

## II Macroeconomic Implications of CAFTA-DR

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Five Central American countries (Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua) and the United States signed the Central American Free Trade Agreement (CAFTA) in May 2004. The Dominican Republic (DR) joined the negotiations at the beginning of 2004 and signed the agreement (CAFTA-DR) in August 2004. The agreement will go into effect after the respective legislative bodies have ratified it.<sup>1</sup>

CAFTA-DR negotiations were seen as a boost in regional cooperation because Central America negotiated as a region and most of the issues were addressed within a single framework. Schedules for market access, however, were negotiated bilaterally between the United States and the individual Central American countries. In many respects, the agreement is modeled on other bilateral free trade agreements the United States has recently signed, such as those with Chile and Singapore.<sup>2</sup> Though the Central American countries already have strong trade and investment relations with the United States and enjoy preferential access in the context of the Caribbean Basin Initiative (CBI), CAFTA-DR is substantially more comprehensive and changes the form of trade relations from the unilateral preferential arrangement defined under the CBI to a permanent bilateral agreement.<sup>3</sup> For the Central American countries, the main expected benefits of the agreement are enhanced access to their largest ex-

port market, increased foreign direct investment, and institutional strengthening across a range of trade- and investment-related areas.

CAFTA-DR's main objective is to eliminate all tariffs and substantially reduce nontariff barriers between the United States and the Central American countries.<sup>4</sup> CAFTA-DR also includes a provision to foster trade flows between the Central American countries. During the past 10 years, the Central American countries have already significantly decreased tariffs for intraregional trade, and the common external tariff (CET) of the Central American Common Market is generally low and covers about 95 percent of imports to the region (Table 2.1).<sup>5</sup> In addition, these countries have taken various steps to reduce the dispersion of tariffs. Immediately after CAFTA-DR enters into force, tariffs on all nonagricultural and nontextile exports from Central America to the United States, and tariffs on about 80 percent of nonagricultural and nontextile exports from the United States to Central America, will be reduced. Tariffs on other goods will be phased out incrementally over a 5- to 20-year period. Though a significant proportion of exports from the Central American countries have already had tariff-free access to the U.S. market under the CBI, CAFTA-DR would further reduce various restrictions and eliminate compliance costs necessary to qualify for preferential access (Griswold and Ikenson, 2004).

In the case of agriculture and textiles, CAFTA-DR provides some enhanced market access, but its

<sup>1</sup>As of June 2005, the congresses of El Salvador, Guatemala, and Honduras have ratified the agreement. In 1998 the Dominican Republic had already signed a free trade agreement with Central American countries that went into effect with El Salvador, Guatemala, and Honduras in 2001 and with Costa Rica in 2002.

<sup>2</sup>In addition to Israel (1985), NAFTA (1994), and Jordan (2001), the United States has free trade agreements in effect with Chile and Singapore (both 2003) and Australia (2005). The United States has also signed free trade agreements with Bahrain and Morocco and has begun negotiations with several other countries, including Colombia, Ecuador, Oman, Panama, Peru, Thailand, United Arab Emirates, and the five nations of the Southern African Customs Union.

<sup>3</sup>The CBI currently provides 24 beneficiary countries with duty-free access to the U.S. market for most goods. It was first launched in 1983 through the Caribbean Basin Economic Recovery Act (CBERA) and expanded in 2000 through the U.S.–Caribbean Basin Trade Partnership Act (CBTPA).

<sup>4</sup>It was estimated that nearly 80 percent of Central American products enter the United States duty free, partly because of unilateral preference programs, including the CBI and Generalized System of Preferences (GSP) (see USTR, 2005a). Hornbeck (2004) provides a detailed discussion about the provisions of CAFTA-DR. Salazar-Xirinachs and Granados (2004) discuss economic and political objectives of the Central American countries in CAFTA. The full text of the agreement is available on the web page of the United States Trade Representative: [http://www.ustr.gov/Trade\\_Agreements/Bilateral/CAFTA/CAFTA-DR\\_Final\\_Texts/Section\\_Index.html](http://www.ustr.gov/Trade_Agreements/Bilateral/CAFTA/CAFTA-DR_Final_Texts/Section_Index.html).

<sup>5</sup>Section III provides a detailed discussion of tax and tariff policies of the Central American countries.

**Table 2.1. Tariffs in Central America, 1980–99***(In percent)*

	Average Tariffs			Tariff Dispersion		
	1980s	1990s	1999	1980s	1990s	1999
Costa Rica	24.7	11.4	3.3	13.0	7.1	7.8
Dominican Republic	88.0	18.1	14.5	...	9.8	7.9
El Salvador	20.3	11.3	5.7	10.8	6.4	3.4
Guatemala	33.2	12.6	7.6	17.4	7.4	4.4
Honduras	41.9	9.4	8.1	21.8	6.3	7.8
Nicaragua	37.5	9.9	10.9	19.6	6.5	7.3

Source: Inter-American Development Bank.

extent is more limited than initially expected. The agreement envisages transition periods of up to 20 years for several agricultural goods, and it maintains import tariffs on sensitive items such as sugar and corn while increasing related import quotas. A wide range of agricultural products, including beef, butter, cheese, milk, and peanuts, continues to be protected by rather prohibitive tariff rate quotas. Although several of the Central American countries are major producers of sugar, CAFTA-DR does not open the U.S. markets to sugar imports from these countries. The agreement slightly increases their quotas on sugar imports, but the quota tariff on sugar remains very high, which is likely to prevent any sizable increase in sugar exports from the region.<sup>6</sup>

For textiles—compared with the current situation, in which Central America enjoys preferences under the CBI—the main changes will be the permanent nature of those preferences, and some easing of the rules of origin. CAFTA-DR also provides more comprehensive coverage of certain fabrics from Canada and Mexico and provisions for declaring certain fabrics in short supply, which would allow sourcing from third countries. However, rules-of-origin provisions require that exports of textile and apparel products of the Central American countries be produced using local components to qualify for duty-free access to the U.S. market.<sup>7</sup>

CAFTA-DR includes various provisions about flows of investment and financial services, government purchases, and protection of intellectual property rights. CAFTA-DR provides for strict observance of rules on intellectual property rights, investment, government procurement, and competition policies. In addition, it provides for broad access to several other markets, including services. Labor provisions are slightly tighter than under previous agreements because they offer a platform for examining the quality of legislation rather than merely ensuring its implementation.<sup>8</sup> Dispute resolution provisions of CAFTA-DR are modeled on NAFTA, promoting cooperative settlement of disputes but also providing dispute resolution by panels on both the governmental and the investor-state levels. The agreement would create a permanent committee on trade capacity building to help the Central American countries in trade negotiations.<sup>9</sup>

Although CAFTA-DR's provisions ease restrictions on investment flows, they do not contain balance of payments safeguards for transfers related to a wide range of financial and direct investments. In particular, the agreement (like the Singapore and Chile free trade agreements) contains a general prohibition on the use of capital controls for transactions covered by the agreement and restricts the use of capital controls *in extremis* by omitting a balance

<sup>6</sup>For the details of sugar provisions in CAFTA-DR and their implications for trade flows between the member countries, see Jurenas (2003) and USTR (2005b). Elliott (2005) discusses how the U.S. agricultural policies, including those protecting the sugar industry, affect free trade agreements like CAFTA-DR.

<sup>7</sup>Griswold and Ikenson (2004) argue that these rules-of-origin requirements are restrictive, since the size of the textile industry is very small in the region, implying that the Central American countries have to rely on U.S. textile components to gain duty-free access for their exports.

<sup>8</sup>Elliott (2004) provides a detailed account of the labor market provisions of CAFTA-DR and the potential implications for labor standards in the region. USTR (2005c) argues that the labor provisions are comparable to those in other agreements the United States signed, including with Jordan and Morocco.

<sup>9</sup>The United States and the other members of CAFTA-DR also signed supplemental agreements, including an Environmental Cooperation Agreement, to implement environmental provisions of CAFTA-DR and to coordinate the efforts to strengthen environmental cooperation in the region.

of payments safeguard exception. Although these restrictions could help protect U.S. investors from potential costs associated with capital controls that otherwise could be imposed by Central American countries during periods of financial crises, they may be premature given the still underdeveloped domestic financial systems in the region. In particular, they could limit policy options during financial crises when controls may be useful if implemented on a short-term basis in conjunction with other appropriate adjustment and reform measures.<sup>10</sup>

CAFTA-DR will likely have significant macroeconomic implications for Central America. The remainder of this section examines some of the key macroeconomic issues associated with the agreement. It next focuses on the impact of CAFTA-DR on trade flows and foreign direct investment (FDI). The section then addresses the question of whether the agreement is likely to give the region a boost in economic growth. Finally, it discusses how increased openness of trade and greater economic integration with the United States will affect countries' business cycles.

## Implications for Trade and Investment Flows

Though similar preferential trade agreements are relatively recent—therefore providing little empirical evidence—Mexico's experience under the North American Free Trade Agreement (NAFTA) provides some insights on how CAFTA-DR could affect Central America. Signed by the United States, Canada, and Mexico a decade ago, NAFTA was the first major trade agreement to include a developing country and highly developed economies.<sup>11</sup> CAFTA-DR and NAFTA share a number of common characteristics, as both agreements envisage comprehensive tariff reductions, cover a broad spectrum of sectors, and include provisions for dispute settlement.

<sup>10</sup>There has been intensive debate about the relative costs and benefits of capital controls. Birdsall (2003) examines the implications of limiting the use of capital controls in the context of the U.S.-Chile FTA. Birdsall concludes that this could be viewed as a bad precedent for future preferential trade agreements since there is scope for limited market intervention even in financially developed markets during periods of crises. Forbes (2004) argues that the costs of blocking capital market integration are much greater than generally realized, because such controls could make it very difficult for small firms to obtain financing for productive investment. Rogoff (2002) provides a summary of various views about the costs and benefits of capital controls. In the case of CAFTA-DR, further research is necessary to understand the implications of the provisions on transfers and capital controls, including an assessment of adequacy of prudential exemptions in the financial services chapter of the agreement (see Section VI).

<sup>11</sup>Kose, Meredith, and Towe (2005) provide a review of NAFTA's impact on the Mexican economy.

There are, of course, some caveats in analyzing the potential impact of CAFTA-DR in light of Mexico's NAFTA experience. For example, isolating the effects of NAFTA on Mexico is complicated given the other significant external and policy shocks that have occurred over the past decade. Also, Mexico differs from the Central American countries in that it shares a common border with the United States and has a larger and more diverse economy and higher per capita GDP than all Central American countries except Costa Rica (Table 2.2). Moreover, there have been some differences in the evolution of U.S. trade relations with Mexico and with the Central American countries. For example, the Central American countries have developed strong trade relations with the United States through their preferential access to the U.S. market under the CBI since 1983.<sup>12</sup> Before the advent of NAFTA, roughly 50 percent of Mexico's exports to the United States were duty free, whereas 80 percent of exports from Central America had duty-free access to the U.S. market in 2003.

Nevertheless, Mexico's experience under NAFTA provides some guidance in analyzing the potential implications of CAFTA-DR because of the common characteristics noted above. The following subsections analyze the evolution of trade, finance, and macroeconomic data of the CAFTA-DR members and Mexico covering the period 1980–2003. This period can be partitioned into three segments: 1980–93 represents the pre-NAFTA period; 1994–2003 is the NAFTA period; and 1996–2003 is the period following Mexico's peso crisis. This demarcation is useful because it helps isolate the impact of Mexico's peso crisis when analyzing Mexico's experience with NAFTA before and after its implementation.

## Dynamics of Trade Flows

The United States is already the most important trading partner for Central America. In contrast, and counting the European Union as a single market, CAFTA-DR was only the United States' thirteenth-largest export market in 2003. However, within Latin America, Central America is the United States' second largest trading partner behind Mexico, as measured by the dollar value of U.S. trade in 2003. Imports from the Central American countries constituted less than 1.4 percent of total U.S. imports in 2003. Therefore, although the impact of CAFTA-DR

<sup>12</sup>One could also argue that the macroeconomic implications of CAFTA-DR should be less extensive than those of NAFTA, since Central American countries have already reacted to NAFTA and undertaken some economic and institutional reforms to be able to compete with Mexico in the U.S. market during the past 10 years.

**Table 2.2. Selected Economic Indicators: Central America and Mexico, 2004**

	Costa Rica	Dominican Republic	El Salvador	Guatemala	Honduras	Nicaragua	Mexico
GDP (billions of U.S. dollars)	18.4	18.4	15.8	26.1	7.4	4.6	676.5
GDP growth (percent) <sup>1</sup>	4.2	2.0	1.5	2.7	4.6	5.2	4.4
GDP per capita (at PPP)	9,886.6	6,761.0	4,378.9	4,008.7	2,682.2	2,677.1	9,666.3
Inflation (percent)	13.1	28.9	5.5	9.2	9.2	9.3	5.2
Current account balance (percent of GDP)	-4.8	5.8	-4.4	-4.3	-5.2	-18.3	-1.3
Human development index (HDI) rank <sup>2</sup>	45.0	98.0	103.0	121.0	115.0	118.0	53.0

Sources: IMF, *World Economic Outlook*; and United Nations, *Human Development Report* (2004).

<sup>1</sup>Average annual percent growth.

<sup>2</sup>HDI is a composite measure (education, income, and life expectancy) of average achievement in human development. A lower ranking is better: for example, United States (7), Italy (21), and South Korea (30). The 2004 report reflects data for the year 2002.

on Central America could be substantial, its overall effect on the U.S. economy is likely to be limited.<sup>13</sup>

Central America has historically been very open, even more so than Mexico. Moreover, some of the Central American countries experienced a surge in international trade during the past 10 years (Figure 2.1). For example, the average share of trade (merchandise exports and imports) was more than 75 percent of GDP in Central America during 1994–2003, compared with about 55 percent in Mexico. While Central America has been quite open, with an average openness ratio of roughly 60 percent during 1980–2003, there has been some variation across countries. For example, from 1980 to 2003, the average openness ratio was less than 50 percent in El Salvador and Guatemala, but above 75 percent in Honduras and Nicaragua.

Since the launching of NAFTA, Mexico’s trade with the United States has increased substantially. For example, Mexico’s trade with the United States more than doubled in dollar terms between 1993 and 2003, while the share of trade in Mexico’s GDP rose from less than 40 percent in the 1980–93 period to 58 percent during the NAFTA period (Figure 2.2).<sup>14</sup>

<sup>13</sup>For extensive discussions about the impact of the agreement on the U.S. economy, see Hornbeck (2004). The U.S. International Trade Commission (USITC, 2004; and USTR, 2005a) estimates that the impact of the agreement on U.S. GDP will be less than 0.01 percent.

