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Efficiency and Revenue Issues in the Jamaican External Trade Sector

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This article is concerned with issues of the efficiency and revenue aspects of the current Jamaican taxes on trade, including tariffs, other charges, and customs valuation questions. It also considers revenue implications of further Jamaican tariff liberalization through the World Trade Organization as a member of the Caribbean Community and through the proposed Free Trade Agreement of the Americas. Finally, it comments on the scope for integrating tariff reform with reforms in domestic taxes to recoup potential revenue losses and increase the efficiency of the tax system.

Keywords: *imports; tariffs; trade liberalization; Jamaica*

The Jamaican economy faces a number of challenges associated with the external trade sector. After an extensive period of trade liberalization, the country has relatively low tariffs (except in agriculture), although the variability in tariff rates and exemptions makes the system dispersed and inefficient. Furthermore, Jamaica is a small island economy endemically subject to various forms of trade-tax evasion, a situation that supports significant mismanagement in tax assessment and collection.

Also, as a member of the World Trade Organization (WTO) and the Caribbean Community (CARICOM), Jamaica must undertake certain obligations regarding its border measures affecting trade. Most prominently, Jamaica is phasing in a new customs valuation process, which must rely heavily on voluntary revelation of prices by importing firms. The system

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restrains Jamaica's administrative abilities to challenge these prices and may have implications for revenue collections.

Finally, Jamaica's government generates a substantial share of its central revenue from taxes and charges on imports. These revenues are seen as critical in the light of a structural fiscal deficit. However, additional prospective tariff cuts or elimination through regional and multilateral trade agreements such as the prospective Free Trade Agreement of the Americas (FTAA) could significantly reduce revenues generated from imports. A central challenge, therefore, is to integrate tariff cuts with additional tax reforms to offset the revenue shortfalls that could ensue.

In this article, we analyze efficiency and revenue aspects of the current Jamaican taxes on trade, including tariffs, other charges, and customs valuation questions.¹ We also set out a simple model of the revenue impacts of trade-tax evasion. In addition, we consider revenue implications of further Jamaican tariff liberalization through the WTO, as a member of the CARICOM, and also through the proposed FTAA. Finally, we comment on the scope for integrating tariff reform with reforms in domestic taxes to recoup potential revenue losses and increase the efficiency of the tax system.

We focus here on the revenue implications of dealing with these challenges as Jamaica integrates further into the regional and global economies. In the next section, we offer a brief overview of the recent international trade picture in Jamaica, which offers context for the policy discussion. In the third section, we analyze the current Jamaican tariff structure in terms of its levels, dispersion, incentives, and revenue yields and also discuss customs valuation issues. In the fourth section, we present calculations of the potential revenue implications of various trade-policy scenarios, including unilateral tariff unification, expansion of CARICOM, and implementation of the FTAA. In the fifth section, we consider the potential for combining tariff liberalization with broader tax reform, including attempts to reduce tax evasion at the border.

The External Trade Picture

As a small open island economy, Jamaica is dependent on international trade, both on the production side for exports and especially in terms of the share of consumption generated by imports. The ratio of exports plus imports to GDP (measured in Jamaican dollars) was approximately 60 to 65 percent in recent years.²

The Structure of International Trade

Measured in United States dollars, the value of Jamaica's imports rose from \$2.57 billion to \$2.76 billion from 2001 to 2003. However, the value of exports fell from \$1.23 billion to \$1.13 billion, leaving on net a rising deficit in merchandise trade that reached $-\$1.63$ billion in 2003. Indeed, the Jamaican economy faces a significant structural trade deficit because of stagnant growth in exports and steady growth in imports. To some extent, this trade imbalance is offset by a surplus in service transactions, reflecting tourism exports and large inward flows of net remittances from Jamaican workers abroad. Overall, the country had a current-account deficit of about \$850 million in 2003, equivalent to about 10 percent of GDP.

To understand the tariff revenues generated by the trade taxation system, it is important to look at the country composition of Jamaica's trade. Jamaica's merchandise exports overwhelmingly go to developed countries, including primarily the European Union, the United States, and Canada. Together, these regions took 73.3 percent of Jamaica's exports in 2002. The EU's share, at 31.2 percent, reflects the influence of trade preferences for bananas, tropical products, and apparel under the (former) Lome Convention. One concern for the government is that these preferences are slotted to disappear during the next few years. Despite their close proximity, members of CARICOM and other countries in Latin America together accounted for less than 6 percent of Jamaica's exports in 2002, reflecting in part the fact that those countries produce close substitutes for Jamaican goods.

Jamaica's largest source of imports is the United States, with 43.5 percent of trade in 2002. Much of this trade is in food, machinery, motor vehicles, industrial inputs, and materials for assembly and exports. Jamaica also imports substantial amounts from the EU. However, its import pattern is more balanced regarding nearby economies, with 11.2 percent coming from CARICOM members and 12.3 percent from Latin American partners.

Turning to commodity composition, Jamaica's export structure is heavily concentrated in a few products. Crude materials, primarily metals (bauxite and aluminum goods), dominate with 52.4 percent of exports in 2002. Also important are foods (largely sugar, bananas, coffee, and cocoa), which amount to 20 percent of exports. Other important export sectors include beverages (largely rum) and tobacco and chemicals. About 11.5 percent of exports are classified as free-zone goods, which are generally products processed from imported inputs in one of Jamaica's free zones and re-exported. The main products made in this fashion include apparel and electronics.

There is considerably more balance across commodity groups in Jamaica's import structure. The largest category is machinery and transport equipment, which includes motor vehicles, at 29.7 percent of imports in 2002. Other important categories include mineral fuels (petroleum products), food, manufactured goods, and chemicals. Thus, Jamaica imports significant amounts of raw materials and industrial inputs, as befits a small developing economy with limited energy resources.

Trade Agreements

The flexibility that Jamaica's government has in reforming its trade policy is limited strongly by the fact that the country is a member of two significant international trade agreements.³ First, Jamaica joined the WTO in 1995 and had been a member of the General Agreement on Tariffs and Trade (GATT) since 1963. The WTO rules prohibit discrimination in tariffs levied against sources of imports, except among members of a customs union or free-trade agreement.

