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Aid for Trade, Infrastructure, and the Growth Effects of Trade Reform

Issues and Implications for Caribbean Countries

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Abstract

This paper examines how aid-for-trade programs can help to magnify the growth benefits that developing countries can reap from trade reform and global integration, with a special emphasis on the Caribbean region. The first part discusses various rationales for trade-related aid, viewed both as a compensatory scheme (aimed at cushioning the impact of revenue cuts and adjustment costs) and a promotion scheme (aimed at alleviating supply-side constraints). In the latter case, particular attention is paid to the role of infrastructure as a constraining factor on trade expansion. The second part discusses the relevance of aid-for-trade arguments for Caribbean countries and identifies a number of specific issues for the region. The third part illustrates the potential growth effects of aid-for-trade programs with simulation results for the Dominican Republic—a country where infrastructure indicators remain relatively weak. The results illustrate the potentially large growth benefits that a temporary and well-targeted aid-for-trade program can provide to countries of the region.

This paper—a product of the Poverty Reduction and Economic Management, Latin American and the Caribbean Region—is part of a larger effort in the department to understand the linkages between trade, infrastructure, and growth and their policy implications. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The author may be contacted at epintomoreira@worldbank.org or epintomoreira@imf.org.

Aid for Trade, Infrastructure, and the Growth Effects of Trade Reform

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Table of Contents

I. INTRODUCTION

Although the short-run benefits of global trade and financial integration remain a matter of debate, there is broad consensus among economists and policymakers that the longer-run effects of trade liberalization can be substantial. By eliminating distorted incentives (to engage in rent-seeking activities, for instance), trade openness may lead to improved allocation of resources among sectors. By promoting competition in domestic markets, it may force domestic firms to improve the quality of their products: If a foreigner produces a better product that can be imported, domestic firms must make a better product at a lower price to keep selling their product at home. Reducing barriers to imports may also help to promote exports; increased competition from imports lowers the profits that firms can earn by focusing solely on the domestic market, and may increase incentives to export. By facilitating the acquisition of new inputs, intermediate goods, and improved technologies, and by increasing knowledge spillovers from more advanced trading partners, trade integration may also exert beneficial effects on productivity of the economy.

There is indeed broad empirical evidence indicating that trade openness has positive effects on productivity and economic growth; among recent studies are Lee, Ricci, and Rigobon (2004), Winters (2004), and Wacziarg and Welch (2008). The latter study, in particular, found that over the 1950-98 period countries that liberalized their trade regimes experienced average annual growth rates that were about 1.5 percentage points higher than before liberalization. Post-liberalization investment rates rose 1.5-2 percentage points, whereas the average trade to GDP ratio increased by roughly 5 percentage points.[1]

At the same time, however, there has been growing recognition that supply-side bottlenecks in developing countries (particularly the poorest ones) may seriously constrain the ability to reap the benefits from trade liberalization. In particular, the lack of basic transportation infrastructure (ports, roads, and airports) may prevent businesses from sending their goods abroad. Given the lumpy nature of these investments, and the difficulty of

[1] They also noted, however, that there were large differences across countries.

securing private financing in some countries (even in partnership with the public sector), this creates a *prima facie* role for governments to intervene. In turn, this raises the question of how governments should finance investments in infrastructure, given constraints on their budgetary resources and their ability to borrow abroad.

More generally, there is also new evidence that the benefits of trade openness for growth may depend not only on better access to core infrastructure services but also on the implementation of a wide range of complementary structural reforms—most notably in the area of labor markets, governance, and the business climate. This is well illustrated in a simple model by Chang, Kaltani, and Loayza (2009), in which the growth effects of trade depend on the degree of labor market flexibility. Using cross-country, panel-data regressions, they found that the growth effect of openness may depend on a variety of structural characteristics. Specifically, they use nonlinear specifications that interact a proxy of trade openness with proxies of educational investment, financial depth, inflation stabilization, public infrastructure, governance, labor market flexibility, ease of firm entry, and ease of firm exit. They find all these interaction terms to be highly significant. Bolaky and Freund (2004) found similar results with respect to regulation. But if indeed governments should implement a wide range of reforms to fully reap the benefits from trade liberalization, the question that arises again is how the associated costs should be financed, in a context where domestic resources and external borrowing opportunities are limited.

This paper analyzes the interactions between trade and complementary reforms, infrastructure constraints, and the need for "aid-for-trade" programs for developing economies—with particular attention to the current context of Caribbean countries. Despite achieving solid real GDP growth in recent years (averaging 3.6 percent annually over the period 1997-2006, see Table 1) the Caribbean region has not grown as fast as some comparable high performing developing countries. Although the region benefited for decades from the establishment of a variety of preferential trading arrangements with its major trading partner, its share of world trade has declined steadily since the early 1990s (see Tsikata and Pinto Moreira (2009)). A key issue for Caribbean countries at the moment is what type of reforms should be implemented to allow them to take advantages of the opportunities offered

by the new global trade environment. What to do to improve infrastructure, and what role can aid play in that context, are key elements of the debate.

Table 1
Caribbean Countries: Real GDP Growth, 1997-2006
(In percent)

	Average 1997-2000	**Average 2001-2006**	**Average 1997-2006**
Antigua and Barbuda	**3.7**	**5.5**	**4.8**
Bahamas	**4.4**	**2.1**	**3.0**
Barbados	**3.4**	**1.8**	**2.4**
Belize	**7.2**	**5.5**	**6.2**
Dominica	**1.7**	**1.3**	**1.5**
Dominican Republic	**7.6**	**4.9**	**6.0**
Grenada	**6.6**	**2.8**	**4.3**
Guyana	**1.7**	**1.2**	**1.4**
Haiti	**2.1**	**-0.1**	**0.8**
Jamaica	**-0.1**	**1.6**	**0.9**
St. Kitts and Nevis	**3.9**	**3.5**	**3.7**
St. Lucia	**2.3**	**3.7**	**3.2**
St. Vincent and the Grenadines	**3.7**	**3.3**	**3.5**
Suriname	**1.7**	**5.5**	**4.0**
Trinidad and Tobago	**7.7**	**9.2**	**8.6**
Average	**3.9**	**3.5**	**3.6**

Source: World Bank (2008).

The remainder of the paper is organized as follows. Section II analyzes various arguments that have been offered to justify aid-for-trade (AFT) programs for developing economies. Section III discusses the relevance and implications of these various arguments for trade policy in Caribbean countries—particularly for some of the poorer countries in the region, where lack of public infrastructure remains a serious impediment to reaping the benefits from trade reform and spur growth. Section IV presents numerical experiments using a quantitative model for the Dominican Republic—a country where, despite its middle-

income status, infrastructure indicators remain weak. The last section offers some concluding remarks.

II. TRADE REFORM AND THE RATIONALE FOR AID-FOR-TRADE PROGRAMS

Arguments in favor of AFT programs often center on five dimensions—all of which designed to help countries benefit fully from greater trade integration: (i) assistance to offset adjustment costs, such as fiscal support to help countries make the transition from tariffs to other sources of revenue; (ii) technical assistance; (iii) capacity building, including support for trade facilitation; (iv) institutional reform; and (v) investments in trade-related infrastructure.[2] From an analytical standpoint, however, a more convenient analytical approach is to group these arguments under two headers: AFT as a "compensatory scheme" and AFT as a "promotion scheme." These sets of arguments are examined in turn.

1. Aid for Trade as a Compensatory Scheme

Arguments for AFT as a compensatory scheme can be grouped into two main rationales: mitigating revenue-induced cuts in productive expenditure, and mitigating adjustment and implementation costs.

1.1 Mitigating Revenue-induced Cuts in Productive Expenditure

Tariff revenues continue to be a major source of government income relative to the value-added tax and sales taxes in developing countries, particularly in the small, low-income ones (see, for instance, Bird and Zolt (2005)). A key reason for this is that tariffs have proved to be an administratively efficient way of raising revenues in a context where human and

[2]As noted by (stiglitz and Charlton, 2006, p. 8), until recently the existing AFT approach was to provide modest amount of aid on an *ad hoc* basis—primarily to cope with specific bottlenecks, or to support participation in WTO negotiations.

physical resources are limited. Another has been the limited ability to raise revenues from other sources, as a result of a large informal sector and high rates of tax evasion.

Given this dependence, a key issue for many developing countries is the extent to which trade reform may lead to a reduction in revenues, and what these revenue losses may impose on the spending side of the budget.

1.1.1 Trade Reform and Tax Revenues

A reduction in tariffs, unaccompanied by compensatory fiscal measures, may lead to reduced government revenue in the short run. Over time, however, to the extent that lower tariffs lead to increased imports (that is, an expansion of the tax base) trade reform may increase government revenue. Higher revenues may also result from the fact that greater openness to trade leads over time to higher collection efficiency for other taxes, such as VAT (see Aizenman and Jinjarak (2006)). In addition, if offsetting revenue measures (in the form of temporary higher taxes on other items, for instance), or reductions in spending are taken in parallel to cuts in tariffs, the adverse short-run effect may be mitigated.[3]

More generally, although trade liberalization may lead to a fall in revenue in the short term, some trade liberalization measures (such as the replacement of quotas by tariffs) can be implemented without significant declines in revenue. Lifting quantitative restrictions may even lead to higher revenue if the newly liberalized categories of imports increase and are subject to tariffs. Moreover, in countries where the foreign exchange market is being liberalized at the same time, and the official exchange rate depreciates significantly as a result, the increase in the domestic-currency price of imports may be large enough to lead to higher revenue, even with falling tariff rates (see Agénor (2004, Chapter 14)).

[3]There are a number of other channels through which trade openness can affect budget balances; see Combes and Saadi (2006) for a discussion. Using cross-country regression analysis, they find that trade policy (as opposed to "natural" openness) tends to improve budget balances; however, their evidence is static in nature.

Nevertheless, concerns about adverse revenue effects often figure prominently among explanations of a slow pace of trade liberalization (see Ebrill, Stotsky, and Gropp (1999)). In countries where the share of trade taxes in total revenues is large, trade barriers have often been gradually dismantled due to fiscal constraints. The extent to which total tax revenue fall depends, of course, on what alternative tax bases the government can rely on following a cut in tariffs; but switching to other sources of revenues may entail not only (temporary) switching costs, but also a permanently higher administrative burden—which may be all the more important in countries with a large informal sector.[4] If so, then a cut in tariffs is unlikely to be revenue neutral.

The recent experience of developing countries suggests indeed that trade reforms have often been accompanied by revenue losses. In a study dwelling on data for 111 countries over 25 years, Baunsgaard and Keen (2005) found that high-income countries were able to recover from other sources the revenues that they had lost during previous episodes of trade liberalization. However, for middle-income countries, recovery was on average in the order of 45-60 cents for each dollar of lost trade tax revenue; and for low-income countries (which are those that depend the most on trade tax revenues, as noted earlier), recovery was, at best, no more than about 30 cents of each lost dollar. They also found no evidence that the presence of a value-added tax had, in itself, made it easier to cope with the revenue effects of trade liberalization.[5]

1.1.2 Revenue Losses and Spending Cuts

A fall in revenues associated with a reduction in tariffs may force governments to implement concomitant cuts in expenditure in the short term. If these spending cuts take the form of reductions in social expenditure, they will have a direct effect on poverty, thereby

[4]For instance, Emran and Stiglitz (2004) have shown that in developing countries with an informal sector in which, say, a VAT cannot be imposed, it is desirable to retain some trade taxes, e.g., to tax imports at a higher rate than domestic production.

