



“DR-CAFTA: Challenges and Opportunities for Central America”



Central America Department
and Office of the Chief Economist
Latin America and Caribbean Region

“DR – CAFTA: CHALLENGES AND OPPORTUNITIES FOR CENTRAL AMERICA”

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Chapter I. Summary of Findings and Introduction

1. Introduction

A central factor in determining the future of Central America will be the ratification and implementation of DR-CAFTA, the free trade agreement negotiated by Costa Rica, the Dominican Republic (DR), El Salvador, Guatemala, Honduras, and Nicaragua, with the U.S.. This is an important issue, not only because the U.S. is these nations' major trading partner, but also because the treaty holds the potential of increasing trade and investment in the region, which in turn is key to lifting economic growth and improving the welfare of the people of Central America and the DR, including those living in poverty.

This report provides a preliminary assessment of DR-CAFTA, with particular attention to three key themes: (i) expected trade and non-trade benefits, (ii) actions that Central American countries need to pursue to capitalize optimally on the new opportunities, and (iii) identification of the population groups that may require assistance to adapt to a more competitive environment. The report focuses on the developing countries of Central America, namely Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua.¹

Past experience demonstrates that predicting the precise effects of any free trade agreement is always difficult. However, this report draws upon a number of different approaches and methodologies to reach the conclusion that DR-CAFTA is likely to improve growth levels for the participating countries in Central America and the DR, due to the expected positive effects on trade and investment levels. Greater trade levels will arise due to the removal of virtually all tariff and quota barriers to trade among all parties, consolidating – and in some cases expanding – the preferential market access that Central American countries have enjoyed in U.S. markets through the Caribbean Basin Initiative (CBI) program. DR-CAFTA is also expected to deepen regional trade integration (and increase trade levels) among the Central American nations themselves and with the Dominican Republic. DR-CAFTA should additionally promote greater levels of foreign and domestic investment, by improving the certainty of these countries' market access with the U.S., solidifying the broad economic reforms of recent years and spurring further reform efforts. Investors should respond positively to the modernization of key regulations in such areas as trade in services, government procurement and intellectual property rights, – including provisions for greater transparency in government regulations – which will be made more credible under DR-CAFTA commitments.

At the same time, the report's analysis of the gains from trade suggest that, as has been found with other trade agreements, these gains will depend on the ability of the Central American economies to successfully adjust to the changes that the agreement will bring (including changes in relative prices) and to handle effectively the ensuing restructuring of the economy. Hence, the magnitude of the benefits from DR-CAFTA will depend critically on the ability of

¹ Analysis of the effects of DR-CAFTA on the economy of the Dominican Republic can be found in World Bank (2005a and 2005b).

the Central American economies to pursue a complementary policy agenda, as the agreement's benefits can lead to substantial developmental gains if it is accompanied by parallel efforts in areas like trade facilitation (e.g., ports, roads, and customs), institutional and regulatory reforms, and innovation and education.

The analysis presented in the report shows that the vast majority of the population in Central America is likely to experience welfare gains from implementation of DR-CAFTA, even in the short run. At the same time, the removal of trade barriers in sensitive agricultural crops could adversely affect a small share of the population living in rural areas in Central America. Although provisions in DR-CAFTA will allow for long timetables in reducing tariffs for most sensitive products, appropriate support programs may need to be designed. In addition, selective investments in education, rural infrastructure, rural finance, and technical assistance will be required to ensure that the rural poor have the means to take full advantage of the new opportunities arising out of DR-CAFTA.

The rest of this summary reviews the main findings of the chapters of the report in the order in which they appear. Chapter II places DR-CAFTA in the historical context of the economic reforms that Central American countries have been undertaking since the late 1980s. Chapter III provides a summary overview of the recently negotiated DR-CAFTA, with special attention on the extent to which the agreement's provisions would significantly change market access for Central American goods and services, and also on how far they could be expected to consolidate prior reforms. Chapter IV reviews various analyses that assess the potential impacts of DR-CAFTA on the developing countries of Central America. Chapter V focuses on the identification and quantification of potentially affected populations from the easing of trade restrictions in sensitive agricultural products and analyzes policy options to assist vulnerable groups. Chapter VI reviews evidence related to key macroeconomic implications of DR-CAFTA, namely the potential revenue losses that might be produced by the removal of import taxes and the treaty's potential effect on the patterns of business-cycle synchronization. Chapter VII reviews evidence from each Central American country in the areas of trade facilitation, institutional and regulatory reforms, and innovation and education, in order to identify key priorities for the complementary agenda for DR-CAFTA.

2. Is DR-CAFTA the End of the Road?: Trade and Development in Central America Since 1990

Chapter II provides a description of the wide-ranging unilateral and regional trade reforms that Central American nations have pursued since the late 1980s. Tariffs have been slashed and most non tariff barriers have been removed. Regional agreements have been revitalized and countries have engaged in the expansion of trade markets through the negotiation of bilateral trade agreements. The CBI preferences granted by the U.S. have also opened important opportunities, especially in the development of new *maquila* exports.

However, these impressive achievements in the trade policy area have yielded mixed economic results. On the one hand, export volumes have increased, and some diversification has occurred, as demonstrated by the appearance of new exports -- including the impressive growth of *maquila* in most Central American countries and high technology goods in Costa

Rica. These are positive developments, because – among other considerations – exporting sectors have been shown to provide higher wages and improved working conditions compared to other areas of the economy.

At the same time, while trade has made a significant contribution to growth in Central America since 1990, its impact has not been sufficient to lift aggregate growth rates enough to transform these countries' economies and radically reduce poverty rates. Nor have trade opportunities by themselves served to offset some of the constraints to progress in the region, such as the still inadequate progress in improving infrastructure, education and governance, or continuing vulnerabilities in areas of macroeconomic and financial management that continue to add to investors' uncertainties in some of the countries. Beyond this, the new *maquila* industries have only developed a limited degree of integration with the local economies, while textile and apparel export prospects are still fragile due to the growing competition from Asian competitors. Although the diversification of Central American countries' exports has increased, this tendency partly reflects negative trends during the period, such as the decline or stagnation in exports of traditional commodities such as cotton, coffee and bananas. Ironically, while Honduras has achieved the highest degree of trade openness relative to its level of income, it is also the country with the weakest record of growth in Central America since the early 1990s.

Why these mixed results? As noted earlier, trade policy is unfortunately not the only determinant of trade (or growth) outcomes. There are still many obstacles to further export growth and trade diversification in Central American nations, including poor infrastructure, weaknesses in labor skills, inflexible regulations, trade barriers in other markets, deficiencies in governance (e.g., corruption, inefficient customs), and macro-fiscal and financial market vulnerabilities.

DR-CAFTA certainly caps the decade and a half of reforms in Central America, particularly in the trade area. It offers a great opportunity to make further progress in fostering trade-led growth. Yet it should not be seen as a silver bullet. On the positive side, it is a potentially more useful tool than the combination seen so far of unilateral removal of trade barriers and trade preferences, as it effectively guarantees long-term market access to the largest trading partner and locks in the reforms of recent years, boosting credibility and attracting investment. However, DR-CAFTA alone should not be expected to unleash radically higher levels of trade and growth, for the same reasons that trade policies since the early 1990s obtained only limited results. Countries will need to accompany DR-CAFTA implementation with policies to address key constraints and bottlenecks in order to reap the full social and economic results of this initiative, as will be justified in more detail in Chapter IV of this report and illustrated by the identification of certain country-specific elements of the complementary agenda in Chapter VII.

3. The Content of DR-CAFTA: Implications for Market Access and Domestic Reforms

Chapter III provides an overview of the recently negotiated DR-CAFTA, concentrating on the extent to which the agreement's provisions would significantly change market access for Central American goods and services, and also on how far they could be expected to

consolidate prior reforms and/or spur further domestic reforms in Central American countries. The overall assessment presented in the chapter is that, on both fronts, the answers are broadly positive, suggesting that DR-CAFTA should be expected to have a positive impact on trade flows and investment.

On market access, DR-CAFTA would consolidate and expand the current generous access that Central Americans currently enjoy to the U.S. market, while extending broadly reciprocal access for U.S. goods to their own markets. The benefits offered under the CBI would be locked in for Central American countries, and some additional permanent duty free access would be obtained for goods that had been previously exempted from CBI preferences. Other significant results would include the flexibilization of rules of origin for textiles and apparel, as well as commitments to help producers meet sanitary and phytosanitary standards required for the entry into the U.S. of promising non traditional agricultural exports. DR-CAFTA also includes reciprocal commitments on access to service markets, which consolidate domestic reforms that opened most of these markets to private participation in recent years.

Central American countries also agreed to grant reciprocal tariff-free access to their markets to U.S. products. Certain sensitive agricultural crops would be subject to extended transition periods (up to 20 years), in order to allow for gradual adjustment and to respond to domestic sensitivities. Central American countries secured access to flexible safeguard mechanisms to prevent sudden surges in imports or declines in prices.

Commitments embedded in DR-CAFTA would gradually erode current protection levels for various products that have retained high protection in Central American economies, during earlier efforts at easing trade restrictions in the past. The gradual decline expected in prices of basic food staples as a result should prove positive for the vast majority of Central Americans who are net consumers of such goods and whose welfare will be increased by lower prices. This said, not all sensitive products are included, in response to cultural and political factors, and these limitations – together with the agreement's still excessively restrictive rules of origin for the entry of textile products to the U.S. – represent barriers to trade that will continue to foster some inefficiencies in the deployment of domestic resources both in the U.S. and Central America.

On the questions related to domestic reforms, DR-CAFTA commitments promise to lock in a number of the policy and regulatory changes implemented in recent years for the opening of competition in previously protected sectors (e.g., telecoms, financial services, energy) and the modernization of key norms and procedures in areas such as government procurement, intellectual property rights and the treatment of foreign investment, by locking in current levels of access of investors (and bidders) from the U.S.

Costa Rica is the only country that will be required to make significant legislative changes to adapt policies and regulations to its commitments under DR-CAFTA, allowing access to significant portions of its telecom and insurance markets. These reforms had been long postponed and should further foster the modernization, efficiency and competitiveness of these areas of the Costa Rican economy.

Aside from consolidating and spurring further reforms, the treaty should strengthen commitments to upgrade enforcement levels of domestic legislation. This represents a significant challenge in areas like labor, environment and intellectual property rights, which will require decisive efforts and resources to modernize and boost the capacity of public agencies. The net impact of these efforts should be positive, as investment is likely to be attracted to environments with effective institutions. However, while DR-CAFTA will put pressure on the modernization of these institutions, it will not by itself create such modernization. Countries will need strong independent plans of action and sufficient dedication of implementation capacity and resources.

The agreement includes cooperation accords to boost standards and enforcement levels in areas such as labor, environment, customs and other areas. It also offers proposals to develop further cooperation and “trade capacity building”, which should aid in the mobilization of human and financial resources required for key reforms and institutional actions required to implement the agreement and the broader developmental challenges.

Finally, a welcome side effect of the negotiation of DR-CAFTA has been the advancement of regional integration efforts. The decision to make the provisions of the agreement apply multilaterally among Central American countries and the Dominican Republic will deepen regional integration efforts in the region and facilitate the creation of a Central American Customs Union.

4. Economic Effects of DR-CAFTA: More Art than Science

Chapter IV reviews various analyses undertaken to assess the potential impacts of DR-CAFTA on the developing countries of Central America. It begins by highlighting that standard theoretical treatments of the gains from trade indicate that such gains depend on an economy’s capacity to change its productive structure. Otherwise, the gains are limited to the gains on the consumption side, which allow domestic agents to consume a bundle of goods that is larger in economic value than the one without trade reforms. The gains from productive transformation can be substantially higher than the gains from enhanced consumption alone. These conclusions refer to static analyses of the gains from trade.

Regarding empirical analyses of the potential static gains from trade, the evidence reviewed in the chapter highlights two key complementary factors, namely, the infrastructure that affects international transport costs and the regulatory environment. There is strong evidence suggesting that exports to the U.S. market will benefit from the shift from unilateral preferences (CBI) to a free trade agreement, but perhaps more importantly, international transport costs (freight, insurance) have a robust and large effect on the value of exports, regardless of the type of preferential treatment. Also, the evidence reviewed suggest that the gains from trade in terms of increases in GDP per capita is intermediated by the regulatory environment that determines how quickly firms and workers can change their sectors of operation and employment. Thus a complementary agenda to enhance the impact of the DR-CAFTA should consider these factors, even when concerned about the static gains from trade.

Partial equilibrium analyses of the potential sectoral effects of DR-CAFTA suggested that the main short-term winners of the agreement would be concentrated in the apparel industries, abstracting from any impact of the elimination of world quotas in this sector. Nevertheless, these analyses suffer from an inability to capture the potential effects on sectors that are relatively small, since the effects predicted by these models are proportional to the initial level of exports. In addition, they have difficulty dealing with technical issues such as the restrictiveness of rules of origin. Furthermore, such partial-equilibrium models do not consider the effects of the trade reforms in the economy as a whole since they do not consider inter-sector interactions through factor and goods markets.

This chapter also presents the simulation results from a so-called “Computable General Equilibrium” (CGE) model for Nicaragua linked to household data. The simulation relates the macroeconomic results of the model to changes in the returns to unskilled labor to poverty outcomes. Indeed, under a restrictive set of conditions (e.g., segmented labor markets, no dynamic effects, effective transmission of tariff reductions to relative producer prices, and no further unilateral trade reforms) DR-CAFTA could have an overall modest positive effect on Nicaragua’s welfare (income per capita) but with a very small (positive) effect on poverty, and the potential for poor rural households to be negatively affected. Thus, as with the other static analyses, these results further support the contention that DR-CAFTA might not be enough to reduce poverty, although these results need to be interpreted with caution, as they are obviously limited by key theoretical and empirical assumptions.

The rest of the chapter is dedicated to understanding the potential dynamic gains from DR-CAFTA. The first part covers evidence concerning the potential effect of free trade agreements (FTAs) - and trade more generally - on foreign investment, corruption, and innovation. Existing evidence suggests that FDI responds to FTAs indirectly, by enhancing the effect of exports and GDP on FDI. The evidence also indicates that trade might not have a direct effect on corruption, and thus we should not expect large dynamic gains from DR-CAFTA to come from the impact of international trade on the quality of public institutions. The process of democratic consolidation seems much more important, although certain aspects of DR-CAFTA that put pressure on governments to improve the enforcement of their own laws could also be helpful. The existing literature on innovation and economic discovery suggests a mixed picture. On the one hand, innovation efforts might not be related to the incidence of international trade. On the other hand, the probability of observing episodes of “economic discovery” seems to be positively correlated with overall export growth.

This chapter also reviews the econometric challenges and results by investigating the empirical link between FTAs and subsequent economic growth in a large sample of countries. The main result is that the growth rate of GDP per capita is positively associated with a country’s participation in FTAs. This finding is robust to the inclusion of various control variables and econometric methods. Unlike the evidence presented in previous work, the new evidence reviewed does not find that the increase in GDP growth of about 0.6 percent per year was sensitive to the type of partner in the FTA. In contrast, a previous empirical study using a different set of control variables and specifications of the empirical models, did find that access to larger markets has a larger effect on growth than FTAs with smaller partners. In any case, there seems to be substantial evidence that FTAs might help accelerate the pace of

economic development, at least for the first five years subsequent to implementation. In the long-run, the steady-state level of income will be determined by a plethora of other factors and as economies get richer, their pace of growth will tend to decline. Consequently, there does not seem to be a silver bullet, and DR-CAFTA is unlikely to be the solution to all development challenges faced by Central America.

The evidence reviewed should make clear that ex-ante analyses of the potential effects of DR-CAFTA (and trade reforms in general) remain an art rather than a science, since the results are highly sensitive to theoretical assumption and empirical methods. Chapters V, VI and VII of this report provide more guidance regarding the “complementary agenda”, which includes policies that can help DR-CAFTA beneficiaries overcome the challenges posed by the adjustment process as well as the long-term challenge of economic development in the context of DR-CAFTA.

5. Policy Approaches to Managing the Economic Transition: Ensuring that the Poor Can Benefit from DR-CAFTA

While the vast majority of people in Central America are expected to benefit from DR-CAFTA in the medium to long-term, there are at least some people who are at risk of bearing the costs of trade-related economic adjustment in the short-to-medium term. Specifically, although the Central American economies are already relatively open, due to unilateral efforts at lowering barriers to trade undertaken in the 1990s (Chapter II), a handful of sensitive agricultural commodities (e.g., maize, beans, dairy, and poultry) still have significant levels of protection. Chapter V focuses on quantifying the size of the potentially affected population and the magnitude of the potential effects. It additionally examines alternative policy approaches on how to best assist vulnerable groups to ensure that they can benefit from emerging opportunities arising out of the DR-CAFTA.

Given current levels of protection, the introduction of more trade competition for sensitive agricultural commodities under DR-CAFTA can be expected to lead to lower domestic prices for sensitive commodities in each country – in some cases significantly lower prices. For this reason, DR-CAFTA includes a wide range of provisions (described in Chapter III) for dealing with the easing of trade restrictions on sensitive goods, including grace periods for initiating the removal of tariffs, extended phase-out periods for tariffs, interim quotas and/or phase-downs of tariff-rate-quotas, as well as special safeguard measures to protect local farmers from undue harm. Indeed, the Agreement includes extended timetables for reducing protection on sensitive agricultural crops. Phase-out periods are, for some commodities, as long as 20 years and, at least for a few countries, white maize, an important staple crop produced by the poor, was exempted from the commitments to eliminate tariffs. These provisions in themselves represent important protections for producers of sensitive crops, giving them an extended timeframe over which to undertake the necessary economic adjustments.

Given this, what might policymakers expect to be the impacts of removing barriers to trade in sensitive agricultural commodities under the DR-CAFTA? Three new empirical studies using nationally representative household survey data from Nicaragua, Guatemala, and El Salvador help shed light on this and related policy issues. All three studies apply a comparable *net*

consumer-net producer framework to assess likely first-order impacts on household welfare of eliminating quotas and reducing to zero tariffs on several sensitive agricultural products, including maize, beans, milk, poultry meat, bovine meat, apples, pork, wheat, and rice. Despite the phasing out of trade protection negotiated under the DR-CAFTA, these analyses examine expected impacts *as if* all tariffs and quotas were going to be removed completely and immediately under the DR-CAFTA. The approach provides useful insights into the first-order impacts of introducing more competition in the markets for sensitive commodities. It also provides a useful baseline from which to examine policy options – including some important policy trade-offs implicit in the gradual approach to easing trade barriers negotiated under the Agreement.

This analysis on Nicaragua, Guatemala, and El Salvador indicates that the vast majority of households in these countries stand to gain from the price changes associated with removing trade barriers for the "sensitive" agricultural commodities. More specifically, 90 percent of Nicaraguan households, 84 percent of Guatemalan households, and 68 percent of Salvadoran households, respectively, were found to be *net consumers* of the basket of sensitive agricultural commodities, and as such, can be expected to benefit from DR-CAFTA-related price changes. Only about 9 percent of Nicaraguan households, 16 percent of Guatemalan households, and 5 percent of Salvadoran households were found to be *net producers* of the basket of sensitive commodities and, thus, would be expected to experience welfare losses. For El Salvador, a further 27 percent were estimated to remain unaffected due to their essentially negligible gains or losses. Even though potential losers are thus relatively small minorities, nonetheless appropriate attention needs to be paid to ensure that anticipated losses do not harm the poorest and most vulnerable groups, for which targeted programs aimed at those that may suffer significant welfare losses may be justified.

While DR-CAFTA has built into it considerable grace periods and extended phase-out periods for eliminating tariffs and quotas that provide reasonable protection to producers of sensitive crops over a prolonged adjustment period, this approach is not without its own economic and social trade-offs. While phasing of reforms provides producers an extended period to make the necessary economic adjustments, it also deprives consumers for that same extended time period of the benefits associated with lower prices for important agricultural staples. In this context, an alternative (and some might argue more efficient) approach might involve a shorter period of removal of trade barriers for the sensitive commodities, coupled with transfers targeted to those adversely affected by DR-CAFTA in the short-term. In principle, a shorter liberalization period combined with targeted transfers is more efficient economically than phased removal of barriers, as consumers do not have to wait up to 20 years to reap the full benefits of lower prices. Coupling well-targeted transfer programs with quick easing of trade restrictions could thus enhance households' welfare in the short-term on the consumption side while providing producers with a reasonable period of support to make the economic transition.

Regardless of whether the DR-CAFTA countries in Central America choose to pursue this alternative approach, it is important to understand the broad options that policy makers can use to mitigate potential income losses arising from declines in commodity prices if extended phase-outs and safeguards are deemed insufficient: (i) "decoupled" income support payments

to farmers of sensitive crops (e.g., as in Mexico's Procampo program), (ii) technical assistance programs to farmers of sensitive crops, (iii) conditional cash transfers (CCTs) to rural families, effective only as poor families make investments in their children's education, health, and nutrition, and (iv) provision of public goods (e.g., economic infrastructure, basic education, rural financial services, technical assistance) targeted to households and/or regions that are either expected to be particularly affected by DR-CAFTA.

These options can be viewed from two different perspectives. The first is the institutional sophistication required to implement support programs, recognizing that different approaches will tax the implementation capacity of Central American countries to different degrees. This criteria recognizes that effective programs will require, *inter alia*, a viable method of targeting vulnerable populations, a minimum degree of know-how among the civil servants of the implementing public sector agency, the creation of new government organizations (or transformation of old ones) and a minimum degree of independence to ensure the application of technical criteria and avoid political interference. The second dimension is related to whether the program provides incentives (or other support) for broad production diversification, including strengthening the capacity of families to exploit new income opportunities for off-farm and/or non agricultural activities – which may be critical to ensure greater economic mobility among poor households.

The classification is useful to assess the requirements and objectives that may be relevant in each country, as the choice of which type of support program would be more appropriate should be made on the basis of country-specific factors. Decoupled transfers require relatively low institutional sophistication but offer few incentives for farmers to seek new income opportunities, as demonstrated by the Procampo experience in Mexico. Technical assistance programs place a greater burden on the capacities of government agencies, while giving incentives for productive diversification (or upgrading), but only within agriculture. Public goods programs require less institutional sophistication by relying on existing institutions for program delivery, while creating conditions for rural inhabitants to diversify economic activities – although programs of this type may require a strong regional concentration of potentially affected poor households in order to make economic sense. CCTs require relatively sophisticated new institutional capacity (especially in countries where programs of this type are not currently being implemented, such as in Costa Rica, Guatemala and El Salvador), although by strengthening families' human capital, they offer broad support for production diversification.

6. Macroeconomic Policy Implications of DR-CAFTA

Chapter VI reviews evidence related to two macroeconomic policy issues. The first concerns the potential revenue losses that might be produced by DR-CAFTA's removal of import taxes. The other topic is related to the treaty's potential effect on the patterns of business-cycle synchronization (BCS) that could be affected by changes in the structure of international trade.

The fiscal losses that DR-CAFTA is likely to create need to be compensated in all Central American countries to avoid further deterioration of public finances. At present, all Central

American countries with the exception of Guatemala exhibit relatively high debt indicators and require tight fiscal stances to maintain or decrease indebtedness. However, relatively small losses in the first years allow for some flexibility in the timing of the fiscal response in some of the countries -- particularly as some time may be needed for adequate political conditions to emerge.

A more comprehensive fiscal response to DR-CAFTA requires efforts to raise revenues above and beyond fiscal losses, as some of the key measures needed to optimize its effect require increases in public investments (e.g., infrastructure, education, institutional strengthening, and transitional adjustment programs). While some of these expenditures may be temporary and could arguably be financed by greater indebtedness, this may be difficult in practice due to high current debt levels.

The fiscal response to DR-CAFTA should be adapted to the fiscal situation of each country. For the cases of El Salvador and Guatemala, where tax revenue ratios are low (below 13 percent of GDP), the ideal fiscal response would be actions that go significantly beyond recovering direct losses, in order to finance additional social and infrastructure investments that are needed to boost growth and that are made more urgent and productive by the opportunities of DR-CAFTA. In Costa Rica, where the tax ratio is higher but still short of the level needed to guarantee debt sustainability, the ideal response should also involve going beyond compensation for the relatively low projected losses, making improvements in the efficiency and allocation of public expenditures, as well as attracting private financing to fund some of the most significant infrastructural needs. Honduras and Nicaragua, which have benefited recently from the Heavily Indebted Poor Countries Initiative (HIPC), will likely require additional fiscal revenues, improvements in expenditure efficiency and attraction of private financing to respond to the opportunities of DR-CAFTA. In all countries, an essential element of efforts to improve fiscal performance should include the institutional strengthening of tax agencies and their collection capacity, as well as the elimination of exonerations from VAT and income taxes.

DR-CAFTA implementation should also be used to deepen regional coordination efforts in the realm of tax policy. Going forward, a regional coordination agenda should include gradual harmonization of VAT and excise rates, fiscal incentives for foreign investors, information exchange for tax enforcement efforts, double taxation treaties and transference prices.

Regarding the prospects for macroeconomic policy coordination among Central American countries and perhaps with the U.S., business cycle synchronization within Central America is quite low compared to NAFTA and EU, but not when compared to MERCOSUR. In fact, synchronization in Central America is highest between Costa Rica and El Salvador, El Salvador and Guatemala, El Salvador and Nicaragua and Honduras and Nicaragua. Costa Rica and Honduras have a higher degree of co-movement with the U.S. than with any other Central American country. Yet synchronization with the US is still below the levels among NAFTA and even MERCOSUR members.

Furthermore, unlike NAFTA, EU and MERCOSUR, trade in Central America is not predominantly intra-regional. The U.S. is by far Central America's most important trading

partner. With the exception of Costa Rica, there is virtually no evidence of intra-industry trade between Central America and the U.S. The level of intra-industry trade within Central America is comparable to that of MERCOSUR, but below the levels of NAFTA (Canada and the US) and EU (Germany and France). Finally, the degree of business cycle synchronization seems only weakly related to trade intensity and trade structure (intra-industry trade), although the relationship between intra-industry trade and synchronization is slightly stronger, which is consistent with existing international evidence. As such, the gain in synchronization through trade expansion could be modest.

In sum, at present neither Central America's trade structure nor its degree of business cycle synchronization make a compelling case for macro coordination within Central America or between Central America and the U.S. Clearly, trade integration is a dynamic process and as trade intensities and compositions of trade flows change so will business cycle patterns. To fully assess the consequences of closer trade integration for the conduct of macroeconomic policies, information about the future evolution of trade structures in DR-CAFTA are needed. If trade becomes more intra-industry (vertical or horizontal), business cycles are expected to become more similar and independence of macro policy will be less of a concern. However, if trade integration takes the form of higher inter-industry trade then business cycles are likely to diverge from current levels and the ability to conduct independent macro policies will grow more important. In the meantime, other factors that are not directly related to the structure of international trade will remain more important considerations for the design of macroeconomic policies over the business cycle in Central America. One important consideration, for example, is the extent of dollarization of financial assets and liabilities. Hence the macro agenda in the light of DR-CAFTA should remain focused, at least in the short-run, on fiscal consolidation.

7. Obtaining the Payoff from DR-CAFTA: Priorities for the Complementary Agenda

Chapter VII reviews recent evidence in the areas of trade facilitation, institutional and regulatory reforms, and innovation and education, in order to identify key priorities for the complementary agenda for DR-CAFTA. The main challenges identified for Costa Rica include improving road quality, port and customs efficiency, boosting financial depth, and improving the quality and coverage of secondary education. For El Salvador, priorities focus around increasing road quality, reducing shipping costs, and tackling governance challenges, as well as improving the quality and coverage of secondary education. Both countries need to devote more public resources to R&D (with monitoring and evaluation efforts put in place to assess results over time), strengthen public private partnerships for innovation, and enhance the institutional capacity to enforce intellectual property rights laws. In addition to tackling weaknesses in the areas identified for Costa Rica and El Salvador, Guatemala also needs to continue to build on recent accomplishments in improving customs administration, coverage and quality of primary education, and road density, as well as devoting some attention to fostering the development of new export products.

The challenges for Honduras and Nicaragua are likely to encompass a broader set of policy issues, as they face more limitations due to their lower development level. Both countries need to address governance, and work on improving the coverage and quality of primary

education, improving the operational efficiency of ports and increasing the quality of roads and their density. They also need to improve their capacity to absorb knowledge from abroad, strengthen institutions in charge of innovation policy and increase linkages between public R&D programs and the needs of the private sector. Honduras also needs to upgrade customs administration and reduce the costs and time to establish new business ventures.

All Central American countries share a regional economic agenda which needs to focus urgently on achieving a Customs Union, which is critical to reduce transaction costs to trade within the region. In addition, efforts should be deepened to coordinate the development of infrastructure that benefits from a regional perspective, including major road networks, and the development of ports. Mechanisms to formulate a common regional trade policy need to be strengthened, to ensure coherence of future bilateral, regional and global commitments with the new framework provided by DR-CAFTA. In addition, improved coordination of key regulatory policies (e.g., financial supervision, competition, fiscal incentives) may be needed to establish the basis of a deeper and more integrated regional market in the future.

All of the elements of the complementary agenda mentioned here are also components of the broader agenda to boost economic growth in the region. Recent analytical work produced by the World Bank to prioritize actions for broad-based growth in the nations of Central America has highlighted the high return that would be obtained from improvements in the areas of infrastructure, education and governance. DR-CAFTA enhances the social return to these actions and makes them more urgent. Hopefully, this important agreement serves as a useful tool to rally support for consolidating policy reforms of recent years and pushing forward with new energy in the areas in which weaknesses remain, in order to boost the pace of growth and poverty reduction across Central America.

Chapter II. Is DR-CAFTA The End Of The Road?: Trade And Development In Central America Since 1990

Abstract

Central American countries have implemented wide-ranging unilateral and regional trade reforms since the late 1980s. These achievements in the trade policy area have yielded mixed results. They have produced significant growth in trade volumes, some trade diversification, and the emergence of new exports including the large growth of *maquila* goods and high technology goods from Costa Rica. Greater trade volumes have also made a significant contribution to growth in Central American in the 1990s, although their impact has not been sufficient to compensate for less dynamic factors, including low levels of education, weak governance, lagging infrastructure, and weaknesses in macro policies and financial sectors. From this perspective DR-CAFTA can be seen as offering an important opportunity for further progress in consolidating trade-led growth, but it needs to be complemented by addressing key bottlenecks that can maximize its trade, investment and growth impact.

1. Introduction

Negotiations for a free trade agreement between the U.S. and the nations of Central America follow a long process of trade and broad policy reforms that have been undertaken in the region since the late 1980s. While reforms were associated with an initial growth spurt, the slowdown in most of the economies of the region in the late 1990s and early 2000s has yielded some disappointment. In some quarters, DR-CAFTA has been received as the missing piece of the puzzle to jumpstart economic activity in Central America, while others see the treaty as an opportunity for improving growth which requires complementary policies to obtain its promise.

This chapter sets the background for DR-CAFTA's appearance in the scene in Central America. To better understand the context for this treaty in the region, this chapter provides a broad review of the progress in trade liberalization and integration policies that have taken place in Central America since the early 1990s, and the results obtained in the areas of trade flows, trade diversification and overall growth. The analysis of the potential effects of DR-CAFTA for Central American economies is left for a later chapter.

The next section summarizes the most significant changes in trade policy since 1990 in the Central American region. In the third, the results obtained in trade performance are reviewed along with an analysis of its impact on overall growth. The fourth section presents a summary and some thoughts on the results that can be expected from DR-CAFTA for the Central American economies.

2. Trade policies in Central America 1990-2003

Over the past decade and a half, Central American countries have put in place ambitious reforms aimed at invigorating economic activity by shifting away from the old inward-looking pattern of development to one that is more reliant on market forces and private initiative. The reforms have included trade liberalization, privatization of infrastructure services, removal of exchange controls, opening up to FDI and efforts to boost the efficiency of government programs.

A key aim of the reforms has been to increase trade openness and the outward orientation of the economy. Reforms in this area included unilateral liberalization of trade barriers, removal of exchange controls, opening up to foreign investment flows, and increased participation in global, regional and bilateral trade agreements. In order to encourage trade flows, these policies were complemented with more flexible foreign exchange arrangements and selected actions in other fronts (e.g., improved infrastructure, customs reform).