WTO members agree in periodic trade negotiations to reduce their tariff bindings, or levels above which tariffs cannot be raised. Most developed countries and higher income developing countries bind the majority of their tariffs (except in agriculture) at the same levels as their applied rates, which are the taxes actually imposed. Conversely, developing countries including Jamaica tend to have bound rates that are considerably in excess of their legislated rates to provide room for additional charges. Jamaica's tariff structure and related measures will be discussed in the next section. As this brief discussion suggests, WTO membership places restraints on Jamaica's trade policies. Most significant, from the standpoint of tariff policy, are requirements to harmonize the customs valuation system with WTO rules. This issue is further discussed in the section on Jamaica's tariff structure.

Second, Jamaica is a member state of the Caribbean Community and Common Market, founded in 1973. CARICOM is, in principle, a customs union, meaning that it sets a common external tariff (CET) schedule that is supposed to be adopted by all members. This schedule is agreed on jointly, and indeed, reductions in the average CET are a major form of trade liberalization for Jamaica. The CET applies to imports from non-members, while trade among members takes place at zero tariffs. However, CARICOM permits its member states to impose additional "nontariff" charges on extraregional and intraregional trade, while customs procedures have yet to be harmonized. Accordingly, there is not fully free trade within the region. Membership in CARICOM limits Jamaica's flexibility

because states have relatively little scope to depart from its largely harmonized tariff policy. Any significant reforms of the CET tariff bindings would require negotiation at the WTO by CARICOM as a group.

Finally, the possibility remains that Jamaica will join the FTAA, which establishes zero tariffs on most goods traded among all members of the Western Hemisphere. This would represent a major expansion of the zone of countries from which Jamaica would not be able to collect tariff revenues. As noted earlier, nearly 60 percent of Jamaica's merchandise imports come from potential FTAA members including the United States.

Analysis of Jamaica's Tariff Structure

Jamaica began its period of trade liberalization in the early 1980s (Hudson 2003; World Bank 2003). The program eliminated some quantitative restrictions (QRs), cut average tariffs to 15 to 18 percent per year, reduced the dispersion in legislated rates, and widened the import tax base somewhat. A second phase of liberalization ended in 1991, involving the establishment of several tariff "tiers" (depending on the stage of processing or final use) and further elimination of QRs. Since 1990, additional tariff cuts have been coordinated with the CET in CARICOM. By 1998, the highest CET rate was set at 20 percent for nonagricultural goods. This third phase of liberalization also involved cuts in additional stamp duties and a restriction in the number of tariff lines exempted from partial import taxation to expand the revenue base.

Tariff Structure

Despite these tariff cuts, Jamaica sustains a high degree of taxation on imports. Table 1 shows the basic Jamaican tariff schedule by tier, with a list of many product types to which the tariff rates apply. Several conclusions may be drawn from this table. First, Jamaica has ten basic tariff rates, ranging from 0 to 100 percent. Second, there is considerable escalation in the tariff structure. Most raw materials and machinery and equipment categories face no tariff, intermediate products come in at 10 to 15 percent rates, and consumer goods tend to attract rates of 20 to 30 percent. Thus, one clear objective of the structure remains protection of final goods processing. Third, motor vehicles are taxed quite differently. Completely knocked down (CKD) kits for assembly have a 5 percent rate, buses and trucks a 10 percent rate, and motor vehicles a 35 percent rate. Agricultural goods and food

Table 1
Tariff Rates and Examples of Covered Products

Tariff Rate (%)	Products Covered
0.0	Live animals for breeding, vegetables for processing, spices, grains, raw materials, chemicals, medicines, some film, rubber products, furs, paper, print media, basic textiles, fabrics, glass, engines, machinery, electronic equipment, instruments
5.0	Some processed meats, some dairy, coal, completely knocked down (CKD) motor vehicles
10.0	Gasoline, fuel oils, agricultural products, raw sugar, basic metal products, buses, trucks, scientific equipment, musical instruments, athletic equipment
15.0	Metal products, produce, cement, some organic chemicals, medicines, paints, plastic products, wood products, stone products
20.0	Processed meats, food products, dairy, baked goods, coffee, cosmetics, film, leather products, some wood products, paper products, carpets, apparel, bottles, finished metal products, appliances, air compressors, some machinery, a/v tapes, motorcycles, cameras, toys
25.0	Rice, some lighting equipment, auto parts
30.0	Tobacco, alcoholic beverages, some tires, jewelry, compact disks, machine parts
35.0	Crude oil, live animals, some processed meats, live plants, processed vegetables, spices, flour, sugar, motor vehicles
40.0	Some meats, vegetables, fruits, crude oil, some small motor vehicles
100.0	Processed poultry

Source: Compiled by authors from Jamaican tariff files at the ten-digit tariff line.

products also tend to face heavily differentiated tariff rates. Live animals and grains are not taxed, processed meats and dairy are taxed at different levels, rice has a 25 percent tax, and processed poultry products attract the 100 percent tariff rate. Again, these rates presumably exist for reasons of protecting domestic industrial and farming concerns. Finally, there are many exceptions to all of these observations, and within any broad category, the actual rate at the ten-digit tariff line can vary considerably.

Tariff Revenue Collections and Tariff Dispersion

To get a precise idea about the detailed dispersion of tariff rates and the efficiency of revenue collections from the tariff structure, we compiled and analyzed data from the electronic files provided by the Jamaican government from transaction-level customs forms for the year 2003. The customs declarations identify detailed (ten-digit) tariff lines of the harmonized system (HS) classification, the tariff rate that should be applied, the amount of revenue that should be paid, and the actual revenue paid.⁴ The latter often is smaller than the former because of a number of exceptions and limitations. Our calculations found that approximately 5 percent of import transactions were exempted legally.

The greatest numbers of exemptions apply to duty-free imports from CARICOM. The second most common category is remission by minister, involving special orders from the minister of finance excusing importers from paying the tariff. There are additional exemptions for imports by firms from specific industries, plus exceptions for use by the government, the university, hospitals, and other public activities. Taking account of the entire sample of customs forms, our calculations show that while the weighted-average applied tariff rate across all three-digit sectors was 10.18 percent in 2003, the actual weighted-average collected rate was 5.28 percent.⁵ Some product-line exemptions were particularly noteworthy. For example, in petroleum oils, the average applied tariff rate was 9.2 percent, but the collected rate was just 1.4 percent. Overall, Jamaica legally exempted from collection about ten billion Jamaican dollars, in comparison with total tariff collections of J\$10.2 billion. Almost J\$1.2 billion of these exemptions were in motor vehicles.