[5]By contrast, Agbeyegbe, Stotsky, and WoldeMariam (2006), using panel data for 22 countries in Sub-Saharan Africa over 1980-96, found evidence that the relationship between trade liberalization and tax revenue is sensitive to the measure used to proxy trade liberalization.

mitigating the welfare gains from trade—at least in the short term. There is some empirical evidence suggesting that this has indeed been the case in some countries (see Winters, McCulloch, and McKay (2004)).

There is also evidence to suggest that the loss of revenue has led not only to cuts in current spending but at times to significant cuts in public investment, most notably in the core public infrastructure (see Atolia (2007)). Given the importance and broad range of externalities associated with public infrastructure (as discussed for instance by Agénor (2009)), a sustained loss in tariff revenue may have a sustained adverse effect on growth, which may greatly mitigate the benefits of greater openness. Moreover, the positive effect of public capital on the marginal productivity of private inputs may hold not only for infrastructure but also for other components of public spending and public capital—such as in education and health, which may both affect the productivity of labor and the ability to benefit from knowledge spillovers associated with greater trade. Thus, cuts in productive expenditure in general may be particularly damaging to growth.[6]

1.1.3 The Role of Aid

To the extent that trade liberalization may reduce trade-related revenue, that replacing lost tariff revenue with other sources may take time and may have high associated costs, and that revenue losses may have an adverse effect on productive public expenditure, tariff reforms may need to be accompanied by a temporary increase in aid. This will provide "breathing space" for governments to implement measures aimed at strengthening the domestic tax system (by reducing tax collection costs, fighting tax evasion, etc.) and other reforms on the expenditure side (such as improving the efficiency of public spending).[7]

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[6]Other components of public spending, related for instance to the enforcement of property rights and maintenance of public order, could also increase productivity and exert a positive effect on private investment and growth, despite the fact that they may not be considered as being directly "productive."

[7] Note also that aid may also affect incentives to control public spending and collect taxes. An increase in aid may lead to a decline in public savings through lower tax revenues, as governments reduce their tax collection effort. This is one of the issues addressed in the "fiscal response" literature dealing with aid; see, for instance, McGillivray (2009). Alternatively, as documented by Chatterjee, Giuliano, and Kaya (2007), increases in aid may translate into a shift in the composition of government spending away from investment and toward

1.2 Mitigating Adjustment Costs and Implementation Costs

The relative price adjustments that accompany (or precede) trade liberalization often entail large intersectoral movements in resources; firms may incur sizable adjustment costs as a result of these movements. While it may take some time for the gains from trade to materialize (as they often depend on reform in other areas), adjustment costs tend to be "paid" upfront.

For some countries, these adjustment costs (which include not only higher rates of unemployment in import-competing sectors but also pressures on the balance of payments and fiscal accounts) may be particularly significant. Even by spreading adjustment costs over a relatively long implementation period (say, 10 to 15 years), some countries may have limited capacity to bear them.[8]

There are also costs associated with the implementation of the regulatory reforms that are part of trade agreements.[9] While tariff reductions are relatively easy to implement, regulatory changes (customs reform, intellectual property rights, and sanitary and phytosanitary measures) may impose a significant burden (at least in the short term) compared to the immediate benefits that countries may reap from new market access opportunities. For instance, these regulatory changes may require higher expenditure on system design and drafting of legislation, capital expenditure on buildings and equipment, personnel training, as well as improvements in administration and enforcement capability. For some of the poorest countries, the extent of reform of administrative systems that is required to meet agreed standards may be overwhelming.

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consumption. In turn, reduced incentives to mobilize domestic resources, or shifts away from productive spending, may mitigate the benefits of sustained increases in aid for economic growth.

[8]Labor mobility costs can slow adjustment to trade liberalization significantly; see Artuc et al. (2008) for some illustrative simulation results. Agénor and Aizenman (1996) provide a theoretical analysis of the impact of trade reform on unemployment in the presence of imperfect labor mobility across sectors.

[9]A case in point is the EPA recently signed between Caribbean countries and the European Union, as discussed later.

Thus, although implementation costs are hard to quantify, there is a risk that changes in the regulatory environment that are mandated by trade agreements draw money away from development budgets (and possibly from more productive uses), as pointed out by Stiglitz and Charlton (2006) in a broader context. The role of aid in this context is not only to mitigate job losses in areas most adversely affected by trade liberalization, or to help those who have lost their jobs obtain alternative employment (as is commonly argued), but also to mitigate the risk that the implementation of the regulatory agreements that are required as part of trade arrangements may lead to "resource diversion," a cut in productive expenditures, and thereby an adverse effect on growth in the longer run.

2. Aid for Trade as a Growth-Promoting Scheme

In addition to being viewed as a "compensatory" mechanism, aid may be designed to help countries realize the full benefits of new market opportunities. In that perspective, the first argument is that aid may help countries invest in basic infrastructure (not only at the national but also possibly at the regional level), so as to alleviate supply-side constraints. The second is that it may help to support capacity building and strengthen the institutional environment in which trade reform is being implemented. The third is that it may help to support structural reforms that are complementary to trade liberalization, such as labor market reforms and regulatory reforms.

2.1 Facilitating Domestic and Regional Investment in Core Infrastructure

It is now well recognized that market access, on its own, is not sufficient to bring the benefits of trade; in many cases, countries are unable to take significant advantage of new trading opportunities because their supply capacity and competitiveness are limited. In particular, as discussed in more detail in Box 1, poor transport infrastructure can prevent local farmers from accessing domestic markets and international ports; poor storage facilities can increase inventory costs; and inadequate energy and water supplies can disrupt production or increase costs. Some countries need to invest in the necessary exporting infrastructure (e.g. efficient ports, adequate roads, reliable electricity and communications) to stimulate private

investment in productive capacity. Thus, by supporting domestic infrastructure investment, AFT programs may foster the ability of the private sector to take advantage of new trade opportunities, improve competitiveness of domestic products, and more generally enhance the role of private activity in promoting development.

Box 1. The Gains from Trade and Access to Infrastructure

From the perspective of external trade performance (as opposed to growth *per se*), improved access to infrastructure is critical for most developing countries who intend to reap the benefits from trade. There are three specific channels through which infrastructure can impinge on trade performance: through transportation costs, the quality of the labor force, and adjustment costs to tariff cuts.

From the perspective of international trade, the reduction in production costs that improved infrastructure may lead to is the most direct effect. Eliminating infrastructure constraints, such as water shortages, electricity outages and difficult road access, can facilitate the process of shifting private resources to more productive sectors, for instance from nontradables to tradables, or from agriculture to services and manufacturing. In addition, by facilitating movement of people and goods, improved infrastructure can lead in the medium term to higher investments in the rural sector and greater agricultural diversification, by raising expected rates of return. Farmers must be able to obtain inputs at reasonable costs, and also to sell their outputs at remunerative prices. Transportation costs, in particular, are crucial for them to decide whether or not to engage in certain activities.

Several studies have indeed documented the importance of good infrastructure for trade and export performance. In a study conducted in the late 1990s, the African Development Bank found that freight charges on exports of the poor countries of the region to the United States, as a proportion of CIF value, are on average 20 percent higher than for comparable products from other low-income countries. Yoshino (2007) found that poor quality of public infrastructure—measured in terms of the average numbers of days per year for which firms experience disruptions in electricity—has an adverse effect on exports in sub-Saharan Africa. In Rwanda, farmers receive only 20 percent of the price of their coffee as it is loaded onto ships in Monbasa; the other 80 percent disappear into the costs of poor roads (as well as red tape) between Rwanda and Kenya. High domestic and international transport costs have also been identified as a key impediment to export growth in South Africa (see Naudé and Matthee (2007)). De (2008, 2009) found that transport costs and the quality of infrastructure are a key component of trade costs for several Asian countries, including China.

Regarding Latin America and the Caribbean, a study by the Inter-American Development Bank suggests that for many countries of the region shipping costs (which depend significantly on port efficiency) may be a greater barrier to U.S. markets than import tariffs (see Micco and Pérez (2002)). Moreover, a comparative study by Dollar et al. (2006) of four countries in Latin America (Brazil, Honduras,

Nicaragua, and Peru) and four Asian countries (Bangladesh, China, India, and Pakistan) found that inadequate access to core infrastructure services is one of the key factors that explains the more rapid pace of international trade integration in the latter group of countries.

A possible mechanism through which infrastructure may affect positively exports is through foreign direct investment (FDI); for Latin America in particular, there is indeed evidence suggesting that FDI flows are positively related to the availability of infrastructure services (as measured by the number of telephone lines per capita; see Nunes, Oscategui, and Peschiera (2006).

Another way through which infrastructure may enhance trade performance relates to its external effects on human capital. To the extent that, as discussed by Agénor (2009), core infrastructure exerts positive effects on health and education outcomes, improved access to infrastructure services can generate significant benefits for export activities in terms of a more productive/higher quality labor force.

Moreover, if infrastructure capital enhances the degree of complementarity between skilled labor and physical capital, it will also increase private incentives to invest in the accumulation of knowledge. This may in turn create new opportunities for trade (by opening up new areas of specialization) and economic growth.

Finally, a third channel through which infrastructure may enhance trade performance is by mitigating adjustment costs associated with reductions in tariffs and the loss of protection for some industries. When tariffs are reduced, import-competing firms must reduce their production in the face of new competition, causing some of their workers to become redundant and their capital to lie idle for a period. In addition, as resources are moved from one sector to another, firms may incur adjustment costs—that is, frictions that prevent firms from adjusting their labor force and capital stock fully and instantaneously in response to the change in relative prices associated with trade reform.

Improved access to infrastructure may reduce these costs by facilitating the movement of resources to those (tradable) sectors where relative prices have improved. Moreover, by lowering not only production costs (at a given level of the stock of capital) but also adjustment costs related to investment, improved provision of infrastructure services will tend to raise expected rates of return and therefore stimulate private capital formation. And by enhancing the ability of the private sector to respond to price signals, lower adjustment costs may be accompanied by efficiency gains, which may translate into permanent growth effects. All these effects may help to explain why, as noted in the introduction, recent studies such as Chang, Kaltani, and Loayza (2009) found that improved access to infrastructure magnifies the gains from trade liberalization.

In addition, AFT is particularly important to foster the development of *regional* public goods in infrastructure. In addition, for regions where countries are relatively small, size is an important incentive for governments to pool resources for the provision of efficient, cost-

effective common services. This is a particularly important consideration for a region like the Caribbean, where many observers have argued that coordination failures have created a gap in the optimal provision of regional public goods (see CARICOM (2007)). In such cases, regional investments in core infrastructure, supported by foreign grants, may generate potentially large returns.[10]

2.2 Supporting Capacity Building and Institutional Reform

When implementing trade reforms, capacity building and institutional reforms are essential in a range of areas. As noted earlier, strengthening tax administration and enforcement capability is essential in the medium term to mitigate the impact of tariff reductions on revenues. In addition, countries often lack the necessary technology and knowledge to meet product standards prevailing in high value markets (sanitary measures, technical barriers, certification, etc.). Assistance to build supply capacity may involve fostering the development of a favorable business climate to help private sector enterprises capitalize on new trade opportunities and identifying infrastructure bottlenecks (Dollar et al. (2006)). In turn, this may entail removing the obstacles that ineffective institutions place on the ability of firms with high export potential to grow—by developing for instance more effective customs authorities, more accountable policing, and more efficient port authorities.[11] To benefit fully from trade liberalization, developing countries may also need to strengthen regional institutions. A well-designed AFT program, which avoids the "diversion risk" alluded to above, may promote all these objectives.

