largely inter-industrial, there is ample evidence indicating the potential for stronger intra-industry linkages (ECLAC, 2014). The modeled results and RCA analysis conducted in this study provide an empirical basis to identify individual products and product categories through which these linkages can be strengthened.

Special attention must be given to the agroindustrial sector, a sector that appears to have great potential in the target markets analyzed in the study. Export promotion policies focused on strengthening exporting capacities for companies that produce agro-industrial products should be a priority. Some actions with the potential to enhance international integration of Jamaican companies in this sector are:

- Market intelligence studies to detect winning products in each market of interest. These studies should include cultural elements that could affect the demand for products of Jamaican origin (flavour, texture, market differentiation). In addition, the identification of exportable supply sufficient to meet the demand in the target markets should be prioritized;

- Training in compliance with quality standards and technical requirements necessary to enter Spanish-speaking markets, especially Mexico and the countries of Central America;

- Increase the value added content incorporated into agro-industrial exports through the improvement of packaging, cold chain, labeling, as well as advertising and marketing techniques aimed at new markets;

- Identify a country brand strategy that includes the identification of exotic niche products of Jamaica. This could include canned or preserved special products (soups, sauces, cakes, purées, among others) and liquors and drinks (rum, beer, malt, etc.);
- Facilitate the participation of Jamaican producers in fairs of small and medium producers in Central American countries. This includes special missions that identify potential buyers, especially in food and beverages; and

- Support research in Universities and local Research Centers on innovation processes in the design of non-traditional products identified for the target markets.

The aforementioned policies must be accompanied by additional efforts by the local business community in order to boost their investment efforts and expansion of productive capacity, mainly in niche rather than extension markets. This strategy is much more viable than one that seeks to increase market share only.

ECLAC also recommends the promotion of actions to reduce the high administrative costs that have a negative impact on the capacity to export. Some measures and actions in this direction are:

- Reducing the number of administrative controls and customs procedures necessary to export, both at maritime and airport customs.

- Introducing technological facilities that accelerate customs procedures. This includes the use of digital certificates, and electronic data transfer, among other measures.

1. Introduction

This document has been prepared under the United Nations Development Account project "Enhancing the Contribution of Preferential Trade Agreements to Inclusive and Equitable Trade", implemented by the United Nations Regional Commissions for Asia (ESCAP), Africa (ECA) and Latin America and the Caribbean (ECLAC), whose objective is to facilitate the negotiation of fair and equitable trade agreements that can contribute to a vision of development that combines growth with social inclusion.

Specifically, the study evaluates the economic and social impact resulting from the potential increase of commercial relations between Jamaica and Mexico, the Central American countries and those of the North of the Caribbean, after signing a Free Trade Agreement (FTA). Jamaica is currently a party to trade agreements with a number of countries in the study through its membership in CARICOM and the study assesses the potential results from further liberalizing trade with these partners and others. As part of the aforementioned project, the Regional Integration Unit of the International Trade and Integration Division of ECLAC has developed a Technical Assistance Project at the request of the Government of Jamaica. The results of this analysis can be used to inform future trade negotiations and identify specific opportunities for export diversification and expansion.

In a context marked by decades of growth in international trade, Jamaica is not yet fully integrated. It has been characterized as a country that while benefitting from growing sectors such as tourism and the aluminum trade, has not managed to strengthen its productive apparatus in order to be competitive in the international context. Thus, the effects of trade have not generated the expected profits in terms of wealth and employment creation, due to the stagnation of its exports and the gradual increase in imports. On the other hand, impediments in the country itself, such as high transport and energy costs, among others, have constrained the country's productive dynamism as well.

The second section analyzes the country's overall socioeconomic status over the long term, considering the evolution of the main macroeconomic growth constraints, namely, external debt and fiscal deterioration. It also analyzes the evolution of inflation, unemployment and poverty, three key indicators of the country's social evolution. These factors constitute the baseline, which will serve as the starting point for the analysis of a change in trade policy as proposed in the study.

The third section will review the evolution of Jamaica in the world economy, considering bilateral trade between Jamaica and Central America, as well as between Jamaica and Mexico, and the neighboring countries of the Northern Caribbean (mainly Bahamas, Cuba, Dominican Republic and Haiti). This section also summarizes a set of background information on similar studies developed to assess changes in public policy in Jamaica.

The fourth section describes the main sources of information used in the study. Subsequently, section five describes the methodologies of the analysis conducted in order to determine the particular state of the bilateral relations with each of the partners under analysis. This section combines the analysis of a set of trade indicators that capture the state of Jamaica's trade pattern with each partner, with an ex-ante evaluation method that simulates the existence of deeper trade agreements between Jamaica with each partner of interest previously identified. From a comprehensive evaluation with a Computable General Equilibrium (CGE) model, the effects on the main macroeconomic variables (consumption, production and trade) were derived. Then, through a microsimulation approach, effects were also derived regarding some social variables, namely employment, poverty and income distribution.

The sixth section develops the analysis of the results, concentrating on the macroeconomic effects, mainly on value added and trade. Finally, the seventh section presents the main conclusions and recommendations of the study.

2. Socioeconomic Situation of Jamaica

Jamaica is the fourth largest economy among the Caribbean nations. With a population of 2.73 million, the country is classified as an upper middle-income country. In the last few decades it has been struggling with low growth and high unemployment, but has still managed to achieve substantial improvements in other indicators, such as poverty and inflation reduction. Like many Caribbean neighbors, it is a heavily indebted nation, with its debt-to-gross domestic product (GDP) ratio reaching 122% of GDP in 2016. In recent years, the Government of Jamaica has shown strong commitment to achieving macroeconomic stabilization and fiscal consolidation (STATIN, 2017a; World Bank, 2017a; Bank of Jamaica, 2017).

After a period of strong economic growth in the late eighties, economic growth started to fade from the nineties onwards. In 2016, Jamaica's real GDP grew by 1.4%. This was the second best performing year in the post-crisis period, even though the country has not reached its pre-crisis level of output. GDP per capita in 2010 constant US dollars in 2016 is practically the equivalent of the average of the 2000s, and only slightly higher than the average of the nineties. The reasons behind this sluggish performance might be linked to the failure of some sectors to recover to their pre-crisis levels. In 2016, the Mining and Quarrying sector (including bauxite and alumina) represented 50.9% of its 2007 level and the Wholesale and Retail Trade, Repairs, Installation of Machinery and Equipment sector, 92.2% (STATIN, 2017b; World Bank, 2017a).

In 2016, the service sector was responsible for around 75.7% of the nation's GDP. Industry and agriculture represent 21% and 7.3%, respectively. The evolution of the country's productive structure from 1993 to 2016 has shown a gradual shift from industry to services, mainly driven by an increase in the service sector and a decline in the manufacturing sector, both in relative terms (GDP share reduction from 13.9% in 1993 to 8.5% in 2016) as well as in absolute terms (the value of manufacturing output in 2016 was around 70% of its 1993 value). Tourism-related sectors have been playing an increasing role in the Jamaican economy. The increase in the services sector has been led by the hotels and restaurants segment, which in 2016 represented 5.8% of the total value added of GDP and showed an average growth rate 2.8% in real terms. The agriculture sector is very vulnerable to exogenous weather shocks. Droughts, flooding and hurricanes are some of the reasons behind this sector's volatile growth rates. (STATIN, 2017b).

Figure 1 - Jamaica: Total Production Overview

GDP Index (1980-2016)
Index numbers (2010=100)

Agriculture Forestry & Fishing VA (1993-2016)
(growth rate, year over year in percentages)
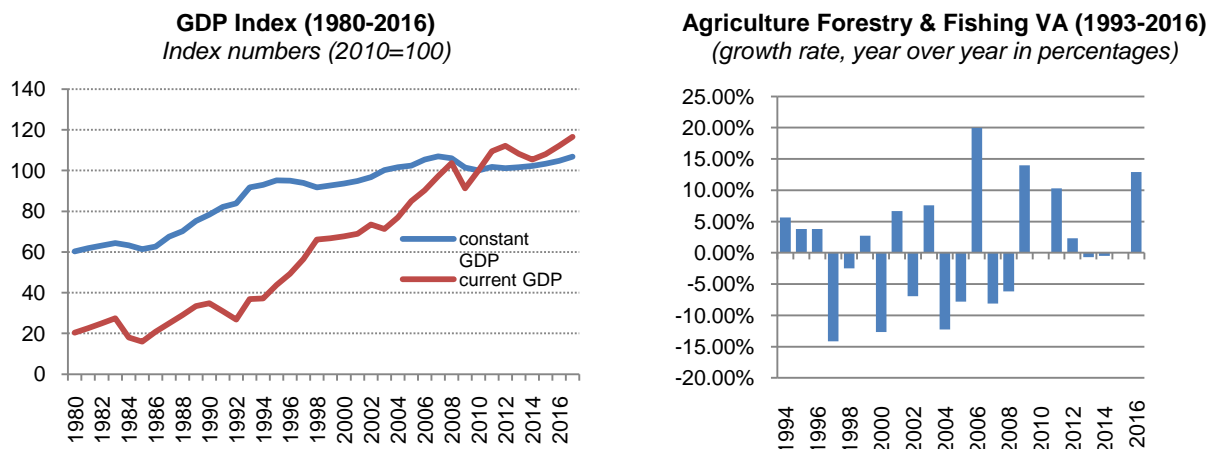
Source: ECLAC, based on World Development indicators and STATIN data.

The Jamaican economy is heavily reliant on its external sector, with trade representing around 74% of GDP.[1] The top exports of Jamaica in 2015 were Aluminium Oxide (US$ 570 million), Aluminium Ore (US$ 130 million), Hard Liquor (US$ 78.3 million), Refined Petroleum (US$63.3 million) and Raw Sugar (US$46.6 million) in 2015.[2] Its two top imports, refined petroleum (US$642 million) and crude petroleum (US$342 million) leave the trade balance exposed to shocks in oil prices. The country has run a trade deficit in the last few decades and in 2015 the value of goods imported reached a level of almost four times the value of goods exported. When trade in services is also taken into account this ratio is reduced to 1.75.

Table 1 - Jamaica: Main socioeconomic indicators: 1981-2016

	1981-1990	1991-2000	2001-2010	2011-2015	2016
GDP growth (%)	2.7	1.8	0.7	0.7	1.4
GDP per capita (constant 2010 US$)	3822	4814	4994	4853	4931
GDP per capita (current US$)	1440	2523	4211	5170	5276
Consumer price index (%)	15.1	25.9	12.1	7.1	2.3
Unemployment (% PA)	23.7	15.8	11.6	13.9	12.9
Services/GDP	…	60.0[a]	70.2	71.4	…
X/GDP	46.1	50.1	36.6	30.5	26.9
M/GDP	52.3	55.8	55.7	51.9	47.1
(X+M)/GDP	98.3	105.9	92.3	82.3	73.9

Source: ECLAC, based on World Development indicators.
[a]1993-2000

Even though the 1990s and the 2000s yielded a slack economic performance, Jamaica achieved impressive results in poverty reduction. The percentage of the population living under the poverty line in Jamaica decreased from 44.6% in 1991 to 9.9% in 2007. Part of these gains vanished with the impact of the 2008 financial crisis and its weak subsequent recovery, resulting in a rebound of the poverty ratio to a level of 19.9% in 2015. The reduction of poverty in the first period (1991-2007) might be related to the control of the high rates of annual inflation, especially in the beginning of the nineties (1990: 53%, 1991: 133%, 1992: 51%). As poorer households are more likely to hold their assets as currency, an inflation tax imposes a higher burden on them compared to the middle and upper class. According to the World Bank (2004), the relative fall of food prices contributed to the reduction of poverty in Jamaica due to the large role that food plays in the budget of the poor. They also identified a strong positive correlation between the poverty headcount and inflation during this first period. The post-crisis period, however, showed a divergence of these two variables, with inflation continuing its descending trend and poverty picking up. The decrease in fuel prices relative to food prices might explain why inflation dropped with no impact in the poverty rate in the recent years (Varma et al., 2015).

The Government of Jamaica has made significant advances in restoring economic stability. Its economic reforms have gained support from the International Monetary Fund (IMF), World Bank, and the Inter-American Development Bank, which have further financed the country's reforms. Varma et al. (2015) explain that the fiscal policy is the centerpiece of the reforms. Key measures include: *(i)* the introduction of a fiscal rule into the annual budget process; *(ii)* a freeze on the public sector wage bill; *(iii)* the publication of the Tax Administration of Jamaica's National Compliance Plan for FY2015/16; *(iv)* the preparation of amendments to the Customs Act, the General Consumption Tax, and the tax regime governing Special Economic Zones; and *(v)* the modernization of tax collection systems.

---

[1] All values in this study are presented in terms of United States dollars (US$). In cases where the original data source is in Jamaican dollars, the figures are converted to US$ using the average rate of the relevant time period (i.e. for the 2007 baseline, the exchange rate used is 68.8 Jamaican dollars per US$).
[2] 1992 revision of the HS (Harmonized System) classification.

Table 2 - Jamaica: Main socioeconomic indicators

Indicators	1991	1995	2000	2005	2007	2010	2015
Poverty (% of population)	44.6	27.5	18.7	14.8	9.9	17.6	19.9[a]
Gini Index	41.1[b]	40.4[c]	44.1[d]	45.5[e]	…	…	…
Annual inflation (%)	15.4	16.2	8.3	5.8	9.3	8.0	9.5
Unemployment (% P.A.)	15.7	16.2	15.5	11.2	9.4	12.4	13.5

Source: ECLAC, based on World Development indicators.
[a] 2012 (last year available); [b] (1990); [c] (1996); [d] (1999); [e] (2004).

The country has achieved a primary surplus above 7% of GDP for a fourth consecutive year and its debt-to-GDP is on a downward trajectory. In 2015, the country raised funds in the international bond market (at competitive rates) and managed to retire most of Jamaica's stock of PetroCaribe debt, reducing its total public debt by approximately 10% of GDP (Varma et al., 2015). Tax reforms have led to greater reliance on indirect taxation which has the advantage of broadening the tax base and simplifying collection while increasing the assurance of revenue (IMF, 2017).

These government commitments to stabilization have pushed up business and consumer confidence indices in the previous years. Foreign direct investments (FDI), which saw a sudden reduction in net inflow figures after the financial crisis, have increased from 1.2% of GDP in 2011 to 6.5% in 2015. Still, they remain well below their maximum value (10.1%) that was achieved in 2008 (World Bank, 2017a).

Even though the country is ranked above the Latin American and the Caribbean (LAC) average regarding the ease of doing business, the country still has room for improvements in different areas according to 2016 data from the Doing Business Report (World Bank, 2017b). The country is ranked 67th out of 190 countries in ease of doing business and is the 6th best performing country when only Latin American and Caribbean countries are taken into account. Starting a business (12/190) and getting credit (16/190) are among the positive points which place Jamaica above the region's average. The areas in which the country underperforms are: trading across borders (131/190; costs to imports and exports in terms of border compliance are above the regional average), registering property (123/190; it takes on average 18 days, eight procedures, and 10% of the property value to register a property), enforcing contracts (117/190; less time but higher costs to enforce contracts compared to the region), paying taxes (116/190) and getting electricity (101/190, requires 7 procedures, takes 95 days and costs 231.6% of income per capita).

When compared to its Caribbean and Central American neighbors, the competitiveness of Jamaica's tax policies remains mixed. A business incorporated in Jamaica pays lower taxes (34.3% of commercial profits) and makes fewer payments (11) than its regional counterparts, however, the hours needed to prepare, file and pay taxes (268 hours per year) lie above the regional average (World Bank, 2017a).

The high cost of energy on the island is related to the fact that over 90% of electricity production on the island comes from petroleum imports. This oil import dependency comes at a high cost. The goals and strategies underpinning the National Energy Policy (2009 – 2030) have laid the road to tackle this problem from different angles. In the last few years, diversification of fuels as well as the development of renewable energy sources together with the modernization of the country's energy infrastructure and the development of a comprehensive governance/regulatory framework are among the areas where priority was placed (World Bank, 2017b; Ministry of Science and Technology, 2015). The Jamaican Government is making efforts to diversify its energy mix and places no restrictions on the source of electricity generation with an aim to encouraging solar photovoltaic, wind, hydro, biofuels/biomass and waste to energy solutions, petroleum coke, coal and natural gas electricity production.

Despite some improvements, the country still faces high unemployment, with a particularly high youth unemployment rate. Recent reforms are expected to increase the private sector's role in the economy and thus foster GDP growth. Nevertheless, in order to lift economic activity, achieve sustained growth and reduce

unemployment and poverty, the country will need the government to invest efficiently, while still maintaining its tight fiscal constraints.

3. Jamaica in the World Economy

As mentioned in the previous section, over the last few years, Jamaica has made substantial efforts to meet the goals of its National Development Plan (Vision 2030 Jamaica), which consist of reducing fiscal debt, increasing employment, facilitating economic growth and strengthening mechanisms of social development. These efforts have benefited the country in many aspects, leading to an improved performance in international rankings of transparency and corruption (2015 Corruption Perception Index) and entrepreneurship (World Bank, 2017b).

Guided by the National Development Plan and with the support of the Official Development Assistance (ODA), the country has seen its value added growing, alongside with macroeconomic stability marked by controlled inflation, moderate currency depreciation, an increase in consumer confidence, reduction of the fiscal deficit and an increase in employment. Apart from the international support from ODA, Jamaica is also making use of tools such as the Extended Fund Facility (EFF) agreement with the International Monetary Fund to combat balance of payments problems, the European Development Fund (EDF) on Crime and Security Cooperation, and the Banana Accompanying Measures (BAM) to combat poverty and improve incomes in areas dependent on bananas.

In the multilateral setting, Jamaica is a founding member of the WTO. At a regional level, it is a member of the Caribbean Community (CARICOM), and is currently benefiting from a number of free trade agreements, including the Generalized System of Preferences (UNCTAD), the Caribbean Basin Initiative (CBI) granting Duty Free Access to the US market, the Commonwealth Caribbean/Canada Trade Agreement (CARIBCAN) yielding Duty Free Access to the Canadian Market, the CARICOM Bilateral Agreements with Venezuela, Colombia, the Dominican Republic, Costa Rica and Cuba, the PetroCaribe Trade Compensation Mechanism with Venezuela, and the CARIFORUM/EU Economic Partnership Agreement (EPA). Table 3 summarizes the agreements signed and schemes of which Jamaica is a part. Although Jamaica has signed a number of FTAs, performance in international trade has historically been feeble, since the country has not been able to transform its productive system in order to take advantage of potential market access opportunities through trade agreements (ECLAC, 2014).

Table 3 - Jamaica: Trade Agreements Signed by Jamaica (including signed FTAs and ongoing negotiations)

International trade institutions / FTA partners	Main features related to institutions or FTA
World Trade Organization (WTO)	Founding member. Jamaica is currently engaged in the Doha Round negotiations, and is recognized as a small and vulnerable economy (SVE).
Generalized System of Preferences (GSP)	Grants zero or reduced tariff rates to beneficiary countries. Jamaica benefits from these schemes in Belarus, Canada, Japan, New Zealand, Norway, Russia, Switzerland, Turkey, and the U.S.
Caribbean Basin Initiative (United States of America)	Launched in 1983 through the Caribbean Basin Economic Recovery Act, the CBI provides beneficiary countries, including Jamaica, with duty-free access to the U.S. market for most goods.
Caribbean Community (CARICOM)	Founding member together with Barbados, Guyana and Trinidad and Tobago (July 1973). Trade policies defined in the context of CARICOM provide guidance to economic integration, cooperation and coordination of positions on trade negotiations.
CARICOM – Colombia	Signed in July 1994 and in force since January 1995. Only a partial preferential agreement. Around ninety products from CARICOM (including Jamaica) immediately received zero tariffs. And

International trade institutions / FTA partners	Main features related to institutions or FTA
	CARICOM countries gave Colombia zero tariffs on 180 products. The agreement also provides a framework for future collaboration among contracting parties in the areas of services and investment
CARICOM – Dominican Republic	Signed in August 1998 and in force since December 2001. While the Agreement is focused on trade in goods, it also provides a timetable for the negotiation of a trade in services regime and for government procurement.
CARICOM Bolivarian Republic of Venezuela (AAP.A25TM No. 24)	Signed in October 1992 and in force since January 2000. It is a Partial Scope Agreement. It currently offers one way duty-free access for products from CARICOM entering the Venezuelan market. It is primarily focused on trade in goods but provides for future collaboration in the promotion of services and investment.
CARICOM – Costa Rica FTA	Signed in March 2004 and applied provisionally until it was put in force by Jamaica in June 2015. Other countries of CARICOM (Trinidad and Tobago, Guyana, Barbados and Belize) had ratified the FTA before that date. The Agreement is focused on trade in goods. In addition, it provides for further negotiations in Competition Policy, Government Procurement, Double Taxation and Services. The FTA is based on reciprocity with the five More Developed Countries of CARICOM and non-reciprocity for CARICOM Less Developed Countries (LDCs).
CARICOM – Cuba Trade and Cooperation Agreement	A Partial Scope Agreement, which was signed on July 5, 2000. The Agreement is focused on trade in goods but provides a timetable for negotiating a trade in services regime and commits the Parties to doing the same for reciprocal promotion and protection of investment and for government procurement. Jamaica is implementing the Agreement.
CARIFORUM – European Union Economic Partnership Agreement (EPA)	Signed in October 2008, the EPA came into effect, provisionally, on December 29, 2008 with the EU applying duty-free-quota-free market access to all products from CARIFORUM countries, except arms. Jamaica has been applying the Agreement provisionally ever since, pending ratification. Jamaica began implementing the phased reduction of duties on the importation of goods from the EU, as required by the Agreement, as of January 1, 2011.

ECLAC, based on Ministry of Foreign Affairs and Foreign Trade of Jamaica webpage (http://mfaft.gov.jm/wp/caricom-bilateral-trade-agreements/), and the Organization of American States webpage (http://www.sice.oas.org/ctyindex/JAM/JAMagreements_e.asp).

Jamaica is characterized as an economy with a relatively small domestic market, a disproportionate dependence on external markets, and a concentration of its exports in few markets and products. This leaves the economy exposed to negative external shocks, particularly due to fluctuations in the prices of commodities. For this reason, diversifying its productive structure is important in a context described by a highly specialized production and exports of goods.

3.1. Trade with the World

Jamaica's participation in the international context is dominated by extraregional markets, mainly the United States, European Union and Canada (70% total exports and 50% of total imports). The Latin American market represents less than 10% of Jamaican exports and 27% in the case of imports, with the selected countries and CARICOM partners both accounting for 10% of imports to Jamaica, respectively (see Figure 2).

Since the 1980s, Jamaica's relation with international markets has been marked by a structural trade deficit. In the long term, this deficit is explained by three main factors: a) the gradual increase in imports of goods, b) the stagnation of exports of goods, and c) the deterioration of the terms of trade, which has been attenuated by the fall in oil prices in recent years.

Figure 2 - Jamaica: Trade by main partners, 2016
(Share in total)
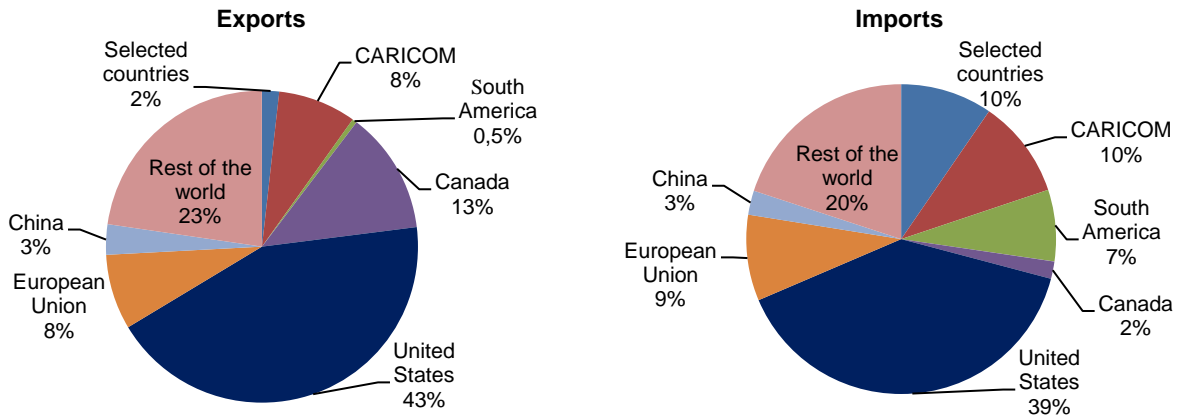
Source: ECLAC, based on data from UN Comtrade.
Note: Selected countries group include: Bahamas, Costa Rica, Cuba, Dominican Republic, Guatemala, Haiti, Honduras, The Salvador, Mexico, Nicaragua, and Panama.

The sustained increase in the trade deficit of goods contrasts with the historical surplus in the services balance, where tourism has historically played a predominant role (see Figure 3). This surplus was able to counterbalance the deficit in the goods balance for some years up to the mid-1990s (see Figure 4). After 1995, services exports could not offset the growing increase in goods imports, mainly from the United States and the European Union. In addition, up to the year of 2008, the deterioration of the terms of trade also played a major role, with export prices increasing more slowly than import prices of products such as oil (UNCTAD, 2015).

Figure 3 - Jamaica: Trade evolution, 1980-2016
(Millions of US dollars)
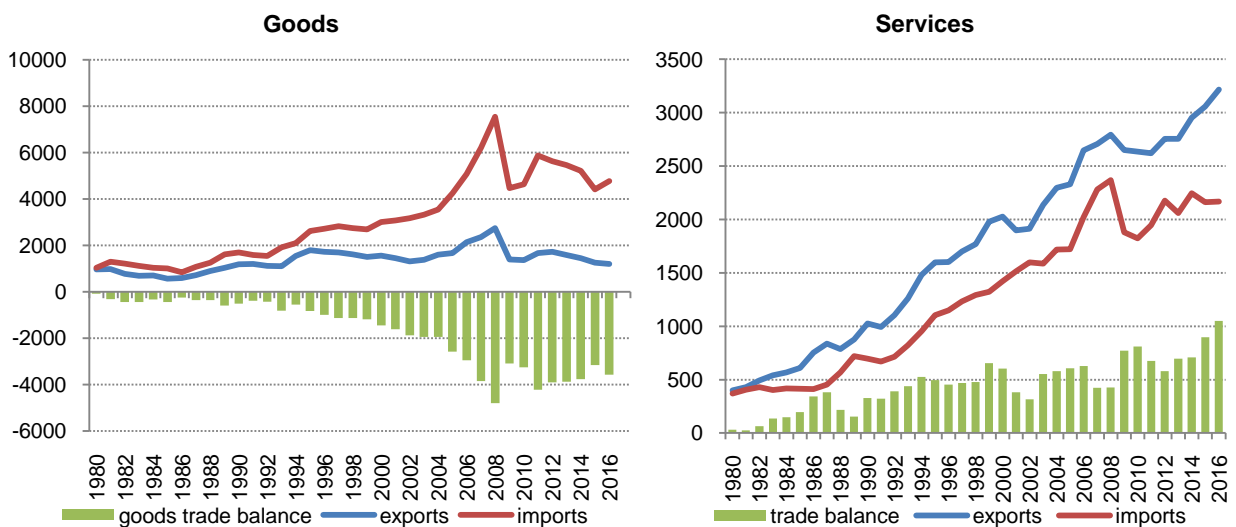
Source: ECLAC, based on data from UN Comtrade.

Figure 4 - Jamaica: Development of trade in goods and services
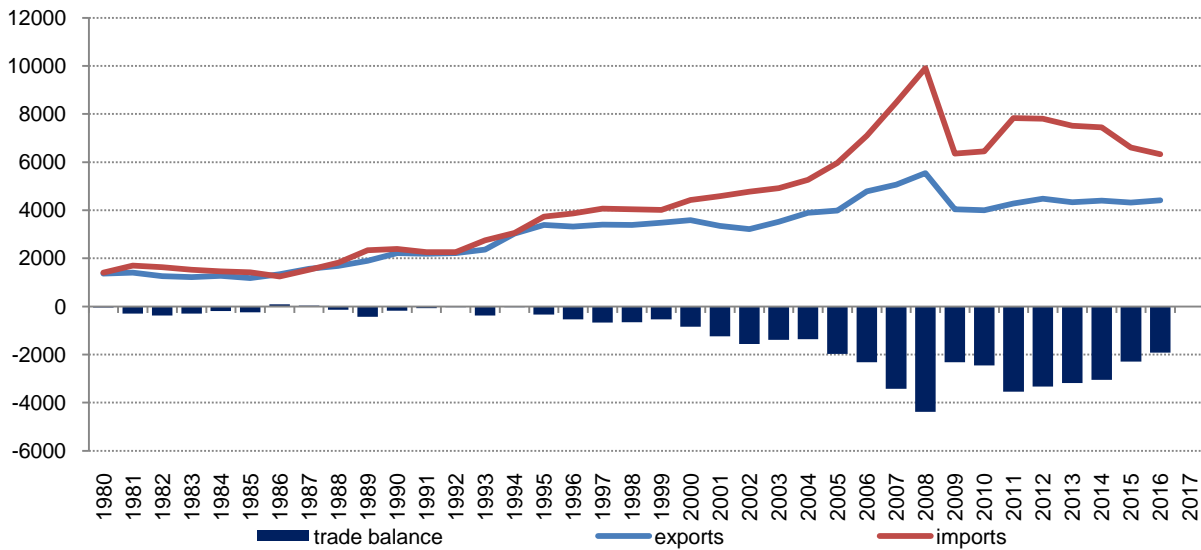
In recent years, the trade deficit has been reduced, mainly driven by the reduction of the value of imports in fossil fuels and chemicals, since exports have not increased. Weak external demand in recent years has led to a decline in exports of goods in sectors such as chemicals, crude oil, limestone, mineral fuels, food (vegetables, yams, ackee, animal feed) and beverages (Planning Institute of Jamaica, 2015). With respect to traditional domestic exports, 2016 saw an increase in the income from agricultural exports from coffee, bananas, pimento, citrus and cocoa. After being affected by droughts in 2015, which reduced profits of the exports of products like cacao, citrus and red pepper, the sector recovered in 2016. However, exports of manufactures dropped by 40% in 2016 due to a 73% decline in sugar exports. With regard to aluminum and bauxite, the two historically most exported products, exports contracted due to a reduction in external demand from the United States (Planning Institute of Jamaica, 2016).

With regard to Jamaican imports of goods, there is a dependence on the chemical and petrochemical industry (fuels and lubricants, rubber and plastic products), followed by other intermediate goods related to industrial supplies (Planning Institute of Jamaica, 2015). Agroindustry, related to final consumer goods (the manufacture of prepared animal feeds), is the next largest import sector, followed by wood and paper (mainly furniture, wood and products of wood and straw materials) and manufactures of paper and paper products, and other manufactures (manufactures of basic metals and fabricated metal products, printing and publishing) (see Table 4).

Table 4 - Jamaica: Trade pattern, biennium 2015-2016
(Millions of US dollars)

Main sectors	Total value			Share in total	
	Exports	Imports	Trade balance	Exports	Imports
Agricultural and livestock	59	234	-174	1.4	3.3
Mining	111	0	111	2.6	0.0
Agroindustry	216	669	-452	5.0	9.5
Textiles, clothing and footwear	2	134	-132	0.1	1.9
Wood and paper	6	231	-225	0.1	3.3
Chemical and petrochemical	202	1438	-1 235	4.7	20.5
Non-metallic mineral products	21	119	-98	0.5	1.7
Machinery and equipment	22	720	-699	0.5	10.3

	Exports	Imports	Trade balance	Exports	Imports
Other manufactures	592	1335	-743	13.7	19.0
Transport	180	744	-565	4.2	10.6
Travels	2459	245	2214	57.0	3.5
Other services	442	1157	-715	10.2	16.5
Total good and services	**4313**	**7027**	**-2714**	**100.0**	**100.0**

Source: ECLAC, based on data from UN Comtrade and Bank of Jamaica

Trade in services deserves special mention since from 2009 the bulk of Jamaican exports have not come from the goods account but from the services account. In services, the main export sector is Travels, which encompasses all tourism-related activities (hotels and restaurants). This is an important sector in Jamaican commerce which has shown great resilience even after the global financial crisis. In 2016, the number of passengers grew by 4.1% compared to the previous year, raising up visitor spending. This boost flowed through to the construction and entertainment and sports services sectors, mainly in activities such as betting and gaming activities as well as radio and television broadcasting (Planning Institute of Jamaica, 2016). Since transport is determined by the trade balance of goods, it shows a negative balance. Jamaica has also not been able to establish a base in the export of other services (UNCTAD, 2015), generating a deficient balance due to imports of business, insurance and construction services. Only the sectors of communication and personal, cultural and recreational services presented a surplus.

Table 5 - Jamaica: Trade in services, 2016
(Millions of US dollars)

Main sectors	Total value			Share in total	
	Exports	Imports	Trade balance	Exports	Imports
Transport	175	733	-558	5.4	34.0
Travels	2539	256	2283	78.9	11.9
Other services	504	1167	-663	15.7	54.1
Communications, information and information services	128	81	47	4.0	3.7
Construction services	0	95	-95	0.0	4.4
Insurance services	2	120	-117	0.1	5.5
Financial services	9	40	-30	0.3	1.8
Royalties and license fees	5	51	-45	0.2	2.4
Other Business Services	223	678	-455	6.9	31.4
Personal, cultural and recreational services	105	42	63	3.3	2.0
Government Services	31	62	-30	1.0	2.9
Total trade	3218	2156	1062	100.0	100.0

Source: ECLAC, based on data from Balance of Payments of Jamaica, provided for the Bank of Jamaica

Not only in trade, but also in its contribution to GDP, the service industry is of paramount importance in Jamaica. Thanks to the fall in oil prices in recent years, there was a reduction in electricity consumption costs, which in turn increased the value added of the energy sector. The increased passenger movement and number of mobile phone users has boosted the Transport, Storage and Communication sector, demonstrating the robust nature of the latter sub-industry in Jamaica. Financial and insurance services have increased in 2016 for the fourth consecutive year. Finally, the wholesale and retail trade sector, repair and installation of machinery is the largest contributor to GDP (17.4%) mainly due to the demand for motor vehicles, auto repair, pharmaceuticals and textiles.