The Jamaican practice of differentiating tariff rates and offering extensive exemptions generates a considerably high degree of dispersion in applied and collected tariff rates. Across all three-digit HS sectors, the coefficients of variation of both applied and collected rates were well above unity.

Table 2
Additional Stamp Duty (ASD) Rates by Product Category

Product Category	ASD Rate
Tobacco products	56%
Products with tobacco substitutes	0%
Alcoholic beverages	34%
Crude oil	18%
Some basic metal products	20–25%
Some meat products	33% or 55–62%
Some vegetables and fruits	33–36% or 86–90%
Some processed fruits and vegetables	55–62%
Some vegetable oils	65%
Some fruit juices	69%
Some grains and meal	70%
Some poultry parts	80%
Poultry backs and necks	0%

Source: Jamaica Tariff Files.

Other Charges and Taxes on Imports

There are numerous other taxes and fees on imports that tend to vary across product categories, and this situation both raises protection markedly in some cases and increases the dispersion of trade taxes. Following is a listing of these additional charges, beginning with import taxes.

All imports entering Jamaica are subject to a basic stamp duty of J\$5 on transactions less than J\$5,500 and of J\$100 on transactions greater than J\$5,500. These are specific charges that diminish in importance with the size of the import transaction, and we do not consider them further here. An additional stamp duty (ASD) is payable on certain items such as chicken and most chicken parts, meats and some meat products, some aluminum products, alcoholic beverages, and tobacco products. Table 2 provides perspective on the ASD, which is added to the legislated tariff to raise protection rates toward bound rates.⁶ Tobacco products are subject to a 56 percent duty, presumably reflecting a policy preference to raise the cost of smoking. Alcoholic beverages are subject to a 34 percent duty. Note, however, that these are taxes imposed on imports only, and therefore, have a significant protective effect for domestic producers. Thus, although these high tariffs are justified dubiously under the rhetoric of “sin taxes” in Jamaica, they are primarily protective in nature. Similarly,

the 20 to 25 percent ASD on some metal products is designed to protect domestic aluminum production.

The remainder of table 2 shows that particular product lines within various categories face an ASD. For example, most fruits and vegetables face no ASD, but a selected set of goods is charged between 33 percent and 90 percent. Famously, while most poultry parts come in with an 80 percent ASD (in addition to a 100 percent tariff), there is no ASD on chicken backs and necks (neither is there a tariff on these goods). The stated reason for this differential treatment is that the 100 percent tariff exists to offset dumping of United States chicken and turkey parts in Jamaica, while the exemption of chicken backs and necks exists to keep the prices of those parts affordable to consumers. While the latter goal may be laudable, the system sets up obvious incentives to bring in poultry products (and other nonpoultry products) under the latter category. Indeed, chicken backs generally are described as a major source of tariff evasion, as importers classify many other goods in this category.⁷

Next, Jamaica imposes a customs user fee (CUF) of 2 percent on all imports, which is not high in relation to other developing countries. Furthermore, there is a standards compliance fee (SCF) of 0.3 percent on most food products, tobacco products, chemicals, some textiles and apparel, and most basic industrial products. Finally, there is a processing fee for the submission of certain documents that is additional to the CUF. Jamaica also applies a US\$200 charge per container imported and exported, in addition to a port security fee, to defray the country's costs of port modernization.

Jamaica charges other taxes in addition to these various duties and fees, but they are imposed also on domestic production (if any). The most prominent is the general consumption tax (GCT), which is effectively a value-added tax (VAT). The standard rate is 15 percent, but there are some exempted items, and tax rates themselves vary from 0 to 100 percent. In fact, there is not much variation in the GCT at the tariff-line level.

The most variable element in the GCT pertains to motor vehicles. Buses, trucks, and automobiles imported by dealers attract the standard GCT rate of 15 percent. Trucks and tractors for agricultural use tend to face a 23 percent rate. However, motor vehicles imported in completely-knocked-down kits for domestic assembly and vehicles brought in by individuals and franchises are subject to a much higher tax. This difference in treatment establishes a large range in effective taxes on imported motor vehicles. Within those 161 HS-based product lines, the average sum of the tariff and GCT is 61 percent, with a standard deviation of 34 percent. For

this reason, motor vehicles are another source of major tax evasion within the customs system, through two mechanisms. First, many motor vehicles imported presumably for private uses are classified for public use, thereby escaping tariffs. Second, observers claim that a significant proportion of motor vehicles is imported in containers classified as completely different goods subject to low or zero tariffs, such as chicken backs.

Jamaica also imposes a special consumption tax (SCT) on imports of particular goods. The SCT also is imposed on similar domestically produced goods and is best considered an excise tax. Alcoholic beverages are taxed at rates ranging from 16 to 30 percent, some tobacco products at 12 percent, and cigarettes at 169 percent. Certain fuels have SCT rates ranging from 1 percent to 64 percent, though gasoline is taxed at 770 percent, according to the tariff file. A final charge is an excise (health) tax of 23 percent on tobacco products, raising the total consumption tax on cigarettes to 227 percent beyond the 86 percent tariff. In consequence, it is not surprising to discover that cigarettes are a source of evasion and are commonly smuggled into the country.

Just as with the tariffs, the customs forms list the amount of taxes that should be paid on imports. Computations show that the applied tax rates are higher than collected tax rates because of numerous exemptions and remission programs. Across all categories, the weighted average tax rate was 20.7 percent, but the collected rate was about half that at 10.9 percent. The figures suggest that actual taxes paid in 2003 amounted to J\$22.3 billion, while J\$42.4 billion should have been collected, leaving a revenue shortfall of J\$20.1 billion.⁸

To study variability, we compute the total taxes applied on imports at the tariff-line level by combining the overall percentage tariff rate (tariff plus ASD plus CUF plus SCF) with the SCT, excise tax, and GCT, accounting for the stage at which each is applied. A considerable anomaly exists in poultry parts, for which most categories face a combined tax of 224 percent but chicken backs just 17 percent, generating a significant incentive for misclassifying and undervaluing goods. However, in industrial goods, especially intermediate materials, the economy is open: there are no tariffs, and the primary tax is the GCT. Across all tariff lines, more than half face composite tax rates in the range of 16 to 20 percent. These are goods with only the GCT and CUF, coming in at a zero tariff. Another large group exists at 36 to 40 percent, facing the GCT and a significant tariff rate. Finally, there are more than eight hundred tariff lines with very high combined tax rates, which typically involve both the SCT and ASD.