2.3 Financing Complementary Structural Reforms

To achieve their full impact, trade reforms often need to be accompanied by complementary structural reforms. It is well recognized, for instance, that the need to invest in

[10]See Weiss (2008) for a general discussion of the design of regional cooperation arrangements in the context of infrastructure development.

[11]Institutional capacity can affect trade costs if customs procedures, inspections, and certifying bodies are run inefficiently.

educational programs that enhance competitiveness and support diversification, by allowing workers (particularly those who lose their jobs in import-competing industries) to "retool" and adjust their skills to those required in the expanding sectors. More generally, there is good analytical and empirical evidence suggesting that trade liberalization has stronger beneficial effects when labor markets are more flexible (see Oslington (2005) and the survey by Hoekman and Winters (2005)).

However, the need for complementary reforms may involve not only the labor market but also the financial sector (see Chang, Kaltani, and Loayza (2009)). In countries with underdeveloped financial sectors, inadequate access to finance—whether to finance short-term capital needs or physical investment—is a major factor inhibiting exports. Difficulties in assessing the creditworthiness of (and the value of collateral pledged by) small exporting firms, in particular, may constrain access to formal sector loans, with an adverse effect on employment. Again, a well-designed AFT may help to alleviate these constraints.

III. IMPLICATIONS FOR TRADE REFORM IN THE CARIBBEAN

As noted in the introduction, the ongoing debate on AFT programs for developing economies has important implications for Caribbean countries, given the importance of the structural and budgetary constraints that the region faces in attempting to revive its trade reform agenda and take advantage of new opportunities offered by the global trade environment. This section begins by reviewing the relevance of AFT arguments presented earlier; it then discusses some issues that are specific to the region.

3.1 Relevance of Aid-for-Trade Arguments

Consider first the arguments that view AFT as a compensatory scheme. The first two arguments (the need to mitigate revenue losses and avoid cuts in productive expenditure) are highly relevant for Caribbean countries in the present context. Some of these countries rely quite heavily on trade taxes as a source of current revenue. In particular, the six Eastern

Caribbean States (Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, and, St. Vincent and the Grenadines) all depend on trade taxes for more than 25 percent of current government revenue. Dominica and St. Vincent rely on such taxes for more than 40 percent of their current tax revenues.[12]

At the same time, since 2000 many countries in the region have been grappling with difficult fiscal and public debt situations. In Antigua and Barbuda for instance, public debt in 2003 accounted for 142 percent of GDP; in the same year, this ratio reached 171 percent in St Kitts and Nevis, and 150 percent in Jamaica. Although some countries in the region have embarked on a sustained process of fiscal adjustment and public sector reform, fiscal imbalances remain high in many of them.

Large fiscal deficits and high ratios of public debt act of course as major constraints on the ability of most countries of the region to cut tariffs. Indeed, in an analysis of the fiscal effects of tariff reduction for the Caribbean Community, Peters (2005) concluded that Caribbean countries are likely to experience short-run revenue shortfall as a consequence of trade liberalization. Indications are that the shortfall could be as much as a 45 percent decline in customs duties. Such a large effect could be mitigated in a variety of ways—most notably by lowering tax exemptions, enhancing indirect tax systems (by implementing a broad based tax such as the VAT) and by improving tax collection and administration (with regard in particular to the personal income tax). However, developing non trade-based, fiscal revenue structures which are broad based and capable of generating revenues on a sustainable basis is likely to take significant time. Thus, to avoid possible adverse effects of revenue losses on productive government spending (as noted earlier), temporary financing in the form of increased aid may be necessary to increase incentives to implement and sustain trade reform in the Caribbean.

[12]By contrast, taxes on international trade account for only 7 percent of current revenues for Trinidad and Tobago and 9 percent for Barbados. See World Bank (2008, Chapter 2) for more details.

Arguments often used to justify AFT as a promotion scheme apply with equal force to the current context of Caribbean countries. The Economic Partnership Agreement (EPA) completed in December 2007 between the European Union and the CARIFORUM Group contains explicit provisions related to compliance with, and adoption of, international technical, health, and quality standards pertaining to food production and marketing (agricultural goods, fish and fish products, etc.).[13] Compliance with these (at times very demanding) standards will impose a significant burden on governments in the region; to ensure that resources are not diverted from other productive uses, an AFT program may be essential. This need is well recognized in the EPA.[14]

Other arguments that can be used to justify an AFT program as a promotion scheme are also highly relevant for Caribbean countries. As discussed in more detail in World Bank (2008) and Tsikata and Pinto Moreira (2009), significant supply-side and institutional constraints prevent producers in a number of Caribbean countries from taking full advantage of new opportunities offered by trade reform. Indeed, the ability of many firms from the region to compete in world markets is undermined by the absence or inadequacy of infrastructure services (such as roads and ports), a weak institutional environment (including modern and efficient customs), or simply knowledge about export market opportunities and how to access them. As shown in Table 2, although some countries in the region display infrastructure indicators that compare favorably with other successful developing countries in other regions, some countries (including the Dominican Republic, Guyana, and Haiti) continue to suffer from large "infrastructure gaps."

Furthermore, reaping the full benefits of trade reforms in terms of productivity and growth may require complementary reforms in many of these countries. In particular, the

[13]The EPA, negotiated in individual regional groupings, replaces the Cotonou Agreement signed between the EU and ACP countries from January 1, 2008. The agreement also indicates that the EU will assist CARIFORUM States in establishing harmonized intra-regional sanitary and phytosanitary (SPS) standards. See European Commission, "Economic Partnership Agreement Between the CARIFORUM States, of the One Part, and the European Community, and Its Member States, of the Other Part.

[14]The EPA also includes provisions to provide technical assistance for tax reforms aimed at reducing CARIFORUM States' reliance on trade taxes.

flexibility of labor markets and the business climate must be significantly improved (see World Bank (2008)). Thus, from that perspective, there is a strong case for increased assistance to Caribbean countries, in the form of grants or loans (with disbursements perhaps over a 4-5 year horizon), to cover a wide range of needs—from investments in infrastructure (at both the domestic and regional levels), to capacity building and institutional reform, and support for complementary structural reforms, notably in the area of labor markets—to alleviate key obstacles to trade expansion.

Table 2
Selected Infrastructure Indicators of Caribbean Countries
And Comparable Developing Countries 2004-06

	Fixed line and mobile phone subscribers (per 100 people)	Improved sanitation facilities (% of population with access)	Improved water source (% of population with access)	Internet users (per 100 people)	Price basket for Internet (US$ per month)	Roads, paved (% of total roads)
Antigua and Barbuda	168.9	95.0	91.0	38.1	22.0	33.0
Bahamas, The	111.6	100.0	97.0	31.9	25.0	57.4
Barbados	116.8	100.0	100.0	54.8	25.6	100.0
Belize	51.1	47.0	91.0	11.4	12.7	17.0
Dominica	87.9	84.0	97.0	36.1	16.5	50.4
Dominican Republic	57.2	78.0	95.0	20.8	12.3	49.4
Grenada	68.3	96.0	95.0	18.2	22.0	61.0
Guyana	52.9	70.0	83.0	21.6	12.5	7.4
Haiti	6.9	30.0	54.0	6.9	12.0	24.3
Jamaica	117.7	80.0	93.0	46.4	26.5	73.9
St. Kitts and Nevis	74.5	95.0	100.0	21.4	22.0	..
St. Lucia	..	89.0	98.0	33.9	22.0	..
St. Vincent and the Grenadines	92.1	..	..	8.4	22.0	70.0
Suriname	88.2	94.0	92.0	7.1	16.2	26.3
Trinidad and Tobago	149.1	100.0	91.0	12.3	12.6	..
Caribbean	**88.8**	**82.7**	**91.2**	**24.6**	**18.8**	**47.5**
East Asia & Pacific	57.8	50.6	78.5	11.1	5.8	11.4
Latin America & Caribbean	72.8	77.0	90.9	18.4	12.2	24.3
Comparators						
Benin	209.0	13.0	33.0	67.0	8.0	11.0
Korea, Rep.	138.5	..	92.0	70.5	34.6	76.8
Malaysia	91.2	94.0	99.0	43.2	2.7	81.3
Mauritius	90.1	94.0	100.0	14.5	16.2	100.0
Singapore	148.1	100.0	100.0	38.3	13.2	100.0
Taiwan, China	165.4	..	..	63.6	1.5	95.5
Thailand	75.5	99.0	99.0	13.3	5.8	98.5

Sources: World Bank (2008).

The EPA recently concluded with the European Union recognizes these needs. In Part I, Article 8 states that development co-operation shall be primarily focused on the following areas: (i) The provision of technical assistance to build human, legal and institutional capacity in the CARIFORUM States so as to facilitate their ability to comply with the commitments set out in the Agreement; (ii) The provision of assistance for capacity and institution building for

fiscal reform in order to strengthen tax administration and improve the collection of tax revenues with a view to shifting dependence from tariffs to other forms of indirect taxation; (iii) The provision of support measures aimed at promoting private sector and enterprise development, in particular small economic operators, and enhancing the international competitiveness of CARIFORUM firms and diversification of the CARIFORUM economies; (iv) Diversification of CARIFORUM exports of goods and services through new investment and the development of new sectors; and (v) Support for the development of infrastructure in CARIFORUM States necessary for the conduct of trade. However, concrete steps toward the elaboration of an AFT program that addresses these issues have yet to be taken.

3.2 Some Specific Issues for the Region

Although there are a number of arguments in favor of a comprehensive AFT program for Caribbean countries, there are also several issues that need to be kept in mind in designing such a program to ensure that it brings the benefits expected. The first relates to a possible "additionality" problem. The second refers to the mechanism through which aid should be delivered and monitored. The third relates to the possibility that large increases in trade-related aid may generate Dutch disease effects. Finally, the fourth relates to the possibility that aid flows may remain highly volatile, hampering the ability of Caribbean countries to design medium-term investment programs.

3.3 The "Additionality" Problem

Although there seems to be convergence regarding the benefits of an AFT program for Caribbean countries, it is important to ensure that this translates into the allocation of *additional resources* to support trade. In the EPA concluded in December 2007 with the European Union, for instance, no specific mechanism for new aid is projected. The risk is that

aid allocated to promote trade may substitute for other allocations of aid, some with potentially higher return in terms of growth and welfare—such as education and health. This new "aid additionality" problem needs to be carefully monitored.[15]

3.4 Delivery and Monitoring of Aid

The experience with "aid for trade" programs under the Doha round suggests that there is a need to improve coherence and coordination of action among donors. Indeed, a multiplicity of actors (international organizations and individual counties) may create problems of coherence and consistency (to the extent that priorities are determined independently), efficiency in management, as well as cost and development effectiveness. Donors, in particular bilateral institutions and non-specialized international organizations, have been criticized for appearing to determine their priorities independently of each other. Moreover, in practice donors have often proved unable to coordinate their efforts with national development strategies. This may explain why trade-related assistance has a mixed record on country ownership.

The Integrated Framework for Trade-Related Technical Assistance (IF) is a complementary mechanism upon which to build an expanded AFT program for the Caribbean.[16] The IF is intended to ensure that aid for trade corresponds to country priorities and focuses on poverty reduction. From that perspective, it is important to view AFT not only as a mechanism for transfers to compensate for losses but also (as argued earlier) as a development tool, designed to ensure that the root causes of weak supply response and lagging export performance are addressed.

