

# III Trade Liberalization and Tax Coordination

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The free trade agreements between the Central American countries, the Dominican Republic, and the United States (CAFTA-DR) are expected to have a significant impact in many areas of the region's economies, including public finances.<sup>1</sup> Given the importance of the United States as a major trading partner, and the continued reliance on trade taxes as a source of revenue, CAFTA-DR is likely to have a notable—albeit varying—impact on Central American budgets.

This section considers the revenue consequences of CAFTA-DR for each of the Central American countries.<sup>2</sup> It then provides estimates based on highly disaggregated customs data and on each country's calendar for trade liberalization. The revenue impact of CAFTA-DR was recently analyzed in Barreix, Villela, and Roca (2004) and in Paunovic and Martínez (2003), but with a lesser degree of custom data disaggregation than in this section.<sup>3</sup> Moreover, the trade liberalization schedule (agreed upon in 2004) was not known when these studies were completed. Using 2002 tariff data, Barreix, Villela, and Roca estimated a total revenue loss ranging from 1.6 percent of GDP for Nicaragua to 7.5 percent for Honduras. Assuming different liberalization calendars, Paunovic and Martínez found that in the first year of CAFTA-DR, revenue losses range from 0.1 to 0.3 percent of GDP in Costa Rica and from 0.23 to 0.69 percent of GDP in Honduras.

This section also considers possible compensating revenue measures and reviews the implications for tax policy and its coordination within the region. The first subsection provides background by summarizing the current tax systems in the region and

outlining recent changes. The next subsection presents estimates of the near-term revenue cost of CAFTA-DR for each of the Central American countries. These estimates show that the impact is significant, although its size and timing vary across countries, depending on their reliance on trade taxes; trade patterns (particularly the importance of trade with the United States); and the respective calendars for transition to the new regime. This subsection also considers the possible long-term revenue effects of growth enhancement from CAFTA-DR. The following subsection discusses compensating revenue measures, and the final subsection before the conclusion considers the heightened need for tax coordination among the Central American countries as a result of CAFTA-DR.

## Structure and Trend of Tax Revenues in Central America

### Recent Evolution of the Tax System

The tax ratio—tax revenue relative to GDP—increased in nearly all Central American countries during the 1990s (Figure 3.1). For the region as a whole, the unweighted average rose from 11.0 to 13.1 percent between the periods 1990–94 and 1999–2003. These revenue increases were driven mainly by increased revenues from sales taxes (value-added tax—VAT) and excise taxes on particular commodities (Figure 3.2).

Though the trend has been the same in most countries, tax ratios vary significantly across the region, from about 9 percent in Panama to 16 percent in Honduras. This variation stems from differences in rates, coverage, and the effectiveness of tax administration. The measured ratios may in some cases be distorted by possible underestimates of GDP.<sup>4</sup> Nevertheless, they do point to real differences in the tax effort in the region.

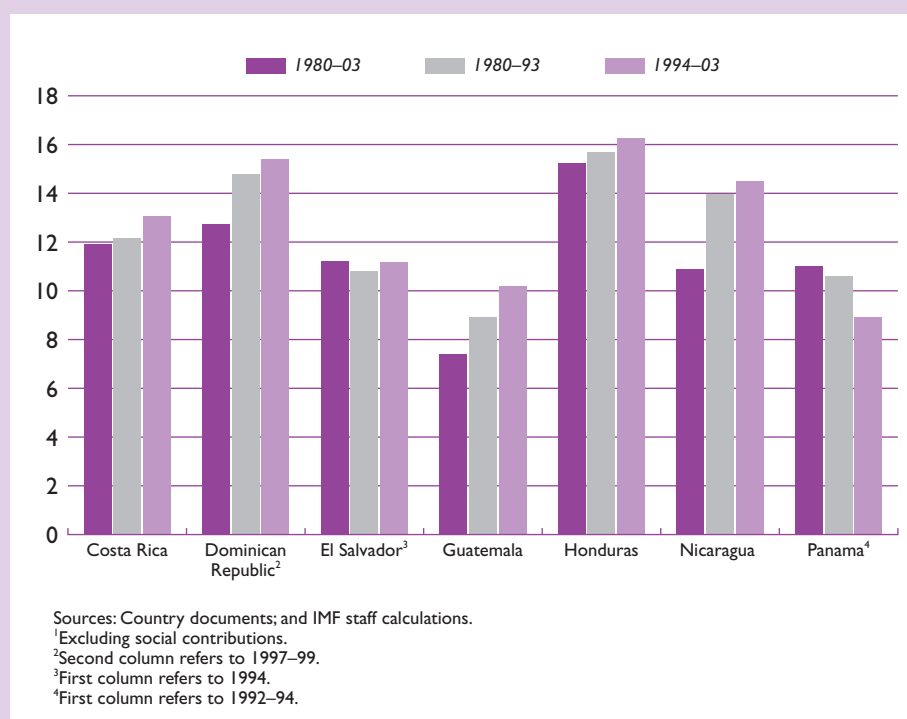
<sup>1</sup>For a broad review of the economic impact of CAFTA-DR, see Section II. Trade within Central America is already largely liberalized. Key documents pertaining to Central America integration, including the Protocol to the General Treaty of Central American Economic Integration (Guatemala Protocol) of October 29, 1993, are available at [www.sgsica.org](http://www.sgsica.org), website of the General Secretariat, Central America Integration System.

<sup>2</sup>Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua.

<sup>3</sup>Barreix, Villela, and Roca (2004) estimate the tax revenue consequences of trade liberalization initiatives for the whole Western Hemisphere, including the Central American countries.

<sup>4</sup>In Nicaragua, for example, the tax ratio has fallen in recent years mainly as the result of a major upward revision of GDP in 2000.

**Figure 3.1. Tax Revenue, 1990–2003<sup>1</sup>**  
(In percent of GDP)



All Central American countries have relatively modern tax systems that rely on diverse sources of revenue,<sup>5</sup> including a well-established and fairly broad-based VAT,<sup>6</sup> excises on a limited number of goods, taxes on individual and business incomes, and streamlined customs duties. Domestic taxes on goods and services are the broadest and largest source of tax revenue across the region. Taxes on income, profits, and capital gains are the second main source of tax revenues, and international trade taxes come third (Table 3.1).

The region has become less dependent on trade taxes over the past decade as the countries have eliminated taxes on intraregional trade and the common external tariff (CET) of the Central American Common Market has been reduced gradually. Export taxes have been eliminated (except in Costa Rica, where the authorities are phasing out a 1 percent tax on general exports and a specific tax on the export of

bananas), and the share of import duties in total tax revenue has declined on average from 23 percent in the early 1990s to 14 percent in the early 2000s. An exception is Nicaragua, where trade taxes have increased in importance over this period and now account for nearly 30 percent of total tax revenue.

The Central American countries have generally succeeded in increasing domestic tax revenues to replace customs revenue forgone as a consequence of trade liberalization (Figure 3.3). Though in the 1990s indirect taxes (VAT and excises) grew much faster than direct taxes (especially in 1995–99), in the early 2000s the trend was reversed, with direct taxes growing faster.