Tax Evasion at the Border

Jamaican customs officials estimate that evasion through misclassification and undervaluation of imports reduced their revenues by perhaps J\$2 billion in fiscal year 2002-2003. The incentives to evade arise from the large variation in tariffs, the high and variable domestic taxes, and the extensive exemptions that are available. The problems in smuggling in liquor and cigarettes are associated with high taxes and tariffs, while misclassification problems with automobiles and chicken parts are endemic.

Jamaica recently has implemented a new customs valuation procedure to be consistent with WTO requirements in this area (WTO Customs Valuation, 1994). While the WTO rules are complicated, they essentially rest on the notion that private traders should be trusted to declare their imports truthfully and that customs authorities can question these invoices and take steps to revalue them only with strong prior evidence that they are fraudulent. Jamaican customs officials argue that these new requirements may reduce their ability to counteract evasion.

It is evident that one way to reduce the problem is to unify effective taxation at the border, including limiting exceptional treatment and administrative duty remissions. However, Jamaica's tariff rates are set by CARICOM in the CET, and negotiating greater unification may be difficult.

Revenue Impacts of Potential Tariff and Tax Policy Changes

In this section, we put forward basic answers to certain questions surrounding Jamaican tariff and tax policy. The aim is to shed light on the implications for central government revenues of various potential changes in border taxes. We initially consider a shift toward tariff unification that is consistent with the CET. We then integrate this change with partial unification of nontariff taxes on trade. We also set out a simple model of price-based tax evasion to explore whether such unification would reduce that problem. Finally, we look at implications of joining the FTAA in the sense of reducing tariff rates on those potential partner countries to zero.

It must be emphasized that these are partial-equilibrium calculations and rely on assumptions about import demand elasticities.⁹ Thus, we calculate the anticipated revenue changes sector by sector, without permitting the price changes to affect intersectoral production and consumption shifts. In this regard, the calculations likely understate the efficiency gains, and

therefore, revenue enhancements that could ensue from the policy changes. Also missing are potentially important impacts on factor prices in general equilibrium, which in turn could affect revenue collections directly in labor and capital markets. Whether these effects would indirectly raise or lower factor-tax revenues would depend on sectoral production and consumption allocations and the overall induced efficiency impacts on the economy.¹⁰

We assume that Jamaica is a small economy and that foreign firms offer products to the country at fixed prices regardless of Jamaica's taxes on trade. This is a reasonable assumption that we maintain throughout the analysis.¹¹

Preliminary Notes on Tariff and Tax Unification

The highly variable tariffs and taxes discussed above suggest that movements toward rate unification should result in greater efficiency and higher revenues. Readers schooled in standard public-finance theory may be surprised by the notion that tariff unification could be efficiency-enhancing. Standard public economics notes that differential commodity taxes under a Ramsey rule (with consumption taxes higher on goods with inelastic demands than on goods with elastic demands) would generate the least consumption distortion for a given revenue target (Myles 1995). However, this standard result does not hold for tariffs, for they are discriminatory between domestic and imported goods in the same categories. Ramsey commodity taxes drive a wedge between consumer and producer prices, whereas tariffs drive that wedge between consumer and import prices (Vousden 1990). The protection afforded by import tariffs permits domestic-producer prices to rise, generating a secondary production distortion that is not neutral between sources of supply for a given commodity. Thus, a tariff is equivalent to a tax on consumption combined with a subsidy to production by domestic producers, injecting two deadweight losses into an economy. Import tariffs are not the same as commodity taxes, and the former are less efficient at raising revenues.

These secondary production distortions are what underlie the standard trade economists' prescription that tariffs should be unified if not eliminated. Highly variable tariff rates across sectors and between intermediate goods and final goods can generate net taxes or subsidies across commodities that allocate resources inefficiently, according to standard theories of effective protection.

To put this problem in simpler terms, the Jamaican tariff structure, as noted above, is characterized by significant tariff escalation as the stage of processing increases. Tariff escalation bears two forms of inefficiency.

First, it can imply high rates of effective protection to value added in final goods. For example, suppose that a can of tomato paste has a 25 percent tariff, while tomatoes are imported freely and the share of raw tomatoes in manufacturing tomato paste is 0.8. Then the effective rate of protection to value added in tomato paste is actually 125 percent, far higher than the published tariff rate. In contrast, if the tariff rate on tomatoes were also 25 percent, the effective protection to tomato paste would be 25 percent, equal to its published rate. In the first case, the processed-foods industry would expand more than in the second case, implying even greater inefficiency of the implicit tax on other goods.

Second, it raises uncertainty about the full package of incentives in an economy. When there are many imported inputs all coming in at various tariff rates, the effects on effective protection and resource pulls would require more information to calculate, increasing the uncertainty facing firms in various sectors. An additional uncertainty arises whenever goods may be misclassified, which often happens in a tariff system in which tax rates vary considerably across similar product categories and in which official classifications are subject to frequent changes. Furthermore, calculations of effective protection should be adjusted for impacts of other policies on goods prices and quality, including subsidies, incentives, and exchange-rate misalignments. The net result is that the system becomes increasingly nontransparent to firms and investors as tariff rates vary across sectors at different stages of processing.

For such reasons, trade analysts generally argue for unification of trade-tax rates to neutralize incentives among sectors.¹² This result does not imply that Ramsey taxes are incorrect in the context of an economy that is either closed or that imports all of its goods (in which case, tariffs are the same as commodity taxes). Jamaica does import many goods that it does not produce, suggesting that differential commodity taxes may be revenue enhancing in some degree. Furthermore, tariff unification ignores the possibility that higher import taxes may be used to limit consumption of goods exhibiting negative externalities (albeit at the cost of raising production of domestic substitutes).¹³ These possibilities suggest that tariff unification per se is unlikely to be welfare maximizing, a point with which the authors agree.¹⁴ Overall, however, the inefficient incentives of a mixed system and the tendency toward tax exemptions indicate that tariff unification at low rates could expand both efficiency and revenues. Our operating assumption in the partial-equilibrium analysis, therefore, is that tax unification may be beneficial from an efficiency standpoint, without considering any gains from dealing with externalities through the tax system.