<sup>14</sup>Following the strong performance in the late 1990s, Mexico’s trade with the United States began to fall off during the period 2000–03 (Figure 2.2). This appears to reflect a combination of both cyclical and structural factors. The U.S. economy has grown less rapidly in recent years than in the second half of the 1990s, especially in the industrial sector, which is the destination for most of Mexico’s exports. In addition, Mexico has faced increased competition from other emerging market economies. In particular, China has been rapidly expanding its market share in

After the start of NAFTA, exports to (imports from) the United States as a percent of GDP increased to about 23 (21) percent from 7 percent during the 1980–93 period (Figures 2.3 and 2.4).

Several studies find that NAFTA contributed to the impressive growth of trade between Mexico and the United States. Some of these studies employ gravity models (Krueger, 1999, 2000), whereas others use export and import demand equations to analyze the impact of NAFTA on trade dynamics using aggregate trade data (CBO, 2003).<sup>15</sup> These studies conclude that the effect of NAFTA on trade linkages was substantial. Other studies using sectoral data series also find a more significant impact of NAFTA on trade flows (Romalis, 2002) than those employing aggregate trade data.<sup>16</sup>

Trade linkages between the United States and Central America have grown rapidly over the past decade. As a group, Central American countries’

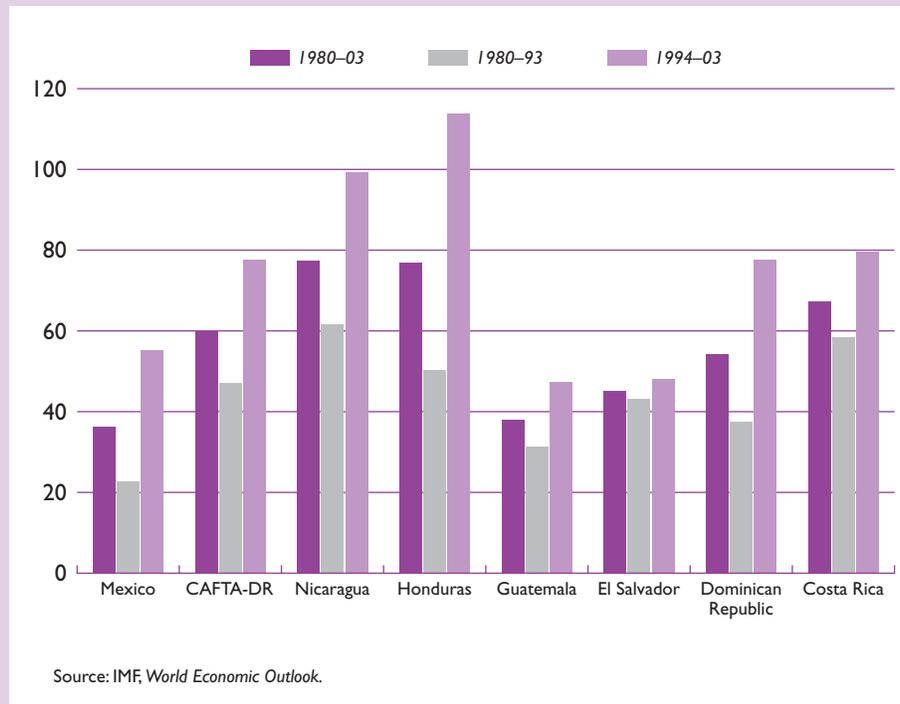
the United States, and some of the lower value-added segments of Mexico’s export sector, such as textiles, have shifted production to elsewhere in the region, including Central America. The real appreciation of the peso in the late 1990s may also have affected Mexico’s competitiveness, although this effect would be expected to unwind given the subsequent downward adjustment.

<sup>15</sup>Krueger (1999, 2000) points out that NAFTA was not trade diverting, since the categories in which Mexican exports to the United States registered the largest increase for the period 1990–96 overlapped with those in which they rose most rapidly with the rest of the world.

<sup>16</sup>Other studies use general equilibrium models to analyze the impact of NAFTA on the dynamics of trade and economic growth. Studies employing static computable general equilibrium (CGE) models estimate NAFTA’s long-run impact on Mexico’s exports to the United States at between 3 and 16 percent (CBO, 2003). In dynamic versions of these models, the impact of NAFTA on trade flows is found to be larger. For example, using a dynamic CGE model, Kouparitsas (1997) finds that the increase in Mexico’s trade flows associated with NAFTA is about 20 percent.

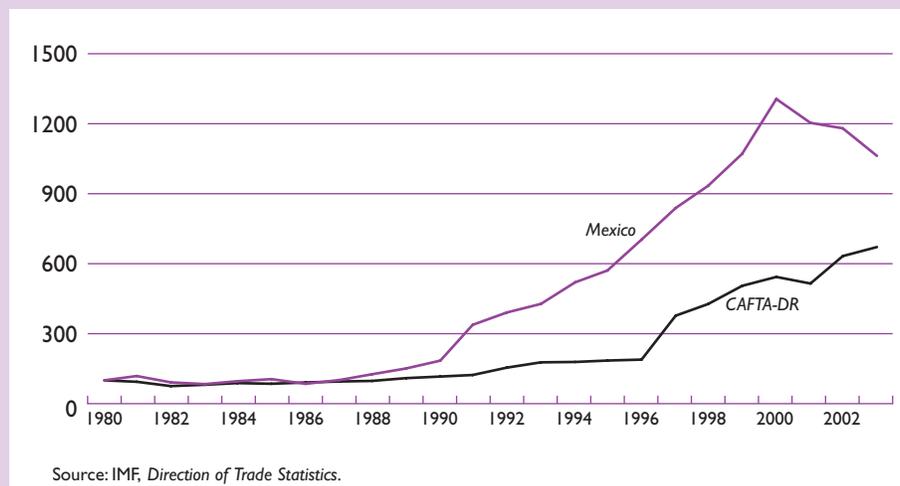
**Figure 2.1. Trade Openness**

(Exports + imports; percent of GDP)



**Figure 2.2. Trade with the United States**

(Exports + imports; index numbers; 1980 = 100)

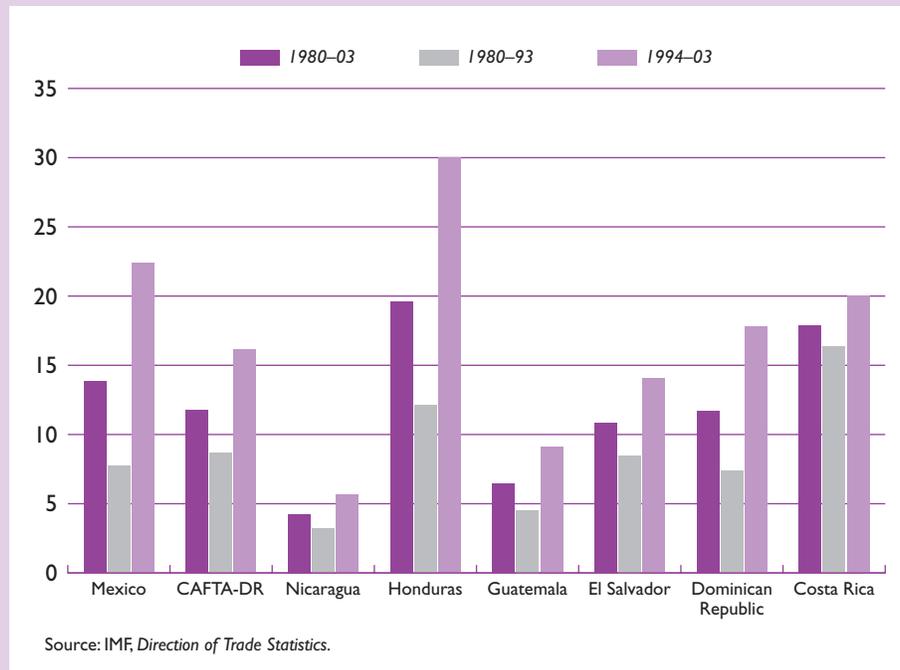


trade with the United States increased fivefold in dollar terms in the period 1994–2003. However, the extent of trade linkages with the United States

differed substantially across the respective countries. Between 1994 and 2003, Honduras sent more than 55 percent of its total exports to the United States;

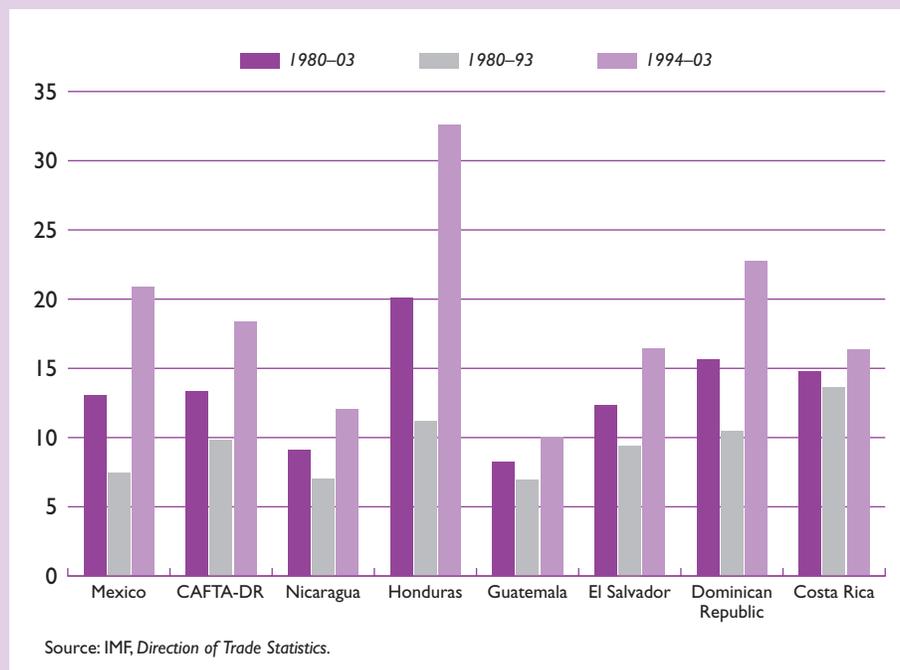
**Figure 2.3. Exports to the United States**

(Share of GDP; percent)



**Figure 2.4. Imports from the United States**

(Percent of GDP)



**Table 2.3. Growth of Exports and Imports***(Average, in percent)*

	Mexico	Emerging Markets	CAFTA-DR Average	Costa Rica	Dominican Republic	El Salvador	Guatemala	Honduras	Nicaragua
<b>Exports</b>									
1980–2003	9.35	7.72	3.90	9.33	3.93	4.55	3.42	1.09	4.69
1980–93	7.56	7.98	1.77	11.20	3.69	–0.18	3.22	–0.22	–0.01
1994–2003	11.67	7.38	6.67	7.83	4.24	10.72	3.61	2.80	10.80
1996–2003	8.58	6.13	5.72	7.92	3.73	10.48	2.52	2.60	7.07
<b>Imports</b>									
1980–2003	8.10	6.31	4.08	8.29	2.83	6.18	6.89	1.60	3.25
1980–93	6.42	6.75	2.41	12.04	1.55	4.34	7.23	0.34	–1.39
1994–2003	10.28	5.75	6.24	5.28	4.49	8.58	6.55	3.25	9.29
1996–2003	12.07	3.06	5.03	5.59	4.71	6.19	6.62	3.56	3.52

Sources: IMF, *World Economic Outlook*; and IMF staff calculations.

the corresponding figure for Costa Rica was 27 percent. The Dominican Republic commanded the largest share of the region's exports to the United States, accounting for more than 25 percent of the dollar value of exports in 2003; Nicaragua's share was the smallest, at less than 5 percent. The region's imports from the United States also increased substantially over the same period and, on average, accounted for more than 20 percent of GDP of the Central American countries during 1994–2003.

### CAFTA-DR's Potential Impact on Trade Flows

Although both Mexico and the Central American countries have increased their trade linkages with the United States substantially during the NAFTA period, Mexico's trade with the United States grew much faster than Central America's. For example, the U.S. share in Mexico's exports rose from an annual average of 66 percent in 1980–93 to 86 percent during the period 1994–2003. The increase in the average export share of the Central American countries was less than 4 percentage points during the same period. Moreover, the average growth rate of total Mexican exports after the inception of NAFTA was roughly twice that of Central American exports (Table 2.3). Mexico's export growth rate was also much higher than the average growth rate of exports of several emerging market economies over the same period.<sup>17</sup>

Recent research suggests that trade flows between the United States and the Central American coun-

tries were not affected significantly by NAFTA. Since the United States has been the major trading partner for both Mexico and the Central American countries, Mexico's preferential treatment under NAFTA could have changed the dynamics of trade flows between the Central American countries and the United States. However, as documented by Lederman, Perry, and Suescún (2002), the extent of trade diversion from the Central American countries to Mexico was minimal after the inception of NAFTA. They argue that the Central American countries were effective in using the preferential access to the U.S. market under the CBI. They also find that NAFTA's rules-of-origin requirements limited Mexico's preferential access for sensitive export items of the Central American countries, such as apparel and textile products. Moreover, the liberalization programs implemented by the Central American countries during the 1990s were instrumental in boosting exports to the United States.<sup>18</sup>

Mexico's experience under NAFTA suggests that trade flows between the Central American countries and the United States could increase rapidly after the inception of CAFTA-DR.<sup>19</sup> Employing a multi-country computable general equilibrium (CGE) model, Hilaire and Yang (2003) find that the Central American countries' exports to the United States could increase by 28 percent after the inception of CAFTA-DR. This finding is consistent with

<sup>17</sup>The emerging market countries in the sample started undertaking trade and financial liberalization programs at about the same time Mexico did during the 1980s.

<sup>18</sup>Lederman, Maloney, and Serven (2003) also provide empirical evidence that NAFTA did not adversely affect trade flows between the Central American countries and the United States.

<sup>19</sup>These estimates do not take into account the possible impact of the expiry on January 1, 2005, of the world trade quotas of textiles and clothing. See also footnote 26.

**Table 2.4. Top Eight U.S. Merchandise Imports from Central America, 2003**

(In millions of U.S. dollars)

Product and HTS Number	Total	Costa Rica	Honduras	Guatemala	El Salvador	Nicaragua	Dominican Republic
Total U.S. imports	16,862	3,362	3,312	2,945	2,019	769	4,455
Knit apparel (61)	5,595	309	1,887	1,076	1,318	147	858
Woven apparel (62)	3,629	282	680	686	403	337	1,241
Edible fruit and nuts (08)	1,022	519	150	337	1	15	...
Electrical machinery (85)	1,364	814	98	2	34	39	377
Optical/medical equipment (90)	939	480	0	9	0	0	450
Spices, coffee, tea (09)	453	126	26	216	45	40	...
Fish and seafood (03)	303	69	124	21	19	70	...
Mineral fuel, oil (27)	187	4	0	177	6	0	...
Other	3,370	759	347	421	193	121	1,529
Top eight imports as percent of total	83	71	90	83	89	81	82

Sources: U.S. Department of Commerce; Harmonized Tariff Schedule (HTS); and Hornbeck (2004).