While the reduction in international oil prices has contributed to more cost-efficient electricity generation in recent years, Jamaica's energy and manufacturing oil dependency has also determined the trade deficit. The productive structure of Jamaica is dependent on oil, both as a means of generating electricity and for manufacturing uses. In 2007, for each domestic intermediate input unit required to meet final demand, sectors such as the manufacture of chemical and chemical products including petroleum imported 8.4 units. Other manufacturing sectors like manufacture of grain mill products imported 2.7 units for each unit of domestic intermediate input (see Table 6).

Table 6 - Ratio of imported inputs over domestic intermediate inputs, 2007

Sectors	Import inputs/Domestic intermediate inputs
Manufacture of chemical & chemical products incl. petroleum	8.4
Manufacture of grain mill products	2.7
Manufacture of furniture, wood and products of wood and straw materials	2.2
Bauxite mining and alumina processing	1.9
Manufacture of textiles and wearing apparel	1.9
Manufacture of rubber and plastic products	1.9
Manufacture of paper and paper products	1.7
Manufacture of basic metals & fabricated metal products	1.5
Electricity & water supply	1.4
Printing and publishing	1.2
Fishing and aquaculture	1.1
Manufacture of prepared animal feeds	1.1

Source: Input-Output table of Jamaica 2007 (Planning Institute of Jamaica).

The concentration of exports in a few products coupled with dependence on oil generates a situation that harms Jamaica. Jamaica faces a number of challenges that it will need to overcome so as to boost its exports and seek trade complementarity and remove structural gaps that make it difficult to improve competitiveness. These include high costs of transport (mainly maritime) and logistics, unsustainable dependence on imported fossil fuels, the need to diversify production and exports, and to create complementarities between goods and services (clusters) as in the case of the food, hotel and tourism sectors (ECLAC, 2014).

3.2. Trade with Selected Partners

Historically, the share of trade between Jamaica and the partner countries of interest has been very low. In 2016, the Bahamas, Costa Rica, Cuba, the Dominican Republic, Guatemala, Haiti, Honduras, Mexico, Nicaragua, and Panama accounted for a mere 2.1% of Jamaica's total exports and 9.8% of its imports. From 2000 onwards, these countries' weight in Jamaica's total exports has remained relatively constant, oscillating between 1.0% and 2.2%. As a share of Jamaica's imports, they accounted for 7.4% in 2000 and decreased to a minimum of 4.5% in 2008 before increasing since.

Among these partners, it is important to highlight that Jamaica mainly exports to the Bahamas, Cuba, Mexico, the Dominican Republic, Panama and Haiti. However, with the exception of Haiti, with whom it has a historically run a trade surplus, as well as Nicaragua, with whom it has practically no commercial relations, Jamaica has a trade deficit with the rest of the countries of study. This deficit is highly dependent on the fluctuation of value of imports from these partners, which has averaged approximately four times the value of exports in the last five years. Imports from Mexico, 47% of which are petroleum and mineral products, contributed most to Jamaica's trade deficit with countries in the study, accounting for 40% of total imports.

Exports such as agroindustrial products, other manufactures, non-metallic mineral products, and machinery and equipment are foremost in Jamaica's trade in goods. The difference between the export patterns to the selected economies in this study with respect to the world is that exports to these partners are more focused on other manufactures, chemical and petrochemicals, and mining, although the number of exported products remains extremely low. Jamaica's exports to these partners are not led by bauxite and aluminum, but by other types of products such as beverages, lime, cement, inorganic chemicals (oxides and salts), disinfectants, insecticides, etc. The export specialization with Central American countries is focused on primary and agroindustrial products, which are mostly different from those exported to the United States and the European Union (see Table 7). Promoting this productive diversification can be of interest. In addition, the Central American Integration System (SICA) has proven to be a natural trading partner of Jamaica by virtue of their relative import and export structures (ECLAC, 2014). Talks between CARICOM and SICA were held in 2007 with a view to deepening trade relations between the blocs, but no agreement was reached. Among Central

American countries, Jamaica has a FTA with Costa Rica, one of its most important trade partners among SICA countries. Costa Rica is an important importer of synthetic fiber, glass waste, bottles and containers, plastic caps and devices, and alcoholic beverages (rum and other spirits).

With regard to imports from these selected partners, in 2016 four broad sectors represented more than 75% of Jamaica's imports: the chemical and petrochemical sector (33%), agroindustry (18%), other manufactures (14%) and machinery and equipment (10%).

Table 7 - Jamaica: Trade with partners of interest, biennium 2015-2016

Main sectors	Total value			Share in total	
	Exports	**Imports**	**Trade balance**	**Exports**	**Imports**
Agricultural and livestock	0.1	1.2	-1.1	0.5	0.3
Mining	0.0	0.0	0.0	0.0	0.0
Agroindustry	5.1	80.5	-75.4	33.6	18.7
Textiles, clothing and footwear	0.1	12.8	-12.7	0.8	3.0
Wood and paper	0.4	26.9	-26.5	2.8	6.2
Chemical and petrochemical	1.3	161.7	-160.4	8.4	37.5
Non-metallic mineral products	2.3	35.1	-32.8	15.0	8.1
Machinery and equipment	1.6	48.6	-47.0	10.5	11.3
Other manufactures	4.3	64.6	-60.2	28.4	15.0
Total	15.3	431.4	-416.1	100.0	100.0

Source: ECLAC, based on data from UN Comtrade.

Jamaica has been one of the most active countries in the Caribbean in regard to implementing major changes in its trade policy. During the 1950s and 1960s, Jamaica deliberately applied high tariffs and import quotas to protect its local industry, including its fledgling footwear industry. The industries of processed foods, textiles, chemicals, and metals accounted for 60 per cent of establishments in 1978 and 50 per cent of the gross value of the country's production (Ayub, 1981). In the 1970s, the country faced a balance of payments crisis that forced it to maintain quantitative restrictions to its imports. Subsequently, after entering into a World Bank Structural Adjustment loan agreement in 1983, the country began to remove its quantitative restrictions and to reduce its MFN tariff, with the aim of simplifying the tariff system and allowing exporters to obtain inputs at more competitive world prices (Planning Institute of Jamaica, 1988). Likewise, it sought to solve the discrepancy in the application of special arrangements to importers, which made de jure tariffs not coincide with de facto tariffs. For example, although tariffs in 1982 and 1986 were high, in practice the values actually applied were low and well below official values. Weiss (1985) found that in the footwear sector, the average of the effectively applied tariff was 12%, well below the official tariff rate ranging from 20% to 45%, with most items showing tariffs of 45%. In this way, Weiss estimated that for the entire tariff regime there were 78% of concessions to importers.

In the most recent period, tariff reform has been deepened as a result of the various trade negotiations undertaken in the last fifteen years. Consequently, Jamaica's applied tariff in 2016 is estimated to be of 4.4 per cent (see Figure 5).

Despite the many changes in Jamaica's trade policy during its economic history, only a few studies have assessed the effects of such changes. In the rest of this section, some relevant studies that carry out quantitative assessments are reviewed. Some follow methodologies similar to those applied in the present study. For this reason, the main conclusions of the most significant works are summarized.

Figure 5- Jamaica: MFN reported tariff and applied tariff estimates

(Simple average and weighted by PTAs)
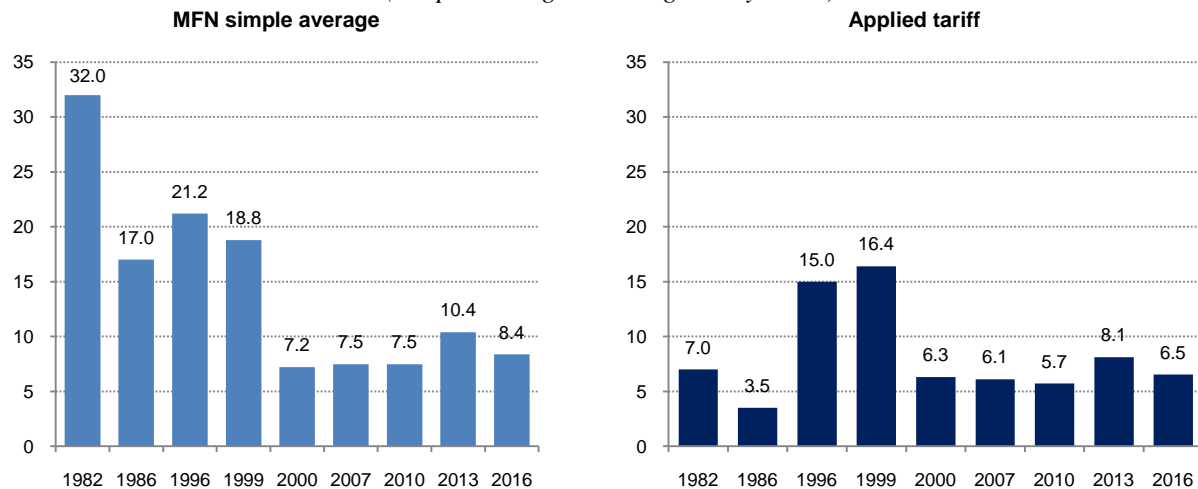
Source: ECLAC, basis on World Bank and WTO tariff statistics. Years of 1982 and 1986 are estimates based on Weiss (1985) and Gallimore (1994). The tariff estimates applied for the period 1996-1999 were obtained from Hudson (2003). From 2010 onwards were estimated considering the share of imports of members subject to tariff preferences: CARICOM countries, Costa Rica, Republic Dominican Republic, Colombia, Cuba, and the countries of the European Union. For the case of Bahamas it was considered the application of MFN tariffs.

Gallimore (1994) analyzes, from a historical perspective, Jamaica's commercial policy, placing special emphasis on the role of tariffs as a source of tax revenue. It uses the CGE methodology to determine an optimal tariff structure that guarantees tax neutrality and maximizes tax collection. The author compared the optimal structure generated by a CGE model with that of the structure implemented in the first phase of the tariff reform program during the period of 1987 to 1991. Gallimore's main conclusion is that Jamaica's tariffs in 1986, the year immediately prior to the tariff reform, exhibited substantial elements of an optimal tariff, maximizing welfare and avoiding high increases in the country's imports, but also did not support an increase in exports.

Hudson, (2003) reviews Jamaica's trade policy changes for a longer period than the one considered by Gallimore (1994), who only considered the first phase of the tariff reform program. Hudson considers the impact of changes in export and import tariffs on the trade balance and GDP for the period 1988-2002 using complementary econometric techniques: a vector error-correction model (VECM) to estimate the import demand, and a VAR model to evaluate the changes in the policy of tariff modification. One of the main findings of the paper is that tariff rates in Jamaica have a significant impact on the macro-economic environment, specifically through imports.

At this point, the author argues that there is a need for caution in the trade liberalization process, mainly because of its potential adverse impact on the external account and on the broader macro economy in the future. For Hudson, a reasonable adjustment period should be negotiated, in order to minimize the adverse macroeconomic effects.

In a World Bank study, Tsikata, Moreira and Hamilton (2009) assessed the potential effects of trade liberalization measures that would take place between the CARIFORUM countries and the European Union following the implementation of the EPA. Using a GLOBE model, they calibrated a CGE model and simulated the impacts of a tariff reduction on the bilateral trade of all countries that negotiated the agreement. In the case of Jamaica, the results obtained for the scenario assuming the enforcement of the agreed schedules, resulted in a slight fall of productivity and trade for Jamaica, concluding that a superficial integration would be formed with a larger burden for Jamaica than the one assumed by the EU. The result also pointed to a slight

12

deterioration of Jamaica's terms of trade. The work of Tsikata et al. (2009) also assessed alternative scenarios, such as a scenario for which productivity increases are assumed in the services sector, another one assuming full opening of the sugar sector and one with a positive shift in foreign direct investment, assuming deep integration. In these scenarios the results of the model were of greater benefit to Jamaica. The conclusions of the analysis are clear in the sense that for Jamaica to benefit from liberalization following an agreement such as that signed with the European Union, it will have to achieve liberalization beyond merely opening up the exchange of goods. It needs to promote policies to increase the productivity of services and to attract FDI.

So far no studies are known to have evaluated the effects of trade liberalization between Jamaica and the group of countries of interest. However, it is recognized that the work developed by Tsikata, Moreira and Hamilton (2009) applies a similar methodology to the one deployed here. The only difference is that in our case a country model was calibrated with Jamaica SAM data for 2007.

3.3. Non-tariff measures in Jamaica

Non-tariff measures (NTMs) are generally defined as policy measures other than ordinary customs tariffs that can potentially have an economic effect on international trade in goods, changing quantities traded, or prices or both (UNCTAD, 2015). These measures might have a positive or negative impact on trade of goods and services. According to Grubler et al. (2016) if NTMs increase fixed or variable costs along the production and supply chain, everything else equal they result in higher prices and potentially in a fall in import demand. For some NTM types, such as quotas and prohibitions, the effect on trade is negative by design[3]. However, for other NTM types, such as sanitary and phytosanitary (SPS) measures and technical barriers to trade (TBTs), also a trade-promoting effect can be expected. In particular, it is widely agreed that in the presence of information asymmetries, the imposition of NTMs (e.g. labeling) can increase consumer trust, decrease transaction costs and promote trade. Furthermore, some NTM types bear the potential of increasing product quality, e.g. through a minimum quality standard, thereby positively affecting trade.

The Trade Intelligence Portal (I-TIP) of the World Trade Organization (WTO) contains information on NTMs as reported by countries. From 1995 up to the date of this study, Jamaica reported 105 NTMs, most of them being TBTs. Figure 6 show the incidence over the last years.

Figure 6 - Jamaica: Number of new NTMs per year
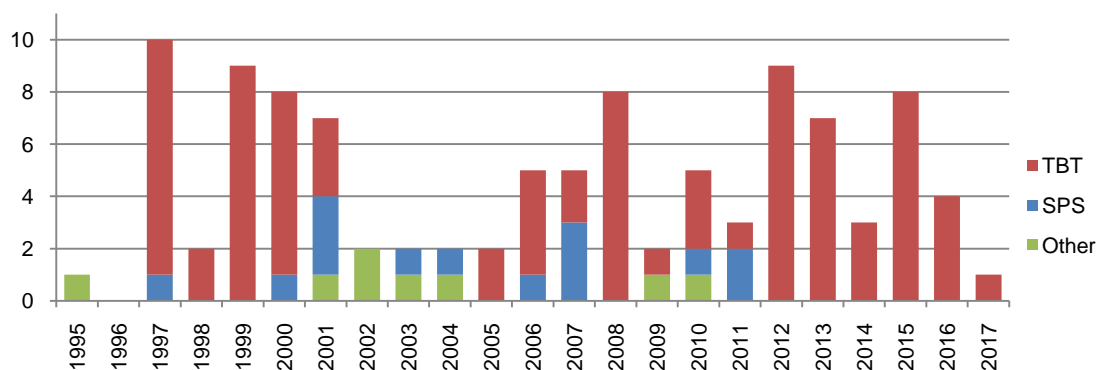
Source: ECLAC, based on data from Integrated Trade Intelligence Portal (I-TIP) from the WTO.
Notes: 1) The "Other" category includes one measure deactivating temporarily state trading enterprise (STE), a safeguard measure (SG) on cement imports and anti-dumping measures (ADP) also on cement imports from specific partners. 2) The value of 2017 correspond data up to 10-10-2017. 3) The graph displays number of new NTMs yearly according to their entry into force date, which when missing were replaced by dates as recommended by the methodology session of I-TIP/WTO.

---

[3] For a detailed definition of NTMs see UNCTAD (2015).

Only six of these NTM were established on a bilateral basis, with the rest affecting all countries. Only two of these notifications were a bilateral notification with respect to one of the studied countries. The last one happened in April 30, 2010 when the government of Jamaica initiated an anti-dumping investigation on imports of Portland cement originating from the Dominican Republic. On 9 December 2010, the Jamaican authorities terminated the investigation without the imposition of duties. Along the decade, similar measures were imposed on the same product in respect to different partners. The following figure 7 shows the evolution of imports of Portland cement (HS 252329) from some countries for which an anti-dumping measure was applied or an antidumping investigation was carried[4].

Figure 7 – Jamaica: Portland cement trade (HS 252329) and anti dumping measures

(Green line, date of initiation; Blue line, date in force; Red line, date withdrawal; Value in millions of US dollars)

Imports from China

Imports from Dominican Republic

Imports from Indonesia

Imports from Thailand

---
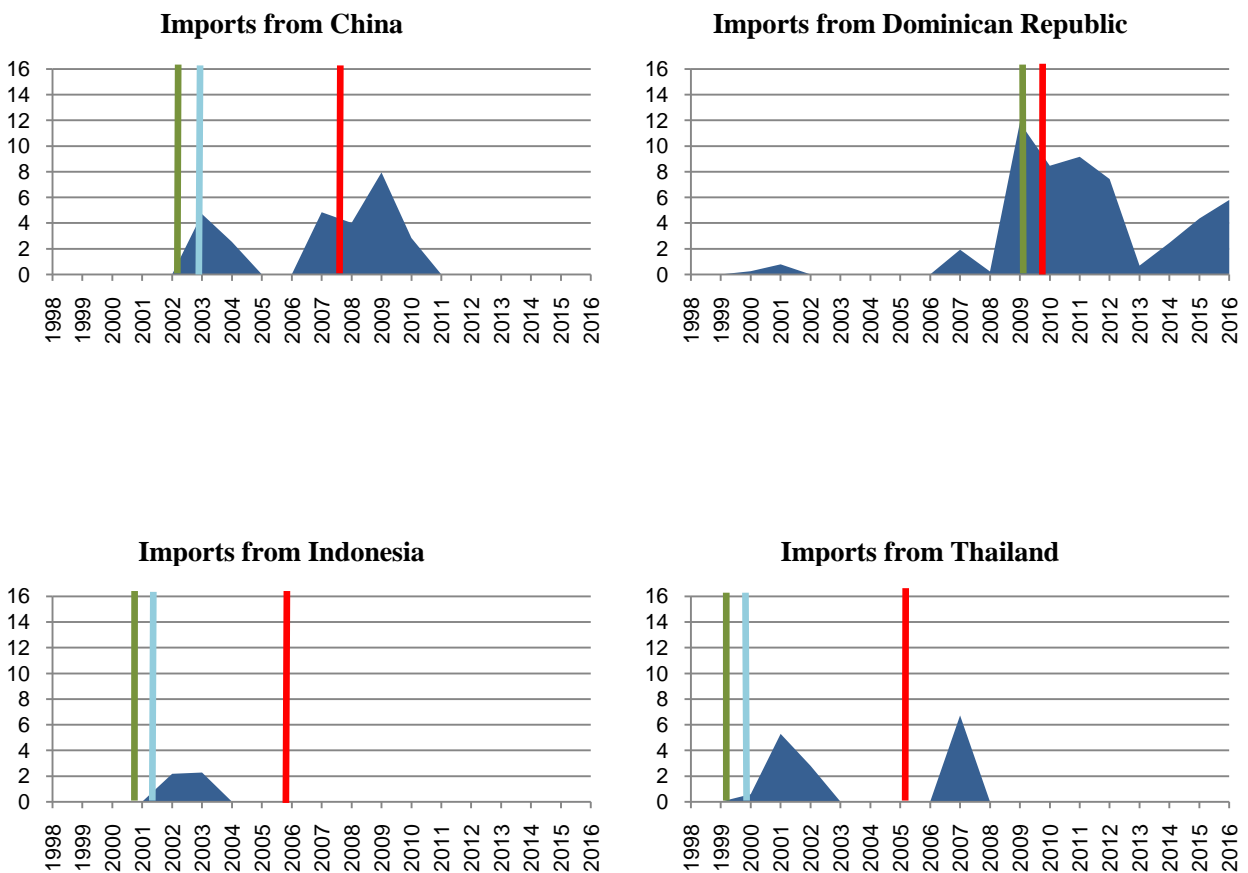
[4] Although the measure might have covered other products, the figure only display imports from Portland Cement, believed to be at the centre of all notifications.

Imports from the USA

Import and Export in Million of USD
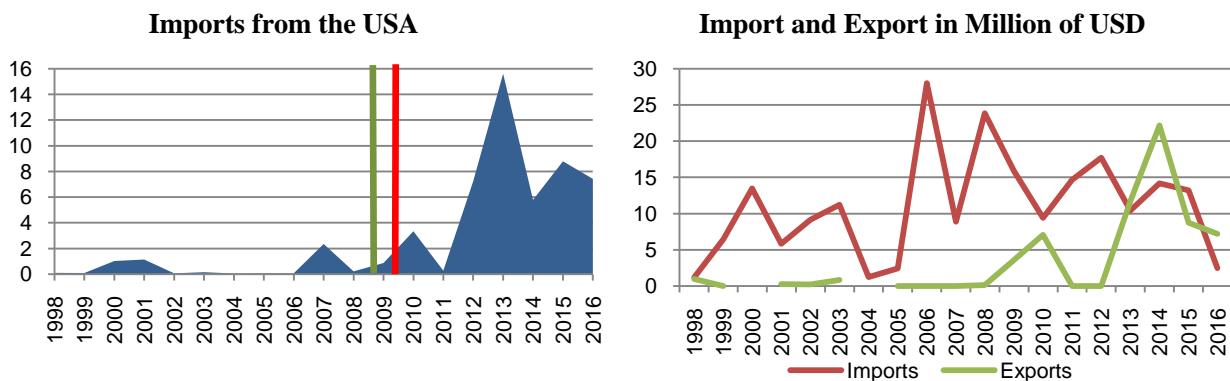
Source: ECLAC, based on data from Integrated Trade Intelligence Portal (I-TIP) from the WTO and UN COMTRADE.
Notes: 1) The values of exports for 2006 and 2013 are reverse trade flows. 2) Graphs without a date in force means that there was only an investigation and that no anti-dumping measure was applied.

The figure shows that in most cases imports of this particular product did not continue to increase after the anti-dumping measure entered in force. Despite this fact, there is not enough evidence to indicate that these measures have a negative impact on trade since no time effects and/or further control variables were taken into account.

When the NTMs imposed on all partners by Jamaica and the selected countries are analyzed it becomes clear that the country has issued fewer notifications to the WTO when compared to the selected partners. Figure 8 shows the number and type of reported NTM notifications by each selected country and the cumulative number of products affected by all notifications.

Among the selected economies, Mexico had the most number of NTMs in force by the end of 2015 with these NTMs covering more than 42,000 products[5]. The Dominican Republic filed fewer NTM notifications than Costa Rica but these notifications covered more HS 6-digit products than Costa Rica's notifications. Jamaica only issued more notifications than Cuba and Haiti.

Regarding non-tariff measures applied to Jamaican exports, in a 2013 study by the International Trade Centre it is shown that at the level of exporting companies, the businesses most affected by NTMs are concentrated in fresh and processed foods, all agro-industrial products, accounting for 49% of the total companies surveyed. The main complaints were due to delays in customs clearance, as well as high costs for certifications and compliance with technical requirements. In terms of countries, the largest obstacles Jamaican producers face are from the United States and the countries of CARIFORUM, which include Cuba, Haiti, the Bahamas, and the Dominican Republic (ITC, 2013).

---

[5] Measured at a six digit level of the 1996 Harmonized System.

Figure 8 – NTMs imposed by Jamaica and selected partners on all members

NTM in force in 2015	**Number of products affected by NTM in 2015**
(Number of NTM notifications)	*(Count of HS 6 digit codes in each NTM notification)*
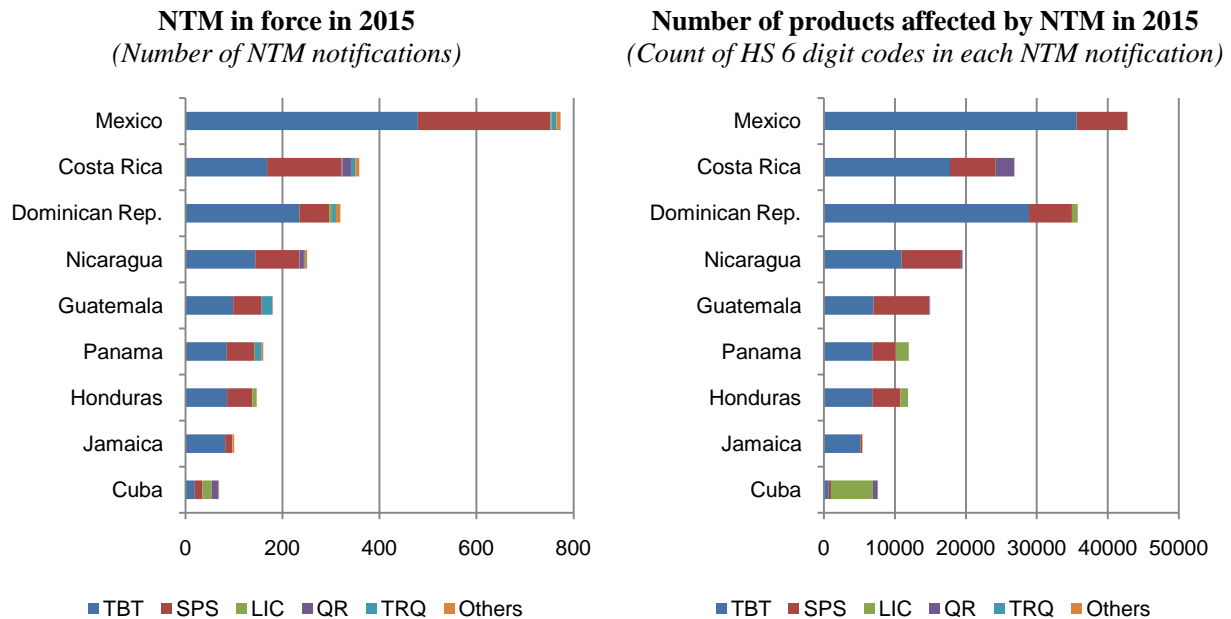
Source: ECLAC, based on data from Ghodsi et al. (2017) and the Integrated Trade Intelligence Portal (I-TIP) from the WTO.
Notes: 1) No data was available for Bahamas since the country is not a WTO member. Haiti had 3 notifications with no product description and was therefore left outside of the graph. 2) The NTM abbreviations stand for Import Licensing (LIC), Quantitative Restrictions (QR), Tariff-rate quotas (TRQ) while the "Other" category include Export Subsidies (XS), Pre-Shipment Inspection (PSI), State Trading Enterprises (STE), Safeguards (SG) and Special Safeguards (SSG). 3) Since a country rarely enters a withdrawal notification for a STS or TBT notification, if the notification was initiated it is assumed it is currently in force. 4) Notifications withdrawal before the end of 2015 were not taken into account. 5) The right graph was calculated with HS codes from the 77.7% of all notification that were identified by Ghodsi et al. (2017).

In general, two reasons might explain these differences. One is that indeed Mexico, Costa Rica and the Dominican Republic impose higher standards for the products entering their markets. The second might be related to reporting differences. According to Ghodsi et al. (2017) some countries report every NTM applicable, whereas others report only NTMs which depart from international standards.

Another NTM measure that might have affected outward trade flows was announced on 19 December 2012 by the Jamaican Minister of Industry, Investment and Commerce. Changes to the regulations surrounding industrial scrap metal trade consisted in the introduction of special licenses, mandatory custom inspections, a mandatory bond to be posted per entity to the government and introduction of new regulatory fee. New conditions to non-industrial scrap metal trade included more stringent eligibility criteria for exports, introduction of licenses application requirements and various permits specified by a number of government agencies. The new regulatory regime came into force in January 2013 and according to the Global Trade Alert database (2017) might have affected the outward flows of Jamaica for "Ferrous waste and scrap; remelting scrap ingots of iron or steel" (7204) and "Aluminium waste and scrap" (7602).

4. Sources of Information Used in the Study

For the development of the work, official statistics from various national and international sources were used. At least four types of data were collected: *(i)* macroeconomic data; *(ii)* international trade data; *(iii)* tariff data; and *(iv)* household surveys. Table 8 summarizes the particular use of these data.

Table 8 - Detailed information on the data bases used in the study on the impact of possible new trade negotiations between Jamaica and Mexico, Central America, the Cuba, Haiti, Bahamas, and the Dominican Republic

Data bases used	Main purpose
Social Accounting Matrix of Jamaica (2007)	Calibration of a Computable General Equilibrium Model for Jamaica.
Foreign trade information	Analysis of Jamaica's international insertion pattern in bilateral trade with the principal countries identified in the study.
Tariff Data	Determination of bilateral tariffs to be used in policy simulations.
Employment surveys	Estimation of possible social effects of a trade policy that promotes new trade agreements with Mexico, Central America, Haiti, the Bahamas, Cuba, and the Dominican Republic.
Income and spending surveys	

Source: ECLAC, own elaboration.

In the following, specific features inherent to each data set will be briefly reviewed. Also their sources and update frequency are presented.

4.1. Social Accounting Matrix

The main information for the elaboration of the study presented here has as its central axis the Social Accounting Matrix (SAM) for Jamaica for the year 2007. This presents the baseline for the modeling of a CGE model.

The main source of information to render the CGE model operational (i.e. to calibrate it) is given by a SAM. In short, a SAM is a square matrix that shows all the transactions that were made in the economy during a given year. SAMs are combined with estimates of free parameters (that is, obtained from the literature or, better yet, econometrically estimated), such as supply and demand elasticities. In addition, the data that complement the SAM are used as estimates for the unemployment rates by the category of work. Overall, this includes the following data: (A) exports and imports to and from each of the countries identified in the model, (B) bilateral tariffs imposed by Jamaica, and (C) bilateral tariff rates faced by Jamaica.

In addition, for a dynamic model it is necessary to make a projection or a base scenario under the assumption of "business as usual" that serves as a reference for the comparison of the counterfactual scenarios that are simulated later, i.e. trade liberalization scenarios that are compared to the baseline scenario or "baseline".

The SAM of Jamaica from 2007 identifies 40 activities and 44 commodities (see Table 9), the seven primary production factors (salaried and unsalaried jobs, capital, land and natural resources used in forestry, fisheries and mineral extraction), two national actors (households and government), the rest of the world, five taxes, and finally public and private investment.

Table 8 above also details the trading partners that are considered to be open in the SAM. These are the countries analyzed in the study with whom it is assumed that free trade agreements are signed, namely Cuba, Haiti, the Bahamas, Central America, Mexico and the Dominican Republic.

The remainder of this section describes the data used to calibrate the model from the SAM. In particular, the productive structure and patterns of trade in Jamaica are described.

Table 9 presents the sectoral structure of the main variables of Jamaica's economy. This information is key to interpreting the results that the CGE simulations will yield. The fact is that the production and value-added

structure of Jamaica's economy is concentrated in services exports, with a share of 81% in value added, 75% in production, and 86% in employment. The production of manufactured goods accounts for 15% of GDP while primary products account for 11%.

However, among these, the sector with the greatest relative weight is that of agroindustry, which accounts for just over half of all manufacturing production. Among others, the sectors of greater prominence are the activities of beverages, confectionery (bakery), meat and its products. These sectors also account for a significant proportion of the sector's employment.

Also within the manufacturing sector is the petrochemical sector, which represents about 27% of all manufacturing production, the second largest sub-sector.

On the export side, after other services (including tourism), bauxite and alumina have by far the largest share and account for 26% of the total value of exports. This corresponds to 95.6% of this sector's exported production. It is by far the sector with the greatest propensity to export. The third most important sector in exports is the petrochemical one, which represents 12% of total exports. It is also the sector with the second highest propensity to export after bauxite and aluminia. One out of every two dollars produced in the sector is exported.

Table 9 - Accounts of the Social Accounting Matrix of Jamaica 2007

Sectors	Sectors and others accounts	Sectors and others accounts
Sectors (44)	Sectors (44) … cont.	
Primary products (15)	*Manufactures (21) cont…*	*Distribution margins (17)*
Sugarcane	Basic metals	domestic products
Banana	Machinery and equipment	imports (8)
Citrus	Other manufactures	exports (8)
Coffee and cocoa		
Other export crops	*Services (4)*	*Institutions (3)*
Root crops (excl. ginger)	Construction	Households
Vegetables, corn, pulses	Trade	government
Other crops	Government services	Rest of the world
Other animal products	Other services	
Poultry and eggs		
Agricultural services	*Other sectors (4)*	*Capital (3)*
Forestry and logging	industrial sup, unproc	Capital account, households
Fishing and aquaculture	industrial sup, proc	Capital account, government
Bauxite mining and alumina	machinery and equip	Capital account, rest of the world
Other mining	transport equipment	
Manufactures (21)	*Factors (7)*	*Investment (3)*
Meat and meat products	Salaried work	Private investment
Fruit and vegetable products	Unpaid work	Public investment
Dairy	Capital	Stock Variation
Grain mill products	Earth	
Animal feeds	Forest resource	
Bakery	Fishing resource	
Sugar	Mining resource	
Other food		
Beverages	*Taxes (12)*	*Trade partners (8)*
Tobacco products	Tax activities	Cuba
Textiles and wearing apparel	tariff (one for each 8 partner)	Haiti
Leather	Products Tax	Central America
Wood	Direct tax	Mexico
Paper	Bauxite tax	Dominican Republic
Printing and publishing		Rest of Central America
Petrochemical		Rest of CARICOM
Rubber and plastic		Rest of the world
Non-metallic mineral products		

Source: ECLAC based on the Social Accounting Matrix of Jamaica 2007.