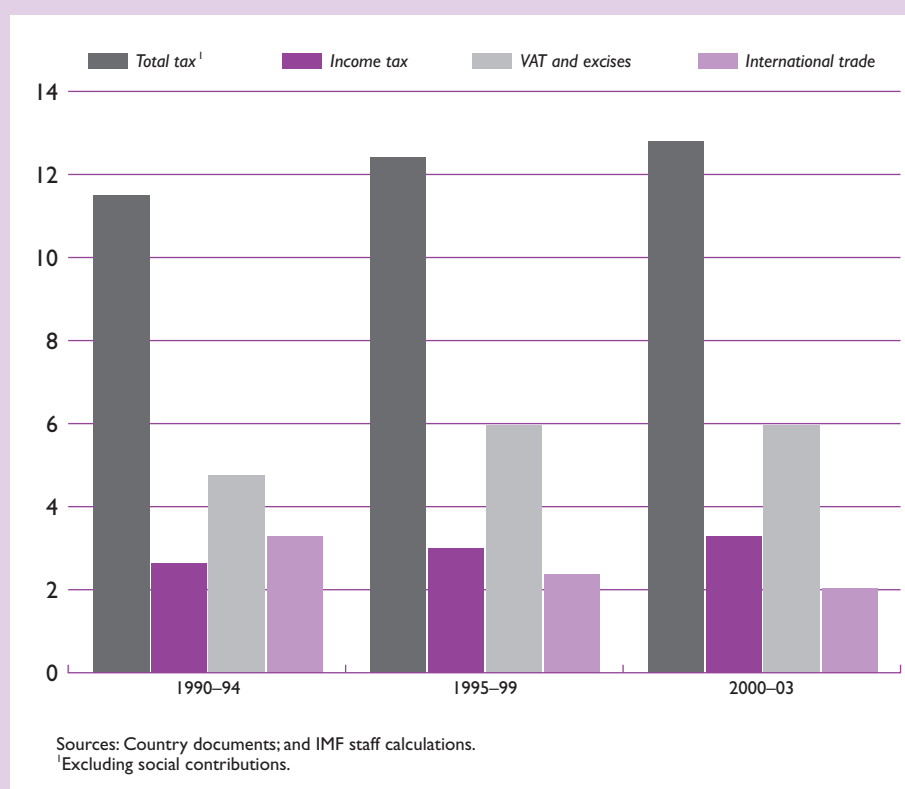
### Tariff Policies

The Central American countries have been involved in a long process of trade integration, which has resulted in the adoption of a common trade nomenclature (1993) and a common external tariff (1997). Although the pace of liberalization and implementation of the common tariffs has been uneven across countries, a remarkable overhaul of tariff structures has taken place, bringing about a major re-

<sup>5</sup>See Stotsky and WoldeMariam (2002) for a recent description and assessment of the tax systems of Central American countries.

<sup>6</sup>Nicaragua was the first in the region to introduce a VAT (1975), and Costa Rica was the last (1992).

**Figure 3.2. Central America: Composition of Tax Revenue, 1990–2003**  
(In percent of GDP)



duction in average collected tariffs. Table 3.2 shows that collected tariff rates<sup>7</sup> have declined in all countries of the region since the late 1980s. In Costa Rica, the collected tariff rate fell from an average of 11.2 percent in the period 1985–89 to 2.1 percent in 2003. All countries in the region now have collected tariff rates between 2.0 and 5.5 percent, which is relatively low by international standards.

The tariff structure reflects the participation of the Central American countries in the Central American Common Market (CACM).<sup>8</sup> Most-favored-nation (MFN) tariffs are defined by the Central American Customs System (CACM), with 6,256 eight-digit tariff lines.<sup>9</sup> About 92 percent of these lines are harmonized among the CACM members, establishing a common external tariff for these items. Those that

are not harmonized concern mainly sensitive items such as agricultural goods, textile, petroleum derivatives, metallic products, and pharmaceuticals.

The common external tariff is composed of four basic rates: zero for capital goods and raw materials not competing with those produced in Central America; 5 percent on raw materials competing with those produced in the region; 10 percent on intermediate goods not competing with those produced in Central America; and 15 percent on final consumer and other goods. For the complete liberalization of internal trade in goods, only 26 tariff lines need to be eliminated—although these apply to goods that are considered sensitive.

#### Customs Duty and Tax Revenue on Trade with the United States

Tax revenue on imports from the United States remains significant, although it varies among the Central American countries. In 2003, tariff revenues from these imports, together with the VAT and excise taxes, accounted for an average of 0.4 percent of

<sup>7</sup>Defined as the ratio of import tariff revenue to import values.

<sup>8</sup>The CACM includes Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua.

<sup>9</sup>The number of tariff lines varies across the region because some tariff lines have subcodes specific to each country. For example, in Honduras there are 6,310 lines, including the subcodes.

**Table 3.1. Consolidated Central Government: Tax Structure for Selected Central American Countries, 2000–03**  
(In percent of tax revenues)<sup>1</sup>

	Taxes on Income and Social Contributions		Taxes on Goods and Services			Taxes on International Trade				
	Total	Taxes on income, profits, and capital gains	Social contributions	General taxes on goods and services;		Total	Customs and other import duties	Of which		
				VAT	Excises			Other	Taxes on exports	Taxes on property
Costa Rica	26.3	23.2	...	64.6	36.5	11.8	6.3	1.7	2.5	1.0
Dominican Republic	31.6	26.6	5.0	44.8	24.7	20.2	19.7	0.0	1.7	1.1
El Salvador	29.0	29.0	...	60.3	52.0	8.3	9.8	...	...	0.9
Guatemala	28.0	26.1	1.9	60.3	44.8	12.3	11.9	0.0	0.1	1.9
Honduras	21.3	21.3	...	64.2	34.8	1.5	12.8	0.0	0.0	0.5
Nicaragua	37.1	19.4	17.7	51.5	24.0	27.4	24.4	0.0	-0.1	4.7
Panama	104.2	42.4	61.8	34.3	15.4	13.4	17.5	0.0	...	5.8
Unweighted average <sup>2</sup>	39.6	26.9	21.6	54.3	33.2	13.6	14.6	0.3	1.1	2.3

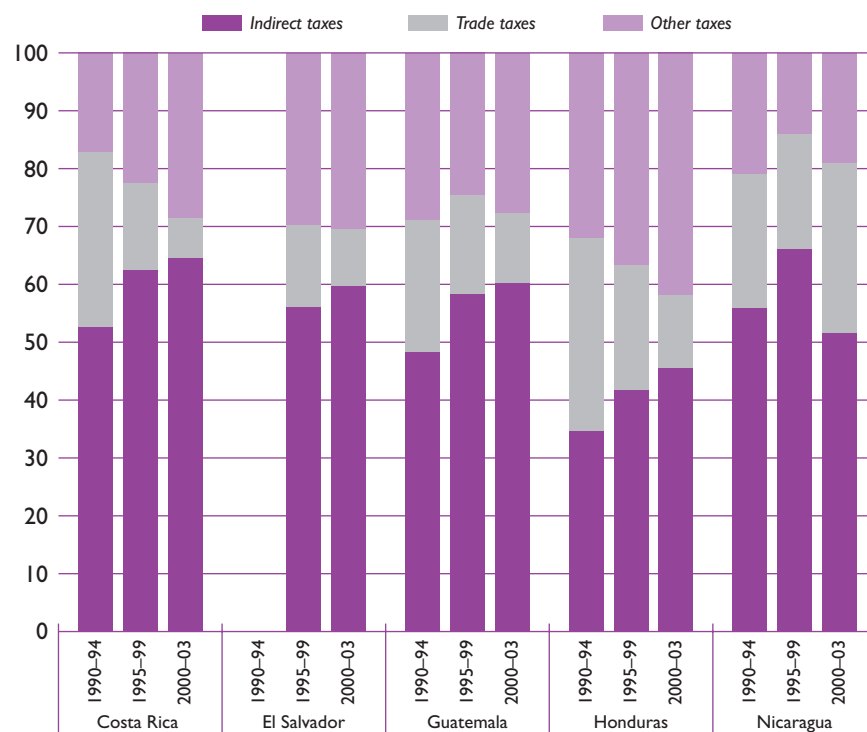
Sources: IMF, *Government Finance Statistics*; country documents; and IMF staff calculations.