Tariff and non tariff barriers

Central American countries began to reduce tariffs unilaterally starting in the late 1980s or early 1990s. By the mid-1990s, average tariff levels in Central America were among the lowest in the LAC region. For the five DR-CAFTA members, average import duties fell from

45 percent in 1985 to 14.1 percent in 1990 and to 7.1 percent by 1999 (See Table 1). By 1999, Costa Rica exhibited the lowest average tariff at 3.3 percent and Nicaragua the highest at 10.9 percent.

Table 1: Average Tariffs 1985-2000

	1985	1990	1995	1999- 2000 weighted	1999- 2000 unwtd.
Costa Rica	53.0	16.4	11.2	3.3	6.0
El Salvador	23.0	16.0	10.2	5.7	7.0
Guatemala	50.0	16.0	12.0	7.6	6.9
Honduras	na	41.9*	9.7	8.1	6.5
Nicaragua	54.0	8.0	10.7	10.9	5.1
<i>Average</i>	<i>45.0</i>	<i>14.1</i>	<i>10.8</i>	<i>7.1</i>	<i>6.3</i>

* Data for 1989.

Source: Lora (2001) and IDB (2004).

The reduction of tariff levels has also been accompanied by a reduction in tariff dispersion levels. This process has been aided by harmonization efforts in the context of the Central American Common Market (CACM) to gradually converge to a four-tier common tariff ranging between 0 and 15 percent for most goods imported into the region.¹ Within the region, El Salvador stands out with the most parsimonious tariff structure, with only 5 tariff levels (0, 5, 10, 15 and 20) and dispersion levels among the lowest in LAC. At the other extreme, despite boasting a low average tariff, Costa Rica exhibits a relatively high dispersion due to the persistence of a number of additional tariff levels beyond 20.²

Most countries still exhibit a few tariff peaks (e.g., ad valorem rates over 20 percent), protecting sensitive areas of the economy. While the list varies somewhat from country to country, sensitive activities typically include maize, poultry meat, rice, sugar, and dairy products. The continued protection afforded to these products has been explained by the strength of small, highly organized producing groups coupled with urban sympathy to some farming groups who may have difficulties in facing international competition (Monge et al, 2003; Arce and Jaramillo, 2005).

To complement the reduction of tariffs, Central American nations also removed most non tariff barriers, which had been widely used prior to the reforms. As a result, prohibitions and quantitative restrictions are today mostly limited to sanitary or technical standards grounds. However, specific complaints of the use of non tariff barriers – often using phytosanitary arguments – continue to be reported with some regularity.³ In addition, some countries

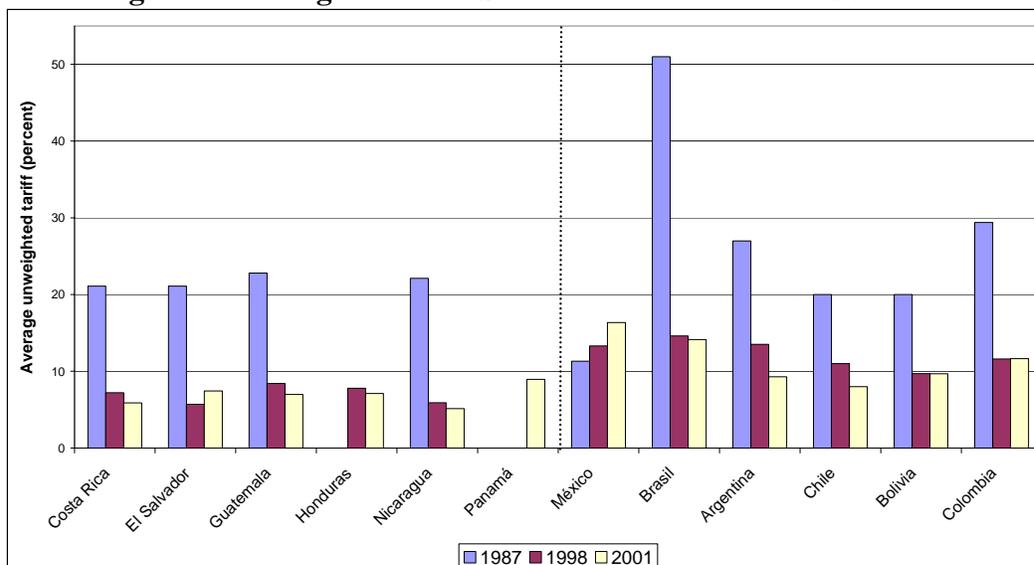
¹ This common tariff structure consist of rates of 0 percent for goods not produced in Central America; 5 percent for primary and capital goods produced in CA; 10 percent for intermediate and capital goods produced in CA and 15 percent for final goods.

² Costa Rica's tariff levels beyond 20 percent currently include: 30, 35, 40, 45, 50, 65 and 150 percent.

³ Allegations of arbitrary use of non tariff barriers for sensitive agricultural products in some Central American countries have been common at the WTO and other fora. Honduras, for example, has been accused in recent years of the arbitrary use of sanitary and phytosanitary measures in agriculture, particularly in reference to imports of poultry, dairy products, pork, feed grains and rice (U.S Embassy Honduras, 2003).

continue to require importers to purchase part of the local crop of some sensitive commodities before issuing import permits.⁴

Figure 1: Average Tariffs – Selected Latin American Countries



Source: Lederman et al (2002) with data from WITS, USITC and IADB.

Export Promotion

As part of the trade reforms of the early 1990s, Central American countries also restructured their approach to promoting exports. Direct fiscal subsidies gradually gave way to the recognition that the removal of traditional import protection eliminated the anti-export bias of traditional policies. Incentives to attract and facilitate the development of export ventures were granted through Export Promotion Zone (EPZ) regimes which exempted firms from import, sales and income taxes. Most countries in the region also introduced regimes that allowed for the tax free importation of inputs (raw materials, semi-processed goods, machinery and equipment) for use in the production of goods and services intended for export. In conjunction with trade preferences granted by the U.S., EPZ and temporary importation of import regimes have greatly facilitated the expansion of exports throughout the region since the late 1980s.

Integration initiatives

In addition to unilateral liberalization efforts, trade developments in Central America were significantly influenced by other trade initiatives in the 1990s, including the active pursuit by Central American nations of multiple trade negotiations in what has been termed a three-tiered strategy (Salazar, 2002). At the global level, all countries participated actively in the Uruguay Round (1986-1994) and those that were not already members joined the GATT-WTO. At the regional levels Central American countries revitalized the CACM under new

⁴ Under these schemes, producers and processor negotiate a reference price for these products. Once the domestic supply to these grains has been exhausted, a quota is introduced that allows processors to import these products at a preferential rate, often duty free.

principles (see below) and participated actively in the negotiations for the Free Trade Area of the Americas. At the bilateral level, all countries actively engaged in negotiations of bilateral or subregional FTAs to expand markets and attract investment.

On the latter front, Costa Rica pioneered independent FTA negotiations with Mexico (1995) and finalized agreements with Chile (2000), Dominican Republic and Caricom (2000) and Canada (2002). CACM members jointly negotiated FTAs with the Dominican Republic (1998), Chile (2001) and Panama (2002) and are currently participating in talks to establish the Free Trade Area of the Americas (FTAA). The Northern Triangle (Honduras, Guatemala and El Salvador) subscribed an FTA with Mexico in 2000.⁵ This strategy of “open regionalism” has been the subject of some controversy (see IADB, 2002, Chapter 2). On the one hand, it has created a multiplicity of agreements that may have high administration costs and can lead to confusion about application as well as information costs – related to what is known as a “spaghetti bowl”. On the other hand, these agreements have opened new trading opportunities, improved the capacity of national trading teams to participate in regional and global negotiations and may have served as building blocks to reach negotiations with the large market represented by the U.S.. In any case, the literature suggests that these agreements are useful inasmuch as they do not generate trade diversion nor hamper efforts for broader global negotiations.

The revitalization of the Central American Common Market (CACM) also merits mention, as it is responsible for a resurgence of intra-regional trade in recent years. Created in 1961 as the first regional trade agreement in LAC under the inward looking strategy of industrialization as a Customs Union with low barriers to intra-regional trade and high barriers to imports from third countries, it faced growing obstacles to its consolidation since the late 1960s and suffered from the macroeconomic and political upheavals that were present in the region in the 1980s. It was significantly restructured and re-launched in the 1990s with a lower common external tariff structure and deeper integration disciplines in areas such as investment, intellectual property and technical standards (Salazar-Xiriñachs, et al, 2001). Revitalization occurred through the 1991 Tegucigalpa Protocol and the 1993 Guatemala Protocol, aimed at eliminating the remaining trade barriers, working towards a customs union, and promoting integration in other areas beyond trade. Trade negotiations spurred by these protocols led to rapid progress in reduction of trade barriers among members and in harmonization of tariffs towards extra-regional partners. Lower trade barriers as a result of the new version of the CACM have yielded an impressive resurgence of intra-regional trade, which has grown at rates that are more than double those of extra-regional trade between 1990 and 2004. While intra-regional trade averaged only 21 percent of all trade in Central America in 1990, by 2004 these flows had increased to 38 percent.

Despite the progress made, there are some issues that need to be tackled to meet fully the trade liberalization objectives of the CACM. Intra-regional trade still faces tariff and non tariff barriers, in products such as non-roasted coffee, cane sugar, wheat flour, and ethyl alcohol.

⁵ In addition, El Salvador Guatemala, Honduras and Nicaragua are jointly negotiating an FTA with Canada. The five countries are in the early stages of FTA talks with the European Union. In addition to FTAs, several Central American countries have signed partial scope trade agreements with Colombia and Venezuela.

For the CACM to become a fully operating customs unions, further progress will need to be made in the harmonization of external tariffs. As of early 2004, still 8 percent of tariff lines required harmonization, including some inconsistencies arising from the differences in some of the bilateral agreements that were not negotiated by the five countries jointly. A well functioning customs union will also require upgrading of the rules of origin framework, to bring them to the same level of formality as the rules of origin that will be agreed for trade with the U.S. within DR-CAFTA.

Aside from trade, Central American countries have embarked on deeper regional integration efforts. The new regional integration agenda has included macroeconomic, political, legal, social, territorial and environmental agreements. However, many of the non-trade commitments have had few practical consequences and regional institutions in other areas are still weak. Clearly, trade stands out as the area where most substantive achievements have been made. A noteworthy development of the past decade is the significant growth of cross border investment within the region, which has gone hand in hand with greater regional trade flows. The expansion of intra-regional FDI flows (highlighted by investments in the financial sector and retailing from El Salvador and other countries) has been changing private sector relationships and may be heralding the beginning of a deeper phase of integration.

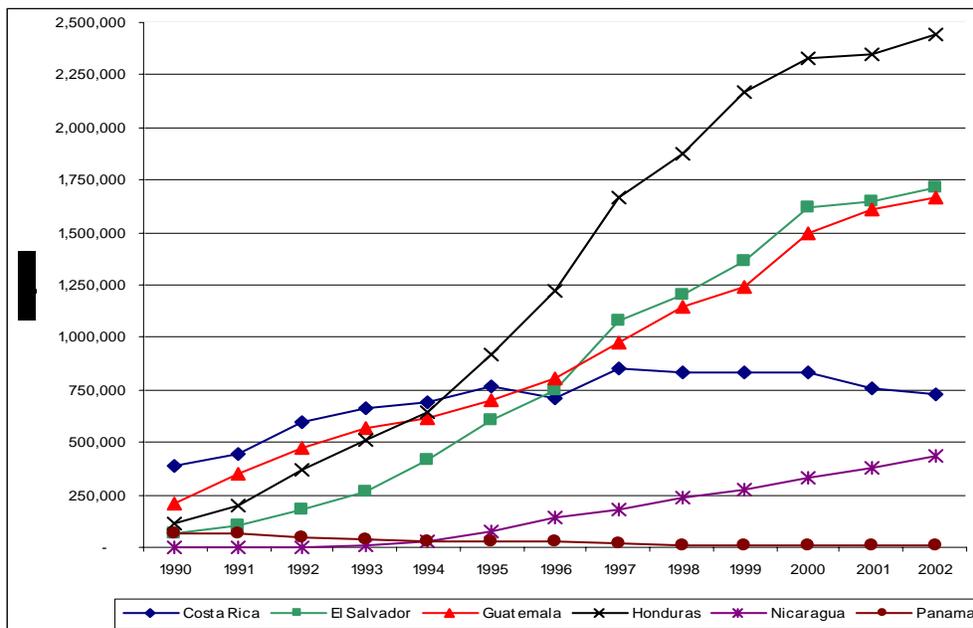
Caribbean Basin Initiative

Since 1983, Central American countries have enjoyed trade preferences to the U.S. market under the Caribbean Basin Initiative (CBI). This initiative allows duty-free access to the U.S. market for a substantial number of products. In 1986 the coverage was extended to include apparel assembled from fabric formed and cut in the U.S., a key factor behind the birth of the *maquila* production of apparel in the region. In 2000, the U.S. Trade and Development Act extended the benefits of the CBI by granting trade concessions similar to those enjoyed by Mexico under NAFTA for apparel, and lowered tariffs for other products previously excluded from the Initiative (e.g., footwear, canned tuna, petroleum products, watches and leather goods), granting duty free access to almost 75 percent of all Central American exports to the U.S.

The new access provisions approved in 2000 permitted the incorporation of more value added from the region in textile exports. In particular, it eliminated duties and quotas from apparel cut and assembled in the region from U.S. made fabric, whereas previously tariffs were levied on the value added and products could not be cut in the region. New provisions also allowed for duty-free entry of items made from knit fabric made in the region from U.S. yarn, although subject to an annual quota. In addition opportunities for greater regional value added were granted by allowing for some finishing processes to be performed in the region (i.e., dyeing, perm pressing and printing) as well as for the use of some inputs (i.e., findings and trimmings) of non U.S. origin.

The CBI has brought considerable benefits for trade expansion to Central American nations.⁶ All have become significant exporters of apparel to the U.S., with the largest export volumes coming from Honduras, El Salvador and Guatemala – with the former achieving substantially greater exports over the others as a result, *inter alia*, of its logistics advantages in accessing East Coast destinations from the relevant urban center (i.e., San Pedro Sula). Success has come despite rules of origin restrictions which have limited the development of greater linkages with the local economy as well as greater flexibility in the sourcing of inputs.⁷ Besides apparel and textiles, Central American countries have used CBI preferences to export traditional export goods (bananas, coffee, sugar) free of duty as well as for the development of a number of growing non traditional agricultural exports and some light manufactures. On the other hand, studies on the hurdles that have remained to further expansion of exports despite CBI preferences reveal the continued existence of non tariff barriers for agricultural products in the U.S. (e.g., sanitary and phytosanitary restrictions, standards, labeling), complex rules of origin for some sectors such as textiles as well as the high costs of transport and the lack of economies of scale (Monge, Loria and Gonzalez Vega, 2003).

Figure 2: Textile and Apparel Imports into the U.S.



Source: Office of Textiles and Apparel, U.S. Department of Commerce.

⁶ The expansion in trade and FDI associated with CBI preferences is also the result of complementary actions by Central American governments, including export promotion and investment attraction policies. The latter included the active role of specialized agencies (CINDE in Costa Rica, FUSADES in El Salvador and FIDE in Honduras) which played an important role in designing incentives, policies and actual promotional work.

⁷ Rules of origin restrictions explain why a significant of apparel exports to the U.S. do not qualify for CBI duty free treatment. For 2002, the share of apparel exports which were able to enter duty free were 65 percent for Costa Rica, 63 percent for El Salvador, 73 percent for Honduras and only 29 percent for Nicaragua (World Bank, 2003).

3. The results of trade policies: Trade and growth outcomes

The ultimate test of success of trade policies is significant growth and diversification of trade flows. However, simple assessments using these criteria are problematic as improvements in trade are usually determined also by a number of different policy and exogenous issues. Nevertheless, in this section we attempt a preliminary assessment of trade policies by examining recent trends in trade flows, trade diversification and growth in Central America. The evidence on growth is also reviewed in an attempt to evaluate if trade policies of recent years may have contributed to overall economic performance since the early 1990s.

Trade openness

Table 1 displays a common measures of trade flows (also known as trade openness, defined as exports plus imports as a share of GDP) for Central American countries and other LAC countries for 1990-91 and 2000-01.⁸ The figures indicate that in the early 1990s, trade volumes in the region (47 percent on average for the five DR-CAFTA countries) were somewhat lower than the LAC average (51 percent). However, the figures for the early 2000s indicate that Central America led the region in the growth of trade volumes, along with Mexico. Between the early 1990s and the early 2000s, the Central American average grew by 29 percentage points to 76 percent. Expansion of trade volumes was most impressive for Honduras (62 ppts) and Nicaragua (40 ppts) and less so – but still quite significantly –for El Salvador (17 ppts), Costa Rica (14 ppts) and Guatemala (13 ppts).⁹

⁸ While trade openness has been used in the literature as a common proxy of trade policy, strictly speaking it is an outcome variable that reflects a broad array of policies and other structural features of an economy (i.e., area, landlocked situation, oil exporter). The indicators of trade volume presented in this section include the best available information for all trade, including all imports and exports related to free trade zones and maquila activity.

⁹ One of the reasons for the apparent large trade openness (and gains) magnitudes as a share of GDP obtained for Honduras and Nicaragua is the potential underestimation of their gross domestic product figures.

Table 2: Trade Openness*
(Percent of GDP)

	1990-91	2000-01	Change
Central America			
Costa Rica	0.56	0.70	0.14
El Salvador	0.42	0.59	0.17
Guatemala	0.38	0.51	0.13
Honduras	0.68	1.30	0.62
Nicaragua	0.32	0.72	0.40
CA Average	0.47	0.76	0.29
Other LAC			
Argentina	0.14	0.22	0.08
Bolivia	0.48	0.43	-0.05
Brazil	0.16	0.25	0.10
Chile	0.64	0.65	0.01
Colombia	0.35	0.40	0.05
Dominican Republic	0.71	0.63	-0.08
Ecuador	0.61	0.69	0.09
Haití	0.40	0.43	0.03
Jamaica	1.06	0.97	-0.09
México	0.37	0.61	0.24
Panama	0.73	0.70	-0.03
Paraguay	0.71	0.59	-0.12
Peru	0.28	0.33	0.05
Suriname	0.47	0.94	0.47
Trinidad and Tobago	0.75	1.02	0.28
Uruguay	0.40	0.39	-0.01
Venezuela, RB	0.59	0.42	-0.16
Other LAC Average	0.52	0.57	0.05
LAC Average	0.51	0.62	0.11

* Exports and imports of goods, including *maquila* (gross).

Source: World Bank with data from Central Banks and private sector sources.

Between 1991 and 2001, growth in trade volumes in all countries of Central America was larger for imports (16.9 percentage points for the Central America average) in comparison to exports (10.2 percentage points) (see Table 2). The disparity is mostly due to the resumption of capital flows (including FDI, aid and public and private indebtedness) which allowed for the financing of larger trade deficits than was possible in the 1980s. For countries such as El Salvador, Guatemala and Honduras, the significant secular growth in remittances have also contributed to financing trade deficits. On the export side, growth can be explained in great part due to the surge in *maquila* exports (mainly textile and apparel), and the development of non traditional agricultural exports (particularly in Costa Rica, Guatemala and Honduras). Traditional exports have stagnated (coffee, bananas, sugar) or declined (cotton) as a result of heavy supply competition and slow demand growth, which have led to declining prices. Costa Rica's outstanding performance is related also to success in developing new manufacturing

lines of export, including high technology exports (e.g., Intel microchips) and a wide array of other manufacturing products.

**Table 3: Trade Openness, Exports and Imports*
(Percent of GDP)**

	1991	2001	Change
Guatemala	0.39	0.50	0.11
Exports	0.18	0.19	0.01
Imports	0.21	0.31	0.10
El Salvador	0.42	0.57	0.15
Exports	0.14	0.21	0.07
Imports	0.29	0.36	0.08
Honduras	0.69	1.28	0.59
Exports	0.34	0.58	0.24
Imports	0.35	0.69	0.34
Nicaragua	0.32	0.71	0.39
Exports	0.09	0.24	0.15
Imports	0.23	0.47	0.24
Costa Rica	0.59	0.70	0.12
Exports	0.27	0.30	0.04
Imports	0.32	0.40	0.08
Central America average	0.48	0.75	0.27
Exports	0.20	0.31	0.10
Imports	0.28	0.45	0.17
México	0.36	0.67	0.31
Exports	0.16	0.33	0.16
Imports	0.19	0.34	0.15

* Exports and imports of goods, including *maquila* (gross).

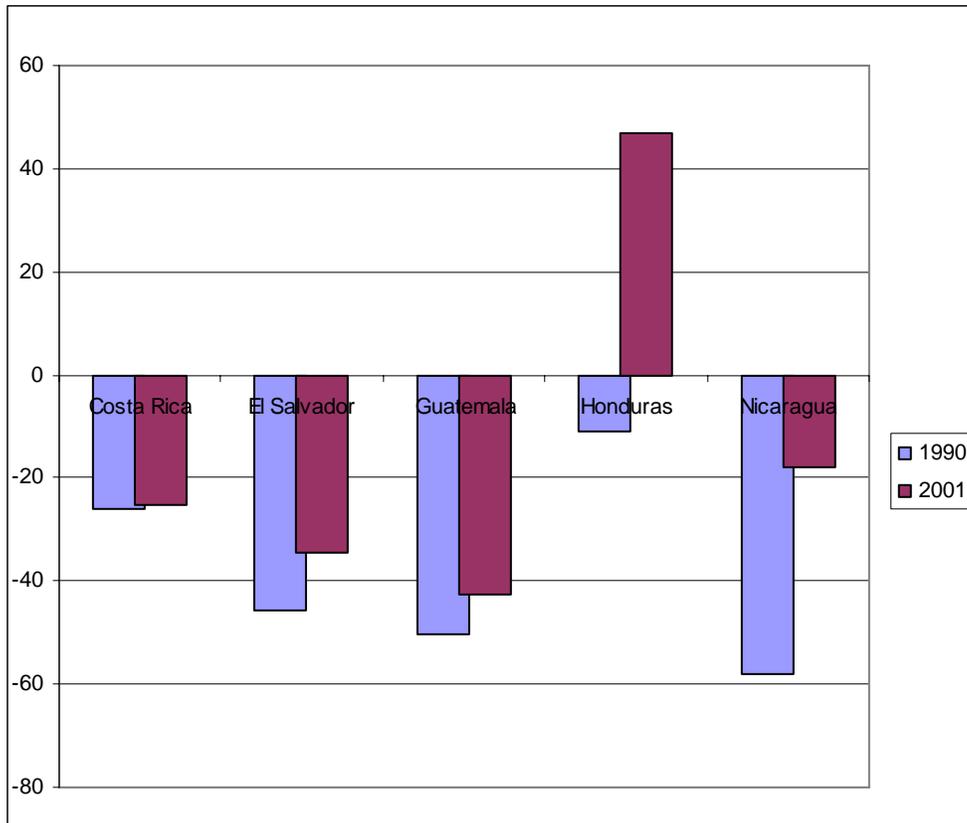
Source: World Bank with data from Central Banks and private sector sources.

Although trade volumes have grown impressively in Central America since the early 1990s, there seems to be scope for further trade increases in the future. To evaluate this potential, it is useful to compare their trade outcomes with those of other economies in similar situations. Figure 3 show the results of a simple benchmarking exercise of trade openness indicators for a sample of 124 countries by per capita income, controlling for factors that may affect trade but are unrelated to government policies (i.e., area, population, access to coast, oil exports).¹⁰ In this light, the positive performance of trade since 1990 can be reinterpreted as catching up from significant initial deficits, relative to international norms. By 2001, Honduras was the only Central American country that performed beyond international comparators, due in great

¹⁰ Accounting for the factors mentioned is done so that we do not unfairly attribute to trade policy what is merely the result of structural country characteristics. We follow here the corrections included in Loayza et al (2002).

part to the huge success of *maquila* exports. For the remaining countries, only Nicaragua managed to cut the deficit significantly since 1990, although the other countries are among the top in Latin America in terms of progress achieved in this front.¹¹ However, the fact that most of the countries continued to exhibit shortfalls by the early 2000s in relation to international comparators is a likely result of continued constraints in transportation costs, port bottlenecks and other behind the border weaknesses.

Figure 3: Trade Openness as percent of GDP: Deviations from Predicted Values by Level of Income



Source: Own calculations.

Trade diversification

Another important measure of the success of trade policies is the degree of diversification of exports. It is well known that countries that rely heavily on a few goods for its exports, are more vulnerable to swings in market conditions than those that enjoy a diversified export basket. The importance of this point was highlighted recently in a study by Lederman and Maloney (2002) which found that countries that exhibit a high concentration of exports in a few products tend to exhibit less growth.

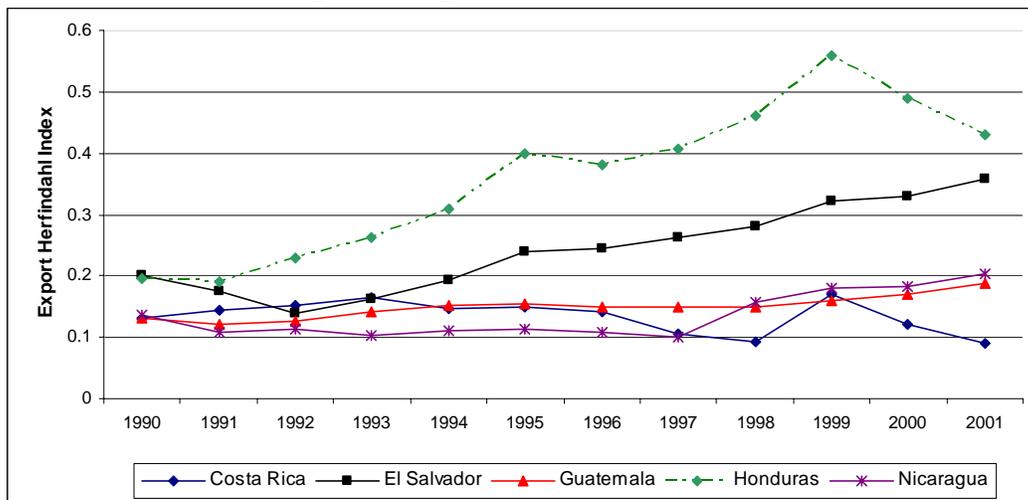
¹¹ The reductions in the deficit for El Salvador, Guatemala and Costa Rica seem small by comparison to achievements in Honduras and Nicaragua, but the latter may be overestimated due to the undervaluation of GDP.

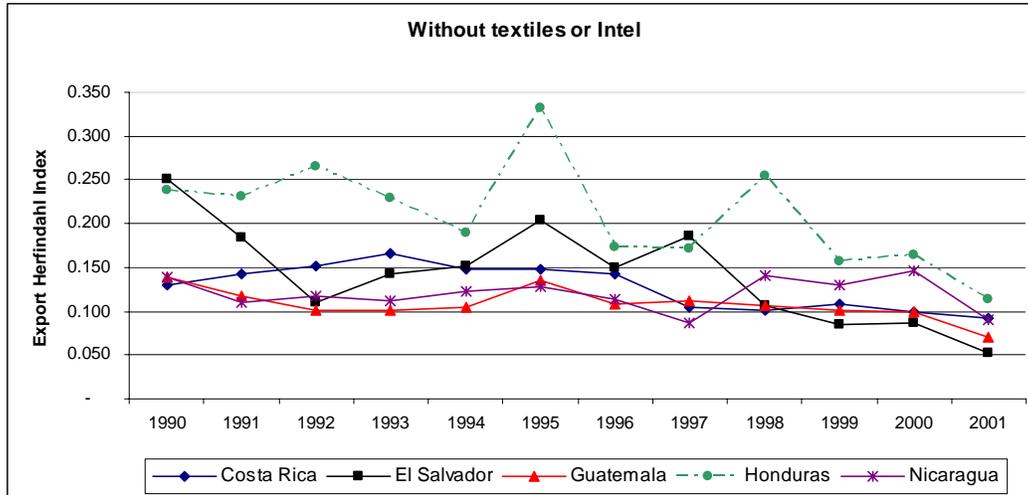
The export basket for most Central American countries has exhibited significant changes since 1990. A clear structural transformation is evident, with the share of traditional commodity exports declining in favor of light manufactures. The case of El Salvador is representative. Traditional exports fell from 50 percent of total exports in 1990 to 15 percent in 2002. In the same period, the shares of non traditional exports and net *maquila* exports went from 48 percent to 58 percent and from 3 percent to 28 percent, respectively.

Despite the structural change in the composition of exports, conclusions about their diversification are not as sanguine. For El Salvador, Honduras and, to a lesser extent, Nicaragua, the Herfindahl index of export revenue concentration (calculated at the two digit level) deteriorates sharply since the early 1990s, as the concentration in a few traditional commodities has been replaced by a new concentration of exports in *maquila* manufactures (Figure 4). Results for Guatemala show unchanging diversification levels until the late 1990s, followed by increasing concentration levels in recent years. Costa Rica displays a diversification trend that ends abruptly in 1999, when the sudden surge in exports of high-tech products produces a new concentration trend.

Interestingly, if the analysis excludes *maquila* and high technology products, strong diversification trends become evident for all countries with the only exception of Nicaragua. This demonstrates that aside from the disproportionate success of *maquila* products and microprocessors – industries that are still not fully integrated into the local economies --, exports in Central America have shown significant diversification, particularly into non traditional agricultural goods, processed foods and other light manufactures.

Figure 4: Export Diversification Index





Source: Own calculations.

Growth

Table 4 presents growth figures for the five Central American countries starting in 1990. While there is substantial disparity in annual growth rates per country, it is possible to detect three distinct phases. The first is of relatively high growth rates between 1990 and 1995. The second is one of mixed results between 1996 and 1999. Poor economic results are more prevalent in the third which starts at around 2000. The only country that seems to deviate from the general trend is Nicaragua, which exhibited low growth until 1994 and a boom situation in 2000 induced by aid flows after Hurricane Mitch.

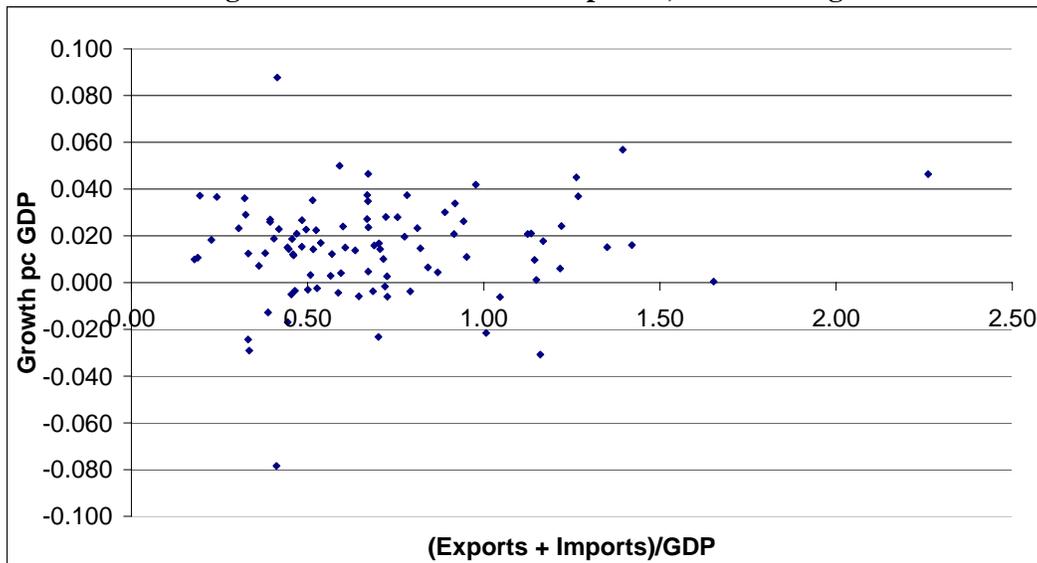
Table 4: GDP Growth, 1990-2004

Year	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Average	Average (exc. Nicaragua)
1990	3.6	4.8	3.1	0.1	-0.1	2.3	2.9
1991	2.3	3.6	3.7	3.3	-0.2	2.5	3.2
1992	9.2	7.5	4.8	5.6	0.4	5.5	6.8
1993	7.4	7.4	3.9	6.2	-0.4	4.9	6.2
1994	4.7	6.0	4.0	-1.3	3.3	3.4	3.4
1995	3.9	6.4	4.9	4.1	4.3	4.7	4.8
1996	0.9	1.7	3.0	3.6	4.8	2.8	2.3
1997	5.6	4.2	4.4	5.0	5.1	4.9	4.8
1998	8.4	3.8	5.0	2.9	4.1	4.8	5.0
1999	8.2	3.4	3.8	-1.9	7.4	4.2	3.4
2000	1.8	2.2	3.6	5.7	12.8	5.2	3.3
2001	1.0	1.7	2.4	2.6	3.0	2.1	1.9
2002	2.9	2.1	2.2	2.5	1.0	2.2	2.5
2003	5.6	2.0	2.1	3.2	2.3	3.0	3.2
2004p	3.9	2.1	2.6	4.3	4.3	3.4	3.2

Source: Central Banks of Central America and World Bank projections.