Table 10 - Jamaica: Production, employment and trade pattern in the baseline, 2007
(in percentages)

Products/Groups of products	Participation in total (shares in percentages)					Coefficients (%)	
	Value added	Produc-tion	Employ-ment	Exports	Imports	Exports/ Production	Imports/ Consumption
Primary products	**9.7**	**10.6**	**7.3**	**27.2**	**1.5**	**53.7**	**3.7**
Agricultural and livestock	5.5	4.7	5.0	1.4	1.4	4.9	8.3
Bauxite and alumina	4.1	5.7	2.1	25.8	0.0	95.6	0.0
Other mining	0.2	0.2	0.2	0.0	0.0	2.0	3.2
Manufactures	**8.9**	**14.9**	**7.1**	**17.9**	**79.7**	**21.2**	**48.6**
Agroindustry	4.7	7.6	4.0	5.2	8.5	11.2	28.4
Textiles, clothing and footwear	0.1	0.1	0.1	0.1	2.6	7.6	88.6
Wood and paper	0.9	1.1	0.9	0.2	4.8	2.7	59.4
Petrochemical	1.8	4.1	0.9	11.9	28.1	53.2	83.2
Rubber and plastic	0.3	0.3	0.2	0.1	2.0	5.0	68.5
Non-metallic mineral products	0.6	0.8	0.5	0.0	1.8	0.3	45.3
Machinery and equipment	0.5	0.9	0.4	0.3	19.7	6.5	36.4
Other manufactures	0.0	0.0	0.0	0.1	12.2	19.6	90.6
Services	**81.4**	**74.5**	**85.6**	**54.9**	**18.8**	**15.7**	**9.5**
Construction	8.3	8.3	9.4	0.0	0.1	0.0	0.2
Trade	16.5	12.0	17.3	0.0	0.0	0.0	0.0
Government services	12.9	8.9	19.6	0.0	0.1	0.0	0.3
Other services	43.7	45.4	39.3	54.9	18.7	25.7	15.4
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**20.5**	**33.0**

Source: ECLAC, based on the Social Accounting Matrix of Jamaica 2007

The last column of Table 10 shows the coefficient of imports over consumption. Note that a third of all imports are directed at the total consumption of the economy, the import orientation of the manufacturing sectors being particularly high, as they import almost 50% of their total consumption. This coefficient shows that Jamaican manufacturing depends heavily on imports. Among the manufacturing subsectors, there are some that show a greater dependence on imports, namely other manufactures (90.6%), textiles, clothing and footwear (89%), petrochemical (83%), rubber and plastic (68.5%), and wood and paper (59.4%). Although the agroindustrial sector has a 28% import coefficient, there are some sub-sectors for which the propensity to import is high and above the average of all manufacturing (tobacco: 98%, sugar: 77%, others food: 50%).[6] Among agricultural products, the greatest propensity to import is found in the vegetable sector and other crops (see Table B.1 in the appendix).

Given that the calibrated model uses the information obtained from the 2007 Social Accounting Matrix as a baseline, and in order to verify the greater or lesser closeness of the model used with the current structure of Jamaica (in 2015), a comparative analysis was carried out with more information regarding production and trade. This comparison is presented in Table 11. Note that in general the structure of production and trade are still quite similar. An index of similarity was calculated for the two years considered and in all cases, the index was above 80%, being higher in production (95%) (see Figure 9). The most notable difference is a relative decline in the share of exports of bauxite and alumina. This is mainly due to the reduction in exports of aluminium oxide, the country's main export product, from 25% of total exports of goods and services in 2007 to 16% in 2015 and from 59% to 47% of total exports of goods over the same time period (see Figure 10).

Table 11 - Comparison of the structure of main macroeconomic variables of the model, 2007 vs. 2016
(in percentages)

	Production		Exports		Imports	
Products	2007	2016	2007	2016	2007	2016
Primary products	**9.7**	**8.8**	**27.2**	**13.7**	**1.5**	**1.8**
Agricultural and livestock	5.5	6.8	1.4	1.5	1.4	1.8

---

[6] Appendix 1 at the end of the document presents the structure and the coefficients for all the sectors that make up the Input-Output Table of Jamaica.

	Production		Exports		Imports	
Bauxite mining and alumina	4.1	2.0	25.8	12.2	0.0	0.0
Manufactures	**8.9**	**7.9**	**17.9**	**13.5**	**79.7**	**67.1**
Agroindustry	4.7	…	5.2	5.7	8.5	11.2
Textiles, clothing and footwear	0.1	…	0.1	0.1	2.6	1.9
Wood and paper	0.9	…	0.2	0.2	4.8	3.1
Petrochemical	1.8	…	11.9	4.2	28.1	19.0
Rubber and plastic	0.3	…	0.1	0.3	2.0	3.4
Non-metallic mineral products	0.6	…	0.0	0.4	1.8	1.6
Machinery and equipment	0.5	…	0.3	1.5	19.7	12.7
Other manufactures	0.0	…	0.1	1.2	12.2	14.2
Services	**81.4**	**83.3**	**54.9**	**72.8**	**18.8**	**31.1**
Construction	8.3	6.6	…	…	0.1	1.4
Trade	16.5	16.1	…	…	…	…
Government services	12.9	11.8	0.0	0.7	0.1	0.9
Other services	43.7	48.8	54.9	72.1	18.7	28.9
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: ECLAC, based on the Social Accounting Matrix of Jamaica 2007, information from UN Comtrade, and information obtained from the Statistical Institute of Jamaica for the year 2016 Note: In the case of production, the two bases used are in constant currency of 2007. In the case of exports and imports, the source used reported the information in current US dollars.

Figure 9 - Jamaica: Similarity index of macroeconomic variables, 2007 and 2016
(In percentages)
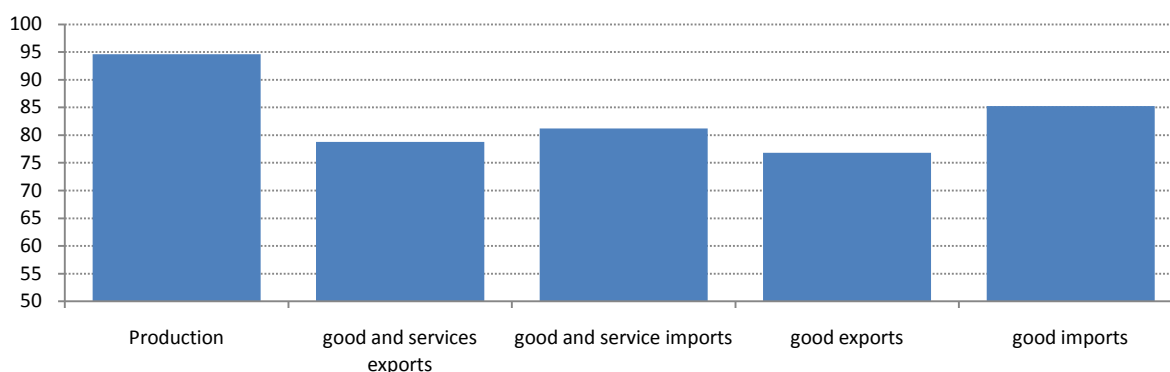
Source: ECLAC, based on Table 11

Figure 10- Jamaica: Development of total exports and exports of Bauxite mineral and alumina, 2000-2016
(*in millions of US dollars and percentages*)
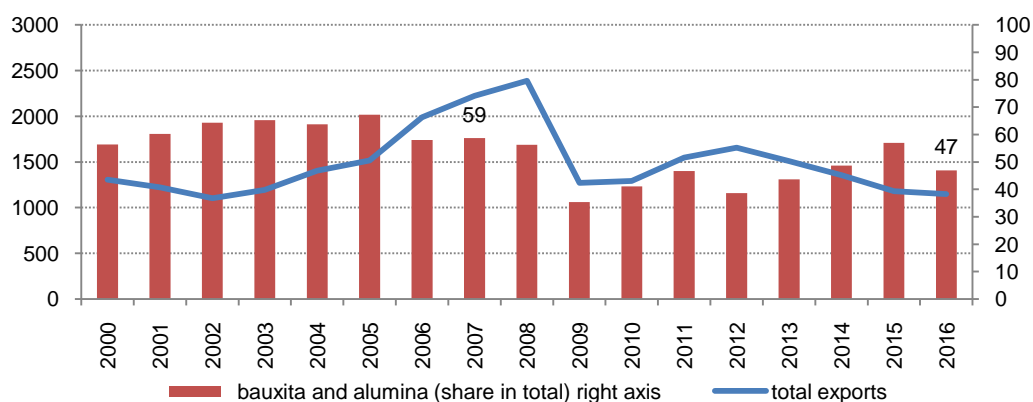
Source: ECLAC, based on data from UN Comtrade.

The factorial composition of value added is shown in Table 12. The columns show how the sectoral value added is distributed among the identified factors of production. As we see, services are the most intensive in the use of labor, both salaried and unsalaried labor, and manufactures are the most intensive in capital. Still, within the manufacturing sectors, there is a relevant use of labor throughout all sectors, especially in the case of the sugar and leather sectors, where the proportion of salaried labor is 89% and 80% respectively. The lowest proportion of employment is located in the petrochemical sector, which is offset by a large share of capital (67.9%). A prominent feature of manufacturing is that in all sectors, the factorial share of capital is high, and above 30% and 40%.

Although the highest intensity of the use of salaried and non-wage labor is concentrated in the services sector, it is important to highlight that among the primary sectors there is an important group of sectors for which the labor intensity is highly representative. These are the cases of agricultural, animal products, fishing and in the sectors using natural resources, mainly the land resource in the case of vegetable, other crops, root crops, coffee and cocoa, and banana sector (see Table B.2 in the Annex).

Table 12 - Jamaica: Composition of value added; intensity of factor use by broad sectors, 2007
(in percentages)

Sector	Salaried labor	Unsalaried labor	Capital	Natural resources	Total
Primary products	**32.5**	**15.8**	**26.5**	**25.1**	**100.0**
Agricultural and livestock	33.7	25.7	7.8	32.8	100.0
Bauxite mining and alumina	31.0	3.0	50.7	15.3	100.0
Manufactures	**42.5**	**9.9**	**47.7**	**0.0**	**100.0**
Agroindustry	46.9	9.1	44.0	0.0	100.0
Textiles, clothing and footwear	48.3	8.9	42.8	0.0	100.0
Wood and paper	57.7	7.3	35.1	0.0	100.0
Petrochemical	18.1	14.1	67.9	0.0	100.0
Rubber and plastic	53.9	7.9	38.2	0.0	100.0
Non-metallic mineral products	50.7	8.5	40.8	0.0	100.0
Machinery and equipment	41.4	10.1	48.6	0.0	100.0
Other manufactures	61.0	6.7	32.3	0.0	100.0
Services	**58.4**	**10.5**	**31.2**	**0.0**	**100.0**
Total	**54.4**	**10.9**	**32.2**	**2.4**	**100.0**

Source: ECLAC, based on the Social Accounting Matrix of Jamaica 2007.

4.2. Foreign Trade Data

Table 13 shows the trade structure of Jamaica with its main trading partners, highlighting the trade with the countries selected for the exercises presented in this study. Note that the major trading partners of Jamaica are the United States, as well as the other CARICOM countries, Canada and the European Union. Together they represent more than 70% of exports and 60% of imports, respectively. In terms of relevance then follow countries from the rest of the world, including China and the countries of Southeast Asia, which are important destinations for exports of aluminum oxide and bauxite. As a result, the countries analyzed in the study represent only 1.0% of exports and 4.5% of imports in the baseline of the model. This situation has not changed much between 2007 and 2016, since these countries still account for only slightly more than 2% of Jamaica's exports. Significant increases have been observed in these countries' share of Jamaica's imports, having increased by more than 5 percentage points between 2007 and 2016 largely due to increased imports of petroleum and mining and chemical and pharmaceutical products (see Table 13).

Table 13 - Jamaica: Pattern of goods trade with main trade partners, 2007, 2015 and 2016
(in percentages of total)

Countries	Exports (Share in total)			Imports (Share in total)		
	2007	2015	2016	2007	2015	2016
Selected countries	**1.0**	**1.1**	**2.0**	**4.6**	**7.5**	**10.2**
Bahamas	0.1	0.1	0.3	0.0	0.6	0.6
Haiti	0.0	0.1	0.4	0.0	0.0	0.0
Cuba	0.3	0.1	0.1	0.2	0.0	0.1

Dominican Republic	0.2	0.1	0.1	0.6	1.2	1.6
Central American	0.2	0.3	0.5	2.2	3.0	3.8
Mexico	0.2	0.4	0.6	1.5	2.6	4.1
Rest of CARICOM	2.6	4.9	8.1	17.7	24.0	10.3
South America	0.1	1.2	0.5	14.9	11.3	7.5
Canada	15.0	15.5	12.6	2.0	1.9	1.8
United States	37.2	39.6	43.4	40.4	37.5	39.5
European Union	26.2	8.8	7.8	6.0	7.8	9.0
Rest of the World	18.0	29.0	25.8	14.4	10.6	22.5
World	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: ECLAC, based on data from UN Comtrade.

In order to complete the SAM, information from the United Nations Commodity Trade Statistics database (UN Comtrade) was used to open the foreign trade vector and to model trade openness. For this purpose, information was obtained for all 36 sectors of goods identified in the SAM. This information was compared to the SAM structure, with a similarity index of 95% for exports and 87% for imports. In this way, the opening of trade for the different partners was determined from UN Comtrade.

Tables 14 and 15 show the destination and origin of Jamaica's sectoral exports and imports, respectively, for 2007, i.e. for the baseline of the model to be applied. In general terms, we see that among the intra-Latin American destinations only the "Rest of CARICOM" region is an important destination for Jamaican exports. Clearly, the main destinations of Jamaica's exports are mainly the rest of the world. Especially in the case of mining, as well as agriculture and livestock, almost all of the exports are destined for outside the region. The participation of CARICOM can be highlighted in textiles, clothing and footwear, wood and paper, as well as rubber and plastic. In other cases, it is only for some specific products that the model countries/regions have a significant share in Jamaican exports. For example, Cuba receives 3.2% of exports of non-metallic minerals, and other countries in the region 26%. Central America also accounts for 3.6% of rubber and plastic exports. Mexico receives 1.5% of the exports of the agroindustrial sector, and the rest of Latin America, 26.2% of exports of non-metallic minerals (see Table 14).

Table 14 - Jamaica: Destination of goods and services exports by broad sectors, 2007
(in percentages)

Sectors	Cuba	Haiti	Bahamas	Central America	Mexico	Dominican Republic	Other LAC	Rest of CARICOM	Rest of the World	World
Agricultural and livestock	0.0	0.0	0.1	0.0	0.0	0.2	0.0	2.6	97.0	100.0
Bauxite mining and alumina	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	99.9	100.0
Agroindustry	0.0	0.0	0.2	0.1	1.6	0.1	0.3	8.1	89.5	100.0
Textiles, clothing and footwear	0.4	0.0	3.9	1.8	0.0	0.0	0.3	56.0	37.6	100.0
Wood and paper	0.1	0.0	5.5	0.9	0.5	0.6	0.1	46.3	46.0	100.0
Petrochemical	0.7	0.0	0.2	0.1	0.0	0.8	0.0	3.3	94.9	100.0
Rubber and plastic	1.2	0.8	1.5	3.6	0.2	0.6	0.2	71.1	20.9	100.0
Non-metallic mineral products	3.2	0.6	3.9	0.0	0.0	0.0	26.2	21.9	44.2	100.0
Machinery and equipment	1.8	0.0	0.0	0.6	0.2	0.3	0.6	2.2	94.3	100.0
Other manufactures	2.7	0.1	0.4	5.1	0.3	1.2	0.5	13.0	76.8	100.0
Services	1.4	0.1	0.1	0.5	0.2	0.2	1.5	28.0	68.2	100.0
Total	0.9	0.0	0.1	0.3	0.2	0.2	0.9	16.7	80.7	100.0

Source: ECLAC, based on data from UN Comtrade.

In turn, Jamaican imports by country of origin are less concentrated than exports - compare the total rows in Tables 14 and 15. Thus, Table 15 shows that the countries of Central America are important suppliers of products such as textiles, leather and other manufactures.[7] In addition, the rest of Latin America and the Dominican Republic are important suppliers of some products such as fruits and vegetables, other animal products, as well as wood and paper, petrochemicals, and non-metallic minerals. Mexico appears as supplier of

---

[7] The Central American Common Market also represents more than 37% of the Jamaican sugar imports. However, in absolute terms, this value is extremely small compared to the total imports. Jamaica is a clear net exporter of sugar.

3% of all imports in the machinery and equipment sector. Despite the greater diversification of imports by origin, there is a high participation of other extra-regional partners in other manufactures, textiles and clothing, rubber and plastics, and machinery and equipment. Tables B.3 and B.4 in the appendix, show the structure of the destination and origin of exports and imports for each of the sectors of the model.

Table 15 - Jamaica: Origin of goods and services imports by broad sectors, 2007
(in percentages)

Sectors	Cuba	Haiti	Bahamas	Central America	Mexico	Dominican Republic	Other LAC	Rest of CARICOM	Rest of the World	World
Agricultural and livestock	0.2	0.0	0.0	1.3	1.1	0.0	1.5	22.7	73.2	100.0
Bauxite mining and alumina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0
Agroindustry	0.0	0.0	0.0	4.9	0.7	1.5	8.2	14.7	70.1	100.0
Textiles, clothing and footwear	0.1	0.0	0.1	13.0	0.1	0.3	0.9	0.6	84.9	100.0
Wood and paper	0.0	0.0	0.0	5.9	2.4	2.2	11.7	8.3	69.4	100.0
Petrochemical	0.0	0.0	0.0	0.5	1.2	0.1	27.0	34.7	36.5	100.0
Rubber and plastic	0.0	0.0	0.1	3.9	1.7	2.2	6.4	2.2	83.5	100.0
Non-metallic mineral products	2.5	0.0	0.6	20.7	2.1	4.9	17.5	1.5	50.3	100.0
Machinery and equipment	1.1	0.0	0.0	1.1	3.0	0.6	7.2	1.6	85.4	100.0
Other manufactures	0.1	0.0	0.0	0.7	1.1	0.1	1.8	1.3	94.9	100.0
Services	0.3	0.0	0.0	5.1	2.0	0.8	7.1	8.9	75.8	100.0
Total	**0.3**	**0.0**	**0.0**	**2.7**	**1.6**	**0.6**	**13.5**	**16.1**	**65.1**	**100.0**

Source: ECLAC, based on data from UN Comtrade.

Tables 16 and 17 show the product composition of bilateral Jamaican exports and imports, respectively. As we see, after the predominance of services in the composition, the petrochemicals sector is the main export to all trading partners considered except Mexico and the rest of the world. In the case of Mexico and the rest of the world, the main exports are beverages, among agroindustrial products, and bauxite / alumina, respectively.

Table 16 - Jamaica: Composition of sectoral exports by destination, 2007
(in percentages of country total)

Sectors	Cuba	Haiti	Bahamas	MCCA	Mexico	Dominican Republic	Other LAC	CARICOM	Rest of the World	World
Agricultural and livestock	0.0	0.0	0.9	0.0	0.0	1.4	0.0	0.2	1.3	1.0
Bauxite mining and alumina	0.3	19.7	0.0	0.0	0.0	0.0	1.5	0.0	32.3	26.1
Agroindustry	0.2	3.9	14.9	2.7	40.5	2.6	1.9	2.8	6.4	5.8
Textiles, clothing and footwear	0.0	0.0	2.8	0.4	0.0	0.0	0.0	0.2	0.0	0.1
Wood and paper	0.0	0.0	3.7	0.2	0.1	0.2	0.0	0.2	0.0	0.1
Petrochemical	6.4	4.5	13.7	1.4	0.0	37.1	0.2	1.6	9.7	8.2
Rubber and plastic	0.2	3.1	2.9	2.0	0.2	0.6	0.0	0.8	0.0	0.2
Non-metallic mineral products	0.2	0.8	2.4	0.0	0.0	0.0	1.7	0.1	0.0	0.1
Machinery and equipment	4.4	0.3	0.3	4.3	1.4	3.1	1.5	0.3	2.5	2.2
Other manufactures	2.2	0.9	2.8	11.3	0.9	4.6	0.4	0.6	0.7	0.7
Services	86.0	66.9	55.6	77.7	56.8	50.5	92.7	93.3	47.0	55.6
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: ECLAC, based on data from UN Comtrade.

On the import side, we see a concentration in manufactures of industrial origin, whatever the country of origin that we analyze. For example, imports of manufactures of industrial origin account for a little more than 91% of the total of goods imported from Mexico, with imports of petrochemicals being the most densely populated,

accounting for slightly more than a third of total imports in Jamaica's total import bill. Another product group Jamaica is dependent on is the agroindustry group. In this case, the great relative weight of some subgroups in the total imports from the Dominican Republic and Central America is highlighted, accounting for slightly more than 17% in each case. At the level of particular sectors in the model, the cases of the imports of fruits and vegetables from the Dominican Republic, and of sugar from Central America, as well as of beverages of Haitian origin are particularly notable.

Table 17 - Jamaica: Composition of sectoral imports by origin, 2007
(in percentages of country total)

Sectors	Cuba	Haiti	Bahamas	MCCA	Mexico	Dominican Republic	Other LAC	CARICOM	Rest of the World	World
Agricultural and livestock	1.5	0.0	0.0	0.8	1.1	0.0	0.2	2.3	1.8	1.6
Bauxite mining and alumina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agroindustry	0.3	22.3	0.0	15.9	3.7	20.2	5.4	7.6	9.6	8.8
Textiles, clothing and footwear	0.4	5.6	10.2	9.6	0.2	0.8	0.1	0.1	2.6	2.0
Wood and paper	0.0	4.8	0.0	8.1	5.7	13.1	3.3	1.9	4.0	3.8
Petrochemical	0.8	0.0	0.2	6.5	27.5	6.0	69.4	75.0	19.5	34.8
Rubber and plastic	0.0	0.0	14.2	4.2	3.1	9.9	1.4	0.4	3.7	2.9
Non-metallic mineral products	17.5	0.1	46.2	13.3	2.3	13.5	2.3	0.2	1.4	1.8
Machinery and equipment	56.8	30.1	1.6	5.0	23.9	11.6	6.7	1.3	16.4	12.5
Other manufactures	3.1	0.2	3.3	3.5	10.1	2.1	1.8	1.1	20.0	13.8
Services	19.5	36.9	24.4	33.1	22.4	22.8	9.5	10.0	20.9	18.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: ECLAC, based on data from UN Comtrade.

Among the countries with the lowest share of imports in the total, such as Cuba and Haiti, different structures are observed. Imports from Cuba have a large proportion of manufactures, mainly machinery and equipment and non-metallic mineral products. Imports from Haiti contain a greater proportion of services.

For a broader overview, see Tables B.5 and B.6 in the appendix, which include all sectors of the model.

4.3. Tariff Data

Figures 11 to 16 show the effective tariffs (i.e. computed as the ratio of revenue collection to the corresponding value of imports) applied by Jamaica (Panel A on the left-hand side) and faced by Jamaica (Panel B on the right-hand side). As we can see, there are not many cases in which a relatively high tariff coincides with a significant trade flow. Consequently, it is expected that the free trade agreements discussed in the next section will not show large aggregate effects (e.g., above one percent of GDP). In general, Jamaica applies higher tariffs than those it faces from its partners, and the highest protections are shown in the case of Central America. It is important to emphasize that Jamaica already has a free trade agreement with Costa Rica and the Dominican Republic, as well as a trade and cooperation agreement with Cuba, and trade preferences with Haiti as a fellow member of CARICOM.

Figure 11 - Reciprocal tariff protection between Jamaica and Cuba: Main sectors
(in percentages of ad valorem)

A. Applied by Jamaica

Sector	Value
Beverages	30
Non-metallic mineral..	27
Textiles and wearing..	20
Wood	20
Other food	20
Leather	20
Rubber and plastic	18
Paper	15
Machinery and equipment	5
Petrochemical	2
Other manufactures	1
Basic metals	0
Printing and publishing	0

B. Faced by Jamaica

Sector	Value
Beverages	0
Non-metallic mineral..	3
Textiles and wearing..	17
Wood	0
Other food	10
Leather	0
Rubber and plastic	12
Paper	0
Machinery and equipment	14
Petrochemical	6
Other manufactures	10
Basic metals	6
Printing and publishing	4

Source: ECLAC, based on data from TRAINS of the World Bank.

Figure 12 - Reciprocal tariff protection between Jamaica and Haiti: main sectors
(in percentages of ad valorem)

A. Applied by Jamaica

Sector	Value
Other manufactures	0
Basic metals	20
Non-metallic..	20
Rubber and plastic	15
Petrochemical	10
Wood	20
Beverages	0
Other food	0
Grain mill products	0
Fruit and vegetable..	0

B. Received by Jamaica

Sector	Value
Other manufactures	7
Basic metals	0
Non-metallic..	0
Rubber and plastic	4
Petrochemical	3
Wood	0
Beverages	5
Other food	6
Grain mill products	1
Fruit and vegetable..	8
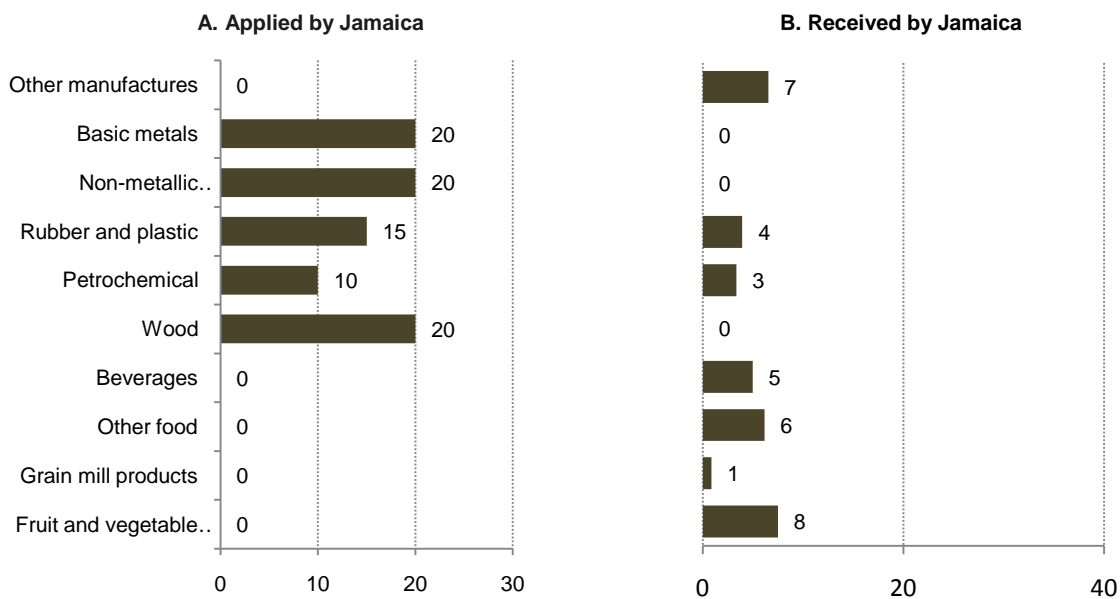
Source: ECLAC, based on data from TRAINS of the World Bank.

Figure 13 - Reciprocal tariff protection between Jamaica and Bahamas
(in percentages of ad valorem)

A. Applied by Jamaica

Category	Value
Other manufactures	6
Machinery and equipment	1
Basic metals	20
Non-metallic mineral products	6
Rubber and plastic	15
Petrochemical	11
Printing and publishing	0
Paper	0
Wood	0
Leather	0
Textiles and wearing apparel	0
Beverages	0
Other food	0
Grain mill products	0
Dairy	0
Fruit and vegetable products	0
Vegetables, corn, pulses	40
Root crops (excl. ginger)	0
Other export crops	0

B. Faced by Jamaica

Category	Value
Other manufactures	32
Machinery and equipment	19
Basic metals	35
Non-metallic mineral products	35
Rubber and plastic	26
Petrochemical	11
Printing and publishing	1
Paper	37
Wood	35
Leather	15
Textiles and wearing apparel	24
Beverages	26
Other food	18
Grain mill products	33
Dairy	10
Fruit and vegetable products	25
Vegetables, corn, pulses	30
Root crops (excl. ginger)	0
Other export crops	30

Source: ECLAC, based on data from TRAINS of the World Bank.

Figure 14 - Reciprocal tariff protection between Jamaica and Central America

(in percentages of ad valorem)

A. Applied by Jamaica

Category	Value
Other manufactures	12
Machinery and equipment	10
Basic metals	16
Non-metallic mineral..	10
Rubber and plastic	13
Petrochemical	14
Printing and publishing	10
Paper	10
Wood	0
Leather	17
Textiles and wearing..	18
Tobacco products	30
Beverages	20
Other food	17
Sugar	37
Bakery	15
Animal feeds	0
Grain mill products	14
Dairy	49
Fruit and vegetable..	18
Meat and meat products	30
Other mining	0
Bauxite mining and..	0
Fishing and aquaculture	31
Forestry and logging	3
Poultry and eggs	0
Other animal products	0
Other crops	0
Vegetables, corn, pulses	1
Root crops (excl. ginger)	0
Other export crops	39
Citrus	0
Banana	0

B. Faced by Jamaica

Category	Value
Other manufactures	3
Machinery and equipment	3
Basic metals	1
Non-metallic mineral..	4
Rubber and plastic	5
Petrochemical	9
Printing and publishing	6
Paper	1
Wood	4
Leather	10
Textiles and wearing..	12
Tobacco products	55
Beverages	24
Other food	0
Sugar	0
Bakery	0
Animal feeds	0
Grain mill products	11
Dairy	0
Fruit and vegetable..	13
Meat and meat products	0
Other mining	0
Bauxite mining and..	0
Fishing and aquaculture	0
Forestry and logging	
Poultry and eggs	
Other animal products	0
Other crops	0
Vegetables, corn, pulses	15
Root crops (excl. ginger)	0
Other export crops	8
Citrus	0
Banana	0

Source: ECLAC, based on data from TRAINS of the World Bank.

Figure 15 - Reciprocal tariff protection between Jamaica and Mexico
(in percentages of ad valorem)

A. Applied by Jamaica

Category	Value
Other manufactures	11
Machinery and equipment	11
Basic metals	7
Non-metallic mineral..	14
Rubber and plastic	8
Petrochemical	3
Printing and publishing	1
Paper	7
Wood	11
Leather	20
Textiles and wearing..	19
Tobacco products	0
Beverages	22
Other food	12
Sugar	0
Bakery	0
Animal feeds	0
Grain mill products	11
Dairy	5
Fruit and vegetable..	17
Meat and meat products	0
Other mining	0
Bauxite mining and..	0
Fishing and aquaculture	0
Forestry and logging	0
Poultry and eggs	40
Other animal products	30
Other crops	0
Vegetables, corn, pulses	40
Root crops (excl. ginger)	0
Other export crops	36
Citrus	0
Banana	0

B. Faced by Jamaica

Category	Value
Other manufactures	10
Machinery and equipment	7
Basic metals	7
Non-metallic mineral..	17
Rubber and plastic	13
Petrochemical	8
Printing and publishing	3
Paper	10
Textiles and wearing..	24
Beverages	20
Other food	20
Sugar	0
Bakery	0
Animal feeds	0
Grain mill products	0
Dairy	0
Fruit and vegetable..	0
Meat and meat products	0
Other mining	0
Bauxite mining and..	0
Fishing and aquaculture	0
Other animal products	0
Other crops	0
Vegetables, corn, pulses	0
Root crops (excl. ginger)	0
Other export crops	0
Citrus	0
Banana	0

Source: ECLAC, based on data from TRAINS of the World Bank.

Figure 16 - Reciprocal tariff protection between Jamaica and the Dominican Republic
(in percentages of ad valorem)

A. Applied by Jamaica

Category	Value
Other manufactures	16
Machinery and equipment	8
Basic metals	2
Non-metallic mineral..	25
Rubber and plastic	10
Petrochemical	15
Printing and publishing	17
Paper	5
Wood	11
Leather	6
Textiles and wearing..	5
Tobacco products	29
Beverages	7
Other food	20
Sugar	33
Bakery	20
Animal feeds	0
Grain mill products	20
Dairy	0
Fruit and vegetable..	16
Meat and meat products	20
Other mining	0
Bauxite mining and..	0
Fishing and aquaculture	0
Forestry and logging	10
Poultry and eggs	0
Other animal products	0
Other crops	0
Vegetables, corn, pulses	39
Root crops (excl. ginger)	0
Other export crops	18
Citrus	0
Banana	0

B. Faced by Jamaica

Category	Value
Other manufactures	0
Machinery and equipment	0
Basic metals	0
Non-metallic mineral..	0
Rubber and plastic	0
Petrochemical	0
Printing and publishing	0
Paper	0
Wood	0
Leather	9
Textiles and wearing..	0
Tobacco products	0
Beverages	20
Other food	4
Sugar	0
Bakery	0
Animal feeds	0
Grain mill products	0
Dairy	0
Fruit and vegetable..	19
Meat and meat products	0
Other mining	0
Bauxite mining and..	0
Fishing and aquaculture	0
Other animal products	0
Other crops	0
Vegetables, corn, pulses	0
Root crops (excl. ginger)	0
Other export crops	0
Citrus	0
Banana	0

Source: ECLAC, based on data from TRAINS of the World Bank.

4.4. Household Surveys on Employment and Spending

To analyze the socioeconomic impacts of possible trade agreements, two fundamental sources of information are used which are complemented with the results of the CGE model. Labor Force Surveys conducted by the Statistical Institute of Jamaica are used in the case of employment. These surveys are conducted on a quarterly basis and generate information on employment disaggregated by gender, sector and geographical location, among other dimensions.

In the case of the effect on prices, we used the "Survey of Living Conditions" conducted by the Statistics Institute of Jamaica in 2014. This survey covers the whole country and includes rural areas. It is conducted through in-depth interviews of a total of approximately 1,800 households. The survey provides information on the socioeconomic characteristics of households including educational levels, employment sectors, health levels and, most importantly, the basket of consumption of each household as well as the detail of expenditure on each of these products. One of the limitations of this survey is that it does not have data on household income making it impossible to measure this dimension of the impact trade policy changes could have on income distribution.