In practice, however, unifying all tariffs is impossible because the tariff structure is set largely by CARICOM within the CET. Thus, an initial question is the extent to which tariff changes are permissible under these restrictions. To answer this question, we analyzed the CET at the ten-digit tariff-line level. Within the CET, there are two forms of flexibility in setting direct tariff rates (as opposed to nontariff trade taxes and the CUF and SCF). The first is called List A, which permits each country to reduce the tariff rate on products on this list to zero. That is, such tariff lines are not constrained from below. There are 106 such lines (of a total number of tariff lines in the CET of 6,869), largely in agricultural goods and a few industrial materials. Jamaica does not take advantage of many of these zero-tariff lines. The major exception is the infamous chicken-back tariff line, which has a zero duty.

The second is called List C, which sets a minimum tariff for nonmember countries on goods on that list that is almost always higher than zero. Countries are free to choose a tariff above this level. There are 355 tariff-line items on this list. List C minimum tariffs are found in many products including alcoholic beverages, tobacco products, fuels, and motor vehicles. Jamaica generally adopts tariffs well above these minimum rates in buses and motor vehicles but otherwise tends to adopt minimum rates. To summarize, if an item is not on List A or List C, we assume that Jamaica's tariff rate is the same as the CET rate and ineligible to be moved, at least in terms of its legislated rate.

To develop a set of tariff rates that reasonably could capture these elements of flexibility, we concorded the tariff-line data to the four-digit aggregated HS codes. This permitted us to calculate an approximate range for the weighted-average tariff in each four-digit sector without violating the CET schedule. We then determined for each four-digit category the weighted-average applied (or, equivalently in terminology, legislated) tariff rate, the weighted-average collected tariff rate, the ASD, GCT, SCT, excise tax, CUF, SCF, and rates at which remissions are granted on tariffs and nontariff trade taxes.

Our essential goal is to unify tariff rates as much as possible at a rate of 10 percent. In considering potential changes in detailed tariff rates, the following algorithm, which we refer to as partial unification of tariffs, was chosen.¹⁵ First, if the weighted-average applied tariff exceeded 10 percent and the collected rate was below 10 percent, we set the new collected rate at 10 percent. This would not violate any CARICOM obligations; it simply would close the gap between applied and collected rates (that is, reduce exemptions). Second, if the weighted-average applied rate was

zero, we kept the collected rate at zero to reflect policy preferences for free trade. Third, if the applied tariff was between 0 and 10 percent, we set the collected rate equal to the applied rate (that is, eliminated exemptions in these cases). Next, if both the applied and collected rates were above 10 percent and there were no List A or C restrictions, we set the tariff rate equal to the collected rate, keeping the structure of exemptions intact to sustain what were presumably underlying policy preferences. Furthermore, if both the applied and collected rates were above 10 percent and there were List A or C minimum rates, we set the tariff to 10 percent if that was above the minimum, otherwise, we selected the A or C minimum. We kept the collected CARICOM rates at their current levels throughout, so all of the above changes refer strictly to tariffs on ROW imports.

Turning to tax reforms, our unifying theme was to move as close as possible to a regime in which the GCT of 15 percent would be applied uniformly to all imported goods while eliminating the distortionary ASD. Any GCT rates in excess of 15 percent would be swept into the SCT in recognition of the policy goals of the consumption tax. The CUF and SCF would be kept intact as WTO-consistent modest user fees to avoid the revenue losses that would ensue from eliminating them. Thus, we set the GCT to 15 percent in all categories in which it was at that level or higher and did not change the CUF or SCF. The unified nontariff tax rate was, therefore, either 17 or 17.3 percent. If the GCT was less than 15 percent, we kept it unchanged. If it was above 15 percent, we cut the GCT to that level and shifted the additional tax to the SCT, without reducing the overall tax in the sector.¹⁶ Finally, we eliminated the ASD.

A further comment is that the government is unlikely to realize full yields on all of these tariffs and taxes, given the existence of exemptions and remissions. Thus, we compute revenue impacts both with full collection and with tariff collections of 52 percent and tax collections of 53 percent, the current average collections rates.

An additional complication arises concerning accounting for remissions. In Jamaica, applied (statutory) tariffs are levied on the amount of imports that are not subject to remissions, and a zero rate is levied on the amount of remissions. To account for this difference, it is sensible to assume that any new policy rate is applied to the amount not subject to remissions but that some remissions will remain in place. Immediately, this raises two questions, however. How much of the additional (marginal) import taxes will be remitted, and how should we factor in these remissions in determining changes in import volumes?

Our approach is as follows. First, we compute the amount of remissions Jamaica awarded in 2003 for tariffs (and taxes) by four-digit product line. We had product-level data for tariff remissions but had to apply average three-digit tax rates to four-digit product categories for trade taxes, keeping intact the overall amounts of revenues generated and remissions made. Thus, we estimated remission rates by product line. Second, we compute anticipated changes in import volumes using collected tariff and tax rates. Third, we compute the new remissions amounts after implementation of the tariff or tax policy changes. For this purpose, we apply the same remissions rates as calculated in the initial 2003 data to the new import volumes and tariff or tax rates. The notion here is that remissions rates are policy choices that may not be affected by reforms. However, we also assume that the government reduces the volume of these remissions by a certain percentage. In the calculations presented here, that percentage is 50 percent. Obviously, the more the remissions are reduced, the greater the revenue gains would be. Finally, we compute the new levels of tariff or tax revenues as the new collected tax rates times the appropriate tax base (import volumes or tariff-inclusive import volumes) minus the new amount of remissions.

In these latter calculations, we are really computing impacts on revenues from applying new policy rates to calculate the marginal (i.e., not subject to remissions) tax liabilities. This will generate smaller estimated revenue gains by avoiding double-counting of taxes on remissions. In the tables below, we refer to these cases as policies applied to marginal changes, where the word *marginal* refers simply to accounting for remissions made at the initial and new equilibrium points.