An important question is whether the expansion of trade flows described above had an influence on growth results. Generally, correlations and scatter plots do not display simple bivariate relationship between trade volumes (or growth in trade volumes) and economic growth. Figure 5 illustrates this point with data from a large sample of countries. Can we conclude then that the positive trade results of recent years had no discernible impact on growth?

Figure 5: Growth and Trade Openness, 1990s average



Source: Own calculations.

There are several reasons that explain why a simple bivariate empirical relationship between growth and trade is not obvious, and why the growth record of Central America has been lackluster in the late 1990s despite progress in increasing trade flows throughout the decade. The first is that in addition to trade, a number of other important factors impinge on growth. For example, in the endogenous growth literature, trade openness is one of the structural and institutional policies linked to growth along with other public policies such as education, financial depth, government burden, public services and infrastructure and governance. In addition to structural determinants, long run growth performance is also a result of successful fiscal, monetary and financial policies that contribute to a stable macroeconomic environment and avoid financial and balance of payments crisis. External conditions (e.g., terms of trade, external financing flows, investor perceptions) also exert a significant influence on economic developments.

Disentangling the effects of trade policies on growth from other effects (from structural, macroeconomic and external conditions) is challenging. This is particularly difficult in Latin America during the 1990s, as the region was hit by volatile capital flows which exerted an amplified impact on the short run economic performance of regional economies due to weak macro-financial policies. Loayza et al (2002) found that after controlling for cyclical and global factors, trade and other variables that capture the structural reforms of the 1990s had a significant empirical effect on growth for a sample of 135 countries. This finding is consistent with many recent cross country studies which have also confirmed a positive and significant

relationship between trade openness and income growth (see for example, Kraay 2003, Dollar and Kraay, 2002; others).¹²

Table 4 displays the determinants of changes in growth for the Central American economies derived from the Loayza et al study for the case of the Central American economies in the 1990s. These results indicate that growing trade volumes in the 1990s contributed moderately to higher growth rates in all countries of Central America (ranging from 0.21 ppts to 0.41 ppts annually, except for Honduras¹³), although not as much as in countries like Mexico which saw large growth in trade volumes due to NAFTA and other factors. The results suggest the progress registered in trade and other policy areas were not sufficient to compensate for weak performance in other areas (e.g., financial depth in Honduras, Costa Rica and Guatemala, education in Honduras and business cycle factors in El Salvador, Guatemala and Nicaragua).

**Table 5: Explaining changes in growth, 1990s vs 1980s
(percentage points)**

	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua
<i>Structural determinants</i>					
Education	0.15	0.42	0.46	-0.10	0.48
Financial depth	-0.10	0.13	-0.06	-0.16	0.41
Trade openness	0.41	0.37	0.21	-0.07	0.30
Government burden	0.26	0.65	0.43	0.44	1.00
Infrastructure	0.35	0.63	0.41	0.60	0.37
Other	0.05	-0.11	-1.45	0.10	-0.72
<i>Change in growth 1990s vs 1980s</i>					
Predicted	1.13	2.09	2.44	0.82	1.84
Actual	3.80	4.14	3.05	0.84	4.40

Source: Adapted from Loayza, Fajnzylber and Calderón (2002).

A second important reason for the lack of an empirical relationship between trade and growth is that liberalization policies need to be complemented in order for trade to exert its full positive effect on growth. Recent studies have shown that Mexico did not take full advantage of NAFTA because of lagging complementary actions. The states of the South of Mexico took little advantage because of a poorly trained workforce, infrastructural deficiencies (esp. telecommunications) and weak institutions (World Bank, 2003). These conclusions suggest that there are interactions between trade and other policies that are required for trade to be a

¹² The positive relationship between trade and growth was challenged by Rodriguez and Rodrik (2000) on the grounds that trade openness may capture the effect of omitted variables. However Warczziag (2001) identified a positive direct effect of liberal trade policies on economic growth. A recent study by Lederman and Maloney (2003) also finds that trade liberalization policies have a positive effect on growth.

¹³ The estimations presented in Loayza et al. (2002) use trade openness data that net out maquila flows, as opposed to the figures reported in Tables 2 and 3. This underestimates most significantly the trade gains achieved in the 1990s for Honduras as reported in Figure 3, due to the substantial growth in gross maquila export flows. Rough estimates suggest that the impact of greater trade openness on growth for this country after correcting for this, yield results in the range of 0.2-0.4 per year, in line with those for the other Central American nations.

significant engine of growth. A recent study by Bolaky and Freund (2003) finds that trade has little impact on growth in economies with excessive business and labor regulations, as these regulations prevent resources from moving into the most productive sectors following liberalization. In addition, in highly regulated economies, increased trade is more likely to occur in sectors in which comparative advantage is weak.

A third reason to explain why increased trade openness does not always lead to higher growth is that the composition of exports is also relevant. Traditionally, much of the literature had assumed that export concentration in primary products was a “curse” of early developing countries. However, Lederman and Maloney (2002) find that concentration in any type of goods, be it agricultural or manufacturing, has an empirically measurable deleterious effect on growth outcomes. This finding is of concern to Central American nations since the favorable export performance of the last decade and a half has not been accompanied by growing diversification levels, as shown earlier.

Other more technical reasons include the difficulty of measuring trade stances and establishing causation. Also, obtaining summary measures of trade policy often involves aggregating tariff levels and non tariff barriers, with the latter being more technically difficult to establish. An often quoted paper by Rodriguez and Rodrik (2001) shows that trade openness, usually measured by imports plus exports relative to GDP, and is likely to be endogenous, making traditional inferences problematic.

Trade, poverty and inequality

Fewer empirical studies have focused on the impact of trade on poverty and inequality. On the relationship between trade and poverty, a recent survey concludes that the empirical evidence broadly supports the view that trade liberalization is poverty-alleviating in the long run and on average, as predicted by economic theory, mainly due to its effect on growth (Winters et al, 2004). It also finds that since trade policy is only one of they many determinants of growth (and, by extension, of poverty reduction), greater trade should generally contribute positively to poverty reduction but the ultimate outcomes are jointly determined by a host of additional factors.

The stronger empirical linkage between growth and poverty reduction has been documented in numerous studies. Using cross country regression methods, Ravallion (2001) finds that a 1 percent increase in mean income results, on average, in a fall of 2.5 percent in the proportion of people in absolute poverty. Kraay (2003) concludes that about between 66 and 90 percent of the variation in medium term changes in poverty can be explained by growth in average incomes. In a similar vein, Dollar and Kraay (2002) investigated the determinants of growth in incomes of the poorest quintile in a large sample of countries and found that it tracked growth in average incomes one-for-one. While there have been some methodological challenges to cross country studies, these findings are broadly consistent with those of country case studies (Winters, et al, 2004). The broad empirical backing for growth as the key determinant of poverty reduction in recent decades is also consistent with the reduction of Central American poverty rates, which have tracked growth performance closely over the past decade and a half.

By contrast, the empirical evidence on the link between trade and inequality is more mixed. Some studies have found that increased openness increases summary measures of inequality, at least in low-income countries (Barro, 2000; Lundberg and Squire, 2003; Milanovic, 2003; Lopez, 2004). On the other hand, Dollar and Kraay (2002) find no correlation between several measures of openness and income distribution while Kraay (2003) finds some evidence of openness reducing inequality and poverty using a cross country sample of household survey data, and indicates that among the factors that may play a role in facilitating reductions in inequality are policies that support small farmers and small firms in taking advantage of new trade opportunities.

Since Central American countries have made significant improvements in trade openness in the 1990s, recent trends in inequality indicators may suggest a relationship. Although the measurement of inequality and its comparison across time is fraught with numerous pitfalls, Table 5 presents the evolution of inequality (Gini) indicators for selected Central American countries along with the average from a large sample of LAC countries drawn from a recent Bank study which examined this issue in detail (World Bank, 2004). The overall trend in LAC between the early 1990s and the early 2000s is ambiguous, as the unweighted average displays a slight deterioration and the weighted average shows an improvement. Results for Central America are equally ambiguous. Between the early 1990s and early 2000s, the level of inequality seems to have increased slightly for Costa Rica and El Salvador, remained essentially unchanged for Nicaragua and decreased for Honduras. This evidence suggests that there does not seem a simple relationship between changes in trade openness and inequality in Central America, an unsurprising conclusion in economies in which structural changes, exogenous shocks (e.g., natural disasters, terms of trade swings) and business cycle variations respond to a wide host of factors beyond trade.

**Table 6: Evolution of inequality in LAC
(Gini coefficients)**

Countries	Early 90s	Early 00s	Change
Costa Rica	43.9	44.6	0.7
El Salvador	50.5	51.8	1.3
Honduras	55.6	53.0	-2.6
Nicaragua	54.2	54.1	-0.1
LAC average (unwtd)	50.5	51.4	0.9
LAC average (weighted)	51.9	51.5	-0.4

Source: De Ferranti et al, 2003.

4. Summary and Conclusions

This chapter has provided a description of the wide-ranging unilateral and regional trade reforms that Central American nations have pursued since the late 1980s. Tariffs have been slashed and most non tariff barriers have been removed. Regional agreements have been revitalized and countries have engaged in the expansion of trade markets through the negotiation of bilateral trade agreements. The CBI preferences granted by the U.S. have also opened important opportunities, especially in the development of new *maquila* exports.

However, these impressive achievements in the trade policy area have yielded mixed economic results. On the one hand, export volumes have increased, and some diversification

has occurred, as demonstrated by the appearance of new exports -- including the impressive growth of *maquila* in most Central American countries and high technology goods in Costa Rica. These are positive developments, because – among other considerations – exporting sectors have been shown to provide higher wages and improved working conditions compared to other areas of the economy.

At the same time, while trade has made a significant contribution to growth in Central America since 1990, its impact has not been sufficient to lift aggregate growth rates enough to transform these countries' economies and radically reduce poverty rates. Nor have trade opportunities by themselves served to offset some of the constraints to progress in the region, such as the still inadequate progress in improving infrastructure, education and governance, or continuing vulnerabilities in areas of macroeconomic and financial management that continue to add to investors' uncertainties in some of the countries. Beyond this, the new *maquila* industries have only developed a limited degree of integration with the local economies, while textile and apparel export prospects are still fragile due to the growing competition from Asian competitors. Although the diversification of Central American countries' exports has increased, this tendency partly reflects negative trends during the period, such as the decline or stagnation in exports of traditional commodities such as cotton, coffee and bananas. Ironically, while Honduras has achieved the highest degree of trade openness relative to its level of income, it is also the country with the weakest record of growth in Central America since the early 1990s.

Why these mixed results? As noted earlier, trade policy is unfortunately not the only determinant of trade (or growth) outcomes. There are still many obstacles to further export growth and trade diversification in Central American nations, including poor infrastructure, weaknesses in labor skills, inflexible regulations, trade barriers in other markets, deficiencies in governance (e.g., corruption, inefficient customs), and macro-fiscal and financial market vulnerabilities.

DR-CAFTA certainly caps the decade and a half of reforms in Central America, particularly in the trade area. It offers a great opportunity to make further progress in fostering trade-led growth. Yet it should not be seen as a silver bullet. On the positive side, it is a potentially more useful tool than the combination seen so far of unilateral removal of trade barriers and trade preferences, as it effectively guarantees long-term market access to the largest trading partner and locks in the reforms of recent years, boosting credibility and attracting investment. However, DR-CAFTA alone should not be expected to unleash radically higher levels of trade and growth, for the same reasons that trade policies since the early 1990s obtained only limited results. Countries will need to accompany DR-CAFTA implementation with policies to address key constraints and bottlenecks in order to reap the full social and economic results of this initiative, as will be justified in more detail in Chapter IV of this report and illustrated by the identification of certain country-specific elements of the complementary agenda in Chapter VII.

Chapter III. The Content of DR-CAFTA: Implications for Market Access and Domestic Reforms

Abstract

This paper provides an abbreviated overview of the recently negotiated FTA between five Central American countries, the Dominican Republic, and the U.S. It evaluates whether provisions changed significantly market access and domestic regulations vis-à-vis the status quo in Central American countries. In market access, it finds that DR-CAFTA consolidates access terms gained by Central American nations through ongoing CBI preferences, eliminates remaining tariffs on a few sensitive goods in the U.S. and adds more flexibility to rules of origin, especially for the export of apparel. It also provides for a gradual opening of some sensitive agricultural markets in Central American economies, although long transition periods, safeguards and exemptions were obtained. The agreement includes chapters on services and some disciplines that most Central American countries had not included in previous trade negotiations, including intellectual property rights, government procurement, e-commerce, labor and environment. The inclusion of these new areas will exert an important lock-in effect of recent market-oriented reforms, and provide incentives to improve transparency and due process in public agencies. The multilateral application of the treaty's disciplines among the Central American countries will also strengthen the regional integration process. In the case of Costa Rica, commitments will require significant legal changes that will allow private provision of some telecommunications and insurance services.

1. Introduction

After more than a decade of market reforms and significant advances in trade reforms, five nations of Central America (Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua) embarked on negotiations for an FTA with the U.S. in early 2003. The outcome is DR-CAFTA, an agreement that was signed by the executive branches of all countries involved in August 2004 and is now in the midst of its ratification process in legislatures.¹

While the signature of an FTA with the U.S. is not a guaranteed path to sustained economic growth and prosperity, past experience suggests that it may play a fruitful role in two critical areas: improved market access and domestic reforms. The former is important because lowering trade barriers expands markets and increases trade flows that help resource allocation, specialization, economies of scale, technology transfer and overall economic dynamism. FTAs have also proven useful as a means of furthering policy and regulatory reforms in key areas and improving their credibility and permanence. For Central American nations, locking many of the reforms of recent years with an FTA that is costly to violate should generate a credibility effect that could boost investment levels.² Reforms that can have strong investment effects include trade liberalization, non discriminatory treatment of domestic and foreign investors, and removal of restrictions for private sector participation in most sectors of the economy.

This chapter presents an overview of the contents of the DR-CAFTA. While a detailed analysis of the final text and its implications falls outside of the scope of this chapter, it summarizes its most significant provisions and evaluates them from the point of view of their potential effect on market access, domestic regulations and institutions. The chapter attempts to provide preliminary answers to two sets of questions:

- *Expansion of market access:* Does the recently negotiated DR-CAFTA contain commitments to provide permanent and stable market access at least similar to that available to Central America exporters under CBI?³ Will it provide access to exports (i.e., relaxation of tariff and non tariff barriers, flexibilization of rules of origin) beyond that available to Central American countries under CBI provisions? Will it also remove trade barriers in the few remaining protected subsectors in Central America that have proven resistant to past efforts to reduce protection? A positive answer to this set of questions is likely to signify that DR-CAFTA would have the potential to increase trade flows, improve domestic resource allocation, and boost investment in new exporting ventures from Central America.

¹ As of this writing, DR-CAFTA has been formally ratified in El Salvador, Guatemala and Honduras.

² Trade agreements can effectively lock in domestic reforms if countries really value belonging to the agreement and if the credibility of the threat of action if rules are broken is high. From this point of view, a treaty with a developed country like the U.S. is likely to be most effective, as large trade flows are at stake.

³ There is some question whether the benchmark to evaluate market access commitments should be the unilateral preferences under CBI or an alternative such as U.S. most favored nation tariffs or tariff binding levels at the WTO. If a country were not to ratify DR-CAFTA, it is likely that its market access would be less favorable in relation to the existing CBI preferences, as has been relayed in press accounts of statements by members of the U.S. congress and officials of the executive branch.

- *Domestic reforms:* Do commitments included in the DR-CAFTA agreement effectively extend and/or lock-in the policy and regulatory reforms of recent years in Central American countries? Do they require significant additional changes? Do they require greater efforts in the enforcement of current regulations? A positive answer to this set of questions would suggest that DR-CAFTA will signal a strong commitment of Central American countries to consolidate and extend recent policy and regulatory reforms, and to their enforcement. While some countries in the region have already “locked in” some reforms through other international agreements, DR-CAFTA offers a chance for a higher credibility level of commitment that should yield a higher investment response.

This chapter is thus a summary of key commitments found in the DR-CAFTA text and deals with the topics of the agreement in the following order: market access in goods (agriculture, manufactures, apparel and textiles), services, other disciplines (i.e., investment protection, intellectual property rights, labor and environment, government procurement and other provisions) and the regional application of commitments. The main conclusions are drawn at the end.

2. Market access for goods

As a result of DR-CAFTA, duties affecting trade with the U.S. will be eliminated for virtually all goods. Due to strong sensitivities, some agricultural products were exempted from the eventual zero-duty status: sugar for entry into the U.S., white maize for entry into four Central American nations (El Salvador, Guatemala, Honduras and Nicaragua) and potatoes and onions into Costa Rica. While the bulk of tariffs will be removed upon implementation, some tariffs will be phased out gradually. Central America’s number of products with gradual phase-outs is significantly higher than that at the U.S. number.

Agriculture

CAFTA commitments in agriculture include the reciprocal elimination of all tariffs, with the only exceptions as described above. For Central American countries, this will consolidate the current access allowed under CBI legislation for Central American products and provide for some expansion of their zero duty access to a few new products that had been kept outside of the preferences.⁴ DR-CAFTA also includes reciprocal commitments from Central American countries to consolidate access to their agricultural markets to U.S. exports, eliminate tariff peaks and open further those sensitive sectors that still enjoy restrictions to imports.

Market Access. DR-CAFTA commits parties to eliminate tariffs for virtually all tariff lines, through tariff reductions, expansion of zero-tariff quotas and combinations of these two approaches. A separate schedule of commitments applies to each country, with El Salvador,

⁴ Some of the goods that will now enjoy zero tariff treatment under DR-CAFTA included canned tuna for Nicaragua; products that contain sugar up to 65 percent, ethnic cheeses, fresh vegetables, snacks, fresh fruits and melon for El Salvador. Nicaragua also obtained a peanut quota of 10,000 mt annually and 2,000 mt for peanut butter.

Guatemala, Honduras and Nicaragua excluding white maize from tariff reduction obligations⁵ and Costa Rica excluding onions and potatoes.

Tariff Elimination. Tariffs are to be phased-out according to specific schedules negotiated on a product and country-specific basis (Table 1). Tariffs will be reduced within one of the following timeframes: immediate, 5 years, 10 years, 12 years or 15 years (18 years - 20 years for poultry parts, rice and dairy products). While most tariffs will be reduced in equal annual installments over the phase-out period, for specified sensitive products, tariff reductions will be back-loaded, with no cuts in the initial years of the phase-out period and larger cuts in the later years of the phase-out period. Central American producers obtained longer time periods for tariff phase outs as well as a greater share of the back-loaded phase out periods than the U.S.

Table 1: Tariff Reduction Schedule for Sensitive Agricultural Products

Product	Guatemala			Honduras			El Salvador			Nicaragua			Costa Rica		
	IT	PP	GP	IT	PP	GP	IT	PP	GP	IT	PP	GP	IT	PP	GP
	(%)	(yrs)	(yrs)	(%)	(yrs)	(yrs)	(%)	(yrs)	(yrs)	(%)	(yrs)	(yrs)	(%)	(yrs)	(yrs)
Beef*	n/d	10	0	15	15	6	15	15	0	15	15	3	15	15	4
Pork	15	15	0	15	15	0	40	15	6	15	15	0	47	15	6
Poultry (leg quarters)	164.4	18	10	164.4	18	0	164.4	18	10	164.4	18	10	151	17	10
Dairy products	15	20	10	15	20	10	40	20	10	40	20	10	66	20	10
Yellow maize	n/d	10	0	45	15	6	15	15	6	15	15	0	15	15	0
Beans	20	15	6	15	15	0	20	15	15	30	15	0	47	15	0
Fresh potatoes	15	15	0	15	15	0	15	12	0	15	15	0	Excluded		
Rice	29.2	18	10	45	18	10	40	18	10	63	18	10	36	20	10
Sorghum	0	0	0	15	15	0	15	15	0	20	15	6	15	15	0

* Beef products other than prime and choice cuts.

IT: initial tariff level; PP: phase-out period; GP: grace period; N/D: no data.

Source: CEPAL (2004).

Tariff-Rate Quotas. For many sensitive products, immediate market access will be provided through the creation and gradual expansion of tariff-rate quotas (i.e., zero duty access for a specified quantity of imports). For example, Nicaragua will gradually increase TRQs in some sensitive U.S. products such as peanuts, peanut butter, beef and dairy products. Table 2 examines the TRQs obtained by Central America. For cases in which initial quotas account for relatively small shares of recent import volumes, significant changes in local market conditions should not be expected. For a few cases in which quotas are near 100 percent of local volumes or above, detailed analysis of specific commodity markets would be required that falls beyond the scope of this report. Such analysis would need to take into account the structure of the market, whether duty-free quota imports have been allowed in recent years (as in the case of several grains in El Salvador and Nicaragua) and whether performance requirements (see below) would apply in that market. Most quotas were agreed to grow at rates of between 2 percent and 5 percent, roughly at or below the rates of growth of the economies projected for the next decade.

⁵ The exclusion of white maize was apparently motivated by the cultural importance and political sensitive of the crop, according to press accounts and interviews with negotiators.

**Table 2: Recent Imports (2003) vs. DR-CAFTA
Quotas of Sensitive Agricultural Commodities**

	Guatemala		Honduras		El Salvador		Nicaragua		Costa Rica	
	Imports	Quota								
	(% of local production)	(% of total imports)	(% of local production)	(% of total imports)	(% of local production)	(% of total imports)	(% of local production)	(% of total imports)	(% of local production)	(% of total imports)
Beef	9.5	15.0	3.2	No Quota	50.0	0.7	0.0	No Quota	8.7	No Quota
Pork	42.3	55.6	80.0	35.9	66.7	45.2	25.0	115.4	2.8	86.1
Poultry	18.7	21.3	7.5	84.0	1.3	33.0	1.8	12.7	2.5	34.5
Potatoes	7.7	No Quota	110.5	0.0	233.3	No Quota	57.1	No Quota	24.4	No Quota
Maize	59.4	87.3	65.3	84.4	63.8	98.2	7.3	182.5	4483.3	No Quota
Rice	275.6	84.0	1372.0	102.1	320.6	15.7	34.8	110.9	41.1	56.9
Milk	83.7	1.8	19.0	3.2	53.9	1.9	12.9	487.7	4.6	48.5
Butter	100.0	10.7	25.0	12.3	100.0	5.4	0.0	196.0	0.0	41.4

Source: Faostat (2004) and own calculations.

Agricultural Safeguard. DR-CAFTA includes a special agricultural safeguard to provide temporary protection against import surges of selected sensitive products. The safeguard is activated automatically if import quantities surpass pre-specified levels. If activated, an immediate tariff increase to pre-agreement (MFN) levels is allowed in the early years of implementation, and to gradually declining levels for the ulterior years. The agricultural safeguard cannot be in force for more than four years and can only be used once for most sensitive crops listed in the agreement during the transition period.⁶

Sanitary and Phytosanitary Measures. The parties agree to apply the science-based disciplines of the WTO Agreement on Sanitary and Phytosanitary (SPS) Measures. An SPS working group will expedite resolution of technical issues and contribute to the dissemination of the regulations and procedures applied in the U.S. but affecting agricultural and food products, which we believe can contribute to rural and national development in Central America. During negotiations, a working group on these matters aided Central Americans in resolving problems to meet standards required to enter the U.S. market and commitments were made for the continuation of technical assistance from U.S. sanitary and agriculture agencies.⁷

Agricultural export subsidies. Although much public attention was paid to large U.S. production and marketing subsidies during DR-CAFTA negotiations, no significant commitments were made by the U.S. in this area, consistent with its policy to negotiate this issue only in the context of global trade negotiations at the WTO. DR-CAFTA includes the

⁶ The treaty specifies that these safeguards expire after tariff protection is phased out but allows for its extension, if all parties agree.

⁷ The U.S. is committed to resolve delays in food inspection procedures for meat and poultry products from Central America. Another example is the schedule that Honduras obtained from the U.S. for the resolution of sanitary issues that affect exports of poultry, dairy products, tomatoes and peppers, as well as technical assistance to strengthen institutions in the sanitary and phytosanitary area. Nicaragua is receiving help in solving sanitary and phytosanitary problems for exports of cheese, papaya, pitahaya, peppers and tomatoes. Costa Rica obtained guaranteed access of ornamental plants over eighteen inches in height, more flexible sanitary treatment for some of its flower exports. Progress was also made in the recognition of its poultry inspection system. These changes are expected to have significant impacts, e.g. in the case of Costa Rica's ornamental plants, producers have estimated that this may increase their export earnings by 50 percent just by exporting taller rather than shorter plants.

commitment by all parties not to subsidize exports to each other's market, except to compete with third party export subsidies.

Performance requirements. Imports of some sensitive products will be subject to performance requirements (e.g., agreements by importers to purchase a share of the local crop during the phase out period). This is the case of pork, rice, white and yellow corn in El Salvador, and rice in Costa Rica and Honduras.

Sugar. Although excluded from the final tariff elimination commitment by the U.S., DR-CAFTA includes a pledge to double the zero-tariff import quota of sugar from Central American nations, from 99,000 metric tons in the first year to about 140,000 over fifteen years (Table 3).⁸ While this keeps imports from the region below 1.7 percent of total U.S. consumption, it will provide greater revenues for Central American producers, who will be able to increase sales in the U.S., where import prices have been almost 200 percent above those prevailing elsewhere.⁹ The new market access will mean that Central American countries will double the share of current production that is exported to the U.S. from an average of less than 4 percent to about 8 percent.

Table 3: Sugar Imports to the U.S. from Central America

Country	Avg. Imports	Additional Quotas	
	2000-2002	Year 1	Year 15
Guatemala	58.9	32.0	49.8
El Salvador	30.5	24.0	36.0
Nicaragua	17.8	22.0	28.2
Costa Rica	15.8	13.0	15.8
Honduras	9.6	8.0	10.2
Total	132.6	99.0	140.0

Source: USTR.

Evaluation

In agriculture, DR-CAFTA provides significant gains in market access for all parties. It consolidates current CBI access to Central American exporters, introduces some flexibility to current non-tariff barriers and includes commitments to provide technical assistance in overcoming sanitary hurdles for nontraditional agricultural exports. The latter commitment is critically important for Central American producers interested in exporting into the U.S. market, as lack of adequate information and to effective procedures to remove these hurdles has been identified as a major obstacle to new exports in the past (Monge, Loria and González-Vega, 2003).

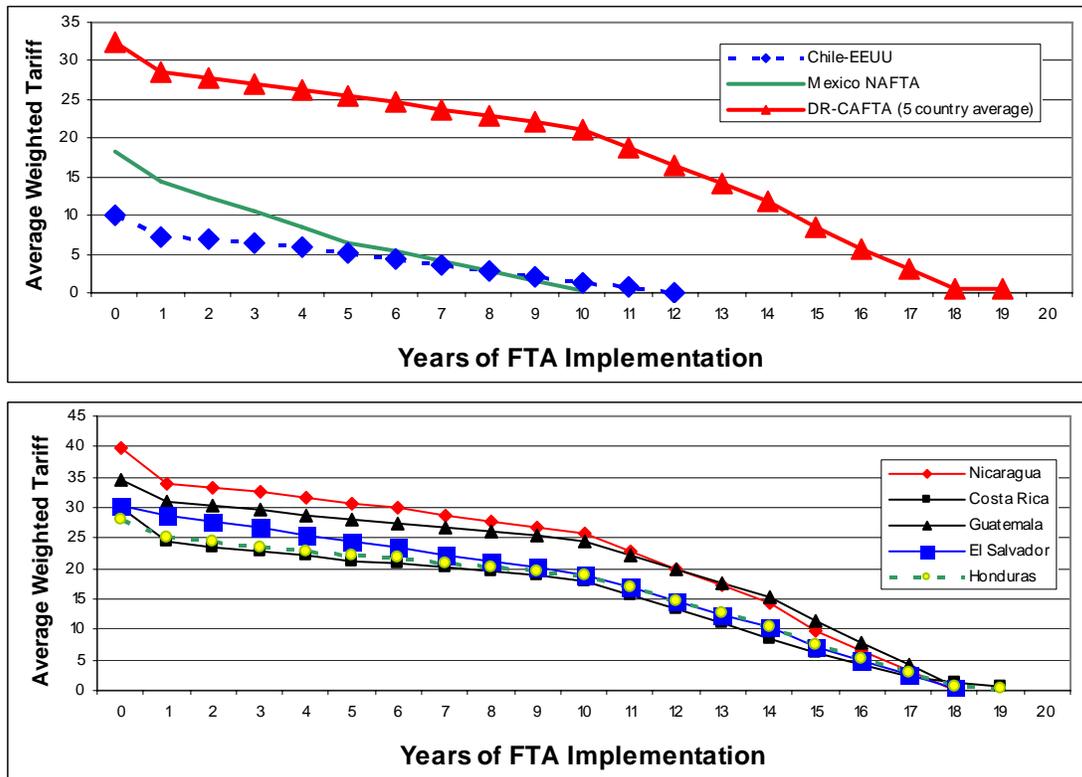
DR-CAFTA will also commit Central American countries to gradually eliminate remaining protection in products that had proven resistant to liberalization efforts in the past. Our

⁸ Costa Rica's quota includes 2,000 metric tons of organic sugar.

⁹ Article 3.15 of DR-CAFTA gives the U.S. the right to unilaterally compensate Central American exporters in lieu of allowing the quota obligations to enter duty free.

impression is that skillful negotiators on all sides achieved a delicate balance between pressures to prolong adjustment periods and provide safeguards for import-competing products and market access for Central America’s nontraditional agriculture. A comparison of the treatment afforded to Central American sensitive commodities with other U.S. free trade agreements suggests that they may have obtained comparatively the highest tariffs and longest periods, a likely result of the fact that agriculture accounts for a larger share of the economy and employment in Central America (Figure 1).¹⁰ This will benefit farmers and laborers engaged in the production of sensitive crops, but it will limit gains for consumers – including the majority of the poor -- who will not see potentially more rapid declines in prices of key components of the food basket. While the exceptions granted in sugar, maize, potatoes and onions respond to strong political factors, they will impede trade and the most efficient deployment of resources in Central America and the U.S.

**Figure 1: Weighted Tariffs for Sensitive Agricultural Items
– U.S. FTAs: NAFTA, Chile and DR-CAFTA***



* Tariffs weighted by each sensitive item’s contribution to agricultural GDP.

Source: Tejada and Jaramillo (2005).

From the point of view of domestic reforms in Central American nations, DR-CAFTA provisions for the most part lock-in current agricultural trade policies, and in the future will

¹⁰ See Arce and Jaramillo (2005) for a discussion of the significance of sensitive agricultural activities in rural employment and in the value added of overall agricultural output. They find that sensitive crops are very heterogenous on both counts. Corn (especially, white corn) is important for employment in Guatemala, Honduras and Nicaragua, but not too significant in El Salvador or Costa Rica. Beans are important in Honduras and Nicaragua, but of lesser relevance for employment and overall production elsewhere.

provide for greater liberalization by setting deadlines and firm commitments to move to freer trade for the bulk of agricultural goods.

On the issue of U.S. farm subsidies, it is unfortunate that no commitments were included in DR-CAFTA, as it is well known that these types of policies continue to create significant distortions in some key global markets (World Bank, 2002; Anderson, 2004). World Bank studies have shown that the elimination of these interventions would be favorable for the reduction of poverty on a global scale, mainly due to the positive effect on the income of farmers and farm laborers in countries with large exporting potential in activities such as grains, oilseeds, cotton and dairy products. However, these studies also warn that increasing food prices would represent welfare losses for consumers, and that food importing countries that have limited capacity to become exporters at low cost would lose from the removal of these subsidies (World Bank, 2002). Argentina and Brazil would be among the most likely winners in Latin America, while net food importers such as the small island nations of the Caribbean and some Central American countries would stand to lose from this policy change (De Ferranti et al, 2005).