Mexico’s experience under NAFTA, since Mexico’s exports to the United States also rose by more than 50 percent in dollar terms in less than two years after the inception of NAFTA. They also find that the main sources of the increase in CAFTA-DR’s exports to the United States are textiles, clothing, and processed crops.<sup>20</sup>

CAFTA-DR also could lead to an increase in trade flows through its impact on productivity and specialization patterns. Because the agreement includes various provisions about the flows of investment, financial services, and intellectual property, these gains could be substantial. Kehoe (2003) argues that static CGE models severely underestimated the impact of NAFTA on the volume of regional trade, because these models were unable to account for much of the increase in sectoral trade flows. Yet another potential problem associated with these models is that they do not capture the effects of productivity changes associated with trade agreements and they do not allow endogenous changes in specialization patterns. Thus, static CGE models, such as those used in Hilaire and Yang (2003), might show that the largest increase in trade would take place in those sectors that already have intensive trade linkages, though in fact

<sup>20</sup>Using a CGE model, USITC (2004) estimates that U.S. imports from the region will increase by 12.5 percent after the advent of CAFTA-DR. Brown, Kiyota, and Stern (2005) also use a CGE model to analyze the implications of CAFTA-DR. They find that production in textiles, wearing apparel, and leather products and footwear industries would increase substantially in Central American countries after the agreement because of their comparative advantage in these sectors.

the opposite could be true, as in the case of NAFTA.<sup>21</sup> Overall, these findings imply that CAFTA-DR’s positive effect on trade flows between the Central American countries and the United States could be larger than suggested by the static CGE models.

### CAFTA-DR’s Potential Impact on the Composition of Trade

The Central American countries’ major exports to the United States include agricultural products (bananas and coffee), apparel, and electrical machinery. The shares of coffee and bananas in total exports declined during the past decade and stood at about 6 percent and 3 percent, respectively, in 2003. However, apparel remained the main export item for all countries except Costa Rica (Table 2.4). The Dominican Republic, El Salvador, and Honduras accounted for almost 75 percent of the Central American countries’ total apparel exports to the United States. The preferential market access provided by the CBI program played an important role in the rapid growth of apparel exports.

Roughly 60 percent of total exports of electrical machinery from the Central American countries to the United States was produced in Costa Rica, which has been able to attract sizable FDI flows to build plants for the production of computer parts in the past three years. The Central American countries’ major

<sup>21</sup>Kehoe and Ruhl (2003) document that the trade share of least-traded goods before NAFTA has almost tripled following the inception of NAFTA.

**Table 2.5. Top Eight U.S. Merchandise Exports to Central America, 2003**

(In millions of U.S. dollars)

Product and HTS Number	Total	Costa Rica	Honduras	Guatemala	El Salvador	Nicaragua	Dominican Republic
Total U.S. exports	15,074	3,414	2,845	2,274	1,824	503	4,214
Electrical machinery (85)	2,091	1,237	84	177	111	51	431
Knit apparel (61)	1,166	103	423	36	252	8	344
Machinery (84)	1,206	307	224	220	195	48	212
Knit/crocheted fabric (60)	664	34	340	16	266	8	...
Plastic (39)	817	256	81	147	79	11	243
Cotton yarn (52)	818	13	307	165	74	11	248
Woven apparel (62)	736	141	254	37	33	36	235
Cereals (10)	447	109	77	107	104	50	...
Other	7,129	1,214	1,055	1,369	710	280	2,501
Top eight exports as percent of total	54	64	63	40	61	44	54

Sources: U.S. Department of Commerce; Harmonized Tariff Schedule (HTS); and Hornbeck (2004).

**Table 2.6. Diversification of Exports**

(Average, in percent of total)

	Mexico	Emerging Markets	CAFTA-DR Average	Costa Rica	Dominican Republic	El Salvador	Guatemala	Honduras	Nicaragua
<b>Manufacturing</b>									
1980–2001	53.3	44.9	28.0	32.9	43.3	37.9	27.7	14.1	11.8
1980–93	37.1	38.9	24.2	25.4	43.6	33.5	25.1	8.6	9.2
1994–2001	81.6	55.5	34.4	46.1	42.6	45.4	32.2	23.8	16.2
<b>Agriculture and food</b>									
1980–2001	10.1	32.5	66.8	62.7	44.0	57.3	68.8	82.1	86.1
1980–93	11.9	35.7	72.4	69.3	55.4	62.3	71.9	86.9	88.6
1994–2001	7.0	26.8	55.7	51.0	15.6	48.5	63.5	73.6	81.9
<b>Fuel and ores</b>									
1980–2001	36.5	20.2	2.7	1.6	0.7	4.7	3.5	3.7	1.8
1980–93	50.9	22.6	2.7	1.7	0.9	4.1	3.0	4.4	2.0
1994–2001	11.2	15.8	2.6	1.5	0.2	5.7	4.3	2.4	1.6

Sources: World Development Indicators; and IMF staff calculations.

import items from the United States included electrical machinery, apparel, and fabric (Table 2.5).

Mexico's export base shifted toward manufactured goods following NAFTA's introduction. Although the share of manufactures in total exports had been increasing since at least 1980, the pace of diversification accelerated after the inception of NAFTA (Table 2.6). As a result, Mexico's export and import bases have become among the most diversified of emerging market economies. After the incep-

tion of NAFTA, vertical specialization has increased, with member countries increasingly specializing in particular stages of the production process. The prime example of this change has been the *maquiladora* trade along Mexico's northern border, where firms import inputs from the United States, process them, and re-export products back to the United States. *Maquiladora* firms often specialize in the manufacture of electronics, auto parts, and apparel. The growth of the *maquiladora* industry

**Table 2.7. Gross Foreign Direct Investment Flows**

	Mexico	CAFTA-DR Average	Costa Rica	Dominican Republic	El Salvador	Guatemala	Honduras	Nicaragua
<i>(Fraction of GDP, in percent)</i>								
Gross FDI flows								
1980–2003	1.9	2.2	2.5	2.4	1.1	1.2	1.6	8.2
1980–93	1.3	1.2	2.0	1.3	0.7	1.2	0.8	0.0
1994–2003	2.9	3.5	3.2	4.0	2.0	1.1	2.7	8.2
<i>(Fraction of fixed investment, in percent)</i>								
Gross FDI flows								
1980–2003	10.1	9.2	12.9	10.7	6.8	8.0	7.2	9.7
1980–93	6.8	5.8	10.0	5.8	5.7	8.5	4.6	0.0
1994–2003	14.8	14.0	17.0	17.5	8.3	7.2	10.8	23.2

Sources: IMF, *World Economic Outlook*; and IMF staff calculations.

accelerated during the 1990s, as the average annual growth rate of real value added produced by the *maquiladora* sector was about 10 percent in the period 1990–2002, over three times the average growth rate of real GDP during the same period (Hanson, 2002). Intra-industry trade between Mexico and the United States also rose significantly as the share of intra-industry trade in Mexico’s manufacturing sector rose from 62.5 percent in the period 1988–91 to 73.4 percent in 1996–2000 (OECD, 2002). Moreover, NAFTA boosted intrafirm trade and resulted in a substantial increase in the variety of products traded between Mexico and the United States (Hillberry and McDaniel, 2002).

During the period 1994–2001, the Central American countries substantially diversified their trade bases. For example, the share of manufacturing exports rose from less than 25 percent in 1980–93 to approximately 34 percent over the period 1994–2001. Costa Rica, El Salvador, Honduras, and Nicaragua significantly increased their manufacturing exports. However, agricultural and food products still accounted for almost 60 percent of total exports during the period 1994–2001. Moreover, the extent of diversification was much lower in the Central American countries than in Mexico. During the period 1994–2001, the average share of manufactured exports of the Central American economies was less than half that of Mexico.

Mexico’s experience under NAFTA suggests that CAFTA-DR could further accelerate diversification of Central America’s trade base. There was a major change in the nature of goods exported from Mexico to the United States as these two countries developed stronger trade linkages during the past two decades. As discussed above, NAFTA was instru-

mental in the rapid growth of intra-industry and vertical trade between Mexico and the United States in the past 10 years. Compared with Mexico, the extent of the Central American countries’ intra-industry trade with the United States—except Costa Rica’s—has been much smaller. However, the Central American countries have recently begun expanding the scope of both vertical and intra-industry trade. For example, most of their imports of electrical machinery and apparel from the United States have been used as intermediate inputs in the production of other goods that have been re-exported back to the United States.<sup>22</sup>

### Foreign Direct Investment Flows

The Central American countries were able to increase FDI flows significantly in the period 1994–2003. In Costa Rica, the Dominican Republic, and Nicaragua, gross FDI flows relative to GDP were larger than in Mexico over the same period, although the dollar amount of these flows was much smaller than that received by Mexico, given the larger size of the Mexican economy (Table 2.7). However, these flows were significant relative to

<sup>22</sup>Intra-industry trade within Central American countries is greater than between the Central American countries and the United States. However, there has been a change in recent years as intra-industry trade involving, in particular, apparel and electronic components has risen substantially. For example, apparel exports from the region to the United States have been increasing rapidly during the past 10 years. Costa Rica has been able to increase its exports of electronic components and to expand the scope of intra-industry trade because of U.S. investment in the production of electronic components and medical equipment (Taccone and Nogueira, 2004).

**Table 2.8. Foreign Direct Investment Inflows from the United States***(In millions of U.S. dollars)*

	1999	2000	2001	2002
Mexico	37,151	39,352	56,554	58,074
Costa Rica	1,493	1,716	1,677	1,602
Dominican Republic	968	1,143	1,233	1,123
El Salvador	621	540	361	580
Guatemala	478	835	389	391
Honduras	347	399	242	184
Nicaragua	119	140	157	242
Total CAFTA-DR countries	4,026	4,773	4,059	4,122

Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Note: Data reflect stock of FDI historical-cost basis (Hornbeck, 2004).

total domestic investment, representing about 14 percent of domestic investment on average. The United States is the largest source of FDI flows to each Central American economy. About one-third of FDI flows from the United States went to Costa Rica between 1999 and 2002 (Table 2.8), and about one-fourth went to the Dominican Republic.

FDI flows between Mexico and its partners strengthened after NAFTA. The agreement contained various provisions that improved the relative standing of investors from the partner countries in Mexico and expanded the sectors in which they could operate. These changes helped boost FDI flows to Mexico from US\$12 billion during 1991–93 to roughly US\$54 billion in the period 2000–02. The share of FDI flows in domestic gross fixed capital formation (investment) also increased from 6 percent in 1993 to 11 percent in 2002, mainly as a result of inflows from Mexico's NAFTA partners.

CAFTA-DR is likely to boost FDI flows to the Central American countries, as NAFTA did in the case of Mexico. Recent research suggests that NAFTA membership significantly affected the volume of FDI flows to Mexico. For example, Cuevas, Messmacher, and Werner (2002a) and Waldkirch (2003) show that NAFTA led to a significant increase in FDI flows to Mexico. The latter study argues that NAFTA's impact on FDI flows to Mexico was the result of increased vertical specialization as well as the agreement's effect on Mexico's commitment to liberalization and reform programs. As NAFTA did, CAFTA-DR could serve as a commitment device and encourage FDI flows while inducing a change in the nature of trade flows in favor of vertical trade. CAFTA-DR could also help attract

foreign multinational corporations to the Central American countries, as Mexico's NAFTA experience proved (see Blomström and Kokko, 1997).<sup>23</sup>

CAFTA-DR could, however, encourage suboptimal policymaking in efforts to encourage FDI inflows. The individual Central American countries could be inclined to offer tax incentives to attract FDI flows and by doing so induce a "race to the bottom." To limit this risk, policy coordination might be warranted (see Section III on taxation and the fiscal implications of CAFTA-DR).

## Implications for Economic Growth and Welfare

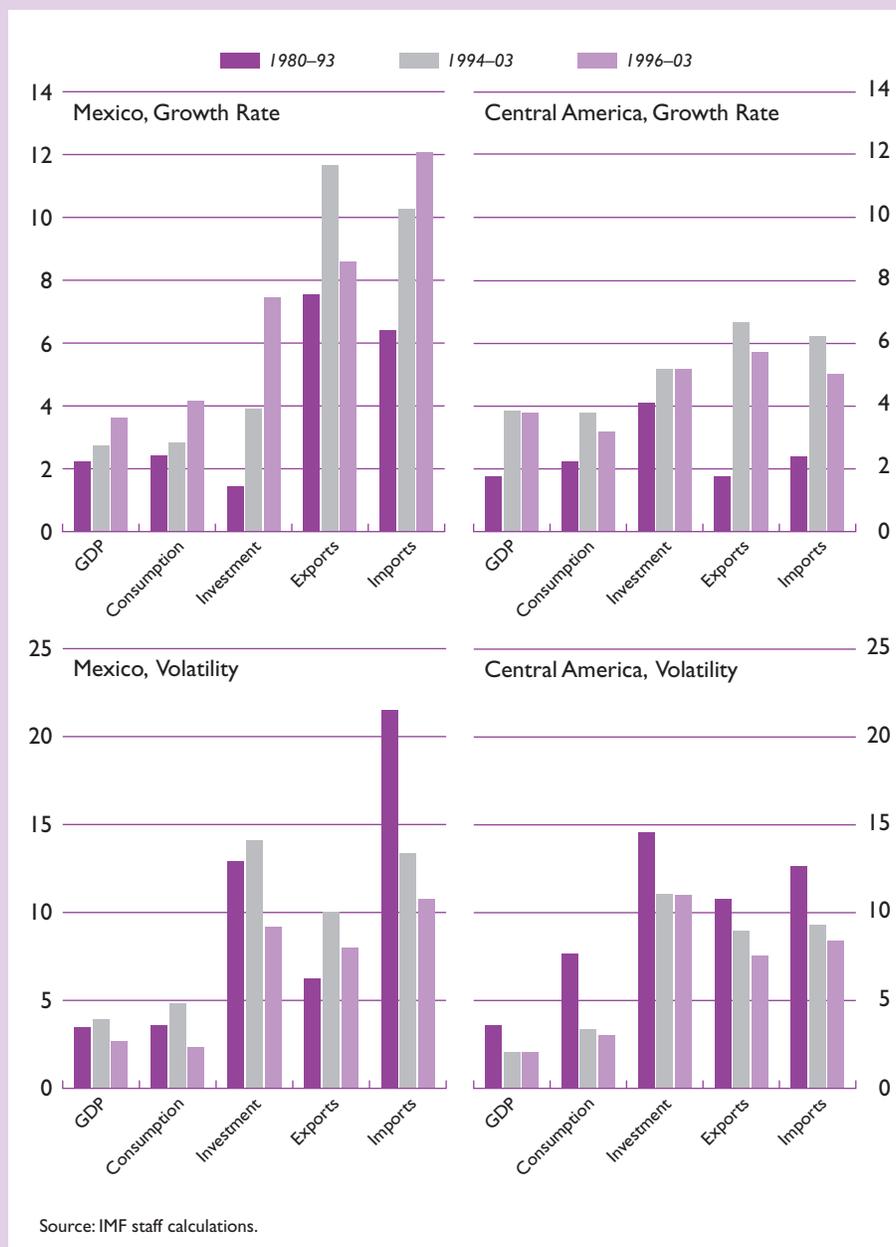
How would CAFTA-DR affect the long-run growth prospects of Central America? The theoretical impact of regional trade agreements on economic growth and welfare is somewhat ambiguous, since it depends on various factors, including changes in trade volume and terms of trade after the advent of such agreements.<sup>24</sup> However, various theoretical models emphasize the importance of trade openness

<sup>23</sup>Cuevas, Messmacher, and Werner (2002a) employ panel regressions and find that Mexico's participation in NAFTA led to roughly a 70 percent increase in FDI flows. Waldkirch (2003) concludes that NAFTA induced a 40 percent increase in the volume of FDI flows. Blomström and Kokko (1997) conclude that foreign multinationals increased their investment in Mexico in response to NAFTA as well as to the relaxation of various barriers on FDI flows since the mid-1980s.