A key parameter in determining the impact of tariff and tax reforms on revenues is the elasticity of import demand. To keep things simple, we consider two cases. In one situation, we assign an elasticity of -1.0 to import demand. In the other, we make a distinction between goods that might be called necessities (food, tobacco, fuels, and medicines) and all other goods. We assign a lower demand elasticity of -0.5 to the necessity goods while retaining the unitary elasticity for other commodities. We do not have empirical support from the literature for these elasticity choices. To our knowledge, there are no elasticity estimates for a country such as Jamaica at the four-digit tariff-line level, which is the nexus of our analysis. Note that the highly disaggregated nature of our analysis suggests that substitution across goods is possible, and therefore, these estimated elasticities may not be too high. Using lower demand elasticities generally tends to raise marginally the computed gains in tariff and tax revenues, as shown in Maskus and Rioja (2004).

Revenue Implications of Tariff and Tax Reforms

Various revenue calculations are made in tables 3 and 4, using detailed four-digit tariff lines.¹⁷ Each scenario begins with a description to clarify what is being computed.

Scenario 1. Achieve the partial unification of tariff rates, consistent with CET, assuming these are either 100 percent or 52 percent collected. Keep CARICOM tariffs unchanged. Maintain the existing tax structure, including the collected rates.

Table 3, part A refers to the situation in which new tariffs are applied to full import volumes, while part B refers to the situation in which remissions are granted at 50 percent of the original rates by product (the marginal cases discussed above). In both scenarios, indirect tax rates are kept at their original levels. As may be seen in part A, the revenue implications of this feasible tariff unification depend on the ability of the government to collect the new rates. If the tariffs are fully collected, revenues could rise by about J\$2 billion. Note that for the dual-elasticity case, there are some follow-on tax-revenue changes as import volumes are altered by the tariff changes. In any event, these induced-tax-revenue effects are small. However, if tariffs are only 52 percent collected, revenues could fall by between –J\$3.1 billion and –J\$3.6 billion.

In part B, we compute these effects in the marginal sense. As may be seen, potential revenue gains are smaller in the case of 100 percent tariff collection, amounting to about J\$1.5 billion. Revenue losses from tariff reform and 52 percent collection rates would be somewhat higher than before, at between –J\$3.4 billion and –J\$3.8 billion.

Conclusion: Partial tariff unification within the bounds of CET, by itself, could lose revenue for the government unless collection rates are increased. The source of any gains here would be a better attempt to collect the available revenues by reducing exemptions and remissions.

Scenario 2. Achieve the partial unification of tariff rates, consistent with CET, assuming these are either 100 percent or 52 percent collected. Keep CARICOM tariffs unchanged. Add partial unification of nontariff tax rates, assumed to be collected either at 100 percent or 53 percent.

This case is summarized in table 4. In panel I, we assume tariffs are fully collected and then consider two tax reform cases, again considering total (part IA) and marginal (part IB) revenue impacts. For each case, the

Table 3
Implied Changes in Tariff Revenues from Partial Tariff Unification,
CARICOM Tariffs Unchanged (J\$ millions)

Tariff Rates	Elasticity of Import Demand					
	-0.5 and -1.0*			-1.0		
	Tariff Revenue	Tax Revenue	Total Revenue	Tariff Revenue	Tax Revenue	Total Revenue
A. Applied to full changes						
Partial unification, 100% collected	+2192	-185	+2007	+2141	+0	+2141
Partial unification, 52% collected	-3613	+499	-3114	-3602	+0	-3602
B. Applied to marginal changes						
Partial unification, 100% collected	+1758	-185	+1573	+1709	+0	+1709
Partial unification, 52% collected	-3854	+499	-3355	-3843	+0	-3843

Source: Computed by authors from Jamaica Tariff Files.

Note: In case*, the import demand elasticity for necessities is set at -0.5, and for all other goods, at -1.0. In the full-changes cases, we eliminate remissions. In the marginal-changes cases, we assume that 50 percent of new tariff remissions (calculated at initial remission rates) are eliminated. CARICOM = Caribbean Community.

Table 4
Implied Changes in Tariff and Trade-Tax Revenues from Partial Tariff Unification, CARICOM Tariffs Unchanged, at Partial and Full Unification of Tax Rates (J\$ millions)

Tax Policy	Elasticity of Import Demand					
	-0.5 and -1.0*			-1.0		
	Tariff Revenue	Tax Revenue	Total Revenue	Tariff Revenue	Tax Revenue	Total Revenue
Panel I: Tariffs 100% collected						
IA. Applied to full changes						
Partial unification, 100% collected	+591	+23972	+24563	+279	+20103	+20382
Partial unification, 53% collected	+1941	+5556	+7497	+1834	+4857	+6691
IB. Applied to marginal changes						
Partial unification, 100% collected	+228	+21935	+22163	-71	+18181	+18110
Partial Unification, 53% collected	+1525	+4314	+5839	+1423	+3637	+5060
Panel II: Tariffs 52% collected						
IIA. Applied to full changes						
Partial unification, 100% collected	-4493	+25349	+20856	-4623	+21689	+17066
Partial unification, 53% collected	-3790	+6285	+2495	-3813	+5698	+1885
IIIB. Applied to marginal changes						
Partial unification, 100% collected	-4574	+24872	+20298	-4819	+19686	+14687
Partial unification, 53% collected	-4021	+5004	+983	-4042	+5313	+1271

Source: Computed by authors from Jamaica Tariff Files.

Note: In case*, the import demand elasticity for necessities is set at -0.5, and for all other goods, at -1.0. In the full-changes cases, we eliminate remissions. In the marginal-changes cases, we assume that 50 percent of new tariff emissions (calculated at initial remission rates) are eliminated. CARICOM = Caribbean Community.

first reform is the partial tax-rate unification mentioned above, fully collected. The second is the same set of tax rates but 53 percent collected.