[15]The problem of "additionality" of foreign resources was first raised in studies of the HIPC initiative and basically consists in a tradeoff between debt reduction and new aid (see, for instance, Powell (2003)). Here, it is viewed essentially as a "crowding out" problem.

[16]The IF brings together multilateral agencies (the IMF, ITC, UNCTAD, UNDP, WTO, and the World Bank) and bilateral and multilateral donors to assist poor countries in integrating trade into national development plans and Poverty Reduction Strategies, and providing coordinated delivery of trade-related technical assistance.

However, ensuring that trade is adequately integrated into broader growth and development strategies, remains a challenge in the region. For the poorest countries in the Caribbean (such as Guyana and Haiti), for which the international community makes external assistance conditional on the elaboration of an explicit Poverty Reduction Strategy (PRS), it is essential to enhance their ability to bring trade needs into the PRS process. Doing so would allow these countries to generate additional resources, to address infrastructure constraints, the lack of human capital, and so on. In that sense, AFT would involve helping Caribbean countries to design and implement a trade agenda as part of a donor-supported, broader national development strategy. Countries could then decide whether to use resources allocated to trade reform either for specific projects identified within the prioritized list of trade-capacity building needs, or for direct budget support (in case of loss of fiscal revenue).[17] A review of existing PRSs in the region, however, indicates that trade reforms have received limited consideration (See World Bank (2008)).

For the richer countries in the Caribbean, donors should also ensure that AFT assistance is linked with broader development programs and complements or strengthens a country's own plans, budgets, and structures. However, monitoring is more difficult in the case of these countries because they are not, in a sense, "required" to develop an explicit development strategy.

Regarding the form that aid should take, it is clear that for the poorest and least creditworthy countries in the Caribbean, direct grants to governments (in the form of additional contributions from ODA budgets) will continue to be the primary means of addressing development needs—particularly for lumpy investments in infrastructure, education, and health. Richer countries of the region, however, have limited access to ODA grant resources and concessional lending. Non-concessional lending (through multilateral institutions, in particular) and equity investment will therefore be key in addressing the

[17] In practice, however, a key problem is to distinguish between infrastructure projects that are conducive to development in general, and those that have a direct effect on trade; in the words of Stiglitz and Charlton (2006, p. 6), "When you are building a road, how close does it have to be to the port to become and aid for trade

region's trade-related capacity and infrastructure needs. From that perspective, AFT grants may be viewed as providing crucial "seed money" for larger infrastructure programs and other supply-side interventions (such as the creation of lending institutions to finance export-oriented investments) that require non-concessional financing or "blending" with donor assistance.[18]

3.5 Dutch Disease Effects

Assuming that there is no additionality problem, and that an AFT program translates into a sizable increase in aid flows, an important issue that Caribbean countries may need to address is whether an increase in these flows may paradoxically have unintended negative consequences for trade—through a Dutch disease effect. The argument, essentially, is that if aid is at least partially spent on nontraded goods, it may put upward pressure on domestic prices and lead to a real exchange rate appreciation. In turn, a real appreciation may induce a reallocation of labor toward the nontraded goods sector, thereby raising real wages there in terms of the price of tradable goods. The resulting deterioration in competitiveness may lead to a decline in export performance, unsustainable current account deficits, and eventually an adverse effect on growth.

The international evidence does suggest that aid may lead to real exchange rate appreciation, and thereby reduce international competitiveness, in the short run. However, if aid raises public investment in infrastructure, then the longer-run effect on the real exchange rate may be depreciation. A possible reason is the positive supply-side effects that are associated with improved access to public infrastructure or health services, financed by the increase in aid.[19] These effects tend to develop gradually, in contrast to the demand-side effects of aid. Put differently, once dynamic considerations are taken into account, the Dutch

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project?" This has important implications for the *allocation* of aid, to the extent that trade-offs may emerge regarding the effect of various components on growth.

[18]For richer countries of the region, with some existing industrial capacity, donors should devote greater attention to the private sector, and attempt to implement programs that act as catalysts and facilitators for enterprises to establish themselves, grow, adopt technology, acquire finance, and reach international markets.

[19]See Agénor et al. (2008) and Agénor and Yilmaz (2008) for a more detailed discussion.

"disease" does not have to be a terminal illness; longer-run, supply-side effects may eventually outweigh short-term, adverse demand-side effects on the real exchange rate. It is therefore important for Caribbean countries to ensure that an AFT program includes a significant component of spending allocated to productive uses. At the same time, ensuring that adequate attention is paid to other, nonprice aspects of competitiveness (such as product standards, etc.) is also important.

3.6 Aid Volatility

Finally, a possible concern for trade reform in Caribbean countries relates to aid volatility. This is a general issue associated with aid, as documented in a number of recent studies.[20] Of course, by their very nature, some types of aid (such as emergency aid or, to a lower extent, program aid) should indeed exhibit a high degree of volatility. By contrast, project aid should be relatively stable, given that it is designed to promote (directly or indirectly) investment in physical and human capital. Volatility in that category of aid could make it difficult for recipient governments to formulate a medium-term AFT-related investment program to support trade reform and spur growth. In the specific context of Caribbean countries (especially among the poorest ones), it is therefore important to ensure that any AFT initiative that involves a sizable increase in spending on trade-related infrastructure makes aid flows predictable over the medium term, to secure sustained commitment in the region. In the current context of a global financial crisis and severe budgetary pressures in all major donors, this may unfortunately be difficult to achieve.

[20] Bulir and Hamann (2006) and Hudson and Mosley (2007) have found that the volatility of aid is much larger than the volatility of domestic tax revenues. Both studies also found that aid volatility has actually increased since the late 1990s, as does Kharas (2007) for a large group of aid recipients. See Agénor and Aizenman (2009) for a more detailed discussion.

IV. AID FOR TRADE, TRADE REFORM, AND GROWTH: ILLUSTRATIVE EXPERIMENTS FOR THE DOMINICAN REPUBLIC

To illustrate how AFT programs may condition the benefits of trade reforms and their impact on economic growth, a dynamic model of the Dominican Republic is used in this section.[21] Although the Dominican Republic is among the richest countries of the region, and therefore among those that are not necessarily in the best position to benefit from a large AFT program to accompany the EPA recently signed by Caribbean countries with the European Union, its infrastructure indicators remain relatively weak (see Table 2); the "infrastructure argument" in favor of an AFT program as a compensatory scheme is thus highly relevant. Thus, the model helps to illustrate the importance of complementing trade reforms with productive government spending, in a context where infrastructure constraints (in addition to implementation costs) are significant, to enhance their effect on growth.

The next subsection provides a brief discussion of the model. The baseline scenario for the period 2000-20 is then characterized and several policy experiments, involving changes in tariffs and in aid flows, are presented.

4.1 The Quantitative Framework

The model used to analyze the impact of trade reform and aid programs in the Dominican Republic is a one-sector, one-household model, which does not therefore allow an analysis to address issues related to the sectoral impact of a trade agreement and its implications for income distribution.[22] Accounting for these allocative effects is of course

[21]The analysis in this section was conducted in close collaboration with staff from the Ministry of the Economy, Planning, and Development in the Dominican Republic, to whom the Team expresses its sincere gratitude.

[22]More precisely, the model is a SPAHD framework built at the country's Ministry of the Economy,

essential to provide a detailed assessment of the potential costs associated with factor movements across sectors. In addition, the lack of disaggregation of trade flows by categories of goods and geographical regions precludes an analysis of the "trade diversion" effects associated with trade agreements with a particular partner or group of partners.

However, the model has other advantages for the purpose at hand. Being dynamic in nature, it allows the analyst to trace the aggregate effects of trade reforms (viewed as changes in average tariffs and possibly export prices) on growth and employment. Moreover, it incorporates a detailed account of the composition of public investment and capital (disaggregated into infrastructure, education, and health), with infrastructure exerting positive externalities in the production of goods, health services, and education services—in addition to a more conventional "complementarity" effect on private investment. It is therefore well suited to analyze the dynamic effects of an AFT program involving an increase in public investment—with the goal of alleviating the supply-side constraints that hamper the ability of producers to take advantage of new opportunities created by trade reforms.

4.2 Baseline Scenario

Table 3 present the results of the baseline scenario for the period 2009-20 for the Dominican Republic. The table provides data on macroeconomic indicators. The scenario is based on a number of assumptions—such as a constant population growth, no terms-of-trade effects for final goods (with export prices and prices of imports of final goods in foreign-currency terms growing at the same rate), constant effective tax rates, and fixed shares of public spending in GDP for maintenance, wages and salaries, investment (at 5 percent), and subsidies. The world price of oil is assumed to increase by 5 percent a year. In addition, the average (effective) tariff rate on nonoil final imports, which is 5.3 percent in 2007, is kept constant for the period 2009-20. This figure represents a significant drop from 2005 (when it was 14.3 percent), because of the implementation of CAFTA in 2006-07. Aid flows, which

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Planning, and Development, which builds on Agénor, Bayraktar, and El Aynaoui (2008) and subsequent applications by Pinto Moreira and Bayraktar (2008) and Nganou (2009). For a more detailed presentation of the

are small to begin with, are kept constant throughout at 0.2 percent of GDP and so is the share of domestic borrowing in GDP (0.5 percent).

In this scenario, the average growth rate of real GDP per capita, as well as real private consumption per capita, is about 4 percent. The unemployment rate drops gradually over time, from 6.5 percent in 2009 to 5.1 percent in 2020. The current account deficit remains in the two-digit range throughout, but this is financed by large inflows of foreign direct investment and substantial government borrowing (which reflects a persistent fiscal deficit). The share of tax and nontax revenues in GDP, at about 15 percent, remains relatively low compared to countries at a similar level of development. With total expenditure varying between 22 and 23 percent, and with limited ability to borrow domestically, external debt increases sharply, from about 41 percent in 2009 to almost 72 percent in 2020. This scenario would therefore call eventually for significant fiscal adjustment. It also helps to illustrate the difficult fiscal context in which some countries in the region may operate, as they strive to implement the EPA agreement.

4.3 Policy Experiments, 2009-20

To illustrate the impact of trade reforms, accompanied or not by an aid-for-trade program, several experiments are performed with the model. All of them assume that the main provisions of the EPA can be implemented in 2008-2009. In addition, they all involve a cut in tariffs imposed by the Dominican Republic, as well as an increase in export prices, with the latter reflecting the cut in tariffs on the country's exports to the EU. Calculations based on data on the composition of the Dominican Republic's external trade indicate that immediate implementation of the EPA leads to a permanent drop in the average tariff rate of about one percentage point, or equivalently, a permanent revenue loss of about 0.4 percent of GDP, in 2008 and beyond. This drop reflects a fall in duties on final imports originating not only from the EU but also products from other CARIFORUM countries, which also benefit from the cut

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model used here, see World Bank (2008).

in tariffs specified in the agreement.[23] This number is relatively small, because most of the country's external trade is with the United States, and a sizable cut in tariffs was implemented in the context of CAFTA, as noted earlier.

Because most products exported by the Dominican Republic already enter duty free in the European Union, the reduction in EU tariffs is assumed to have only a marginal effect on the country's export prices; specifically, we assume that export prices (measured in foreign-currency terms) increase permanently by about 0.2 percentage points, starting in 2008.

4.3.1 Base Experiment: Tariff Loss Compensated by higher Indirect Taxes

The first experiment assumes that the fall in tariff revenues is entirely offset by an immediate increase in indirect taxes. The impact of this policy on the economy is illustrated in Table 4, in terms of deviations from the baseline scenario. As can be expected, the effect on growth is negligible, whereas both exports and nonoil imports increase slightly as a share of GDP.