The distribution of employment in Jamaica has not changed substantially between 2007 and 2015. It should be noted that the share of services in total employment accounts for 76% of total employment, followed by the participation of the primary sector, in which the weight of agribusiness, livestock, hunting and fishing has remained around 18%, with approximately 200,000 jobs, of which 80% corresponds to female employment. In general, female labor force participation is important, accounting for 57% in both 2007 and 2015. This structural feature of Jamaica's labor force will be taken into account when analyzing the social effects derived from Agreements (see Table 18). A further fact that has to be highlighted is that among the sectors with a large share of exports of goods, such as the bauxite and aluminum sector, labor force participation does not exceed 1% in the periods considered. Likewise, the agroindustry represents just over 2% of total employment.

Table 18 - Jamaica: Employment 2007 and 2015
(Employment numbers and percentages)

	2007 (1,155,387 employments)				2015 (1,139,467 employments)			
	Share of total	men	women	total	Share of total	men	women	total
Agricultural and livestock	17.8	19.7	80.3	100.0	17.6	20.3	79.7	100.0
Bauxite mining and alumina	0.8	9.5	90.5	100.0	0.6	5.4	94.6	100.0
Agroindustry	2.1	31.5	68.5	100.0	2.2	30.3	69.7	100.0
Textiles, clothing and footwear	1.7	81.2	18.8	100.0	0.9	71.6	28.4	100.0
Wood and paper	0.5	56.2	43.8	100.0	0.5	15.3	84.7	100.0
Petrochemical	0.0	…	…	…	0.1	35.6	64.4	100.0
Rubber and plastic	0.1	39.5	60.5	100.0	0.1	46.2	53.8	100.0
Non-metallic mineral products	0.2	12.6	87.4	100.0	0.2	0.0	100.0	100.0
Machinery and equipment	0.9	5.6	94.4	100.0	0.7	5.0	95.0	100.0
Other manufactures	1.5	7.1	92.9	100.0	1.3	13.7	86.3	100.0
Construction	10.4	5.3	94.7	100.0	7.4	2.4	97.6	100.0
Government services	4.7	49.6	50.4	100.0	5.3	47.5	52.5	100.0
Other services	59.2	56.7	43.3	100.0	63.3	55.0	45.0	100.0
Total	**100.0**	**42.6**	**57.4**	**100.0**	**100.0**	**42.7**	**57.3**	**100.0**

Source: ECLAC, based on household surveys of Jamaica for 2007 and 2015, respectively.

5. Methodologies Applied

In general, three complementary methodologies were used: i) International trade indices; ii) a CGE Model calibrated for Jamaica; and iii) Microsimulations to identify social effects.

5.1. Foreign Trade Indicators

The main calculations that have been carried out are the Index of Revealed Comparative Advantage (IRCA), the Hirschman-Herfindahl Index (HHI), and the Grubel-Lloyd Index (GLI). In the case of the IRCA, bilateral trade flows between Jamaica and the Caribbean and Central American countries analyzed in the study are used for the calculation, as follows (1):

$$\text{IRCA}_\text{m} = \frac{M_{ji}^k / MT_{ji}}{M_{jw}^k / MT_{jw}} , \tag{1}$$

where M are the imports, MT the total imports, the subscript k corresponds to the products, i to the countries to be compared, j to the specific market and w to the world.

In the case of Jamaica, the IRCA of its exports has also been calculated following the same formulation. This index has been normalized, with values greater than 0.33 representing an advantage for the country and less than -0.33 representing a disadvantage for the country. Finally, the import needs of the countries included in the country (IRCA of imports) have been compared with the export potential of Jamaica (IRCA of exports). In this manner, we can observe those products that are imported by the Caribbean and Central American countries in greater than typical volumes in which Jamaica has comparative export advantages, thus illustrating areas with high potential for an expansion of trade.

Regarding the HHI, it is formally calculated as follows (2):

$$\text{HHI} = \sum_{j=1}^{n} \left(\frac{X_{ij}}{X_{iw}} \right)^2 , \tag{2}$$

where X is exports, the subscript j represents the destination countries, i is the country of origin and w is the world.

The HHI has been normalized and indexed to the year 2000 as reference year. A normalized HHI greater than 0.18 is considered to be a "concentrated" market while values between 0.10 and 0.18 are characterized as a "moderately concentrated" one, and the range between 0.0 and 0.10 is considered "diversified".

Finally, in order to study the potentialities of Jamaica's bilateral relationships with the partners identified in the study and to determine the sectors most likely to have productive links in the form of value chains, the Grubel-Lloyd index (GLI) was calculated at the level of industries.[8] The analysis used the methodology proposed by Grubel and Lloyd (1975), which considers the use of bilateral trade flows to analyze the greater or lesser degree of coincidence in the exchange. The GLI has been calculated at the industry (3) and country level (4):

$$\text{GLI} = 1 - \frac{\left| X_{ij}^k - M_{ij}^k \right|}{X_{ij}^k + M_{ij}^k} , \tag{3}$$

$$\text{GLI} = 1 - \frac{\sum \left| X_{ij}^k - M_{ij}^k \right|}{\sum \left(X_{ij}^k + M_{ij}^k \right)} , \tag{4}$$

where X_{ij}^k and M_{ij}^k are the exports and imports, respectively, of industry k of country i with respect to country j in a given year or period, in this case 2004. High GLI values that are close to one indicate trade in similar sectors. Analytically, if for a particular industry the bilateral trade relationship is mostly intra-industrial, it is

---

[8] An industry is defined at the 3-digit level of the Standard International Trade Classification (SITC). To get from the microdata to this classification, an official converter provided by the UN Statistics Division was applied
(*http://unstats.un.org/unsd/trade/conversions/HS%20Correlation%20and%20Conversion%20tables.htm*).

interpreted as evidence of the existence of more integrated value chains. Therefore, a reduction in the costs of trade - as is the objective of a Trade Facilitation Program - can have a greater impact on these industries, according to the understanding that a greater bilateral trade in intermediate goods is interpreted as evidence of a greater degree of productive linkages between the countries involved. For the particular analysis of the sectors with the highest intensity of intra-industrial trade, the interpretative approach proposed in Durán and Zaclicever (2013) was followed, according to which GLI values above 0.33 indicate a high incidence of intra-industry trade, while values between 0.10 and 0.33 reflect the existence of potential intra-industry trade.

It was not possible to classify or distinguish socioeconomic agents because of the absence of information to carry out such analysis.

5.2. A General Computable Equilibrium Country Model

In this study, we use a recursive dynamic CGE model for Jamaica that identifies several trading partners (i.e., destinations and origins of exports and imports, respectively). Thus, it allows us to simulate preferential free trade agreements. In particular, a new version of the model used in ECLAC (2013) and ECLAC (2017) is used to analyze the possible effects of free trade agreements with Central America, Mexico and the Northern Caribbean countries on Jamaica. In what follows from this section we make a discursive presentation of the model. Appendix 1 contains the mathematical presentation of the model, which mainly follows the development of the analysis carried out in ECLAC (2013).

The model has several standard features and fits into the neoclassical-structuralist tradition (Dervis et al., 1982; de Melo and Robinson, 1989; Lofgren et al., 2002). In general terms, it is a recursive dynamic open economy model with multiple trading partners that can be used to assess (ex ante) the effects of shocks on a particular economy. In particular, it allows for the assessment of the short-term and long-term effects of different trade liberalization scenarios. Scheme 1 summarizes the main flows that our CGE model captures in each period. Arrows represent flows of money, where each one corresponds to a flow of products or factors of production in the opposite direction. In general, CGE models such as the one used here consider the real side of the economy, excluding the monetary aspects. Consequently, they do not consider phenomena such as inflation. Instead, they focus on capturing changes in the way the resources of the economy are allocated.

Scheme 1 - The circular flow of the rent in a CGE model
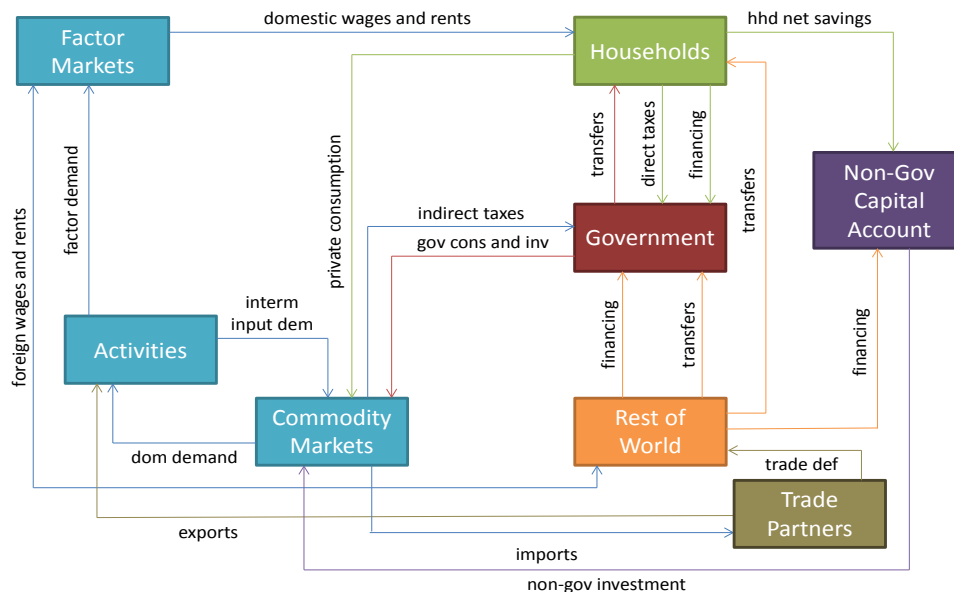
Source: ECLAC, own elaboration.

The productive sectors are represented by activities that maximize their benefits in competitive markets. The production technology is summarized in Scheme 2.[9] In the first place, value added and intermediate inputs are combined in fixed proportions. Value added, in turn, is generated by combining primary factors of production (labor, capital and - depending on the sector - natural resources). The activities can produce one or more products in fixed proportions. In turn, each product can be produced by more than one activity. The total production of each good or service can be destined to the domestic market or exported to the rest of the world.[10] In the implementation of the model, the analyst has the flexibility to determine the elements included in each of the components of the production function summarized in Scheme 2. For example, "labor" could include different types of work classified according to their level of qualification. In turn, capital could be disaggregated into physical or reproducible capital and natural capital or natural resources such as land or mineral deposits.

Scheme 2 - Production function
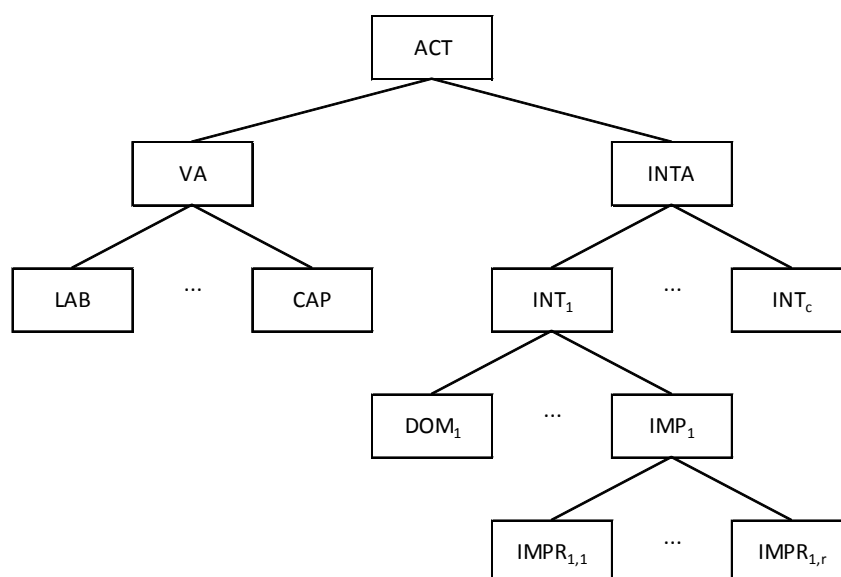
Symbols: *ACT* = production (gross value of production), *VA* = value added, *INTA* = total intermediate consumption, *LAB* = labor, *CAP* = capital, *INT* = intermediate consumption by sector, *DOM* = domestic, *IMP* = total imports, *IMPR* = bilateral imports by trade partner. Note that small numbers (1 to r) are representative of different sectors;
Source: ECLAC, own elaboration.

Typically, families/households, businesses, government and the rest of the world are identified as institutional sectors. Households receive their income from the productive factors they possess, as well as the transfers they receive from the other institutions included in the model. Households spend their income to buy the goods and services they consume, save, pay direct taxes and make transfers to other institutions. The government receives tax collection at the same time as it consumes/supplies goods and services, transfers to households and saves (or creates deficit). The model identifies eight types of taxes (income from households, activities, consumption, value added, exports, imports, factor input, and the use of inputs by productive activities). Trade partners demand exports and offer imports. In addition, the rest of the world transfers/provides funding to national institutions.

---

[9] To simplify Scheme 2, it only considers labor and capital as production factors, but further ones like land, other natural resources and/or different types of labor and capital can be included.
[10] The functional Leontief or fixed coefficients forms, CSE (Constant Substitution Elasticity) and CTE (Constant Transformation Elasticity) that are applied in the implementation of the model calculation are common in the literature.

33

Margins of marketing and transportation are modeled explicitly, assuming that the corresponding services are needed at fixed rates to move a good from the producer to the consumer. Specifically, the distribution margins that are applied to domestic goods, exports and imports are modeled.

In terms of foreign trade, goods and services are assumed to differ according to country of origin (Armington, 1969). Thus, trade can be modeled in two directions (i.e. the same is imported and exported simultaneously). The combination of domestic and imported products is carried out at the border. That is, the composition of national/imported consumption and imports by country of origin is the same irrespective of the destination of the products (e.g. intermediate consumption versus final consumption). The assumption of imperfect substitution between imports and domestic purchases is implemented with a Constant Transformation Elasticity (CTE)-type function. On the production side, a symmetrical assumption is made: exports are an imperfect substitute for sales to the domestic market - as mentioned above, a CTE-type function is used. In turn, a similar assumption is made to determine exports to each trading partner.

In the labor market it is assumed that there is unemployment generated by a wage curve (Figure 17), which establishes a negative relationship between wage level and unemployment rate (see Blanchflower and Oswald, 1994). In all cases, the labour force is perfectly mobile between sectors. For its part, capital, once installed, is immobile between sectors.

Figure 17 - Labor market with unemployment
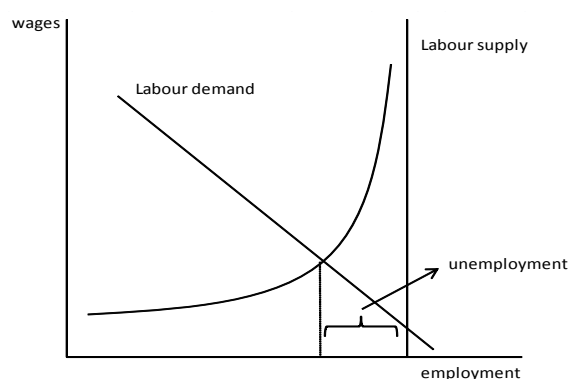
Source: ECLAC, based on Cicowiez (2016).

DYNAMICS. The model is recursively dynamic. That means the economic agents are supposed to be myopic, so their expectations are stationary. The sources of dynamics are four: accumulation of capital, labor force growth, growth in the supply of natural resources, and increases in factor productivity. At the beginning of each period, the sectoral capital stocks are modified based on the investments of the previous period. On the other hand, the endowments of the other productive factors grow exogenously. The investment and capital stocks of each period differ between public and private ones.

5.3. Micro simulations

In general, to evaluate socioeconomic effects we follow a Top-Down micro simulation methodology in the tradition of the models developed by Bourguignon et al. (2008), Bussolo and Cockburn (2010) Cicowiez (2009), and Ravallion and Lokshin (2004).

This methodology, which is represented in Scheme 3 uses information from the surveys described in section 4.4 to connect and reconcile the aggregate results. In this case, the strategy to estimate welfare effects uses the results of the CGE macroeconomic model to generate a vector of prices and employment variables by sector corresponding to the effect of future liberalization. The micro model will then be used to generate changes in the level of sectoral employment, and changes in the level of expenditure caused by the price effect at the household level. In doing so, the complete distribution of real household income can be assessed

34

corresponding to the simulated policy or shock. It is important to note that, since we do not count on income data, we will assume that the expenditure level is an approximation of household income. Clearly this assumption tends to be more accurate in the case of lower income households but is not as real for the higher quintiles. Given the lack of information in the surveys and due to the structure of the estimated CGE (there is no sectoral wage dynamics), the micro simulation model gives us a partial description of the mechanisms that affect household income. However, it is possible to describe some relevant results of the effects of the proposed opening.

Scheme 3 - Representation of the Top-Down Modeling approach

General Equilibrium Macroeconomic Model

Sectoral Aggregate variables

Household micro econometric model
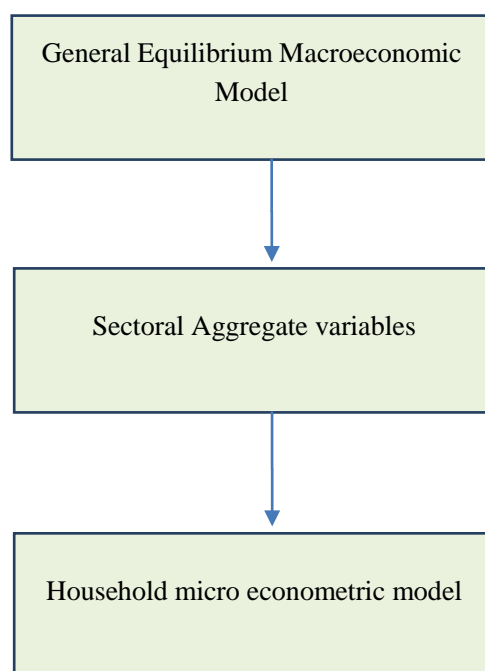
Source: ECLAC, own elaboration.

In the case of the price analysis we will follow the methodology developed by Ravallion and Lokshin (2004) and in the case of employment we will make a descriptive analysis of the data reconciling the results of the employment surveys with the outputs of the CGE.

6. Modeled Scenarios and Results Obtained

6.1. Modeled Scenarios

In order to carry out the exercises, the tariffs applied by Jamaica between 2007 and 2016, as well as the ones faced by the country in the markets of its trading partners, were considered as a reference framework. From that point on, a set of counterfactual scenarios were defined that consider the fact that Jamaica enters into free trade agreements with a number of Caribbean Basin countries, mainly those that are not members of CARICOM, Mexico and Central America. Jamaica is currently a party to trade agreements with Cuba, Costa Rica, the Dominican Republic, and Haiti through its membership in CARICOM, but these scenarios analyze the changes that would be expected to occur if all tariffs are reduced to zero, further opening trade with these partners. The simulated scenarios are explained in detail below:

0. BASELINE SCENARIO (business as usual). This scenario shows the evolution of Jamaica's economy from 2007 to 2020. The 2017-2020 projection assumes that no shock impacts Jamaica.

The reference scenario is constructed by imposing, for the period between the first year of the simulation, or base year (in our case, 2007), and 2016, the observed evolution for the Jamaican economy. Then, for the period 2017-2020, it uses projections obtained from the International Monetary Fund's World Economic Outlook from October 2016. On average, we assume that Jamaica grows at 2.5% per year during 2017-2020.[11] Likewise, government expenditures and revenues are assumed to remain constant relative to GDP for the entire simulation period of the model. As a consequence of these assumptions, the Jamaican economy grows in a relatively balanced manner - at both aggregate and sectoral levels - for the entire modeling period. That is, both macroeconomic aggregates and sectoral value added grow at similar rates throughout the baseline scenario. It should be noted, however, that the growth rate of the agricultural sector is somewhat lower, since its supply is constrained by the rate of growth of available agricultural land.

Based on the baseline scenario, five alternative scenarios were estimated for which the possible effects on production and trade were estimated. In all the defined scenarios, the reduction of bilateral tariffs is considered for the period 2017-2020.

1. Scenario: trade agreement with the Dominican Republic;
2. Scenario: trade agreement with Haiti;
3. Scenario: trade agreement with the Bahamas;
4. Scenario: trade agreement with Cuba;
5. Scenario: trade agreement with Mexico; and
6. Scenario: trade agreement with Central America.

The scenarios described are simulated under the following macroeconomic closure rule. The public budget is balanced by changes in the rate of direct tax that affects the income of households. Thus, before a loss of tax collection would be incurred, the direct tax rate will be increased. Consequently, the results presented below assume "fiscal consistency" in the sense that the government does not allow for debt to offset the loss of tax collection that could occur as a result of the reduction of tariffs. Currency inflows and outflows (i.e. the current account of the balance of payments) are matched by endogenous movements of the real exchange rate. Finally, we assume that the investment adjusts endogenously to match the savings generated by the modeled economy.

The results of the simulations are presented below. In all cases, the baseline scenario is compared to the five trade liberalization agreements described above. As we shall see, the results presented below must be interpreted in relative terms, rather than as precise estimates of the effects of each of the scenarios analyzed. In all cases, context information is presented on the recent evolution of trade flows and their composition by partner. This facilitates the interpretation of the effects derived from the simulations.

---

[11] To derive these GDP growth rates (in the baseline scenario only) Total Factor Productivity (TFP) is modified endogenously to replicate the observed development of GDP. In the remaining scenarios, the exogenous component of the TFP is held constant regarding the values calibrated for the modeling of the baseline scenario.

6.2. Aggregate Results

Table 19 shows the aggregate results of the first four scenarios analyzed for the Caribbean countries. In all cases, the results of the simulations do not substantially change the growth path that Jamaica would observe in a similar scenario in which no trade agreements are signed. The most substantial changes are in the variable private investment for free trade agreements with the Dominican Republic and Cuba.

Table 19 - Jamaica: aggregated macroeconomic results in real terms for the scenarios of the Caribbean countries

(percentage changes with respect to the baseline scenario)

Macroeconomic aggregates	FTA with Dominican Republic		FTA with Haiti		FTA with the Bahamas		FTA with Cuba	
	2017	2020	2017	2020	2017	2020	2017	2020
Private consumption	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government consumption	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Private investment	0.02	0.02	0.00	0.00	0.00	0.00	0.02	0.02
Public investment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stock Variation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exports	0.01	0.02	0.00	0.00	0.00	0.00	0.01	0.01
Imports	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01
GDP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: ECLAC, based on simulations of CGE model calibrated for Jamaica.

A first explanation for the zero impact observed in macroeconomic indicators is that Jamaica's bilateral trade with these four trading partners does not exceed 0.9 per cent of Jamaica's total exports, the lowest being with Haiti and Cuba. In these two countries, domestic goods exports did not exceed 6 million US dollars in 2016, and trade was concentrated in just a few products. In addition, with the exception of the Bahamas, these countries apply tariffs to few sectors, while the tariff applied by Jamaica is typically higher, as indicated in the section on tariff protection.

In the case of imports from the four countries, the annual flow amounted to 109 million US dollars in 2016. The Dominican Republic is the most significant of these partners for Jamaica as a supplier of certain agroindustrial products (food, beverages and tobacco), petrochemicals, cement and some machinery and equipment (iron and steel bars), among others. During the last sixteen years, Jamaica has maintained a bilateral trade deficit with the Dominican Republic, without having been able to increase its level of its exports, which have remained below 10 million US dollars per year (see Figure 18).

Figure 18 - Development of bilateral trade between Jamaica and the Dominican Republic, 1990-2016
(in millions of US dollars)
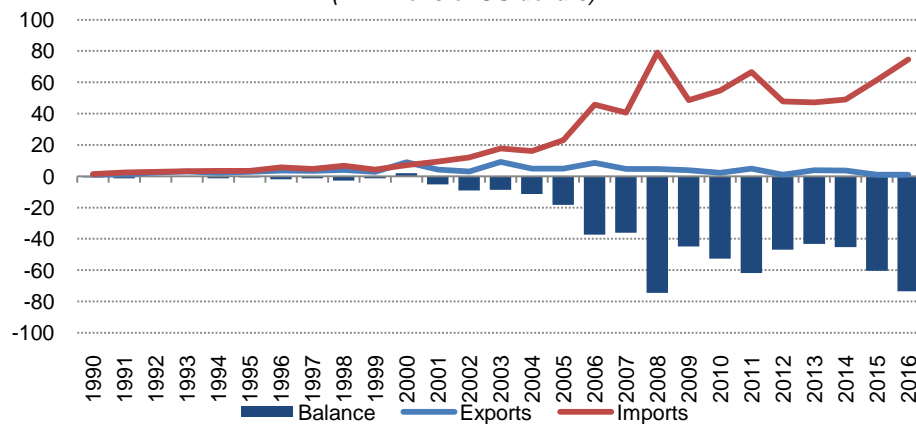
Source: ECLAC, based on data from UN Comtrade.

Although Cuba was previously a major trade partner of Jamaica and supplier of metals and by-products, that situation changed dramatically since 2007, as Jamaica reduced imports of flat rolled iron or non-alloy steel. The relationship has changed to the point where Jamaica in 2015 managed to reverse its deficit into a surplus, although in 2016 it maintained a slight deficit again (see Figure 19). The low level of trade that would result from the signing of a trade agreement between the two countries and the zero effect on macroeconomic variables is a clear indication that the bilateral trade relationship between the two countries is largely unexploited. The greatest potential opportunities for expansion in Jamaican exports to Cuba lie in some intermediate products for Cuban industry, including disinfectants, insecticides, fungicides, inorganic chemicals, lime, cement, stone, sand and gravel, as well as some middle technology manufacturing items (pumps, motors, and parts and accessories of non-electrical machinery, among others). The top 10 products represent just over 90% of Jamaica's export bill to Cuba. This represents a great challenge to Jamaica as the bilateral trade pattern is moderately concentrated.

Figure 19 - Development of bilateral trade between Jamaica and Cuba, 1990-2016
(in millions of US dollars)
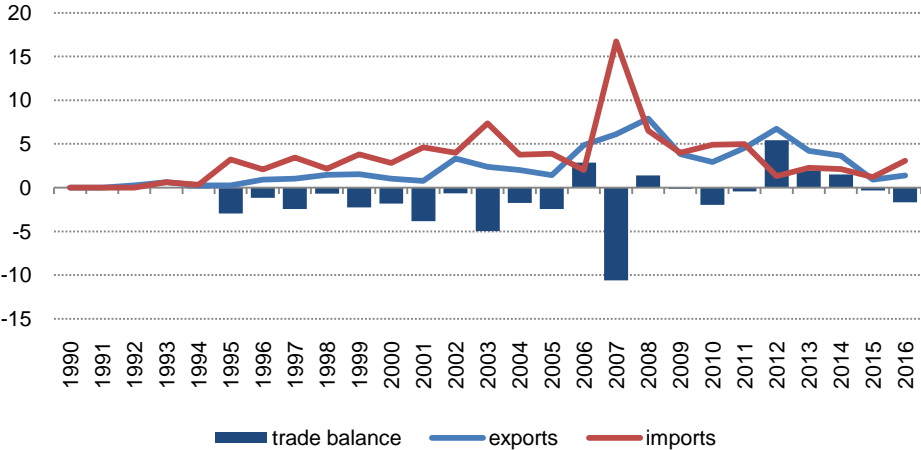
Source: ECLAC, based on data from UN Comtrade.

As for bilateral trade with Haiti, Jamaica has an inter-industry relationship in which Jamaica exports a number of manufactured goods of importance to Haiti, mainly cement, plastic bags, zinc plates, and food for animals, among others. For its part, Jamaica imports some food preparations, wheat flour, prepared cereals, food mixtures with cereals, as well as perfumery and cosmetics from Haiti. Despite the predominance of inter-industry trade, there are a number of sectors with potential for Jamaica, including edible preparations, non-alcoholic drinks, and cereal preparations, three sectors in which Jamaica's trade with Haiti is more intense.

Later we will see the expected results for Jamaica's bilateral trade relations with these countries in each of the scenarios modeled at the sectoral level. Indeed, at the sectoral level, important changes can be observed that account for the expansion of Jamaica's trade with Haiti, Cuba, and the Dominican Republic. We will return to this when we analyze the particular results on the different sectors of the model in each scenario.

Figure 20 - Development of bilateral trade between Jamaica and the Haiti, 1990-2016
(in millions of US dollars)
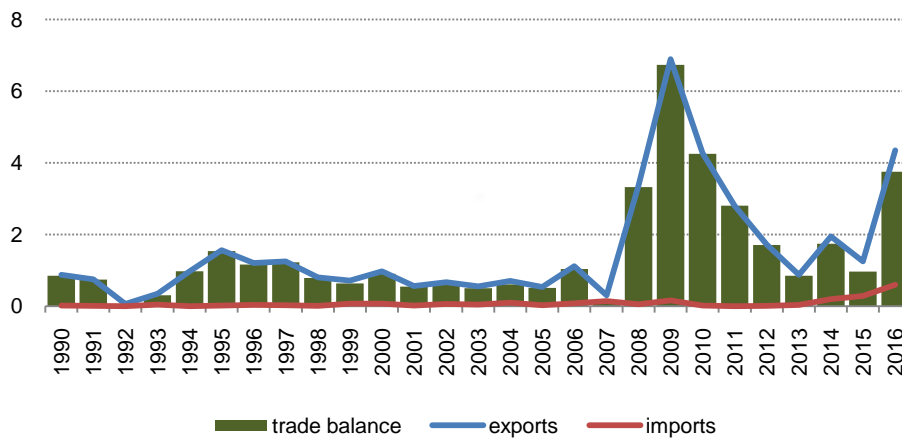
Source: ECLAC, based on data from UN Comtrade.

Trade between Jamaica and the Bahamas has expanded considerably from a very low base before 2010. A large expansion of petrochemical imports from 2010 onwards has generated a bilateral trade deficit for Jamaica as exports to the Bahamas have remained relatively stable with the exception of 2012 when petrochemical exports of 19.6 million US dollars led to a significant expansion in exports. The model results showing that the largest macroeconomic impacts would be on imports from the Bahamas to Jamaica reflects the current imbalance in the goods trade between the two countries.

Figure 21 - Development of bilateral trade between Jamaica and the Bahamas, 1990-2016
(in millions of US dollars)
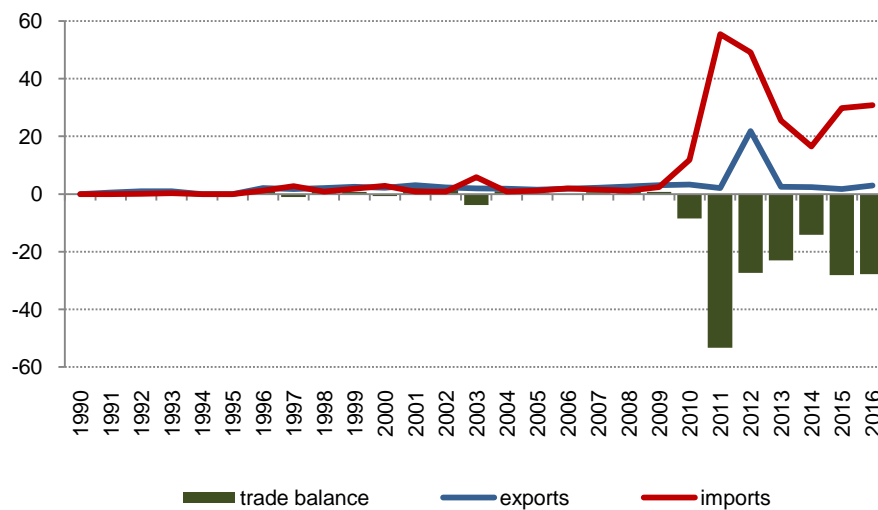
Source: ECLAC, based on data from UN Comtrade.

In general terms, only the trade integration scenarios with Mexico and Central America show results that are significantly different from the baseline. In all other cases, the aggregate effects are minimal. For example,

volumes exported and imported grew by 0.17 and 0.10% in the Jamaica-Central America scenario. In summary, and as we shall see, it is only at the sectoral level that the scenarios considered have significant effects on trade flows. Macroeconomic aggregates such as private consumption and investment are not substantially modified in any case. However, the results tend to be positive, although small, both on GDP and welfare, with a relatively higher increase in trade with the countries of Central America than in Mexico (see Table 20).

Table 20 - Jamaica: Aggregate macroeconomic results in real terms for the scenarios of FTAs with Mexico and Central America

(percentage changes with respect to the baseline scenario)

Macroeconomic aggregates	FTA with Mexico		FTA with Central America	
	2017	2020	2017	2020
Private consumption	0.00	0.00	0.01	0.01
Government consumption	0.00	0.00	0.00	0.00
Private investment	0.04	0.06	0.03	0.05
Public investment	0.00	0.00	0.00	0.00
Exports	0.02	0.02	0.17	0.18
Imports	0.02	0.03	0.10	0.10
GDP	0.00	0.01	0.03	0.03

Source: ECLAC, based on simulations of CGE model calibrated for Jamaica.

6.3. Sectoral Results

At the sectoral-level, the impact of signing FTAs with the countries in this study would be expected to have differential impacts on Jamaica's trade balance by sector. The overall trade deficit is anticipated to grow as a result of more liberalized trade, however, the largest absolute increase would stem from the machinery and equipment sector. The large increase in the deficit in machinery and equipment and other intermediate goods would be a positive development for Jamaica's structural transformation, which requires the import of capital goods to boost the country's manufacturing capacity and value added by extension. The trade balance in agroindustry, on the other hand, is expected to shrink by an average of 5.1 million US dollars per year during the simulated period 2017-2020 (see Figure 22).