<sup>24</sup>Baldwin and Venables (1995) provide a survey of theoretical studies on the growth and welfare implications of regional trade agreements.

**Figure 2.5. Growth Rate and Volatility of Macroeconomic Aggregates in Mexico and Central America**

(Average; in percent)



in promoting economic growth. Some of these models focus on static gains, including the gains derived from increased specialization. Others consider knowledge spillovers associated with international trade as an engine of growth (Grossman and Helpman, 1991).

Several empirical studies suggest that trade openness has a direct and positive effect on economic growth (Sachs and Warner, 1995; Frankel and Romer, 1999; and Dollar and Kraay, 2004). Some other studies focus on the positive effect of increased trade linkages on productivity (USITC, 2004) and on

investment growth (Levine and Renelt, 1992; and Baldwin and Seghezza, 1996). Rodrik and Rodriguez (2000), however, present a critical review of some of these empirical studies.<sup>25</sup>

There are various direct and indirect channels through which increased financial flows can enhance growth in developing countries. While direct channels include augmentation of domestic savings, reduction in the cost of capital through better global allocation of risk, development of the domestic financial sector (Levine, 1996), and transfer of technological know-how, indirect channels are associated with promotion of specialization and inducement for better economic policies (Gourinchas and Jeanne, 2004).

However, recent empirical research has been unable to establish a clear link between financial integration and economic growth. Prasad and others (2003) review several empirical studies and conclude that the majority of the studies find financial integration has no effect or a mixed effect on economic growth. For example, Edison and others (2002) employ a regression model that controls for the possible reverse causality—that is, the possibility that any observed association between financial integration and growth could result from the mechanism that faster-growing economies are also more likely to liberalize their capital accounts. They conclude that there is no robust, significant effect of financial integration on economic growth. However, some other studies (Borenzstein, De Gregorio, and Lee, 1998) find that FDI flows (rather than other capital movements) tend to be positively associated with investment and output growth.

Mexico's growth performance improved after the inception of NAFTA. Compared with several other emerging market countries, the Mexican economy performed well since NAFTA's implementation and, in particular, after the 1995 crisis (Figure 2.5). Moreover, the average growth rate of investment was particularly impressive, as it rose almost eightfold during the period 1996–2003 (Table 2.9).

<sup>25</sup>Berg and Krueger (2003), Baldwin (2003), and Winters (2004) provide extensive surveys of the literature on trade and growth. Winters (p. F4) concludes that “while there are serious methodological challenges and disagreements about the strength of the evidence, the most plausible conclusion is that liberalization generally induces a temporary (but possibly long-lived) increase in growth.” Harrison and Tang (2004) argue that “while trade integration can strengthen an effective growth strategy, it cannot ensure its effectiveness. Other elements are needed, such as sound macroeconomic management, building trade-related infrastructure, and trade-related institutions, economy-wide investments in human capital and infrastructure, or building strong institutions.” Brown, Kiyota, and Stern (2005) use a different CGE model and estimate that the GNP of Central American countries could increase by 4.4 percent after the inception of CAFTA-DR.

As pointed out in Section I, the average growth rate of the Central American countries increased notably during the period 1994–2003. In particular, the average growth rate of GDP more than doubled over this period, with all countries, except Honduras, recording significant increases in their growth rates (Figure 2.5). The average growth rate of investment also rose in the Central American countries, but it fell short of the increase in Mexico. Although El Salvador and Nicaragua were able to achieve much higher rates of investment growth, Costa Rica and Honduras witnessed a significant decline over the 1994–2003 period.

Mexico's experience under NAFTA suggests that CAFTA-DR could change the dynamics of economic growth in the Central American countries. The effects of exports and investment on growth in Mexico have changed after NAFTA's implementation, as their contributions to GDP growth have more than doubled following the introduction of the agreement (Table 2.10). For example, while the contribution of investment (exports) was about 0.4 (1.1) percentage points before NAFTA, it went up to 1.4 (2.6) percentage points during the period 1996–2003. A similar change in the roles of investment and exports took place in Central America over the period 1994–2003, although their contribution to growth is still lower in the Central American countries than in Mexico.

CAFTA-DR could generate various growth benefits to the Central American countries, as NAFTA did in the case of Mexico. Hilaire and Yang (2003) use a CGE model to examine the growth benefits of CAFTA-DR and conclude that GDP of the Central American countries could increase by as much as 1.5 percent as a result of the agreement.<sup>26</sup> This finding is in the range of the estimates produced by various studies using similar models to analyze the impact of NAFTA on the Mexican economy.<sup>27</sup> Hilaire and

<sup>26</sup>Hilaire and Yang use the Global Trade Analysis Project (GTAP) model for their simulations, which assume that the agreement is signed by the United States and five Central American countries, including Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua. Their findings indicate that the welfare effect of CAFTA-DR on the United States is also positive, although it is much smaller than the positive effect on the Central American countries. The agreement also increases global welfare as the gains from expanded sales of textiles, clothing, and processed crops offset potential losses associated with trade diversion. Hilaire and Yang also conduct some alternative simulations involving the global removal of quotas in textiles and clothing alongside the CAFTA-DR agreement. These alternatives reduce the growth of the Central American countries' exports to the United States, but CAFTA-DR still leads to a 1.1 percent increase in regional GDP.

<sup>27</sup>Baldwin and Venables (1995) provide a summary of the studies using CGE models to evaluate the impact of NAFTA. Some recent empirical studies also establish a positive association between NAFTA membership and Mexico's growth performance (Arora and Vamvakidis, 2005; CBO, 2003).

**Table 2.9. Dynamics of Economic Growth**

(Average, in percent)

	Mexico	Emerging Markets	CAFTA-DR Average	Costa Rica	Dominican Republic	El Salvador	Guatemala	Honduras	Nicaragua
<b>GDP</b>									
1980–2003	2.45	3.45	2.66	3.84	3.91	1.72	2.47	2.87	1.16
1980–93	2.24	3.67	1.75	3.47	2.80	0.50	1.66	3.05	–0.96
1994–2003	2.73	3.17	3.84	4.31	5.36	3.30	3.54	2.65	3.91
1996–2003	3.63	2.45	3.79	4.31	5.57	2.65	3.30	2.96	3.93
<b>Consumption</b>									
1980–2003	2.60	3.40	2.92	4.23	3.49	2.88	3.22	3.76	1.74
1980–93	2.42	3.57	2.25	5.27	1.90	2.22	2.71	4.74	0.09
1994–2003	2.84	3.18	3.80	3.40	5.57	3.73	3.73	2.48	3.88
1996–2003	4.17	2.35	3.20	2.98	5.37	2.60	3.40	2.43	2.39
<b>Investment</b>									
1980–2003	2.52	3.27	4.57	6.78	5.61	3.95	5.37	4.02	4.26
1980–93	1.46	4.28	4.10	9.11	5.62	3.75	5.40	6.37	–0.21
1994–2003	3.91	1.94	5.18	4.91	5.60	4.21	5.34	0.95	10.07
1996–2003	7.46	–0.11	5.19	5.54	8.06	1.85	5.91	3.00	6.77

Sources: IMF, *World Economic Outlook*; and IMF staff calculations.

**Table 2.10. Contributions to GDP Growth**

(Average, in percent)

	Mexico	CAFTA-DR Average	Costa Rica	Dominican Republic	El Salvador	Guatemala	Honduras	Nicaragua
<b>Investment</b>								
1980–2003	0.39	0.75	1.23	1.01	0.61	0.71	0.70	0.76
1980–93	0.16	0.58	1.68	0.92	0.55	0.67	1.12	–0.40
1994–2003	0.69	0.98	0.87	1.12	0.70	0.74	0.14	2.28
1996–2003	1.37	1.03	0.97	1.64	0.25	0.83	0.69	1.79
<b>Consumption</b>								
1980–2003	1.74	2.21	2.90	2.69	2.55	2.73	2.60	1.08
1980–93	1.63	1.56	3.49	1.42	2.02	2.26	3.33	–0.77
1994–2003	1.87	3.06	2.42	4.35	3.24	3.19	1.64	3.49
1996–2003	2.78	2.56	2.11	4.17	2.25	2.92	1.63	2.25
<b>Exports</b>								
1980–2003	1.87	1.15	3.41	1.35	0.82	0.59	0.37	1.59
1980–93	1.09	0.39	3.73	0.83	–0.45	0.53	–0.27	0.22
1994–2003	2.88	2.15	3.16	2.02	2.47	0.65	1.20	3.38
1996–2003	2.63	1.94	3.29	1.76	2.51	0.45	1.01	2.64

Sources: IMF, *World Economic Outlook*; and IMF staff calculations.

Yang (2003) also find that if the agreement excludes agricultural sector liberalization, the growth effect associated with CAFTA-DR drops to 1.1 percent of GDP of the Central American countries.

CAFTA-DR’s impact on economic growth could be larger than estimated by the static CGE models. As previously discussed, these models are unable to account for various dynamic effects associated

with accumulation of capital, changes in specialization patterns, and stronger productivity spillovers. Though the growth impact associated with NAFTA is estimated to be about 2 percent in static models, it is more than 3 percent in dynamic models.<sup>28</sup> CAFTA-DR has extensive provisions involving services and investment flows. However, the static models, including the one employed by Hilaire and Yang (2003), do not incorporate the effects of such provisions, which could lead to potentially large changes in the flows of services and investment.<sup>29</sup>

Moreover, Mexico's experience under NAFTA suggests that CAFTA-DR could have a positive effect on productivity growth and institutional quality in Central America. Recent research shows that NAFTA contributed to total factor productivity in Mexico and accelerated economic convergence in the region. For example, Lopez-Cordova (2002), using plant-level data, finds that NAFTA raised total factor productivity by roughly 10 percent in Mexico over the sample period, partly in response to foreign capital inflows. Easterly, Fiess, and Lederman (2003) document that the speed of convergence of productivity among NAFTA partners accelerated after the implementation of NAFTA. Lopez-Cordova (2001) argues that the passage of NAFTA induced some institutional changes, among them a revamping of institutions in charge of competition policy, intellectual property protection, and standards.

Increased trade and financial integration associated with CAFTA-DR could reduce the adverse effects of macroeconomic instability (volatility) on economic growth. As documented by a growing literature, there is a negative relationship between volatility and growth (Ramey and Ramey, 1995). This implies that policies and exogenous shocks that affect volatility can also influence growth. Thus, even if volatility is considered intrinsically a second-order issue, its relationship with growth suggests that volatility could indirectly have first-order welfare implications. Highly volatile macroeconomic fluctuations have been a major impediment to sustained growth in Central America. Kose, Prasad, and Terrones (2005a, 2005b) document that increased trade and financial integration appear to diminish the negative impact of volatility on growth. Specifically, in regressions of growth on volatility and other con-

trol variables, they find that the estimated coefficients on interactions between volatility and trade integration are significantly positive. In other words, countries that are more open to trade appear to face a less severe tradeoff between growth and volatility. They also find a similar, although slightly less significant, result for the interaction of financial integration with volatility.<sup>30</sup>

The need to move forward with CAFTA-DR becomes more urgent given the rising competition from Asia, especially from China. Simulations based on the GTAP model suggest that the first round impact on exports and GDP could be sizable.<sup>31</sup> While the negative impact could be more moderate—given the proximity to the United States and deepening supply chain linkages—pressures are likely to rise. The recent decision by the United States to impose curbs on some categories of Chinese textile exports to the United States will give Central America some relief in the short term, allowing the region to implement CAFTA-DR.

The degree to which CAFTA-DR will lead to strong growth and improve the long-run growth potential of the region will depend critically on supporting policies. As Mexico's NAFTA experience shows, the Central American countries must undertake various structural reforms to sustain the potential benefits associated with CAFTA-DR. Although NAFTA has had a significant and favorable impact on exports and foreign direct investment flows, Mexico's growth performance could have been even stronger if structural reforms had been pursued more aggressively. The major lesson from Mexico's experience is that a trade agreement like CAFTA-DR should be used to accelerate, rather than postpone, needed structural reform.

In particular, the Central American countries need to employ policies to improve the quality of institutions, regulatory bodies, the rule of law, property rights, the flexibility of labor markets, and human capital infrastructure. Gruben (2005) argues that while the Central American countries have been able to liberalize their trade regimes during the past 10 years, they have lagged in undertaking the necessary

<sup>28</sup>Kouparitsas (1997) considers a dynamic general equilibrium model that captures the impact of NAFTA on investment flows in the region. He finds that the agreement increases Mexico's steady-state level of GDP by 3.3 percent, consumption by 2.5 percent, and investment by more than 5 percent.

<sup>29</sup>More importantly, CAFTA-DR could affect economic growth through its impact on the country risk premium of the Central American economies. This was the case in Mexico after the inception of NAFTA as documented by Manchester and McKibbin (1995).

<sup>30</sup>Kose, Prasad, and Terrones (2005a) document that during the 1990s, emerging markets had a similar level of output volatility, on average, to other developing economies but experienced much higher growth. Their findings indicate that the higher level of trade openness of emerging markets accounts for about half of the observed difference of about 2 percentage points in average growth rates between emerging markets and other developing economies. In other words, despite experiencing a similar level of volatility, emerging markets were able to post higher growth rates because of the greater degree of trade openness.

<sup>31</sup>The first-round static impact on GDP could range between 0.7 percent in the case of Guatemala and 4.7 percent in the case of Honduras.

structural reforms to improve various domestic policies, including those pertaining to financial systems, labor markets, protection of property rights, transparency, regulatory frameworks, and importance of the informal sector.<sup>32</sup> CAFTA-DR has the potential to produce much larger benefits for the countries in the region if the agreement is used effectively as an anchor to implement the necessary policy reforms (see Salazar-Xirinachs and Granados, 2004).