4.3.2 Aid as a Temporary Compensation Scheme

The second experiment assumes that the fall in tariff revenues is initially offset by an increase in aid, with domestic taxation implemented subsequently. Specifically, the fall in tariff revenues is assumed to be compensated by an increase in foreign grants by the same amount, that is, 0.4 percentage points of GDP, for three years (2008 to 2010), and by an offsetting increase in the indirect tax rate starting in 2011, and kept constant after that.

The impact of this policy on the economy is illustrated in Table 5. The inflow of capital associated with the increase in aid leads (after a year) to a small real appreciation, which dampens the expansion of real exports and stimulates imports. The net effect is a deterioration of the trade balance during the initial phase of adjustment. Nevertheless, the

[23]Oil imports are not taxed in the Dominican Republic.

current account improves slightly at first, due to the increase in aid flows. The real appreciation exerts a slight positive effect on output growth (due to the reduction in the domestic price of imported oil) and employment, but this effect is short lived.

4.3.3 Aid as a joint Compensation-Promotion Scheme

In the next set of experiments, aid is assumed to not only compensate for the tariff loss during 2008-10, as in the previous case, but also to increase for four years, starting in 2009, by 2 percentage points of GDP, to finance public investment. The idea here is that the lack of public capital is a key constraint on the ability to capitalize on new trade opportunities, and that aid can play a critical role in alleviating these constraints.

In the first variant of this experiment, the allocation of public investment between infrastructure, education, and health, remains the same as in the baseline scenario; thus, only the level of public investment is affected. The results are illustrated in Table 6. They indicate that the impact on growth is quite substantial—real GDP per capita increases at a rate of 2.4 percent in 2009 and about 1 percent in the subsequent 3 years.[24] This effect stems from both the externalities associated with public capital embedded in the model (see Box 1) and the reduction in the relative price of imported oil associated with the initial real appreciation. The expansion in labor demand leads to a significant drop in unemployment as well after 2009. However, the real appreciation associated with the inflow of aid translates within a year into a fall in the share of exports into GDP as well as a large increase in the share of total imports in GDP. As a result, the trade balance deteriorates quite significantly during the first few years of the adjustment process.

In the second variant of this experiment, the increase in aid is assumed to be allocated totally to an increase in public investment in infrastructure. As a result, the share of public

[24]The results also show that the "growth dividend" tapers off over time. This, of course is very much because of the nature of the experiment. It could also be assumed that over time, as the increase in aid is removed, a tax reform or a reallocation of expenditure (from current spending to investment) is implemented to allow a sustained increase in public capital accumulation.

investment allocated to infrastructure goes up temporarily (until 2012) from about 56 percent in the baseline to 68.5 percent in this scenario. The results are illustrated in Table 7. The implications for growth and trade flows are similar to those presented in the previous tables.

Finally, as an alternative to this experiment, instead of assuming that aid increases for four years by 2 percentage points of GDP and decreases abruptly back to its baseline value, it is assumed that the reduction is gradual—after going up by 2 percentage points of GDP in 2009 and 2010, it drops to 1.5 percent in 2011, 1 percent in 2012, 0.5 percent in 2013, and back to baseline value after that. Results obtained with fixed allocation shares of public investment are reported in Table 8; they are qualitatively similar to those reported earlier—with the difference that the impact on growth and trade flows is more persistent, as could be expected.[25]

It is important to stress that the experiments reported above are illustrative in nature. Nevertheless, they provide a good sense of the potential benefits of an AFT program associated with a trade agreement—even for a middle-income country. Indeed, even as a compensation scheme, a temporary increase in aid can be helpful, to the extent that it mitigates the direct effect of changes in taxation on the cost of living. From both the welfare and political economy perspectives, this may be an important consideration to ensure the sustainability of trade reforms. Moreover, if external support can also be provided to finance increases in public investment aimed at alleviating supply bottlenecks, domestic producers may be better able to capitalize on new trade opportunities.

[25]Results obtained with the increase in aid allocated only to infrastructure are not reported here to save space but they are also qualitatively similar to those reported earlier.

V. CONCLUDING REMARKS

The purpose of this paper was to examine how aid-for-trade (AFT) programs can help to magnify the growth benefits that developing countries can reap from trade reform and global integration, with a special emphasis on the Caribbean region. The first part discussed various rationales for trade-related aid, grouped for analytical convenience into those that view AFT as a compensatory scheme (aimed at alleviating the adverse effects of trade liberalization, by cushioning the impact of revenue cuts and mitigating the adjustment costs that are typically associated with trade reform) and those that view it as a promotion scheme (aimed at alleviating the supply-side constraints that constrain the ability of firms to take advantage of lower tariffs and improved relative price signals). In that context, the evidence on the impact of trade reforms on tax revenues, and possible adverse effects of revenue losses on public expenditure, was also examined.

In discussing aid as a promotion scheme, particular attention was paid to the role of infrastructure as a constraining factor on trade expansion. It was argued that there are a number of ways through which inadequate access to infrastructure can prevent countries from reaping the full benefits from greater trade integration. This is corroborated by recent empirical studies based on cross-country, panel-data regressions, such as Chang, Kaltani, and Loayza (2009), which shows indeed that improved access to public infrastructure magnifies the impact of trade openness on economic growth. Also in line with the evidence, it was also pointed out that other complementary reforms may be needed to enhance the gains from trade liberalization—including increased labor market flexibility, better governance, and an improved regulatory environment. Thus, if domestic fiscal imbalances limit the ability of governments to finance a comprehensive agenda involving not only trade liberalization but also some critical complementary reforms, a temporary aid program may be essential to maximize the long-run benefits of openness.

The second part of the paper discussed the relevance of AFT arguments for Caribbean countries and identified a number of specific issues for the region. It was noted that most of these arguments are highly relevant in the current context of these countries. In particular, it

was noted that the ability of many firms from the region to compete in world markets is undermined by the absence or inadequacy of infrastructure services and a weak institutional environment. Furthermore, in many of these countries, reaping the full benefits of trade reforms in terms of productivity and growth will require significant complementary reforms, especially in the area of labor markets. Several issues specific to the design and implementation of AFT programs in the context of Caribbean countries were also discussed—including "additionality" problems; the mechanism through which aid should be delivered and monitored; the possibility that large increases in trade-related aid may translate into Dutch disease effects; and the risk that aid flows may remain highly volatile, hampering the ability of domestic governments to design multi-year investment programs—thereby reducing incentives to implement other critical reforms.

The third part of the paper illustrated the potential growth effects of *temporary* AFT programs associated with trade reform, with simulation results for the Dominican Republic—a country where infrastructure indicators remain relatively weak, compared to others at similar levels of income. Several scenarios were considered, with temporary increases in aid being viewed as both compensatory and promotion schemes, and with alternative assumptions about the speed of tax reform aimed at offsetting a drop in tariffs. Although illustrative in nature, the results illustrate the potentially large growth benefits that a temporary and well-targeted AFT program can provide to countries of the region. In particular, if external support can be provided to finance increases in public investment aimed at improving access to core infrastructure, thereby alleviating supply bottlenecks, domestic producers may be better able to capitalize on new trade opportunities.

The broad policy implication of this paper is thus that, given that for many countries in the Caribbean reaping the benefits of greater openness will require that complementary reforms and policies be implemented prior to (or in conjunction with) trade reform, and given weak fiscal positions to begin with, a temporary aid program may be essential. Failure to provide assistance could hamper the ability of Caribbean countries to respond to the opportunities that recent measures of trade liberalization and integration can bring. At the same time, although trade integration is a key determinant of long-run growth for all countries

in the region, there are important differences among them that need to be considered in designing an AFT program for each individual country. In doing so, an important question that needs to be addressed is to what extent specific countries can absorb potentially large inflows of foreign aid, given their potential adverse effects—real exchange rate appreciation (Dutch Disease) and disincentive effect on tax collection (moral hazard). Another critical issue is to ensure that AFT programs are well coordinated with national development plans and strategies. The success of an AFT agenda will require therefore careful planning at the individual country level.

Table 3
Dominican Republic: Baseline Scenario, 2009-20

	Years											
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
External Sector (% of GDP)												
Current account	-10.4	-10.5	-10.5	-10.6	-10.7	-10.9	-11.2	-11.4	-11.5	-11.8	-11.9	-12.1
Trade balance	-14.0	-14.0	-13.8	-13.8	-13.8	-13.8	-13.9	-14.0	-13.9	-13.9	-13.9	-13.9
Exports of goods and NFS	38.4	39.0	39.3	39.6	40.0	40.3	40.5	40.7	41.0	41.2	41.5	41.8
Imports of goods and NFS	52.4	53.0	53.1	53.4	53.8	54.0	54.4	54.7	54.9	55.2	55.4	55.6
Private unrequited transfers	11.7	11.8	11.8	11.7	11.7	11.6	11.5	11.4	11.3	11.2	11.1	10.9
Income (net)	-8.3	-8.6	-8.7	-8.8	-8.9	-9.0	-9.1	-9.1	-9.2	-9.3	-9.3	-9.4
Public	-1.8	-2.0	-2.1	-2.3	-2.4	-2.5	-2.7	-2.8	-2.9	-3.0	-3.1	-3.3
Private	-6.5	-6.6	-6.5	-6.5	-6.5	-6.4	-6.4	-6.3	-6.3	-6.2	-6.2	-6.2
Aid, total	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other current account flows (net)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Capital account	10.9	11.1	11.2	11.4	11.6	11.7	11.9	12.1	12.2	12.4	12.6	12.7
Foreign direct investment	5.1	5.2	5.2	5.3	5.3	5.4	5.4	5.5	5.6	5.7	5.7	5.8
Public borrowing	5.2	5.3	5.4	5.5	5.6	5.7	5.8	6.0	6.0	6.1	6.2	6.3
Other capital inflows	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Government Sector (% of GDP)												
Total resources (including grants)	16.4	16.5	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4
Total tax revenues	15.3	15.3	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Domestic taxes	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
Direct taxes	4.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Indirect taxes	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1
Indirect taxes on imports	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0
Total nontax revenues	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Foreign aid (grants)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total expenditure	22.1	22.2	22.3	22.4	22.5	22.6	22.8	22.9	22.9	23.0	23.1	23.2
Spending on goods and services (total)	6.2	6.2	6.2	6.2	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Maintenance expenditure	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Other expenditures on goods and services	5.6	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.4	5.4	5.4
Wages and salaries	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
Investment	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Interest payments	4.9	5.1	5.2	5.3	5.4	5.6	5.7	5.8	5.9	5.9	6.0	6.1
Domestic debt	3.1	3.1	3.1	3.1	3.0	3.0	3.0	3.0	2.9	2.9	2.9	2.9
Foreign debt	1.8	2.0	2.1	2.3	2.4	2.5	2.7	2.8	2.9	3.0	3.1	3.3
Subsidies	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Overall fiscal balance including grants (cash basis)	-5.7	-5.8	-5.9	-6.0	-6.1	-6.2	-6.3	-6.5	-6.5	-6.6	-6.7	-6.8
Total financing	5.7	5.8	5.9	6.0	6.1	6.2	6.3	6.5	6.5	6.6	6.7	6.8
Domestic borrowing	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Foreign financing	5.2	5.3	5.4	5.5	5.6	5.7	5.8	6.0	6.0	6.1	6.2	6.3
Real exchange rate (% change)	1.4	1.2	0.4	0.6	0.5	0.4	0.4	0.2	0.2	0.1	0.1	0.1
Macroeconomic Indicators												
Real GDP per capita at factor cost (% change)	5.0	5.2	5.8	5.9	6.0	6.1	6.2	6.3	6.3	6.3	6.3	6.3
Real GDP per capita at market prices (% change)	3.2	3.4	3.9	4.0	4.1	4.2	4.3	4.4	4.4	4.4	4.4	4.4
Real disposable income per capita (% change)	3.3	3.6	3.7	4.0	4.1	4.2	4.4	4.4	4.3	4.4	4.4	4.4
Private savings rate (% of GDP)	14.9	15.0	14.9	14.9	14.9	14.9	15.0	15.0	15.0	15.0	15.0	14.9
Real private consumption per capita (% change)	3.3	3.6	3.7	4.0	4.1	4.2	4.4	4.4	4.4	4.4	4.4	4.4
Unemployment rate	6.5	6.4	6.2	6.0	5.9	5.7	5.6	5.5	5.4	5.3	5.2	5.1
Private investment (% of GDP)	13.1	13.0	12.9	12.9	12.9	12.8	12.9	12.9	12.9	12.9	12.9	12.9
Private investment (% of total investment)	72.3	72.2	72.1	72.1	72.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0
Public investment (% of total public expenditure)	22.7	22.5	22.4	22.3	22.2	22.1	22.1	22.0	21.9	21.8	21.8	21.7
Health (% of public investment)	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Infrastructure (% of public investment)	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2	56.2
Education (% of public investment)	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
Other (% of public investment)	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5
Domestic debt (% of GDP)	18.8	18.7	18.4	18.3	18.1	18.0	17.9	17.7	17.6	17.4	17.3	17.2
External debt (% of GDP)	41.0	44.7	47.8	50.9	53.8	56.6	59.4	62.0	64.5	66.9	69.2	71.5
Interest payment on external public debt (% of exports)	4.7	5.1	5.4	5.7	6.0	6.3	6.6	6.9	7.1	7.4	7.6	7.8
Degree of openness (total trade in % of GDP)	90.8	91.9	92.4	93.1	93.7	94.3	94.9	95.4	95.9	96.4	96.9	97.4
Educated labor (in % of population)	22.4	22.7	23.0	23.3	23.6	23.9	24.3	24.7	25.1	25.5	26.0	26.4