Figure 22 - Net absolute annual impact of FTAs on sectoral trade balances
(in millions of US dollars)
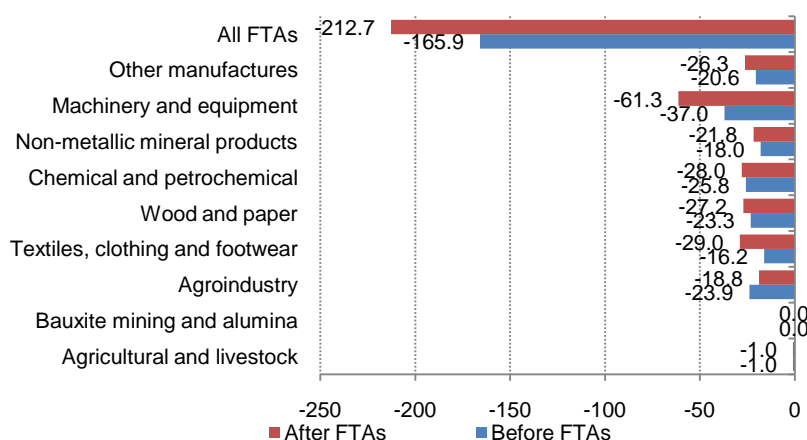
Source: ECLAC, based on simulations of CGE model calibrated for Jamaica.

Tables 21 to 23 show the aggregate results for broad economic sectors for value added (VA), exports and imports of goods and services.

Of course, to explain the sectoral results, we must consider the initial patterns of trade and protection. Take, for example, the negative result on the VA of the primary sectors shown in Table 21. As can be seen in the section on tariff protection, Mexico imposes a zero tariff on Jamaica. Consequently, there are no additional potential profit opportunities since market access conditions for Jamaica are already strong. By contrast, for some of these products (and even more for industrial manufactures), Jamaica imposes positive tariffs on its imports from Mexico. Consequently, the domestic production of the corresponding sectors is reduced by the greater external competition in the modeled scenario. Certainly, input-output relationships could go in the opposite direction, i.e. agriculture as an input to food and food production could gain access to the market. However, this does not happen in our simulations. In addition, sectors without market access gains reduce their production to free up resources that are used in other sectors. In fact, in the Jamaica-Mexico scenario, the sector with the most gains is beverages, with an increase of 0.42% in their value added and 1.88% in exports, respectively (see Tables 21 and 22).

Table 21 - Total sectoral value-added in real terms, 2017-2020
(percentage changes with respect to the baseline scenario)

Sectors	Base year 2017 (millions J$)	Share in total	Dominican Republic	Haiti	Bahamas	Cuba	Mexico	Central America
Agricultural and livestock	40614	5.5	-0.01	-0.03	0.00	-0.01	-0.03	-0.06
Bauxite mining and alumina	31533	4.3	0.01	0.00	-0.01	0.00	0.00	0.17
Foods	24416	3.3	0.00	-0.02	0.01	0.00	-0.02	-0.07
Beverage	10300	1.4	0.02	0.42	0.03	-0.01	0.42	0.12
Tobacco products	3	0.0	-0.01	-0.04	-0.01	-0.01	-0.04	0.26
Textiles, clothing and footwear	779	0.1	-0.01	-0.02	0.19	0.01	-0.02	-0.01
Wood and paper	6449	0.9	-0.02	-0.02	0.06	0.00	-0.02	-0.11
Petrochemical	13047	1.8	0.00	-0.01	0.02	0.05	-0.01	0.03
Rubber and plastic	1917	0.3	-0.03	0.01	0.01	0.03	0.01	-0.13
Non-metallic mineral products	4508	0.6	-0.11	0.03	0.10	0.00	0.03	-0.36
Base metal products	2249	0.3	0.01	0.00	0.00	0.03	0.00	-0.05
Machinery and equipment	1795	0.2	0.01	-0.06	0.00	0.13	-0.06	-0.06
Other manufactures	326	0.0	0.01	-0.02	0.22	-0.01	-0.02	0.25
Construction	61436	8.3	0.01	0.04	0.00	0.00	0.04	0.04
Trade	122521	16.6	0.01	0.04	0.01	0.01	0.04	0.08
Government services	95736	12.9	0.00	0.00	0.00	0.00	0.00	-0.01
Other services	324294	43.8	0.00	-0.01	0.00	0.00	-0.01	0.03
Total Value Added	**741922**	**100.0**	**0.00**	**0.01**	**0.00**	**0.00**	**0.01**	**0.03**

Source: ECLAC, based on simulations of CGE model calibrated for Jamaica.

In terms of sectoral VA, the free trade agreements between Jamaica and the Dominican Republic, Cuba and Haiti do not show significant results. On the other hand, integration with Central America shows a greater number of winning sectors in terms of VA. In each case, these sectors include primary products or manufactures of agricultural origin. A detailed review of all sectors for which there are increases in value added, mainly in the scenario of signing a free trade agreement with Central America, shows that about a dozen sectors for which Jamaica has a positive revealed comparative advantage (sugarcane, coffee and cocoa, bauxite and alumina, animal feed, sugar, leather, petrochemical, as well as all service sectors) experience increases (see Table 21). Many of these increases translate into an increase of total exports, which are positive throughout the basket of exports. This is because there is a group of sectors that also register increases in their imports from Central America, especially in manufacturing, and benefit for their part from lower prices after liberalization with Jamaica (see Tables 22 and 23). Inasmuch as Jamaica is more integrated in some agro-industrial sectors of its Caribbean Community neighbors (such as in alcoholic beverages, cereal preparations and flour preparations, fruit and vegetables, preserved fruits, meat and offal, fuels, food products, among

others), increased production in certain sectors would allow for greater productive integration with some of its other neighbors in the subregion, namely Barbados, Guyana, Saint Lucia, and Trinidad and Tobago. ECLAC (2014) concluded that at least 56% of Jamaica's total exports to its CARICOM partners had potential intra-industry relationships, mainly in the food and beverage, chemical and pharmaceutical, rubber and plastic industries, with agroindustry being the most emblematic of intra-industry potential (food, beverages and tobacco). The other sectoral results can be interpreted in a similar way to the examples analyzed here. Bilateral trade flows for both exports and imports are discussed below. In this case, the effect of creating bilateral trade that occurs after the signing of each simulated free trade agreement is shown more clearly.

Table 22 - Total sectoral exports in real terms
(percentage changes with respect to the baseline scenario)

Sectors	Base year 2017 (millions J$)	Share in total	Dominican Republic	Haiti	Bahamas	Cuba	Mexico	Central America
Agricultural and livestock	4942	1.4	0.02	0.00	-0.01	-0.02	-0.04	0.18
Bauxite mining and alumina	90191	25.8	0.01	0.00	-0.01	0.00	-0.01	0.18
Foods	11508	3.3	0.04	0.01	0.04	-0.02	-0.05	0.26
Beverage	6789	1.9	0.07	0.00	0.13	0.02	1.88	0.68
Tobacco products	2	0.0	0.02	0.00	-0.04	-0.03	-0.09	3.32
Textiles, clothing and footwear	242	0.1	0.01	0.00	1.72	0.17	-0.01	0.23
Wood and paper	587	0.2	0.04	0.00	1.61	-0.01	0.00	0.24
Petrochemical	41519	11.9	0.01	0.00	0.01	0.08	-0.01	0.12
Rubber and plastic	330	0.1	0.00	0.00	1.32	0.49	0.11	0.89
Non-metallic mineral products	40	0.0	-0.01	0.00	0.04	0.14	0.01	0.62
Base metal products	964	0.3	0.02	0.00	-0.02	0.15	0.03	0.13
Machinery and equipment	243	0.1	0.02	0.00	-0.02	5.00	-0.04	0.22
Other manufactures	192	0.1	0.04	0.03	0.77	1.27	-0.02	1.32
Government	14	0.0	0.01	0.00	-0.01	-0.01	-0.03	0.10
Other services	192059	54.9	0.02	0.00	-0.02	0.00	-0.01	0.17
Total exports	**349621**	**100.0**	**0.02**	**0.00**	**0.00**	**0.01**	**0.02**	**0.18**

Source: ECLAC, based on simulations of CGE model calibrated for Jamaica.

Table 23 - Total sectoral imports in real terms
(percentage changes with respect to the baseline scenario)

Sectors	Base year 2017 (millions J$)	Share in total	Dominican Republic	Haiti	Bahamas	Cuba	Mexico	Central America
Agricultural and livestock	7861	1.4	-0.02	0.00	0.01	0.00	-0.02	-0.13
Bauxite mining and alumina	114	0.0	-0.08	0.00	0.01	-0.05	0.06	-0.29
Foods	39650	7.3	0.05	0.00	0.01	0.00	0.01	0.36
Beverage	5982	1.1	-0.01	0.00	0.00	-0.01	0.03	0.02
Tobacco products	576	0.1	-0.02	0.00	0.00	-0.01	-0.04	-0.22
Textiles, clothing and footwear	14202	2.6	-0.01	0.00	0.01	0.00	-0.01	1.70
Wood and paper	25893	4.8	0.12	0.00	0.01	0.00	0.09	0.39
Petrochemical	152709	28.1	0.00	0.00	0.00	0.00	0.00	0.07
Rubber and plastic	10786	2.0	0.04	0.00	0.01	0.00	0.06	0.20
Non-metallic mineral products	9797	1.8	0.18	0.00	0.02	0.15	0.14	0.62
Base metal products	12228	2.3	0.01	0.00	0.01	0.02	0.05	0.07
Machinery and equipment	94558	17.4	0.00	0.00	0.00	0.00	0.00	0.00
Other manufactures	66324	12.2	0.00	0.00	0.01	0.00	0.00	0.00
Construction	330	0.1	-0.04	0.00	0.01	0.00	0.04	-0.17
Government	372	0.1	-0.01	0.00	0.01	0.01	0.02	-0.09
Other services	101194	18.7	-0.02	0.00	0.01	0.00	0.00	-0.16
Total imports	**542575**	**100.0**	**0.01**	**0.00**	**0.01**	**0.01**	**0.03**	**0.10**

Source: ECLAC, based on simulations of CGE model calibrated for Jamaica.

6.4. Bilateral Results

In terms of overall effects, the results of the CGE model show that signing FTAs with all of the countries in the study would expand both Jamaica's exports and imports with a greater absolute impact on the volume of imports. Total exports of goods and services would be expected to grow by 21.8 million US dollars per year during the simulated period in comparison to the 2007 baseline while imports of goods and services would be expected to grow by 70.8 million US dollars. Figure 23 below shows the differential bilateral effects on the trade balance with partners in the study, before and after the signing of FTAs.

Figure 23 – Net absolute annual impact of FTAs on bilateral trade balances
(in millions of US dollars)
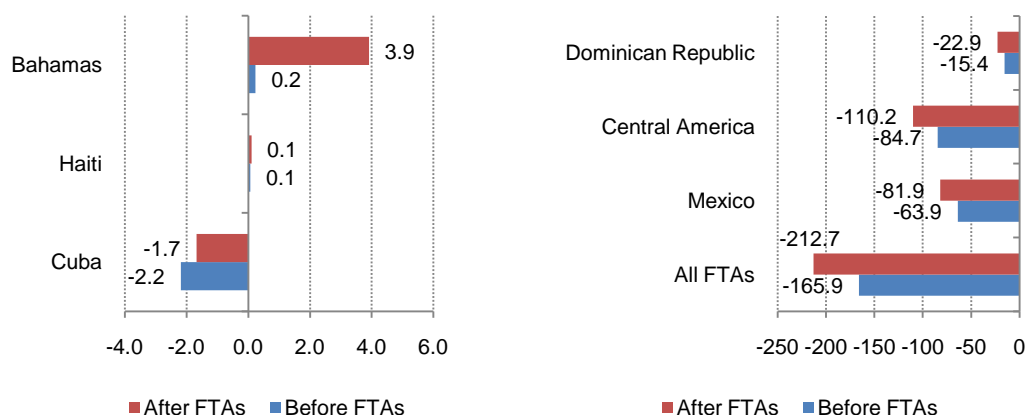
Source: ECLAC, based on simulations of CGE model calibrated for Jamaica.

The modeled results simulating a free trade agreement between Jamaica and Cuba show that increases in exports from Jamaica to Cuba would result from a further reduction in trade barriers between the two countries.

The only significant impacts perceived in the case of such FTAs occur bilaterally, with expected 18% increases in Jamaica's exports of goods to Cuba and 9% in imports, amounting to a 2.2 million US dollar average annual expansion in Jamaican exports and an annual 1.7 million US dollar net increase in Jamaica's bilateral trade balance with the country. While absolute growth potential for exports to Cuba are highest in chemical and petrochemical products, with anticipated increases of 16%, increases are also expected to occur in manufactures, mainly machinery and equipment. However, it should be noted that Cuba accounts for only 0.1% of Jamaica's total exports and imports (see Table 13). If an increase in productivity of the service sector is assumed, as per Tsikata, Moreira and Hamilton (2009), and the bilateral trade in services expands at a rate close to their medium-term average between 1989 and 2015 (that is 4.9% for exports and 4.3% for imports), Jamaica's exports and imports of goods and services to Cuba would increase by 6.8% and 7.8%, respectively, following the signing of an FTA (see Table 24). Alternatively, if the increase is double the value of the aforementioned rate, the expansion of Jamaica's total exports to Cuba (goods and services) would increase at a rate of 11% between 2017 and 2020. Clearly, services are very important in Jamaica's export basket to Cuba.

Table 24 - Jamaica: bilateral trade in the scenario with a FTA with Cuba
(in millions of US dollars and percentage changes with respect to the baseline scenario)

Sectors	Baseline values, millions of US dollars (2007)			changes in percentages (2017-2020)	
	exports	imports	trade balance	exports	Imports
Agricultural and livestock	0.0	0.0	0.0	0.0	0.7
Bauxite mining and alumina	0.0	0.0	0.0	0.0	0.0
Agroindustry	0.2	0.1	0.2	1.0	24.0
Textiles, clothing and footwear	0.0	0.0	0.0	53.0	30.4
Wood and paper	0.0	0.1	-0.1	0.0	0.8
Chemical and petrochemical	2.4	2.4	0.0	16.1	17.2
Non-metallic mineral products	0.0	2.4	-2.4	7.4	0.1
Machinery and equipment	0.5	0.5	0.0	31.2	8.7
Other manufactures	0.1	0.0	0.1	27.9	0.0
Goods	**3.3**	**5.5**	**-2.2**	**18.4**	**9.2**
Services	**20.6**	**2.2**	**18.4**	**4.9**	**4.3**
Total goods and services	**23.9**	**7.7**	**16.2**	**6.8**	**7.8**

Source: ECLAC, based on simulations of CGE model calibrated for Jamaica and an ad hoc assumption regarding trade in services.

In the case of Haiti, the implementation of a free trade agreement is expected to increase goods exports by 12.3% and boost goods imports by 5.4%. Although the anticipated increase in goods exports is in the double digits, and are particularly high for agroindustrial exports (17.5%), Haiti as accounts for only 0.4% of Jamaican exports, and less than 0.1% of total imports. In 2016, total exports from Jamaica to Haiti had a value of 4.3 million US dollars. This makes the absolute impact very limited. However, the signing of an agreement would open up opportunities to increase exports in agribusiness (food preparations, cheese, non-alcoholic beverages, alcoholic beverages, animal feeding), and the chemical and petrochemical sector, including rubber and plastics.

On the Haitian side, there are potential opportunities to increase exports to Jamaica, mainly in chemical and petrochemical products (perfumery and cosmetic preparation, boxes, cases, crates and similar articles of plastics), as well as in textiles and clothing, a sector in which Haiti has comparative advantages in a great variety of products like women's trousers, brace overalls, breeches and shorts knitted/crocheted, and t-shirts of cotton of textile materials other than wool/fine animal hair/cotton/synthetic fibers. Jamaica's trade relations with Haiti still have a lot of room to grow from their current low base. In 2016, according to the 6-digit Harmonized System, Jamaica imported only 20 products from Haiti totaling 596,000 US dollars.

Assuming increases in trade in services in line with the historical trend, increases of 4.9% for Jamaican service exports to Haiti and 4.3% for service imports from Haiti could be expected (see Table 25).

Table 25 - Jamaica: bilateral trade in the scenario with a FTA with Haiti
(in millions of US dollars and percentage changes with respect to the baseline scenario)

Sectors	Baseline values, millions of US dollars (2007)			changes in percentages (2017-2020)	
	exports	imports	trade balance	exports	imports
Agricultural and livestock	0.0	0.0	0.0	0.0	0.0
Bauxite mining and alumina	0.0	0.0	0.0	0.0	0.0
Agroindustry	0.1	0.0	0.0	17.5	0.0
Textiles, clothing and footwear	0.0	0.0	0.0	0.0	29.4
Wood and paper	0.0	0.0	0.0	0.0	0.0
Chemical and petrochemical	0.1	0.0	0.1	8.4	12.8
Non-metallic mineral products	0.0	0.0	0.0	0.0	10.3
Machinery and equipment	0.0	0.1	-0.1	0.0	0.0
Other manufactures	0.0	0.0	0.0	18.6	0.0
Goods	**0.1**	**0.1**	**0.0**	**12.3**	**5.4**
Services	**0.7**	**0.0**	**0.6**	**4.9**	**4.3**
Total goods and services	**0.8**	**0.2**	**0.6**	**6.2**	**5.1**

Source: ECLAC, based on simulations of CGE model calibrated for Jamaica and an ad hoc assumption regarding trade in services.

While the results of the modeled scenario with the Bahamas show the potential for increased trade between the countries in particular sub-sectors, their low absolute level of bilateral trade limits the potential upside.

An FTA between Jamaica and the Bahamas would be expected to increase goods exports by 3.8 million US dollars per year over the baseline level, representing 61.0% growth. The largest absolute increases to Jamaican exports to the Bahamas are expected to occur in the chemical and petrochemical, wood and paper, and agroindustry sub-sectors. In particular, exports of petrochemicals from Jamaica to the Bahamas are expected to grow by 39.2%, or 0.8 million US dollars annually, while wood and paper exports are expected to more than double. On the other hand, goods imports from the Bahamas are expected to grow by only 0.1 million US dollars per year, 4.5% over the baseline, leading to a larger bilateral goods trade surplus for Jamaica (Table 26).

Table 26 - Jamaica: bilateral trade in the scenario with a FTA with the Bahamas
(in millions of US dollars and percentage changes with respect to the baseline scenario)

Sectors	Baseline values, millions of US dollars (2007)			changes in percentages (2017-2020)	
	exports	imports	trade balance	Exports	imports
Agricultural and livestock	0.0	0.0	0.0	100.7	0.0
Bauxite mining and alumina	0.0	0.0	0.0	0.0	0.0
Agroindustry	0.3	0.0	0.3	77.0	0.0
Textiles, clothing and footwear	0.1	0.1	-0.1	78.0	0.2
Wood and paper	0.3	0.0	0.3	62.2	0.0
Chemical and petrochemical	0.5	0.1	0.4	39.2	11.9
Non-metallic mineral products	0.0	0.6	-0.6	106.4	3.8
Machinery and equipment	0.0	0.0	0.0	0.0	3.5
Other manufactures	0.0	0.1	-0.1	109.4	5.9
Goods	**1.2**	**1.0**	**0.2**	**61.0**	**4.5**
Services	**15.4**	**0.3**	**15.1**	**4.9**	**4.3**
Total goods and services	**16.6**	**1.2**	**15.3**	**9.0**	**4.5**

Source: ECLAC, based on simulations of a CGE model calibrated for Jamaica and an ad hoc assumption regarding trade in services.

Deepening the existing free trade agreement between Jamaica and the Dominican Republic so that all tariffs fall to zero would result in the expansion of the reciprocal trade between both countries, with a somewhat greater increase in the case of exports from Jamaica to the Dominican Republic in terms of percentage growth. In absolute terms, however, imports from the Dominican Republic would outweigh Jamaica's growth in exports. The simulations capture well the complementary nature of the trade relations of both countries, since in the case of Jamaica's exports the incremental earnings would come from sectors in which it has a comparative advantage, mainly in agroindustry products. In this sector, there are potential gains for Jamaican exporters, especially in fruits and vegetables, bakery products, sugar, as well as in the beverage industry, areas in which Jamaica has comparative advantages.

On the import side, a full liberalization of trade with Dominican Republic would expand the entrance of manufactures, especially non-metallic mineral products, as well as machinery and equipment products, like grinding machines for earth, articles of iron or iron, parts for structures (bridges sections, lock-gates, towers, etc.), nails, tacks, drawing pins, corrugated nails, staples, tubes, pipes and hollow profiles, among others. It is also important to take into account that one-third of Jamaican imports from the Dominican Republic are energy products (propane, butane and petroleum).

For both countries, reciprocal bilateral trade in services is significant (84% of Jamaican exports and slightly more than one-third of Jamaican imports from the Dominican Republic). Given that the model did not consider

simulations of trade in services, assuming growth rates of 4.9% and 4.3% for exports and imports based on the historical trend, the impact of an agreement on Jamaica's total exports to the Dominican Republic is estimated to be 3.6%, and 10% for imports (see Table 27).

Table 27 - Jamaica: bilateral trade in the scenario with a FTA with Dominican Republic
(in millions of US dollars and percentage changes with respect to the baseline scenario)

Sectors	Baseline values, millions of US dollars (2007)			changes in percentages (2017-2020)	
	exports	imports	trade balance	exports	imports
Agricultural and livestock	0.0	0.0	0.0	0.0	5.3
Bauxite mining and alumina	0.0	0.0	0.0	0.0	0.0
Agroindustry	0.3	4.3	-3.9	8.9	11.2
Textiles, clothing and footwear	0.0	0.3	-0.3	0.0	7.5
Wood and paper	0.0	4.9	-4.9	0.0	16.5
Chemical and petrochemical	2.8	3.0	-0.2	0.0	6.3
Non-metallic mineral products	0.0	3.1	-3.1	0.0	16.2
Machinery and equipment	0.0	2.6	-2.6	0.0	5.3
Other manufactures	0.1	0.5	-0.4	0.0	12.3
Goods	**3.2**	**18.7**	**-15.4**	**1.0**	**12.0**
Services	**6.6**	**6.5**	**0.1**	**4.9**	**4.3**
Total goods and services	**9.9**	**25.2**	**-15.3**	**3.6**	**10.0**

Source: ECLAC, based on simulations of CGE model calibrated for Jamaica and an ad hoc assumption regarding trade in services.

Jamaica's bilateral trade with Mexico after the signing of an FTA would expand Jamaica's exports of goods to that country by 61.5%, or 8.4 million US dollars per year more than the 2007 baseline. The sectors that stand to benefit the most are those linked to Jamaica's dominant comparative advantages: agroindustrial and petrochemical products. Among agroindustrial sub-sectors, the highest anticipated increases are in beverages (62%), and among manufacturers, petrochemical (36%), and rubber and plastic (46%) sub-sectors are expected to be the largest gainers. In the case of exports from Mexico to Jamaica, there are also significant increases in agroindustrial products, with increases in fruit and vegetable products (11%), grain mill products (4.9%), other food (7.6%), and beverages (14%) (See annex B.14)

An FTA with Mexico would also greatly expand imports of goods from that country, especially non-metallic mineral products, as well as machinery and equipment, with increases of 9% and 20%, respectively. Mexican goods imports would be expected to grow by 11.8%, or 26.4 million US dollars per year more than the baseline during the simulated period. Services are important in Jamaica-Mexico trade because they account for about 50% of Jamaica's total exports and just over 36% of Jamaica's total imports from Mexico. Bilateral trade between the two countries, in which Jamaica has a deficit, tends to balance somewhat, at least when considering the flows of the model's baseline. It is estimated that, following the signing of a bilateral trade agreement, Jamaica's total exports to Mexico could expand by around 33%, while imports are expected to rise 10.4% (see Table 28).

Table 28 - Jamaica: bilateral trade in the scenario with a FTA with Mexico
(in millions of US dollars and percentage changes with respect to the baseline scenario)

Sectors	Baseline values, millions of US dollars (2007)			changes in percentages (2017-2020)	
	exports	imports	trade balance	exports	imports
Agricultural and livestock	0.0	0.4	-0.4	0.0	0.1
Bauxite mining and alumina	0.0	0.0	0.0	0.0	0.0
Agroindustry	2.6	1.9	0.6	61.8	7.8
Textiles, clothing and footwear	0.0	0.1	-0.1	0.0	26.8
Wood and paper	0.0	4.8	-4.8	0.0	11.2
Chemical and petrochemical	0.0	16.7	-16.7	36.0	1.4
Non-metallic mineral products	0.0	1.8	-1.8	46.0	8.8

Machinery and equipment	0.0	25.5	-25.5	19.6	20.0
Other manufactures	0.0	15.2	-15.2	0.0	8.6
Goods	**2.6**	**66.5**	**-63.9**	**61.5**	**11.8**
Services	**2.6**	**15.8**	**-13.2**	**4.9**	**4.3**
Total goods and services	**5.3**	**82.3**	**-77.1**	**33.0**	**10.4**

Source: ECLAC, based on simulations of CGE model calibrated for Jamaica and an ad hoc assumption regarding trade in services.

Of all of the modeled FTAs that Jamaica could accede to, the one that with the countries of Central America shows the largest potential increases in trade flows, mainly exports. The six countries in the subregion currently account for 0.6% of Jamaica's exports, and are the origin of about 4% of its total imports.

Following the signing of a free trade agreement with Central American countries, good exports would increase by 31% and imports by 9.5%. Agroindustry and textiles show surprising increases following the simulation of an FTA (see Table 29). Such increases occur from fairly low levels of trade. The largest expected expansion is mainly in agroindustrial products that the subregion consumes and is not necessarily able to self-provide. In this way, many of the products that Jamaica exports to Central America have great growth potential. Up to now, Jamaica exports an average of 70 products to the subregion, at the 6-digit Harmonized System level, with Nicaragua and Honduras having the lowest product penetration, and Panama receiving the greatest product variety. For more sector results see annex B.16.

Table 29 - Jamaica: bilateral trade in the scenario with a FTA with Central America
(in millions of US dollars and percentage changes with respect to the baseline scenario)

Sectors	Baseline values, millions of US dollars (2007)			changes in percentages (2017-2020)	
	exports	imports	trade balance	exports	imports
Agricultural and livestock	0.0	0.6	-0.6	0.0	3.9
Bauxite mining and alumina	0.0	0.0	0.0	0.0	0.0
Agroindustry	0.3	21.4	-21.1	65.1	4.2
Textiles, clothing and footwear	0.0	15.8	-15.8	38.0	22.0
Wood and paper	0.1	13.9	-13.8	1.5	0.7
Chemical and petrochemical	0.4	9.7	-9.4	17.9	5.9
Non-metallic mineral products	0.0	10.0	-10.0	0.0	4.4
Machinery and equipment	0.0	8.9	-8.9	2.0	18.3
Other manufactures	0.3	5.3	-5.0	6.9	9.0
Goods	**1.0**	**85.6**	**-84.7**	**31.0**	**9.5**
Services	**15.3**	**40.8**	**-25.5**	**4.9**	**4.3**
Total goods and services	**16.3**	**126.5**	**-110.2**	**6.4**	**7.8**

Source: ECLAC, based on simulations of CGE model calibrated for Jamaica and an ad hoc assumption regarding trade in services.

To complement the results of the CGE analysis, individual products were analyzed based on the trade patterns of Jamaica and the countries in the study to see what unexploited complementarities could be harnessed to expand bilateral trade volumes. These are specific products at the Harmonized System 6-digit level for which Jamaica has a comparative advantage in its exports, taking into account that the countries in the study demand these products.

The results for the analyzed Caribbean partners show a number of products where complementarities exist across the agricultural, agroindustrial, chemical and petrochemical, and selected machinery and equipment sectors. The chemical and petrochemical and machinery and equipment sectors include products that are more complex, and an expansion of exports in these categories have the potential to enhance capacities in Jamaica's manufacturing sector. The products in these sectors listed below in Table 30 are imported by at least two Caribbean partners in each case with higher than typical intensity and present viable opportunities for expanded trade given that Jamaica already exports them with higher intensity than most other countries that produce them.

Table 30 - Jamaica: Sectors and products with positive RCA in the Caribbean market
(*products with RCA > 0.33 in imports of the trade partner*)

Products with RCA > 0.33	Bahamas	Cuba	Haiti	Dominican Republic
Selected Agricultural products and agroindustry products (food and beverage)				
Papaws (papayas), fresh (080720)	X		X	
Pepper of the genus Piper, crushed or ground (090412); Meat, meat offal and blood, prepared or preserved, nes (160290)	X	X		X
Cocoa powder, sweetened (180610); Tomato ketchup and other tomato sauces (210320)	X	X	X	X
Infant foods of cereals, flour, starch or milk, retail (190110); Single fruit, veg juice nes, not fermented or spirited (200980); Mixtures of juices not fermented or spirited (200990); Rum and tafia (220840)			X	X
Sweet biscuits, waffles and wafers (190530); Soups and broths and preparations thereof (210410); Protein concentrates and te1tured protein substances (210610); Vodka (220860); Animal feed preparations nes (230990)		X		X
Sauces nes, mixed condiments, mixed seasoning (210390); Fermented beverages nes (eg cider, perry, mead, etc) (220600)		X	X	
Vermouth and other flavoured grape wines - pack > 2l (220590); Salt (sodium chloride) including solution, salt water (250100)	X			X
Selected chemical and petrochemical products				
Cement clinkers (252310)			X	X
Portland cement, other than white cement (252329)	X		X	
Petroleum oils&oils obta (271000)	X			X
Resinoids (330130)		X	X	
Soaps, for toilet use, solid (340111)	X	X	X	X
Soaps for purposes other than toilet soap, solid (340119)	X	X	X	
Selected machinery and equipment products				
Containers for compressed/liquefied gas, iron or steel (731100)	X	X		
Electrodes, coated, of base metal, for arc welding (831110)		X	X	
Construction equipment, not self-propelled nes (843069)	X		X	
Welding machinery not gas-operated (846880)	X	X		
Office duplicating machines (847210)		X		X
Cinematographic cameras for film >16mm wide (900719)		X	X	

Source: ECLAC based on an analysis of IRCA.

The analysis of revealed comparative advantages in the Mexican market showed a few agroindustrial products with potential, mainly cereals, soup preparations, and maize-based foods. However, in the case of alcoholic beverages, a strong intra-industrial trade intensity was detected. In fact, exports of alcoholic beverages accounted for 46% of Jamaica's total exports to Mexico in 2014.

The same analysis for the Central American countries shows the existence of a large group of products with the characteristics described above in the food, beverages and tobacco, chemical and petrochemical sectors, as well as some particular manufactures. This potential has yet to be exploited by Jamaica, since there are still few products exported to these countries. To Nicaragua, for example, the number of products exported does not exceed ten. In the case of products exported to Guatemala and Honduras, the number is a little bit higher, and of the total of the products on the list that Jamaica could export to Mexico and Central America, there is still a set of products that are not yet being exported. Jamaica could introduce new products to the Central American market in which demand is already evident. For example cereal-based foods, sauces and condiments,

biscuits, animal feeds, fruit juices, and countless alcoholic beverages (rum, vodka, vermouth, frothy liquids, among others) as well as toiletries and chemicals and petrochemicals such as cement (Table 31).

Table 31 - Jamaica: Sectors and products with positive RCA in the Mexican and Central American market

(*products with RCA > 0.33 in imports of the trade partner*)

Products with RCA > 0.33	Mexico	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Panama
Selected Agricultural products							
Beans, small red (Adzuki) dried, shelled (071332); Pepper of the genus Piper, crushed or ground (090412); Papaws (papayas), fresh (080720)						X	X
Selected agroindustry products (food and beverage)							
Cereal foods, roasting of cereal (190410); maize (corn) groats or meal (110313); Caramel and artificial honey (170290); Mixed condiments, mixed seasoning (210390); tomato ketchup and other tomato sauces (210320); soups and broths and preparations thereof (210410); Non-alcoholic beverages (220290); Cofee extracts, essence (210111); Wheat of meslin flour (110100); Protein concentrates (210610); Fruit, edible plants prepared/preserved (200899); Sweet biscuits, waffles and wafers (190530); Infant foods of cereals (190110);Communion wafers, rice paper (190590); Beer made from malt (220300); Vermouth and other flavoured grape wines pack>21 (220590); Rum and tafia (220840); Animal feed preparations (230990).	X	X		X	X	X	X
Single fruits, vegetable juice fruits (200980); Beverage waters, sweetened or flavoured (220210); Cocoa powder, sweetened (180610); Vodka (220860)					X	X	
Soya sauce (210310); Cheese except fresh, grated, processed or blue-veined (040690); Grapefruit juice, not fermented or spirited (200920); Alcoholic liqueurs nes (220890)							X
Selected chemical and petrochemical products							
Cement clinkers (252310); Soap for purposes other than toiled soap, solid (340119); Soap for toilet use, solid (340111) Petroleum oils (271000)		X		X	X	X	X
Portland cement, other than white cement (252329); Ice snow and potable water not sweetened or flavoured (220190)						X	
Powders, for skin care and make-up (330491); Bituminous mix, mastic from asphalt (271500)							X

Source: ECLAC based on an analysis of IRCA.

6.5. Socioeconomic Results

6.5.1. Effects on wages

Changes in wages in each of the scenarios indicate that, in general, the increase in wages for both salaried and non-salaried employees is greatest in the case of an FTA with Central America, though in none of the cases are the changes greater than 1%. In Central America, the increase in wages for salaried and non-salaried employees is 0.22% and 0.23%, respectively (See Figure 24). The case of Mexico follows as the next most significant.

These changes derived from the macro model (CGE model) and the various simulated scenarios could not be translated into effects on income levels due to the lack of disaggregated information for salaried and salaried employment. Both the household survey and the employment survey with which the study was conducted lacked sectoral information that would allow for the decomposition of salaried and non-salaried work. Due to this limitation in the data it was not possible to derive sectoral effects on the income of households due to wage changes. For this reason, only results of the change in prices on household spending are presented in the following section.