It is obvious in part IA that if all taxes are fully collected, the government would gain considerable tax revenues. This is because the new tariff schedule would represent a slight increase in average tariffs, while the new tax schedule would constitute a large increase in average tax rates. Notice in the first row of part IA, for example, that with a mixed elasticity of -0.5 or -1.0 , tariff revenues could rise by J\$591 million and tax revenues by J\$24.0 billion. With a unitary elasticity in all goods, the tax-revenue gain would decline to J\$20.1 billion. The fact that tariff revenues would rise by less is a result of the overall increase in taxes on imports, causing a reduction in import volumes. Overall, however, this kind of outcome clearly is not realistic because of the difficulty of collecting this revenue fully.

A more reasonable scenario would be for the partially unified taxes to be collected at 53 percent, the current average collections rate. In this case, assuming a mixed elasticity, tariff revenues could rise by J\$1.9 billion and tax revenues by an additional J\$5.6 billion, with a net rise in revenues of J\$7.5 billion. Revenue gains would be somewhat smaller with a uniform unitary elasticity. Because cases in which tax-collection rates remain at 53 percent seem more realistic than the full-collection scenarios, we list these results in boldface.

The two rows in part IB consider the same scenarios while accounting for remissions changes in the marginal cases. This kind of change would increase revenues by somewhat less. Note that if tax-collection rates were not to rise, there would be a gain in overall revenues of about J\$5.8 billion.

The scenarios in panel II are more pessimistic by assuming that tariff revenues are only collected at 52 percent of applied tariff rates, consistent with the current situation. In all cases, this scenario would reduce tariff revenues sharply, ranging in amount from $-J\$3.8$ billion to $-J\$4.0$ billion. However, there would be an increase in tax revenues from partial unification of taxes, even at 53 percent collection. Again, to take a realistic case: using the mixed demand elasticities and a 53 percent collection rate, tariff revenues would fall by $-J\$3.8$ billion, but tax revenues would rise by J\$6.3 billion. The overall increase would be J\$2.5 billion. Thus, there is potential to increase revenues from taxes on trade through rationalization of the tariff and tax structure, even holding current collection rates constant.

However, accounting for remissions in the marginal cases, we find that potential revenue gains would be smaller. It may be that net gains would amount only to about J\$983 million to J\$1.3 billion.

Conclusion: Partial tariff unification within the bounds of the CET, combined with partial rationalization of the nontariff taxes on trade, bears the potential to increase revenues by perhaps J\$1.9 billion to J\$2.5 billion, even at current levels of collection. However, accounting for remissions, this gain would be reduced to about J\$1 billion. Larger revenues would ensue from reducing exemptions and remissions.

Our final consideration in this part is the issue of evasion of tariffs and trade taxes through underinvoicing import prices. It is evident from earlier discussion that Jamaica's ability to collect tariff and tax revenues suffers from considerable opportunities to evade taxes. It is possible to get a conservative estimate (lower bound) for such costs by implementing a simple model of tax-evasion behavior by importers. Suppose that importers engage in greater underinvoicing as the total tax bite rises, according to the following relationship:

$$\frac{P^T}{P^R} = [(1+t)(1+\tau)]^\alpha. \quad (1)$$

In this equation, P^T refers to the true price of a unit of imports and P^R refers to the price reported to customs. The tariff rate is t , the aggregated additional tax rate is τ , and α is a nonnegative parameter indicating how rapidly the gap between the true and reported prices rises with the tariff rate. There is no incentive to undervalue imports for any product with a zero tariff rate. Regarding the exponent, if α is less than 1, the amount of underinvoicing would rise with the total tax bite but at a decreasing rate. However, if α exceeds 1, the extent of misreporting would go up at an increasing rate.

If we assume that reported quantities of imports are accurate (i.e., there is no underreporting of import volumes), it is easy to calculate what the true value of imports would have been given the relationship above. Thus, given initial import values by sector, collected tariff and tax rates, and the value of α , we can compute what import values and tariff and tax revenues would have been in the absence of underinvoicing.

We calibrate the value of α to be 0.65, which generates an estimated loss in tariff revenue from underinvoicing, under existing policies, of J\$2.07 billion, close to the Jamaica Customs estimate of J\$2.0 billion listed earlier. Thus, considering a third policy scenario that is identical to Scenario 2 above, with collection rates of 52 percent for tariffs and 53 percent for taxes but also computing the changes in tax evasion, we reach the following conclusion.

Conclusion: Partial tariff unification within the bounds of the CET, combined with partial rationalization of the nontariff taxes on trade, bears the potential to increase revenues by up to J\$4.3 billion, even at current rates of collection, accounting for automatic reductions in price evasion.

Revenue Implications of Free Trade Agreement of the Americas

A significant challenge facing Jamaican authorities is that to join the FTAA would imply reducing tariffs on the bulk of the country's imports to zero through time, resulting in potentially large revenue declines. To analyze entry into the FTAA, we set the collected tariff rates on imports from the FTAA countries to zero and compute the implied effects on tariff and tax revenues. For this purpose, FTAA is defined as CARICOM, North America, and the remainder of the Western Hemisphere except Cuba.

The results of the calculations, not shown here, are straightforward. The anticipated reductions in direct tariff and tax revenues earned on FTAA trade would come to as much as -J\$5.4 billion under unitary import demand elasticity. Thus, the elimination of tariffs on imports from FTAA countries, because those imports are so large in Jamaica's trade pattern, would reduce tariff collections by significant amounts, perhaps by 60 percent of fiscal year 2002-2003 tariff revenue. It should be noted that tariff cuts in the FTAA presumably would be phased in through time, permitting a period within which to organize alternative sources of government revenue.

Concluding Remarks

In this article, we considered the structure of Jamaica's tariffs and other taxes on imports and made simple computations of the revenue implications of various policy options available in this area. We may summarize our basic findings as follows.

First, the Jamaican tariff system, in conjunction with its additional taxes on trade, is inefficient at raising revenues. This is largely the result of excessive limitations, exemptions, remission, and weak customs enforcement, but the variable nature of the tariff structure itself contributes to the problem. There is scope for unifying tariff rates without reducing tariff revenues collected. The ability to raise revenues would be markedly enhanced by unifying the nontariff components of taxing imports. Additional revenues could be forthcoming from endogenously reduced tax

evasion, but the major gains would come from reducing exemptions and remissions.