<sup>1</sup>Total tax revenues exclude social security contributions.

<sup>2</sup>For each revenue classification, only countries for which data are available are included in the calculation.

**Figure 3.3. Composition of Tax Revenue, 1990–2003**

(In percent of tax revenue)



Sources: IMF, Government Finance Statistics (GFS); and International Financial Statistics (IFS).

**Table 3.2. Average Collected Import Duty Rates**

(In percent of total imports)

	1995	1996	1997	1998	1999	2000	Average		
							1985–89	1990–95	1996–2000
Costa Rica	7.2	4.1	4.2	3.2	2.3	2.1	11.2	9.5	3.2
Dominican Republic	12.5	11.9	12.9	12.1	13.1	14.2	16.0	17.6	12.8
El Salvador	6.4	5.4	4.1	3.9	3.8	3.0	5.5	6.4	4.0
Guatemala	9.1	8.5	7.0	6.2	5.8	4.9	9.2	8.6	6.5
Honduras	10.0	7.6	7.4	6.4	5.5	5.4	18.8	13.0	6.5
Nicaragua	4.7	3.8	4.1	5.9	2.9	3.1	n.a.	11.1	4.0
Panama	2.7	2.8	2.9	3.2	3.6	2.9	4.1	2.8	3.1
Unweighted average	7.5	6.3	6.1	5.8	5.3	5.1	10.8	9.9	5.7

Source: IMF, Government Finance Statistics.

**Table 3.3. Customs Revenue on Imports from the United States, 2003**

	Custom Duties	Import		Total Revenue from U.S. Imports	Revenue from Customs Duties on U.S. Imports
		VAT	Excises		
					(In percent of tax revenue)
Costa Rica	0.30	0.03	0.00	0.33	2.44
El Salvador	0.29	0.03	0.00	0.32	2.71
Guatemala	0.44	0.05	0.00	0.50	7.77
Honduras	0.57	0.03	0.01	0.61	5.21
Nicaragua	0.30	0.04	0.01	0.35	1.78
Unweighted average	0.38	0.04	0.00	0.42	3.98

Sources: National customs; and IMF staff calculations.

GDP in the region, which is equivalent to about 4 percent of total tax revenue. Again, there are quite marked differences across countries (Table 3.3). Tax revenue from U.S. imports ranges from a little less than 2 percent of total tax revenue in Nicaragua to nearly 8 percent in Guatemala.

### Estimating the Loss of Tax Revenue from CAFTA-DR

Although CAFTA-DR was negotiated collectively, with all parties subject to the “same set of obligations and commitments,” each Central American country negotiated its own schedule for market access on a bilateral basis with the United States. Annex 3.3 of each CAFTA-DR agreement defines the tariff elimination schedule for each custom line. Each traded good is classified into one of eight categories (labeled A through H), which define the period over which duties will be eliminated and the schedule of tariff reductions. Many goods will be zero rated immediately (Schedule A), and the tariffs for others will be phased out incrementally so that liberalization is reached in 5, 10, 15, or 20 years from the time the agreement takes effect. The phaseout periods differ for the various groups of products and within the same group of products; for example, in Honduras white and dark chicken meat is subject to different schedules.

The CAFTA-DR agreement is asymmetric. On the U.S. side, liberalization is immediate: from day one, 100 percent of nonagricultural and nontextile goods will enter the United States duty free. On the Central American side, each country has a different allocation of goods to the eight categories and, hence, a different time profile of tariff reduction.

When CAFTA-DR enters into force, for about 80 percent of nonagricultural and nontextile exports, all tariffs will be removed within 10 years (covering schedules A, B, and C). Tariffs on many product categories will be set to zero in the first year of the treaty, including information technology products, some agricultural and construction equipment, paper products, chemicals, and medical/scientific equipment under Schedule A. Tariffs on other goods are being removed linearly over 5 or 10 years, and others have lengthy periods of grace (of up to 20 years); some are to become duty free in a nonlinear way.

The entry into effect of CAFTA-DR, and trade liberalization more generally, will affect government revenue both directly and indirectly:

- The direct (or “static”) revenue effect is that which arises at unchanged import volumes and prices (before customs duties). This includes not only the impact on tariff revenues themselves, but also the impact on the revenues from taxes imposed on tariff-inclusive import values (as is normal and recommended practice for VAT and ad valorem excises).<sup>10</sup> These effects—as well as the indirect effects discussed below—depend, in principle, on the nature of competition in the marketplace; except as specified below, competitive behavior and returns to scale are assumed constant, so that prices exclusive of tariffs remain unchanged by CAFTA-DR.<sup>11</sup>

<sup>10</sup>Note that revenue from many other taxes may also be directly affected; for instance, taxable corporate income will be increased as a result of reduced import costs. Such effects are ignored in the calculations reported here.

<sup>11</sup>Central American countries are small economies that cannot affect world market prices.

- Indirect effects result from changes in import volumes and/or tariff-exclusive prices induced by the reform. There are many potential effects of this kind. Tariff cuts would be expected—all things being equal—to increase the demand for imports, possibly to such an extent that revenue actually increases (though this seems improbable given the relatively low initial level of tariffs in Central America).<sup>12</sup> Trade liberalization may also spur economic growth—one of the underlying objectives of CAFTA-DR—which can help strengthen government finances, and tax revenue in particular; but this effect would tend to become evident only over time, and it may be prudent not to count on this effect to recover revenue losses (see Section II regarding CAFTA-DR’s implications for growth).

A potential indirect effect of CAFTA-DR is the possibility of trade diversion, with imports from the United States replacing those from third countries that remain subject to the CET. Although this is a concern from a welfare perspective—to the extent that imports from third countries are cheaper than those from the United States, the former are socially preferable—the concern in this section is the additional erosion of tariff revenue that trade diversion causes. It is difficult to determine a priori the likely form or extent of such diversion. There are several possibilities. For instance, there may simply be no substitution between U.S. and third-country imports, even within the same tariff line, in which case there would be no trade diversion. Or, when substitution is perfect but competition is not, third-country exporters may seek to preserve their market position by cutting their pretariff price by enough to leave their tariff-inclusive price at the same level as the now tariff-free price of exports from the United States. In that case, one might expect the shares of third country and U.S. imports to remain unchanged—with the change in the overall volume reflecting the price elasticity of the demand for imports—and expect tariff revenues from third-country imports to fall to the extent that the unchanged MFN rate is charged on a lower tariff-exclusive price.

<sup>12</sup>Ebrill, Stotsky, and Gropp (1999), for instance, conclude that the revenue-maximizing collected tariff rate is about 20 percent. Though one can question the validity of this notion for an individual tax (since many different tariff structures can yield the same collected rate), it is noteworthy that average collected rates in Central America are far below this level.

## Quantifying the Impact

The quantitative analysis below considers several scenarios and aspects of the revenue implications of CAFTA-DR.<sup>13</sup>

- The immediate direct impact in the first year of implementation (taking account of the differing liberalization schedules of the Central American countries), assuming no change in the volume or composition of imports.
- Immediate effects, but allowing for impacts through third-country imports under the alternative assumptions that (1) third countries cut tariff-exclusive prices to offset tariff reductions on imports from the United States; (2) there is trade diversion of 20 percent (non-U.S. imports fall by one-fifth); and (3) diversion is 100 percent (as an illustrative scenario).
- The long-run effect, when there is trade diversion of 35 percent, and when tariffs on imports of U.S. goods are zero.