Figure 24: Jamaica, changes in wages in every scenario simulated
(Percentage changes with respect to the baseline scenario)
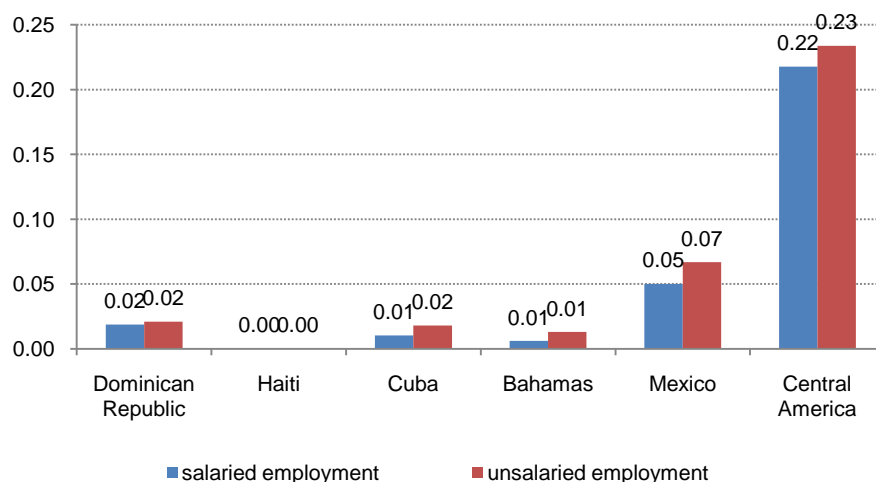
Source: ECLAC, based on simulations of GCE model calibrated for Jamaica

6.5.2. Effects of prices on households spending

The estimation of the effect of changes in prices on household expenditure can be seen in Table 32. In general, the effect of the change in prices on spending is limited but negative. The most negative effect represents a change of -0.29% for the first quintile of households if the agreement with Central America is to be signed. In all cases of the agreement with Central American countries, the effects are negative but regressive, meaning the lower quintiles are more affected. This is explained by the fact that, in general, the prices that rise in the case of trade liberalization with Central America are centered in basic food, which represents a significant portion of the expenditures of low-income households.

Table 30 - Change in expenditure level over the baseline scenario

Quintiles	Central America	Mexico	Cuba	Bahamas	Haiti	Dominican Republic
1	-0.29%	0.03%	0.01%	0.01%	0.00%	-0.10%
2	-0.24%	0.02%	0.00%	0.00%	0.00%	-0.05%
3	-0.28%	0.01%	0.00%	0.00%	0.00%	-0.04%
4	-0.23%	0.01%	0.00%	0.00%	0.00%	-0.02%
5	-0.12%	-0.02%	-0.01%	0.00%	0.00%	0.00%

Source: ECLAC, based on the output of the CGE model and the microsimulation model.

The positive effects are concentrated in the scenario of an eventual agreement with Mexico and the benefits flow mainly to the first quintile. The effects of a possible agreement with Mexico are rather positive and progressive, meaning the foremost beneficiaries are the poorest, although the effect is much smaller. The changes to household expenditure resulting from possible agreements with Cuba and Haiti are practically zero.

In short, the opening of Jamaica to these countries produces small but negative changes in the level of household expenditure, which can lead to a welfare loss if they are not accompanied by similar increases in income resulting from the agreement itself. This aspect, however, cannot be analyzed for the limitations in the data. In this sense, the only agreement that increases the level of spending is the treaty with Mexico.

6.5.3. Effects on employment

In terms of employment, the results are generally positive, as can be seen in Table 33. The aggregate results generate an increase in employment in all scenarios except in the scenario of an agreement with Central America.

Table 31 - Change in the sectoral employment with respect to the baseline scenario

No	Sector	Dominican Rep.	Haiti	Bahamas	Cuba	Mexico	Central America
1	Agricultural and livestock	0.01%	0.00%	0.02%	0.01%	0.03%	0.14%
2	Bauxite mining and alumina	-0.02%	0.00%	-0.02%	0.01%	0.02%	-0.38%
3	Foods	0.00%	0.00%	0.03%	0.01%	0.03%	0.07%
4	Beverage	-0.03%	0.00%	0.05%	-0.01%	-0.63%	-0.18%
6	Textiles, clothing and footwear	0.02%	0.00%	0.44%	-0.03%	0.03%	0.20%
7	Wood and paper	0.04%	0.00%	0.20%	0.00%	0.03%	0.22%
8	Petrochemical	-0.01%	0.00%	0.02%	-0.11%	0.04%	-0.06%
9	Rubber and plastic	0.04%	0.00%	0.15%	-0.05%	-0.01%	0.20%
10	Non-metallic mineral products	0.14%	0.00%	-0.01%	0.11%	-0.03%	0.46%
11	Machinery and equipment	-0.01%	0.00%	0.00%	-0.07%	0.02%	0.08%
12	Other manufactures	-0.01%	-0.01%	0.30%	-0.40%	0.03%	-0.34%
13	Government	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
14	Construction	-0.01%	0.00%	0.00%	-0.01%	-0.04%	-0.04%
15	Other services	0.00%	0.00%	-0.01%	0.00%	0.02%	-0.04%
16	No previous Industry	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Total	0.00%	0.00%	0.01%	0.00%	0.01%	-0.01%

Source: Own Calculations based in the output of the CGE model and the microsimulation model

As can be seen in Table 33, there is a varied dynamic in terms of changes in employment by sector. This opens up the possibility for complementary policies that point to potential effects in sectors where openness is beneficial and helps workers in sectors that are harmed by the opening. In particular, this holds for the construction sector that is negatively affected in almost all the possible scenarios.

7. Conclusions

This study evaluated the possible effects of free trade agreements to be signed between Jamaica and a number of countries with which it has the potential to deepen its commercial relations in the region. The partners analyzed include Cuba and the Dominican Republic, which while party to trade agreements with CARICOM, have not fully liberalized trade with Jamaica. The Bahamas, which is a member of CARICOM but does not participate in the CARICOM Single Market, and Haiti, which is only a partial participant in the CARICOM Single Market, were also analyzed. Finally, the study also evaluated the potential impacts of the deepening of trade relations with Mexico and the countries of Central America.

To evaluate such effects, a CGE Model for Jamaica was calibrated from the Input-Output Table, Supply and Use Tables, and a Social Accounting Matrix for the year 2007, the most recent year available, to estimate the effects of possible free trade agreements with the previously mentioned countries.

The particular exercises performed were complemented by the calculation of a set of trade indicators, namely the Herfindahl-Hirschman index to measure the concentration/diversification of trade, the Grubel Lloyd index

to determine the greater or lesser degree of intra-industrial integration, and the Index of Revealed Comparative Advantage, to determine the set of products from Jamaica's export basket that could have potential in the selected markets of interest.

Likewise, to derive the potential socioeconomic effects, microsimulation exercises were carried out using the Jamaican income and expenditure survey for the year 2014. For the determination of the particular effects on poverty and income distribution, changes in the index of consumer prices were obtained, which were derived from the different policy simulations with each partner.

The greatest macroeconomic effects occur when Jamaica signs trade agreements with Mexico and Central America. In these cases, production increases of 0.01% and 0.03%, respectively, would be expected, with slight increases in private investment and consumption. The results of the macroeconomic aggregates obtained from the CGE model showed that more profound trade agreements with the Cuba, Haiti, the Bahamas and the Dominican Republic would have little impact on consumption, investment, trade, and production. In general, the percentage changes over the baseline for these three agreements did not yield significant results. Among these Caribbean partners, only small increases were observed in the case of exports to the world in the FTAs with Cuba and the Dominican Republic (0.01%).

The only significant impacts perceived in the case of these FTAs with Caribbean partners occur bilaterally, where the largest absolute net changes in trade in goods observed in agreements with Cuba and Haiti, though these countries account for only 0.1% and 0.4% of Jamaica's total exports, respectively. Although goods exports increase most in the case of FTAs with Mexico and the Bahamas, the increase in imports from these countries enlarges the bilateral deficits with these partners.

The simulated FTA with the countries of Central America shows the greatest estimated increase in trade flows in growth terms, primarily in exports. In absolute terms, the expansion of imports to Jamaica from the region is expected to be greater than the change in Jamaican exports. Nonetheless, deepening trade relationships with Central American partners with whom Jamaica currently has very little trade, could likely lead to an interesting expansion in the set of products exported by Jamaica. This includes mainly agroindustrial products that the subregion consumes and is not necessarily capable of self-providing. Similarly, deepening bilateral trade relations between Jamaica and the Dominican Republic would result in a greater expansion in imports from the Dominican Republic than in Jamaican exports, but the simulations capture the complementary nature of the trade relations of both countries, which could present opportunities for greater export diversification.

Another important element of the simulation results is that Jamaica could access cheaper imports from Mexico and Central America, which could improve its competitive position in exports to other destination markets including Central America, other Caribbean countries, mainly fellow CARICOM member countries, including Haiti, as well as Cuba and the Dominican Republic.

A special mention must be made in the case of the services sector, which was estimated to be largely linked to the provision of goods for export. Transport services, real estate activities, leasing of real estate, vehicles, and machinery and equipment, as well as the use of telecommunications services, are particularly important. The particular analysis of export output, through a forward linkages analysis, showed that the transfer of goods to satisfy export needs is markedly relevant in the cases of bauxite extraction and aluminum processing, as well as in the manufacture of sugar and molasses, and the manufacture of chemical and petrochemical products. The increased demand for imported goods from the agroindustrial, as well as the chemical and petrochemical sectors, will also have an indirect impact on the provision of services incorporated in goods exports.

On the other hand, the tourism sector, mainly the provision of restaurant and hotel services, recreational and sports services, requires inputs from other service sectors such as electricity, retail and wholesale trade, and agroindustrial manufactures such as processing of food, beverages, bakery products, meats, as well as the production of eggs and poultry. It was estimated that an increase in total services by 5%, mainly from travel tourism, would increase the expected positive effects of the FTAs considered, especially those signed with Mexico and the Central American countries.

If Jamaica subscribes to a broad spectrum and multi-country FTA in a comprehensive agreement with all partners considered in each of the simulations, it would receive a more significant positive impact on its levels of production and trade. Jamaica would experience production increases in sugar cane, cereals, sugar, leather, bauxite and aluminum, beverages and tobacco, petrochemicals, transport services and other services. However, the country must be prepared for an event like this as there are clearly national sectors of the country that will receive competition from these countries. For example, the textile and clothing sector, the industry that produces animal feed, and much of the agricultural and livestock production are likely to be affected. A more gradual liberalization in vulnerable sectors is important to ensure the minimization of the negative impacts of trade liberalization.

Results on the socioeconomic effects of signing the analyzed trade agreements indicate that after the signing of an FTA with Central America, a scenario that appears more dynamic, there would be welfare increases in the middle and high income sectors of the population, with less impact on low income sectors. Part of the explanation for this result is found in Jamaica's scant production scale. A number of sectors are driven by production and trade to the rest of the world at the expense of local production. This could lead to higher domestic prices, mainly for food and agro-industrial products, all essential products in the basket of the most vulnerable sectors (sugar, coffee, cocoa, meat, milk and other products).

In order to maximize the gains from trade liberalization with its neighbors in the Caribbean Basin, and especially with Central America and Mexico, it is important that Jamaica apply policies to stimulate increases in the productivity of the services associated with trade of goods. This will ensure a better competitive environment for the country. Moreover, policies to promote the creation of beneficial linkages between various sectors across services, manufacturing and primary production could further contribute to the development of value chains and economic diversification.

ECLAC recommends a set of policy actions to help Jamaican producers take advantage of the benefits that could accrue from deeper trade relations with the partners analyzed in this study. These include measures to:

- Increase the technical capacities and export market knowledge of the main actors involved in the provision of services, in such a way that each sector clearly knows the characteristics of their respective sectors in terms of supply capacity, regulatory standards, and above all common challenges to address;
- Expand the promotion of Jamaican exports in the region through activities that enhance awareness of Jamaican producers with a specific focus on product categories in which Jamaica enjoys a competitive advantage;
- Strengthen the institutional capacity of public agencies linked to trade;
- Focus public and private actions on the identification of specific needs that favor the increase of sectoral competitiveness. For example, retaining high-skilled human capital by reducing the migration of technicians, promoting partnerships of tourism-related service providers to promote approaches such as all-inclusive, ecotourism, etc.;
- Encourage coordination between public bodies to ensure the coherence of development policies to be promoted; and
- Take advantage of flexibility in rules of origin requirements to support the development of intra-regional value chains. Though Jamaica's trade relationship with other CARICOM partners is largely inter-industrial, there is ample evidence indicating the potential for stronger intra-industry linkages (ECLAC, 2014). The modeled results and RCA analysis conducted in this study provide an empirical basis to identify individual products and product categories through which these linkages can be strengthened.

Special attention must be given to the agroindustrial sector, a sector that appears with greater potential in the target markets analyzed in the study. Export promotion policies focused on strengthening exporting capacities for companies that produce agro-industrial products should be a priority. Some actions with the potential to enhance international integration of Jamaican companies in this sector are:

- Market intelligence studies to detect winning products in each market of interest. These studies should include cultural elements that could affect the demand for products of Jamaican origin (flavour, texture, market differentiation). In addition, the identification of exportable supply sufficient to meet the demand in the target markets should be prioritized;
- Training in compliance with quality standards and technical requirements necessary to enter Spanish-speaking markets, especially Mexico and the countries of Central America;
- Increase the value added content incorporated into agro-industrial exports either through the improvement of packaging, cold chain, labeling, as well as advertising and marketing techniques aimed at new markets;
- Identify a country brand strategy that includes the identification of exotic niche products of Jamaica and promotes the country's image. Canned or preserved special products (soups, sauces, cakes, purés, among others); liquors and drinks (rum, beer, malt, etc.);
- Facilitate the participation of Jamaican producers in fairs of small and medium producers in Central American countries. This includes special missions that identify potential buyers, especially in food and beverages; and
- Support research in Universities and local Research Centers on innovation processes in the design of non-traditional products identified for the target markets.

The aforementioned policies must be accompanied by additional efforts by the local business community in order to boost their investment efforts and expansion of productive capacity, mainly in niche rather than extension markets. This strategy is much more viable than one that seeks to increase market share only.

ECLAC also recommends the promotion of actions to reduce the high administrative costs that have a negative impact on the capacity to export. Some measures and actions in this direction are:

- Reducing the number of administrative controls and customs procedures necessary to export, both at maritime and airport customs.
- Introducing technological facilities that accelerate customs procedures. This includes the use of digital certificates, and electronic data transfer, among other measures.

Effective execution of this approach will require the involvement and cooperation of multiple Government Ministries, Departments and Agencies in conjunction with the private sector. Clearly, Jamaica will need the implementation of complementary policies to counter the undesirable effects of a possible liberalization.

8. Bibliography

Armington, P. (1969), A Theory of Demand for Products Distinguished by Place of Production, International Monetary Fund Staff Papers, Vol. 16 (1), pp. 159-178.

Ayub, Mahmood (1981), Made in Jamaica: The Development of the Manufacturing Sector, World Bank Staff Occasional Papers, No. 31

Bank of Jamaica (2017), Bank of Jamaica 2016 Annual Report.

Berrettoni, Daniel and Cicowiez, Martín (2005), El acuerdo de libre comercio MERCOSUR–Comunidad Andina de Naciones: Una evaluación cuantitativa, Serie estudios estadísticos y prospectivos, CEPAL, Naciones Unidas.

Berrettoni, Daniel and Cicowiez, Martín (2005), El acuerdo de libre comercio MERCOSUR Comunidad Andina de Naciones: Una evaluación cuantitativa,Serie estudios estadísticos y prospectivos, Comisión Económica para América Latina y el Caribe.(CEPAL), Naciones Unidas

Blanchflower, D. and A. Oswald (1994), The Wage Curve, MIT Press

Bourguignon, François, Maurizio Bussolo and Luiz Awazu Pereira da Silva (eds.) (2008), The Impact of Macroeconomic Policies on Poverty and Income Distribution: Macro-Micro Evaluation Techniques and Tools. World Bank and Palgrave Macmillan.

Bourguignon, François, Robilliard, Anne Sophie and Robinson, Sherman (2008),"Examining the Social Impact of the Indonesian Financial Crisis Using a MacroMicro Model," Open Access publications from Université ParisDauphineurn:hdl:123456789/5130, Université ParisDauphine.

Bussolo, Maurizio and John Cockburn (eds.) (2010), Macro-Micro Analytics: A Guide to Combining Computable General Equilibrium and Microsimulation Modelling Frameworks. The International Journal of Microsimulation.

Caribbean Development Bank (2016), 2015 Economic Review, 2016 Forecast. Caribbean Development Bank, St. Michael, Barbados.

Cicowiez, Martín (2009), La evaluación cuantitativa de políticas económicas: el enfoque Macro- Micro. In O. O. Chisari (ed.). Progresos en Economía Computacional. Asociación Argentina de Economía Política y TEMAS Grupo Editorial. Buenos Aires.

De Melo, J. and Robinson, S. (1989), Product differentiation and the treatment of foreign trade in computable general equilibrium models of small economies, Journal of International Economics, Vol. 27(1-2), pp. 47-67.

Dennis, A. and Shepherd, B. (2011), Trade Facilitation and Export Diversification, The World Economy, Vol. 34 (1), pp. 101-122.

Dervis, K., de Melo, J. Robinson, S. (1982), General Equilibrium Models for Development Policy, World Bank.

Duran, J. and Zaclicever, D. (2013), "América Latina y El Caribe en las cadenas internacionales de valor", Serie Comercio Internacional, N 124 (LC/L.3767), Santiago de Chile, CEPAL.

ECLAC (2013), Nota Técnica: Evaluación de los posibles impactos de la Adhesión plena del Ecuador al MERCOSUR. Abril de 2003.

ECLAC (2014), Latin America and the Caribbean in the World Economy. Regional integration and value chains in a challenging external environment. October. http://www.cepal.org/en/publications/type/latin-america-and-caribbean-world-economy

ECLAC (2017), Evaluación de los posibles impactos de un acuerdo comercial entre el Ecuador y la Unión Europea. Documento de Proyecto. Available at: http://www.cepal.org/es/publicaciones/40924-evaluacion-posibles-impactos-un-acuerdo-comercial-ecuador-la-union-europea.

Finot, Alfonso (2016), The Impact of Trade Facilitation Measures on International Trade Flows: An application to Central America. Mimeo.

Ghodsi, M., Grübler, J., & Stehrer, R. (2016). Estimating importer-specific ad valorem equivalents of non-tariff measures. "Wiener Institut für Internationale Wirtschaftsvergleiche"(wiiw).

Ghodsi, M., J. Grübler, O. Reiter and R. Stehrer (2017), The Evolution of Non-Tariff Measures and their Diverse Effects on Trade, wiiw Research Report, No. 419, May.

GTA (2017), Global Trade Alert Database. Available from: http://www.globaltradealert.org/data_extraction

IMF (2016), World Economic Outlook: Subdued Demand, Symptoms and Remedies, October. Available at: http://www.imf.org/external/pubs/ft/weo/2016/02/

IMF (2017), Interview with Niel Clark, Jamaica's Ambassador of Economic Affairs and Deputy Chair of the Economic Growth Council. Available at: https://www.imf.org/en/News/Articles/2017/05/09/na051017-jamaicas-economic-reform-and-growth-interview-with-nigel-clarke.

International Trade Centre (2013), Jamaica: Company Perspectives, Technical Paper: An ITC Series on Non-Tariff Measures. Available from: http://www.intracen.org/publications/ntm/Jamaica/

Gallimore, Courtney L., (1994), A tariff for Jamaica: a computable general equilibrium analysis. Iowa State University. Digital Repository. Retrospective Theses and Dissertations. http://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=11747&context=rtd

Hudson, Suzette, (2003), Trade Liberalization and the Jamaican Economy: Prospect and Effects of Tariff Adjustment. Bank of Jamaica. October.

Lofgren, H., Harris, R.L. and Robinson, S. (2002), A Standard Computable General Equilibrium (CGE) Model in GAMS, Microcomputers in Policy Research, No. 5, International Food Policy Research Institute.

McLean S. and Khadan, J. (2015), An assessment of the performance of CARICOM extraregional trade agreements. An initial scoping exercise. Studies and perspectives series, ECLAC, Santiago de Chile.

McLean S., Pantin, M. and Skerrette, N. (2014), Regional integration in the Caribbean. The role of trade agreements and structural transformation. Studies and perspectives series, ECLAC, Santiago de Chile.

Ministry of Science and Technology (2015), An Overview of Jamaica's Electricity Sector. Available at http://mset.gov.jm/overview-jamaicas-electricity-sector.

Organización Mundial de Comercio, OMC (2015), Informe sobre el Comercio Mundial 2015. Ginebra.

Planning Institute of Jamaica (2016), Economic & Social Survey Jamaica 2016: Overview. Ministry of Finance and Planning. Jamaica.

Planning Institute of Jamaica (2015), Economic & Social Survey Jamaica 2015. Ministry of Finance and Planning. Jamaica.

Planning Institute of Jamaica (1988), Terms of reference, Schedule of Activities, and Budget: Tariff Reform Programme. Kingston: P.I.O.J.

Ravallion, M. and M. Lokshin (2004), Gainers and Losers from Trade Reform in Morocco, World Bank Policy Research Working Paper 3368, August.

Robilliard, Anne-Sophie, François Bourguignon and Sherman Robinson (2008), Crisis and Income Distribution: A Micro-Macro Model for Indonesia. In Bourguignon, François, Maurizio Bussolo y Luiz Awazu Pereira da Silva (eds.) The Impact of Macroeconomic Policies on Poverty and Income Distribution: Macro-Micro Evaluation Techniques and Tools. World Bank and Palgrave Macmillan.

STATIN (2017a), Population Statistics. Available at: http://statinja.gov.jm/Demo_SocialStats/PopulationStats.aspx.

STATIN (2017b), Gross Value added by Industry. Available at: http://statinja.gov.jm/NationalAccounting/Annual/NewAnnualGDP.aspx.

Traca, D. and Dutt, P. (2007), Corruption and tariffs as barriers to imports, Université libre de Bruxelles, ULB Institutional Repository.

Tsikata, Moreira and Hamilton (2009), Quantifying the Gains from Global Trade Integration – A Dynamic Macroeconomic Analysys. In chapter 4 of the Wold Bank book "Accelerating Trade and Integration in the Caribbean Policy Options for Sustained Growth, Job Creation, and Poverty Reduction". A World Bank country study. No 49623.

UNCTAD (2015), International Classification of non-tariff measures. 2012 Version, New York and Geneva. Available from: http://unctad.org/en/PublicationsLibrary/ditctab20122_en.pdf

UNCTAD (2015), Trade Policy Framework: Jamaica. United Nations, Geneva.

Varma, S., Ramos Oliveira, L.E., Antonio, M. and Beckerman, P.E. (2015), Jamaica - Laying the foundations for growth and debt sustainability. Jamaica economic update; no. 2. Washington, D.C. : World Bank Group.

Weiss, J. (1985), National Economic Parameters for Jamaica. Ocassional Paper No. 7. Project Planning Centre for Developing Countries. Bradford: University of Bradford.

World Bank (2017a), World Development Indicators. Available at: http://data.worldbank.org/data-catalog/world-development-indicators.

World Bank (2017b), Doing Business 2017 Jamaica Report.

World Bank (2004), The road to sustained growth in Jamaica. World Bank Country Study. Washington, DC: World Bank. Available at: http://documents.worldbank.org/curated/en/593241468752950633/The-road-to-sustained-growth-in-Jamaica.

A. Appendix 1: CGE model*

Computable general equilibrium models can be multi-country or - as used here - focus their attention on a single country. In the first case, the information necessary for the calibration is given by a collection of Social Accounting Matrices connected by commercial flows. Typically, such information is obtained from the Global Trade Analysis Project (GTAP) database. However, the process that is required to gain consistency regarding the information of different countries often means that information for individual countries does not reach a minimum quality standard, particularly in the case of small countries. In turn, an intermediate approach is used in this paper, using a model for Jamaica but allowing for the disaggregation of exports and imports (and tariff collection) by trade partner. In general terms, the advantage of a model like this over another calibrated with the GTAP database is that it allows capturing in more detail the specificities of the economy that is modeled. Furthermore, the commercial partners of the country under study are modeled relatively rudimentarily. In particular, they only appear through functions of demand for exports and supply of imports.

In the model, only exports and imports are "bilateralized", i.e. disaggregated by partner. All other transactions of Jamaica with the rest of the world are represented by a unique origin/destination.

A.1. Mathematical Presentation of the Model

In the mathematical presentation of the model, the following subscripts are used:

$i = j$ = productive sectors/products,

h = households, and

r = trade partners.

---

* The content of this appendix is based on ECLAC (2013).

In addition, the following notation is used: capital letters for endogenous variables, lowercase letters for exogenous variables, Greek letters for behavioral parameters; quantities and prices start with *Q* and *P*, respectively.

In the following, a simplified version of our model is presented. In particular, the following elements are omitted:

- the existence of unemployment modeled by a wage curve;

- marketing and transportation margins. We differentiate between margins of trade and transport on exports, imports, and domestically produced goods;

- differentiation between activities and products;

- the production function explicitly differentiates between value-added and intermediate inputs, which gives flexibility when selecting the elasticity of substitution between the two;

- a more detailed treatment of transfers between institutions;

- a more detailed treatment of factor incomes to / from the rest of the world;

- a more detailed treatment of international trade. Particular cases are contemplated when a product is only exported, imported, or only bought/sold domestically;

- alternative macroeconomic closure rules (for example, flexible household savings rates);

- the institutional sector "companies" is explicitly modeled;

- the variation of inventories is disaggregated into public and private ones;

- the government can receive factor incomes. Typically, this is the case of a government with public oil companies;

- the possibility of replacing the intermediate demand for energy inputs; and

- public investment in infrastructure can have positive effects on total factor productivity.

A.2. Equations and Variables

The equations of the model are organized in the following blocks: production, international trade, income and saving, final consumption, equilibrium conditions, and dynamics.

A.2.1. Production

In this section, the production technology is described. First, the composition by primary production factor (labor and capital) of the value added is determined. For this, the first order conditions of the optimization problem that the companies solve are used; see Equations (FP1) to (FP3). The value-added production technology is of type CSE (constant substitution elasticity). Intermediate inputs are a fixed proportion of output, see Equation (FP4). Implicitly, both the value added and the intermediate inputs are used in a fixed proportion of the level of production of each activity.

$$QX_i = \left(\delta_i^L L_i^{-\rho_i^{VA}} + \delta_i^K K_i^{-\rho_i^{VA}} \right)^{\frac{1}{\rho_i^{VA}}} \tag{FP1}$$

$$L_i = \left(\frac{PVA_i}{W}\right)^{\sigma_i^{VA}} \left(\delta_i^L\right)^{\sigma_i^{VA}} QX_i \tag{FP2}$$

$$K_i = \left(\frac{PVA_i}{R_i}\right)^{\sigma_i^{VA}} \left(\delta_i^K\right)^{\sigma_i^{VA}} QX_i \tag{FP3}$$

$$QINT_{i,j} = io_{i,j} QX_j \tag{FP4}$$

where

K_i	= Capital demand,
L_i	= Labor demand,
PVA_i	= Price of the value-added;
$QINT_{i,j}$	= Intermediate consumption,
QX_i	= Production,
R_i	= Remuneration of capital (can vary between sectors),
W	= Wage (remuneration of labor),
δ_i^K	= Share of capital in value-added in the sector,
δ_i^L	= Share of labor in value-added in the sector,
σ_i^{VA}	= Substitution elasticity in value-added in the sector,
$\rho_i^{VA} = \left(1 - \sigma_i^{VA}\right)/\sigma_i^{VA}$, and	
$io_{i,j}$	= input-output coefficient.

Equation (FP5) implicitly calculates the price of the value-added. The other variables that appear in this equation are determined in other parts of the model.

$$PVA_j = PX_j\left(1 - tx_j\right) - \sum_i PQ_i io_{i,j} \tag{FP5}$$

where

PQ_i	= Consumer Price of product i (imports + domestic),
PX_j	= Producer price of product i (exports + domestic), and
tx_j	= Production tax rate.

A.2.2. International Trade

The treatment of international trade is standard in the literature that employs CGE models. In particular, Armington (1969) assumes that the products differ according to their country of origin. As a result, intra-industry trade can be relatively easily modeled: the same product is exported and imported simultaneously.

Equations (PW1) and (PW2) define domestic prices (i.e., in Jamaica) of bilateral imports and exports, respectively. The model allows the imposition of tariffs on imports and taxes on exports. As can be seen, both world prices and taxes on international trade are bilateral. Consequently, the exogenous variable $tm_{i,r}$ can be used to simulate, for example, a reduction of the tariff Jamaica applies to imports of product i from trading partner r. On the other hand, changes in the tariff rates of trading partners can be simulated as explained below.

$$PMR_{i,r} = (1 + tm_{i,r})EXR.pwmr_{i,r} \qquad \text{(PW1)}$$

$$PER_{i,r} = (1 - te_{i,r})EXR.PWER_{i,r} \qquad \text{(PW2)}$$

where

$PER_{i,r}$	= Domestic price of bilateral exports,
$PMR_{i,r}$	= Domestic price of bilateral imports,
EXR	= Exchange rate,
$PWER_{i,r}$	= FOB price of exports to r,
$pwmr_{i,r}$	= CIF price of imports from r,
$te_{i,r}$	= Tax rate of bilateral exports, and
$tm_{i,r}$	= bilateral tariff rate.

Consumption: Imports. On the consumption side, it is sought to minimize, in the first place, the cost of the total supply of each product, choosing the optimal domestic purchases / imports composition. In order to do this, a CES function is used, which assumes that there is an imperfect substitution between domestic purchases and imports (Equation (IM1)), following the assumption of product differentiation according to the country of origin. The Equation (IM2) is the tangency condition that determines how much of domestic product and how much of imported product is supplied. The Equation (IM3) determines the price of the product that combines domestic purchases and imports.

$$QQ_i = \left(\delta_i^M QM_i^{-\rho_i^Q} + \delta_i^{DD} QD_i^{-\rho_i^Q} \right)^{\frac{-1}{\rho_i^Q}} \qquad \text{(IM1)}$$

$$\frac{QM_i}{QD_i} = \left(\frac{PD_i}{PM_i} \frac{\delta_i^M}{\delta_i^{DD}} \right)^{\sigma_i^Q} \qquad \text{(IM2)}$$

$$PQ_iQQ_i = (PD_iQD_i + PM_iQM_i)(1 + tq_i) \qquad \text{(IM3)}$$

where

QD_i	= Sales/purchases of domestic products,
QM_i	= Total imports,
QQ_i	= Supply of product i (imports + domestic),
tq_i	= Consumption tax rate,
δ_c^M	= Share of imports in total supply,
δ_c^{DD}	= Share of domestic production in total supply,
σ_c^Q	= substitution elasticity in total supply, and

$$\rho_c^Q = (1 - \sigma_c^Q)/\sigma_c^Q .$$

Bilateral Imports. Equations (IM4) and (IM5) are used to model bilateral trade on the import side. The demand for bilateral imports (i.e. product i from country r) is determined in Equation (IM4). This equation arises from minimizing the cost of imports. The price of the import aggregate is calculated in Equation (IM5) as the weighted average of bilateral imports.

$$QMR_{i,r} = \left(\frac{PM_i}{PMR_{i,r}}\right)^{\sigma_i^{MR}} \left(\delta_{i,r}^{MR}\right)^{\sigma_i^{MR}} QM_i \left(\phi_i^{MR}\right)^{\sigma_i^{MR}-1} \tag{IM4}$$

$$PM_i QM_i = \sum_r PMR_{i,r} QMR_{i,r} \tag{IM5}$$

where

$QMR_{i,r}$ = Bilateral imports, and

$PM_{i,r}$ = Price of aggregated imports.

Production: Exports. On the production side, it is sought to maximize the value of the total sales of each product, choosing the optimal domestic sales/exports composition. Equations (EX1) and (EX2) determine domestic sales and total exports, respectively. The model assumes that there is a relationship of transformation between one and the other. In particular, a CET (Constant Elasticity of Transformation function is used to model this possibility. Thus, how much is sold to one and another market arises from solving a problem of maximizing the value of sales at sectoral level. The producer price is given in Equation (EX3).

$$QX_i = \left(\delta_i^E QE_i^{\rho_c^X} + \delta_i^{DS} QD_i^{\rho_i^X}\right)^{\frac{1}{\rho_i^X}} \tag{EX1}$$

$$\frac{QE_i}{QD_i} = \left(\frac{PE_i}{PD_i} \frac{\delta_i^{DS}}{\delta_i^E}\right)^{\sigma_i^X} \tag{EX2}$$

$$PX_i QX_i = PD_i QD_i + PE_i QE_i \tag{EX3}$$

where

QE_i = Total exports,

δ_i^E = Share of exports in total production,

δ_i^{DS} = Share of domestic production in total production,

σ_c^X = Transformation elasticity in total production, and

$\rho_c^X = \left(1 + \sigma_c^X\right) / \sigma_c^X$.

Bilateral Exports Supply. Equations (EX4) and (EX5) are used to model bilateral trade on the export side. The supply of bilateral exports (i.e. product i to country r) is determined in Equation (EX4). This equation arises from maximizing the income of exports. The price (PE_i) of the export aggregate ($QE_{i,t}$) is calculated in Equation (EX5) as the weighted average of bilateral exports.

$$QER_{i,r} = \left(\frac{PER_{i,r}}{PE_{i,r}}\right)^{\sigma_i^{ER}} \left(\delta_{i,r}^{ER}\right)^{-\sigma_i^{ER}} QE_{c,t} \left(\phi_i^{ER}\right)^{-\left(1+\sigma_i^{ER}\right)} \tag{EX4}$$

$$PE_i QE_i = \sum_r PER_{i,r} QER_{i,r} \tag{EX5}$$

where

$QER_{i,r}$ = Bilateral exports, and

$PE_{i,r}$ = Price of aggregated exports.