There are some concerns about the potential effects of CAFTA-DR on fiscal balances in the region. An immediate concern for the Central American economies is the potential impact of CAFTA-DR on their fiscal balances. Since a significant percentage of the Central American economies' imports is sourced from the United States, CAFTA-DR might lead to a fall in customs revenue and deterioration of the countries' fiscal positions. These issues are discussed in detail in Section III. Another concern is associated with the potential impact of the agreement on poverty, which is discussed in the following.

### Could CAFTA-DR Help Reduce Poverty in the Region?

Free trade agreements, like CAFTA-DR, could have distributional implications involving various income groups. In particular, some argue that free trade agreements could have an adverse impact on the poorest segments of the population since these agreements could compress their employment opportunities and wages (see Aisbett, 2005). Moreover, they claim that these agreements could decrease government spending on the poor because of their potentially negative effects on fiscal revenues. The following summarizes the main issues about the potential impact of CAFTA-DR on poverty in the region in light of recent empirical and theoretical studies.

#### Liberalization and Poverty: What Do We Know?

In theory, there are several channels through which increased trade and financial flows could help reduce poverty. As discussed earlier in the section, some of these channels are related to growth-enhancing effects of increased trade and financial

flows. For example, augmentation of domestic savings, reduction in the cost of capital, increase in productivity through transfer of technological know-how, and stimulation of domestic financial sector development could all provide direct growth benefits, which in turn help reduce poverty (see Agénor, 2002; Easterly, 2005, and Goldberg and Pavcnik, 2005). Trade liberalization could also translate into a reduction in the prices of goods consumed by poor households. Moreover, increased trade and financial flows could help reduce macroeconomic volatility, which also could have beneficial effects for the poor (Aizenman and Pinto, 2005).

This is supported through some recent empirical studies.<sup>33</sup> For example, research by Dollar and Kraay (2002, 2003) suggests that increased trade flows are associated with higher economic growth.<sup>34</sup> Kraay (2004) provides strong evidence for the importance of economic growth in poverty reduction as his analysis shows that most of the variation in changes in poverty during the 1980s and 1990s is explained by growth in average income in developing countries.<sup>35</sup> Agénor (2002) finds that there is a non-

<sup>33</sup>Since it is difficult to measure poverty and isolate the impact of trade and financial flows on poverty from various other factors, recent studies do not reach an unambiguous conclusion on this issue. While Easterly (2005) documents that neither financial nor trade flows have any significant impact on poverty, Harrison (2005, p. 15) notes that "there is certainly no evidence in the aggregate data that trade reforms are bad for the poor." Winters, McCulloch, and McKay (2004, p. 105) also argue that the empirical evidence often suggests that trade liberalization helps reduce poverty in the long run and note that "it lends no support to the position that trade liberalization generally has an adverse impact."

<sup>34</sup>Although there has been an intensive debate about the potentially adverse impact of increased trade and financial flows associated with globalization on income inequality, there is no clear empirical evidence that globalization has fostered a sharp rise in worldwide inequality. Several recent studies focus on the impact of globalization on income inequality across countries, but these studies have yet to provide a conclusive answer. For example, globalization could accentuate the already substantial inequality of national incomes and, in particular, lead to stagnation of incomes and living standards in countries that do not participate in this process. Consistent with this view, Quah (1997) has documented that there is evidence in cross-country data of a "twin peaks" phenomenon whereby per capita incomes converge within each of two groups of countries (advanced countries and globalizers) while average incomes continue to diverge across these two groups of countries. In other words, advanced countries and globalizers converge in terms of per capita incomes and so do non-globalizers, but these two groups diverge from each other in terms of their average incomes. Sala-i-Martin (2002), on the other hand, argues that a more careful analysis, using individuals rather than countries as the units of analysis, shows that global inequality has declined during the recent wave of globalization.

<sup>35</sup>Some researchers argue that there are severe data and measurement problems involving poverty series and suggest alternative tests to analyze the impact of trade liberalization. For example, Wei and Wu (2002) find that tariff reductions could lead to a significant increase in life expectancy and reduction in infant mortality.

<sup>32</sup>Gruben (2005) compares the extent of trade openness with an index of market orientation that measures the degree of market openness in eight nontrade domestic policy categories: fiscal policy and fiscal balance, government intervention in the economy, monetary policy (with its inflationary implications), banking policy, flexibility of wages and prices, protection of property rights, transparency and simplicity of regulation, and importance of the informal sector versus the formal taxpaying sector.

linear relationship between increased trade and financial flows and poverty. His empirical results indicate that while these flows could reduce poverty in countries that have a higher degree of integration with the global economy, they could have an adverse impact on the income levels of the poor in countries with a lower degree of integration.<sup>36</sup>

Mexico's experience during the 1990s also suggests that increased trade and financial flows could be beneficial to the poor. For example, while Hanson (2005) documents that poverty increased in Mexico during the 1990s, in part owing to the 1995 peso crisis, income in states that were more open to trade and financial flows increased relative to those that were less open. Moreover, the increase in poverty was only marginal in states that were more exposed to trade and financial flows while it was much higher in those with limited integration with the global economy. Some other country case studies, including those on China, India, and Poland, also suggest that trade liberalization could have poverty alleviating effects (Harrison, 2005).

Some studies emphasize the importance of complementary policies to help increase the benefits of trade and financial integration for the poor. In particular, policies encouraging labor mobility, improving access to credit and technical know-how, and establishing social safety nets seem to increase the benefits of increased integration for the poor. Trade liberalization could lead to contraction in some previously protected industries. Policies that could help workers move from such sectors to sectors that are expanding could diminish the adverse effects of trade liberalization on the poor in the short run while also contributing to poverty reduction in the long run.

### Poverty in Central America and CAFTA-DR

Poverty, as pointed out in Section I, is a major problem in some Central American countries (except Costa Rica). The poverty rate is about 80 percent in Honduras, and about 50 percent in El Salvador, Guatemala, and Nicaragua. Heavy dependence on agriculture appears to accentuate the poverty problem in some Central American countries. For example, agricultural production accounts for roughly 25 percent of GDP in Guatemala and more than 30 percent in Nicaragua.

<sup>36</sup>Agénor (2002) uses a weighted average of trade and financial openness indicators as a measure of economic integration. The nonlinearity stems from the fact that trade and financial integration have a sizable impact on the quality of institutions only beyond a certain level of trade, and financial integration and institutions (including an efficient social safety net) play a major role in channeling the beneficial effects of globalization to the poor and shielding them from its costs.

Some argue that CAFTA-DR could have a negative impact on the poor in the region. They note that by eliminating tariffs on agricultural goods, the agreement opens the small markets of Central American economies to relatively cheaper agricultural exports from the United States (see Oxfam, 2004). They suggest that severe dislocation problems could arise since workers in the agricultural sector, especially poor subsistence farmers, could lose their jobs. They also point out that this could further exacerbate the poverty problem in the region, with consequences for the dynamics of income distribution.

To provide the necessary relief for the vulnerable segments of the population, the CAFTA-DR agreement includes prolonged tariff phase-out and safeguard schedules to all countries with sensitive agricultural products.<sup>37</sup> For example, tariffs and quotas on various agricultural imports from the United States, including pork, beef, poultry, rice, and yellow corn, will be phased out over a 15-year period. Rice and dairy products are subject to longer transition periods (18 to 20 years). All agricultural trade would eventually become duty free except for sugar imported by the United States, fresh potatoes and onions imported by Costa Rica, and white corn imported by the other Central American countries.<sup>38</sup>

Moreover, CAFTA-DR could be beneficial to the poor in the region by improving growth prospects while contributing macroeconomic stability. Sustained economic growth appears to be highly correlated with poverty reduction, and CAFTA-DR has the potential to increase growth in the region. In addition, as discussed later in section, CAFTA-DR could reduce macroeconomic volatility, which has a significantly negative and causal impact on poverty (Laursen and Mahajan, 2005).

Complementary policies should be in place to maximize the benefits of CAFTA-DR for the poor. In particular, policies are needed to strengthen social safety nets and help poorer households take advantage of the benefits of CAFTA-DR. Since their dependence on agriculture varies, the Central American countries could utilize specific policies to ease

<sup>37</sup>Tariffs on more than half of U.S. agricultural exports would be eliminated immediately but the rest are subject to phaseout periods of up to 20 years. For some agricultural products, changes in tariff schedules would be effective only after 7–12 years.

<sup>38</sup>Mason (2005) documents the effects of lifting tariffs on sensitive agricultural products on the poor in Nicaragua, Guatemala, and El Salvador using a net consumer-net producer approach, which helps isolate the first-order effects of such policy changes on welfare. His findings indicate that reduction of barriers could lead to welfare gains for a significant majority of households in these countries because of the reduction in prices, while producers of the sensitive agricultural products could experience welfare losses.

the transition process of workers in the agricultural sector to export-oriented manufacturing and services industries. In addition to providing the necessary infrastructure for labor mobility across sectors, improving access to credit, including microcredit, could also help in this transition.

### CAFTA-DR's Potential Impact on Macroeconomic Volatility and the Co-Movement of Business Cycles

Increased trade and financial flows between the Central American economies and the United States as a result of CAFTA-DR could affect macroeconomic volatility and co-movement of business cycles in the region. Though the Central American economies have been successful in regaining macroeconomic stability over the past decade, they have continued to face substantial shocks. Against this background, the following analyzes how the nature of business cycle fluctuations in the region might change after the inception of CAFTA-DR.

#### Macroeconomic Volatility

The theoretical impact of increased trade and financial flows on output volatility depends on a number of factors, including the nature of financial flows, patterns of specialization, and sources of shocks. For example, increased trade openness, if associated with further *interindustry* specialization across countries and if *industry-specific* shocks are important in driving business cycles, could lead to an increase in output volatility. However, if increased trade is associated with increased *intra-industry* specialization across countries, which leads to a larger volume of intermediate inputs trade, then the volatility of output could decline. In addition, economic theory suggests that increased access to international financial markets should dampen the volatility of consumption while inducing an increase in investment volatility (Kose, Prasad, and Terrones, 2003a).

Recent empirical studies are unable to establish a clear link between stronger economic linkages and macroeconomic volatility. Although some of these studies find no significant relationship between the increased degree of economic interdependence and domestic macroeconomic volatility (Buch, Dopke, and Pierdzioch, 2005), others find that an increase in the degree of trade openness leads to higher output volatility, especially in developing countries (Easterly, Islam, and Stiglitz, 2001). Kose, Prasad, and Terrones (2003a) find that while trade openness increases the volatility of output, income, and consumption in emerging market economies, it reduces the relative

volatility of consumption to output, implying that it improves the consumption risk-sharing possibilities. They also document that increased financial integration is associated with rising relative volatility of consumption, but only up to a certain threshold.

Macroeconomic volatility declined in Mexico after the inception of NAFTA. This can be seen in the uniform decline in the variance of several macroeconomic aggregates between the pre-NAFTA period (1980–93) and the post-crisis period (1996–2003) (Figure 2.5).<sup>39</sup> In particular, output volatility decreased by 20 percent and investment volatility fell by more than 40 percent in the latter period. Consistent with theoretical predictions, increased trade and financial linkages also led to a reduction in the volatility of consumption in Mexico. In addition, consumption became slightly less volatile than output during the 1996–2003 period. This, along with the increased cross-country consumption correlations (documented below), suggests that Mexico became better able to share macroeconomic risk with the United States through increased trade and financial linkages.

The decreased volatility of the Mexican economy during the past 10 years could be the result of several factors, including, in particular, NAFTA and the policy regime changes that Mexico enacted. However, the decrease in volatility could be the result of NAFTA's effect on intra-industry and vertical trade rather than the result of increased stability of domestic macroeconomic policies stemming from the implementation of sound monetary and fiscal policies over the period 1996–2001 (Cuevas, Messmacher, and Werner, 2002a). Both the theory reviewed earlier and the available evidence of the increased importance of regional and external shocks in driving the Mexican business cycles (Kose, Meredith, and Towe, 2005) suggest that this might be the case.

Reflecting in part the success of pursuing sound macroeconomic policies, the volatility of macroeconomic variables decreased in the Central America economies during the past 10 years (Figure 2.5). In particular, there was a significant decrease in the volatility of output fluctuations in El Salvador, Guatemala, and Nicaragua. Both consumption and investment volatility declined in Central America during the period 1996–2003. Although volatility of consumption in Nicaragua and the Dominican Republic declined from 18 percent to less than 7 percent, it was still high in these two countries relative to the rest of Central America. In all countries except

<sup>39</sup>Table 2.A1 in Appendix II presents the volatility of macroeconomic aggregates in detail. Volatility is measured as the standard deviation of the annual growth rate. Since only a limited number of annual data series are available, standard errors associated with volatility statistics are not reported.

Costa Rica, there was a moderation in the size of business cycle fluctuations in exports and imports.

Output volatility in Central America was lower than that of Mexico during the period 1994–2003. However, consumption and investment in those countries exhibited higher volatility than in Mexico over the same period. In addition, during the period 1996–2003, consumption fluctuations were more volatile than those of output in Central America, whereas the volatility of consumption was slightly below that of output in Mexico.

The NAFTA experience suggests that CAFTA-DR could help reduce output volatility in Central America. CAFTA-DR could further reduce volatility by accelerating the diversification of the export base and by fostering intra-industry and vertical trade linkages with the United States. After the inception of CAFTA-DR, shocks originating in the United States could play a more prominent role in Central America, as documented below. Given the stability of the U.S. economy, however, these shocks are expected to be relatively less volatile than shocks specific to Central America, which on balance would result in a more stable macroeconomic environment. Moreover, CAFTA-DR may have a positive effect on the quality of institutions and country risk premium, which in turn should further reduce volatility.

In the same vein, CAFTA-DR could play a major role in reducing consumption and investment volatility in Central America. NAFTA appears to have helped Mexico achieve relatively more stable consumption and investment dynamics through its impact on FDI flows. CAFTA-DR could be similarly instrumental in increasing the volume of FDI flows to the region, since it would signal a long-term commitment to implementing trade-promoting policies and thus help reduce the amplitude of investment fluctuations. In addition, CAFTA-DR could expand the scope of international risk-sharing opportunities, which in turn could help diminish the variation in consumption fluctuations.

CAFTA-DR could result in welfare gains in Central America by helping to expand the set of available financial instruments for international risk-sharing purposes. These instruments would allow domestic residents and firms to use international financial markets for consumption smoothing, resulting in significant welfare benefits. Recent studies document that the benefits from international risk sharing tend to be large when a country's consumption growth is volatile, positively correlated with domestic output growth, and not highly correlated with world consumption.

Some of the Central American economies face highly volatile consumption fluctuations, implying that the benefits to CAFTA-DR and consequent reductions in consumption volatility could be large.

**Table 2.11. Potential Welfare Gains from International Risk Sharing**

(In percent of consumption)

	Gains
Costa Rica	1.30
Dominican Republic	6.38
El Salvador	3.74
Guatemala	0.39
Honduras	1.21
Nicaragua	14.95
CAFTA-DR (average)	4.66
CAFTA-DR (median)	2.52

Source: IMF staff calculations.