Perhaps the main lesson here is that collection efficiency, exemptions and remissions, and evasion are more significant issues for revenue generation than are tariffs, a fact that will become more evident as future trade liberalization proceeds. In that context, Jamaican fiscal authorities should revisit their tendencies to award large and frequent tax exemptions, while customs officials should place significant emphasis on upgrading procedures and deterring evasion. More frequent audits of import transactions, additional inspection machinery that can identify cargo within containers, and more inspection personnel could generate revenue gains.

Second, the need for effective integration of trade taxes with general fiscal reforms is evident. As Jamaica heads further toward regional reductions in trade barriers within CARICOM and the FTAA, its tariffs will generate rapidly declining revenues. The primary policy challenge will be to develop efficient and broad-based taxes to offset this problem.

In some ways, the problems identified in this article may be specific to Jamaica. Its tariff and tax systems seem unusually captured by political interests that prefer to avoid and evade taxes through preferential rates, exemptions, and the like. However, Jamaica's customs and tariff difficulties, in addition to its production structure, are similar to those of other Caribbean economies—indeed, to most island economies in the world. Like Jamaica, other small island economies typically face substantial tax evasion, product misclassification, and smuggling, while the majority of small developing countries continue to have highly variable tariff rates that are not well integrated with domestic taxes. The computations offered here may, therefore, be of interest to fiscal authorities in such countries around the world.

Appendix

In this appendix, we present formulas for the basic calculations. It is evident that the impact on revenues from a tariff change would depend on the elasticity of import demand. We define this elasticity ε_M as the percentage change in imports divided by the percentage change in domestic price; this parameter is negative or zero. Given information about the tariff rates before and after unification and assumptions about import demand, it is straightforward to calculate the change in imports:

$$\frac{M_1}{M_0} = 1 + \varepsilon_M \left(\frac{t_1 - t_0}{1 + t_0} \right). \quad (2)$$

From customs data, we know the initial CIF value of imports, P^*M_0 , and initial tariff revenue, $t_0P^*M_0$. From the equation above, we can calculate the new CIF value of imports

$$P^*M_1 = P^*M_0 \left[1 + \varepsilon_m \frac{(t_1 - t_0)}{1 + t_0} \right], \quad (3)$$

and therefore, also calculate new tariff revenue, $t_1P^*M_1$. We apply this approach across each four-digit product category and compute the effects presented in tables 3 and 4.

We next consider how the revenue of nontariff taxes would be affected when tariffs are partially unified as in the scenarios described in the article. In principle, the revenues generated could rise or fall. In the calculations that follow, we are interested in computing effects on nontariff tax revenues. Because all taxes are ad valorem, the formula for computing increases in CIF import values is the same as above. However, the formula for tax collections is

$$\text{Tax revenue} = \tau P^*(1 + t_i)M_i \text{ for } i = 0, 1. \quad (4)$$

To elaborate on this procedure (which is applied to generate the results of table 3),

- we set each tariff according to the partial-unification criteria described in the article and hold other taxes constant;
- we compute the implied change in CIF import values using equation 3 above; and
- using equation 4, we calculate the implied change in both tariff and tax revenues that would be generated by the new import volumes.

Finally, we describe the approach to compute revenue changes from the partial unification of tariffs and taxes as described by the scenarios in table 4. In this case, the change in tax rates also would affect domestic prices of imported goods, and therefore, would change import volumes along with the changes in tariff rates. A revised version of equation 3 is then

$$P^*M_1 = P^*M_0 \left[1 + \varepsilon_m \left\{ \frac{(1 + t_1)(1 + \tau_1)}{(1 + t_0)(1 + \tau_0)} - 1 \right\} \right], \quad (5)$$

that is, in this case,

- we set each tariff and nontariff tax at the partial unification rate;
- we compute the implied changes in CIF import values from equation 5; and
- we compute the implied changes in overall revenues (tariffs plus taxes) from the new import volume and tax rates.

Notes

1. The article summarizes the main results of Maskus and Rioja (2004).
2. See International Monetary Fund, *International Financial Statistics* database, and Bank of Jamaica.
3. The country is party to several smaller bilateral and sectoral agreements that we do not discuss here.
4. Specifically, the data reflect information obtained from C-78 customs forms. These forms must be filled out by the importer or a broker for all but the smallest (less than US\$1,000) transactions.
5. A weighted-average tariff for a three-digit sector averages the tariff of all the products in that category, weighting each by its import value.
6. The ASD seems to be used in lieu of a straightforward increase in the tariff rate toward bound levels to permit customs officials to discriminate among specific goods within tariff lines, hence the word *some* in several lines of table 2.
7. This information was provided in an interview with Jamaica Customs officials, 18 February 2004.
8. Figures from the Ministry of Finance and Planning of Jamaica indicate that revenues collected in fiscal year 2002-2003 for stamp duty, GCT on imports, and SCT on imports added to J\$16.5 billion. Thus, our calculation of \$22.3 billion payable from the customs forms is somewhat larger than the official figure.
9. Several examples of such partial-equilibrium analyses of tariff reforms may be found in Francois and Reinert (1997).
10. Eby Konan and Maskus (2000) analyze such possibilities extensively in the context of a computable general equilibrium model of the Egyptian economy.
11. To the (doubtful) extent that Jamaica has market power, a reduction in a tariff would raise the foreign export supply price and tend to increase any anticipated tariff revenue loss, though the precise impact would depend on a number of elasticities.
12. A sensible goal is to attempt to unify tariff rates at a low level to reduce the misallocation effects and broaden the tax base. It is quite possible in a distorted economy for tariff unification to raise revenues from tariffs, permitting yet lower domestic tax rates (Eby Konan and Maskus 2000). An important component of this unification is the elimination, to the extent possible, of exemptions and opportunities to have tax liabilities overturned administratively.
13. It is also conceivable that tariffs qua consumption taxes may be designed on equity grounds to increase the progressivity of taxes, but there is scant evidence of this objective in Jamaica's tariff structure.
14. We are grateful to two referees for this point.
15. Other calculations, available on request, show that full unification of tariff rates would be capable of generating substantial revenue gains. Such a policy is infeasible for reasons noted.
16. To the extent that GCT rates above 15 percent are designed by Jamaica to redistribute income and their replacement by the SCT does not achieve such an objective, this approach may be politically problematic.
17. The appendix describes in detail the approach for computing changes in import volumes and implied changes in revenues.

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