Manufactures

Market access: Commitments to include all manufactures in duty free commitments imply a consolidation and some improvement over CBI benefits for Central American countries. Tariffs will be eliminated for a few products that had been explicitly excluded from CBI preferences such as canned tuna, shoes, jewelry and hooks.

Tariff elimination: In contrast to agricultural goods, the vast majority of manufacturing tariffs will be eliminated upon entry into force of DR-CAFTA. There are some items that will undergo reductions in phase-out periods of 5 to 10 years. Once again, Central Americans placed more tariff lines in the gradual elimination categories, in response to considerations of so-called “asymmetries” between the U.S. and the developing countries of Central America. As a result, the U.S. will liberalize 99.8 percent of manufacturing products upon entry into force of DR-CAFTA, with only 19 Central American goods facing a 10 year gradual phase out of tariffs into the U.S. market. By contrast, about 80 percent of U.S. manufacturing exports will enter Central American countries duty free immediately. While 9 percent will be subject to a five year phase out, 9 percent to 10 years and 4 percent to a 12-15 year schedule. Transition periods were obtained by Central American negotiators for some sectors that asked for time to prepare for competition with the U.S. (e.g., beer, water, rum and wheat flour) as well as for some items that generate significant fiscal revenues (such as imports of vehicles for Honduras).

Tariff-Rate Quotas. Immediate market access for products included in phase-out categories is provided through the creation of tariff-rate quotas that grow in time.

Rules of origin: A large number of manufacturing products are subject to special rules of origin. While a careful evaluation of such provisions exceeds the scope of this chapter, DR-CAFTA takes, in general, a much more flexible approach than NAFTA (e.g., in the area of steel products, steel need not be produced in the region in order for the product to be a

qualifying good). Also, special provisions will allow for “co-production” arrangements, in which different stages of production of inputs or final goods can take place in the U.S. or Central American countries. The special case of apparel and textiles is treated separately, as complex rules of origin requirements have been the instrument of choice to maintain trade restrictions.

Safeguards: A safeguard provision is included to avoid the disruptive effects of sudden surges in imports. These safeguards can be invoked during the first 10 years of application of the treaty for manufactures (15 years for agricultural goods not subject to the special agricultural safeguard).¹¹ The safeguard can be invoked as long as total imports of the product surpass current import levels by at least 3 percent, reinstating current tariff levels temporarily for up to four years.

Antidumping: DR-CAFTA allows countries to maintain their rights derived from the WTO’s Antidumping agreement. In addition, the U.S. vowed to continue to extend the preferential treatment afforded to Central American countries under CBI for antidumping investigations in the U.S.

Dealer agreements: DR-CAFTA includes commitments from four countries with existing dealer protection laws – Costa Rica, the Dominican Republic, El Salvador, and Honduras – to revise their legislation to eliminate compulsory exclusivity of distribution of imported products from the U.S.¹²

Evaluation

DR-CAFTA consolidates and expands the access that Central American exporters enjoy today under CBI preferences for manufactures. From the point of view of Central American reforms, DR-CAFTA provisions for manufactures lock-in current trade policies and broaden them to apply to some sensitive items, after transition periods.

The elimination of all duties by all parties and the inclusion of products that had been excluded from CBI preferences should improve trade prospects and resource allocation. It is more difficult to evaluate the impact of the many sector-specific rules of origin. In some cases, these provisions are likely to continue to pose significant barriers of entry to the U.S. market, as has been shown by several Bank studies including “Lessons from NAFTA” (World Bank, 2005). In others, Central American negotiators obtained special treatment that should facilitate trade. Given the importance and complexity of the textile and apparel provisions, a review of changes in rules of origin is included below.

¹¹ A special safeguard for the case of textile and apparel is also contemplated, although its use is restricted to the first five years after entry into force of the agreement.

¹² Dealer protection laws have been a longstanding source of friction between U.S. exporters and some Central American nations, as they are perceived as locking foreign companies into costly exclusive and permanent relationships with local distributors, regardless of the latter’s performance. In some cases they have been used to ban imports of U.S. products when disputes have arisen with a local distributor, adding to perceived risks of trading in Central America.

Apparel and textiles (“*Maquila*”)

In textiles and apparel, DR-CAFTA expands CBI treatment (as reflected in the Caribbean Basin Trade Partnership Act of 2000 known also as “NAFTA Parity”) by including some flexibility in the rules of origin that should allow zero duty entry to the U.S. for a broader set of products. A number of features of DR-CAFTA will facilitate goods to qualify for duty free treatment: unlimited use of regional inputs, flexible short supply lists, accumulation of origin with regional partners, exceptions for specific types of apparel, and temporary quotas for goods that do not need to meet strict rules of origin for Costa Rica and Nicaragua.

Regional inputs. DR-CAFTA provisions grant duty free treatment to apparel made from regional (knit or woven) fabric using yarn produced in the region (known as the yarn forward rule). This treatment contrasts with the latest CBI legislation (CBTPA approved in 2000) which had only allowed duty free and quota free treatment for goods made in Central America from U.S. inputs, and duty free entry for some goods that used regional fabrics and yarns but under quantitative restrictions.¹³

Accumulation. The treaty allows for the accumulation of origin from Mexico and Canada as well as the Central American parties to the agreement. This means that inputs from these countries will count as domestic inputs (those from Mexico and Canada subject to quantitative limits) for minimum content requirements.

Short-supply. A list of accepted “short-supply” inputs (those which can be sourced from third countries without losing the zero duty status) was expanded and the process to request inclusions of additional inputs to the list was streamlined.

Exceptions for selected products. Less restrictive rules of origin were negotiated for selected products such as bras, boxer shorts, pajamas and sleepwear, and textile luggage. For these products, the use of fabric made in third countries will be accepted as long as “substantial transformation” (i.e., cutting and sewing) takes place in a Central American country.

De minimis. The share of third party content that may be allowed in garments (known as the “de minimis” rule) was increased from the level currently applied under CBI (7 percent) to 10 percent in DR-CAFTA.

Temporary quotas. Two Central American countries obtained temporary quotas (known as TPLs) with less restrictive rules of origin. Nicaragua was awarded a temporary quota which exempts apparel exports from all rules of origin requirements.¹⁴ The quota amount is for 100 million square meters equivalent (about 75 percent of its current use of third party inputs) and will be in force for the first five years of the treaty, to be eliminated gradually during the following five years. Costa Rica also obtained a two year TPL for 500 thousand squared

¹³ Only knit apparel was allowed under the regional inputs quota.

¹⁴ Press reports and interviews with negotiators revealed that the quota obtained by Nicaragua was awarded due to its low level of economic development and the incipient status of its *maquila* industry.

meter equivalent for woolen apparel that would enter the U.S. free from rules of origin restrictions at a tariff level equivalent to 50 percent of that applied for most favored nations.¹⁵

In addition, liberalization commitments included in DR-CAFTA may be retroactive to January 1st 2004 only for the case of textiles and apparel. This means that Central American exporters of these products will be able to obtain a refund for duties paid while DR-CAFTA is ratified by legislatures. The purpose of this concession is for Central American countries to begin to capitalize on DR-CAFTA immediately, attracting new investments and allowing some time for the industry to prepare for the upcoming end of the global textile quota regime in early 2005.

Of particular interest to the *maquila* sector were the provisions related to export processing zones and duty drawbacks. DR-CAFTA provisions did not include commitments on significant changes to these instruments, aside from ratifying the need to comply with broader WTO obligations. For the higher income countries of Central America (Costa Rica, El Salvador and Guatemala), WTO pledges will require them to dismantle fiscal subsidies implicit in export processing schemes starting in 2009.

Evaluation

DR-CAFTA provisions on textile products effectively relax some of the current non tariff barriers implicit in rules of origin requirements that apparel and textile exports from Central America face under CBI. Once DR-CAFTA is ratified, Central American exporters will benefit from the most flexible set of market access conditions that any country enjoys into the U.S. for this sector. However, it should be said that access conditions are still restrictive in comparison to those granted in virtually all other sectors of manufacturing.

The new rules have been seen as a potential boom to regional suppliers of fabrics, yarns and other key inputs and may induce Central American exporters to forge new links with suppliers in Mexico and Canada. Given the dearth of regional supplies of textile inputs, DR-CAFTA provisions may contribute to attract the establishment of textile mills in the region. While all of this may favor exports of Central American apparel in the short run, it may also be extending implicitly the protection prevailing in U.S. markets to regional suppliers of inputs, which may not be necessarily competitive in world markets and could be subject to future adjustment costs in a sector where global liberalization trends are likely to continue. In the short run, the retroactive nature of the agreement and the flexibilization of rules of origin should allow firms based in Central American countries to gain an edge in a more competitive environment in the U.S. market as a result of the end of global quotas in 2005. In the medium and long run, strong competition and the likely erosion of trade preferences imply that countries will need to increase their productivity and rely on a sound overall investment climate to attract further investment in this sector.

¹⁵ This TPL could be extended beyond the original two years.

3. Services

In services, DR-CAFTA breaks new ground in the relationship between Central American countries and the U.S. since current CBI legislation did not contain significant commitments in most of the areas included in this chapter. In discussions and interviews with the authors of this report, policymakers and specialists from Central America have expressed optimism in the sense that these aspects of the treaty should boost the credibility of the reforms of recent years that opened provision of most services to private operators, including those from abroad.

DR-CAFTA includes commitments which apply to a long list of service sectors (exceptions are included in country-specific negative lists), including financial services, telecommunications, professional services, distribution, tourism, express delivery, computer and related services, audiovisual and entertainment, energy, transport, construction and engineering, advertising and environmental services. In addition, the agreement contains disciplines in the area of e-commerce, an area that most Central American countries had not included in previous FTAs. While a thorough evaluation of the implications for each one of these sectors is beyond the scope of this paper, this section provides a broad evaluation of implications for market access and domestic reform.

The commitments in services concentrate on securing the non-discrimination of firms from partner countries in market access and in the application of domestic regulations. Since all Central American countries and the U.S. currently grant broad non discrimination status between domestic and foreign firms for access to most domestic service markets, as well as non discrimination in their regulations, DR-CAFTA consolidates the status quo by locking-in the reforms undertaken in recent years to open sectors to private participation. Only for the notable case of Costa Rica, significant legislative reforms will be required in order to comply with obligations in the telecom and insurance markets (See Box 1).

In addition, DR-CAFTA spells out strong commitments to transparency in regulatory processes. Regulatory authorities are required to use open and transparent administrative procedures, consult with interested parties before issuing regulations, allow for comment periods for proposed rules, provide advance notice before the entry into force of new regulations, and publish all regulations. While several of these rules have been applied in Central American countries, for some countries and some service sectors, it will require significant upgrading in the process of consultation and application of regulatory decisions. However, these improvements in the transparency of regulations in Central American should contribute to strengthening the investment climate.

Some of the specific service sector commitments include:

- *Financial services (banking, insurance, securities):* Due to the complexities of the sector, a separate chapter in DR-CAFTA was negotiated to deal with financial services. The chapter centers on granting providers of these services non-discriminatory rights to establish branches, subsidiaries, and “sociedades anónimas” while preserving the right of domestic regulators to apply prudential measures to ensure the security and stability of the financial system. The chapter also includes provisions on transparency of domestic

regulatory regimes. U.S. based firms also gained the possibility of offering cross border services in areas such as financial information and data processing, and financial advisory services, while Central American mutual fund managers will be allowed to use foreign-based portfolio managers. For the case of insurance, Central American (except for Costa Rica) countries committed to allowing access through branches within four years. In addition, Central American countries opened their markets to U.S. based firms for the supply of insurance services on a cross border basis for a limited number of risks (e.g., reinsurance; reinsurance brokerage and marine, aviation and transport insurance).

- *Telecoms*: the agreement provides for non-discriminatory access for users to public telecom networks, providing the right to U.S. firms of interconnecting at nondiscriminatory, cost based rates (as in the Chile FTA). Commitments allow for current concession rights to private providers to continue until their expiration, such as Enitel in Nicaragua.
- *Professional services (architects, engineers, accountants)*: An issue of debate during negotiations was temporary entry of professionals and procedures for assessing their qualifications.¹⁶ Some Central American nations pledged to remove some local residency requirements for the exercise of some services. The agreement includes reciprocal recognition of domestic procedures and institutions that grant degrees and authorization to exercise a profession.
- *E-commerce*: The agreement recognizes that services can be supplied through electronic means and binds the parties to uphold the non-discriminatory treatment of digital products (software, music, videos, text), not to impose customs duties on digital products and to cooperate on numerous policy areas related to e-commerce.

¹⁶ The issue of the temporary entry of business employees was discussed during the negotiations but minimum annual visa numbers similar to those negotiated by the U.S. with Chile and Singapore were not agreed, due to strong opposition of these provisions in the U.S. Congress.

Box 1: Costa Rica's commitments in telecoms and insurance

Costa Rica did not open its telecommunications and insurance sectors to private competition in the 1990s, as most other countries in Latin America did, keeping both under the control of strong state-owned monopolies. An attempt to allow for competition in the provision of telecom services in the late 1990s was aborted due to strong public sentiment against the proposal. With DR-CAFTA, Costa Rica will commit to introduce competition to state agencies.

Telecommunications: Costa Rica pledged to undertake a partial and gradual opening of its telecom sector, specifically in three areas – private network services, Internet services, and wireless phone services. The process of opening will need to comply with the principles of “universality” and “solidarity” in the supply of these services, meaning that plans will need to be designed to facilitate inclusion of rural and disadvantaged segments of the population. Costa Rica committed to approve legislation for the modernization and strengthening of the local telecom company (originally by December 2004, although approval has been delayed), and to have in place modern regulatory norms and a regulatory authority by January 1st 2006. Private network services will be open to competition by January 1st 2006 while wireless services by January 1st 2007.

Insurance: Costa Rica also committed to allow private competition in its insurance market. The establishment of a modern regulatory framework, including a supervisory agency, is planned for 2007. The majority of the sector would be open by January 1st, 2008 with universal access to private providers in all lines of insurance by January 1st, 2011.

4. Other provisions

The remainder of the legal agreements of DR-CAFTA focus on commitments on disciplines that cover a wide range of issues, most of which Central American countries had not included in previous trade agreements. In this section we provide some summary observations of the content of each of them and evaluate them briefly for their potential for strengthening the credibility of domestic regulations.

Investment protection

DR-CAFTA grants reciprocal non-discriminatory rights to investors from signatory parties to establish, acquire and operate investments on an equal footing with local investors, unless specifically stated otherwise. The chapter deepens the commitments that Central American countries have made at the WTO and to one another in the area of investment protection. All forms of investment are protected under the agreement, including enterprises, debt, concessions, contracts and intellectual property. Investors receive protection under DR-CAFTA for due process as well as the right to receive a fair market value for property in the event of an expropriation. The agreement also includes impartial procedures for dispute settlement and explicit commitments to free and expeditious transfers of profits, subject to non-discriminatory domestic regulations on the financial sector and the protection of creditor rights.

Evaluation

This chapter of DR-CAFTA locks-in legal rights of U.S. investors which were already recognized by non-discrimination norms throughout Central America, and many of which had been locked in by Bilateral Investment Treaties that some of the countries had signed in

previous years with the U.S. Non discrimination, stable rules, and compensation for expropriation are important internationally recognized rights for investors. The consolidation of these rights should send a strong signal of improvement in the investment climate.

Intellectual property rights

DR-CAFTA provisions in the intellectual property rights chapter includes commitments related to improving intellectual property rights (IPRs) protection and granting firms non-discriminatory treatment. Three types of commitments are included. The first is the obligation to ratify a number of international agreements dealing with trademarks, patents, satellite TV, trademarks, newly developed plant varieties and other IPR issues.¹⁷ The second is the establishment of minimum standards for protection in the areas of brands, geographical indications, Internet domain names, author's rights, satellite signals and patents – including the expansion of copyright protection from 50 to 70 years. The third is the application of procedures and resources for the enforcement of IPRs, including the criminalization of end user piracy. For the most part, commitments in this area imply obligations that apply generally, and not just to nationals of the signatory countries. Some of the key commitments include:

In the area of patents, significant obligations include the automatic extensions of patents in case of delays in processing of patenting submissions as well as non-disclosure of confidential and sensitive information used for patent purposes (i.e., test data and trade secrets) with terms of 5 years for pharmaceuticals and 10 years for chemicals. In the sensitive areas of pharmaceuticals, DR-CAFTA preserves the rights of governments to use compulsory licenses and parallel imports for pharmaceuticals, on any grounds (as provided by the TRIPS agreement) including for public health emergencies such as HIV-AIDS. In addition, no obligations were developed in relation to the patenting of diagnostic, therapeutic and surgical methods or for the recognition of patents for second uses of previously patented pharmaceutical products. However, difficult as it is to ascertain the overall costs and benefits of these IPR reforms, our view is that the previous two provisions should help reduce the risk of rising prices of medicines to deal with pressing public health concerns.¹⁸

¹⁷ Countries must adhere by the 2008 deadline the following treaties: the International Treaty for Patent Cooperation, the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, the agreement for the Brussels Convention Relating to the Distribution of Programme-Carrying Signals Transmitted by Satellite (1974) and the Trademark Law Treaty (1994). In addition, countries must make efforts to ratify the Patent Law Treaty (2000), Hague Agreement Concerning the International Deposit of Industrial Designs (1999), and the Protocol Relating to the Madrid Agreement Concerning the International Registration of Marks (1989). For protection of new plant varieties, countries are obligated to ratify the UPOV 1991 treaty.

¹⁸ The provisions protecting test data information for at least five years are perhaps the most ambiguous for us to evaluate a priori. On the one hand, allowing the use of test data for domestic production of medicines can reduce the prices of products not yet available in the U.S. On the other hand, there might be consumer and public-health gains to be had from restricting access to information that might lead to the production of products for yet unauthorized medicines. The existing empirical literature on IPRs is not detailed enough to answer this type of question.

Box 2: Controversies in protecting the rights of investors in FTAs

Some controversy has surrounded the chapters on investment protection in recent free trade agreements. While there is consensus that attracting investment and providing stable rules for investors are positive, critics hold that treaties give foreign investors excessive privileges. However, Central American countries have already incorporated these commitments in other FTAs and Bilateral Investment Treaties; hence, DR-CAFTA does not really impose “brand new” obligations to Central American countries. Some of the key controversies in this front include:

- Investors’ rights and public interest. Critics contend that FTAs extend rights to investors to use international arbitration panels to revoke local regulations, even if these are enacted for legitimate public interest objectives, including public health, safety and environmental protection. NAFTA’s Chapter 11 has been often criticized in this vein. DR-CAFTA’s Annex 10-C.4 (b) was drafted to address this issue by exempting most regulatory actions that are designed and applied to protect legitimate public welfare objectives, such as public health, safety, and the environment from being deemed “indirect expropriations” – the source of most disputes in the NAFTA experience.
- Dispute settlement. Critics charge that the tribunals allowed under FTAs to resolve disputes allow investors to bypass domestic judiciary systems. However, the use of international panels has become commonplace for disputes with international investors, as local judiciaries have often been perceived as more easy to influence by domestic concerns. In response to criticism, newer FTAs (including DR-CAFTA) are including the creation of an appellate body to review decisions of individual panels.
- Performance requirements. Investments provisions explicitly prohibit governments from imposing requirements on foreign investment, such as commitments to export certain volumes, minimum usage of local inputs or compulsory technology transfer. Such requirements were commonplace in the past in many Latin American countries but were eliminated by the WTO’s Trade Related Investment Measures (TRIMs) agreement, which eliminates most performance requirements in the area of goods. DR-CAFTA introduces the prohibition of some performance requirements in services.
- Destabilizing Capital Flows. The U.S. has pressed in its FTAs for provisions that limit the ability of governments to curtail the movement of short-term capital flows. This has been subject to debate because speculative short-term outflows have been linked in the past to certain types of balance of payments crises. While the issue remains controversial, many studies suggest that monetary authorities should retain some powers to halt, even if temporarily, short term debt or investment flows to prevent herding behavior and macro destabilization. This issue has not been a strong concern in Central America, where significant flows of short term capital flows have not occurred.

Evaluation

DR-CAFTA commitments in the area of IPR are similar to those included in other recent U.S. free trade agreements and, similarly, go beyond several multilateral standards on intellectual property (Fink and Reichenmiller, 2005). These commitments will lock-in some recent upgrading to Central American IPR legislation but will also require significant modifications to legal frameworks, mainly through the adherence to a number of international treaties. Most importantly, DR-CAFTA will require more strict enforcement of IPR norms.

Enforcement of IPR might be important for two reasons. First, because complaints and disputes with holders of intellectual property rights (e.g., television broadcasters, owners of videos and compact disks, books) could send negative signals to investors about overall respect for the rule of law in the country and weakens the investment climate. Second,

because investors interested in development of important sectors (e.g., high technology, software, pharmaceuticals and agrochemicals) will look for environments where their rights are enforced in order to consider new ventures.¹⁹ With DR-CAFTA, non compliance with IPR commitments will be subject to dispute settlement provisions which could eventually lead to monetary fines. Central American nations will need to improve their capacity to enforce IPR commitments, including substantial institutional strengthening of relevant agencies.

In controversial areas, such as the impact of more stringent standards (TRIPs plus) for protecting pharmaceutical patents, no methodologies have yet been developed to evaluate the welfare impacts of these types of commitments – especially if we consider gains from other aspects of the FTA. While greater IPR protection usually means restrictions on the use of generic drugs, the treaty seems to provide flexibility for government's to bypass the usual protections in order to protect public health, through compulsory licensing and the option of parallel imports.²⁰

Labor and environment

DR-CAFTA includes chapters on labor and environment, as mandated by the authorization given by the U.S. Congress to the executive branch. The inclusions of such provisions have generated heated public debate about whether they should be included in FTAs and whether they can be effectively used to improve standards in developing countries.²¹

CAFTA commits all signatory countries to enforce current domestic labor and environmental laws and regulations. While respecting sovereign rights to modify its legislation in these areas, it bans the relaxation of labor or environmental regulations to encourage trade and investment. Obligations are subject to the dispute settlement provisions of the agreement and could eventually lead to monetary penalties (maximum of US\$15m) which would then be used by the offending party to strengthen its enforcement capacity.²²

Parallel agreements were reached to establish a cooperative program to improve labor laws and enforcement, in cooperation with the International Labor Organization. The office of the U.S. Trade Representative has announced programs to build the capacity of Central American nations to monitor and enforce labor rights through specialized consultations and targeted

¹⁹ Fink and Maskus (2004) provide a comprehensive review of empirical evidence on the links between IPRs, trade, FDI and technology transfer.

²⁰ Fink and Reichenmiller (2005) have highlighted the need to analyze further the difficulties that would be faced in granting compulsory licenses, related to regulatory permissions and test data exclusivity, as well as those associated with parallel imports.

²¹ Recent studies suggest that their inclusion is unnecessary as firms engaged in trade are those in which labor and environmental regulations tend to be followed (Stern, 2003).

²² For monetary penalties to be required, non-compliance needs to have an effect on trade or investment, and several stages of consultation and dialogue with labor and environmental authorities need to be exhausted before the dispute settlement rules can actually be activated. A contracting party will first need to require technical consultations in case of a complaint. If differences are not solved at that level, consultations can be elevated to the Environmental Affairs Council. If the complaint is not resolved at this level, the dispute resolution mechanisms can be activated, calling for arbitration by experts. If the panel of experts agrees with the complaint, governments can face monetary penalties for maximum of US\$15m which would then be used by the offending party to strengthen its enforcement capacity.

training programs in the areas of child labor, public awareness of worker rights and labor inspection systems (USTR, 2004). DR-CAFTA includes an annex of Labor cooperation which defines cooperation priorities and financing. The U.S. committed \$6.7 million for the first year to support to improve administrative capacity of the DR-CAFTA countries in labor matters.

The environmental chapter includes an environmental cooperation agreement that provides a framework for capacity building (including strengthening the capacity to develop, implement and enforce environmental laws) and establishes an Environmental Cooperation Commission. The agreement includes a commitment for frequent consultation mechanisms between the parties to evaluate compliance with DR-CAFTA obligations. The treaty goes beyond provisions included in the recent treaties between the U.S. and Chile and the U.S. and Singapore in allowing for a public submissions process to ensure that views of civil society are considered; envisions benchmarking of environmental cooperation activities and input from international organizations in evaluating progress; and enhances the mutual support of DR-CAFTA and multilateral environmental agreements (USTR, 2004). In addition, the agreement makes explicit reference to the right of member countries to protect and conserve genetic resources.²³

Evaluation

DR-CAFTA will in effect lock-in key features of current labor and environmental laws and regulations for the first time for most Central American countries through an international treaty.²⁴ The obligations under DR-CAFTA are unlikely to require significant changes in current legislation but are likely to lead to pressures to upgrade enforcement, particularly in exporting sectors. While these sectors have been identified in the past as those in which labor and environmental regulations seem to be respected (Stern, 2003), overall institutional strengthening is likely to improve enforcement efforts in all areas of the economy. This should boost the investment climate by demonstrating a strong commitment to the rule of law. For the case of *maquilas*, labor provisions will be critical in addressing past criticism related to cases of violations of basic worker rights and should diminish pressure from sporadic international boycotts. Nonetheless, Central American countries will likely require resources and technical assistance to boost the enforcement of current norms, along the lines of the action plans included in the “White Book” drafted by Trade and Labor Ministers and supported by the ILO and other international organizations.

²³ See article 15.1.5.a of DR-CAFTA, which states that signatory parties understand that there are no contradictions with adherence to the 1991 UPOV treaty and the rights of countries with respect to protection and conservation of genetic resources.

²⁴ Costa Rica included a parallel agreement on labor in its FTA discussions with Canada. The agreement also commits Costa Rica to uphold its legislation and prohibits relaxation to favor trade or investment. A parallel environmental agreement was also included with similar commitments.

Government procurement and corruption

DR-CAFTA includes commitments for reciprocal non-discriminatory access of firms to public contracts, as well as commitments to improve transparency in procurement processes.²⁵ The agreement gives access to Central American firms to markets for purchases by federal and state governments while U.S. firms gain access to bids on contracts from Central American government ministries, agencies and departments. Low value contracts are excluded and applicable thresholds vary by country. The agreement requires fair and transparent procurement procedures, such as advance notice of purchases and timely and effective bid review procedures. In addition, strict guidelines are spelled out for when governments can resort to procurement methods other than open bidding. Costa Rica will be able to keep its programs for bidding in favor of small and medium enterprises. DR-CAFTA commits signing parties to make bribery in government contracting a criminal offense.

Evaluation

DR-CAFTA locks in part of the reforms of recent years to government procurement norms. The importance of fair and transparent procedures in government procurement is self-evident. Despite substantial reforms in recent years, accusations of corruption, and lack of transparency in public purchases continue to plague Central American countries. DR-CAFTA will contribute to strengthening the trend towards the application of transparent and efficient procurement methods, and reducing avenues for corruption. It is likely to require some administrative changes in processes to boost transparency and reduce opportunities for corruption.

²⁵ Commitments do not apply to purchases financed by loans and donations, hiring of public sector employees or sales of companies under liquidation.

Box 3: DR-CAFTA and government procurement

DR-CAFTA requires that listed entities (e.g., central government agencies, autonomous enterprises, municipal governments) use specific procedures when the value of the procurement is above the agreed thresholds and commits governments to ensure the application of those procedures. The agreement contains basic disciplines on non-discrimination, transparency, and due process. These disciplines specifically refer to: Publication of notice of intended procurement, Time limits for the tendering process, Tender documentation, Technical specifications, Requirements and conditions for suppliers' participation in procurement, Tendering procedures, Award of contracts, Information on awards, Non-disclosure of information.

DR-CAFTA also establishes the obligation of the Central American governments to have operational a domestic review and challenge mechanism. This is an impartial authority that acts to preserve the supplier's opportunity to participate in procurement and to ensure that governments comply with their implementing measures. These measures require an effective procedure by which interested parties can bring complaints, initially, to the head of the procuring entity and, in the second instance, to the responsible manager in government for public procurement to take administrative remedies to correct violations of the regulations

In addition DR-CAFTA incorporates specific commitments on non-discriminatory market access (foreign suppliers of goods and services must be allowed the same treatment as domestic suppliers). DR-CAFTA's scope is limited to the entities listed in the agreement's annexes, including entities at the central, local and decentralized level when applying national budget funds. For example, in the case of Honduras, the rules apply to 169 government entities:

Honduran Entities subject to DR-CAFTA Requirements

Central level	Municipalities	Other Entities
16	142	11

The agreement establishes that where the value of the procurement is estimated to equal or exceed agreed threshold levels DR-CAFTA rules shall be applied. DR-CAFTA allows higher thresholds for the Central American countries for the first three years of the agreement; thereafter, all DR-CAFTA countries, including the U.S., will have the same thresholds. For the specific case of Honduras, DR-CAFTA will require modifications in national legislation, as all these thresholds differ substantially from those currently valid.

CAFTA's Thresholds for Goods and Services by Level of Administration (US\$)

Federal Level	= >58,550 =>117,100 *
Sub-Federal Level	= >477,000 =>650,000 *
Other Entities	= >250,000 =>538,000 ¹
For Construction Services. All levels	= >6,725,000 => 8,000,000*

* For Central American Countries for a 3-year-period.

¹ For specified U.S. entities

DR-CAFTA also incorporates a provision for "Ensuring Integrity in Procurement Practices." This provision establishes that each party shall have and maintain systems that list each entity that is ineligible to participate in procurement because it has engaged in past fraudulent or other illegal actions. The agreement also provides for the exchange of this information with other DR-CAFTA members. To comply with this obligation, Central American countries will have to create a database of suppliers disqualified by national procuring entities.

Source: DR-CAFTA text and World Bank, Honduras CPAR (2004).

Customs

DR-CAFTA includes obligations aimed at strengthening, improving and modernizing the operation of customs in order to facilitate trade among signatory parties. Provisions seek to facilitate customs procedures and reduce room for discretion. It includes rules of origin that are designed to be easier to administer. It also requires transparency, procedural certainty and efficiency in administering customs procedures, including DR-CAFTA rules of origin. Central American countries committed to a list of actions within three years to accomplish goals such as the publication of all norms and regulations in the Internet, the automatization of the clearance procedures, the electronic presentation of certificates of origin and the implementation of management and risk evaluation systems. All signatories also agreed to share information to combat illegal trans-shipment of goods. A program of technical assistance was agreed to support Central American countries in carrying out their commitments in this area.

Evaluation

Customs related issues have posed significant barriers to trade in Central America, due to complex and lengthy procedures, inefficiencies and opportunities for fraud and corruption. In many surveys conducted among private sector firms, complaints against customs procedures and officials usually top the list. The clarifications and simplifications of some procedures with respect to verifying rules of origin are of value but unlikely to be enough to end deep seated problems. Central American nations will need to push ahead with strong reforms (independent of DR-CAFTA) if they are to reap the full benefits of trade for development.

Dispute settlement

DR-CAFTA provides for all core obligations to be subject to a bilateral dispute settlement panel with high standards for openness and transparency. It includes monetary penalties to enforce commercial, labor and environmental obligations.

Evaluation

The dispute settlement section of any FTA is where key incentives are laid out for parties to get serious about compliance with provisions and strengthening domestic norms and institutions. DR-CAFTA sets appropriately high standards for openness and transparency in settlement procedures. While monetary penalties were included - a first for any FTA signed by Central American countries – they would only be used after long consultation periods and tests for non compliance. For Central American countries, having a reciprocal dispute settlement mechanism is a significant gain with respect to the CBI regime, in which no recourse was provided to unilateral actions by the U.S.

Trade capacity building

The agreement includes a Committee on Trade Capacity Building for the first time for any FTA involving the U.S. or any of the Central American nations. Also the creation of the

Institute for Trade Capacity Building, in New Orleans, which will focus on developing capacity for support programs for small and medium enterprises. In addition, a coalition of U.S. companies came together to support the creation and strengthening of trade capacity in Central America.