Although these benefits would, on average, have the same effect as about a 5 percent permanent increase in the level of per capita consumption, they differ significantly across the Central American economies (Table 2.11).<sup>40</sup> The gains are generally inversely proportional to the volatility of consumption. To illustrate, Nicaragua, the most volatile Central American economy, stands to gain close to 15 percent, whereas the gain for the least volatile economy, Guatemala, is less than ½ percent.<sup>41</sup>

### Sources of Business Cycles in Central America

Consistent with the high degree of openness to international trade of the countries in the region, both external and regional shocks play important roles in Central America, even though there are marked differences in their roles across countries. For example, in at least three countries, external

<sup>40</sup>A simple general equilibrium model is used to assess the extent of potential welfare gains from international risk sharing. The methodology is similar to the one employed in Van Wincoop (1999). In brief, the model compares two scenarios. The first scenario has no additional risk sharing relative to what is already implied by observed consumption behavior; in the second, there is perfect risk sharing so that each country consumes a constant fraction of total world consumption (see Prasad and others, 2003).

<sup>41</sup>There has been a substantial increase in the volume of remittance inflows to the region from Central Americans in the United States (see Taccone and Nogueira, 2004, and IMF, 2005). Although El Salvador and the Dominican Republic on average received the highest levels of remittances during the period 1990–2003, the growth of the remittances was quite significant in other countries, especially Nicaragua and Honduras. These flows could be instrumental in helping the Central American countries to mitigate the impact of various shocks and thereby lowering the volatility of consumption (Rapoport and Docquier, 2005, and IMF, 2005).

**Table 2.12. Forecast Variance Decomposition of GDP Growth**

	External Shocks	Domestic Shocks
Costa Rica	0.67 <i>0.31</i>	0.33 <i>0.20</i>
Dominican Republic	0.10 <i>0.15</i>	0.90 <i>0.33</i>
El Salvador	0.23 <i>0.23</i>	0.77 <i>0.34</i>
Guatemala	0.55 <i>0.35</i>	0.45 <i>0.28</i>
Honduras	0.42 <i>0.24</i>	0.58 <i>0.27</i>
Nicaragua	0.18 <i>0.23</i>	0.82 <i>0.35</i>
Average CAFTA-DR	0.36	0.64
Standard deviation	0.24	0.32
Average standard error	0.25	0.29
Mexico	0.33 <i>0.22</i>	0.67 <i>0.26</i>

Sources: IMF, *World Economic Outlook*, and IMF staff calculations.  
Notes: Data cover the period 1964–2003. Standard errors in italics.

shocks explain a larger share of GDP volatility than in Mexico, and they are particularly important in Costa Rica and Honduras. In Nicaragua and the Dominican Republic, domestic shocks are at least as important as regional shocks, whereas regional shocks are most important in El Salvador and Guatemala. The following subsections analyze these issues in detail by considering the roles of external, regional, and domestic shocks in accounting for macroeconomic fluctuations in Central America and Mexico.

### Importance of External Shocks

Country-specific vector autoregressive systems (VARs) are estimated to assess the relative importance of external and domestic shocks in explaining business cycle variation in Central American economies. To capture the influence of external shocks, the following variables are included: the U.S. real GDP growth, a measure of the ex post U.S. real interest rate (the U.S. Federal Fund rate minus annual consumer price index inflation), and the ratio of oil to nonfuel commodity prices (a proxy for the terms of trade of

these economies). The domestic variables are the inflation rate, the ratio of the trade balance to GDP, and the real GDP growth rate.<sup>42</sup>

These VARs permit assessment of the relative importance of external and domestic shocks for growth variability. It is assumed that six shocks drive the business cycle dynamics of these economies: three external shocks and three domestic shocks. The identification strategy used in the VARs separates the influence of external shocks from those of domestic ones.<sup>43</sup>

External shocks play an important role in the Central American region, but there are differences across countries. While, on average, external shocks explain about the same share of growth variability as in Mexico (about 30 percent), in Costa Rica, Guatemala, and Honduras external shocks account for a much larger fraction of growth variability than in Mexico (Table 2.12). At the same time, in the Dominican Republic, El Salvador, and Nicaragua, domestic shocks explain a much larger share than in Mexico. In the countries in which external shocks play the largest role, the response to a U.S. supply shock is deeper and more persistent. In these countries GDP growth is affected significantly for several years (Figure 2.6).<sup>44</sup> By contrast, in those countries in which domestic shocks dominate, a U.S. supply shock has only a very short-lived effect. The great importance of external shocks for some countries of the Central American region is consistent with the relatively high degree of openness of these economies.<sup>45</sup> Conversely, in the Dominican Republic, El Salvador, and Nicaragua, the relatively high share of growth variance explained by domestic shocks, despite the sizable degree of openness, could reflect in part political instability and in part the resulting negative policy shocks.

<sup>42</sup>These VARs include six variables in addition to a constant and a linear trend. The data frequency is annual and the sample period is 1996–2003. The lag length is two for all VAR systems estimated. The estimation methodology follows Rebucci (1998). Since the sample contains only a small number of countries with a limited amount of annual data series, it is not possible to undertake a rigorous pooling exercise involving a panel VAR.

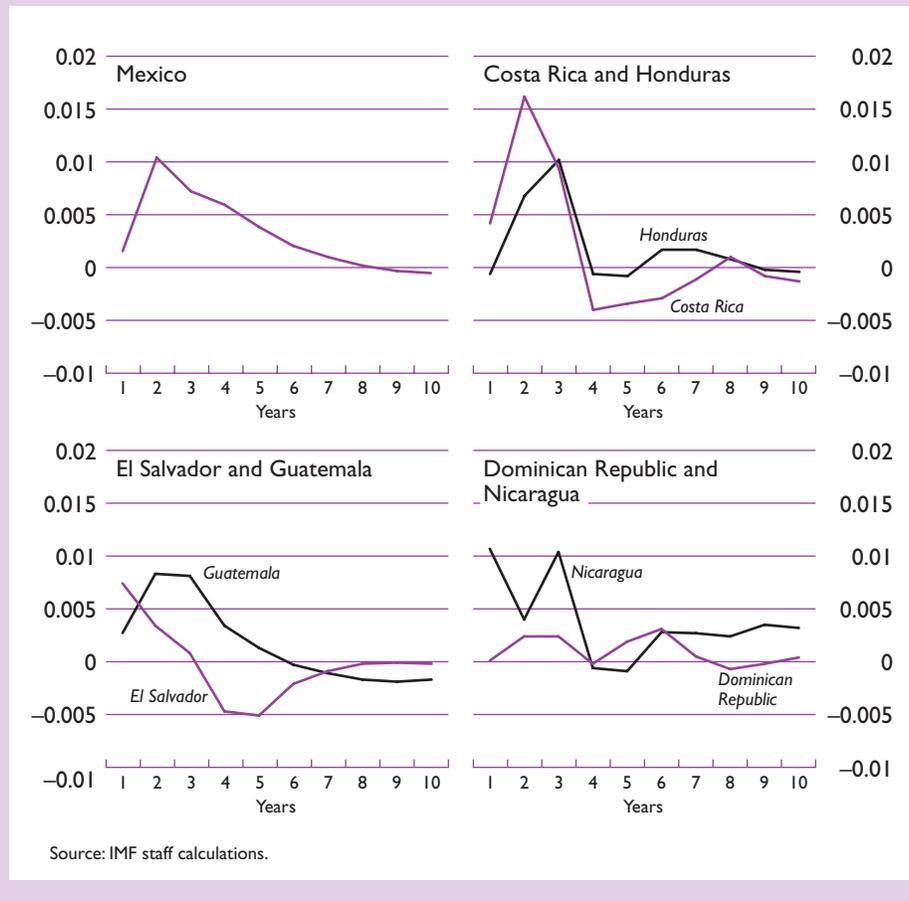
<sup>43</sup>To be more specific, a small open economy assumption justifies using the Cholesky decomposition of the reduced-form variance-covariance matrix to help separate the impact of external shocks from those of domestic ones. This decomposition also permits decomposition of the variability of growth in these two blocks of shocks without identifying individual shocks separately and without placing restrictions on their long-run dynamics.

<sup>44</sup>In these impulse responses, a positive supply shock is represented by a one-standard-deviation decrease in the U.S. real interest rate.

<sup>45</sup>These findings are also in line with those documented by Lederman, Perry, and Suescún (2002) and Hoffmaister and Hall (1999), as well as with the predictions of dynamic, small open economy models, including those of Mendoza (1995) and Kose (2002).

**Figure 2.6. Impulse Responses of GDP**

(Deviation from steady state in response to a one-standard-deviation increase in supply shock in the United States)



### Importance of Regional Shocks

A multicountry VAR system is employed to assess the relative importance of regional shocks. The multicountry VAR includes the United States and Mexico, and the six Central American economies considered before (Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, and Nicaragua). By including the United States and Mexico, it is possible to control for external shocks. The VAR includes the real GDP growth series for each country to conserve the degree of freedom, a constant, and a linear trend. The VAR permits assessment of the relative importance of the North American, regional, and domestic shocks for growth variability.<sup>46</sup>

<sup>46</sup>As in the country-specific systems, a small open economy assumption motivates using the Cholesky decomposition of the reduced form residuals to identify different blocks of shocks. The Cholesky decomposition of a block recursive system is invariant to the order of variables within each block. So, by placing the U.S.

Regional shocks explain a relatively large share of growth variability, on average, in the Central America region, but there are still large cross-country differences. Regional shocks explain—on average—about 50 percent of growth variability (Table 2.13). The share of regional shocks is significantly larger for Guatemala and El Salvador and smallest for Honduras.

### Co-Movement of Business Cycles with the United States

What impact could CAFTA-DR have on the co-movement of business cycles in Central America and

and Mexico GDP growth series in the first block and those of each Central America country in the last block, it is possible to assess the relative importance of the remaining block of Central American countries for the growth variability of the country placed last in the system. As a result, the relative importance of the domestic shock is also isolated by this identification strategy.

**Table 2.13. Forecast Variance Decomposition of GDP Growth (Regional Shocks)**

	NAFTA Shocks	Regional Shocks	Domestic Shocks
Costa Rica	0.26 <i>0.20</i>	0.58 <i>0.26</i>	0.16 <i>0.10</i>
Dominican Republic	0.12 <i>0.17</i>	0.45 <i>0.28</i>	0.43 <i>0.02</i>
El Salvador	0.26 <i>0.21</i>	0.63 <i>0.31</i>	0.11 <i>0.08</i>
Guatemala	0.21 <i>0.19</i>	0.70 <i>0.33</i>	0.09 <i>0.07</i>
Honduras	0.34 <i>0.24</i>	0.25 <i>0.23</i>	0.24 <i>0.14</i>
Nicaragua	0.16 <i>0.18</i>	0.44 <i>0.26</i>	0.40 <i>0.19</i>
Average CAFTA-DR	0.22	0.51	0.24
Standard deviation	<i>0.11</i>	<i>0.24</i>	<i>0.16</i>
Average standard error	<i>0.20</i>	<i>0.28</i>	<i>0.10</i>

Sources: IMF, *World Economic Outlook*, and IMF staff calculations.

Notes: Data cover the period 1964–2003. Standard errors in italics. NAFTA shocks include those from the United States and Mexico.

the United States? In theory, increased trade linkages have ambiguous effects on the co-movement of business cycles in Central America and the United States. Stronger trade linkages can result in more highly correlated business cycles, since they generate both demand- and supply-side spillovers across countries. Moreover, if stronger trade linkages are associated with increased intra-industry specialization across countries, and if industry-specific shocks are important in driving business cycles, then the co-movement of business cycles would be expected to increase. However, the degree of co-movement might diminish if increased trade is the result of a rise in interindustry trade and if industry-specific shocks are important in driving business cycles.

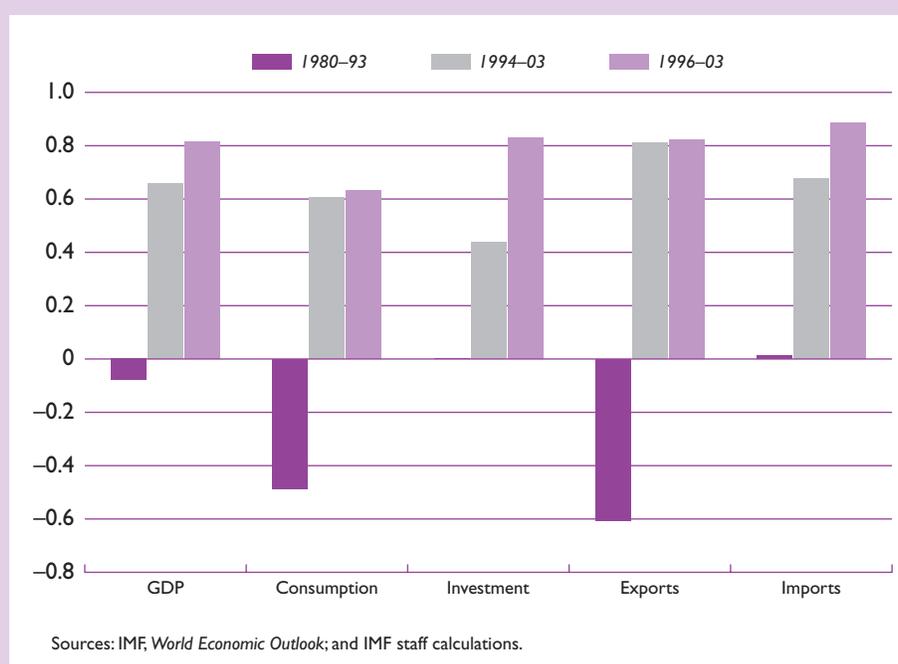
Increased financial flows also have an ambiguous theoretical effect on business cycle correlations. For example, stronger financial linkages could result in a higher degree of synchronization of output fluctuations by generating large demand-side effects. However, financial linkages could stimulate specialization of production through the reallocation of capital in a manner consistent with countries' comparative advantage. This type of specialization, which could result in more exposure to industry- or country-specific shocks, could lead to a decrease in the degree of output correlations while inducing stronger co-movement of consumption across countries (Kalemli-Ozcan, Sørensen, and Yosha, 2003).

Several recent empirical studies, however, suggest that both trade and financial linkages result in greater business cycle synchronicity. For example, using the results from cross-country or cross-region panel regressions, Frankel and Rose (1998), Clark and van Wincoop (2001), Calderón, Chong, and Stein (2002), and Kose and Yi (2005) show that pairs of countries that trade more with each other exhibit a higher degree of business cycle co-movement. Calderón (2003) documents that the impact of trade intensity on cross-country business cycle correlation is larger if the two countries have a free trade agreement. Kose, Prasad, and Terrones (2003b) report that countries that are more open to financial flows have business cycles more highly correlated with the G-7 aggregate. Imbs (2004) also finds that financial integration has a positive effect on the degree of co-movement of business cycle fluctuations in output and consumption.