Note: The real exchange rate is defined as the growth rate of nominal exchange rate plus the growth rate of the import price index minus the growth rate of composite good price after indirect taxes.

Table 4
Dominican Republic: Deviations from Baseline Scenario, 2009-20
Cut in Tariffs Compensated by Higher Indirect Taxes

	Years											
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
External Sector (% of GDP)												
Current account	(0.0)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trade balance	(0.0)	0.1	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Exports of goods and NFS	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Imports of goods and NFS	0.2	(0.0)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Private unrequited transfers	0.1	(0.0)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Income (net)	(0.0)	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Public	(0.0)	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Private	(0.0)	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Aid, total	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other current account flows (net)	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital account	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Foreign direct investment	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Public borrowing	(0.0)	0.0	0.0	0.0	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Other capital inflows	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Government Sector (% of GDP)												
Total resources (including grants)	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total tax revenues	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Domestic taxes	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Direct taxes	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Indirect taxes	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Indirect taxes on imports	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)
Total nontax revenues	(0.0)	(0.0)	0.0	0.0	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Foreign aid (grants)	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total expenditure	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spending on goods and services (total)	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maintenance expenditure	0.0	(0.0)	0.0	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Other expenditures on goods and services	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wages and salaries	(0.0)	(0.0)	0.0	0.0	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Investment	(0.0)	(0.0)	0.0	0.0	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Interest payments	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Domestic debt	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foreign debt	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subsidies	(0.0)	(0.0)	0.0	0.0	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Overall fiscal balance including grants (cash basis)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0
Total financing	0.0	0.0	0.0	0.0	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Domestic borrowing	(0.0)	(0.0)	0.0	0.0	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Foreign financing	(0.0)	0.0	0.0	0.0	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Real exchange rate (% change)	0.1	(0.3)	0.4	0.0	0.0	0.0	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Macroeconomic Indicators												
Real GDP per capita at factor cost (% change)	(0.1)	0.2	(0.1)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real GDP per capita at market prices (% change)	(0.1)	0.2	(0.1)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real disposable income per capita (% change)	(0.0)	(0.1)	0.1	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0
Private savings rate (% of GDP)	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real private consumption per capita (% change)	(0.0)	(0.1)	0.1	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0
Unemployment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Private investment (% of GDP)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0
Private investment (% of total investment)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0
Public investment (% of total public expenditure)	(0.0)	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Health (% of public investment)	-	-	-	-	-	-	-	-	-	-	-	-
Infrastructure (% of public investment)	-	-	-	-	-	-	-	-	-	-	-	-
Education (% of public investment)	-	-	-	-	-	-	-	-	-	-	-	-
Other (% of public investment)	-	-	-	-	-	-	-	-	-	-	-	-
Domestic debt (% of GDP)	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
External debt (% of GDP)	0.1	(0.1)	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
Interest payment on external public debt (% of exports)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Degree of openness (total trade in % of GDP)	0.4	0.1	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Educated labor (in % of population)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)

Table 5
Dominican Republic: Deviations from Baseline Scenario, 2009-20
Cut in Tariffs, initially compensated by an Increase in Aid

	Years											
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
External Sector (% of GDP)												
Current account	0.1	0.2	(0.2)	(0.2)	(0.0)	(0.0)	(0.0)	(0.0)	(0.1)	(0.0)	(0.0)	(0.0)
Trade balance	(0.4)	(0.2)	(0.2)	(0.3)	(0.1)	(0.0)	(0.0)	(0.0)	(0.1)	(0.0)	(0.0)	(0.0)
Exports of goods and NFS	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Imports of goods and NFS	0.5	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Private unrequited transfers	0.0	(0.1)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Income (net)	(0.0)	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Public	0.0	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Private	(0.0)	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Aid, total	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other current account flows (net)	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital account	(0.0)	(0.1)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foreign direct investment	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public borrowing	(0.1)	(0.1)	0.0	0.1	(0.0)	(0.0)	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Other capital inflows	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Government Sector (% of GDP)												
Total resources (including grants)	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total tax revenues	(0.4)	(0.4)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Domestic taxes	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Direct taxes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Indirect taxes	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Indirect taxes on imports	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)
Total nontax revenues	0.0	(0.0)	0.0	0.0	0.0	0.0	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Foreign aid (grants)	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total expenditure	0.0	(0.0)	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spending on goods and services (total)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maintenance expenditure	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other expenditures on goods and services	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wages and salaries	0.0	(0.0)	0.0	0.0	0.0	0.0	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Investment	0.0	(0.0)	0.0	0.0	0.0	0.0	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Interest payments	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Domestic debt	0.0	(0.0)	0.0	0.0	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0
Foreign debt	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subsidies	0.0	(0.0)	0.0	0.0	0.0	0.0	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Overall fiscal balance including grants (cash basis)	0.1	0.1	(0.0)	(0.0)	0.0	0.0	0.0	0.0	(0.0)	0.0	0.0	0.0
Total financing	(0.1)	(0.1)	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Domestic borrowing	0.0	(0.0)	0.0	0.0	0.0	0.0	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Foreign financing	(0.1)	(0.1)	0.0	0.1	(0.0)	(0.0)	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Real exchange rate (% change)	(0.1)	(0.4)	0.2	0.2	(0.1)	0.0	0.0	0.0	0.0	(0.0)	0.0	0.0
Macroeconomic Indicators												
Real GDP per capita at factor cost (% change)	0.0	0.2	(0.5)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0	(0.0)	0.0	0.0
Real GDP per capita at market prices (% change)	0.0	0.2	(0.5)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0	(0.0)	0.0	0.0
Real disposable income per capita (% change)	0.0	(0.1)	(0.4)	(0.1)	(0.2)	(0.0)	(0.0)	(0.0)	0.0	(0.0)	0.0	0.0
Private savings rate (% of GDP)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real private consumption per capita (% change)	0.0	(0.1)	(0.4)	(0.1)	(0.2)	(0.0)	(0.0)	(0.0)	0.0	(0.0)	0.0	0.0
Unemployment	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Private investment (% of GDP)	0.0	(0.0)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Private investment (% of total investment)	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Public investment (% of total public expenditure)	(0.0)	0.0	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Health (% of public investment)	-	-	-	-	-	-	-	-	-	-	-	-
Infrastructure (% of public investment)	-	-	-	-	-	-	-	-	-	-	-	-
Education (% of public investment)	-	-	-	-	-	-	-	-	-	-	-	-
Other (% of public investment)	-	-	-	-	-	-	-	-	-	-	-	-
Domestic debt (% of GDP)	0.1	(0.0)	0.0	0.0	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0
External debt (% of GDP)	(0.1)	(0.4)	(0.0)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Interest payment on external public debt (% of exports)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Degree of openness (total trade in % of GDP)	0.6	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Educated labor (in % of population)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 6
Dominican Republic: Deviations from Baseline Scenario, 2009-20
Cut in Tariffs, Initially Compensated by an Increase in Aid, and Temporary Increase in Public Investment