For the region as a whole, about two-fifths of imports from the United States will become duty free immediately, although the degree of front-loading varies widely across countries. Of all imports from the United States on which duty is currently payable, 43 percent will become duty free in the first year of the treaty. However, the degree to which imports from the United States are liberalized in the first year of the treaty varies substantially across countries (Table 3.4). Costa Rica will liberalize almost all of its imports from the United States, so that 97 percent of long-term revenue loss from CAFTA-DR—about 2.4 percent of all tax revenues—would come immediately (Table 3.5). Nicaragua, in contrast, liberalizes 17 percent of U.S. imports in the first year and front-loads only 13 percent of any long-term loss.

Revenue will decrease by an average of 0.2 percent of GDP, or 2 percent of total tax revenue, in the first year of CAFTA-DR. This impact reflects a direct loss of customs duties (0.15 percent of GDP) and indirect domestic taxes (0.02 percent of GDP); the effect on excise tax revenue is minimal. Once again, the extent of the revenue loss varies across countries. Costa Rica has the greatest degree of front-loading, although imports from the United States account for a relatively low share of all imports. Honduras has the second-largest loss in the first year; tax revenues fall by about 0.2 percent of GDP, representing one-third of the full long-term

<sup>13</sup>The data and methodology used are described in the Appendix.

**Table 3.4. Schedule A Imports, 2003<sup>1</sup>**

	Total Imports from the United States (In percent of total imports) (A)	Schedule A Imports (In percent of total imports) (B)	Schedule A Imports (In percent of imports from the United States) (B/A)
Costa Rica	20.8	20.7	99.5
El Salvador	31.3	12.2	38.9
Guatemala	34.8	5.7	16.4
Honduras	...	...	...
Nicaragua	26.4	4.4	16.7
Unweighted average	28.3	10.7	42.9

Sources: National customs; and IMF staff calculations.

<sup>1</sup>Schedule A comprises imports from the United States that will be liberalized in the first year of CAFTA-DR.

**Table 3.5. Revenue Impact of CAFTA-DR, First Year<sup>1</sup>**

	Tariff Loss	Sales Tax Loss	Excise Loss	First-Year Revenue Loss		
				(In percent of GDP)	(In percent of tax revenue)	(In percent of total revenue loss)
Costa Rica	0.29	0.03	0.00	0.32	2.37	96.97
El Salvador	0.08	0.01	0.00	0.09	0.76	28.13
Guatemala	0.15	0.01	0.00	0.16	1.99	32.00
Honduras	0.21	0.01	0.00	0.22	1.35	25.88
Nicaragua	0.04	0.00	0.00	0.05	0.23	12.71
Unweighted average	0.15	0.01	0.00	0.17	1.34	39.14

Sources: National customs; and IMF staff calculations.

<sup>1</sup>Base year 2003.

revenue loss. Nicaragua has the lowest degree of front-loading (13 percent), and hence the lowest revenue loss (0.05 percent of GDP) in the first year.

These figures should be thought of as lower bounds on the likely revenue loss, as they do not allow for trade diversion.<sup>14</sup> To illustrate the possible impact of trade diversion, calculations were made for the cases of Honduras and Nicaragua—the only Central American countries for which the necessary line-by-line information on non-U.S. imports is available. The results, calculated under the three alternative assumptions described above, are summarized in Table 3.6. The *base case* assumes that there is no trade diversion, but that suppliers from outside the CAFTA-DR zone

lower the prices of goods competing with imports from the United States to offset their tariff disadvantage. The *intermediate case* assumes trade diversion of 20 percent in the first year of the trade agreement and 35 percent in the long term, and the *extreme case* assumes 100 percent of trade diversion for those goods that are already imported from the United States (meaning non-U.S. imports go to zero).<sup>15</sup>

With offsetting price cuts by third countries, the revenue losses in Honduras and Nicaragua are

<sup>14</sup>On the other hand, they overstate the revenue loss over the transition period to the extent that reduced (but nonzero) tariffs lead to increased imports from the United States.

<sup>15</sup>The diversion cases are presented for illustrative purposes. The process of trade diversion is likely to take longer than in the first year of the treaty. Krueger (1999, 2000) found that in the case of Mexico, NAFTA was not a trade-diverting agreement, since the categories in which Mexican exports to the United States registered the largest increase for the period 1990–96 overlapped with categories in which exports rose most rapidly, along with the rest of the world, suggesting that the impact of NAFTA on Mexico involved other trade dynamics.



**Table 3.6. Honduras and Nicaragua: Revenue Impact of CAFTA-DR, First Year**

	No Trade Diversion <sup>1</sup>	20 Percent Trade Diversion	100 Percent Trade Diversion
<i>(In percent of GDP)</i>			
Honduras	0.25	0.30	0.50
Nicaragua	0.06	0.08	0.20
<i>(In percent of total tax revenues)</i>			
Honduras	1.53	1.84	3.07
Nicaragua	0.28	0.42	0.99

Sources: National customs; and IMF staff calculations.  
<sup>1</sup>Suppliers from outside the United States lower pre-tariff prices of goods competing with U.S. imports.

somewhat larger than when only direct effects arise. The loss in Honduras is estimated at 0.25 percent of GDP in the first year of the treaty, compared with a direct loss of 0.22 percent (0.06 percent of GDP versus 0.04 percent in Nicaragua). The impact in Honduras reflects the impact caused by the reduction in the c.i.f. price of goods competing with imports from the United States (0.03 percent of GDP), the direct loss of taxes in the form of customs duty, as before (0.22 percent of GDP), and the indirect impact on sales tax (0.01 percent of GDP). The impact on excise tax revenue is minimal. The impact is much smaller in Nicaragua, where the loss of customs duty is 0.05 percent, the loss from the sales tax and excises is negligible, and that from the reduction in the c.i.f. price of goods competing with imports from the United States is 0.01 percent of GDP.

The revenue loss could potentially double in Honduras and triple in Nicaragua if there were full trade diversion. With 20 percent diversion, the revenue loss in the first year would be 0.3 percent of GDP for Honduras, and about 0.08 percent of GDP for Nicaragua. With 100 percent diversion, the loss for Honduras would be 0.5 percent of GDP, and for Nicaragua it would be about 0.2 percent of GDP. The extent of the long-term revenue loss is highly sensitive to the extent of trade diversion. In the absence of trade diversion, the long-term total loss could amount to 0.4 percent of GDP for the region as a whole (Table 3.7). For Honduras, the loss would represent 0.6 percent of GDP, but it would rise to a total of 1.45 percent of GDP if all goods were subject to 100 percent trade diversion. Although for Nicaragua the loss without trade diversion would be 0.35 percent of GDP, it would reach 0.9 percent with 100 percent trade diversion.

**Table 3.7. Summary Table: Revenue Loss of CAFTA-DR**
*(In percent of GDP)*

	First Year					Long-Term		
	Only static effects	No trade diversion <sup>1</sup>	20 percent trade diversion	100 percent trade diversion	Total tax revenues	Only static effects	35 percent trade diversion	100 percent trade diversion
Costa Rica	0.32	...	...	...		0.33	...	...
El Salvador	0.09	...	...	...		0.32	...	...
Guatemala	0.16	...	...	...		0.50	...	...
Honduras	0.22	0.27	0.31	0.49	16.3	0.61	1.01	1.45
Nicaragua	0.05	0.06	0.08	0.20	19.9	0.35	0.51	0.88
Unweighted average	0.17	0.16	0.20	0.34		0.42	0.76	1.17

Sources: National customs; and IMF staff calculations.

<sup>1</sup>Suppliers from outside the United States lower pre-tariff prices of goods competing with U.S. imports.

**Box 3.1. Revenue Effects of Growth Enhancement from CAFTA-DR**

The improved growth performance expected to result from CAFTA-DR can be expected to increase tax revenues, offsetting to some degree the direct revenue losses. As private incomes rise, so do revenues from the income tax, VAT, excises, and other taxes (including remaining tariffs). Even in the absence of changes in the parameters of the tax system, revenue would be expected to increase as a consequence of expanded tax bases.