Bilateral Exports Demand. On the demand side, Jamaican exports to each country identified in the model face demand curves with negative slopes (see Equation (EDEM1)). Thus, it is possible to simulate tariff changes of

Jamaica's trading partners. In fact, Equation (EDEM2) computes the price faced by consumers in country r with respect to imports from Jamaica of commodity c. (To simplify the expression, insurance and freight costs are assumed to be zero.)

$$QER_{i,r,t} = \overline{qer}_{i,r,t}\left(\frac{P^*_{i,r,t}}{pwser_{i,r,t}}\right)^{-\eta_{i,r}} \tag{EDEM1}$$

$$P^*_{i,r,t} = PWER_{i,r,t}\left(1+t^*_{i,r,t}\right) \tag{EDEM2}$$

where

$\overline{qer}_{c,r,t}$	= Jamaican exports of product i to country r in the SAM,
$pwser_{c,r,t}$	= World price of the substitutes to Jamaican exports of product i to country r,
$\eta_{c,r}$	= price elasticity of the demand for Jamaican exports of product i to country r, and
$P^*_{c,r,t}$	= Price of product i that importers face in country r.

The modeling of bilateral trade allows us to simulate changes in tariffs imposed by trading partners on imports from Jamaica through reductions in t^*. It is worth mentioning that a reduction of t^* is expected to drop P^* while increasing $PWER$. The magnitude of such variations will depend on the value of domestic export elasticities of supply and demand for imports from the trading partner.

A.2.3. Income and Savings

Factors. Equations (YF1) and (YF2) compute total labor income and capital, respectively. In them, the first term to the right of the equal corresponds to the total of the payments to the factor that the productive sectors make. For its part, the second term includes transfers from the rest of the world.

$$YL = \sum_i W.L_i + trnsfr_{L,row} \tag{YF1}$$

$$YK = \sum_i R_i K_i + trnsfr_{K,row} \tag{YF2}$$

where

YL	= Labor income,
YK	= Capital income,
$trnsfr_{L,row}$	= Labor income from rest of the world, and
$trnsfr_{K,row}$	= Capital income from the rest of the world.

Households. Household income is obtained by adding (*i*) the remuneration they receive for the factors they own, and (*ii*) the transfers they receive from the other institutions in the model, see Equation (H1). Equation (H2) computes the amount saved by each representative household. In this presentation, the marginal propensity of households to save is assumed exogenous. Equation (H3) calculates household consumption expenditures as net income from savings and direct taxes. Equation (H4) defines the consumer price index as a weighted average of the demand price of the products.

$$YH_h = sh_h^L YL + sh_h^K YK + trnsfr_{h,gov}CPI + trnsfr_{h,row}EXR \tag{H1}$$

$$SH_h = mps_h YH_h\left(1 - ty_h\right) \tag{H2}$$

$$CON_h = YH_h\left(1 - ty_h\right) - SH_h \tag{H3}$$

$$\sum_i PQ_i cwts_i = CPI \tag{H4}$$

where

CPI = Consumer Price Index,

CON_h = Household consumption,

SH_h = Household saving,

YH_h = Household income,

$cwts_i$ = Weight of good c in the CPI,

mps_h = Marginal propensity of Households to save,

sh_h^L = Share of households in labor income,

sh_h^K = Share of households in capital income, and

ty_h = Direct tax rate.

Government. Equation (G1) computes government income as the sum of (*i*) tax revenue and (*ii*) the transfers it receives from the rest of the world. The government uses its income to buy goods and services and make transfers to households, see Equation (G2). Government savings are computed in Equation (G3) as the difference between current income and expenditure.

$$\begin{aligned} YG = &\sum_h ty_h YH_h \\ &+ \sum_i ta_i PA_i QA_i + \sum_i tq_i \left(PD_i QD_i + PM_i QM_i \right) \\ &+ \sum_i tm_i EXR.pwm_i QM_i + \sum_i te_i EXR.pwe_i QE_i \\ &+ trnsfr_{gov,row} EXR \end{aligned} \tag{G1}$$

$$EG = \sum_i PQ_i qg_i + \sum_h trnsfr_{h,gov} CPI \tag{G2}$$

$$SG = YG - EG \tag{G3}$$

where

PD_i = Domestic product price,

SG = Government savings,

EG = Government spending,

YG = Government income, and

qg_i = Government consumption.

Rest of the World. Equation (RW1) is the current account of the Balance of Payments, expressed in currency of the rest of the world. The left (right) side shows the foreign currency inflow (outflow). The current account balance of the Balance of Payments is the negative of the savings of the rest of the world.

$$\sum_i pwe_i QE_i + \sum_{ac} trnfr_{ac,row} + SROW = \sum_i pwm_i QM_i \tag{RW1}$$

where

$SROW$ = Savings of the rest of the world.

A.2.4. Final Consumption

Households decide how much to consume of each good according to a Stone-Geary utility function, from which a linear expenditure system (Equation (CF1)) is derived. Equation (CF2) calculates the consumption of product i for investment purposes. It is assumed that the composition by type of good of the investment is kept constant in the initial values. This means, in the face of an increase in the gross formation of fixed capital, the demand for investment of all goods increases in equal proportion. As we will see, the value of *RGFCF* is modified to equal saving and investment. For its part, public consumption is supposed to be exogenous.

$$QH_{i,h} = qhmin_{i,h} + \frac{\delta_{i,h}^{LES}}{PQ_i} \left(CON_h - \sum_j PQ_j qhmin_{j,h} \right) \tag{CF1}$$

$$QINV_i = \sum_i cc_i RGFCF + \sum_i cc_i^{GOV} RGFCF^{GOV} \tag{CF2}$$

where

$QH_{i,h}$	= Household consumption,
$QINV_i$	= Demand of product i for investment,
$RGFCF$	= Private fixed gross capital formation,
$RGFCF^{GOV}$	= Public fixed gross capital formation,
$qhmin_{i,h}$	= Minimum household consumption,
$\delta_{i,h}^{LES}$	= Marginal share of product i in household consumption,
cc_i	= Input-output coefficient of private capital good, and
cc_i^{GOV}	= Input-output coefficient of public capital good.

A.2.5. Equilibrium Conditions

Equations (EQ1) and (EQ2) correspond to the equilibrium conditions in labor and capital markets, respectively. In this presentation, factor supply is exogenous. As we have seen, the supply of each product - composed of domestic and imported goods - is destined for intermediate consumption, household consumption, government, investment, and stock change (EQ3). Equation (EQ4) refers to the equality between savings and investment. There are three institutions that can contribute to total savings: households, government, and the rest of the world.

$$ls = \sum_i L_i \tag{EQ1}$$

$$ks = \sum_i K_i \tag{EQ2}$$

$$\sum_h QH_{i,h} + \sum_j QINT_{i,j} + QINV_i + qg_i + qdstk_i = QQ_i \tag{EQ3}$$

$$IT + IT^{GOV} = \sum_h SH_h + SG + EXR.SROW \tag{EQ4}$$

where

IT	= Value of private investment,
IT^{GOV}	= Value of public investment,
ls	= Labor supply,
ks	= Capital supply, and

$qdstk_i$ = Stock change.

A.2.6. Dynamic; Investment by Destination

The dynamics of the model are described in this group of equations. In particular, we present the mechanisms used to allocate the investment that is made in each period between sectors. As we shall see, a distinction is made between stocks of public and private capital. In both cases, the investment of each period increases the capital stock of the following period.

Private Sector. In this case, it must be determined how the new capital is allocated between sectors. In our model, we assume for private investment that the new capital stock is allocated between productive activities according to the differences in the profitability of capital. That is, sectors with relatively high (low) capital returns will receive a relatively higher (lower) share of new capital. The price of a unit of private capital goods is calculated in Equation (DP1). The new capital is assembled by a production function of fixed coefficients. Equation (DP2) establishes the equality between total private investment and the sum of gross fixed capital formation and the change in stocks. Equation (DP3) computes the gross formation of real capital. It refers to the number of new private equity capital units that will be available for production in the following period. The average rate of return on capital is calculated in Equation (DP4). It is the quotient of the total remuneration to capital and the total capital stock. The participation of each productive sector in the new capital stock is calculated in Equation (DP5), according to what is indicated in the previous paragraph. The parameter, which varies between zero and one, measures the degree of capital mobility among productive sectors. When the parameter is equal to zero, the investment is allocated between sectors according to the initial participation of each sector in the total capital stock. When the parameter is positive, the investment is allocated between sectors according to the differences in the rates of return to capital. Finally, Equation (DP6) shows how sectoral capital stocks are updated.

$$PK = \sum_i cc_i PQ_i \tag{DP1}$$

$$IT = GFCF + \sum_i PQ_i qdstk_i \tag{DP2}$$

$$RGFCF = \frac{GFCF}{PK} \tag{DP3}$$

$$RBAR = \frac{\sum_i R_i K_i}{\sum_i K_i} \tag{DP4}$$

$$IND_i = RGFCF \frac{K_i}{\sum_j K_j}\left[1 + \kappa\left(\frac{R_i}{RBAR} - 1\right)\right] \tag{DP5}$$

$$K_i = (1 - \delta)K_{i,-1} + IND_{i,-1} \tag{DP6}$$

where

$GFCF$	= Private gross fixed capital formation,
IND_a	= Investment by destination,
PK	= Private capital price,
$RBAR$	= Average capital remuneration,
$RGFCF$	= Real private gross fixed capital formation, and
δ	= Private capital depreciation rate.

Public Sector. In the case of the government, investment is determined as a policy variable (i.e., it is exogenous). In this presentation, in order to simplify, we omit the equations referred to the modeling of public investment.

In addition, the dynamics of the model requires the imposition of growth rates for other factor endowments, the minimum consumption of households, and the transfers captured in the parameter *trnsfr$_{ac,ins}$*.

B. Appendix 2: Tables

Table B.1
Jamaica: Production, employment and trade pattern in the baseline, 2007
(in percentage)

Products	Participation in total (shares in percentages)					Coefficients (%)	
	Value added	Production	Employ-ment	Exports	Imports	Exports/ Production	Imports/ Consumption
Sugarcane	0.3	0.3	0.4	0.0	0.0	0.0	0.0
Banana	0.6	0.5	0.5	0.2	0.0	5.6	0.0
Citrus	0.0	0.0	0.0	0.0	0.0	11.3	0.0
Coffee and cocoa	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Other export crops	0.0	0.0	0.0	0.1	0.0	30.6	14.6
Root crops (excl. ginger)	1.2	0.6	0.9	0.4	0.0	8.4	3.0
Vegetables, corn, pulses	1.4	0.7	1.1	0.0	0.9	0.7	28.8
Other crops	0.5	0.3	0.4	0.1	0.2	5.5	17.9
Other animal products	0.2	0.3	0.2	0.0	0.0	0.0	3.4
Poultry and eggs	0.7	1.3	0.9	0.0	0.2	0.0	5.7
Agricultural services	0.1	0.2	0.2	0.6	0.0	64.3	2.8
Forestry and logging	0.0	0.0	0.0	0.0	0.0	0.0	23.4
Fishing and aquaculture	0.4	0.3	0.3	0.0	0.0	0.5	1.5
Bauxite mining and alumina	4.1	5.7	2.1	25.8	0.0	95.6	0.0
Other mining	0.2	0.2	0.2	0.0	0.0	2.0	3.2
Meat and meat products	0.7	1.3	0.5	0.2	2.2	2.8	37.0
Fruit and vegetable products	0.5	0.7	0.3	0.3	1.5	7.7	46.6
Dairy	0.3	0.6	0.3	0.1	0.5	2.6	21.4
Grain mill products	0.2	0.4	0.1	0.0	0.7	2.0	39.1
Animal feeds	0.2	0.6	0.1	0.0	0.2	0.2	11.6
Bakery	0.8	1.4	0.8	0.2	0.2	2.3	5.0
Sugar	0.2	0.4	0.3	1.9	0.7	81.9	76.9
Other food	0.3	0.5	0.3	0.5	1.2	15.5	49.6
Beverages	1.4	1.7	1.2	1.9	1.1	17.7	22.0
Tobacco products	0.0	0.0	0.0	0.0	0.1	7.1	98.2
Textiles and wearing apparel	0.1	0.1	0.1	0.1	1.8	9.3	88.4
Leather	0.0	0.0	0.0	0.0	0.8	3.6	89.0
Wood	0.3	0.4	0.3	0.0	2.1	1.6	63.2
Paper	0.1	0.1	0.1	0.1	1.1	7.0	76.7
Printing and publishing	0.5	0.5	0.5	0.1	1.6	2.5	51.8
Petrochemical	1.8	4.1	0.9	11.9	28.1	53.2	83.2
Rubber and plastic	0.3	0.3	0.2	0.1	2.0	5.0	68.5
Non-metallic mineral products	0.6	0.8	0.5	0.0	1.8	0.3	45.3
Basic metals	0.3	0.5	0.2	0.3	2.3	8.8	61.8
Machinery and equipment	0.2	0.4	0.2	0.1	19.7	3.3	63.1
Other manufactures	0.0	0.0	0.0	0.1	12.2	19.6	90.6
Construction	8.3	8.3	9.4	0.0	0.1	0.0	0.2
Trade	16.5	12.0	17.3	0.0	0.0	0.0	0.0
Government services	12.9	8.9	19.6	0.0	0.1	0.0	0.3
Other services	43.7	45.4	39.3	54.9	18.7	25.7	15.4
Total	100.0	100.0	100.0	100.0	100.0	20.5	33.0

Source: ECLAC, based on the Social Accounting Matrix of Jamaica 2007.

Table B.2
Jamaica: Composition of value added; intensity of factor use, 2007
(*in percentages*)

Sector	Salaried labor	Unsalaried labor	Capital	Natural resources	Total
Sugarcane	70.2	9.8	3.0	17.0	100.0
Banana	44.6	18.3	5.5	31.6	100.0
Citrus	72.8	9.0	2.7	15.5	100.0
Coffee and cocoa	27.2	24.0	7.3	41.5	100.0
Other export crops	58.4	13.8	4.2	23.7	100.0
Root crops (excl. ginger)	23.4	25.3	7.7	43.7	100.0
Vegetables, corn, pulses	27.2	24.1	7.3	41.5	100.0
Other crops	21.0	26.1	7.9	45.0	100.0
Other animal products	62.2	12.5	3.8	21.5	100.0
Poultry and eggs	41.0	45.3	13.7	0.0	100.0
Agricultural services	56.4	33.5	10.1	0.0	100.0
Forestry and logging	34.0	40.5	12.2	13.3	100.0
Fishing and aquaculture	21.8	25.4	7.7	45.1	100.0
Bauxite mining and alumina	31.0	3.0	51.1	14.9	100.0
Other mining	31.0	2.4	41.0	25.5	100.0
Meat and meat products	37.6	10.7	51.7	0.0	100.0
Fruit and vegetable products	37.3	10.8	51.9	0.0	100.0
Dairy	48.8	8.8	42.4	0.0	100.0
Grain mill products	31.1	11.8	57.0	0.0	100.0
Animal feeds	25.9	12.7	61.3	0.0	100.0
Bakery	59.4	7.0	33.6	0.0	100.0
Sugar	89.4	1.8	8.7	0.0	100.0
Other food	46.8	9.1	44.1	0.0	100.0
Beverages	46.2	9.2	44.5	0.0	100.0
Tobacco products	46.2	9.2	44.5	0.0	100.0
Textiles and wearing apparel	38.3	10.6	51.1	0.0	100.0
Leather	79.5	3.5	16.9	0.0	100.0
Wood	57.7	7.3	35.0	0.0	100.0
Paper	25.7	12.7	61.5	0.0	100.0
Printing and publishing	64.3	6.1	29.6	0.0	100.0
Petrochemical	18.1	14.1	67.9	0.0	100.0
Rubber and plastic	53.9	7.9	38.2	0.0	100.0
Non-metallic mineral products	50.7	8.5	40.8	0.0	100.0
Basic metals	40.6	10.2	49.2	0.0	100.0
Machinery and equipment	42.5	9.9	47.7	0.0	100.0
Other manufactures	61.0	6.7	32.3	0.0	100.0
Construction	64.6	9.7	25.7	0.0	100.0
Trade	42.6	25.9	31.5	0.0	100.0
Government services	99.7	0.0	0.3	0.0	100.0
Other services	51.0	7.8	41.2	0.0	100.0
Total	54.4	10.9	32.2	2.4	100.0

Source: ECLAC, based on the Social Accounting Matrix of Jamaica 2007.

Table B.3
Jamaica: Destination of exports by product, 2007
(in percentages)

	Cuba	Haiti	Bahamas	Central America	Mexico	Dominican Republic	Other LAC	Other CARICOM	Rest of the World	Total World
Sugarcane	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0
Banana	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0
Citrus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.0	72.0	100.0
Other export crops	0.1	0.0	1.1	0.0	0.0	1.6	0.0	7.4	90.8	100.0
Root crops (excl. ginger)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	99.6	100.0
Vegetables, corn, pulses	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.5	99.5	100.0
Other crops	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0
Other animal products	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	100.0
Agricultural services	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0
Poultry and eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	99.9	100.0
Forestry and logging	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	100.0
Fishing and aquaculture	0.0	0.0	0.0	0.0	0.0	0.8	0.0	5.8	93.4	100.0
Bauxite mining and alumina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0
Other mining	3.9	0.7	0.0	0.0	0.0	0.0	32.9	20.9	41.5	100.0
Meat and meat products	0.0	0.0	0.0	0.0	0.0	3.7	0.8	69.3	26.3	100.0
Fruit and vegetable products	0.2	0.1	0.5	0.1	0.0	0.1	0.0	19.5	80.0	100.0
Dairy	0.0	0.0	0.3	0.0	0.0	0.0	0.0	42.4	57.6	100.0
Grain mill products	0.1	0.1	1.3	0.0	0.0	0.1	0.0	33.4	66.3	100.0
Animal feeds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	94.0	6.0	100.0
Bakery	2.4	0.0	0.0	0.0	0.0	0.0	0.0	11.4	86.3	100.0
Sugar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0
Other food	0.0	0.3	0.7	0.5	0.0	0.7	0.0	23.6	74.9	100.0
Beverages	0.0	0.0	0.2	0.3	3.5	0.0	0.7	5.8	89.7	100.0
Tobacco products	0.0	0.0	0.0	1.4	0.0	0.0	0.0	3.0	95.6	100.0
Textiles and wearing apparel	0.5	0.0	4.2	2.1	0.0	0.0	0.4	54.7	42.3	100.0
Leather	0.0	0.0	1.5	0.0	0.0	0.0	0.0	94.2	5.7	100.0
Wood	0.0	0.0	4.2	0.0	1.4	1.4	0.0	36.3	60.8	100.0
Paper	0.5	0.0	3.0	3.2	0.0	0.3	0.0	50.4	45.6	100.0
Printing and publishing	0.0	0.0	8.0	0.4	0.0	0.1	0.2	64.7	34.6	100.0
Petrochemical	0.7	0.0	0.2	0.1	0.0	0.8	0.0	3.5	94.9	100.0
Rubber and plastic	1.2	0.8	1.5	3.6	0.2	0.6	0.2	72.6	20.9	100.0
Non-metallic mineral products	3.2	0.6	3.9	0.0	0.0	0.0	26.2	25.8	44.2	100.0
Basic metals	1.4	0.0	0.0	0.2	0.2	0.2	0.0	0.3	97.7	100.0
Machinery and equipment	3.0	0.0	0.0	2.0	0.1	0.6	2.5	7.8	84.0	100.0
Other manufactures	2.7	0.1	0.4	5.1	0.3	1.2	0.5	13.4	76.8	100.0
Government services	6.2	0.3	0.1	62.3	6.2	6.2	6.2	6.2	6.2	100.0
Other services	1.4	0.1	0.1	0.4	0.2	0.2	1.5	28.1	68.2	100.0
Total	**0.9**	**0.0**	**0.1**	**0.3**	**0.2**	**0.2**	**0.9**	**16.8**	**80.7**	**100.0**

Source: ECLAC, based on the SAM of Jamaica 2007.

Table B.4
Jamaica: origin of imports by product, 2007
(in percentages)

	Cuba	Haiti	Bahamas	Central America	Mexico	Dominican Republic	Other LAC	Other CARICOM	Rest of the World	Total World
Banana	0.0	0.0	0.0	0.0	0.0	0.0	4.5	52.1	43.0	100.0
Citrus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0
Other export crops	0.0	0.0	0.0	0.9	0.2	0.1	5.4	4.0	89.5	100.0
Root crops (excl. ginger)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0
Vegetables, corn, pulses	0.0	0.0	0.0	0.3	0.0	0.0	4.7	5.4	89.6	100.0
Other crops	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	99.5	100.0
Other animal products	2.6	0.0	0.0	0.0	49.4	0.0	0.0	0.0	48.0	100.0
Agricultural services	0.0	0.0	0.0	0.0	0.0	0.0	4.5	52.1	43.0	100.0
Poultry and eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	99.8	100.0
Forestry and logging	0.0	0.0	0.0	31.6	0.0	0.0	1.1	0.3	67.0	100.0
Fishing and aquaculture	0.4	0.0	0.0	0.3	0.0	0.0	0.7	45.6	53.0	100.0
Bauxite mining and alumina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0
Other mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0
Meat and meat products	0.0	0.0	0.0	3.9	0.0	0.0	16.4	2.1	77.5	100.0
Fruit and vegetable products	0.0	0.0	0.0	1.0	0.3	1.6	2.3	16.1	78.8	100.0
Dairy	0.0	0.0	0.0	0.0	0.2	0.0	9.8	0.0	90.1	100.0
Grain mill products	0.0	0.0	0.0	2.7	2.2	2.8	2.7	36.6	53.0	100.0
Animal feeds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	99.9	100.0
Bakery	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	99.8	100.0
Sugar	0.0	0.0	0.0	48.1	0.0	0.0	35.6	3.3	13.0	100.0
Other food	0.0	0.0	0.0	1.8	1.3	3.7	10.1	6.0	77.1	100.0
Beverages	0.0	0.1	0.0	0.5	1.1	0.2	2.7	38.4	57.0	100.0
Tobacco products	0.0	0.1	0.0	0.1	0.0	1.3	1.3	84.1	13.2	100.0
Textiles and wearing apparel	0.1	0.0	0.2	10.8	0.1	0.3	0.7	0.9	87.1	100.0
Leather	0.0	0.0	0.0	20.6	0.1	0.2	1.8	0.1	77.2	100.0
Wood	0.0	0.0	0.0	12.0	2.0	3.8	24.3	1.1	56.8	100.0
Paper	0.0	0.0	0.0	5.8	2.6	2.7	10.3	16.6	61.9	100.0
Printing and publishing	0.0	0.0	0.0	0.1	2.5	0.1	1.4	4.4	91.4	100.0
Petrochemical	0.0	0.0	0.0	0.5	1.2	0.1	27.0	34.7	36.5	100.0
Rubber and plastic	0.0	0.0	0.1	3.9	1.7	2.2	6.4	2.3	83.5	100.0
Non-metallic mineral products	2.5	0.0	0.7	20.7	2.1	4.9	17.5	2.2	50.3	100.0
Basic metals	2.5	0.0	0.0	1.3	2.9	2.0	21.3	1.5	68.5	100.0
Machinery and equipment	0.6	0.0	0.0	1.0	3.0	0.1	2.0	1.7	91.6	100.0
Other manufactures	0.1	0.0	0.0	0.7	1.1	0.1	1.8	1.3	94.9	100.0
Construction	0.5	0.1	0.0	3.8	3.1	1.3	9.0	10.6	71.6	100.0
Government services	0.5	0.1	0.0	3.8	3.1	1.3	9.0	10.6	71.6	100.0
Other services	0.5	0.1	0.0	3.8	3.1	1.3	9.0	10.6	71.6	100.0
Total	**0.3**	**0.0**	**0.0**	**2.5**	**1.8**	**0.7**	**13.8**	**16.4**	**64.4**	**100.0**

Source: ECLAC, based on the SAM of Jamaica 2007.

Table B.5
Jamaica: Sectoral composition of exports by destination
(in percentages of the country total)

	Cuba	Haiti	Bahamas	Central America	Mexico	Dominican Republic	Other LAC	Other CARICOM	Rest of the World	Total World
Sugarcane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Banana	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
Citrus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Other export crops	0.0	0.0	0.7	0.0	0.0	0.6	0.0	0.0	0.1	0.1
Root crops (excl. ginger)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4
Vegetables, corn, pulses	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.2
Other crops	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other animal products	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agricultural services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Poultry and eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forestry and logging	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fishing and aquaculture	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.1	0.2	0.2
Bauxite mining and alumina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.3	26.1
Other mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meat and meat products	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.1	0.0	0.0
Fruit and vegetable products	0.1	0.6	1.9	0.1	0.0	0.3	0.0	0.4	0.4	0.4
Dairy	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.2	0.1	0.1
Grain mill products	0.0	0.5	3.8	0.0	0.0	0.2	0.0	0.6	0.2	0.3
Animal feeds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bakery	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sugar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.0
Other food	0.0	3.4	2.6	0.5	0.0	1.3	0.0	0.5	0.3	0.4
Beverages	0.1	0.3	6.3	2.0	40.5	0.2	1.9	0.9	2.9	2.6
Tobacco products	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Textiles and wearing apparel	0.0	0.0	2.7	0.4	0.0	0.0	0.0	0.2	0.0	0.1
Leather	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Wood	0.0	0.0	0.9	0.0	0.1	0.2	0.0	0.0	0.0	0.0
Paper	0.0	0.0	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Printing and publishing	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Petrochemical	6.4	5.6	13.7	1.4	0.0	37.1	0.2	1.7	9.7	8.2
Rubber and plastic	0.2	3.9	2.9	2.0	0.2	0.6	0.0	0.8	0.0	0.2
Non-metallic mineral products	0.2	0.9	2.4	0.0	0.0	0.0	1.7	0.1	0.0	0.1
Basic metals	2.6	0.0	0.1	1.0	1.2	1.5	0.0	0.0	2.0	1.6
Machinery and equipment	1.8	0.3	0.2	3.3	0.2	1.6	1.5	0.3	0.6	0.5
Other manufactures	2.2	1.1	2.8	11.3	0.9	4.6	0.4	0.6	0.7	0.7
Government services	0.0	0.0	0.0	0.6	0.1	0.1	0.0	0.0	0.0	0.0
Other services	86.2	83.3	55.6	77.1	56.7	50.3	94.1	93.1	47.0	55.6
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	100.0

Source: ECLAC, based on the SAM of Jamaica 2007.

Table B.6
Jamaica: Sectoral composition of imports by origin, 2007
(in percentages of country total)

	Cuba	Haiti	Bahamas	Central America	Mexico	Dominican Republic	Other LAC	Other CARICOM	Rest of the World	Total World
Banana	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Citrus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other export crops	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Root crops (excl. ginger)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vegetables, corn, pulses	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.5	0.3
Other crops	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other animal products	0.3	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Agricultural services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Poultry and eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.4
Forestry and logging	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.1	0.1
Fishing and aquaculture	1.0	0.0	0.0	0.1	0.0	0.0	0.0	2.1	0.6	0.8
Bauxite mining and alumina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meat and meat products	0.0	0.0	0.0	1.3	0.0	0.0	1.0	0.1	1.0	0.9
Fruit and vegetable products	0.0	0.0	0.0	1.0	0.4	5.4	0.4	2.4	3.0	2.5
Dairy	0.0	0.0	0.0	0.0	0.1	0.0	0.5	0.0	0.9	0.7
Grain mill products	0.0	0.0	0.0	0.8	0.9	2.8	0.1	1.6	0.6	0.7
Animal feeds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.4
Bakery	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2
Sugar	0.0	0.0	0.0	12.8	0.0	0.0	1.7	0.1	0.1	0.7
Other food	0.3	0.0	0.0	1.3	1.3	9.1	1.3	0.7	2.2	1.8
Beverages	0.0	3.3	0.0	0.2	0.7	0.4	0.2	2.5	0.9	1.1
Tobacco products	0.0	0.5	0.0	0.0	0.0	0.2	0.0	0.5	0.0	0.1
Textiles and wearing apparel	0.3	0.2	11.2	6.7	0.1	0.6	0.1	0.1	2.1	1.6
Leather	0.0	0.6	0.0	3.7	0.0	0.1	0.1	0.0	0.5	0.5
Wood	0.0	0.7	0.0	5.3	1.2	5.8	1.9	0.1	1.0	1.1
Paper	0.0	0.0	0.0	3.5	2.2	5.6	1.1	1.5	1.4	1.5
Printing and publishing	0.0	0.0	0.0	0.1	1.6	0.1	0.1	0.3	1.6	1.1
Petrochemical	0.7	0.0	0.2	7.1	24.3	5.2	67.7	73.2	19.7	34.7
Rubber and plastic	0.0	0.0	9.5	4.6	2.7	8.6	1.3	0.4	3.8	2.9
Non-metallic mineral products	15.1	0.0	54.2	14.5	2.1	11.9	2.2	0.2	1.4	1.8
Basic metals	28.9	1.7	0.0	1.7	5.5	9.0	5.2	0.3	3.6	3.4
Machinery and equipment	20.1	2.7	0.3	3.7	15.6	1.2	1.3	0.9	13.0	9.2
Other manufactures	2.7	0.0	0.3	3.8	8.9	1.9	1.8	1.1	20.3	13.7
Construction	0.1	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1
Government services	0.1	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1
Other services	30.4	89.6	24.2	27.0	31.2	31.9	11.6	11.5	19.9	17.8
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: ECLAC, based on the SAM of Jamaica 2007.