	Years											
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
External Sector (% of GDP)												
Current account	0.8	0.7	0.3	0.5	(0.2)	(0.1)	0.1	0.2	0.1	0.1	0.1	0.1
Trade balance	(1.4)	(1.5)	(1.5)	(1.2)	(0.2)	0.0	0.2	0.2	0.1	0.1	0.1	0.1
Exports of goods and NFS	(1.1)	(1.2)	(1.2)	(1.2)	(0.0)	(0.0)	0.1	0.2	0.1	0.2	0.2	0.2
Imports of goods and NFS	0.3	0.3	0.3	0.1	0.1	(0.0)	(0.1)	(0.1)	0.0	0.1	0.1	0.1
Private unrequited transfers	(0.4)	(0.6)	(0.6)	(0.7)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)
Income (net)	0.3	0.4	0.4	0.5	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0
Public	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Private	0.2	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Aid, total	2.4	2.4	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other current account flows (net)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Capital account	(0.3)	(0.5)	(0.4)	(0.5)	(0.3)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)
Foreign direct investment	(0.0)	(0.1)	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)
Public borrowing	(0.2)	(0.3)	(0.2)	(0.3)	(0.1)	0.0	(0.0)	(0.0)	0.0	(0.0)	0.0	0.0
Other capital inflows	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Government Sector (% of GDP)												
Total resources (including grants)	2.1	2.1	2.1	2.0	(0.0)	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)
Total tax revenues	(0.3)	(0.3)	0.1	0.1	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)
Domestic taxes	0.1	0.1	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4
Direct taxes	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Indirect taxes	0.1	0.1	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Indirect taxes on imports	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)
Total nontax revenues	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Foreign aid (grants)	2.4	2.4	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total expenditure	1.9	1.8	1.9	1.8	(0.1)	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)
Spending on goods and services (total)	(0.0)	(0.0)	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Maintenance expenditure	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other expenditures on goods and services	(0.0)	(0.0)	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wages and salaries	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Investment	2.0	2.0	2.0	2.0	0.0	0.0	0.0	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Interest payments	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)
Domestic debt	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)
Foreign debt	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Subsidies	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Overall fiscal balance including grants (cash basis)	0.2	0.3	0.2	0.3	0.1	(0.0)	0.0	0.0	0.0	0.0	0.0	(0.0)
Total financing	(0.2)	(0.3)	(0.2)	(0.3)	(0.1)	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0
Domestic borrowing	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Foreign financing	(0.2)	(0.3)	(0.2)	(0.3)	(0.1)	0.0	(0.0)	(0.0)	0.0	(0.0)	0.0	0.0
Real exchange rate (% change)	(1.7)	(0.3)	0.3	0.0	1.6	0.2	(0.1)	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Macroeconomic Indicators												
Real GDP per capita at factor cost (% change)	2.4	0.9	0.5	0.8	(1.7)	(0.1)	(0.4)	(0.4)	(0.3)	(0.3)	(0.3)	(0.3)
Real GDP per capita at market prices (% change)	2.3	0.9	0.5	0.8	(1.6)	(0.1)	(0.4)	(0.4)	(0.3)	(0.3)	(0.3)	(0.3)
Real disposable income per capita (% change)	1.3	0.9	0.4	0.4	(0.7)	(0.4)	(0.5)	(0.3)	(0.2)	(0.2)	(0.2)	(0.2)
Private savings rate (% of GDP)	(0.1)	(0.1)	(0.1)	(0.2)	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)	(0.0)
Real private consumption per capita (% change)	1.3	0.9	0.4	0.4	(0.7)	(0.4)	(0.5)	(0.3)	(0.2)	(0.2)	(0.2)	(0.2)
Unemployment	(0.1)	(0.2)	(0.3)	(0.4)	(0.5)	(0.4)	(0.3)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)
Private investment (% of GDP)	0.0	0.0	0.2	0.3	0.4	0.5	0.4	0.3	0.2	0.2	0.1	0.1
Private investment (% of total investment)	(7.2)	(7.1)	(6.9)	(6.7)	0.5	0.6	0.5	0.4	0.3	0.3	0.2	0.2
Public investment (% of total public expenditure)	6.5	6.6	6.6	6.6	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0
Health (% of public investment)	-	-	-	-	-	-	-	-	-	-	-	-
Infrastructure (% of public investment)	-	-	-	-	-	-	-	-	-	-	-	-
Education (% of public investment)	-	-	-	-	-	-	-	-	-	-	-	-
Other (% of public investment)	-	-	-	-	-	-	-	-	-	-	-	-
Domestic debt (% of GDP)	(0.2)	(0.3)	(0.5)	(0.7)	(0.6)	(0.6)	(0.6)	(0.5)	(0.4)	(0.4)	(0.3)	(0.3)
External debt (% of GDP)	(1.6)	(2.3)	(2.5)	(3.0)	(1.4)	(1.2)	(1.0)	(0.8)	(0.6)	(0.4)	(0.2)	0.0
Interest payment on external public debt (% of exports)	(0.0)	(0.1)	(0.1)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)
Degree of openness (total trade in % of GDP)	(0.8)	(0.8)	(1.0)	(1.1)	0.1	(0.1)	(0.0)	0.1	0.2	0.3	0.3	0.4
Educated labor (in % of population)	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4

Table 7
Dominican Republic: Deviations from Baseline Scenario, 2009-20
Cut in Tariffs, Initially Compensated by an Increase in Aid, and Temporary Increase in Infrastructure Investment Only

	Years											
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
External Sector (% of GDP)												
Current account	0.8	0.7	0.4	0.5	(0.3)	(0.0)	0.1	0.1	0.1	0.1	0.1	0.1
Trade balance	(1.4)	(1.5)	(1.4)	(1.3)	(0.2)	0.0	0.1	0.2	0.1	0.1	0.1	0.1
Exports of goods and NFS	(1.1)	(1.2)	(1.2)	(1.2)	(0.1)	(0.1)	(0.0)	0.0	0.0	0.1	0.1	0.1
Imports of goods and NFS	0.3	0.3	0.1	0.0	0.1	(0.1)	(0.2)	(0.2)	(0.1)	(0.1)	(0.0)	0.0
Private unrequited transfers	(0.4)	(0.6)	(0.6)	(0.7)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)
Income (net)	0.3	0.4	0.4	0.5	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0
Public	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	(0.0)
Private	0.2	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Aid, total	2.4	2.4	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other current account flows (net)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Capital account	(0.3)	(0.5)	(0.5)	(0.5)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)
Foreign direct investment	(0.0)	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)
Public borrowing	(0.2)	(0.3)	(0.3)	(0.3)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other capital inflows	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Government Sector (% of GDP)												
Total resources (including grants)	2.1	2.1	2.1	2.0	0.0	(0.0)	(0.1)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)
Total tax revenues	(0.3)	(0.3)	0.1	0.1	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Domestic taxes	0.1	0.1	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4
Direct taxes	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Indirect taxes	0.1	0.1	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Indirect taxes on imports	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)
Total nontax revenues	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foreign aid (grants)	2.4	2.4	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total expenditure	1.9	1.8	1.8	1.8	(0.0)	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	0.0
Spending on goods and services (total)	(0.0)	(0.0)	(0.0)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Maintenance expenditure	(0.0)	(0.0)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Other expenditures on goods and services	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(0.0)
Wages and salaries	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Investment	2.0	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Interest payments	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)
Domestic debt	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)
Foreign debt	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0
Subsidies	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Overall fiscal balance including grants (cash basis)	0.2	0.3	0.3	0.3	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Total financing	(0.2)	(0.3)	(0.3)	(0.3)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Domestic borrowing	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foreign financing	(0.2)	(0.3)	(0.3)	(0.3)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real exchange rate (% change)	(1.7)	(0.4)	0.1	0.1	1.6	0.2	0.0	0.0	0.0	(0.0)	(0.0)	(0.0)
Macroeconomic Indicators												
Real GDP per capita at factor cost (% change)	2.4	0.8	0.4	0.7	(1.7)	(0.0)	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)
Real GDP per capita at market prices (% change)	2.3	0.8	0.4	0.7	(1.7)	(0.0)	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)
Real disposable income per capita (% change)	1.3	0.8	0.2	0.4	(0.8)	(0.4)	(0.4)	(0.3)	(0.2)	(0.2)	(0.2)	(0.2)
Private savings rate (% of GDP)	(0.1)	(0.1)	(0.1)	(0.2)	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Real private consumption per capita (% change)	1.3	0.8	0.2	0.4	(0.8)	(0.4)	(0.4)	(0.3)	(0.2)	(0.2)	(0.2)	(0.2)
Unemployment	(0.1)	(0.1)	(0.1)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Private investment (% of GDP)	0.0	0.0	0.2	0.3	0.4	0.5	0.5	0.4	0.4	0.4	0.3	0.3
Private investment (% of total investment)	(7.2)	(7.1)	(6.9)	(6.8)	0.6	0.7	0.7	0.7	0.6	0.5	0.5	0.4
Public investment (% of total public expenditure)	6.5	6.6	6.6	6.6	0.1	0.1	0.1	0.1	0.1	0.0	0.0	(0.0)
Health (% of public investment)	(1.7)	(1.7)	(1.7)	(1.7)	-	-	-	-	-	-	-	-
Infrastructure (% of public investment)	12.5	12.5	12.5	12.5	-	-	-	-	-	-	-	-
Education (% of public investment)	(2.0)	(2.0)	(2.0)	(2.0)	-	-	-	-	-	-	-	-
Other (% of public investment)	(8.7)	(8.7)	(8.7)	(8.7)	-	-	-	-	-	-	-	-
Domestic debt (% of GDP)	(0.2)	(0.3)	(0.4)	(0.6)	(0.5)	(0.5)	(0.5)	(0.5)	(0.4)	(0.4)	(0.3)	(0.3)
External debt (% of GDP)	(1.6)	(2.3)	(2.6)	(3.0)	(1.4)	(1.1)	(0.9)	(0.7)	(0.5)	(0.2)	(0.0)	0.2
Interest payment on external public debt (% of exports)	(0.0)	(0.1)	(0.1)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)
Degree of openness (total trade in % of GDP)	(0.8)	(0.9)	(1.1)	(1.2)	(0.0)	(0.2)	(0.2)	(0.1)	(0.1)	0.0	0.1	0.2
Educated labor (in % of population)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1

Table 8
Dominican Republic: Deviation from Baseline Scenario, 2007-20
Cut in Tariffs, Initially Compensated by an Increase in Aid, then gradual reduction, and Temporary Increase in Public Investment

	Years											
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
External Sector (% of GDP)												
Current account	0.8	0.7	0.2	0.1	0.1	(0.1)	0.1	0.1	0.0	0.1	0.1	0.0
Trade balance	(1.4)	(1.5)	(1.2)	(0.8)	(0.4)	(0.0)	0.1	0.2	0.1	0.1	0.1	0.1
Exports of goods and NFS	(1.1)	(1.2)	(0.9)	(0.6)	(0.3)	0.0	0.1	0.2	0.1	0.2	0.2	0.2
Imports of goods and NFS	0.3	0.3	0.3	0.1	0.1	0.0	(0.0)	(0.0)	0.1	0.1	0.1	0.2
Private unrequited transfers	(0.4)	(0.6)	(0.5)	(0.4)	(0.3)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)
Income (net)	0.3	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0
Public	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	(0.0)
Private	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Aid, total	2.4	2.4	1.5	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other current account flows (net)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Capital account	(0.3)	(0.5)	(0.4)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)
Foreign direct investment	(0.0)	(0.1)	(0.1)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Public borrowing	(0.2)	(0.3)	(0.2)	(0.1)	(0.1)	0.0	(0.0)	(0.0)	0.0	0.0	0.0	0.0
Other capital inflows	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Government Sector (% of GDP)												
Total resources (including grants)	2.1	2.1	1.6	1.0	0.5	(0.0)	(0.1)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)
Total tax revenues	(0.3)	(0.3)	0.1	0.0	(0.0)	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)
Domestic taxes	0.1	0.1	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4
Direct taxes	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Indirect taxes	0.1	0.1	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Indirect taxes on imports	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)
Total nontax revenues	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Foreign aid (grants)	2.4	2.4	1.5	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total expenditure	1.9	1.8	1.4	0.9	0.4	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)
Spending on goods and services (total)	(0.0)	(0.0)	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Maintenance expenditure	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other expenditures on goods and services	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wages and salaries	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Investment	2.0	2.0	1.5	1.0	0.5	0.0	0.0	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Interest payments	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)
Domestic debt	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)	(0.0)
Foreign debt	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0
Subsidies	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Overall fiscal balance including grants (cash basis)	0.2	0.3	0.2	0.1	0.1	0.0	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)
Total financing	(0.2)	(0.3)	(0.2)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0
Domestic borrowing	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Foreign financing	(0.2)	(0.3)	(0.2)	(0.1)	(0.1)	0.0	(0.0)	(0.0)	0.0	0.0	0.0	0.0
Real exchange rate (% change)	(1.7)	(0.3)	0.7	0.5	0.4	0.4	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Macroeconomic Indicators												
Real GDP per capita at factor cost (% change)	2.4	0.9	(0.1)	0.0	(0.3)	(0.6)	(0.2)	(0.4)	(0.3)	(0.3)	(0.3)	(0.3)
Real GDP per capita at market prices (% change)	2.3	0.9	(0.1)	0.0	(0.3)	(0.6)	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.2)
Real disposable income per capita (% change)	1.3	0.9	0.1	(0.1)	(0.2)	(0.4)	(0.4)	(0.3)	(0.2)	(0.2)	(0.2)	(0.2)
Private savings rate (% of GDP)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)	(0.0)
Real private consumption per capita (% change)	1.3	0.9	0.1	(0.1)	(0.2)	(0.4)	(0.4)	(0.3)	(0.2)	(0.2)	(0.2)	(0.2)
Unemployment	(0.1)	(0.2)	(0.3)	(0.4)	(0.4)	(0.3)	(0.3)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)
Private investment (% of GDP)	0.0	0.0	0.2	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.1	0.1
Private investment (% of total investment)	(7.2)	(7.1)	(5.3)	(3.4)	(1.4)	0.5	0.5	0.4	0.3	0.2	0.2	0.1
Public investment (% of total public expenditure)	6.5	6.6	5.1	3.5	1.9	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Health (% of public investment)	-	-	-	-	-	-	-	-	-	-	-	-
Infrastructure (% of public investment)	-	-	-	-	-	-	-	-	-	-	-	-
Education (% of public investment)	-	-	-	-	-	-	-	-	-	-	-	-
Other (% of public investment)	-	-	-	-	-	-	-	-	-	-	-	-
Domestic debt (% of GDP)	(0.2)	(0.3)	(0.4)	(0.5)	(0.5)	(0.5)	(0.5)	(0.4)	(0.4)	(0.3)	(0.3)	(0.2)
External debt (% of GDP)	(1.6)	(2.3)	(2.1)	(1.9)	(1.6)	(1.0)	(0.9)	(0.7)	(0.4)	(0.2)	(0.1)	0.1
Interest payment on external public debt (% of exports)	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)	(0.0)
Degree of openness (total trade in % of GDP)	(0.8)	(0.8)	(0.6)	(0.5)	(0.2)	0.0	0.0	0.1	0.2	0.3	0.3	0.4
Educated labor (in % of population)	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4
Net foreign assets (in months of imports)	0.0	0.0	0.0	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	(0.0)	(0.0)
Oil Price (2005=100)	-	-	-	-	-	-	-	-	-	-	-	-