The magnitude of this indirect revenue recovery depends on (1) the extent to which CAFTA-DR spurs faster growth, and (2) the responsiveness of tax revenues to any increase in the level of income. Both of these quantities are subject to considerable uncertainty.

- On the first, Hilaire and Yang (2003) estimate that CAFTA-DR would increase the aggregate GDP of the Central American region by 1.5 percent in the long run. The modesty of this boost may reflect the high degree of trade integration that already exists between the Central American countries and the United States, or it might be that some dynamic links between CAFTA-DR and growth are not adequately captured. (Other studies point to stronger growth effects of trade liberalization (see, for example, Wacziarg and Welch, 2003), though they do not deal directly with CAFTA-DR.)
- On the second, time-series regressions can be used to estimate for each country the elasticity of tax revenue with respect to GDP. Using data for 1990–2003, this elasticity averages about 0.14 percent.<sup>1</sup> These estimates must be interpreted with caution. In particular, they do not distinguish in-

<sup>1</sup>Specifically, the estimated elasticities (all significantly different from zero at 1 percent) are Costa Rica, 0.13; El Salvador, 0.14; Guatemala, 0.11; Honduras, 0.17; and Nicaragua, 0.23.

creases in revenue from policy reform from the automatic effects of increased income levels, but indicate likely orders of magnitude.

These rough estimates imply that the indirect increase in revenue from improved GDP performance will not fully offset the direct revenue loss. Combining the Hilaire-Yang estimate of a 1.5 percent increase in GDP with the estimated revenue elasticities implies that revenue will, on this account, rise by an unweighted average of 0.22 percent for the region as a whole, ranging from 0.17 percent for Guatemala to 0.34 percent for Nicaragua. This compares with direct revenue losses estimated in the text of 3.1 percent under the long-term static scenario. Thus, indirect growth effects might offset about 7 percent of long-run direct revenue loss.

The extent of indirect revenue recovery will depend on the size of the boost to growth performance, about which there is considerable uncertainty. One way of assessing the potential revenue impact of enhanced growth is to ask instead: by how much would growth have to be increased by CAFTA-DR for the associated revenue increase (as implied by the income responsiveness estimated above) to offset the direct revenue loss estimated in the text? For the Central American countries as a whole, unweighted GDP would have to increase by an average of 21.9 percent to offset the direct revenue loss in the long run.<sup>2</sup> This corresponds to increased annual growth rates, over a 10-year period (roughly matching movement to the final phase of CAFTA-DR), of 2 percentage points, which seems on the high side, reinforcing the view that revenue recovery from CAFTA-DR is likely to require some positive policy response.

<sup>2</sup>The required growth increase is calculated as (direct revenue loss, in percent of GDP) / [(estimated revenue elasticity) × (tax revenue, in percent of GDP)].

CAFTA-DR is expected to strengthen growth, which should partially offset the direct revenue losses from tariff reduction. The size of the indirect revenue increase will depend on the effect of CAFTA-DR on growth as well as the responsiveness of the tax revenue to GDP. However, the indirect growth effect of CAFTA-DR on revenue is rather small, based on the CAFTA-DR-induced GDP growth estimated by Hilaire-Yang (2003) and estimates of revenue elasticities to GDP for the Central American countries (see Box 3.1). The growth dividend would be larger if dynamic growth effects not considered in Hilaire-Yang, are taken into account (see Section II).

### Dealing with the Revenue Impact of CAFTA-DR

The discussion in the previous subsection leads to the conclusion that countries will need to take tax measures to maintain revenue-to-GDP ratios. For the region as a whole, tax measures on the order of 0.17 to 0.2 percent of GDP are needed to maintain the revenue ratio in the first year of CAFTA-DR. In the long term, the need to compensate for revenue losses may total 0.4 to 1.2 percent of GDP. These resources can be obtained by broadening tax bases (consumption and income) and strengthening tax administration.

Economic principles and experience elsewhere both suggest that indirect taxes have a key role to play in responding to revenue shortfalls due to trade liberalization. One simple strategy for dealing with a tariff reduction on a final consumption good, for instance, is to impose an equal increase in the tax on domestic consumption. For a small open economy—one that can have no impact on commodity prices in world markets—this will leave the price faced by consumers unchanged. It will also preserve the efficiency gain from the tariff cut, since the change in the consumption tax does not offset the effect of the reform in bringing the prices faced by domestic producers closer to those in world markets. The government's total tax revenue, however, will go up, since these revenues are now collected on all consumption, domestically produced as well as imported. That increase in government revenues could, in turn, be used to smooth the transition cost of those sectors that stand to lose from trade liberalization—for example, by temporary targeted subsidies—or to reduce consumption taxes to ensure that consumers also end up directly better off as a consequence of the reform. Although there are several qualifications to this argument,<sup>16</sup> it suggests a coherent and simple strategy for securing the efficiency benefits of trade liberalization without jeopardizing revenue and, moreover, without significantly affecting the distribution of the tax burden.

Unless the base of the VAT is broadened, Central American countries would have to increase the statutory VAT rate by at least 1 percentage point to compensate for the revenue loss from the CAFTA-DR.<sup>17</sup> In general, base-broadening measures are preferable to rate increases because they help improve the structure of the VAT and facilitate its administration: there would be fewer exceptions to the rule and less room for misreporting and abuse. Though rate increases are likely to result in increased revenues, they may also have unintended effects on taxpayers' compliance. For illustrative purposes, Figure 3.4

shows by how much the VAT statutory rate<sup>18</sup> in each country would have to increase—given the present tax base—to offset the direct revenue loss from CAFTA-DR. In the first year of liberalization, the VAT rate adjustment required is close to 1 percentage point for Costa Rica, and in the remaining countries it is quite small. However, the VAT rate increase that would be needed to compensate for the full application of the CAFTA-DR is almost 2 percentage points for Nicaragua, and over 1 percentage point for Guatemala and Honduras. These estimates indicate that, everything else being equal, the standard VAT rate that is needed to compensate tariff losses is slightly over 13 percent for Guatemala, 15 percent for Nicaragua, and close to 14 percent for the remaining countries.<sup>19</sup>

Although the VATs of the region are reasonably well structured, with fairly broad bases and low rates, there is scope for improving their design and administration in order to enhance collection and compliance. VAT revenue productivity,<sup>20</sup> a rough efficiency measure that offers some standardization of measurement across countries, is fairly low. Table 3.8 shows that it has not improved over the past 14 years, and that in some countries, such as Honduras and Nicaragua, it has actually worsened. Low and declining productivity often reflects base erosion through legislative changes or reduced tax compliance. Indeed, the VAT base in these countries is punctured by an excessive number of zero-rated and/or exempt items. For example, in Costa Rica, the VAT base excludes many services and does not allow full credit for the VAT paid on purchases of inputs—refunds are granted only when the inputs are effectively used in the production process. There appears to be substantial scope for reducing exemptions as part of a strategy to strengthen Central America's revenue effort, including a plan to offset the impact of CAFTA-DR. Moreover, the rate of VAT evasion is considered high in several Central American economies. Recent estimates point to as much as 40 percent evasion, suggesting that VAT collections could be significantly higher if administrative practices, such as audits, were improved (Stotsky and WoldeMariam, 2002).

<sup>16</sup>See Keen and Ligthart (2004). One qualification deserves particular comment. Strictly, the argument requires that, in order to leave all consumer prices unchanged, the rate structure of the new domestic consumption tax mimic in full the tariff structure that is being replaced. Since most countries apply multiple tariff rates, the reform strategy requires that there also be multiple rates of domestic consumption taxation. But such multiple rates can create their own problems. Nevertheless, the point remains valid that there are likely to be more welfare gains made by combining the shift away from trade taxes with a movement toward a more uniform consumption tax system.