Evaluation

While it is too early to evaluate results of these provisions that have not been included in other U.S. free trade agreements, the Committee could be of use for the coordination of actions by donors, NGOs and the private sector for the improvement of institutional capacity, adjustment to new liberalization commitments and sensitive enforcement challenges.

5. Provisions to deepen regional integration

Central American countries took a momentous decision in making DR-CAFTA a treaty that would be applied multilaterally. Initially, it was thought that the treaty would be so markedly different to the norms that have governed trade among Central American Common Market members – aside from including many areas that are not included in that agreement – that it would only apply bilaterally between the U.S. and each Central American member, in what is known in the literature as the classic “hub-and-spoke” model. However, during negotiations it was agreed that the treaty’s commitments would be applied to trade and investment relations among all parties, including the Dominican Republic, as reflected in the agreement’s Article 1.1. This important decision should have great impact in a number of areas, most significantly in facilitating further trade and deepening regional integration efforts.

The multilateral application of DR-CAFTA will make more goods qualify for free trade between Central American countries than current norms.²⁶ Under DR-CAFTA all goods made with inputs from any of the parties of the agreement will qualify as meeting the rules of origin – in the Central American Common Market regime, input accumulation was not possible and inputs from the U.S. or the D.R. could not count towards meeting origin rules. In addition, DR-CAFTA disciplines will allow free trade in goods produced in Export Processing Zones, as long as they meet origin requirements. As pointed out by González (2005), firms will enjoy an expanded set of input sourcing options when producing for exports to DR-CAFTA members, reducing the distortions that are created by the existence of multiple parallel FTAs. However, to avoid confusion, it may be important to modernize some of the existing Central American instruments which are not superseded by DR-CAFTA, in order to ensure that they are consistent with the treaty and more up to date with recent international trends.

In addition, DR-CAFTA will not contribute to the “spaghetti bowl” syndrome associated with the administration of multiple treaties, particularly costly in terms of the administration of multiple sets of complex rules of origin regulations. Instead, it is likely to foster an atmosphere conducive to finalizing steps for a Customs Union between CACM members, a task which only requires a few additional administrative steps to ensure that imports into the

²⁶ Some of the arguments presented here draw from the excellent analysis of the application of DR-CAFTA among Central American countries and the Dominican Republic of González (2005).

region can stop only once at the port of entry into the region, and then proceed to move freely across the region's borders.²⁷

Multilateral application of DR-CAFTA also deepens regional integration efforts. The over forty years of history in such efforts among Central American nations had yielded a very advanced set of rules for trade in goods. Yet virtually no legal instruments exist for applying a common set of norms among Central American countries in the other areas of commitments included in DR-CAFTA.²⁸ DR-CAFTA will now provide modern rules and disciplines for relations among Central American countries and the Dominican Republic in the areas of trade in services, investment protection, and government procurement – including financial services, telecoms and e-commerce.²⁹ Moreover, it will allow the use of dispute settlement mechanisms in novel areas such as IPR, labor and environment. The new regional rules and disciplines are likely to strengthen regional ties and set the stage for even deeper integration efforts among Central American countries and the Dominican Republic in the future.

6. Conclusions

This chapter provides an overview of the recently negotiated DR-CAFTA, concentrating on the extent to which the agreement's provisions would significantly change market access for Central American goods and services, and also on how far they could be expected to consolidate prior reforms and/or spur further domestic reforms in Central American countries. The overall assessment presented in the chapter is that, on both fronts, the answers are broadly positive, suggesting that DR-CAFTA should be expected to have a positive impact on trade flows and investment.

On market access, DR-CAFTA would consolidate and expand the current generous access that Central Americans currently enjoy to the U.S. market, while extending broadly reciprocal access for U.S. goods to their own markets. The benefits offered under the CBI would be locked in for Central American countries, and some additional permanent duty free access would be obtained for goods that had been previously exempted from CBI preferences. Other significant results would include the flexibilization of rules of origin for textiles and apparel, as well as commitments to help producers meet sanitary and phytosanitary standards required for the entry into the U.S. of promising non traditional agricultural exports. DR-CAFTA also includes reciprocal commitments on access to service markets, which consolidate domestic reforms that opened most of these markets to private participation in recent years.

Central American countries also agreed to grant reciprocal tariff-free access to their markets to U.S. products. Certain sensitive agricultural crops would be subject to extended transition periods (up to 20 years), in order to allow for gradual adjustment and to respond to domestic

²⁷ Arrangements would need to be made during the transition period to free trade for different tariff phase-out periods and for the specific country commitments that were made for tariff rate quotas in sensitive goods.

²⁸ Negotiations in recent years among Central American countries had yielded general texts for draft treaties on Investment and Services and on Government Procurement. Detailed country-specific annexes were still under negotiation when DR-CAFTA discussions started.

²⁹ In government procurement, Central American countries applied much stronger commitments to each other than they allowed with the U.S., by eliminating minimum thresholds or exemptions to any government agency in purchases of goods or services (González, 2005).

sensitivities. Central American countries secured access to flexible safeguard mechanisms to prevent sudden surges in imports or declines in prices.

Commitments embedded in DR-CAFTA would gradually erode current protection levels for various products that have retained high protection in Central American economies, during earlier efforts at easing trade restrictions in the past. The gradual decline expected in prices of basic food staples as a result should prove positive for the vast majority of Central Americans who are net consumers of such goods and whose welfare will be increased by lower prices. This said, not all sensitive products are included, in response to cultural and political factors, and these limitations – together with the agreement’s still excessively restrictive rules of origin for the entry of textile products to the U.S. – represent barriers to trade that will continue to foster some inefficiencies in the deployment of domestic resources both in the U.S. and Central America.

On the questions related to domestic reforms, DR-CAFTA commitments promise to lock in a number of the policy and regulatory changes implemented in recent years for the opening of competition in previously protected sectors (e.g., telecoms, financial services, energy) and the modernization of key norms and procedures in areas such as government procurement, intellectual property rights and the treatment of foreign investment, by locking in current levels of access of investors (and bidders) from the U.S.

Costa Rica is the only country that will be required to make significant legislative changes to adapt policies and regulations to its commitments under DR-CAFTA, allowing access to significant portions of its telecom and insurance markets. These reforms had been long postponed and should further foster the modernization, efficiency and competitiveness of these areas of the Costa Rican economy.

Aside from consolidating and spurring further reforms, the treaty should strengthen commitments to upgrade enforcement levels of domestic legislation. This represents a significant challenge in areas like labor, environment and intellectual property rights, which will require decisive efforts and resources to modernize and boost the capacity of public agencies. The net impact of these efforts should be positive, as investment is likely to be attracted to environments with effective institutions. However, while DR-CAFTA will put pressure on the modernization of these institutions, it will not by itself create such modernization. Countries will need strong independent plans of action and sufficient dedication of implementation capacity and resources.

The agreement includes cooperation accords to boost standards and enforcement levels in areas such as labor, environment, customs and other areas. It also offers proposals to develop further cooperation and “trade capacity building”, which should aid in the mobilization of human and financial resources required for key reforms and institutional actions required to implement the agreement and the broader developmental challenges.

Finally, a welcome side effect of the negotiation of DR-CAFTA has been the advancement of regional integration efforts. The decision to make the provisions of the agreement apply multilaterally among Central American countries and the Dominican Republic will deepen

regional integration efforts in the region and facilitate the creation of a Central American Customs Union.

Chapter IV. Economic Effects of DR-CAFTA: More Art than Science

Abstract

Estimating the effects of trade reforms is in general more art than science due to the need to use highly restrictive assumptions when applying various analytical methods. Standard analyses of the gains from trade suggest that these gains depend on the ability of economies to successfully adjust to changes in relative prices. This entails the restructuring of the economy. The international evidence suggests, however, that FTAs with the U.S. are associated with greater exports and foreign direct investment. There is also some preliminary evidence that FTAs are associated, on average, with transitory improvements in economic growth. But the benefits from DR-CAFTA will depend on the ability of Central American economies to pursue a complementary policy agenda, because DR-CAFTA by itself is unlikely to lead to substantial developmental gains without parallel efforts in institutional and regulatory reforms, infrastructure, and innovation and education.

1. Introduction

Like many Latin American countries, the economies of Central America that recently signed the Central America Free Trade Agreement (DR-CAFTA) underwent a period of dramatic trade reforms in the early 1990s. These reforms were implemented in an era when academics, political leaders, and various civil society organizations from throughout the globe were questioning the merits of trade liberalization. For example, Rodríguez and Rodrik (2000) criticized influential academic papers on the relationship between trade and economic growth on the grounds that the literature had not adequately addressed the key issue of measuring trade policy, as opposed to other factors that might affect the incidence of international commerce on national economies. In the public domain, traditional defenders of free trade are now questioning its benefits in the context of international capital flows (Roberts and Schumer 2004). In fact, a recent World Bank report on the impact of the North American Free Trade Agreement (NAFTA) concluded that this controversial agreement had been moderately positive for the Mexican economy, but that it was certainly not enough to spur fast long-term economic development in Mexico (Lederman, Maloney, and Servén 2005).

This chapter highlights various analytical arguments and their limitations in favor of trade reforms and contrast them with the findings of various analyses undertaken to assess the potential impacts of the DR-CAFTA on the developing countries of Central America, namely Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua.

Assessing the impact of any public policy before it is actually implemented is admittedly difficult. Indeed, Kehoe (2003) points out that popular ex-ante general equilibrium analyses of NAFTA written in the early 1990s turned out to be quite off the mark relative to their predictions about the structural (in terms of industry-level growth) effects of NAFTA on the Mexican economy, mainly because such models are generally incapable of predicting dynamic effects of trade reforms and Free Trade Agreements (FTAs). The problem, however, is not necessarily particular to the general-equilibrium-simulation approach, for all methodologies have advantages and disadvantages, and most provide some useful elements for policy discussions. Ex-ante analyses, either partial- or general-equilibrium simulations have the advantage of focusing on the effects of the FTA on the beneficiary countries. But, since the agreement has not been implemented, these analyses are thus limited by a broad set of assumptions required to make such predictions before the policies are implemented. In contrast, statistical analyses of the impact of international trade and FTAs already in operation have the advantage of using real-world experiences, but are not strictly related to the DR-CAFTA countries themselves. Hence these econometric exercises need to be controlled for an array of variables in an attempt to identify the average effects of FTAs, independent of other country characteristics. In the end, understanding the effects of DR-CAFTA prior to its implementation remains more art than science, but the technical aspects of the various approaches to some extent determine the results obtained from each. For this reason, this chapter provides a wealth of technical discussions of methodologies.¹

This chapter applies two broad approaches for estimating the potential economic effects of trade agreements, namely static and dynamic approaches. The static approach includes efforts

¹ Non-technical readers are encouraged to browse the various results and proceed to the other chapters.

to simulate the impact of DR-CAFTA on each country's structure of trade, returns to factors of production, and on the structure of production itself. This approach includes both partial and general-equilibrium modeling attempts. These simulations are also complemented with statistical evidence from global data that highlight how country-specific characteristics might affect the outcomes of DR-CAFTA. Two such characteristics are transport infrastructure and the regulatory environment that affects the ease with which workers and firms can take advantage of new opportunities.

The dynamic approach includes statistical analyses of the impact of trade in general and FTAs in particular on factors such as investment and institutions. The underlying idea is that for trade to have dynamic effects, these should operate through factors that affect long-term economic growth. Consequently, the final section of this chapter reviews new estimates of the impact of FTAs from throughout the world on the rate of growth of GDP per capita.

The evidence reviewed herein supports three key conclusions. First, DR-CAFTA is likely to have positive effects on economic growth in Central America, by increasing foreign and domestic investment, and increasing both exports and imports, which might help speed up the transfer of technology from abroad. Preliminary evidence, from econometric estimates that control for the possibility that economic conditions themselves determine the probability of signing an FTA (Gould and Gruben 2005), suggests that economies that sign Free Trade Agreements tend to increase their annual growth rates by about 0.6 in the five years following its implementation. Moreover, there is evidence that FTAs offer better market access opportunities to the U.S. than this country's existing unilateral preferential programs, such as the CBI in spite of its recent modifications. The evidence based on data from 2001 and presented by Lederman and Ozden (2005) suggest that, after controlling for various country and industry characteristics, FTAs with the U.S. are associated with higher exports that can be several multiples of the exports of otherwise similar countries that do not benefit from any commercial preferences. Likewise, exports from FTA members are higher than those from CBI beneficiaries, after controlling for industry and country characteristics. Also, the econometric evidence from Cuevas et al. (2002), which was also reported in Lederman, Maloney, and Servén (2005), suggests that FTA members temporarily attract FDI than non-members, by increasing the responsiveness of FDI to a country's economic performance.

Second, the magnitude of these positive effects and how they are distributed within the national economies of Central America will depend crucially on each country's ability to take advantage of the opportunities offered by the agreement, particularly because the gains from trade depend on each economy's ability to change its production and employment patterns and to adopt foreign technologies. More specifically, the evidence suggests that institutional reforms and public investments in innovation and infrastructure will affect the magnitude of the impacts on foreign direct investment, technology transfer, and international commerce.

Third, the agreement will undoubtedly have differential effects within countries. Perhaps more importantly, the overall benefits of DR-CAFTA for these countries will depend on their ability to help the sectors, especially workers that will be negatively affected by the expected changes in relative prices. In other words, the implementation of efficient adjustment

programs will help not only the workers that will face important adjustment challenges, but will also affect the magnitude of the overall gains from DR-CAFTA.

The rest of this chapter provides an analytical overview of both the intuition and empirical evidence that suggest why DR-CAFTA and other trade reforms might not be enough to help Central America enhance its prospects for rapid economic development. The following Section 2 reviews the theory and corresponding literature concerning the so-called “static” gains from trade. Section 3 examines the theory and evidence concerning the “dynamic” gains from trade. The final Section 4 concludes by summarizing the main findings and highlighting broad policy implications, most of which are discussed in more detail in other chapters.

2. Trade Liberalization and the Static Gains from Trade

A. Background

The standard textbook theories that predict gains from international commerce do so usually by comparing the welfare of consumers in a country without trade to that same country after full trade liberalization. At the center of these arguments lies the idea of “comparative advantage” whereby certain countries can produce some products at lower *relative* costs than other goods. The gains from trade for small economies come in two parts²: those related to the increase in the level of consumption for a given level and structure of production, plus the gains derived from the reallocation of labor and other factors of production towards the sectors with the lowest relative costs of production (or higher relative prices of the relevant goods). The technical appendix at the end of this paper reviews some of the basics and shows why the gains from trade have never been thought to be automatic.

A finding of particular relevance for Central America is that the gains from trade are unambiguously positive *only* if the structure of production changes as a consequence of the trade reform. This requires that labor move to those sectors where labor productivity is relatively higher. That is, the gains from trade are feasible as long as economies are able to adjust efficiently to the new set of relative prices after trade liberalization by maintaining a constant level of employment. The static gains from trade will make all citizens better off only if workers that will bear the costs of adjustment by having to change their economic activities are compensated for their efforts.

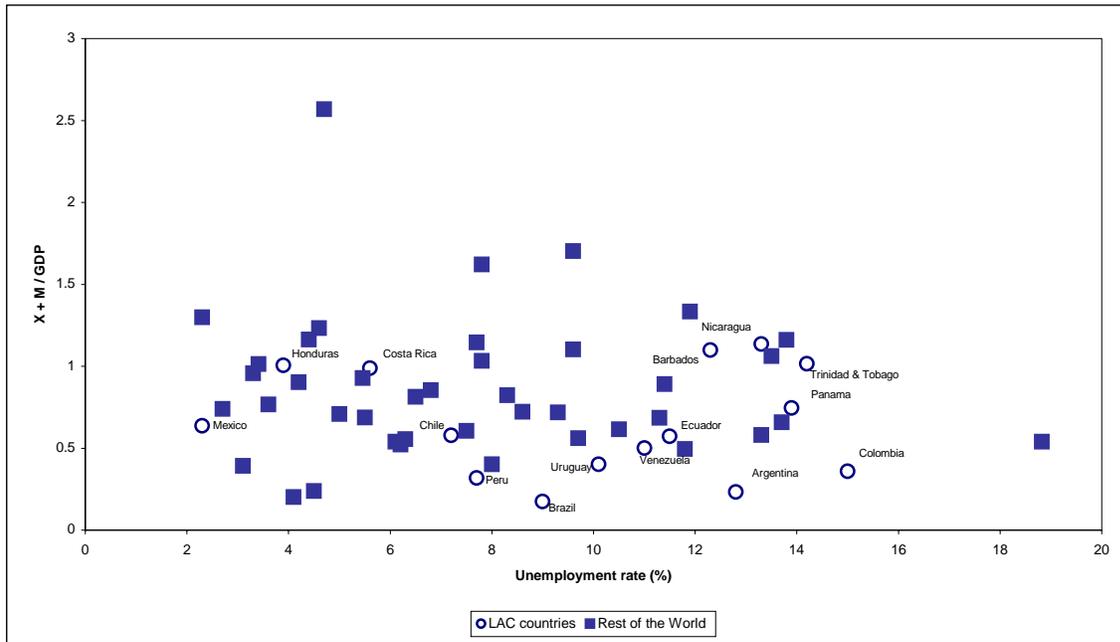
More generally, the potential gains from trade exist in most contexts: when comparative advantage is caused by differences in factor endowments (the Heckscher-Ohlin framework), technologies (the Ricardian model), tastes, the size of domestic markets (in the presence of increasing returns to scale), and even in the presence of trade costs, such as transport and transaction costs. Interestingly, there are gains from trade for small countries even when the sectors of comparative advantage are unknown in the sense that it depends on how (at what price) one measures comparative advantage (Deardorff 2003). But in all these settings, the

² The term “small” is used here to refer to any economy that cannot affect international prices of goods and services.

static gains from trade might not be realized if the adjustment process produces significant and persistent unemployment or if the structure of production does not change.

Some observers have argued that even this conclusion is tenuous in the presence of international capital flows. The argument seems to be that capital will go to countries where, for example, labor standards and wages are lower. Free trade in turn makes these multinational production decisions more profitable, but leaves workers in some countries worse off. While theoretically plausible, substantial independent reviews of the empirical literature suggest that there is no systematic evidence of increased trade leading to the deterioration of wages. Moreover, Figure 1 shows that there is actually no statistical relationship between the incidence of international trade and unemployment rates across countries, thus suggesting that there is no *long-term* relationship between international commerce and unemployment. As will be discussed in detail below, there might be short-term effects as economies adjust to changes in trade policies and thus the public sector has a role to play so as to facilitate a socially and economically efficient adjustment process. Indeed, there's also no evidence that trade or multinational production is associated with the worsening of environmental outcomes (Stern 2003; Brown et al. 2003; Dean 2001 on environmental standards; Copeland and Taylor 2003 on the environment).

Figure 1: Unemployment and the Incidence of International Trade in the Long-Run



Source: De Ferranti, Perry, Lederman, and Maloney (2002, Figure 5.2)

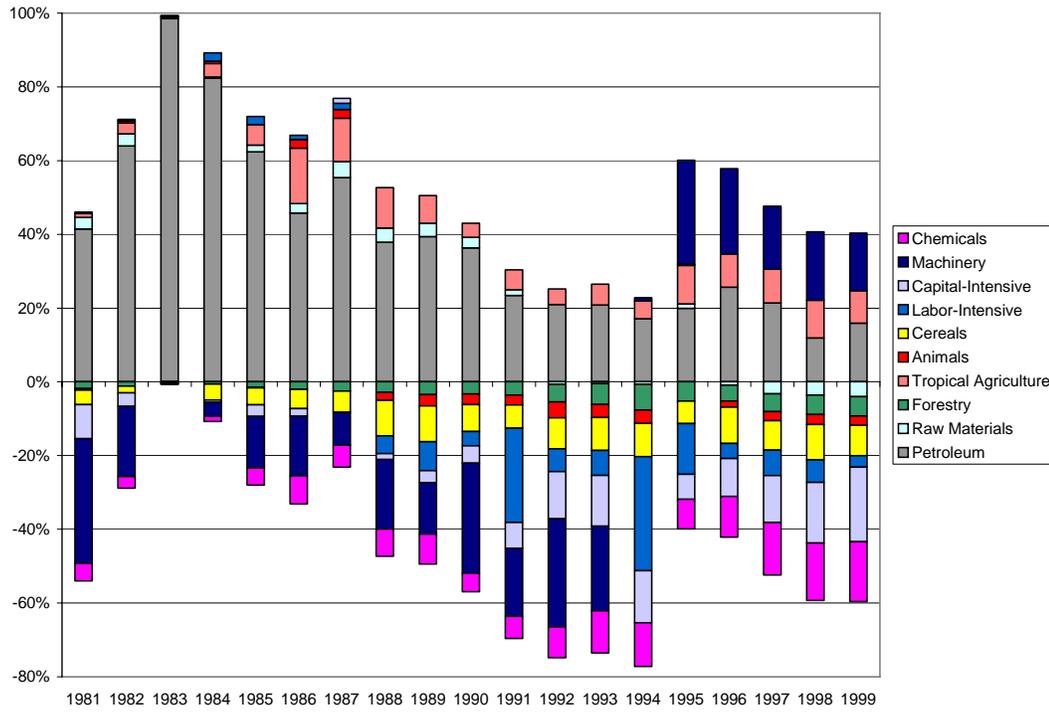
However robust is the international evidence about trade, wages and unemployment, critics of trade agreements often focus on the so-called “core” labor standards. These have to do with the legal rights of workers to unionize or restrictions imposed on child labor or female worker discrimination rather than with economic outcomes, such as wages and unemployment. Busse (2004) finds that overall exposure to international trade (measured by the ratio of trade flows

to GDP) is actually negatively correlated with female-labor discrimination and child labor, thus suggesting that international trade does not promote discrimination against female workers or child labor. But Busse does find that trade is negatively correlated with an indicator of civil liberties (which in turn appears correlated with OECD indicators of union rights). In another article, Busse (2002) presents partial correlations between female labor participation rates, child labor participation, and an index of collective bargaining rights and allegedly labor-intensive exports as a share of total exports. Greater female labor participation actually increases the share of labor-intensive exports, as does the participation of children (ages 10-14), whereas the OECD's index of unions rights tends to reduce comparative advantage in labor-intensive manufactures. This latter study can be amply criticized on various technical grounds, including, as the author notes, that the econometric estimates suffer from endogeneity biases, and that the data did not permit the inclusion of all relevant labor-market variables. More importantly, Busee (2002) is silent with respect to the impact of trade reforms and FDI on domestic labor-market outcomes.

Jones (2000) is perhaps the most comprehensive treatment of issues related to international commerce in the presence of international capital flows. The main theoretical conclusion with respect to the potential gains from trade is that the presence of international capital flows, or even international migration of labor, does not change the basic finding that trade reforms are potentially beneficial for all countries involved in trade. This is so even under various assumptions regarding the sector-specific use of such international capital or labor. The main intuition behind this result is that international flows of factors of production will reinforce the incentives to specialize in the production of goods and services where a given country has a relative productivity advantage. However, international capital or labor flows do make it more difficult to predict in which sectors an economy will specialize, but this ambiguity does not mean that there no gains from trade. The technical appendix discusses analytical issues related to how capital flows can affect both the gains from trade and the pattern of specialization.

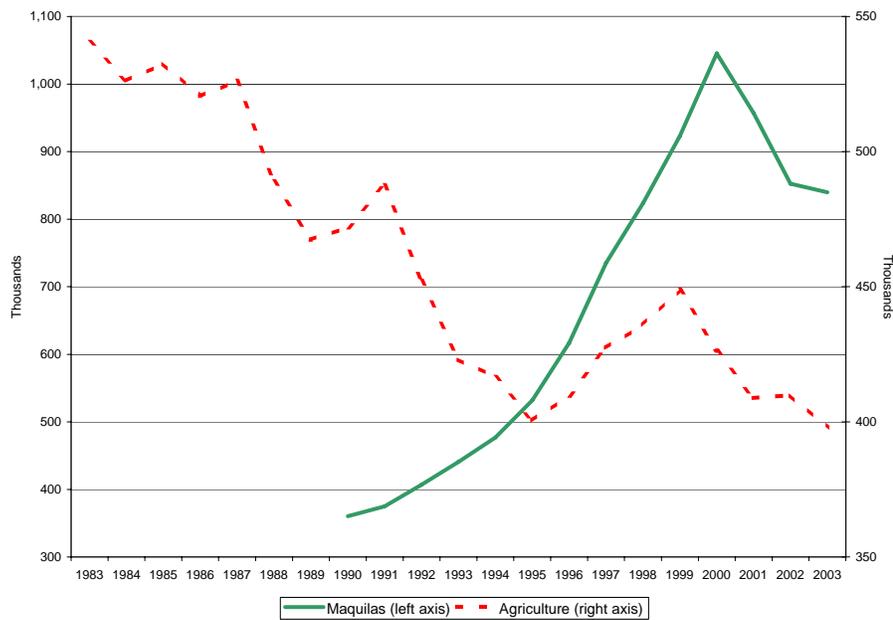
The Mexican experience with NAFTA highlights how an economy adjusts and changes its pattern of trade and employment, which in turn allowed it to benefit from the agreement. Figure 2 shows the evolution of Mexico's pattern of net exports, covering ten broad commodity groups. The implementation of NAFTA in 1994 was associated with the rise of this country's share of net exports of machinery (e.g., vehicles and parts, telecommunications equipment, and computers). De Ferranti, Perry, Lederman, and Maloney (2002) showed that this change in Mexico's pattern of trade with respect to the U.S. became apparent by 1993, just prior to the implementation of the trade agreement. Thus NAFTA had structural effects even prior to the formal implementation of the treaty, possibly related to changes in the pattern of foreign direct investment (FDI). Figure 3 shows the evolution of formal employment in agriculture and manufacturing *maquilas* (and do not include other manufacturing establishments), many of which produce the aforementioned machinery products. This evidence is representative of the structural change experienced by the Mexican economy, which, given that overall unemployment was not higher after NAFTA (except for 1995 during the so-called *Tequila* crisis), represents a healthy structural shift.

Figure 2: Mexico: Structure of Net Exports, 1981-1999



Source: De Ferranti, Perry, Lederman, and Maloney (2002, Figure A.7.)

Figure 3: Mexico: Registered Agricultural and *Maquila* Workers, 1983-2003



Source: Lederman, Maloney, and Servén (2005, Chapter 4, Figure 9).

In fact, the international evidence suggests that long-term development around the world is characterized by structural economic changes whereby the share of agricultural employment and production decline as economies grow (see, for example, Bravo-Ortega and Lederman 2005; Martin 2002). Although this does not necessarily mean that the absolute number of jobs in agriculture declines with development, the absolute number tends to decline in the most developed economies.

The structural change experienced by Mexico under NAFTA is thus consistent with gains from trade, but it is likely that public policies can help Central American economies ensure that DR-CAFTA will deliver on its promises of economic development. The following paragraphs review some of the policy sensitive areas that might affect the capacity of Central American economies to adjust to the new trade regime and thus affect the magnitude of the potential static gains offered by DR-CAFTA.

B. Static gains from trade under various conditions – the role infrastructure and the labor adjustment process

Theory dictates that international trade can provide significant opportunities for development, but these depend on the ability of an economy to prevent unnecessary declines in overall employment as the economy adjusts to a new set of relative prices. Here we cover three related issues – infrastructure and trade facilitation, and labor adjustment – that seem to be important determinants of an economy's capacity to successfully adjust to a new more open trade regime.

Infrastructure and trade facilitation

As mentioned above, the restructuring of an economy is crucial for taking advantage of the economic opportunities offered by trade agreements. A successful adjustment entails the avoidance of substantial job losses, and thus might require that labor literally move to regions that have attracted new investment and that exports of activities with the highest labor productivity can overcome transport and transaction costs. In both instances, an economy's infrastructure is critical for helping this process. If national infrastructure, covering both the movement of people and goods, is not adequate then exports will not rise as much and labor might thus be stuck in the low productivity areas, thus reducing the gains from trade. Indeed, empirical evidence suggests, for example, that for a given economy (in terms of size and geographical location) the international costs of international freight, insurance, and customs procedures affect the value of exports to the U.S.. Table 1 reports various econometric estimates by Lederman and Ozden (2004) concerning the impact of each additional dollar in transport and transaction costs on the value of exports to this market. Regardless of econometric technique, the impact of these costs seems to be quite high. Although the empirical analyses by Lederman and Ozden do not cover all types of infrastructure, logic dictates that telecommunications or the provision of basic services to emerging sectors can also help the economic transformation promised by DR-CAFTA. Chapter 7 of this report provides some guidance regarding the types of infrastructure needs, if any, that should be prioritized in the complementary agenda of the DR-CAFTA beneficiaries.

Table 1: Exports to the U.S.: The Potential Effects of Transport Costs and DR-CAFTA
(Various estimations of the “gravity” model of exports to the U.S. by Lederman and Ozden 2005 with data from 2001)

Explanatory Variables	TOBIT Model (Preferences represented by dummy variables)	TOBIT Model (Preferences represented by utilization rates)	Treatment Model (Preferences as dummies)	Heckman Selection Model (Preferences as utilization rates)
	(1)	(2)	(3)	(4)
GSP	-0.14	-1.46**	-0.10	-0.52
FTA	1.60**	1.05**	1.59**	1.75**
CBI	1.55**	1.35**	1.12**	0.53**
Transport Costs	-5.97**	-5.98**	-5.60**	-5.83**

Table 1 Notes: All models were estimated with a data set that covers over 150 countries and 98 product categories, and all included the following (unreported) control explanatory variables: Product dummy variables; log GDP and log GDP per capita for each country; log distance in kilometers to the U.S.; log area in squared kilometers of each country; dummy variable for membership in the WTO; dummy variable for English-speaking countries; dummy variable for islands; and variables for the AGOA and Andean trade preferences. In specifications 1 and 3, each preferential trade scheme is represented by a dummy variable so that each product from a beneficiary country takes a value of one for each program. In specifications 2 and 4, the use of preferences by each exporting country is captured by the percent of each sector’s exports that entered the U.S. market by utilizing the preferential program. Results for specification 2 were unaffected when country dummy variables were included instead of the country characteristics listed above. In models 3 and 4, the variables that determine the probability of being beneficiary of U.S. preferential treatment were log distance to the U.S., dummy variable for political alliance with the U.S., U.S. aid inflows per capita, and a dummy for sharing a border with the U.S. (Canada and Mexico). All levels of significance were derived from robust standard errors: ** significant at 5 percent; * significant at 10 percent.