References

Agénor, Pierre-Richard, *The Economics of Adjustment and Growth*, second edition, Harvard University Press (Boston, Mass.: 2004).

———, *Public Capital, Growth and Welfare*, work in progress, University of Manchester (April 2009).

Agénor, Pierre-Richard, and Joshua Aizenman, "Trade Liberalization and Unemployment," *Journal of International Trade and Economic Development*, 5 (September 1996), 265-86.

———, "Aid Volatility and Poverty traps," Forthcoming, *Journal of Development Economics* (November 2009).

Agénor, Pierre-Richard, Nihal Bayraktar, and Karim El Aynaoui, "Roads out of Poverty? Assessing the Links between Aid, Public Investment, Growth, and Poverty Reduction," *Journal of Development Economics*, 86 (June 2008), 277-95.

Agénor, Pierre-Richard, and Devrim Yilmaz, "Aid Allocation, Growth and Welfare with Productive Public Goods," Working Paper No. 95, Centre for Growth and Business Cycles, University of Manchester (January 2008).

Agbeyegbe, Terence D., Janet Stotsky, Asegedech WoldeMariam, "Trade Liberalization, Exchange Rate Changes, and Tax Revenue in Sub-Saharan Africa," *Journal of Asian Economics*, 17 (April 2006), 261-84.

Aizenman, Joshua, and Yothin Jinjarak. 2006. "Globalization and Developing Countries—A Shrinking Tax Base?" NBER Working Paper No. 11933,National Bureau of Economic Research, Cam-bridge, MA.

Amiti, Mary, and Jozef Konings, "Trade Liberalization, Intermediate Inputs, and Productivity: Evidence from Indonesia," *American Economic Review*, 97 (December 2007), 1611-38.

Artuc, Erhan, Shubham Chaudhuri, and John McLaren, "Delay and Dynamics in Labor Market Adjustment: Simulation Results," forthcoming, *Journal of International Economics*, (March 2008).

Atolia, Manoj, "Public Investment, Tax Evasion, and Welfare Effects of a Tariff Reform," unpublished, Florida State University (October 2007).

Baunsgaard, Thomas, and Michael Keen, "Tax Revenue and (or?) Trade Liberalization," IMF Working Paper No. 05/112, International Monetary Fund (June 2005).

Bird, Richard M., and Eric M. Zolt, "The Limited Role of the Personal Income Tax in Developing Countries," *Journal of Asian Economics*, 16 (December 2005), 928-46.

Bolaky, B., and C Freund, "Trade, Regulations, and Growth," Policy Research Working Paper No. 3255, World Bank (- 2004).

Bose, Niloy, M. Emranul Haque, and Denise R. Osborn, "Public Expenditure and Economic Growth: A Disaggregated Analysis for Developing Countries," *Manchester School*, 75 (September 2007), 533.56.

Chang, Roberto, Linda Kaltani, and Norman V. Loayza, "Openness can be Good for Growth: The Role of Policy Complementarities," *Journal of Development Economics*, forthcoming (September 2009).

Combes, Jean-Louis, and Tahsin Saadi-Sedik, "How does Trade Openness Influence Budget Deficits in Developing Countries?" *Journal of Development Studies*, 42 (November 2006), 1401-16.

De, Prabir, "Empirical Estimates of Trade Costs for Asia," in *Infrastructure and Trade in Asia*, ed. by Douglas H. Brooks and Jayant Menon E. Elgar (London: 2008).

———, "Empirical Estimates of Transportation Costs: Options for Enhancing Asia's Trade,'' in *Infrastructure's Role in Lowering Asia's Trade Costs*, ed. by Douglas H. Brooks and David Hummels, E. Elgar (London: 2009).

Dollar, David, Mary Hallward-Driemeier, and Taye Mengistae, "Investment Climate and International Integration," *World Development*, 34 (September 2006), 1498-516.

Ebrill, Liam, Janet Stotsky, and Reint Gropp, *Revenue Implications of Trade Liberalization*, Occasional Paper No. 180, IMF (Washington DC: 1999).

Emran, M. Shahe, and Joseph E. Stiglitz, "On Selective Indirect Tax Reform in Developing Countries," *Journal of Public Economics*, 89 (- 2005), 599-623.

Escobari, Marcela, Camila Rodriguez, David Rabkin, *Improving Competitiveness and Increasing Economic Diversification in the Caribbean: The Role of ICT*, - (April 2005).

Fay, Marianne, and Mary Morrison, *Infrastructure in Latin America and the Caribbean: Recent Developments and Key Challenges*, two volumes, World Bank (Washington DC: 2005).

Fedderke, J. W., P. Perkins, and J. M. Lutz, "Infrastructural Investment in Long-Run Economic Growth: South Africa 1875-2001," *World Development*, 34 (June 2006), 1037-59.

Fujimura, Manabu, "Cross-Border transport Infrastructure, Regional Integration, and Development," Discussion Paper No. 16, ADB Institute (November 2004).

McGillivray, Mark, "Aid, Economic Reform, and Public Sector Fiscal Behavior in Developing Countries," forthcoming, *Review of Development Economics* (September 2009).

Gyamfi, Peter, and Guillermo Ruan, "Road Maintenance by Contract: Dissemination of Good Practice in Latin America and the Caribbean Region," Latin America and the Caribbean Regional Studies Program Report 44, World Bank (October 1996).

Hoekman, Bernard, and Alan L. Winters, "Trade and Employment: Stylized Facts and Research Findings," Policy Research Working Paper No. 3676, World Bank (August 2005).

Hudson, John, and Paul Mosley, "Aid Volatility, Policy and Development," SERP Paper No. 2007-015, University of Sheffield (October 2007).

Iimi, Atsushi, "Effects of Improving Infrastructure Quality on Business Costs: Evidence from Firm-Level Data," Policy Research Working Paper No. 4581 (March 2008).

Inter-American Development Bank, *CARICOM Report No. 2*, INTAL (August 2005).

Inter-American Development Bank and Caribbean Development Bank, *Infrastructure for Development: A Policy Agenda for the Caribbean*, Washington DC: 1996).

Jha, Abhas K., "Institutions, Performance, and the financing of Infrastructure Services in the Caribbean," World Bank Working Paper No. 58 (2005).

Kharas, Homi, "Trends and Issues in Development Aid," Working Paper No. 1, Wolfensohn Center for Development, Brookings Institution (November 2007).

Kufa, P., A. Pellechio, and S. Rizavi, "Fiscal Sustainability and Policy Issues in the Eastern Caribbean Currency Union," IMF Working Paper No. WP/03/162 (- 2003).

Lee, Ha Yan, Luca A. Ricci, and Roberto Rigobon, "Once Again, Is Openness Good for Growth?" *Journal of Development Economics*, 75 (December 2004), 451-72.

Li, Xiangming, "Trade Liberalization and Real Exchange Rate Movement," *IMF Staff Papers* 51 (September 2004), 553-84.

Micco, Alejandro, and Natalia Pérez, "Determinants of Maritime Transport Costs," Working Paper No. 441, Inter-American Development Bank (April 2002).

Naudé, Wim, and Marianne Matthee, "The Significance of Transport Costs in Africa," Policy Brief No. 5, United Nations University (2007).

Nganou, Jean-Pascal, "The impact of Debt Relief on Growth, Poverty, and Human Development: A SPAHD-Based Analysis for Burundi, 2009-20," work in progress, World Bank (May 2009).

Nunes, Luis C., José Oscategui, and Juan Peschiera, "Determinants of FDI in Latin America," Working Paper No. 252, Pontificia Universidad Católica de Perú (October 2006).

Oslington, Paul, "Unemployment and Trade Liberalization," *World Economy*, 28 (August 2005), 1139-55.

Peters, Amos, "The Fiscal Effects of Tariff Reduction in the Caribbean Community," unpublished (November 2005).

Pinto Moreira, Emmanuel, and Nihal Bayraktar, "A Macroeconomic Framework for Quantifying Growth and Poverty Reduction Strategies in Niger," *Journal of Policy Modeling*, 30 (May 2008), 523-39.

Pinto Moreira, Emmanuel, and Yvonne Tsikata, "Trade Reform in the Caribbean: Challenges and Policy Responses in the Context of Global Integration," unpublished, World Bank (April 2009).

Powell, Robert, "Debt Relief, Additionality, and Aid Allocation in Low Income Countries," Working Paper No. 03/175, International Monetary Fund (October 2003).

Schott, Jeffrey J., *Prospects for Free Trade in the Americas*, Peterson Institute for International Economics (Washington DC: 2001).

Stiglitz, Joseph E., and Andrew Charlton, "Aid for Trade," *International Journal of Development Issues*, 5 (December 2006), 1-41.

Wacziarg, Romain, and Karen H. Welch, "Trade Liberalization and Growth: New Evidence," *World Bank Economic Review*, 22 (June 2008), 187-231.

Weiss, John, "A Framework for Considering Infrastructure for Regional Cooperation," in *Infrastructure and Trade in Asia*, ed. by Douglas H. Brooks and Jayant Menon, E. Elgar (London: 2009).

Winters, L. Alan, "Trade Liberalization and Economic Peformance: An Overview," *Economic Journal*, 114 (February 2004), 4-21.

Winters, L. Alan, Neil McCulloch, and Andrew McKay, "Trade Liberalization and Poverty: The Evidence so Far," *Journal of Economic Literature*, 42 (March 2004), 72-115.

World Bank, *Organization of Eastern Caribbean States: Towards a New Agenda for Growth*, Report No. 31863-LAC (April 2005).

Yoshino, Yutaka, "Domestic Constraints, Firm Characteristics, and Geographical Diversification of Firm-Level Manufacturing Exports in Africa," Policy Research Working Paper No. 4575, World Bank (March 2008).