<sup>17</sup>Part of the adjustment could also come from increasing excises on excisable goods on which tariffs on U.S. imports are reduced.

<sup>18</sup>The increase of the statutory VAT rate required to offset the revenue loss is estimated as follows:  $[\text{VAT revenues and tariff loss in percent of GDP}] / (\text{VAT revenues in percent of GDP} \text{ minus (statutory VAT rate)})$ .

<sup>19</sup>This is needed to compensate for the loss in revenue under the static long-term scenario (Table 3.7). It is assumed here that there is no behavioral response to the increase in the VAT rate.

<sup>20</sup>This is defined as the ratio of VAT revenues to the product of the standard rate of VAT and final consumption: for a uniform VAT levied on all consumption and with full compliance, the ratio would be one. See Ebrill and others (2001) for further discussion of the VAT productivity notion and its limitations.

**Figure 3.4. Estimated Minimum VAT Rate to Compensate for Tariff Loss, 2003<sup>1</sup>**



Sources: Country documents; and IMF staff estimates.  
<sup>1</sup>Assumes no trade diversion.

Improving VAT compliance will require both management and technical improvements in tax administration, supported by strong political backing for necessary audit and enforcement activities. Tax administrations in the region tend to have poor management control of taxpayers in general, and VAT payers in particular. The VAT registration thresholds are low, implying that there are many more VAT-registered taxpayers than the tax administration can effectively control. Compliance is poor—even with

basic return filing and payment requirements (this is also the case for the large taxpayers)—and the VAT crediting and refund systems are weak. In addition, the effectiveness of the VAT audit is weak; available information is not used effectively to detect noncompliant VAT payers, and when it is used, follow-up actions to enforce payment of undeclared VAT are not rigorous.

The income tax may also have a role to play in recovering revenue—in particular, the base of the cor-

**Table 3.8. VAT Productivities<sup>1</sup>**

	1994	1997	2001	2003
Costa Rica	0.75	0.53	0.69	0.71
Dominican Republic	0.51	0.43	0.41	0.38
El Salvador	0.51	0.43	0.48	0.54
Guatemala	0.39	0.43	0.53	0.42
Honduras	0.55	0.65	0.58	0.53
Nicaragua	0.45	0.45	0.47	0.19
Panama	0.50	0.43	0.36	0.41
Unweighted average	0.52	0.48	0.50	0.45

Sources: IMF, *World Economic Outlook*; country documents; International Bureau of Fiscal Documentation, *Taxation in Latin America, Taxation and Investment in the Caribbean*; PricewaterhouseCoopers, *Corporate Taxes 2003–2004, Worldwide Summaries*; and IMF staff estimates.

<sup>1</sup>Revenue productivity = total VAT revenue as percentage of final domestic consumption divided by the VAT standard rate.

porate income tax should be broadened and tax incentives reassessed. There are signs that other countries that have succeeded in replacing revenues lost from trade tax reform have done so in part by strengthening the personal income tax.<sup>21</sup> In Central America there is also clear scope for revenue enhancement through the corporate income tax. Each of these countries offers special tax regimes to exporters and nonresident corporations. Special regimes, such as the free trade zones and industrial processing zones arrangements, narrow the corporate income tax base by making the offshore processing sector exempt from the payment of any tax other than labor contributions. The regimes create incentives for tax arbitrage by transferring earnings from taxed enterprises to exempt enterprises. Indeed, the use of transfer pricing and financial arrangements may enable other enterprises located onshore to shift taxable profits to offshore processing enterprises with which they are associated in order to reduce their tax burden.<sup>22</sup> Tax incentives should be phased out, since they are an inefficient way to attract additional investment, shift the tax burden onto other bases, create avoidance opportunities, distort economic decisions, discriminate against different types of investment, and complicate tax administration. Some tax incentives may also be in violation of World Trade Organization (WTO) rules.<sup>23</sup> A preferred manner of providing incentives to investment is through generous depreciation allowances and loss carry-forward provisions. If tax incentives are used, they should be narrowly targeted to specific sectors or disadvantaged regions. In all cases, tax incentives should be subject to tax expenditure analysis so that the cost of these incentives is transparent.

<sup>21</sup>See IMF (2005), on dealing with the revenue consequences of trade reform.

<sup>22</sup>The offshore processing sector in the region has been growing over the past 10 years, for various reasons, including the existence of preferential fiscal regimes and preferential access to the U.S. market under arrangements such as the agreement on textiles and clothing under the Caribbean Basin agreement. There is evidence in one country in the region that the ratio of earnings to sales for enterprises operating under special arrangements is about double that of those enterprises not operating under special regimes.

<sup>23</sup>The existence of export-related tax concession regimes contravenes WTO principles. The Agreement on Subsidies and Countervailing Measures (ASCM) prohibits subsidies that require recipients to meet certain export targets; also, the jurisprudence related to the ASCM has defined tax exemptions as subsidies. However, the least-developed countries—in particular those with an annual per capita income of less than US\$1,000, measured using a certain methodology—have received a waiver that has allowed them to maintain those subsidy systems. Such waivers, according to the WTO legislation, should be temporary.

## CAFTA-DR and Issues of Tax Coordination

CAFTA-DR strengthens the case for tax coordination within the region. The theoretical case for tax coordination—not necessarily for full harmonization, in the sense of complete uniformity of taxation—comes from mobility of the tax base across countries (whether capital, goods, services, or labor). In the absence of any tax coordination, countries in Central America may be induced to lower the tax rates in order to attract the mobile taxable base. This harmful competition can lead to effective tax rates being set too low.<sup>24</sup> The largely free trade within these countries already implies significant base mobility between them (discussed further below), but a free trade agreement with the United States would intensify this in two main ways.

- Firms (including from the United States and third countries) that wish to sell in the United States will find Central America a more attractive location after U.S. tariffs are eliminated. Each Central American country will then have an incentive to compete with the others in offering more attractive terms to attract such enterprises.
- U.S. companies wishing to sell in Central America will no longer have an incentive to locate there in order to jump over tariff barriers; so each Central American country also has an incentive to offer better terms than its neighbors in order to retain or attract such companies.

In particular, coordination may be needed to avoid or limit further reduction in corporate tax revenues. Central American countries already offer quite extensive breaks in the form of tax holidays and free trade zones, and—in line with worldwide trends—statutory corporate tax rates in the region have fallen significantly. A continuation of these pressures can be expected irrespective of CAFTA-DR, but for the reasons discussed above CAFTA-DR is likely to intensify them.

Corporate tax coordination could take a variety of forms. The most intense would be the adoption of a single Central America-wide corporate tax, with revenues allocated across the countries by some revenue-sharing formula. Requiring somewhat less, but still very extensive, coordination would be a system of formula apportionment (along the lines of state-level corporate taxes in Canada and the United States), with countries agreeing on a common base

<sup>24</sup>Some argue that tax competition should be welcomed as imposing constraints on wasteful governments, but in Central American countries stronger revenue mobilization is an acknowledged priority.

but being allowed to set different rates, with taxable profits then allocated across them by some formula.<sup>25</sup> Or there might be agreement on a minimum rate of corporate income tax (as proposed in the early 1990s by the Ruding Committee for the European Union; see Ruding, 1990) though this may do little unless some agreement is also reached on the tax base. Or a code of conduct might be imposed to eliminate harmful practices in business taxation.