Other relevant results from the estimations by Lederman and Ozden concern the effect of FTAs on exports to the U.S. market, especially when contrasted with the effects of unilaterally provided preferences such as the Generalized System of Preferences (GSP) and the so-called Caribbean Basin Initiative (or the Caribbean Basin Economic Recovery Act, CBERA). In the authors’ preferred estimations listed under columns (3) and (4) in table 1, the effect of FTAs are larger than the estimates for the unilateral preferences. Only in model 2 is the CBI effect larger, but since the average product-country utilization rates of FTAs (58 percent) is significantly higher than those of CBI (36 percent) in the year of analysis (2001), even this estimate suggests that the average effect (as opposed to the marginal effect) had been much higher for FTA beneficiaries than for CBI beneficiaries, while holding a plethora of control variables constant in the regressions (see Table 1 Notes at the bottom of the table). The data and the coefficients in regression 2, therefore, suggest that DR-CAFTA could raise the value of U.S. by almost 11 percent relative to the benefits offered by the CBI.³ If we take the more generous results under column 4, these benefits in terms of exports increase to over two times CBI benefits. In any case, the exact magnitude of the contribution of moving to an FTA from unilateral preferences offered through the CBI (and GSP) is less important than the general finding that there are additional gains in terms of access to the U.S. market. These gains are probably due to a combination of factors, including the fact that the utilization of the FTA preferences might be easier due to less restrictive rules of origin (see Chapter 3 on the

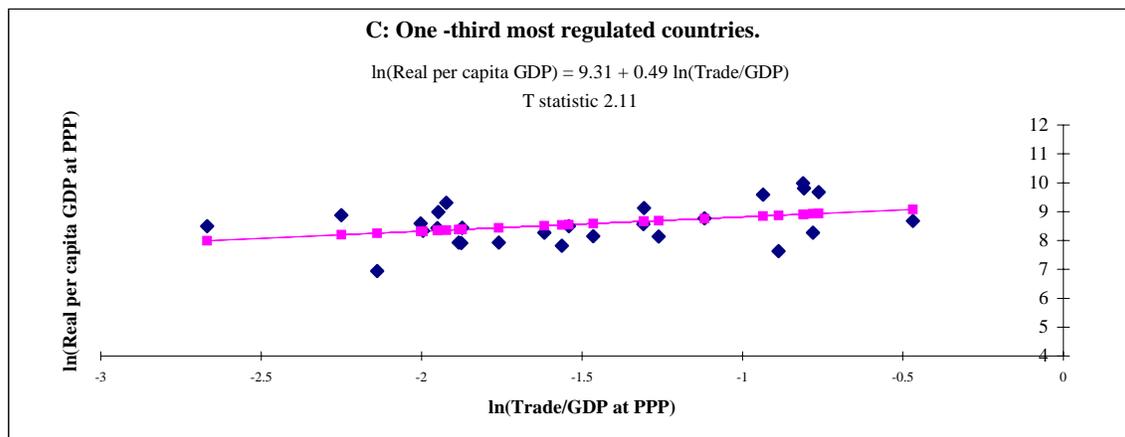
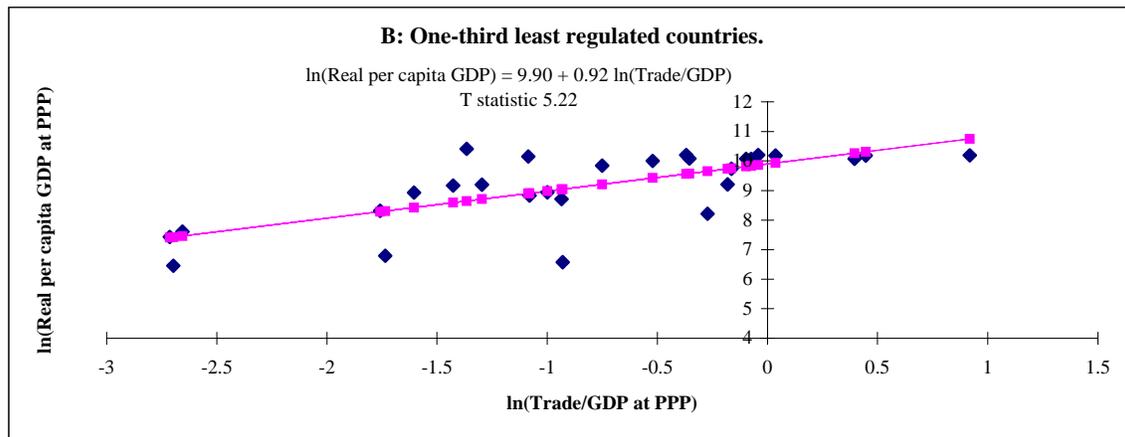
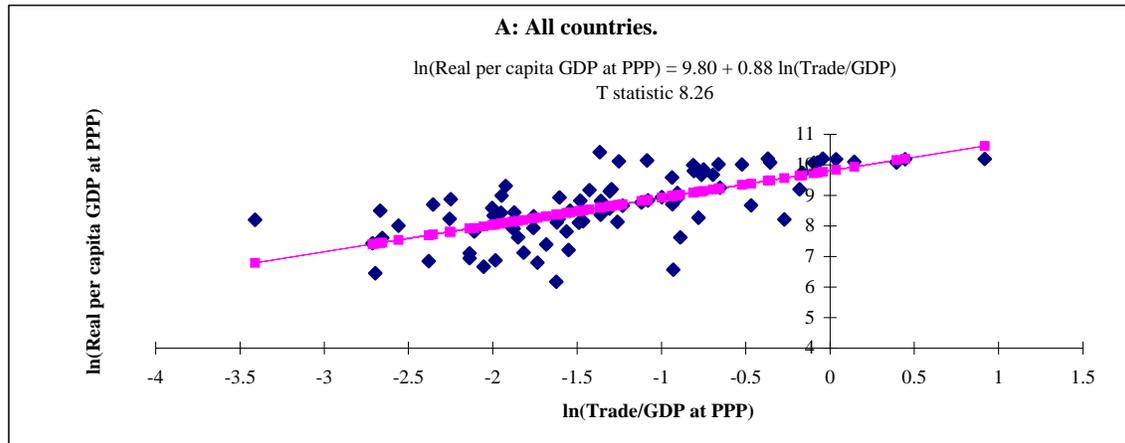
³ This calculation comes from the fact that the model is estimated in log-log form. Thus the effect of FTAs relative to CBI is equal to the ratio of exponential of the product of the FTA coefficients reported in Table 1 multiplied times the average utilization rate divided by the CBI coefficients times the average CBI utilization rate.

contents of DR-CAFTA) as well as the fact that FTAs provide more secured market access rules that entrepreneurs can rely on to make long-term business investments, which would then be reflected in rising exports to the U.S.

Labor and the adjustment process

Another regulatory area concerns labor markets and the ability of firms to enter new markets and the ease with which uncompetitive firms exit other markets. The restructuring of an economy, whereby factors of production migrate from one economic activity to another, requires the disappearance of some firms and the emergence of others. Likewise, it requires workers to find new employment opportunities. Edwards and Edwards (1994) had previously reviewed various theoretical settings where lack of labor mobility could reduce the gains from trade and even turn them negative. Consequently the regulatory environment in these areas could be a crucial element in allowing the economies of Central America to take advantage of the opportunities offered by DR-CAFTA.

One way of examining the role of regulations in determining the gains from trade is to look at how regulations affect the magnitude and sign of the correlation between the incidence of international trade on the domestic economy and the level of development, measured by the value of Gross Domestic Product (GDP) per person. Bolaky and Freund (2003) provided Figures 4a-c, which show the aforementioned correlations for a large sample of countries, for the sub-sample of countries exhibiting the lowest regulatory burdens, and those with the highest regulatory burden. The index of regulatory burden combines ratings on labor regulations and on the bureaucratic procedures that are required to start new business. The data come from the World Bank database on *Doing Business* (see World Bank 2003). Figure 4a shows that trade openness is positively correlated with the level of development in a sample of 75 countries. However, the correlation is flatter and statistically not significant for the 25 countries with the worst regulatory environment, thus suggesting the gains from trade might not materialize in perverse regulatory environments. Bolaky and Freund (2003) provide further discussion of these important issues, but it is worth noting here that a plethora of econometric estimations support the basic intuition reflected in these graphs – that a heavy regulatory burden can seriously reduce the gains from trade.

Figures 4a-c: Trade and Levels of Development: The Regulatory Environment Matters

Source: Bolaky and Freund (2003, Figure 1A-1C).

Upon comparing the regulatory environment in Central American countries with those in other Latin American and other developing countries it becomes evident that regulatory reform should be a key priority in the complementary agenda.⁴ The major ways for improvements are in reducing the number of days for entry procedures and reforming employment laws or any other regulations that impede the intersector labor mobility.

Even the best and most flexible regulatory framework cannot ensure that people will automatically change jobs or that capital will instantaneously reallocate to the most productive activities. Moreover, some workers could experience income losses greater than the gains in terms of lower prices of consumption goods. As highlighted by López (2002), since the marginal utility loss for the poor from a given loss of real income is greater than for the richer workers, then a countries' overall national welfare will also depend on the ability of the economy to provide greater adjustment assistance to the poor, rather than the middle and upper echelons of the labor market.

Thus there is a role to be played by the public sector in terms of aiding the adjustment process. In the case of the DR-CAFTA countries, which have already undergone a substantial process of economic adjustment over the past decade and a half, this intervention by the public sector does not need to be characterized by excessively large adjustment assistance programs. Rather, it is likely that any pro-adjustment program can be contained by targeting workers and small farmers that are most vulnerable to the relative price changes expected from DR-CAFTA. Monge and González-Vega (2003) have identified some key sectors in agriculture that would fall in this category. Moreover, the distinction between net producers and net consumers of the sensitive commodities is also an important ingredient for designing efficient adjustment programs, as argued in Chapter 5.

C. Simulations from partial-equilibrium models

To quantify the potential short-term effect of the elimination of U.S. tariffs on Central American exports, results of partial equilibrium simulations based on market-specific elasticities are reported in summary Table 2 (specifics in Tables A1 to A5).⁵ The simulations suggest that trade gains from DR-CAFTA would amount to a short-term increase in exports ranging from 21 (El Salvador) to 47 percent (Guatemala). As expected, most of the estimated gains for Central American economies would be concentrated in the textile and apparel sector. Smaller absolute gains would also be expected for other made up textile articles, footwear, articles of leather and cotton. Nicaragua could see gains in some processed foods (vegetable oils, processed beef) while Honduras and Guatemala may see significant increases in tobacco products.

⁴ El Salvador is covered in the World Bank regulatory database and thus we leave to the interested reader to undertake the necessary evaluation of this country's regulatory burden. On the other hand, the data reviewed in Chapter VII of this Report suggests that this country might not suffer from excessive regulations more generally.

⁵ Simulation results calculated with SMART software, using tariffs that are corrected by the 2001 utilization rates of the CBTPA preferences (i.e., the share of U.S. imports from El Salvador that actually enjoy the zero tariff treatment upon entry for each item). Results reflect a scenario where all CACM countries gain zero-tariff access to the U.S. simultaneously.

Table 2: Central America – Changes in exports as result of US tariff elimination (%)

	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua
HS.02 Beef	9.3	-	-	9.3	9.3
HS.04 Dairy products, eggs	-	-	-	-	1.9
HS.12 Oilseeds	-	-	-	-	55.0
HS.16 Beef preparations, seafood	18.6	-	-	-	4.0
HS.17 Sugar and sugar products	3.9	3.9	3.7	3.6	-
HS.18 Cocoa and cocoa products	2.3	3.3	3.2	-	-
HS.19 Cereal preparations	1.6	1.6	1.6	1.6	-
HS.21 Misc. food preparations	3.5	3.5	3.5	3.5	3.5
HS.24 Tobacco	-	-	57.1	51.1	56.1
HS.39 Plastics	-	-	2.8	-	-
HS.42 Leather goods	36.1	42.4	32.7	34.8	22.9
HS.46 Straw manufactures	-	4.9	4.9	4.9	4.9
HS.51 Wool	35.2	-	21.1	-	-
HS.52 Cotton	12.5	17.4	21.9	29.2	-
HS.53 Other vegetable fibers	-	20.5	-	-	-
HS.54 Synthetic filaments	24.4	28.7	34.4	26.8	-
HS.55 Synthetic fibres	13.5	36.8	31.4	31.6	-
HS.56 Yarns	9.2	7.4	7.3	9.9	8.4
HS.57 Rugs	17.2	-	5.2	-	-
HS.58 Special woven fabrics	9.6	8.8	18.5	7.9	6.5
HS.59 Special fabrics	9.7	7.8	10.3	-	-
HS.61 Knitted apparel	35.3	23.8	58.4	24.5	59.2
HS.62 Woven apparel	17.8	39.7	34.3	26.4	36.3
HS.63 Other textile articles	19.8	25.7	25.3	21.0	21.8
HS.64 Footwear	40.9	38.8	42.0	95.7	63.0
HS.65 Hats and their parts	11.9	11.8	11.8	11.8	-
HS.94 Furniture, mattresses	8.1	7.9	8.0	-	-

Source: See Annex Tables A1 to A5.

The partial equilibrium results reported above need to be interpreted with caution. While the employ of utilization rates of trade preferences is an improvement over traditional analysis of potential apparel gains, simulations cannot easily deal with the complicated structure of export restrictions associated with rules of origin requirements that are likely to be in place in DR-CAFTA.

For most countries in the region, the greatest potential for expanded Central American apparel exports resides in the loosening up of the rules of origin that govern current tariff preference rules. As explained in Chapter 3, DR-CAFTA will facilitate apparel goods to qualify for duty free treatment by allowing for unlimited use of regional inputs, accumulation of origin with regional partners, exceptions for specific types of apparel, and temporary quotas for goods that do not need to meet strict rules of origin for Costa Rica and Nicaragua. Some of these gains should attract investment into yard spinning, fabric making and other textile processes into Central America that could greatly increase local value added in this sector. Similarly, Central American countries are also likely to benefit from the more flexible “short supply” provisions included in DR-CAFTA, which allows for duty-free exports with inputs from third countries that are not widely available in the U.S.

Hopes for expanded apparel exports from the Central America region depend on how the U.S. market responds to the end of the global textile quotas in January 2005. While there has been a noticeable spike in imports into the U.S. market from China in the first few months of 2005, strong import growth from Central American countries in the same period suggest that other

traditional exporters are bearing the brunt of Chinese shipments. In part, this may be explained since Central American countries continue to enjoy a significant tariff advantage (i.e., zero tariffs vs. 10-30 percent MFN tariffs in apparel categories) over Asian competitors, an edge that is likely to continue once DR-CAFTA enters into force. In addition, gains made in the flexibilization of rules of origin may be retroactive, in the sense that imports that qualify for zero tariff under DR-CAFTA rules (but not under the current tariff preferences) could be allowed to claim refunds for tariff payments. Also, Central American countries benefit from a distance advantage which provides them with a competitive edge in markets where fashion trends change rapidly and just-in-time deliveries and rapid supply response are important. These factors together with the ‘know how’ capabilities developed and the specialization on “full package” services by Central American apparel exporting firms should create significant opportunities for development of local linkages for this cluster, beyond the pure assembly model associated with *maquila*.

Partial equilibrium results do not reveal significant short term export gains aside from *maquila* products, as this technique traditionally underestimates the supply response to FTAs. Available estimation methods cannot anticipate new exports aside from those for which positive export levels exist prior to the implementation of the FTA. Simulations made for Mexico before NAFTA also underestimated the expansion of new export categories for the same reason. Before NAFTA, Mexican exports to the U.S. were concentrated in primary products, including oil. After NAFTA, Mexico’s export base broadened substantially, with manufactures largely surpassing traditional primary products, as mentioned above.

D. A Simulation from a General Equilibrium Model for Nicaragua⁶

This section describes the main features of the CGE model and household survey micro-simulation module that were applied by Bussolo and Niimi (2005) to study the sectorial and national effects of further unilateral trade liberalization and DR-CAFTA on Nicaragua. Unlike the previous partial models, these CGE simulations consider the interactions across industries and factors of production (labor and capital). Since Nicaragua is a relatively poor country for Latin American standards and even relative to the other DR-CAFTA beneficiaries, it is worthwhile to look at this case in detail from a poverty perspective. Nevertheless, at this point it is worth highlighting that other studies that use similar CGE simulations suggest that the overall static gains for DR-CAFTA countries are on average well above 1 percent of the region’s GDP (or GNP, depending on the study) as a whole (see, for example, Hilaire and Yang 2003; Hinojosa-Ojeda 2002 as cited in Pauvonic 2004; and Brown et al. 2004). Here our focus is on understanding the distributional effects of DR-CAFTA and compare them with what could be obtained (under the same restrictive assumptions) with further unilateral trade reforms.

The Nicaragua general equilibrium model and its data

A 2000 Social Accounting Matrix (SAM) has been used as the initial benchmark equilibrium for the CGE model. The SAM, which includes 39 sectors, 39 commodities, 3 factors (skilled and unskilled labor and one composite capital), an aggregate household account, and other accounts (government, savings and investment, and rest of the world), has been assembled

⁶ This section draws heavily from Bussolo and Niimi (2005).

from various sources incorporating data from the 2000 Input Output table and the 2001 LSMS households survey. Since the quality of the initial dataset represented by this SAM directly influences the quality of the model results, particular attention has been devoted in estimating the value added, the trade, and tariff components of the SAM.⁷ The CGE model we use is based on a standard neoclassical general equilibrium model, which is virtually identical to other CGE simulations, including Hilaire and Yang (2003) in terms of the underlying economics concerning constant elasticities of substitution on the production side. The Nicaragua analysis is unique, however, in its treatment of issues related to income distribution, international trade, and factor markets.

Income Distribution and Absorption

Labor income and capital revenues are allocated to households according to a fixed coefficient distribution matrix derived from the original SAM. Notice that one of the main advantages of using the micro-module is to enrich this rather crude macro distribution mechanism. Private consumption demand is obtained through maximization of household specific utility function following the Linear Expenditure System (LES). Household utility is a function of consumption of different goods. Once their total value is determined, government and investment demands⁸ are disaggregated in sectoral demands according to fixed coefficient functions.

International Trade

In the model we assume imperfect substitution among goods originating in different geographical areas.⁹ Imports demand results from a CES aggregation function of domestic and imported goods. Export supply is symmetrically modelled as a Constant Elasticity of Transformation (CET) function. Producers decide to allocate their output to domestic or foreign markets responding to relative prices. As Nicaragua is unable to influence world prices, the small country assumption holds, and its imports and exports prices are treated as exogenous. The assumptions of imperfect substitution and imperfect transformability grant a certain degree of autonomy of domestic prices with respect to foreign prices and prevent the model to generate corner solutions; additionally they also permit to model cross-hauling a feature normally observed in real economies. The balance of payments equilibrium is determined by the equality of foreign savings (which are exogenous) to the value for the current account. With fixed world prices and capital inflows, all adjustments are accommodated by changes in the real exchange rate: increased import demand, due to trade liberalization must be financed by increased exports, and these can expand owing to the improved resource allocation. Price decreases in importables drive resources towards export sectors and contribute to falling domestic resource costs (or real exchange rate depreciation). Thus, this modelling exercise is subject to at least a few caveats. First, it assumes that tariff reductions at the border are directly transmitted to domestic relative prices as viewed by producers. This is a strong assumption given that reported tariffs are not always effective due to the fact that many products, including agricultural commodities, enter Nicaragua (and other Central American markets) through informal channels and often through formal channels as in the

⁷ For more details on the SAM see Bussolo (2004).

⁸ Aggregate investment is set equal to aggregate savings, while aggregate government expenditures are exogenously fixed.

⁹ See Armington (1969) for details.

cases of zero-duty imports allowed to stem rising prices or for specific uses (e.g., feed grains for poultry in Nicaragua). Moreover, changes in border policies do not necessarily mean that producer prices in the interior of Nicaragua will change due to the natural protection offered by distance to markets. Thus all results from this simulation exercises need to be treated with great caution.

Factor Markets

Labor is distinguished into two categories: skilled and unskilled. These categories are considered imperfectly substitutable inputs in the production process; moreover, some degree of market segmentation is assumed: composite capital is sector specific, and labor markets are segmented between agriculture and non-agriculture, with labor fully mobile within each of the two broad sectors, but fully immobile across them. These restrictive conditions are imposed on the modeling framework so that it mimics in the best possible and least contentious way what would be the short term impact of trade reforms on the Nicaraguan economy. One could certainly introduce dynamic features, market imperfections, and other complications, however the debate would then move towards assessing what are the links between trade policy and growth and, although important, this is a much more contentious issue. Finally, the segmented version of the model also facilitates linking the macro results of the CGE model to the household survey micro-model, where households are not allowed to respond to price changes by migrating, increasing their human capital endowments, or even changing their consumption choices.

The labor market specification is a key element of our model and an important driver of poverty and distributional results. Therefore, its specification calls for some clarification and justification. The labor market skill segmentation¹⁰ has become a standard assumption in CGE modeling and it is easily justifiable for the case of Nicaragua, where inequalities in terms of educational endowments and access to education support this assumption. However, the assumption that the market for labor is further segmented into agricultural and non-agricultural activities is more controversial. To test its validity, Bussolo and Niimi (2005) conducted an econometric exercise of wage functions to assess whether Nicaragua exhibits wage gaps across these two sectors after controlling for the individual characteristics of workers. They concluded that the possibility that agricultural workers have different wage from similar workers in other industries cannot be rejected. Although this finding is not conclusive, because the estimated wage gap might have various interpretations and be caused by other factors that were not included in the analysis, it might be sufficient to justify the assumption of segmented labor markets in the CGE simulation exercise.

The micro module: linking household surveys to the CGE model

Poverty effects of trade reforms are estimated using a top-down approach. Initially the CGE model calculates the new equilibrium (i.e. new relative prices and quantities for factors and commodities) following a trade shock. Then prices are transferred to the micro module to estimate a new income distribution, and finally poverty effects are calculated. No feedback from the micro module to the macro model is explicitly accounted for in this version.

¹⁰ See Taubman and Wachter (1986) for a general discussion of labor market segmentation.

The following equation¹¹ represents the core of the micro module:

$$\frac{\partial W_h}{Y_h} = \underbrace{\sum_g -\theta_{h,g}^c \dot{p}_g}_{\text{consumption}} + \underbrace{\theta_h^\ell \dot{w}}_{\text{labor income}} + \underbrace{\theta_h^R \dot{w}}_{\text{remittances}} + \underbrace{\theta_h^{kap} \dot{\pi}}_{\text{profits}} + \underbrace{\sum_g \theta_{h,g}^T (\dot{i}_g + \dot{m}_g)}_{\text{tariff revenue}} \quad (1)$$

The relative gains or losses (W represents welfare), for each household (h) depend on: (a) changes in prices for purchased goods (p_g , where a dot represents percentage change) and the initial share of expenditure on each good ($\theta_{h,g}^c$); (b) changes in factor returns (w stands for returns to skilled and unskilled labor, and π is returns to capital) and the shares of total initial income by source (θ_h^ℓ and θ_h^{kap}); (c) remittances and other transfers which depend on the wage rate and the government revenues. Income by source is calculated for each member of the household, and the above equation, to keep notation simple, shows results after aggregating incomes for each individual in the same household. Once the changes in welfare are calculated, a new distribution of income is generated and this counterfactual distribution is then compared to the initial distribution.

The main advantage of this approach is that it takes into account important sources of heterogeneity across households given that the structure of income by type and the composition of consumption by commodity, the various θ 's in the above equation, are household specific. A large literature on trade and poverty¹² has shown that changes in the distribution of income (or consumption) might differ considerably across different groups of households and that predetermined groupings may not capture the whole spectrum of possible outcomes. Poor households themselves are poor for different reasons and designing compensatory policies that are targeted to the right recipients can be greatly facilitated by having at disposal a whole new counterfactual distribution. In the new distribution, households, as well as individuals, can be identified according to the full set of socio-economic characteristics recorded in the survey. It is thus easier to identify a specific characteristic – such as region of residence, employment status, gender, education, age, etc. – that may strongly correlate with larger than average losses from the trade policy reform and then use this information in targeting compensatory measures.

Clearly how this new counterfactual distribution is generated is rather important. The above equation only considers first order effects and excludes important second order mechanisms that may account for large income changes. Specifically movements in and out of employment or across sectors of production are excluded as well as substitution in consumption, although not accounting for the latter does not normally result in large errors. This approach is better suited to estimate short run impacts and it may overestimate the effects of a trade shock, given that quantity adjustments and substitutions are ruled out. Knowing these limitations, its main advantage though is its transparency and low, in terms of data and time, implementation costs.

¹¹ The formal derivation of this equation is presented in the annex of Bussolo and Niimi (2005).

¹² See Winters et al (2004) for an excellent survey.

Equation (1) implies that, for each household, individual incomes can be readily imputed to the relevant factors of production, namely the two labor types and the composite capital. This is fairly straightforward for urban wage-workers; however for a large group of the Nicaraguan population this imputation is not obvious. As explained in the next subsection, disaggregating income for the self-employed workers in the farm sector can be a laborious and error prone procedure: the labor and capital components are often not easily separable. For households whose heads belong to this group of workers, an approach that bypasses this imputation has been used. This is represented by the following equation:

$$\frac{\partial W}{Y} = \left[\sum_j \theta_j^O \dot{p}_j^O - \sum_k \theta_k^I \dot{p}_k^I \right] + \sum_f \theta_f^w \dot{w}_f - \sum_g \theta_g^C \dot{p}_g^C \quad (2)$$

as before, the relative change in welfare is represented by a change in consumption (the last term in the left hand side of the equation), by a change in explicit wage earnings, and by the profit generated by the activity run by the household (the term in squared brackets). This is estimated as the difference between sales (holding constant the quantity shares of the different goods sold θ_j^O) and input costs (again without changing the structure of input quantities θ_k^I).

Finally, it should be noted that auto-consumption has been explicitly excluded from the computations in both equations (1) and (2) given that price changes – in the short run, and those of the order of magnitude considered here – do not affect it. In terms of equation (2), this means that not only final consumption needs to exclude auto-consumption but also that input costs have to be netted of those costs that relate to production for auto-consumption.

Poverty effects of trade policy reforms

This section first presents the results of the general equilibrium model and then the poverty estimations obtained by linking the changes in the macro variables to the household surveys.

Policy scenarios

The DR-CAFTA agreement has recently been at the center of attention of trade ministers in the Central American region: this agreement should provide almost full free access to one of their major markets, it should assist the implementation of additional domestic market reforms, and, by requiring reciprocal opening, it should produce significant efficiency gains due to resource reallocations towards more competitive sectors. However, as brilliantly illustrated by the Chilean multi-pronged strategy of trade liberalization, DR-CAFTA is just one of the many trade options that the Central American countries can pursue, and probably the best way to evaluate the opportunities offered by such regional agreement is to compare it with a benchmark case of full liberalization. Two main scenarios are considered: (a) DR-CAFTA, and (b) a unilateral non-discriminatory liberalization. The potential advantages and disadvantages of the *reciprocal* liberalization entailed by the regional scenario are illustrated by further decomposing the DR-CAFTA scenario into two separate unilateral liberalizations: first Nicaragua liberalizes vis-à-vis the U.S., which does not reciprocate, and then the U.S. unilaterally liberalizes vis-à-vis Nicaragua. Although not being a realistic policy choice, the full unilateral liberalization provides a useful yardstick against which DR-CAFTA can be evaluated.

In all the simulations only tariffs are modified and eliminated in single sweep. Likewise, each of the simulations is based on a comparative static framework with no capital accumulation, no changes in labor supply or skill levels and factor market segmentation. Consequently, as happened with the early-1990s CGE modeling attempts of the Mexican experience under NAFTA, the results from the simulations might be quite off the mark since dynamic effects might overwhelm the static effects predicted by the simulations even if the assumptions regarding the key parameters (i.e., elasticities of substitution on the demand and supply sides for each of the 28 industries) were realistic (see Kehoe 2004 for an ex-post review of the accuracy of NAFTA CGE models).

Trade reforms: macro results

In a general equilibrium model all relative prices and quantities are determined simultaneously, however to disentangle the trade policy reform effects on the economy it is helpful to describe the adjustment process as if it were sequential. First, tariffs are reduced, this then has an impact on import flows, these, in turn, displace domestic production and generate resources reallocations; these shifts interact with factors' supply and demand, and determine factor prices, these, together with new goods prices, finally affect households' real income level. Then, changed households' incomes feedback into the system through changes in consumption choices and the process continues until a new equilibrium is reached. Three main elements determine the *position* – i.e. the values of the endogenous variables – of the new equilibrium: a) the starting level of some key variables in the initial equilibrium, i.e. the prices and quantities implicit in the initial SAM; b) the functional forms of the model's behavioral equations; and c) some key parameters, namely substitution elasticities among factors in the production process and, for a trade reform analysis, the elasticities of substitution in demand between domestic and imported commodities and the elasticity of transformation in supply between domestic and foreign markets. A broad consensus as emerged as long as the functional forms are concerned and, as described above, the model used here is in line with this consensus. The values for the different elasticities have been borrowed from the available econometric literature, however, depending on the estimation methods as well as on the period or country considered, these values show considerable variation, and this has caused heated controversies among supporters and skeptics of this type of models. Systematic sensitivity analysis, where all elasticities are randomly changed and results are presented with accompanying confidence intervals, has been proposed as a solution to these controversies; however, even this rather computationally intensive proposal has its problems and we do not attempt it here.

The bottom line is then that results presented here are indicative of a likely response to the analyzed shocks. In most cases, the sign and relative, if not absolute, magnitude of the model's results – for example, a finding that gains for unskilled labor are larger than those for skilled labor – should be reliable.

Major advantages of this type of model are that it represents the whole economy in a consistent and theoretically sound framework and that the structural features of the country investigated strongly influence the final results. Table 3 shows these features for Nicaragua in terms of sectorial shares of gross production, imports, exports and private demand; the middle panel details, for each sector, the U.S. weight in total trade; the right panel shows Nicaraguan

tariffs against the U.S. and other partners and the U.S. tariffs against Nicaraguan products. For convenience, the bottom panel of the table reports measurements for aggregate macro sectors, although the model's actual 28 sectors are shown in the top panel. In commenting the results of the policy simulations, we will be referring to data in this table repeatedly.

The initial import protection, both in its level and sectorial variability, is among the key elements determining the simulation outcomes. Three key features are highlighted by the tariff data: a) the overall trade-weighted protection rate is rather low, b) its dispersion is high with a clear bias against agricultural imports, c) tariffs against the U.S. are generally above the trade-weighted average of tariffs against the Rest of the World.

Table 3 also highlights that domestic Nicaraguan agricultural producers may be facing strong competition vis-à-vis imports from the US, which, notwithstanding significant levels of protection, enjoy a large share of total imports of agricultural commodities (41 percent). Anticipating the results shown below, it is likely that a liberalization of US imports, which basically consists of reducing an anti agricultural imports bias, may lead to an increase of competition in the agricultural sectors with a potential initial negative shock for households strongly dependent on farming incomes. Clearly this potentially negative outcome may be exacerbated by the level of sector aggregation used in the model. It may be that at finer sectoral levels, one finds that imports and domestic products are complements rather than substitutes; however, agricultural products are normally fairly homogeneous, and thus substitutable, and the risk of negative impacts should not be completely ruled out.

Table 3: Nicaragua's economic structure (2000)

		Sectoral shares				US weight		Tariffs		
		Xp	M	Ex	Xc	M US	Ex US	Nic - US	Nic - ROW	US - Nic
Agriculture	Coffee	2	0	20	0	14	26	8	6	0
	Sugar Cane	1	0	0	0	0	0	0	0	0
	Basic Grain	3	1	1	4	72	0	29	17	0
	Other Agri. Products	3	2	7	5	18	3	8	4	11
	Livestock	5	1	3	3	35	0	4	2	0
	Forestry	1	0	0	1	93	0	1	1	0
	Fishery	1	0	1	0	34	5	10	5	0
Mining & Energy	Mining	1	10	4	0	1	4	2	0	0
	Electricity Gas Water	2	0	0	1	0	0	10	6	0
	Water Distribution	1	0	0	1	0	0	0	0	0
Food Processing	Meat and Fish Products	5	0	23	5	19	27	18	8	3
	Sugar Products	2	0	5	2	6	11	8	7	0
	Dairy	2	1	3	3	32	0	12	8	0
	Other Food	4	8	2	11	19	0	7	4	1
	Beverages	2	1	1	6	9	0	12	6	0
	Tobacco	0	1	1	1	2	9	4	0	7
Other Manufacturing	Textiles Clothing & Leather	3	4	12	5	39	5	4	4	4
	Wood Products	2	2	2	1	28	0	8	3	0
	Paper Print Products	1	3	0	1	21	0	3	2	0
	Refined Oil	3	5	2	2	9	0	7	7	0
	Chemicals	1	17	2	6	21	0	3	2	0
	Glass No-Metal Products	1	3	1	0	9	2	4	2	0
	Metal Products	0	7	1	0	15	0	3	2	0
	Machinery and Equipment	0	26	1	2	40	0	2	3	0
Services	Construction	9	0	0	0	0	0	0	0	0
	Commerce	10	0	0	1	0	0	0	0	0
	Other Services	29	5	4	28	24	1	0	0	0
	Transport Services	5	1	4	8	24	3	0	0	0
Total		100	100	100	100	24	36	4	3	
--- Aggregate sectors averages ---										
Agriculture		17	4	32	13	41	28	20	6	
Food Processing		15	12	36	29	18	54	8	4	
Mining and Energy		4	10	4	3	1	64	2	0	
Other Manufacturing		12	68	20	19	28	14	3	3	
Services		53	6	8	37	24	40	0	0	

Notes: in the left panel, **Xp** represents the sectoral output as a percentage of total output, **M** the sectoral total imports, **Ex** the exports shares, **Xc** the private consumption shares; in the middle panel, **M US** the initial share of imports coming from the US over total imports, **Ex US** the initial share of exports going to the US; in the right panel there are tariffs: **Nic - US** and **Nic - ROW** are Nicaraguan tariffs against US and other partners imports, respectively, and **US - Nic** are US tariffs against Nicaraguan exports. Source: Nicaragua SAM estimated by the author.