72

Table B.7
Effective tariffs applied by Jamaica, 2007
(*in percentages; a tariff equal to 0 may indicate no trade*)

Sectors / Products	Cuba	Haiti	Bahamas	Central America	Mexico	Dominican Republic	Other LAC	Rest of Caricom	Rest of the world
Sugarcane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Banana	0.0	0.0	0.0	0.0	15.0	0.0	15.0	15.0	15.0
Citrus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.3
Coffe and cocoa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other export crops	0.0	0.0	0.0	88.1	90.5	81.1	92.2	98.8	11.3
Root crops (excl. ginger)	0.0	0.0	0.0	0.0	32.9	0.0	32.9	32.9	32.9
Vegetables, corn, pulses	0.0	0.0	40.0	0.1	0.0	10.5	6.1	10.5	2.9
Other crops	0.0	0.0	0.0	0.0	0.0	0.0	9.5	9.5	8.5
Other animal products	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Poultry and eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agricultural services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forestry and logging	0.0	0.0	0.0	0.0	4.1	0.0	4.1	4.1	4.1
Fishing and aquaculture	5.5	0.0	0.0	5.4	0.0	0.0	5.3	5.4	3.2
Bauxite mining and alumina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meat and meat products	0.0	0.0	0.0	7.9	0.0	0.0	4.8	5.3	6.0
Fruit and vegetable products	0.0	0.0	0.0	6.4	6.1	5.7	7.1	7.4	6.0
Dairy	0.0	0.0	0.0	0.0	1.1	0.0	6.3	0.0	4.1
Grain mill products	0.0	0.0	0.0	4.9	2.8	6.5	5.3	6.2	4.4
Animal feeds	0.0	0.0	0.0	13.1	18.3	0.0	15.7	12.7	2.8
Bakery	11.3	0.0	0.0	11.3	11.3	11.3	11.3	11.3	11.3
Sugar	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.1
Other food	8.6	0.0	0.0	7.8	6.9	8.7	7.2	9.2	9.1
Beverages	0.0	0.0	0.0	9.4	14.2	10.9	9.7	9.5	10.1
Tobacco products	0.0	0.0	0.0	0.7	0.0	0.7	0.7	0.7	0.7
Textiles and wearing apparel	21.6	0.0	0.1	19.8	20.6	5.8	19.1	14.1	16.5
Leather	19.3	0.0	0.0	16.5	18.7	3.8	15.8	9.6	17.9
Wood	12.9	15.6	0.0	3.0	9.1	7.7	7.0	8.3	4.9
Paper	7.8	0.0	0.0	12.4	7.9	4.9	11.3	5.1	6.8
Printing and publishing	0.0	0.0	0.0	1.7	1.7	0.0	1.7	1.7	1.7
Petrochemical	0.2	0.0	10.7	2.8	0.6	2.8	1.1	1.6	1.5
Rubber and plastic	9.6	7.8	15.5	6.8	4.5	5.0	6.1	6.5	5.5
Non-metallic mineral products	0.0	0.0	5.8	0.7	7.9	7.7	5.7	6.5	5.0
Basic metals	0.1	10.0	20.0	6.9	3.4	0.8	1.8	1.3	1.4
Machinery and equipment	2.8	0.0	1.3	6.8	7.1	7.6	6.1	5.9	6.5
Other manufactures	10.9	11.0	6.1	4.4	4.9	2.8	4.4	4.0	8.5
Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
trade services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Government services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ECLAC, based on TRAINS database

Table B.8
Effective tariffs faced by Jamaica, 2007
(*in percentages; a tariff equal to 0 may indicate no trade*)

Sectors / Products	Cuba	Haiti	Bahamas	Central America	Mexico	Dominican Republic	Other LAC	Rest of Caricom	Rest of world
Sugarcane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Banana	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coffe and cocoa	0.00	0.00	0.00	15.00	0.00	0.00	1.10	1.00	0.14
Other export crops	0.00	0.00	0.00	11.32	0.00	0.00	0.24	0.23	1.64
Root crops (excl. ginger)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vegetables, corn, pulses	0.00	0.00	30.0	0.00	0.00	0.00	3.47	2.96	0.22
Other crops	0.00	0.00	30.0	0.00	0.00	0.00	0.00	0.00	0.00
Other animal products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Poultry and eggs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Agricultural services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forestry and logging	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fishing and aquaculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bauxite mining and alumina	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18
Other mining	3.00	0.00	0.00	10.00	0.00	0.00	0.99	0.12	0.08
Meat and meat products	0.00	0.00	0.00	0.00	0.00	0.00	1.42	1.56	3.00
Fruit and vegetable products	0.00	7.50	25.0	13.11	0.00	20.00	5.06	4.40	0.24
Dairy	0.00	0.00	10.0	0.00	0.00	0.00	0.00	0.00	4.08
Grain mill products	0.00	0.88	32.7	11.25	0.00	0.00	2.44	2.27	0.90
Animal feeds	10.00	0.00	0.00	0.00	0.00	0.00	2.64	0.00	0.00
Bakery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sugar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other food	0.00	6.15	17.9	0.38	20.00	3.59	1.96	2.38	1.02
Beverages	0.00	5.00	26.3	24.08	20.00	20.00	9.60	6.53	0.81
Tobacco products	0.00	0.00	24.2	55.00	0.00	0.00	29.96	0.00	43.19
Textiles and wearing apparel	16.60	0.00	15.1	12.38	24.09	0.00	4.53	1.45	11.75
Leather	0.00	0.00	35.0	10.14	0.00	8.51	4.46	4.10	4.86
Wood	14.93	0.00	36.7	1.67	3.88	0.00	1.59	0.54	0.70
Paper	20.00	0.00	0.9	3.42	7.00	0.00	0.37	0.00	0.55
Printing and publishing	0.00	0.00	11.1	0.00	0.00	0.00	5.00	0.00	1.48
Petrochemical	5.81	3.09	26.0	5.34	7.32	0.00	4.21	2.89	0.82
Rubber and plastic	11.72	3.95	35.0	5.17	13.17	0.00	3.26	1.29	1.64
Non-metallic mineral products	10.00	0.00	35.0	15.00	0.00	0.00	8.88	4.40	11.00
Basic metals	5.73	0.00	18.7	0.97	8.28	0.02	0.77	0.56	0.69
Machinery and equipment	12.09	8.79	32.4	5.10	6.52	0.04	3.09	0.06	1.35
Other manufactures	14.93	0.00	17.9	1.14	11.90	0.00	2.49	0.05	1.27
Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
trade services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: ECLAC, based on TRAINS database

Table B.9
Sectoral value-added in real terms, 2017-2020
(percentage change with respect to the baseline scenario)

	Dominican Republic	Haiti	Bahamas	Cuba	Mexico	Central America
Sugarcane	0.02	0.00	-0.03	-0.02	-0.05	0.20
Banana	-0.01	0.00	0.00	-0.01	-0.02	-0.07
Citrus	-0.01	0.00	0.00	-0.01	-0.03	-0.08
Coffee and cocoa	0.01	0.00	-0.01	-0.01	-0.04	0.09
Other export crops	0.00	0.00	0.18	-0.01	-0.04	-0.05
Root crops (excl. ginger)	-0.01	0.00	0.00	-0.01	-0.02	-0.07
Vegetables, corn, pulses	-0.01	0.00	0.00	-0.01	-0.02	-0.09
Other crops	-0.01	0.00	0.00	-0.01	-0.02	-0.07
Other animal products	-0.01	0.00	0.00	0.00	-0.02	-0.12
Poultry and eggs	-0.01	0.00	0.00	-0.01	-0.03	-0.12
Agricultural services	0.01	0.00	-0.01	-0.01	-0.04	0.11
Forestry and logging	-0.01	0.00	0.00	-0.01	-0.03	-0.15
Fishing and aquaculture	-0.01	0.00	0.00	0.00	-0.02	-0.06
Bauxite mining and alumina	0.01	0.00	-0.01	0.00	-0.01	0.18
Other mining	-0.04	0.00	0.00	-0.03	0.03	-0.11
Meat and meat products	-0.01	0.00	0.00	-0.01	-0.02	-0.13
Fruit and vegetable products	0.00	0.00	0.02	0.00	-0.01	-0.05
Dairy	0.00	0.00	0.00	0.00	-0.01	-0.08
Grain mill products	-0.02	0.00	0.02	0.00	-0.02	-0.14
Animal feeds	-0.01	0.00	0.00	-0.01	-0.03	-0.10
Bakery	0.00	0.00	0.00	0.00	-0.02	-0.07
Sugar	0.02	0.00	-0.03	-0.02	-0.05	0.22
Other food	0.01	0.01	0.05	0.00	-0.02	-0.02
Beverages	0.02	0.00	0.03	0.01	0.42	0.12
Tobacco products	-0.01	0.00	-0.01	-0.01	-0.04	0.26
Textiles and wearing apparel	-0.01	0.00	0.24	0.02	-0.02	-0.12
Leather	-0.01	0.00	0.02	-0.01	-0.02	0.31
Wood	-0.04	0.00	0.08	0.00	-0.02	-0.16
Paper	-0.02	0.00	0.26	0.00	-0.02	-0.20
Printing and publishing	0.00	0.00	0.00	0.00	-0.02	-0.05
Petrochemical	0.00	0.00	0.01	0.05	-0.01	0.03
Rubber and plastic	-0.03	0.00	0.10	0.03	0.01	-0.13
Non-metallic mineral products	-0.11	0.00	0.00	-0.09	0.03	-0.36
Basic metals	0.01	0.00	0.00	0.03	0.00	-0.05
Machinery and equipment	0.01	0.00	-0.01	0.20	-0.15	-0.06
Other manufactures	0.01	0.01	0.22	0.30	-0.02	0.25
Construction	0.01	0.00	0.00	0.01	0.04	0.04
Trade	0.01	0.00	0.01	0.01	0.04	0.08
Government services	0.00	0.00	0.00	0.00	0.00	-0.01
Other services	0.00	0.00	0.00	0.00	-0.01	0.03
Total	0.00	0.00	0.00	0.00	0.01	0.03

Source: ECLAC, based on a simulation of general computable equilibrium model calibrated for Jamaica.

Table B.10
Sectoral exports in real terms, 2017-2020
(percentage change with respect to the baseline scenario)

Sectors	Dominican Republic	Haiti	Bahamas	Cuba	Mexico	Central America
Sugarcane	0.02	0.00	-0.03	-0.02	-0.05	0.24
Banana	0.02	0.00	-0.02	-0.01	-0.04	0.18
Citrus	0.02	0.00	-0.02	-0.02	-0.06	0.13
Other export crops	0.01	0.00	0.43	-0.02	-0.05	0.13
Root crops (excl. ginger)	0.02	0.00	-0.02	-0.01	-0.03	0.19
Vegetables, corn, pulses	0.02	0.00	0.05	-0.02	-0.04	0.21
Other crops	0.02	0.00	-0.02	-0.01	-0.03	0.20
Other animal products	0.01	0.00	-0.02	-0.01	-0.04	0.07
Agricultural services	0.02	0.00	-0.03	-0.02	-0.05	0.18
Forestry and logging	0.01	0.00	-0.02	-0.02	-0.05	0.08
Fishing and aquaculture	0.02	0.00	-0.02	-0.01	-0.04	0.27
Bauxite mining and alumina	0.01	0.00	-0.01	0.00	-0.01	0.18
Other mining	0.03	0.00	-0.01	0.00	-0.03	0.19
Meat and meat products	0.01	0.00	-0.02	-0.01	-0.04	0.28
Fruit and vegetable products	0.08	0.01	0.20	-0.01	-0.03	0.28
Dairy	0.02	0.00	0.03	-0.01	-0.01	0.17
Grain mill products	0.00	0.00	0.71	-0.01	-0.03	0.03
Animal feeds	0.01	0.00	-0.02	-0.01	-0.03	0.11
Bakery	0.04	0.00	-0.01	-0.01	-0.02	0.17
Sugar	0.03	0.00	-0.04	-0.02	-0.07	0.27
Other food	0.08	0.04	0.21	0.00	-0.03	0.27
Beverages	0.07	0.00	0.13	0.02	1.88	0.68
Tobacco products	0.02	0.00	-0.04	-0.03	-0.09	3.32
Textiles and wearing apparel	0.01	0.00	1.92	0.20	-0.01	0.12
Leather	0.03	0.00	0.38	-0.01	-0.03	0.91
Wood	0.12	0.00	2.78	-0.01	0.03	0.51
Paper	0.02	0.00	2.71	0.00	0.00	0.17
Printing and publishing	0.01	0.00	0.12	-0.01	-0.02	0.14
Petrochemical	0.01	0.00	0.01	0.08	-0.01	0.12
Rubber and plastic	0.00	0.00	1.32	0.49	0.11	0.89
Non-metallic mineral products	-0.01	0.00	0.04	0.14	0.01	0.62
Basic metals	0.02	0.00	-0.02	0.15	0.03	0.13
Machinery and equipment	0.02	0.00	-0.02	5.00	-0.04	0.22
Other manufactures	0.04	0.03	0.77	1.27	-0.02	1.32
Government	0.01	0.00	-0.01	-0.01	-0.03	0.10
Other services	0.02	0.00	-0.02	0.00	-0.01	0.17
Total exports	0.02	0.00	0.00	0.01	0.02	0.18

Source: ECLAC, based on a simulation of general computable equilibrium model calibrated for Jamaica.

Table B.11
Sectoral imports in real terms, 2017-2020
(percentage change with respect to the baseline scenario)

Sectors	Dominican Republic	Haiti	Bahamas	Cuba	Mexico	Central America
Banana	-0.02	0.00	0.01	0.00	-0.02	-0.20
Citrus	-0.02	0.00	0.01	0.00	-0.02	-0.20
Other export crops	-0.01	0.00	0.03	0.00	0.00	0.51
Root crops (excl. ginger)	-0.02	0.00	0.01	0.00	-0.02	-0.22
Vegetables, corn, pulses	-0.02	0.00	0.01	0.00	-0.03	-0.13
Other crops	-0.02	0.00	0.01	0.00	-0.02	-0.18
Other animal products	-0.02	0.00	0.01	0.00	0.00	-0.21
Poutry and eggs	-0.02	0.00	0.01	0.00	-0.01	-0.22
Agricultural services	-0.01	0.00	0.03	0.00	0.01	-0.11
Forestry and logging	-0.03	0.00	0.02	0.00	-0.02	0.60
Fishing and aquaculture	-0.02	0.00	0.00	0.01	-0.03	0.45
Bauxite mining and alumina	0.01	0.00	-0.01	0.00	-0.01	0.18
Other mining	-0.08	0.00	0.01	-0.05	0.06	-0.29
Meat and meat products	-0.02	0.00	0.01	0.00	-0.02	0.97
Fruit and vegetable products	0.06	0.00	0.01	0.00	0.00	0.09
Dairy	-0.02	0.00	0.01	0.00	-0.02	0.25
Grain mill products	0.11	0.00	0.01	0.00	0.04	-0.05
Animal feeds	-0.02	0.00	0.01	0.00	-0.02	-0.22
Bakery	0.00	0.00	0.01	0.00	-0.02	-0.20
Sugar	-0.01	0.00	0.02	0.00	0.07	-0.11
Other food	0.23	0.00	0.01	0.00	0.04	0.42
Beverages	-0.01	0.00	0.00	-0.01	0.03	0.02
Tobacco products	-0.02	0.00	0.00	-0.01	-0.04	-0.22
Textiles and wearing apparel	-0.01	0.00	0.01	0.01	0.00	1.29
Leather	-0.02	0.00	0.01	0.00	-0.01	2.56
Wood	0.26	0.00	0.01	0.00	0.15	0.80
Paper	0.03	0.00	0.01	0.00	0.06	0.27
Printing and publishing	0.00	0.00	0.01	0.00	0.02	-0.08
Petrochemical	0.00	0.00	0.00	0.00	0.00	0.07
Rubber and plastic	0.04	0.00	0.01	0.00	0.06	0.20
Non-metallic mineral products	0.18	0.00	0.02	0.15	0.14	0.62
Basic metals	0.01	0.00	0.01	0.02	0.05	0.07
Machinery and equipment	0.01	0.00	0.00	0.01	0.13	0.09
Other manufactures	-0.01	0.00	0.01	0.00	0.03	-0.09
Construction	-0.04	0.00	0.01	0.00	0.04	-0.17
Government	-0.01	0.00	0.01	0.01	0.02	-0.09
Other services	-0.02	0.00	0.01	0.00	0.00	-0.16
Total imports	**0.00**	**0.00**	**0.01**	**0.04**	**-0.01**	**0.01**

Source: ECLAC, based on a simulation of general computable equilibrium model calibrated for Jamaica.

Table B.12
Jamaica, bilateral trade in the scenario with a FTA with Cuba
(percentage change with respect to the baseline scenario)

Sectors	Baseline values (millions of US dollars)			changes in percentages (2007-2020)	
	exports	imports	trade balance	exports	imports
Sugarcane	0.0	0.0	0.0	0.0	0.0
Banana	0.0	0.0	0.0	0.0	0.0
Citrus	0.0	0.0	0.0	0.0	0.0
Other export crops	0.0	0.0	0.0	0.0	0.0
Root crops (excl. ginger)	0.0	0.0	0.0	0.0	0.0
Vegetables, corn, pulses	0.0	0.0	0.0	0.0	0.0
Other crops	0.0	0.0	0.0	0.0	0.0
Other animal products	0.0	0.0	0.0	0.0	0.0
Agricultural services	0.0	0.0	0.0	0.0	0.0
Forestry and logging	0.0	0.0	0.0	0.0	0.0
Poultry and eggs	0.0	0.0	0.0	0.0	0.0
Fishing and aquaculture	0.0	0.0	0.0	0.0	6.3
Bauxite mining and alumina	0.0	0.0	0.0	0.0	0.0
Other mining	0.0	0.0	0.0	0.0	0.0
Meat and meat products	0.0	0.0	0.0	0.0	0.0
Fruit and vegetable products	0.0	0.0	0.0	0.0	0.0
Dairy	0.0	0.0	0.0	0.0	0.0
Grain mill products	0.0	0.0	0.0	0.0	0.0
Animal feeds	0.2	0.0	0.2	0.0	0.0
Bakery	0.0	0.0	0.0	0.0	0.0
Sugar	0.0	0.0	0.0	29.4	0.0
Other food	0.0	0.0	0.0	0.0	13.2
Beverages	0.0	0.0	0.0	0.0	0.0
Tobacco products	0.0	0.0	0.0	53.0	0.0
Textiles and wearing apparel	0.0	0.0	0.0	0.0	28.4
Leather	0.0	0.0	0.0	0.0	27.0
Wood	0.0	0.0	0.0	0.0	38.5
Paper	0.0	0.0	0.0	0.0	14.8
Printing and publishing	2.3	0.0	2.3	15.6	0.0
Petrochemical	0.1	0.1	0.0	31.3	0.8
Rubber and plastic	0.0	0.0	0.0	7.4	14.5
Non-metallic mineral products	0.1	2.3	-2.2	15.6	17.2
Basic metals	0.4	2.4	-2.0	34.8	0.1
Machinery and equipment	0.1	0.5	-0.4	27.9	9.1
Other manufactures	0.0	0.0	0.0	0.0	0.7
construction	0.0	0.0	0.0	4.9	4.3
government services	20.6	0.0	20.6	4.9	4.3
other services	0.0	2.2	-2.2	4.9	4.3
goods	3.3	5.5	-2.2	18.4	9.2
services	20.6	2.2	18.4	4.9	4.3
Total	**23.9**	**7.7**	**16.2**	**6.8**	**7.8**

Source: ECLAC, based on a simulation of general computable equilibrium model calibrated for Jamaica.

Table B.13
Jamaica, bilateral trade in the scenario with a FTA with Haiti
(percentage change with respect to the baseline scenario)

Sectors	Baseline values (millions of US dollars)			changes in percentages (2007-2020)	
	exports	imports	trade balance	exports	imports
Sugarcane	0.0	0.0	0.0	0.0	0.0
Banana	0.0	0.0	0.0	0.0	0.0
Citrus	0.0	0.0	0.0	0.0	0.0
Other export crops	0.0	0.0	0.0	0.0	0.0
Root crops (excl. ginger)	0.0	0.0	0.0	0.0	0.0
Vegetables, corn, pulses	0.0	0.0	0.0	0.0	0.0
Other crops	0.0	0.0	0.0	0.0	0.0
Other animal products	0.0	0.0	0.0	0.0	0.0
Agricultural services	0.0	0.0	0.0	0.0	0.0
Forestry and logging	0.0	0.0	0.0	0.0	0.0
Poultry and eggs	0.0	0.0	0.0	0.0	0.0
Fishing and aquaculture	0.0	0.0	0.0	0.0	0.0
Bauxite mining and alumina	0.0	0.0	0.0	0.0	0.0
Other mining	0.0	0.0	0.0	0.0	0.0
Meat and meat products	0.0	0.0	0.0	21.0	0.0
Fruit and vegetable products	0.0	0.0	0.0	0.0	0.0
Dairy	0.0	0.0	0.0	2.1	0.0
Grain mill products	0.0	0.0	0.0	0.0	0.0
Animal feeds	0.0	0.0	0.0	0.0	0.0
Bakery	0.0	0.0	0.0	0.0	0.0
Sugar	0.0	0.0	0.0	17.6	0.0
Other food	0.0	0.0	0.0	14.3	0.0
Beverages	0.0	0.0	0.0	0.0	0.0
Tobacco products	0.0	0.0	0.0	0.0	0.0
Textiles and wearing apparel	0.0	0.0	0.0	0.0	0.0
Leather	0.0	0.0	0.0	0.0	0.0
Wood	0.0	0.0	0.0	0.0	38.5
Paper	0.0	0.0	0.0	0.0	0.0
Printing and publishing	0.0	0.0	0.0	8.4	0.0
Petrochemical	0.0	0.0	0.0	10.2	0.0
Rubber and plastic	0.0	0.0	0.0	0.0	11.7
Non-metallic mineral products	0.0	0.0	0.0	0.0	13.2
Basic metals	0.0	0.0	0.0	0.0	10.3
Machinery and equipment	0.0	0.0	0.0	18.6	0.0
Other manufactures	0.0	0.0	0.0	0.0	0.0
construction		0.0	0.0	0	0.0
government services	0.0	0.0	0.0	0.0	0.0
other services	0.7	0.0	0.6	0.0	0.0
goods	**0.1**	**0.1**	**0.0**	**12.3**	**10.9**
services	**0.7**	**0.0**	**0.6**	**4.9**	**4.3**
total trade	**0.8**	**0.1**	**0.7**	**6.2**	**8.5**

Source: ECLAC, based on a simulation of general computable equilibrium model calibrated for Jamaica.

Table B.14
Jamaica, bilateral trade in the scenario with a FTA with Bahamas
(percentage change with respect to the baseline scenario)

Sectors	Baseline values (millions of US dollars)			changes in percentages (2007-2020)	
	exports	imports	trade balance	exports	imports
Sugarcane	0.0	0.0	0.0	0.0	0.0
Banana	0.0	0.0	0.0	0.0	0.0
Citrus	0.0	0.0	0.0	0.0	0.0
Other export crops	0.0	0.0	0.0	98.8	0.0
Root crops (excl. ginger)	0.0	0.0	0.0	0.0	0.0
Vegetables, corn, pulses	0.0	0.0	0.0	120.6	0.0
Other crops	0.0	0.0	0.0	0.0	0.0
Other animal products	0.0	0.0	0.0	0.0	0.0
Agricultural services	0.0	0.0	0.0	0.0	0.0
Forestry and logging	0.0	0.0	0.0	0.0	0.0
Poultry and eggs	0.0	0.0	0.0	0.0	0.0
Fishing and aquaculture	0.0	0.0	0.0	0.0	0.0
Bauxite mining and alumina	0.0	0.0	0.0	0.0	0.0
Other mining	0.0	0.0	0.0	0.0	0.0
Meat and meat products	0.0	0.0	0.0	0.0	0.0
Fruit and vegetable products	0.0	0.0	0.0	78.8	0.0
Dairy	0.0	0.0	0.0	26.3	0.0
Grain mill products	0.0	0.0	0.0	94.7	0.0
Animal feeds	0.0	0.0	0.0	0.0	0.0
Bakery	0.0	0.0	0.0	0.0	0.0
Sugar	0.0	0.0	0.0	0.0	0.0
Other food	0.1	0.0	0.1	55.5	0.0
Beverages	0.2	0.0	0.2	87.2	0.0
Tobacco products	0.0	0.0	0.0	0.0	0.0
Textiles and wearing apparel	0.1	0.1	-0.1	79.4	0.2
Leather	0.0	0.0	0.0	44.9	0.0
Wood	0.1	0.0	0.1	112.1	0.0
Paper	0.1	0.0	0.1	117.5	0.0
Printing and publishing	0.2	0.0	0.2	2.1	0.0
Petrochemical	0.4	0.0	0.4	29.1	3.3
Rubber and plastic	0.1	0.1	0.0	75.2	12.1
Non-metallic mineral products	0.0	0.6	-0.6	106.4	3.8
Basic metals	0.0	0.0	0.0	0.0	10.3
Machinery and equipment	0.0	0.0	0.0	0.0	3.4
Other manufactures	0.0	0.1	-0.1	109.4	5.9
construction	0.0	0.0	0.0	...	0.0
government services	0.0	0.0	0.0	0.0	0.0
other services	15.4	0.3	15.1	0.0	0.0
goods	**1.2**	**1.0**	**-20.2**	**61.0**	**4.5**
services	**15.4**	**0.3**	**15.1**	**4.9**	**4.3**
total trade	**16.6**	**1.2**	**-5.1**	**9.0**	**4.5**

Source: ECLAC, based on a simulation of general computable equilibrium model calibrated for Jamaica.

Table B.15

Jamaica, bilateral trade in the scenario with a FTA with Dominican Republic

(percentage change with respect to the baseline scenario)

Sectors	Baseline values (millions of US dollars)			changes in percentages (2007-2020)	
	exports	imports	trade balance	exports	imports
Sugarcane	0.0	0.0	0.0	0.0	0.0
Banana	0.0	0.0	0.0	0.0	0.0
Citrus	0.0	0.0	0.0	0.0	0.0
Other export crops	0.0	0.0	0.0	0.0	9.3
Root crops (excl. ginger)	0.0	0.0	0.0	0.0	0.0
Vegetables, corn, pulses	0.0	0.0	0.0	0.0	5.3
Other crops	0.0	0.0	0.0	0.0	0.0
Other animal products	0.0	0.0	0.0	0.0	0.0
Agricultural services	0.0	0.0	0.0	0.0	0.0
Forestry and logging	0.0	0.0	0.0	0.0	0.0
Poultry and eggs	0.0	0.0	0.0	0.0	0.0
Fishing and aquaculture	0.0	0.0	0.0	0.0	0.0
Bauxite mining and alumina	0.0	0.0	0.0	0.0	0.0
Other mining	0.0	0.0	0.0	0.0	0.0
Meat and meat products	0.2	0.0	0.2	0.0	0.0
Fruit and vegetable products	0.0	1.2	-1.1	56.5	10.2
Dairy	0.0	0.0	0.0	0.0	0.0
Grain mill products	0.0	1.0	-1.0	0.0	9.3
Animal feeds	0.0	0.0	0.0	0.0	0.0
Bakery	0.0	0.0	0.0	0.0	47.4
Sugar	0.0	0.0	0.0	0.0	0.1
Other food	0.1	2.0	-1.9	10.1	13.1
Beverages	0.0	0.1	-0.1	63.8	4.5
Tobacco products	0.0	0.1	-0.1	0.0	0.4
Textiles and wearing apparel	0.0	0.2	-0.2	0.0	7.3
Leather	0.0	0.0	0.0	0.0	8.4
Wood	0.0	3.5	-3.5	0.0	19.9
Paper	0.0	1.4	-1.4	0.0	4.8
Printing and publishing	0.0	0.0	0.0	0.0	47.7
Petrochemical	2.8	1.2	1.6	0.0	4.8
Rubber and plastic	0.0	1.8	-1.8	0.0	7.3
Non-metallic mineral products	0.0	3.1	-3.1	0.0	16.2
Basic metals	0.0	1.9	-1.9	0.0	0.8
Machinery and equipment	0.0	0.7	-0.7	0.0	15.9
Other manufactures	0.1	0.5	-0.4	0.0	12.3
construction	0.0	0.0	0.0	0.0	0.0
government services	0.0	0.0	0.0	0.0	0.0
other services	6.6	6.5	0.1	0.0	0.0
goods	**3.2**	**18.7**	**-15.4**	**1.0**	**12.0**
services	**6.6**	**6.5**	**0.1**	**4.9**	**4.3**
total trade	**9.9**	**25.2**	**-15.3**	**3.6**	**10.0**

Source: ECLAC, based on a simulation of general computable equilibrium model calibrated for Jamaica.

Jamaica, bilateral trade in the scenario with a FTA with Mexico
(percentage change with respect to the baseline scenario)

Sectors	Baseline values (millions of US dollars)			changes in percentages (2007-2020)	
	exports	imports	trade balance	exports	imports
Sugarcane	0.0	0.0	0.0	0.0	0.0
Banana	0.0	0.0	0.0	0.0	0.0
Citrus	0.0	0.0	0.0	0.0	0.0
Other export crops	0.0	0.0	0.0	0.0	18.6
Root crops (excl. ginger)	0.0	0.0	0.0	0.0	0.0
Vegetables, corn, pulses	0.0	0.0	0.0	0.0	0.0
Other crops	0.0	0.0	0.0	0.0	0.0
Other animal products	0.0	0.4	-0.4	0.0	0.1
Agricultural services	0.0	0.0	0.0	0.0	0.0
Forestry and logging	0.0	0.0	0.0	0.0	0.0
Poultry and eggs	0.0	0.0	0.0	0.0	0.0
Fishing and aquaculture	0.0	0.0	0.0	0.0	0.0
Bauxite mining and alumina	0.0	0.0	0.0	0.0	0.0
Other mining	0.0	0.0	0.0	0.0	0.0
Meat and meat products	0.0	0.0	0.0	0.0	0.0
Fruit and vegetable products	0.0	0.2	-0.2	0.0	11.3
Dairy	0.0	0.0	0.0	0.0	1.6
Grain mill products	0.0	0.8	-0.8	0.0	4.9
Animal feeds	0.0	0.0	0.0	0.0	0.0
Bakery	0.0	0.0	0.0	0.0	0.0
Sugar	0.0	0.0	0.0	0.0	0.1
Other food	0.1	0.7	-0.6	61.8	7.6
Beverages	0.2	0.3	-0.1	0.0	14.0
Tobacco products	0.0	0.0	0.0	0.0	0.0
Textiles and wearing apparel	0.0	0.1	-0.1	0.0	26.8
Leather	0.0	0.0	0.0	0.0	26.9
Wood	0.0	1.8	-1.8	0.0	20.7
Paper	0.1	1.3	-1.2	0.0	6.2
Printing and publishing	0.0	1.7	-1.7	0.0	3.1
Petrochemical	0.2	15.2	-15.0	36.0	0.9
Rubber and plastic	0.2	1.5	-1.3	46.0	6.4
Non-metallic mineral products	0.0	1.8	-1.8	19.6	8.8
Basic metals	0.0	2.8	-2.8	19.0	3.6
Machinery and equipment	0.0	22.7	-22.7	0.0	21.7
Other manufactures	0.3	15.2	-14.9	0.0	8.6
construction	0.0	0.1	-0.1	0.0	0.0
government services	0.0	0.1	-0.1	0.0	0.0
other services	15.3	15.7	-0.4	0.0	0.0
goods	**2.6**	**66.5**	**-63.9**	**61.5**	**11.8**
services	**2.6**	**15.8**	**-13.2**	**4.9**	**4.3**
total trade	**5.3**	**82.3**	**-77.1**	**33.0**	**10.4**

Source: ECLAC, based on a simulation of general computable equilibrium model calibrated for Jamaica.

Table B.17

Jamaica, bilateral trade in the scenario with a FTA with Central America

(percentage change with respect to the baseline scenario)

Sectors	Baseline values (millions of US dollars)			changes in percentages (2007-2020)	
	exports	imports	trade balance	exports	imports
Sugarcane	0.0	0.0	0.0	0.0	0.0
Banana	0.0	0.0	0.0	0.0	-0.2
Citrus	0.0	0.0	0.0	0.0	0.0
Other export crops	0.0	0.0	0.0	0.0	19.2
Root crops (excl. ginger)	0.0	0.0	0.0	0.0	0.0
Vegetables, corn, pulses	0.0	0.1	-0.1	0.0	-0.2
Other crops	0.0	0.0	0.0	0.0	11.4
Other animal products	0.0	0.0	0.0	0.0	0.0
Agricultural services	0.0	0.0	0.0	0.0	-0.1
Forestry and logging	0.0	0.5	-0.5	0.0	4.1
Poultry and eggs	0.0	0.0	0.0	0.0	0.0
Fishing and aquaculture	0.0	0.0	0.0	0.0	5.3
Bauxite mining and alumina	0.0	0.0	0.0	0.0	0.0
Other mining	0.0	0.0	0.0	0.0	0.0
Meat and meat products	0.0	3.6	-3.6	38.5	16.3
Fruit and vegetable products	0.0	0.6	-0.5	0.0	10.9
Dairy	0.0	0.0	0.0	0.0	0.0
Grain mill products	0.0	0.8	-0.8	0.0	6.3
Animal feeds	0.0	0.0	0.0	0.0	0.0
Bakery	0.0	0.0	0.0	0.0	34.5
Sugar	0.0	15.3	-15.3	1.3	-0.1
Other food	0.1	0.9	-0.9	79.0	10.3
Beverages	0.2	0.2	0.0	396.6	12.4
Tobacco products	0.0	0.0	0.0	38.0	0.2
Textiles and wearing apparel	0.0	8.3	-8.3	30.5	23.8
Leather	0.0	7.5	-7.5	0.0	19.9
Wood	0.0	11.0	-11.0	1.5	-1.6
Paper	0.1	2.8	-2.7	0.0	8.3
Printing and publishing	0.0	0.1	-0.1	23.5	24.7
Petrochemical	0.2	6.3	-6.1	12.8	3.9
Rubber and plastic	0.2	3.4	-3.2	0.0	9.4
Non-metallic mineral products	0.0	10.0	-10.0	2.0	4.4
Basic metals	0.0	1.3	-1.3	0.0	7.8
Machinery and equipment	0.0	7.7	-7.7	6.9	19.9
Other manufactures	0.3	5.3	-5.0	0.1	9.0
construction	0.0	0.1	-0.1	4.9	4.3
government services	0.0	0.1	-0.1	4.9	4.3
other services	15.3	40.6	-25.3	4.9	4.3
goods	**1.0**	**85.6**	**-84.7**	**31.0**	**9.5**
services	**15.3**	**40.8**	**-25.5**	**4.9**	**4.3**
total trade	**16.3**	**126.5**	**-110.2**	**6.4**	**7.8**

Source: ECLAC, based on a simulation of general computable equilibrium model calibrated for Jamaica.

C. Appendix 3: Analysis of the "Jamaica Survey of Living Conditions 2014" to conduct a micro simulations study based on the results of a CGE model.

C.1. Description of the survey form (relevant variables)

In order to carry out our analysis on households, two fundamental sources of information are used which are complemented with the results provided by the CGE model. In the case of employment, the labor force surveys are used (Labor Force Survey) and in the case of prices the Survey Living Conditions.

The Survey of Living Conditions used in this study was conducted by the Statistics Institute of Jamaica in 2014. This survey covers all the country, including rural and urban areas and is conducted through in-depth interviews in a total of approximately 1800 households. It is a survey that provides information on the socioeconomic characteristics of households including educational levels, employment sectors, health levels and, most importantly, the consumption basket of each household as well as the detail of expenditure in each of these products. One of the limitations of this survey is that it does not have data on household income making it impossible to measure this dimension of the impact trade policy changes could have on income distribution.

Table C.1 shows the composition of expenditure for each of the different quintiles of the population. Clearly, households with a lower level of spending have a higher share of the food sector, while they have a smaller share of other goods. On the other hand, the services sector has a stable participation among quintiles. As can be seen, there are some differences with the average weight officially reported by the government. These differences are rather minor and are due in particular to the difference in the reporting periods, apart that there may be differences in the aggregation of items in both classifications. In general, the differences are rather small.

Table C.1: Composition of the expenditure basket by quintile

Quintile	Food	No food goods	Services	Rent+Housing	Total
1	55.7%	6.3%	24.7%	13.3%	100%
2	53.6%	7.6%	25.3%	13.5%	100%
3	52.3%	7.7%	24.7%	15.3%	100%
4	49.9%	8.3%	28.0%	13.7%	100%
5	40.2%	22.0%	17.7%	20.0%	100%
Average	47.2%	13.6%	22.7%	16.5%	100%
Average Jamaica 2005[12]	45.0%	8.2%	34.0%	12.8%	100%

Source: Own Calculations based in the Survey Living Conditions survey

In the case of employment, Labor Force Surveys compiled by the Statistical Institute of Jamaica are used. These surveys are conducted on a quarterly basis and gather information on employment, disaggregated by gender, sector and geographical location among other dimensions. Table C2 shows the general characteristics of the level of sectoral unemployment in the baseline scenario (October 2015). In this period, the economically active population reached 1,325 million people, with employment reaching 1,146 million, representing 86.5% of employment and 13.47% of unemployment. As can be observed, there is considerable heterogeneity between sectors, in addition to a higher unemployment among women compared to men. It would therefore be

---

[12] The 2004/2005 Household Expenditure Surveys (HES) covered the period June 2004 to March 2005.

important to assess the impact of these agreements on job creation in sectors where women may be most affected.

Table C.2: Structure of sectoral unemployment in the baseline scenario by gender

Sector	Baseline 2015				
	Male		Female		Total
Agricultural and livestock	4,704	54%	3,988	46%	8,693
Bauxite mining and alumina	327	54%	284	46%	612
Foods	1,124	39%	1,752	61%	2,877
Beverage	302	51%	292	49%	594
Textiles, clothing and footwear	548	53%	483	47%	1,031
Wood and paper	227	100%			227
Rubber and plastic	20	23%	70	77%	90
Non-metallic mineral products	474	75%	156	25%	629
Machinery and equipment	933	58%	688	42%	1,621
Other manufactures	433	64%	246	36%	679
Government	413	17%	2,039	83%	2,452
Construction	19,172	92%	1,577	8%	20,749
Other services	22,228	23%	72,887	77%	95,116
No previous Industry	16,528	38%	26,710	62%	43,238
Total	67,413	38%	111,194	62%	178,608

Source: ECLAC, based on the Labor Force Survey