A nonbinding code of conduct, a relatively loose form of corporate tax coordination, may be a useful first step. A code of conduct on business taxation was adopted by the European Union in 1997 and has been largely successful.<sup>26</sup> It was specifically aimed at measures that unduly affect the location of business activity in the European Union by being targeted at nonresidents, providing them with a more favorable tax treatment than that which is generally available in the member state concerned. This also helped European Union members to identify many existing national provisions that violated European Union state aid rules. Although Central American countries do not have such counterparts, the European experience suggests that it would be advisable to adopt a strategy toward corporate tax coordination sooner in the integration process rather than later.

There may also be a case for coordination of taxes on capital income and/or enhanced information sharing, to prevent residents of one Central American country from avoiding or evading taxes by locating their savings in another. But there may be only limited scope for this in the case of Central America, because of the availability of the option to save in third countries outside the region.<sup>27</sup>

Excises are the other main candidate for coordination. The concern here is that cross-border shopping and smuggling driven by differences in tax rates will lead governments to respond by setting lower excise rates than they otherwise would. A problem can exist even if no cross-border smuggling is actually observed; countries may defensively and spontaneously

set rates too low. Table 3.9 shows that excise tax rates differ significantly across the Central American countries and that excise tax levels are fairly low by regional standards—both of which suggest that there might indeed be a case for harmonization efforts.

Agreement on minimum excise rates is a natural way to deal with this problem. This has been the strategy in the European Union. Individual countries can be allowed to keep a certain flexibility in setting excise tax rates for meeting immediate budgetary needs or to respond to revenue shortfalls due to trade liberalization.

A strong case can also be made for VAT rate and base coordination. Differences in VAT rates and exemptions can cause problems. When the difference in the rates that countries apply to some commodity is large relative to the cost of transporting it, cross-border shopping and smuggling can become an issue. These erode revenue directly, and moreover can lead to mutually harmful tax competition as countries seek to protect their tax bases by setting lower tax rates than they otherwise would. As noted, this is often more of a problem with excises, but big cross-border differences in VAT rates can lead to significant cross-border shopping, as on the Danish-German border, where the rate differential is considerable (25 percent against 16 percent). Differences in VAT-exempted items can also cause trade distortions, with the VAT in effect akin to an import subsidy.<sup>28</sup>

Agreement on a minimum standard VAT rate would be a desirable element of VAT coordination. Standard VAT rates in Central America countries fall in a narrow range (12–14 percent), except Panama (5 percent). For most countries this tight range should, generally speaking, limit—but not eliminate—cross-border shopping/smuggling of high-value, easily transported goods. Agreeing on a minimum standard rate of VAT, a strategy adopted in the European Union, would protect against downward pressures on rates created by cross-border shopping/smuggling while allowing each country flexibility in setting it depending on budgetary needs. To be meaningful, adoption of a minimum rate would need to be combined with agreement on the bundle of commodities to which that standard rate applies.

<sup>25</sup>The European Union is currently considering schemes of this form. See, for instance, Sørensen (2004).

<sup>26</sup>The Code of Conduct for Business Taxation and Fiscal State Aid was set out by the ECOFIN council of December 1, 1997, in Brussels. It is not a legally binding instrument, but clearly it does have political force. By adopting this code, member states have undertaken to roll back existing tax measures that constitute harmful tax competition and refrain from introducing any such measures in the future.

<sup>27</sup>To ensure the taxation of interest payments earned by European Union citizens in third countries, the recently adopted EU Savings Directive ensures taxation either by exchanging information with third countries or by having member or third countries become collecting agents of European Union member countries. Switzerland, for example, retains only 35 percent of the withholding tax revenue it collects and acts as a collecting agent for the European Union.

<sup>28</sup>Suppose, for instance, that one Central American country (country A) exempts some good used as an intermediate input while another (country B) taxes it fully under the VAT. Then exporters from country B actually have a competitive advantage in country A's internal market, since the uninterrupted chain of VAT means that the zero-rating of exports removes all input VAT throughout the production chain, whereas producers in country A will implicitly bear an unrecovered burden of the tax paid on purchases by their exempt suppliers. Addressing this potential problem in Central America would require undertaking a systematic comparative study of exemptions as a first step toward harmonizing the VAT base.

Table 3.9. Excise Tax Summary

	Costa Rica 2003 <sup>1</sup>	Dominican Republic 5/8/2002	El Salvador 2003	Guatemala 2003	Honduras 2004 <sup>2</sup>	Nicaragua 11/20/2002	Panama 5/31/2003
Alcoholic/nonalcoholic beverages:	(percent)	(percent)	All alcoholic beverages 20 percent plus specific tax US\$0.00751/degree of alcohol	US\$0.13/liter For wine, whiskey, rum, vodka and distilled alcohol US\$0.515–2.47/liter	US\$0.1692/liter For wine, whiskey, rum, vodka and distilled alcohol US\$0.192–2.695/liter	(percent)	US\$1.325/liter US\$0.05/liter Spirits: US\$0.35/degree of alcohol content/liter
Beer	40	25				36	
Wine	40	35				37	
Whisky	50	45				37	
Rum	...	35				36	
Vodka	...	45				37	
Distilled alcohol	...	...				42	
Soft drinks	US\$0.0198/unit of consumption	US\$0.0028/ bottle	10 percent	US\$0.022/liter	US\$0.0213/liter	9	5–6 percent <sup>3</sup>
Taxes on petroleum and natural gas:		Prices (US\$/gallon) <sup>4</sup>	Prices (US\$/gallon)	Prices (US\$/gallon) <sup>4</sup>	Prices (US\$/gallon)	Prices (US\$/gallon)	Prices (US\$/gallon)
Gasoline (regular)	...	2.0213	0.3591	0.4722	15 percent	...	0.60
Gasoline (premium)	...	2.3269	0.3591	0.4787	over c.i.f. import value <sup>8,9</sup>	...	...
Diesel	...	1.3387	0.3591	0.1682		...	0.25
Fuel oil	...	0.9614	...	0.0712 (Bunker) <sup>5,6</sup>		...	0.15
Taxes on tobacco:	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)	32.5 percent of the consumer sales price
Cigarettes	100	50	39	100	47.5	39	
Cigars	...	25	...	...	...	39	

Sources: IMF, *International Financial Statistics*; country document tax summary tables; International Bureau of Fiscal Documentation; and United States Department of Commerce—National Data Bank.  
<sup>1</sup>Soft drinks and gaseous concentrates: US\$0.0198 per unit of consumption; other bottled beverages, including water: US\$0.01721 per unit of consumption; water containers of 18 liters or more: US\$0.00685 per unit of consumption.

<sup>2</sup>Rate is as of 9/3/1999.

<sup>3</sup>Domestically produced or imported carbonated beverages; (5 percent); and syrups or concentrate used in the production of carbonated beverage: (6 percent).

<sup>4</sup>Prices in effect on May 8, 2002. Resolution 112–00 allows for prices to be adjusted periodically for, inter alia, changes in the consumer price index, world oil prices, and the official exchange rate, but in practice, adjustments have been infrequent.

<sup>5</sup>Rates are for 2000.

<sup>6</sup>Additional products and specific rates per gallon are provided as follows: Aircraft gasoline: US\$ 0.2587; gas oil: US\$0.1682; liquid petroleum gas, crude oil used as fuel and other fuel derived from petroleum asphalt are: US\$0.0647.

<sup>7</sup>Data for 2002.

<sup>8</sup>Ad valorem tax on imported oil derivatives (gasoline, diesel, kerosene, jet fuel, bunker, propane and butane). Honduras imports 100 percent of its oil derivatives.

**Box 3.2. Current Status of Customs Administration in Central America**

Selected indicators of customs administration in Central America are as follows.