Unilateral liberalization against all trading partners

As outlined above, the adjustment process caused by this reform is initially described in terms of sectoral demand and supply changes, as shown in Table 4. Consider first the demand/imports side. Initial tariff rates tm^{13} are highest in the agriculture and food processing sectors – in particular in *Basic Grain*, *Meat and Fish Products*, *Sugar Products* and *Dairy* – accordingly these sectors could experience the largest inflows of import volumes once protection is removed, assuming of course that the border-price changes are fully transmitted to domestic consumers throughout the Nicaraguan economy and that the model parameters concerning the responsiveness of domestic demand to such price changes are accurate. The model predicts an increase in import volumes (ΔM) of 23 percent with respect to their initial levels for agriculture and 6 percent their pre-liberalization levels for food processing.

¹³ Note that column tm in Table 4 is the trade weighted average of the Nicaraguan tariffs against U.S. and the Rest of the World (which are separately shown in Table 3).

Nevertheless, imports do not represent a large share of local demand (M/D) in agriculture or food processing. Thus, even with a high (presumed) elasticity of substitution between local production and imports (= 3), the impact of increased imports on sales of domestic goods (ΔS) is low in these sectors. In fact, the model predicts that other manufacturing sectors suffer slightly bigger domestic sales contractions due to their larger initial share of import dependency despite their lower initial level of protection. Reflecting Nicaragua's dependency on foreign production of capital goods, intermediates and energy, imports are well above 50 percent of total local demand for other manufacturing and just below that threshold for energy and mining. For the other manufacturing sectors, cheaper imports displace up to almost 3 percent of domestic production.

Table 4: Sectorial effects of full unilateral trade liberalization

		Imports and Local Sales					Exports and production			
		tm	ΔM	M/D	ΔS	ΔPd	ΔEx	Ex/Xp	ΔXp	ΔPx
Agriculture	Coffee	6	13	8	-1	-1.4	5	101	4	-0.2
	Sugar Cane	0	0	0	1	-2.2	0	0	1	-2.2
	Basic Grain	26	55	11	-4	-6.8	27	3	-3	-6.6
	Other Agri. Products	5	6	14	0	-2.7	12	26	3	-2.1
	Livestock	2	2	4	1	-2.1	10	8	2	-2.0
	Forestry	1	-8	1	1	-4.1	19	2	1	-4.0
	Fishery	6	24	4	1	0.7	-2	6	1	0.7
Mining Ene	Mining	0	-5	85	-2	-1.1	3	55	1	-0.5
	Electricity Gas Water	6	12	2	-1	-2.1	8	0	-1	-2.1
	Water Distribution	0	0	0	-1	-0.8	0	0	-1	-0.8
Food Processing	Meat and Fish Products	10	25	4	-1	-1.8	6	53	2	-0.9
	Sugar Products	7	18	1	-1	-1.2	4	33	1	-0.9
	Dairy	9	18	18	-3	-2.3	6	22	-1	-1.8
	Other Food	5	3	35	1	-3.9	18	7	2	-3.6
	Beverages	6	12	8	-1	-1.8	6	3	-1	-1.7
	Tobacco	0	-2	85	-1	-0.5	1	96	0	-0.1
Other Manufacturing	Textiles Clothing & Leather	4	4	38	-2	-1.8	5	55	1	-0.9
	Wood Products	5	7	23	-1	-2.0	7	12	-1	-1.7
	Paper Print Products	3	1	55	-3	-1.3	2	3	-3	-1.2
	Refined Oil	7	13	26	-6	-0.7	-3	8	-6	-0.7
	Chemicals	2	0	71	-1	-1.7	6	18	0	-1.4
	Glass No-Metal Products	2	2	35	-1	-0.7	2	7	-1	-0.7
	Metal Products	2	1	72	0	-1.6	7	16	1	-1.4
	Machinery and Equipment	3	1	83	2	-2.9	15	73	10	-1.0
Services	Construction	0	0	0	1	-0.5	0	0	1	-0.5
	Commerce	0	0	0	-1	-0.4	0	0	-1	-0.4
	Other Services	0	-3	5	0	-0.9	3	2	0	-0.9
	Transport Services	0	-5	6	0	-1.6	6	9	0	-1.5
Total		3	2	23	-1	-1.5	6	12	0	-1.3
--- Aggregate sectors averages ---										
Agriculture		12	23	7	-0.4	-2.9	7	23	1.1	-2.5
Food Processing		5	6	21	-0.7	-2.3	6	28	1.1	-1.8
Mining and Energy		0	-4	48	-0.8	-1.6	3	12	-0.4	-1.5
Other Manufacturing		3	2	57	-2.9	-1.3	5	21	-1.6	-1.0
Services		0	-4	3	-0.2	-0.8	5	2	-0.1	-0.8

Notes: **tm** represents initial tariff rates, **ΔM** the percent variation in total import volumes with respect to the initial levels, **M/D** the ratio of imports to domestic demand (the sectoral import dependency, calculated using pre-liberalization levels), **ΔS** the percent variation in the volumes of domestic sales of domestic output, **ΔPd** the percent variation in domestic prices for local sales, **ΔEx** the percent variation in the volumes of exports, **Ex/Xp** the ratio of exports to domestic output (the sectoral export orientation), **ΔXp** the percent change of domestic output, **ΔPx** the percent change of output prices.

For the economy as a whole, these low or moderate domestic market share losses are reflected in small declines of producers' prices for local sales (ΔP_d). Some of these effects are larger when disaggregated sectors are examined, and complementary analyses considering very disaggregated sectors of production may be needed to identify specific sensitive commodities.¹⁴

These demand/imports side effects are linked to the supply response to which we now turn. For producers of exportable goods, the reduction of prices in local markets (ΔP_d) combined with unchanged export prices creates incentives to increase the share of sales destined to foreign markets. This export response (ΔEx) varies across sectors and it is linked to the pattern of Nicaragua's comparative advantage, which, according to the exports sectoral distribution (column "Ex" in Table 3) and the export orientation (Ex/X_p in Table 4), is within three main sectors: *Coffee*, *Meat and Fish Products* and *Textiles and Clothing*. For these sectors rising export sales more than offset the reduction of domestic sales and lead to an overall increase in sectoral production (ΔX_p). In other sectors¹⁵, with lower export orientation, the change in sectoral production is roughly equal to the change in local sales (ΔS). Sectors enjoying export led growth also record output price reductions (ΔP_x) that are smaller than those of domestic sales prices (ΔP_d). This is because output prices are a combination (CES prices) of fixed export prices and domestic prices.

In summary, trade liberalization, even if consists of the elimination of a relatively low economy-wide protection (3 percent), entails considerable sectorial adjustment.¹⁶ Within agriculture, *Basic Grain* is the only sector registering a contraction due to its high tariffs and low export orientation; whereas, among others, *Coffee* and *Other Agricultural Products* enjoy significant export-led growths. Similarly in the non-farm portion of the economy, import competing sectors contract and release resources that move towards sectors which were less protected or that produce for foreign markets. Considering the aggregate averages, the macro-sector *Food Processing* is recording positive output changes, whereas the other non-farm macro sectors' outputs experience moderate contractions.

Changes in factors' remuneration, shown in Table 5, are another important aspect of the structural adjustment caused by trade reform. Changes in wages and capital return are linked to changes of goods prices through the production technology and the functioning of the factor markets. Different production technologies are approximated by different factor's and intermediate inputs' intensities across sectors, as shown in Table 6, and factor markets

¹⁴ Usually these analyses consider data at a very fine degree of disaggregation, namely the tariff line. Although trade data at this level may be available, production, consumption and other important variables are unavailable.

¹⁵ Due to the sectorial classification, some sectors in Table 4, notably *Tobacco* and *Machinery and Equipment*, appear to be both import and export intensive. The apparent export intensity in these sectors results from dividing low levels of exports (probably re-exports) by even lower levels of domestic production. Exports of *Tobacco* and *Machinery and Equipment* jointly account for just 2 percent of total exports.

¹⁶ Due to the closure rule of the external account, namely the fixing of foreign savings, and the full employment assumption, the larger expansion of the volumes of exports, with respect to import volumes is compensated with a real exchange rate depreciation which originates from falling domestic resource costs. In other words, exporting sectors expand by employing resources whose relative prices have declined because of their falling demand from the contracting import competing sectors.

function so as to mimic short term adjustment possibilities: capital is sector specific, and the farm and non-farm sectors constitute two segmented markets for the skilled and unskilled labor.

Table 5: Factor price changes due to full trade liberalization

	ΔP	$\Delta(P/CPI)$
<i>Non-Farm Segment:</i>		
Skilled Labor	-0.3	2.1
Unskilled Labor	0.6	2.9
Capital	-0.6	1.8
Sk/Unsk wage gap		-0.9
<i>Farm Segment:</i>		
Skilled Labor	-4.0	-1.6
Unskilled Labor	-6.3	-3.9
Capital	2.7	5.1
Sk/Unsk wage gap		2.5
<i>Price indexes:</i>		
Food price index	-3.6	
Non food price index	-1.5	
CPI	-2.4	

Sources: author calculations from model results.

Notes: the first column, ΔP , represents the percent variation of the price of each factor with respect to the initial levels, $\Delta(S/CPI)$ is the percent variation of the price deflated by the Consumer Price Index;

In the farm segment (which corresponds to the macro-sector *Agriculture* in the previous tables), capital (including land) records a positive real price change and skilled and unskilled labor experience reductions. The agricultural expanding sectors – shaded in Table 6 – are those which use capital relatively more intensively than *Basic grains*, the contracting sector. Indeed combined together, *Coffee*, *Other Agricultural Products* and *Livestock*, the largest output gainers, use almost 70 percent of the total farm capital value added. On the other hand, because of the contraction of the unskilled labor-intensive sector, *Basic grains*, unskilled labor records a greater reduction than skilled labor.

Turning to the non-farm segment and considering the bottom panel of Table 6, it is easy to see that *Food Processing*, the sector with the largest output expansion, is relatively intensive in the use of capital, and, in terms of number of workers (rather than value added which includes wage differential biases), is the sector that uses most intensively unskilled workers. *Other manufacturing*, the sector experiencing the largest contraction, uses unskilled labor to a large extent but not as intensively as *Food Processing*. This relative intensities in the use of labor combined with initial levels of protection and output changes explains the observed wage movements.

Table 6: Value added and employment by sector and factor, and sectoral intermediate uses (%)

	Value Added								Employment (# of workers)				ΔX_p
	Sectoral Intensity				Sectoral Shares				Sect. Intens.		Sect. Shares		
	Sk	Usk	K&L	Xint	Sk	Usk	K&L	Sk	Usk	Sk	Usk		
Coffee	3	66	31	29	7	21	10	1	99	4	10	4.4	
Sugar Cane	2	27	71	40	2	3	7	2	98	4	5	0.8	
Basic Grain	6	77	17	29	17	31	7	2	98	41	55	-3.4	
Other Agri. Products	17	40	43	35	53	16	18	7	93	9	4	2.5	
Livestock	4	32	63	36	20	19	40	4	96	39	23	1.6	
Forestry	0	75	25	47	0	8	3	0	100	0	1	1.1	
Fishery	1	10	89	37	1	2	15	4	96	3	2	0.5	
Mining	9	73	18	48	0	2	1	5	95	0	1	0.5	
Electricity Gas Water	34	6	59	42	3	0	6	63	37	1	0	-0.6	
Water Distribution	20	55	25	37	1	2	1	28	72	1	1	-1.1	
Meat and Fish Products	25	46	29	82	2	3	2	21	79	1	1	2.3	
Sugar Products	12	33	55	70	0	1	3	11	89	0	1	0.7	
Dairy	35	30	35	71	1	1	2	21	79	0	0	-1.0	
Other Food	31	42	27	70	3	3	3	13	87	2	5	2.1	
Beverages	48	15	37	60	3	1	3	51	49	1	0	-1.2	
Tobacco	4	43	53	47	0	0	0	13	87	0	0	0.5	
Textiles Clothing & Leather	20	72	7	50	2	6	1	22	78	5	6	1.0	
Wood Products	16	75	9	58	1	4	1	9	91	0	1	-0.5	
Paper Print Products	28	66	6	61	0	1	0	25	75	0	0	-2.9	
Refined Oil	69	0	31	97	0	0	0	100	0	0	0	-5.8	
Chemicals	36	35	29	65	1	1	1	27	73	0	0	0.0	
Glass No-Metal Products	29	62	9	72	1	1	0	12	88	1	1	-0.6	
Metal Products	24	71	5	76	0	1	0	17	83	1	1	1.1	
Machinery and Equipment	31	63	6	76	0	0	0	20	80	1	2	10.2	
Construction	16	64	20	54	5	17	8	11	89	4	10	1.4	
Commerce	33	56	11	29	18	26	7	19	81	23	31	-0.6	
Other Services	40	21	39	36	55	24	61	35	65	55	32	-0.4	
Transport Services	27	70	3	71	3	6	0	14	86	3	5	0.2	
Total	27	41	32	48	200	200	200	16	84	200	200	0.1	
--- Aggregate sectors averages ---													
Agriculture	6	48	46	35	100	100	100	3	97	100	100	1.1	
Food Processing	31	34	35	72	10	9	13	15	85	4	8	1.1	
Mining and Energy	26	31	43	42	4	4	8	24	76	2	2	-0.4	
Other Manufacturing	24	66	11	71	6	14	3	20	80	9	11	-1.6	
Services	35	37	28	41	80	73	76	25	75	85	79	-0.1	

Notes: All the values in the table except in the last column are calculated from values in the initial equilibrium; highlighted (shaded) rows are those corresponding to expanding sectors. Sectoral intensity sum to 100 percent in each sector, **Sk** represents skilled labor, **Usk** and **K&L** unskilled labor and capital and land respectively, **Xint** is the share of intermediate inputs in total output, ΔX_p is the percent change of domestic output due to full trade liberalization.

The combination of the trade shock with this production structure explains why unskilled labor is the largest gainer in the non-farm segment, followed by skilled labor and capital as shown in Table 5. These results are consistent with the comparative advantage of Nicaragua, a country with abundant unskilled labor, which specializes in the production of agriculture derived products, and is import dependent for capital goods and intermediates, which are normally produced by sectors using skilled workers intensively.

Even with segmented labor markets, the farm and non-farm sections of the economy have strong interconnections that determine the final results. These inter segment links are illustrated in Table 7 for the *Agricultural* and the *Food Processing* aggregate sectors.¹⁷ Both

¹⁷ These two sectors account for a third of total production and for almost 40 percent of total employment.

sectors face the largest average drops in tariff protection and large inflows of imports; however, they are also enjoying the largest aggregate output gains. This is achieved by significant structural shifts that are qualitatively different for these two sectors.

For *Agriculture*, the main adjustment consists of a reduction of one single sub-sector and a specialization towards export oriented sectors. Prices for imported intermediate goods are reduced by the removal of tariffs, however due to the moderate use of intermediates (35 percent of total input value), cost savings needed to compete with cheaper imports in domestic markets and to increase competitive advantage in export markets have to be realized by factor price reductions, and this also explains why labor wages are reduced in *Agriculture*.

For *Food processing*, the inflow of imports does not entail large sectoral contractions because producers can still compete in domestic markets by enjoying reduced production costs due to their use of cheaper intermediates, which represent on average almost 3 quarter of total input value. In fact, most of these intermediate inputs come from agriculture whose prices following the trade shock are reduced.

Table 7: Inter-sectoral links between Agriculture and Food processing

	Agriculture	Food Processing
<i>Initial tariffs, %</i>	12	5
<i>Intermediates as % of output</i>	35	72
<i>Share (%) of tot inputs from sector:</i>		
Agriculture	22	63
Food Processing	13	14
Mining and Energy	1	3
Other Manufacturing	52	14
Services	12	6

Factor price changes as well as the mentioned inter-sectoral intermediates costs savings also help explain why certain sectors record a reduction or almost no increase of imports following tariff abatement. For instance, the absence of imports surge for *livestock*, after the market opening, is explained by the increased domestic sales of local producers who can produce at lower costs and are able to gain market share. A partial equilibrium framework where tariff reduction can only lead to increased imports and lower prices could never account for these types of inter-sectoral linkages.

DR-CAFTA bilateral trade liberalization

The full unilateral trade liberalization serves as a benchmark against which the DR-CAFTA regional agreement can be compared. Table 8 reports sectorial results for the simulation of this regional free trade area. This policy by discriminating between import origins has trade diverting effects which may or not be compensated by trade creation. However, as shown below, this geographic discrimination is not the most relevant aspect to be considered in an evaluation of this policy option.

Nicaragua's liberalization of U.S. imports affects just one quarter of total imports (as shown Table 3) and, thus, has a smaller aggregate impact; however, the overall structural adjustment and inter-sectoral resource reallocation is quite significant. This is due to the large U.S.

weight in some crucial sectors – such as the 72 percent of *Basic Grain* imports and the 26 percent of exports for both of the top two exporting sectors in Nicaragua, *Coffee* and *Meat and Fish Products*. The DR-CAFTA agreement obviously includes increased market access for Nicaraguan products in the US market, however as shown more clearly in the next section, this reciprocal liberalization amounts to a positive but rather small shock. In the model, the implied increased market access is accounted for by increasing border prices for goods exported to the U.S., implicitly assuming that Nicaraguan exporters do not influence domestic prices in the U.S. and that they can enjoy the full rents provided by the initial U.S. tariffs.¹⁸ Given the initial low level of U.S. tariffs, these rents are not very significant.

Table 8: Effects of the DR-CAFTA agreement on Nicaragua's economic sectors

		Imports and Local Sales					Exports and production			
		tmUS	ΔM	M/D	ΔS	ΔPd	ΔEx	Ex/Xp	ΔXp	ΔPx
Agriculture	Coffee	8	3	8	1	-0.6	3	101	3	-0.1
	Sugar Cane	55	0	0	0	-1.3	0	0	0	-1.3
	Basic Grain	29	54	11	-4	-4.8	17	3	-3	-4.6
	Other Agri. Products	8	2	14	1	-0.5	10	26	3	0.1
	Livestock	4	5	4	1	-0.2	2	8	2	-0.2
	Forestry	1	-3	1	1	-2.2	10	2	1	-2.2
	Fishery	10	29	4	2	4.4	-15	6	1	4.2
Mining Ene	Mining	2	0	85	-1	0.2	-2	55	-1	0.1
	Electricity Gas Water	10	1	2	0	0.3	-1	0	0	0.3
	Water Distribution	0	0	0	0	0.5	0	0	0	0.5
Food Processing	Meat and Fish Products	18	13	4	0	0.4	8	53	4	1.4
	Sugar Products	8	2	1	0	-0.1	1	33	0	0.0
	Dairy	12	11	18	-1	-0.3	0	22	-1	-0.3
	Other Food	7	1	35	2	-1.9	11	7	3	-1.8
	Beverages	12	4	8	0	0.0	0	3	0	0.0
	Tobacco	4	0	85	-4	1.5	3	96	2	3.2
Other Manufacturing	Textiles Clothing & Leather	4	4	38	-1	-0.1	2	55	0	0.2
	Wood Products	8	4	23	-1	-0.6	1	12	-1	-0.5
	Paper Print Products	3	1	55	-1	0.1	-2	3	-1	0.1
	Refined Oil	7	2	26	-1	0.0	0	8	-1	0.0
	Chemicals	3	1	71	-1	-0.2	0	18	0	-0.2
	Glass No-Metal Products	4	1	35	-1	0.2	-1	7	-1	0.2
	Metal Products	3	0	72	-1	-0.1	0	16	-1	-0.1
	Machinery and Equipment	2	0	83	-2	-0.2	-1	73	-1	-0.1
Services	Construction	0	0	0	0	0.3	0	0	0	0.3
	Commerce	0	0	0	0	0.7	0	0	0	0.7
	Other Services	0	1	5	0	0.4	-2	2	0	0.4
	Transport Services	0	0	6	0	0.2	-1	9	0	0.1
Total		4	2	23	0	0.0	4	12	0	0.1
--- Aggregate sectors averages ---										
Agriculture		21	22	7	0.1	-0.9	5	23	1.0	-0.7
Food Processing		8	3	21	0.5	-0.4	6	28	1.9	0.0
Mining and Energy		2	0	48	-0.2	0.3	-2	12	-0.4	0.3
Other Manufacturing		3	1	57	-0.8	-0.1	1	21	-0.5	0.0
Services		0	1	3	-0.1	0.4	-1	2	-0.1	0.4

Notes: **tm** represents initial tariff rates, **ΔM** the percent variation in total import volumes with respect to the initial levels, **M/D** the ratio of imports to domestic demand (the sectoral import dependency, calculated using pre-liberalization levels), **ΔS** the percent variation in the volumes of domestic sales of domestic output, **ΔPd** the percent variation in domestic prices for local sales, **ΔEx** the percent variation in the volumes of exports, **Ex/Xp** the ratio of exports to domestic output (the sectoral export orientation), **ΔXp** the percent change of domestic output, **ΔPx** the percent change of output prices.

¹⁸ A regional multi country model that includes the whole U.S. economy, rather than the current single country model, would be better suited to account for all the direct and indirect effects of a liberalization of U.S. tariffs. However the approach used here, namely to model the U.S. simply as one of Nicaragua's trading partners, can be considered as a reduced form of a more complete multi country model which, although theoretically more appealing, has much higher data intensity and empirical implementation costs.

A preferential bilateral agreement with the U.S. shows some relevant divergences from a full liberalization, especially with respect to factor price changes. Firstly, the overall price deflation resulting from partial trade reform is roughly equal to one quarter of the deflation induced by complete tariff abatement (see the bottom right panel of 10). Secondly, a DR-CAFTA agreement entails a liberalization that is geographically and sectorally concentrated. Consider again the shares of imports originating from the U.S. in Table 3: the economy-wide average share is 24 percent, however imports of US *agricultural* goods represent more than 40 percent of total imports in that macro-sector, with peaks of 72 percent for *Basic Grain*, which is also the most protected sector. Additionally, tariffs against U.S. imports are slightly higher than those against other partners (in the data used for these simulations, which correspond to the year 2000). Thus, the DR-CAFTA agreement-induced imports surge of agricultural goods is equal to 94 percent of that induced by a full unilateral liberalization, whereas the economy-wide average stands at 76 percent. These sectoral distortions explain why factor returns in the farm segment undergo changes that are very close to those experienced in a full liberalization scenario; actually the unskilled labor real wage contraction is the same in the two cases, whereas factor returns in the non farm sector record a smaller percentage of the full liberalization shock.

Table 9: Factor price changes due to DR-CAFTA

	ΔP	$\Delta(P/CPI)$	% of Full Lib
<i>Non-Farm Segment:</i>			
Skilled Labor	0.7	1.2	60
Unskilled Labor	1.0	1.6	55
Capital	0.9	1.5	85
Sk/Unsk wage gap		-0.4	
<i>Farm Segment:</i>			
Skilled Labor	-2.0	-1.4	87
Unskilled Labor	-4.5	-3.9	100
Capital	4.1	4.7	92
Sk/Unsk wage gap		2.6	
<i>Price indexes:</i>			
Food price index	-1.4		39
Non food price index	0.0		-1
CPI	-0.6		24

Sources: author calculations from model results. Notes: the first column, ΔP , represents the percent variation of the price of each factor with respect to the initial levels, $\Delta(S/CPI)$ is the percent variation of the price deflated by the Consumer Price Index; the column, **percent of Full Lib**, shows the percent ratio of the real price changes in the DR-CAFTA scenario with respect to the unilateral non discriminatory full liberalization case.

In summary, the impact on factor remuneration of the examined trade reforms, full liberalization and DR-CAFTA agreements, should be positive for urban workers, both wage-employed or self-employed with physical capital, but it may, at least temporarily, be negative for rural wage earners (but not necessarily negative for subsistence farmers). For agricultural households receiving part of their income from capital and land, or even from non-farm activities, the unfavorable farm wage changes should have smaller effect. Notice also that the

wage gap between skilled and unskilled workers does not significantly change with this kind of trade reform.¹⁹

Decomposing the DR-CAFTA scenario

In order to distinguish the effects of market access from those of own-tariff liberalization, the simulated reciprocal DR-CAFTA trade agreement has been decomposed into two separate reforms: in the first, Nicaragua unilaterally eliminates all tariffs against U.S. imports, and, in the second, the U.S. unilaterally responds, i.e. it preferentially liberalizes imports from Nicaragua.²⁰

As already anticipated, the opening of the Nicaraguan market corresponds to almost the full DR-CAFTA shock: the unilateral liberalization achieves roughly three quarters or more of the variation in imports, exports, and domestic output recorded by the reciprocal case. As shown in Table 110, in the case of unilateral U.S. liberalization, effects on imports and local sales are more or less muted, and the most visible effects consist of some additional specialization in exports of food processing products.

Table 10: Decomposing sectoral effects of DR-CAFTA

	Nicaragua Unilat. Lib						US Unilat. Lib					
	Imports and Local Sales			Exports and production			Imports and Local Sales			Exports and production		
	ΔM	ΔS	ΔPd	ΔEx	ΔXp	ΔPx	ΔM	ΔS	ΔPd	ΔEx	ΔXp	ΔPx
Agriculture	19	-0.1	-1.9	5	1.0	-1.7	3	0.2	1.0	0	0.1	1.0
Food Processing	1	0.5	-1.1	3	1.3	-0.9	1	-0.1	0.7	3	0.6	0.9
Mining and Energy	0	-0.2	-0.2	0	-0.2	-0.2	0	0.0	0.5	-2	-0.2	0.5
Other Manufacturing	1	-0.7	-0.4	1	-0.3	-0.3	0	-0.2	0.3	0	-0.2	0.3
Services	-1	-0.1	-0.1	0	-0.1	-0.1	2	0.1	0.5	-2	0.0	0.5
Total	1	-0.1	-0.6	3	0.3	-0.5	1	0.0	0.6	1	0.1	0.6

Notes: ΔM represents the percent variation in total import volumes with respect to the initial levels, ΔS the percent variation in the volumes of domestic sales of domestic output, ΔPd the percent variation in domestic prices for local sales, ΔEx the percent variation in the volumes of exports, ΔXp the percent change of domestic output, ΔPx the percent change of output prices.

The two unilateral liberalizations are consistent in their sectoral output effects. Both induce additional growth of agricultural and food processing sectors and, in this sense, helps Nicaragua exploit its comparative advantage. Although the U.S. already granted preferential access to Nicaraguan exports in the past, the remaining current U.S. tariffs seem to inhibit potential growth in some key sectors in Nicaragua, and obtaining full access to the U.S. markets may then bring some advantages.

¹⁹ This outcome may not hold under a different production specification where skilled workers, for example, are modeled as a complement to capital, rather than as substitutes.

²⁰ This decomposition is not exact given that the sequence in which these reforms are carried out matters for the final results. However in this particular case, given that the magnitude of the shocks, especially the reduction of U.S. tariffs against Nicaraguan products, are not too large, the order in which the two simulations are carried out is almost indifferent.

Table 11: Decomposing factor price changes due to DR-CAFTA

	Nicaragua Unilat. Lib			US Unilat. Lib		
	ΔP	$\Delta(P/CPI)$	% of CAFTA	ΔP	$\Delta(P/CPI)$	% of CAFTA
<i>Non-Farm Segment:</i>						
Skilled Labor	0.0	1.1	86	0.6	0.2	14
Unskilled Labor	0.5	1.5	94	0.6	0.1	6
Capital	0.2	1.2	81	0.8	0.3	19
Sk/Unsk wage gap		-0.4			0.1	
<i>Farm Segment:</i>						
Skilled Labor	-3.2	-2.2	160	1.3	0.8	-60
Unskilled Labor	-5.2	-4.1	106	0.7	0.3	-6
Capital	2.1	3.1	67	2.0	1.5	33
Sk/Unsk wage gap		2.1			0.6	
<i>Price indexes:</i>						
Food price index	-2.0			0.6		
Non food price index	-0.4			0.4		
CPI	-1.0			0.5		

Sources: author calculations from model results. Notes: the first column, ΔP , represents the percent variation of the price of each factor with respect to the initial levels; $\Delta(S/CPI)$ is the percent variation of the price deflated by the Consumer Price Index; the column, **percent of DR-CAFTA**, shows the percent ratio of the real price changes in the unilateral liberalizations with respect to the bilateral DR-CAFTA case.

As long as factor markets effects are concerned, Table 11 suggests that the non-reciprocal removal of Nicaragua's tariffs causes factor prices of the non-farm segment to vary almost as much as with the DR-CAFTA scenario, leaving a small contribution to the full price change to the US unilateral response. Interestingly, the two unilateral liberalizations have contrasting prices effects for factors in the farm segment. In the case of U.S. liberalizing its tariffs, factor prices go up due to the increased export demand and this inflationary effect is not counterbalanced by inflows of cheaper imports. However, these inflows explain why factor prices tend to contract with the unilateral liberalization of Nicaragua, thus showing that access to the U.S. market mitigates the potentially negative shocks to farm incomes associated with the liberalization of Nicaraguan agricultural markets. Finally, since these simulations predict small effects on factor returns, then the corresponding effects on Nicaragua's poverty indicators (the Headcount poverty rate and the poverty gap) decline under both scenarios by rather small amounts, as reported by Bussolo and Niimi (2005). But these authors' reported poverty-reduction effect of DR-CAFTA alone is slightly lower than the predicted poverty effect of a full unilateral reform by Nicaragua. That is, Bussolo and Niimi predict that Nicaragua's percent of poor families would fall by 0.3 percent under DR-CAFTA but by 1.6 percent under the full-liberalization scenario.²¹

3. Complementary Policies and the Dynamic Gains from Trade

The scientific literature on trade and economic growth provides various reasons explaining why trade reforms and trade agreements might have "dynamic" effects, as opposed to the previously discussed static gains. This latter term is used to refer to the impact of trade

²¹ These numbers were calculated with respect to a national poverty rate of 49.8 percent, which was used as the initial level of poverty in Bussolo and Niimi (2005).

policies on factors that can affect the long-term growth rate of developing economies, namely aggregate investment, technological progress, and the quality of public institutions. The following sections review relevant literature and empirical evidence concerning these channels of influence.

A. Dynamic gains from trade through FDI, innovation, and the quality of institutions

*Foreign direct investment*²²

A specific aspect of DR-CAFTA relevant for investment location decisions was the adoption of rules of origin for the determination of the goods that could benefit from the preferences established by the treaty. These rules, which vary across goods (see Chapter 3), provided new incentives for the location of investments in the NAFTA region in general and Mexico in particular, in those industries where existing levels of regional integration were below the threshold levels determined by the rules.

But the effect of FTAs on the perceived riskiness of investment – the so-called ‘credibility effect’ -- can be even greater than the profitability effect. While the term ‘credibility’ is somewhat vague, in the present context it encompasses three different things:²³

- (i) the FTA’s locking-in effect of trade policies;
- (ii) the locking-in effect of broader reforms (ranging from regulation and competition policies to property rights, contract enforcement and macroeconomic stability); and
- (iii) the guarantee of access to partners’ markets.²⁴

Different preferential trade arrangements entail different combinations of (i), (ii) and (iii). For example, EU accession is viewed by a majority of observers as having significant effects in all three dimensions, and particularly in the broader area (ii), as the single market entails a common regulatory framework for all members (leaving aside even broader issues of political unification). In the case of a RIA such as NAFTA, the main effects should in principle accrue through the ‘secured access’ channel and the locking-in of Mexico’s commitment to trade opening initiated in the late 1980s,²⁵ as the treaty entails fewer automatic repercussions than the EU in the broader policy environment. Nevertheless, many analysts have expressed the view that NAFTA’s risk-reducing effect could also be very large, but it is virtually impossible to know with certainty given that Mexico suffered a major financial crisis during the first years of NAFTA and relatively little time has transpired since then.²⁶

²² This section appears in Chapter 4 of Lederman, Maloney, and Servén (2005) and the econometric analysis was undertaken by Cuevas et al. (2002).

²³ The various effects that would fall under ‘credibility’ are spelled out in Whalley (1996) and Fernández and Portes (1998). See also Schiff and Winters (1998).

²⁴ Note that even though FTAs do not necessarily preclude the imposition of antidumping duties, they nevertheless do offer formal mechanisms for dispute resolution. In this sense, they do provide a guarantee of uninterrupted market access. See Fernandez and Portes (1998).

²⁵ This locking-in is emphasized by Kehoe and Kehoe (1994).