NAFTA has been associated with an increased degree of co-movement of business cycles in Mexico and the United States.<sup>47</sup> This can be seen from the

<sup>47</sup>Co-movement is measured as the cross-country correlation of the annual growth rate of main macroeconomic aggregates (output, consumption, investment, exports, and imports). Since only a limited number of annual data series are available, standard errors associated with correlations are not reported. Table 2.A2 in Appendix II presents detailed co-movement statistics. A detailed description of the model is presented in Appendix I. Figure 2.A1 shows the structure of the model.

**Figure 2.7. Co-Movement of Economic Variables in Mexico and the United States**



marked increase in cross-country correlations of the major macroeconomic aggregates, including output, consumption, and investment (Figure 2.7). In particular, the output correlation between Mexico and the United States rose from almost zero in the pre-NAFTA period to about 0.75 during the post-crisis period. There was a significant increase in consumption correlation, suggesting that Mexico was able to diversify its consumption risk more effectively after NAFTA. Cross-country correlations of exports and imports also increased significantly after the inception of NAFTA, possibly resulting from the increased intra-industry trade in the region.

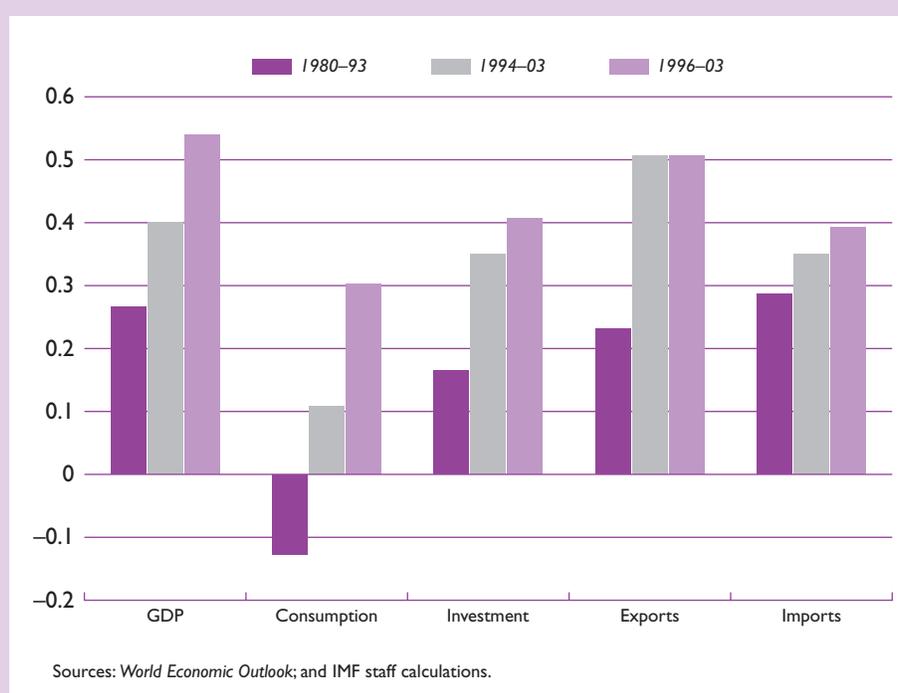
The degree of co-movement of cyclical fluctuations in Central America and the United States on average rose during the past 10 years (Figure 2.8). While cross-country correlations of output in the United States and the Dominican Republic and Guatemala increased significantly in the 1994–2003 period, there was a considerable decrease in the correlations of El Salvador and Honduras with the United States. Output correlation between Costa Rica and the United States remained quite stable over the years. In all of the Central American countries, except Costa Rica, correlation of consumption with the United States rose in the 1996–2003 period. Although Honduran exports became less correlated

with U.S. exports, the other Central American countries exhibited increased co-movement of exports with those of the United States over the same period.

NAFTA's positive effect on business cycle synchronization between Mexico and the United States suggests that CAFTA-DR could have a similar effect on the Central American economies' business cycles. As discussed earlier in this section, CAFTA-DR could lead to a sizable increase in trade and financial linkages between Central America and the United States. The increased trade and financial flows could result in a higher degree of business cycle interdependence through stronger demand and supply channels. Moreover, CAFTA-DR could amplify the spillover of sector-specific shocks through its impact on the nature of trade flows.

CAFTA-DR could lead to an increase in the importance of external shocks in driving business cycles in Central America. Stronger trade linkages after the advent of NAFTA induced a similar change in Mexico's business cycles, as documented in Kose, Meredith, and Towe (2005). Using a dynamic factor model, they find that regional factors associated with the North American business cycle became more important in explaining macroeconomic fluctuations in Mexico over time. In particular, the proportion of output volatility explained by the North American

**Figure 2.8. Co-Movement of Economic Variables in CAFTA-DR Countries and the United States (Average Correlation)**



regional factor rose from less than 1 percent in the period 1980–93 to more than 19 percent in the NAFTA period, whereas the variance of investment accounted for by the regional factor increased almost tenfold. The increased role of the regional factors in the case of Mexico’s business cycles was the result of stronger transmission channels associated with the impact of NAFTA on the regional trade flows. The results of the VARs reported in the previous section also suggest that the U.S. business cycle could become even more important for some countries of the Central American region following the inception of CAFTA-DR. The overall impact might vary significantly across countries, though, by also depending on other changes in policy regimes and institutions triggered by CAFTA-DR.

### **How Could CAFTA-DR Affect the Transmission of Business Cycles?**

A multicountry dynamic stochastic general equilibrium (DSGE) model is employed to study the channels through which CAFTA-DR could affect the transmission of business cycles from the United States to Central America. The multicountry DSGE model is a natural setting for this purpose because it

accounts for the demand- and supply-side spillover channels that are critical in transmitting business cycles. The model, developed by Kose and Yi (2005), extends the two-country free trade, complete market model of Backus, Kehoe and Kydland (1994) by including three countries, trading frictions (tariffs and transportation costs), and international financial autarky, or economic self-sufficiency, and international financial autarky.<sup>48</sup>

The model economy includes a traded intermediate goods-producing sector and a nontraded final goods-producing sector. Perfectly competitive firms in the intermediate goods sector produce traded goods according to a Cobb-Douglas production function. When the intermediate goods are exported to other countries, they are subject to transportation costs, which are considered as a proxy for tariffs and other nontariff barriers, as well as actual transport costs. It is assumed that each country is completely specialized in the production of an intermediate good. Each country’s output of intermediates is used as an input into final goods production. Final goods producers then combine domestic

<sup>48</sup>A detailed description of the model is presented in Appendix I.

and foreign intermediates. These assumptions imply that imports from the United States are used as intermediate inputs to produce final consumption and investment goods in Central America. In each country, households derive utility from consumption and leisure.

The model is calibrated to reflect some basic structural features of the CAFTA-DR members. Since the objective is to analyze the interdependence of business cycles in Central America and the United States, it is assumed that the three countries in the model are a representative Central American economy, the United States, and the rest of world, represented by an aggregate of the members of the European Union. The steady-state levels of trade flows among the three countries in the model are computed using the average trade flows during the past five years. It is assumed that the representative Central American economy is 2 percent of the world economy and that each of the other two countries constitutes 49 percent of the world economy. The elasticity of substitution between domestic and foreign goods is set at 1.05. The impact of CAFTA-DR is simulated by changing the level of transportation costs (trading frictions) between the representative Central American economy and the United States. The model is solved following the standard linearization approach in the international business cycle literature.

The results suggest that CAFTA-DR could magnify the impact of shocks originating in the United States on the Central America economies. To analyze the responses of macroeconomic aggregates in a representative Central American economy to shocks originating in the United States, the model computes the impulse responses of the Central American country's variables to a temporary productivity (supply) shock in the United States. The results indicate that the responses of the representative Central American country's output, consumption, and investment to the external shock increase after the inception of CAFTA-DR (Figure 2.9)

In addition, pre- and post-CAFTA-DR simulations illustrate the substantial increase in the Central American country's exports to the United States, which results from the lowering of tariffs and other trading frictions after the advent of the agreement. In other words, the reduction in trade barriers in the model results in greater intensity of trade flows between the Central American economy and the United States, which in turn leads to a higher degree of business cycle interdependence. An increase in the synchronization of business cycles between the Central American economies and the United States implies that the region is subject to more common shocks, which in turn would facilitate further macroeconomic policy coordination among the Central American countries.

## Conclusions

This section analyzed the macroeconomic implications of CAFTA-DR for the Central American countries in light of Mexico's NAFTA experience. There are, of course, inherent difficulties associated with this analysis. First, isolating the effects of NAFTA on Mexico is itself a complicated task, given the significance of the other external and policy shocks that have occurred over the past decade. Second, Mexico differs from the Central American countries in several dimensions: it shares a common border with the United States, it has a much larger and more diverse economy, and its per capita GDP is much higher than the Central American countries, except Costa Rica. Hence, the analysis in this section and its findings are only tentative.

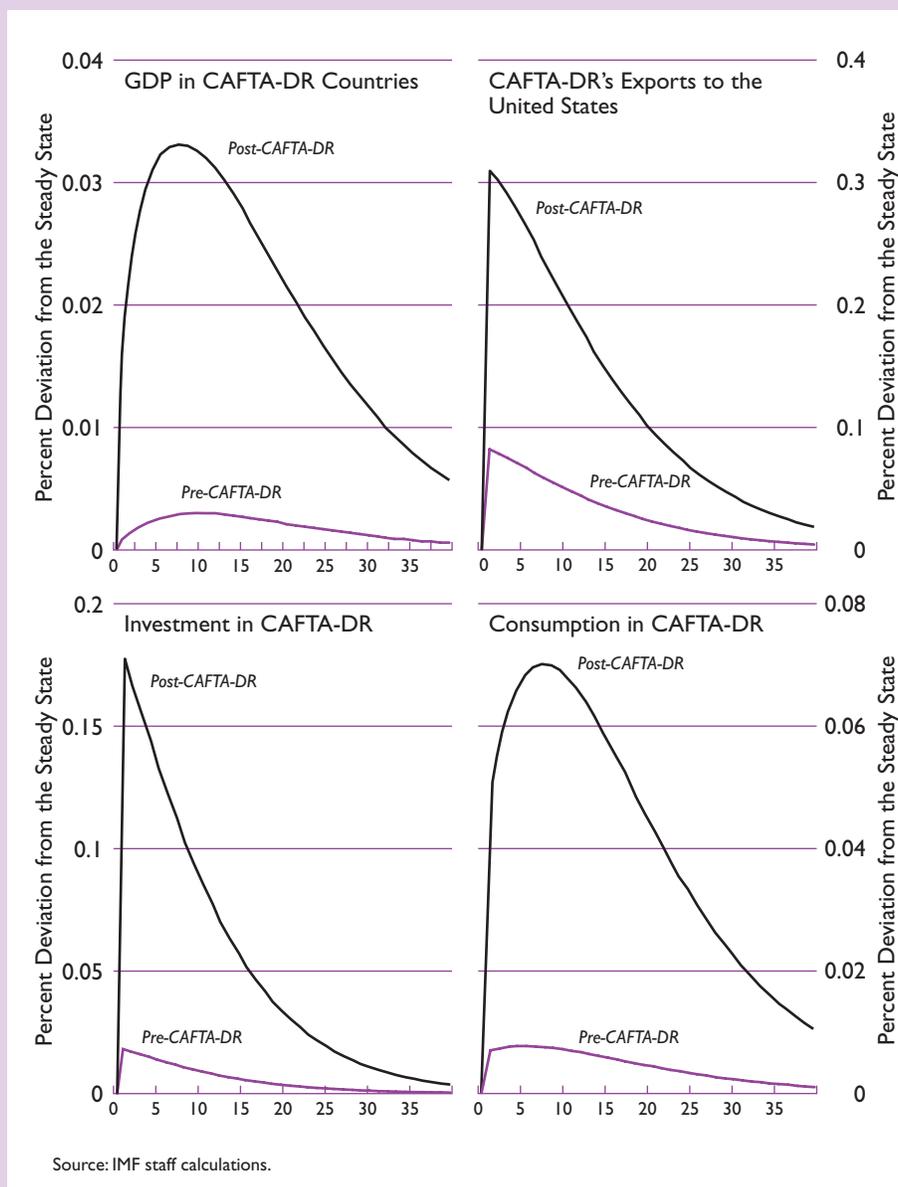
Nevertheless, Mexico's NAFTA experience provides some insights in evaluating the potential effects of CAFTA-DR. CAFTA-DR and NAFTA share several common characteristics, because both agreements envisage comprehensive tariff reductions, cover a broad spectrum of sectors, and include various provisions for dispute settlement. As in Mexico's case prior to NAFTA, Central America is already highly integrated with the United States as its trade linkages with the United States have grown rapidly over the past decade.

In addition to providing a growth stimulus, CAFTA-DR could constitute a turning point in the region's integration with the global economy. Estimates suggest that the region's GDP could grow by 1.5 percent as a result of the agreement. However, the full impact of the agreement on economic growth could be much larger because of the dynamic effects associated with the accumulation of capital, changes in specialization patterns, growth of trade associated with services, and stronger productivity spillovers. Mexico's NAFTA experience suggests that CAFTA-DR could significantly accelerate the pace of the region's integration with the global economy. Since Central America is faced with increased competition from abroad, and the textile sectors are faced with a phasing out of quotas under the Agreement on Textiles and Clothing, CAFTA-DR's successful implementation is paramount for the region to secure enhanced market access to its largest trading partner.

CAFTA-DR could also play a major role in reducing macroeconomic volatility in the region. Both Mexico's experience and ongoing specialization trends in the Central American economies suggest that shocks originating in the United States would play a more prominent role in driving macroeconomic fluctuations in the region after the advent of CAFTA-DR. Since these shocks are generally less volatile than shocks specific to the region, CAFTA-DR is expected to contribute to a more stable macroeconomic envi-

**Figure 2.9. Impulse Responses**

(1 percent increase in supply shock in the United States)



ronment. Though the degree of co-movement of business cycles between the United States and Central America has on average increased substantially over the past 10 years, CAFTA-DR is likely to lead to further cyclical interdependence through increased trade and financial flows. Also, an increase in the importance of shocks from the United States implies that the Central American countries would be faced with more common shocks, which would further the regional coordination of macroeconomic policies.

For the growth and stability benefits of CAFTA-DR to be fully materialized, however, the agreement needs to be accompanied by structural reforms. A broad range of reforms are needed to secure the potential benefits associated with CAFTA-DR. In particular, most Central American countries need to strengthen their institutions, including regulatory bodies, the rule of law, property rights, labor market flexibility, and human capital. Institutional reform could enhance the credibility of the regulatory environment

and improve trade-related institutions in the region. Although CAFTA-DR comes with a strong commitment from the United States to provide technical assistance in the implementation of this agreement, particularly in the areas of financial sector regulation, supervision, and sanitary and technical standards, the Central American economies themselves need to implement the necessary reforms to sustain the gains associated with the agreement.