- Regarding the harmonization of customs documentation, since 1994 there has been a common form for customs transit. In addition, four countries have a common Internet technology system.
- There is a common control system for interregional transit and a common transit system.
- A number of common border posts have been established, but only between some countries.<sup>1</sup>

<sup>1</sup> In a true customs union, the final objective would be to abolish customs posts between the member countries and to establish modern customs posts and controls at the entry points to the region: ports, international airports, and the borders. However, in the transition period it may be useful to retain the posts to keep collecting duties and indirect taxes on imports.

- Although there is a common standard system for the valuation of goods (the WTO agreement), each country interprets the agreement differently. To date, no customs service in the region is fully compliant with the agreement. However, a group of regional customs officials is preparing a common regulation to establish a standard system of goods valuation.
- Common terms and conditions for duty suspension and refund procedures have not been established. A group of regional customs officials has been assigned the task of preparing such common procedures.
- A mechanism for coordinated cooperation and information exchange between customs services has been in place at least since the early 1990s. However, the system is not being used as designed, partly because of a lack of training.
- Joint customs and trade training programs are not yet in place.

The case for coordinating taxes on labor income is weak, since labor tends to be less mobile than goods or capital. Special arrangements may be needed for border workers, who live in one Central American country and work in another. Differences in the tax treatment of higher paid workers, who may be more mobile within Central America, may require some study, but there are no signs that this has emerged as a significant concern.

On tax administration, coordination efforts are needed to continue modernizing the tax administrations in the Central American countries. The focus should be on (1) exchange of tax-related information between countries, especially regarding the indirect taxes (which will require the adoption of a standard taxpayer identification numbering system in each country and maintenance of an updated taxpayer register), and (2) establishing joint auditing capacity to effectively identify and prosecute tax fraud.

Efforts have begun to establish a customs union, but progress has been slow. Although there is now uniformity in parts of customs administration (for example, harmonized customs documentation and transit procedures), and some countries have even taken steps to establish common customs border posts in order to facilitate border control,<sup>29</sup> there are other areas where considerable work remains to be done to move toward common customs administra-

tion procedures (Box 3.2). There are also large differences in health and sanitary standards, as well as in migration policies, with respect to imports. Some countries will be required to improve their standards in these areas before all the Central American countries will agree to joining such a union.

## Conclusions

The revenue challenges from CAFTA-DR are significant for all Central American countries, although they vary markedly in timing and extent. Nicaragua, for instance, appears well placed to cope with these pressures: less than 2 percent of revenue comes from imports from the United States, and the related tariff reductions are back-loaded. Even for Nicaragua, however, trade diversion could lead to losses of up to 0.2 percent of GDP, or 1 percent of tax revenue, in the first year of implementation. The challenges appear greatest in Costa Rica, with a prospective revenue loss in the first year of about 2.4 percent of tax revenue even in the absence of trade diversion.

Dealing with the revenue losses from CAFTA-DR will require strengthening domestic tax systems, especially the VAT. Increased indirect taxation is the natural way to recoup trade tax revenue losses, as it largely preserves the preexisting distribution of the tax burden. Widening the base of the VAT through policy measures and better tax administration would limit the extent to which the standard VAT rate needs to be increased.

<sup>29</sup>As a result of such initiatives, for example, between Nicaragua and Honduras, customs border controls now take 17 to 20 minutes, whereas previously these controls required one day.



CAFTA-DR will also raise the benefits that can be gained from increased tax cooperation among Central American countries. This does not necessarily mean full harmonization, but it does mean looser forms of coordination, such as a code of conduct on business taxation and a common external tariff system. Experience in the European Union and elsewhere suggests that it is wise to address such issues early in the integration process.

## Appendix. Data and Methodology for the Calculation of Revenue Losses

### Data

The General Directorates of Customs of Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua provided most of the data required for calculating the fiscal cost of tariff reduction. These include figures by tariff line of imports (c.i.f. values),<sup>30</sup> tariff rates, sales and excise taxes, and customs duty collected, by type of tax, for 2003.

For Costa Rica, El Salvador, and Guatemala, the database covers only information on imports from the United States. The databases for Honduras and Nicaragua identify imports registered at customs from the United States, the other Central American countries, and the rest of the world in aggregate.

The tariff elimination schedule for Costa Rica, El Salvador, Guatemala, and Nicaragua is based on Annex 3.3 of the CAFTA-DR, which is available via the Internet at [www.ustr.gov/Trade\\_Agreements/](http://www.ustr.gov/Trade_Agreements/).

For Honduras, the tariff elimination schedule was supplied by the Ministry of Industry and Trade. The data include both the tariff elimination schedule and the tariff rate, by tariff line, and by precision subcode.

### Methodology for Estimating Direct Revenue Impact

The estimation of direct fiscal cost includes assessing the impact of tariff exemption on the collection of taxes on foreign trade, as well as its impact on the collection of indirect taxes (sales and excise taxes). This does not allow for any behavioral response, but consideration is given to two scenarios regarding the possible impact of trade diversion for Honduras and Nicaragua.

The simplest case is that of the collection of revenue from tariffs on foreign trade. The base for estimating the impact is the total collection of revenue

<sup>30</sup>Classified in accordance with the Central American Customs System (eight-digit) and precision subcode (two-digit, primarily for tax purposes).

in the form of customs duty for 2003, grouped in accordance with the tariff elimination schedule.

The base for estimating the impact on the collection of excise taxes is the revenue from customs duty multiplied by the actual rate of the excise tax. This is done for each import line where customs duties are collected.<sup>31</sup>

In the case of the sales tax, the base for estimating the impact on the collection is revenue from customs duty multiplied by the actual rate of the sales tax. This is done for each import line where customs duties are collected.<sup>32</sup> For each of the three taxes, an estimate is made of the total aggregate impact, based on the rates of import duty corresponding to each tariff elimination schedule. The fiscal cost is estimated as being directly proportional to the decline in tariffs. Consequently, we assume that exemption rates do not change with tariff elimination.

### Methodology for Estimating Losses from Trade Diversion

A base case was considered in which the proportion of imports from the United States remained unchanged. However, for countries' products to be able to compete with products from the United States, the prices of imports from third countries must be reduced. The case assumes that the price reduction of goods competing with the United States from third countries is directly proportional to the ratio between the revenue loss, described above, and the value of the imports plus the revenue yielded by the above-mentioned taxes. In other words, the price reduction is equivalent to the reduction in the cost of taxing goods from the United States.

For this case, the loss is estimated on the basis of the customs duty collected from the rest of the world for the pertinent goods,<sup>33</sup> grouped by tariff elimination schedule. The fiscal cost is calculated as being directly proportional to the reduction in import duty.

To analyze the impact of possible trade diversion from other countries, the extreme case was considered, with total imports of the pertinent goods coming from the United States. The methodology used to estimate the cost includes assessing the impact on the three taxes and is similar to the methodology described for estimating the direct static impact.

<sup>31</sup>The actual excise tax rate is calculated as the ratio of revenue from the excise tax to the sum of the value of imports plus import duty.

<sup>32</sup>The actual sales tax rate also applies to excise taxes, and is therefore defined as the ratio of the revenue collected from sales tax to the sum of the value of imports, plus import duty collected, plus excise tax collected.

<sup>33</sup>Only the impact on the tariff lines for which there are currently exports from the United States is taken into consideration.

Total trade diversion is truly an extreme case; it is mentioned in this study for illustrative purposes only. Two intermediate cases with 20 percent and 35 percent of trade diversion are considered in this study.

### Methodology for Estimating Revenue Elasticity to GDP

Revenue elasticity to GDP for each Central American country is estimated using a suppressed constant log linear model:  $\log(\text{Revenue}) = b \log(\text{GDP}) + \text{error}$ . Both tax revenue and GDP are expressed in local currency. The estimated coefficient  $b$  gives the revenue elasticity. Annual time-series data from 1990 to 2003 are used.

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