## Appendix I. The Model

This appendix briefly explains the main features of the model economy used in this section. The model extends the basic two-country, free trade, complete market Backus, Kehoe, and Kydland (1994) framework by having three countries, considering transportation costs, and allowing for international financial autarky (zero international asset markets). First, the preferences and technology formulations are described. Then the characteristics of the asset markets are explained. All variables denote own country per capita quantities.

### Preferences

In each of the three countries, representative agents derive utility from consumption and leisure. Agents choose consumption and leisure to maximize the following utility function:

$$E_0 \left( \sum_{t=0}^{\infty} \beta^t \frac{[c_{it}^\mu (1 - n_{it})^{1-\mu}]^{1-\gamma}}{1-\gamma} \right), \quad 0 < \mu < 1; 0 < \beta < 1; 0 < \gamma, \quad (1)$$

$i = 1, 2, 3$

where  $c_{it}$  is consumption,  $n_{it}$  is the amount of labor supplied in country  $i$  in period  $t$ ,  $\mu$  is the share of consumption in intratemporal utility, and  $\gamma$  is the intertemporal elasticity of substitution. Each agent has a fixed time endowment normalized to 1.

### Technology

There are two sectors in each country: a traded intermediate goods-producing sector and a nontraded final goods-producing sector. Each country is completely specialized in producing an intermediate good. Time subscripts were suppressed except where necessary.

### Intermediate Goods Sector

Perfectly competitive firms in the intermediate goods sector produce traded goods according to a Cobb-Douglas production function:

$$y_i = z_i k_i^\theta n_i^{1-\theta}, \quad 0 < \theta < 1; i = 1, 2, 3 \quad (2)$$

where  $y_i$  denotes (per capita) intermediate goods production in country  $i$ ,  $z_i$  is the productivity shock,  $k_i$  is capital input, and  $\theta$  denotes capital's share in output. Firms in this sector rent capital and hire labor in order to maximize profits, period by period:

$$\max_{k_i, n_i} p_i y_i - r_i k_i - w_i n_i \quad (3)$$

subject to  $k_i, n_i \geq 0; i = 1, 2, 3$

where  $w_i(r_i)$  is the wage (rental rate) and  $p_i$  is the factory gate or f.o.b. (freight on board) price of intermediate goods produced in country  $i$ .

The market-clearing condition in each period for the intermediate goods-producing firms in country  $i$  is

$$\sum_{j=1}^3 \pi_j y_{ij} = \pi_i y_i, \quad (4)$$

where  $\pi_i$  is the number of households in country  $i$  and determines country size, and  $y_{ij}$  denotes the quantity of intermediates produced in country  $i$  and shipped to each agent in country  $j$ .

The total number of households in the world is normalized to 1:

$$\sum_{i=1}^3 \pi_i = 1. \quad (5)$$

### Transportation Costs

When the intermediate goods are exported to the other country, they are subject to transportation costs. These costs can be considered as a stand-in for tariffs and other nontariff barriers, as well as transport costs. Following Backus, Kehoe, and Kydland (1992) and Ravn and Mazzenga (1999), the costs are modeled as quadratic iceberg costs. This formulation of transport costs generalizes the standard Samuelson linear iceberg specification and takes into account that transportation costs become higher as the amount of traded goods gets larger. Specifically, if country  $i$  exports  $y_{ij}$  units to country  $j$ ,  $g_{ij}(y_{ij})^2$  units are lost in transit, where  $g_{ij}$  is the transport cost parameter for country  $i$ 's exports to country  $j$ . That is, only

$$(1 - g_{ij} y_{ij}) y_{ij} \equiv m_{ij} \quad (6)$$

units are imported by country  $j$ , and  $g_{ij} y_{ij}$  can be considered as the "iceberg" transportation cost, which is the fraction of the exported goods that are lost in transit. In the simulations, the transport costs are evaluated at the steady-state values of  $y_{ij}$ .

### Final Goods Sector

Each country's output of intermediates is used as an input into final goods production. Final goods firms in each country produce their goods by combining domestic and foreign intermediates via an Armington

aggregator. The Armington aggregator is widely used in international trade models because it allows imperfect substitutability between goods produced in different countries. To be more specific, the final goods production function in country  $j$  is given by

$$F(y_{1j}, y_{2j}, y_{3j}) = \left[ \sum_{i=1}^3 \omega_{ij} [(1 - g_{ij}y_{ij})y_{ij}]^{1-\alpha} \right]^{1/(1-\alpha)} \quad (8)$$

$$= \left[ \sum_{i=1}^3 \omega_{ij} m_{ij}^{1-\alpha} \right]^{1/(1-\alpha)}, \quad (9)$$

$$\omega_{1j}, \omega_{2j}, \omega_{3j} \geq 0; \alpha \geq 0; \quad j = 1, 2, 3$$

where  $\omega_{1j}$  denotes the Armington weight applied to the intermediate goods produced by country 1 and imported by country  $j$  ( $m_{1j}$ ). It is assumed that  $g_2 = 0$  and that  $g_{ij} = g_{ji}$ . In other words, there is no cost associated with intracountry trade; that is,  $m_{22} = y_{22}$ , and transport costs between two countries do not depend on the origin of the goods.  $1/\alpha$  is the elasticity of substitution between the inputs.

Final goods-producing firms in each country  $j$  maximize profits, period by period:

$$\max_{m_{1j}, m_{2j}, m_{3j}} q_j \left[ \sum_{i=1}^3 \omega_{ij} m_{ij}^{1-\alpha} \right]^{1/(1-\alpha)} - p_{1j} m_{1j} - p_{2j} m_{2j} - p_{3j} m_{3j}, \quad (10)$$

where  $q_j$  is the price of the final goods produced by country  $j$ , and  $p_{ij}$  is the c.i.f. (cost, insurance, and freight) price of country  $i$ 's good imported by country  $j$ . Note that  $p_{ij} = p_j$ .

As in Ravn and Mazzenga (1999), the first-order conditions from (10) are used to calculate the price of an imported good  $i$  relative to  $j$ 's own good:

$$\frac{p_{ij}}{p_j} = \frac{\omega_{ij}}{\omega_j} \left( \frac{y_{ij}}{m_{ij}} \right)^\alpha. \quad (11)$$

Also, Ravn and Mazzenga show that, because  $\partial F / \partial y_{ij} = (\partial F / \partial m_{ij})(1 - 2g_{ij}y_{ij})$ :

$$p_i = (1 - 2g_{ij}y_{ij})p_{ij}. \quad (12)$$

Comparing (7) and (12), it is easy to see that the c.i.f. price multiplied by imports exceeds the f.o.b. price multiplied by exports:

$$\begin{aligned} p_{ij}m_{ij} - p_i y_{ij} &= p_{ij}(1 - g_{ij}y_{ij})y_{ij} - p_i y_{ij} \\ &= y_{ij}(1 - g_{ij}y_{ij}) - p_i > 0. \end{aligned} \quad (13)$$

In other words, if the transportation costs are considered as arising from transportation services provided to ship goods between countries, with the

quadratic costs arising because the transportation "technology" is decreasing returns to scale, then, in a perfect competition setting, there are positive profits. That is, the firms providing the transportation services pay the exporting country the factory gate or f.o.b. price of the good, and then receive the c.i.f. price from the final goods firm in the importing country. It is assumed that there is a single representative shipping firm that chooses  $y_{ij}$  to maximize the left-hand side of 13. Households in the importing country own these firms; the firms' profits are distributed as dividends to the households.

Capital is accumulated in the standard way:

$$k_{jt+1} = (1 - \delta)k_{jt} + x_{jt}, \quad j = 1, 2, 3 \quad (14)$$

where  $x_{it}$  is investment and  $\delta$  is the rate of depreciation. Final goods are used for domestic consumption and investment in each country:

$$c_{jt} + x_{jt} = F(y_{1jt}, y_{2jt}, y_{3jt}), \quad j = 1, 2, 3 \quad (15)$$

### Asset Markets

It is assumed that the form of the asset market structure is international financial autarky, under which there is no asset trade; hence, trade is balanced period by period. The following budget constraint must hold in each period:

$$\begin{aligned} q_{it}(c_{it} + x_{it}) - r_{it}k_{it} - w_{it}n_{it} - R_{it} &= 0, \\ \forall t = 0, \dots, \infty; i = 1, 2, 3 \end{aligned} \quad (16)$$

where  $R_{it}$  is profits that the transportation firms distribute as dividends to households. In the complete markets case, there is a single lifetime budget constraint:

$$E_0 = \left[ \sum_{t=0}^{\infty} \sum_s (r_{ist}k_{ist} + w_{ist}n_{ist} + R_{ist}) - \sum_{t=0}^{\infty} \sum_s q_{ist} (c_{ist} + x_{ist}) \right], \quad (17)$$

where the subscript  $s$  indexes the state of nature.

### Solution

Because analytical solutions do not exist, the model is solved following the standard linearization approach in the international business cycle literature. Under financial autarky, the optimization problems of the two types of firms, as well as of the households, are solved, along with the equilibrium conditions.

## Appendix II. Volatility and Co-Movement of Macroeconomic Aggregates

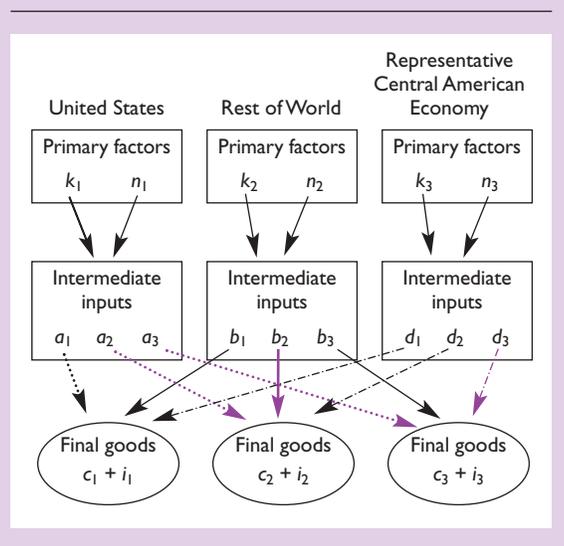
Table 2.A1. Volatility of Macroeconomic Aggregates

(In percent)

	Mexico	CAFTA-DR Average	Costa Rica	Dominican Republic	El Salvador	Guatemala	Honduras	Nicaragua
<b>GDP</b>								
1980–2003	3.6	3.3	3.7	3.7	3.3	2.3	2.5	4.1
1980–93	3.5	3.6	4.4	4.0	3.7	2.7	2.6	4.3
1994–2003	3.9	2.1	2.7	2.9	1.6	1.1	2.5	1.6
1996–2003	2.7	2.1	3.1	3.3	1.0	1.1	2.3	1.8
<b>Consumption</b>								
1980–2003	4.1	6.2	3.2	6.2	6.6	1.6	5.1	14.3
1980–93	3.6	7.7	4.3	6.6	8.5	1.8	6.5	18.3
1994–2003	4.8	3.4	1.9	5.1	2.7	1.2	2.3	6.8
1996–2003	2.4	3.0	1.7	5.8	1.5	1.1	2.6	5.4
<b>Investment</b>								
1980–2003	13.2	13.0	10.6	14.6	8.6	10.6	14.1	19.5
1980–93	12.9	14.6	11.9	16.9	9.4	12.2	16.7	20.4
1994–2003	14.1	11.1	9.7	11.8	8.1	9.5	9.6	17.7
1996–2003	9.2	11.0	10.9	12.0	7.1	10.3	9.0	16.9
<b>Exports</b>								
1980–2003	8.2	10.5	8.6	9.3	13.1	6.5	10.7	14.9
1980–93	6.3	10.8	6.0	10.7	15.2	7.8	9.5	15.7
1994–2003	10.0	9.0	10.3	7.8	6.3	5.4	12.4	11.8
1996–2003	8.0	7.5	11.5	8.8	7.1	4.9	5.9	7.0
<b>Imports</b>								
1980–2003	18.1	11.5	9.3	10.4	12.5	11.4	8.9	16.6
1980–93	21.5	12.7	9.5	11.7	14.9	13.7	11.5	14.8
1994–2003	13.3	9.3	8.5	8.7	8.5	9.2	3.2	17.7
1996–2003	10.8	8.4	9.6	9.8	7.2	10.4	2.5	11.1

Sources: IMF, *World Economic Outlook*; and IMF staff calculations.

**Figure 2.A1. Production Structure of the CAFTA-DR Model**



**Table 2.A2. Co-Movement of Macroeconomic Aggregates with U.S. Aggregates**

	Mexico	CAFTA-DR Average	Costa Rica	Dominican Republic	El Salvador	Guatemala	Honduras	Nicaragua
<b>GDP</b>								
1980–2003	0.2	0.3	0.6	0.2	0.5	0.2	0.2	0.0
1980–93	-0.1	0.3	0.6	0.1	0.5	0.1	0.4	-0.2
1994–2003	0.7	0.4	0.6	0.5	0.3	0.6	-0.2	0.6
1996–2003	0.8	0.5	0.6	0.6	0.7	0.7	0.0	0.7
<b>Consumption</b>								
1980–2003	-0.1	-0.1	0.2	0.2	0.1	-0.3	-0.6	-0.1
1980–93	-0.5	-0.1	0.5	0.1	0.1	-0.6	-0.7	-0.1
1994–2003	0.6	0.1	0.1	0.3	0.0	0.1	0.0	0.2
1996–2003	0.6	0.3	0.2	0.3	0.7	0.4	0.0	0.2
<b>Investment</b>								
1980–2003	0.2	0.2	0.2	0.3	0.1	0.0	0.3	0.3
1980–93	0.0	0.2	0.7	0.2	0.1	-0.2	0.2	0.0
1994–2003	0.4	0.4	0.1	0.5	0.1	0.3	0.6	0.6
1996–2003	0.8	0.4	0.1	0.6	0.0	0.3	0.7	0.7
<b>Exports</b>								
1980–2003	0.1	0.3	0.3	0.5	0.1	0.4	0.4	0.2
1980–93	-0.6	0.2	0.2	0.4	0.0	0.0	0.7	0.1
1994–2003	0.8	0.5	0.2	0.7	0.6	0.9	0.1	0.5
1996–2003	0.8	0.5	0.3	0.8	0.6	0.9	0.0	0.5
<b>Imports</b>								
1980–2003	0.2	0.3	0.3	0.4	0.3	0.1	0.4	0.3
1980–93	0.0	0.3	0.8	0.1	0.2	0.0	0.5	0.1
1994–2003	0.7	0.4	0.4	0.8	0.3	0.3	-0.2	0.4
1996–2003	0.9	0.4	0.4	0.9	0.4	0.4	0.0	0.4

Source: IMF staff calculations.

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