²⁶ See for example Leamer et al (1995). Mexico has not suffered a major financial crisis since the 1994-95 “Tequila” crisis, but it is not clear that the absence of a crisis is due to NAFTA.

To gauge the effect of NAFTA on FDI flows, and disentangle it from that of other factors affecting FDI, we turn to an econometric analysis of the influence of FTA membership on direct investment flows. We then use the empirical estimates to quantify the relative contribution of regional integration, globalization, and other factors to the evolution of FDI in Mexico. This analysis should shed light on what can be expected in DR-DR-CAFTA countries.

The approach is described in detail in Cuevas et al (2002), so here we provide only a summary. The analysis focuses on aggregate FDI flows to 45 countries over 1980-2000.²⁷ This sample includes the same FTAs studied by Frenkel and Wei (1998).²⁸ The framework assumes implicitly that North-North, North-South and South-South FTAs are all the same in terms of FDI effects. This is worth noting because NAFTA is the only North-South FTA in the period studied by Cuevas and his coauthors. The empirical model relates FDI to various explanatory variables. The most relevant ones for this report are FTA-related variables, which comprise a dummy indicating FTA membership of the host country (FTAMEM) and another capturing the anticipation of future membership (EXFTAMEM).²⁹ In addition, we include a measure of the extended market size of the FTAs to which the host country belongs, given by members' total GDP (FTAGDP). These variables should be expected to carry positive signs if FTAs encourage FDI to member countries. Finally, to explore FTAs' potential investment diversion effects, a measure of the degree of trade integration of other countries (INTEGRATION) is used; this is basically a weighted sum of the GDP of all the sample countries participating in FTAs, with the weight of each country's GDP given by the fraction of worldwide GDP covered by its FTA arrangements.³⁰

Table 12 reports empirical estimates of the determinants of FDI obtained from this specification.³¹ Four variants are reported, with different combinations of the FTA-related variables and the institutional variables. On the whole, the explanatory power of the empirical equations is quite satisfactory given the samples employed. The results concerning the variables capturing FTA membership support the notion that joining a trade block leads to higher FDI inflows. The expectation of joining a free trade area (EXFTAMEM) has a positive impact on foreign investment. The coefficient consistently exceeds one-third, indicating that announcement of an imminent entry into a larger regional market raises FDI in that proportion. The fact that the free trade area dummy has a statistically insignificant coefficient reflects the inclusion in the equations of a more direct measure of integration, extended market size (FTAGDP), which is always significant. The elasticity of FDI with respect to this variable is between one tenth and one seventh, implying that if a country joins a free trade

²⁷ This is in contrast with other recent papers focusing instead on bilateral FDI flows or stocks, which often use empirical models based on gravity variables. See for example Levy-Yeyati, Stein and Daude (2001).

²⁸ Specifically, ASEAN, EFTA, what today is the EU, NAFTA, the Group of Three, the Andean Group in its recent revival, Mercosur, and COMESA (which in the analysis is included only as an expected FTA).

²⁹ The results below correspond to the case when FTA membership is anticipated two years ahead of its occurrence. Alternative time horizons were used too, without any substantial changes in results.

³⁰ Thus, an increase in INTEGRATION holding FTAGDP constant would imply a reduced FDI appeal for the host country in question. Note that this variable has only time-series variation.

³¹ The dependent variable is net FDI inflow. All variables with a monetary dimension are measured in constant dollars and expressed in logs. Country fixed effects were added in all the regressions. Endogeneity is potentially an issue, especially in the case of GDP growth. However, specification tests could not reject its exogeneity. Additional experiments are reported in Cuevas et al (2002).

area five times as large as the country itself, it should expect FDI inflows to rise by fifty percent or more. In contrast, we find no significant effects of the variable capturing investment diversion (INTEGRATION), perhaps due to the rudimentary nature of this measure.

Table 12: Fixed-Effects Regressions of the Log of FDI against Membership in a Free Trade Area and Other Variables

<i>Variable \ Model</i>	1	2	5	6
ftamembr	-0.211 <i>0.219</i>		-0.149 <i>0.249</i>	
expfta	0.377 * <i>0.199</i>	0.437 ** <i>0.188</i>	0.341 * <i>0.202</i>	0.389 ** <i>0.185</i>
lngjoint	0.158 <i>0.141</i>	0.162 <i>0.141</i>	0.256 <i>0.166</i>	0.253 <i>0.166</i>
lngdpfta	0.158 ** <i>0.072</i>	0.110 ** <i>0.053</i>	0.146 * <i>0.079</i>	0.114 * <i>0.059</i>
wrldgrwt	-0.072 * <i>0.041</i>	-0.070 * <i>0.041</i>	-0.100 <i>0.062</i>	-0.099 <i>0.062</i>
us1tbill	0.006 <i>0.020</i>	0.007 <i>0.020</i>	0.045 <i>0.039</i>	0.045 <i>0.039</i>
lnfdiwr	0.747 ** <i>0.116</i>	0.744 ** <i>0.116</i>	0.617 ** <i>0.139</i>	0.614 ** <i>0.139</i>
gdpgrwth	0.034 ** <i>0.012</i>	0.033 ** <i>0.011</i>	0.036 ** <i>0.013</i>	0.036 ** <i>0.013</i>
inflatio	-1.31E-04 <i>1.22E-04</i>	-1.47E-04 <i>1.21E-04</i>	-3.45E-05 <i>1.22E-04</i>	-4.31E-05 <i>1.21E-04</i>
curracct	-0.040 ** <i>0.011</i>	-0.041 ** <i>0.011</i>	-0.033 ** <i>0.013</i>	-0.033 ** <i>0.013</i>
relgniph	-2.491 ** <i>1.179</i>	-2.297 ** <i>1.161</i>	-5.493 ** <i>1.394</i>	-5.397 ** <i>1.384</i>
lnexport	0.748 ** <i>0.219</i>	0.719 ** <i>0.217</i>	0.638 ** <i>0.270</i>	0.620 ** <i>0.268</i>
lngdp	0.170 <i>0.240</i>	0.204 <i>0.237</i>	-0.036 <i>0.300</i>	-0.006 <i>0.296</i>
govstab			0.137 ** <i>0.048</i>	0.139 ** <i>0.048</i>
laworder			0.293 ** <i>0.066</i>	0.298 ** <i>0.065</i>
bureau			0.064 <i>0.080</i>	0.061 <i>0.079</i>
constant	-14.806 ** <i>1.796</i>	-14.498 ** <i>1.767</i>	-11.724 ** <i>2.142</i>	-11.518 ** <i>2.113</i>
R-sq: within	0.4703	0.4696	0.4937	0.4934
total	0.8071	0.8068	0.8250	0.8249
No. Obs	787	787	645	645
No. Countries	45	45	45	45

Note: Standard errors appear in italics under the corresponding coefficients.

As for the global variables, world growth carries in all cases a negative coefficient, close to 10 percent significance. This is in agreement with the findings reported by Albuquerque et al (2002) on the role of global factors in FDI flows: other things equal, faster growth in the rest of the world reduces the a country's appeal for international investors. In turn, the

international interest rate is generally insignificant. Finally, world FDI flows are strongly significant and positive, as should be expected.³²

Among the local factors, the elasticity of FDI inflows with respect to exports is about 0.7 and significant in all models, suggesting that openness is a major attractor of FDI.³³ Host country growth is also consistently positive and significant, likely reflecting the positive impact of profitability on FDI, and again consistent with Albuquerque et al (2002). Inflation has a generally negative effect on FDI, as expected, but not statistically significant. Likewise, local market size, as measured by GDP, carries a consistently positive but insignificant coefficient. In turn, the negative coefficient on the current account balance in all regressions seems to reflect financing need (likely driven by domestic investment) rather than an unstable macroeconomic environment. Finally, the measure of relative per capita income (RELGNIPH) always carries a significant negative coefficient. If, as already argued, per capita income differentials proxy for relative wages, the result implies that *ceteris paribus* countries with lower labor costs attract larger FDI inflows.³⁴

The last two columns in Table 3 add the institutional quality variables. They carry significantly positive signs, as one should expect, with the exception of the quality of the bureaucracy indicator, which fails to be significant. On the whole, the coefficients on the other regressors show only modest changes relative to the previous specifications.

The key result from this analysis is the positive effect of FTAs on FDI inflows to member countries. This agrees with earlier empirical studies of the impact of FTAs based on a variety of methodological frameworks ranging from structural model simulations (e.g., Baldwin, François and Portes 1997) to gravity-based studies of bilateral FDI (Levy-Yeyati, Stein and Daude 2002). However, it is notable that the estimated impact of FTAs is much less than what proponents of NAFTA, for example, have argued (e.g., see the USTR's web site) since FDI to Mexico increased by much more than 40 percent (the effect of NAFTA implied by the aforementioned results). Moreover, the results suggest that it is the interaction of FTA membership with other economic outcomes that really has an impact, rather than an FTA by itself. Finally, the variables representing the quality of public sector institutions have strong and independent effects on FDI, thus again suggesting that quality institutions are key for attracting FDI, not just for improving the allocation of factors of production (labor and capital) for productive uses, as discussed in the previous section on the static gains from trade.

There can be little doubt that FDI increases the host country capital stock and contributes the technology embodied in that capital. But the evidence on technological spillovers is sparse, and pessimistic. López-Córdova (2002) finds a *negative* direct impact of FDI on the same

³² The fact that the coefficient on global FDI is less than unity likely reflects the fact that increasingly important FDI recipients are excluded from the sample due to lack of complete data. Our measure of total FDI inflows is not the sum of the inflows into the sample countries, which are obtained from a World Bank database, but a worldwide total reported by UNCTAD's World Investment Report.

³³ While this result is consistent with expectations and previous results concerning the role of openness, simultaneity is a potential concern, as FDI may target traded sectors and lead to stronger export performance. However, there is likely a long gestation period between new investment and exports, which reduces the risk of simultaneity.

³⁴ Albuquerque *et al* (2002) report this result using direct measures of real wages for a reduced country sample.

industry's TFP. This is consistent with numerous other studies.³⁵ The early cross-sectional work by Blomstrom and Wolff (1994) found that both the rate of local firms' labor productivity growth and their rate of catch up to the multinationals were positively related to the industry's degree of foreign ownership. They point out, however, that it is difficult to distinguish a rise in within-firm productivity from simply increased competition forcing out less efficient firms thus raising the average rate of growth.

The macroeconomic evidence regarding the role of FDI in spurring TFP growth is also pessimistic. First, most studies of the causality between investment and growth indicate that investment follows growth (see, for example, Loayza et al. 2002). Calderón, Loayza, and Servén (2002) find that in developing countries FDI also follows national growth. Finally, Carkovic and Levine (2002, abstract) conclude that "the exogenous component of FDI does not exert a robust, independent influence on growth." Thus there seems to be a need to consider the potential role of national innovation and education policies, since we cannot assume that fast-paced growth will automatically result from FDI inflows.

Innovation and education

The most talked about channel through which international trade can raise long-term productivity growth is through the importation of foreign technologies in the form of capital goods (Keller 2001 and 2002; Eaton and Kortum 2002; Trejos and Cavalcanti 2003; among others). For the case of Mexico under NAFTA, Schiff and Wang (2003) present empirical evidence suggesting that capital goods imports from the U.S. had huge impacts on industrial productivity in Mexico. Interestingly, these authors' econometric estimates imply that a marginal increase in the imports of R&D-weighted capital goods from the U.S. lead to a 5.5-7.5 percent increase in the level of Mexican industrial total-factor productivity, whereas capital imports from the Europe or other industrialized countries had negligible effects. These results are consistent with estimates provided by Keller (2002). This author finds that the productivity gains due to the importation of foreign capital goods declines with geographic distance of the trading partners. This result alone should shed some doubt on the channel of influence, since geographic distance should affect the quantity of trade but not necessarily the

³⁵ Lipsey (2002), in a comprehensive review of the literature argues that the evidence is vast that foreign firms tend to be at least as productive as domestic firms and hence their presence pushes up average productivity. The evidence on positive productivity spillovers from foreign firms is ambiguous. The majority of papers that find these effects employ cross sectional data and thus do not control for unobserved country characteristics. Those using firm level panels frequently find insignificant or, even negative effects (e.g., Aitken and Harrison (1999) for Venezuela). Van Pottelsberghe de la Potterie and Lichtenberg (2001) find that investing in a relatively more technologically advanced country and hence adding foreign production to domestic production increases productivity in the home country. But the reverse case of investment in a technologically less advanced country has insignificant or negative results for the host, developing country. Baldwin, Braconier, and Forslid (2000) find mixed results for seven OECD countries and using panel firm level data from Sweden, Braconier, Ekholm, and Midelfart Knarvik (2000) find no spillovers from incoming FDI on productivity and the only variable in their sample affecting TFP is own country R & D. Xu (2000) using panel data on technological transfer from US finds a technology transfer effect by US multinationals only for advanced countries although a competition effect does appear to increase productivity. Kinoshita (2000) found, for example, little evidence at the firm-level of positive effects of FDI in the Czech Republic from 1995-1998. Smarzynska (2002) finds no direct impact of FDI in Lithuania on firms in the same industry although there was an impact on affiliated upstream suppliers.

marginal effects of capital imports. Thus it is likely that the dramatic effects captured by Schiff and Wang for Mexico under NAFTA are due to greater business interactions and learning via contacts rather than through the magic of capital imports.

Recent work in innovation stresses that adopting existing technology is not without cost. Firms and countries need to develop an “absorptive” or “national learning” capacity which, in turn are hypothesized to be functions of spending on research and development (R&D).³⁶ Though often considered relevant only for basic science dedicated to expanding the knowledge frontier, Cohen and Levinthal (1991) among others stress learning -- knowing where the frontier is and figuring out what adaptations are necessary -- as the “second face” of R&D. In fact, Pavitt (2001) argues that investment in pure research is also important for developing countries. First, those most familiar with the frontiers of basic science will best train the applied problem solvers in the private sector. Second, even basic research does not flow easily or costlessly across borders so developing countries cannot simply rely on what is being generated in the advanced countries. Finally, Lederman and Saenz (2003) present econometric evidence suggesting that innovation outcomes, namely patents per capita, are an important explanation of the levels of development observed around the world.

Low rates of investment in R&D can be due to low private and social returns to R&D in developing countries, although Lederman and Maloney (2003) estimate that the economic returns to R&D and to licensing for countries of Costa Rica’s level of income are high at around 65 percent. Further statistical analysis by Lederman and Maloney suggests that financial depth, protection of intellectual property rights, ability to mobilize government resources, and the quality of research institutions are key determinants of R&D effort across countries. Notably absent as a robust predictor of national R&D effort in the preliminary analyses presented by these authors was the incidence of international trade. That is, after controlling for the aforementioned variables, international trade does not seem to be a crucial factor in determining how much each country invests in R&D.

Low levels of innovation outcomes may also arise from inefficiencies in the way in which existing innovation-related resources are utilized through the NIS. One way of estimating the efficiency of a NIS is by examining how R&D investments translate into commercial patents and how the “elasticity” of patents with respect to R&D investment compares to the world average.³⁷ Chapter 7 includes a review of the efficiency of R&D expenditures in Costa Rica, El Salvador and numerous other countries. For the case of LAC as a whole, econometric exercises described in Bosch, Lederman, and Maloney (2005) show that the main explanation of the region’s inefficiency stems from the lack of collaboration between the private sector and research organizations such as universities.³⁸ Additional statistical exercises showed that

³⁶ At the firm level, see Cohen and Levinthal (1990), Forbes and Wield (2000), Griffith, Redding and Van Reenen (2003), Pavitt (2001) at the national level see, for example, Baumol, Nelson and Wolf (1994).

³⁷ Bosch et al. (2005) discuss in detail how these elasticities are estimated and how they vary across regions of the world.

³⁸ This result was derived by estimating a patenting function that includes the interaction between R&D investment and a dummy variable for Latin American and Caribbean countries (LAC). In turn, the same function was estimated but including additional explanatory variables. Among these, the variables from the Global Competitiveness Report on the private sector’s perception of the quality of research institutions and

Costa Rica's privileged position compared to the rest of the LAC countries is due to higher quality of research institutions and greater collaboration with private firms. El Salvador's negative value can be interpreted as an indication of the extent to which the country underperforms in patenting efficiency relative to the OECD average.

El Salvador seems to be more inefficient than the average of LAC countries. Additional statistical exercises showed that El Salvador's inefficiency is only partially explained by variables characterizing the NIS such as quality of research organizations and their collaboration with the private sector. Understanding the shortcomings of El Salvador's NIS remains a topic for future analysis.

A related topic concerns Central America's performance with respect to economic discoveries, namely the introduction of new export products. Hausmann and Rodrik (2003a) provide a theoretical framework that suggests that without public sector intervention the market will not provide incentives for entrepreneurs to invest in discovering new and potentially profitable businesses. In fact, these authors have argued that countries such as El Salvador can revitalize their economic growth through public sector subsidies for the introduction of new products (Hausmann and Rodrik 2003b). Furthermore, Klinger and Lederman (2004) do find evidence suggesting the market failures might in fact impede economic discovery, although these authors also found that general export growth is associated with subsequent increases in the probability of experiencing export discoveries (defined as an episode in which a country begins to export products that were not exported at all at the beginning of a ten-year period). Furthermore, Khan (2004) finds that the introduction of new products does affect economic growth by stimulating productive investment. For Central America, however, the question is whether policies to stimulate economic discoveries have to be a priority over other policy needs. These issues, including some related to the potential gaps in R&D effort observed in Central America, are addressed in Chapter VII of this report.

Institutions

Although the role of institutional quality in promoting economic development remains a fertile area for academic research, there is substantial evidence that suggests that law and order and corruption are key factors in the development process (see, among others, Acemoglu et al. 2001, Easterly and Levine 2003; Rodrik and Subramanian 2003). The economics profession highlighted some time ago the fact that when economic resources are used for rent seeking or directly unproductive activities, the overall level of economic output falls due to the distraction of these potential productive factors. Krueger (1974) was one of the first to focus on the effects of public policies, including trade policies, through this resource-distraction effect. Others have drawn broader implications for competition policy more generally (Bliss and Di Tella 1997). And there is some evidence that trade-policy distortions are positively correlated with empirical (but subjective) measures of corruption (Dutt 2002). This line of reasoning thus suggests that DR-CAFTA itself might have a salutary effect on overall production and potentially national welfare, by reducing rent-seeking which would in

the extent of collaboration between private firms and universities were the ones that eliminated the statistical significance of the LAC variable interacted with R&D. See Bosch et al. (2005) for details.

turn increase potential output. In turn, rent-seeking activities by private agents can themselves breed public corruption and vice-versa.

But does trade really help improve indicators of corruption? Or are there other factors that explain both the incidence of international trade on the domestic economy as well as incidence of corruption? Table 13 presents results from Lederman, Loayza, and Soares (2005) concerning the determinants (of perceptions) of national corruption around the globe during 1984-2000. Contrary to previous literature, this evidence suggests that political institutions such as the prevalence and years of experience under democratic governments are stronger and more robust predictors of international measures of corruption than exposure to international trade. Details concerning the two econometric techniques used to derive the two sets of consistent estimates in Table 13 are present at the bottom of the table. In any case, these results suggest important policy implications, namely that we should not expect international trade to make significant inroads by themselves in the fight against corruption in Central America, at least not in the near future. Rather, governments should encourage proactive policies to improve formal mechanisms of accountability, such as transparency initiatives (publishing budgets, providing time for public comment on regulatory changes and, of course, protecting the freedom of the press). In the long run, it is likely that democratic governance itself, through the formal mechanisms of checks and balances, will become the underpinning of clean governments and more vigorous economies. Nevertheless, certain elements of the DR-CAFTA call for public transparency in government procurement and regulatory changes, thus reducing the scope for discretionary normative changes that can breed corruption among the public sectors of Central America. Moreover, DR-CAFTA also mandates that governments implement their own labor and environmental regulations, which also reduces the scope for selective enforcement of laws. Consequently, modern trade agreements such as DR-CAFTA, whose scope goes beyond traditional trade matters, do hold some promise for tackling institutional deficiencies.

Table 13: Determinants of International Corruption – Does Trade Really Matter?

<i>Estimation</i>	<i>Ordered Probit</i>				OLS			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>democ</i>	-0.1580	-0.5238	-1.8054	-0.7097	-0.2078	-0.4598	-1.2111	-0.6140
	0.1302	0.1547	0.3149	0.2368	0.1195	0.1227	0.2009	0.1870
	0.2250	0.0010	0.0000	0.0030	0.0820	0.0000	0.0000	0.0010
<i>presid</i>	1.0367	0.4324	1.2732	1.1194	0.9261	0.3591	0.7589	0.8403
	0.1030	0.2028	0.3340	0.2710	0.0907	0.1679	0.2237	0.2150
	0.0000	0.0330	0.0000	0.0000	0.0000	0.0330	0.0010	0.0000
<i>reelect</i>	-0.2244	0.0429	-0.3354	-0.3062	-0.2329	0.0385	-0.1668	-0.2676
	0.1375	0.1810	0.2929	0.2609	0.1254	0.1477	0.2153	0.2149
	0.1030	0.8130	0.2520	0.2410	0.0630	0.7940	0.4390	0.2140
<i>dstab</i>	-0.0340	-0.0423	-0.0410	-0.0453	-0.0272	-0.0307	-0.0234	-0.0284
	0.0024	0.0032	0.0055	0.0049	0.0019	0.0022	0.0033	0.0035
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<i>state</i>	-0.0968	0.1525	0.4359	0.1625	-0.1039	0.0828	0.1693	0.0759
	0.0425	0.0543	0.1015	0.0768	0.0370	0.0407	0.0618	0.0557
	0.0230	0.0050	0.0000	0.0340	0.0050	0.0420	0.0060	0.1730
<i>list</i>	-0.1654	0.0426	-0.0817	0.3171	-0.1553	-0.0018	-0.0501	0.1937
	0.0860	0.1035	0.1733	0.1472	0.0683	0.0689	0.0904	0.0909
	0.0550	0.6810	0.6370	0.0310	0.0230	0.9790	0.5800	0.0330
<i>control</i>	0.1628	-0.0574	-0.4270	-0.1001	0.1419	-0.0413	-0.3092	-0.0667
	0.0955	0.1068	0.1864	0.1429	0.0825	0.0808	0.1112	0.1028
	0.0880	0.5910	0.0220	0.4830	0.0860	0.6090	0.0060	0.5170
<i>press</i>	-0.0113	-0.0056	-0.0210	-0.0014	-0.0099	-0.0043	-0.0152	-0.0006
	0.0022	0.0031	0.0061	0.0043	0.0020	0.0024	0.0042	0.0033
	0.0000	0.0690	0.0010	0.7500	0.0000	0.0740	0.0000	0.8500
<i>govrev</i>			0.0389				0.0239	
			0.0098				0.0065	
			0.0000				0.0000	
<i>transf</i>			-0.0632				-0.0184	
			0.0221				0.0110	
			0.0040				0.0950	
<i>open</i>			0.0000				-0.0015	
			0.0030				0.0019	
			0.9930				0.4510	
<i>lngdp</i>				-0.1826				-0.1940
				0.1412				0.1056
				0.1960				0.0670
<i>tvr15</i>				-0.1090				-0.0469
				0.0443				0.0304
				0.0140				0.1230
<i>leg brit</i>		0.2598	0.3293	0.6279		0.1518	0.1735	0.3470
		0.1122	0.2510	0.1672		0.0844	0.1485	0.1216
		0.0210	0.1900	0.0000		0.0730	0.2430	0.0040
<i>elf</i>		0.0123	0.0210	0.0109		0.0100	0.0132	0.0103
		0.0021	0.0040	0.0029		0.0016	0.0024	0.0020
		0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
<i>period dummies</i>	yes	yes	yes	yes	yes	yes	yes	yes
<i>reg/nature vars</i>	no	yes	yes	yes	no	yes	yes	yes
<i>N Obs</i>	1158	1010	490	605	1158	1010	490	605
<i>Pseudo R²/R²</i>	0.24	0.33	0.45	0.38	0.57	0.70	0.79	0.74

Obs.: Std errors and p-values below coefficients. Dep var is ICRG corruption index, (0 to 6, higher values more corruption). Ind vars are (*d* for dummy): democracy *d*, presidential *d*, possibility of reelection *d*, time of democratic stability, indicator of local elections for state govts, gov control of legislative *d*, freedom of press index, gov revenues (% GDP), transfers from central gov to other levels (% GDP), openness to trade (imports as % GDP), ln of per capita GDP, avg schooling in the pop above 15, British legal tradition *d*, index of ethno-linguistic fractionalization, period *d*'s, region *d*'s (E Asia and Pacif, E Eur and C Asia, M East and N Afr, S Asia, Sub-Saharan Afr, and L Am and Carib), and nature variables (landlock *d*, area, tropical *d*, long, and lat). *govrev*, *transf*, *open*, *lngdp*, and *tvr15* lagged. Regressions include all obs available between 1984-97. Robust std errors used. Intercept terms for each level of corruption (1-6) are not reported. Source: Lederman, Loayza, and Soares (2005, table 7).

B. The growth effects of Free Trade Agreements (FTAs)³⁹

The previous paragraphs examined literature that provides insights into the potential dynamic effects of trade through intermediate outcomes, such as FDI, innovation, and the quality of public institutions. This section turns our attention to evidence concerning the overall effects of FTAs on the rate of growth of GDP per capita across countries.

In this section we examine whether DR-CAFTA is likely to have an impact on economic growth. While our empirical results will be indicative, they are not expected to produce precise point estimates of the impact of the FTA on economic growth. Rather the results should provide the average growth impact of FTAs after controlling for a wide variety of country specific factors. Because countries and institutions differ in a myriad of ways, both measurable and immeasurable, one would ideally like to have country-specific empirical results that capture the idiosyncratic circumstances of each country. Due to obvious data limitations, and the fact the most countries in the region typically have only one (or no) prior regional free trade agreement, statistical analysis on a country-by-country basis of past experience is not feasible. Consequently, the empirical analysis undertaken is a cross-sectional time-series panel data analysis that utilizes the experience of 132 countries over a 30-year period. The 30-years of data are divided up into six five-year growth periods and the countries included encompass both developed and developing countries with some 151 country episodes of regional trade agreements. A full description of the data can be found in Tables A6 in the Appendix.

As a starting point for the empirical analysis, we begin by estimating a fixed effects panel growth model that includes the number of regional free trade agreements to determine whether they have any power in explaining economic growth. We also add a variety of important economic and political variables to control for external and internal factors that may also influence economic growth to confirm the robustness of the results. Following this, we account for possible selectivity bias (i.e., the choice of signing a free trade agreement may be endogenously determined by the state of the economy) by explicitly taking into consideration a country's choice to enter into an FTA.

Fixed-effects OLS Regressions

Benchmark Model

We begin the analysis with standard panel data analysis utilizing a fixed-effects regression model and 5-year growth periods. Our benchmark model is the Solow growth model with measures for both physical and human capital investment. The benchmark estimation model takes the following form:

$$\hat{Y}_t = \sum_{i=1}^n \alpha_i \text{CountryDUM}_i + \lambda_1 \ln(Y_{t-1}) + \lambda_2 \ln(K) + \lambda_3 \ln(H) + \mu \quad (1)$$

³⁹ This section was written by David Gould (World Bank) and William Gruben (Federal Reserve of Dallas).

Where, \hat{Y}_t is real GDP per capital growth during period t , $CountryDUM_t$, is a country specific dummy variable, Y_{t-1} , is initial level of real GDP per capita, K is physical capital investment, H is human capital investment, and μ is the error term.

As Table 14, column 1 indicates, the standard benchmark Solow model generally behaves as expected—conditional convergence in growth rates is found as indicated by the negative and statistically significant coefficient on the initial value of log real GDP per capita, and physical capital investment is found to have a positive and statistically significant impact on growth. Our proxy for human capital investment (log of secondary school enrollment as a percentage of total population of that age group that corresponds to secondary school age), however, is negative and not statistically significant. Despite utilizing alternative measures of human capital investment, such as primary and tertiary school enrollment rates as proxies for human capital investment, measures of human capital investment did not become significant. The results would indicate that investment in education, as least for the five-year growth periods does not appear to have a significant impact on growth. However, these results may be due to the relatively short period of growth (5-year periods) or the lack of a good proxy for human capital investment.

Table 14: Fixed Effects Panel Regressions, 1970-2000 (5 year averages)*

	1	2	3	4	5	6	7
Log Initial real GDP p.c. (\$)	-0.017	-0.021	-0.024	-0.035	-0.032	-0.033	-0.034
	(-3.27)	(-3.89)	(-4.37)	(-6.28)	(-5.02)	(-5.10)	(-5.14)
Log secondary school enrollment (%)	-0.004	-0.009	-0.006	-0.003	-0.007	-0.007	-0.007
	(-1.26)	(-2.52)	(-1.64)	(-0.76)	(-1.61)	(-1.48)	(-1.51)
Log of investment share of GDP (%)	0.016	0.017	0.015	0.014	0.013	0.013	0.013
	(3.90)	(4.15)	(3.68)	(3.24)	(2.58)	(2.63)	(2.68)
Number of Regional FTAs		0.008	0.007	0.008	0.007	0.007	0.007
		(3.59)	(3.23)	(3.51)	(3.15)	(2.90)	(2.83)
World GDP growth (%)			0.011	0.010	0.007	0.007	0.007
			(5.37)	(5.36)	(3.69)	(3.45)	(3.47)
Trade share of GDP (%)			0.0004	0.0003	0.0002	0.0002	0.0002
			(5.13)	(3.19)	(2.20)	(2.08)	(2.07)
Black market premium (%)				-0.000006	-0.000004	-0.000004	-0.000004
				(-2.22)	(-1.70)	(-1.67)	(-1.66)
Government share of consumption (%)				-0.0002	-0.0001	-0.0001	-0.0001
				(-0.81)	(-0.43)	(-0.50)	(-0.52)
Fiscal balance as share of GDP (%)					0.001	0.001	0.001
					(3.46)	(3.57)	(3.59)
Choice to liberalize						0.008	0.008
						(1.09)	(1.11)
Freedom							0.002
							(0.66)
Constant	0.134	0.171	0.145	0.241	0.255	0.260	0.258
	(3.06)	(3.83)	(3.16)	(5.04)	(4.61)	(4.70)	(4.66)
Observations	743	743	743	655	557	557	556
R-sq within	0.058	0.076	0.144	0.202	0.206	0.208	0.209
R-sq between	0.002	0.002	0.049	0.008	0.015	0.016	0.019
F- statistic	13.13	13.25	17.99	16.01	12.22	11.12	10.14
* T statistics in parenthesis. Dependent variable: Current per capita real GDP growth							

Regional trade agreements

Regression 2 in Table 14 (column 2) includes a measure for the number of regional free trade agreements in force. To account for the possibility that regional FTAs may be signed in the middle of a five-year growth period, the value of the variable is the portion of the period it is in force. For example, if a country signs its first regional FTA in 1971, then the value of the variable is zero prior to 1970, is equal to 0.8 during the 5 year growth period between 1970-75, and is equal to 1 thereafter (or until another regional FTA is signed). As regression 2 indicates, regional FTAs appear to have a positive and significant impact on growth. The

coefficient on the variable is 0.008, which suggests that a regional free trade agreement would add about 0.8 percentage points to annual growth all else held constant.⁴⁰

Regressions 3 to 7 add various control variables to the benchmark growth model with regional FTA effects. After including these control variables stepwise into the benchmark model with the regional trade agreements variable, we find that the regional trade agreement variable maintains its statistical significance while the size of its impact on growth falls marginally (from 0.8 percentage point impact on annual growth to 0.7 percentage point). As far as the other variables are concerned: world real GDP growth has significant and positive spillover effects on country growth (in the range of 0.7 percent to 1.1 percent); trade as a share of country GDP also has a positive and significant impact in country growth, but is much smaller than the spillover impact of world income growth (in the range of 0.04 to 0.02 percent); as expected, the black market premium has a negative and significant impact on growth, although the impact is rather small—only a -0.0004 to -0.0006 percent impact—and the significance level is lower (95 to 85 percent range); government consumption as a share of total consumption is negative as expected, but is not statistically significant; the fiscal balance as a share of GDP is positive, as expected, and is highly significant suggesting that higher fiscal balances (either due to greater revenues that occur during an economic expansion, or fiscal restraint due to greater tax collections or expenditure cuts) is associated with greater economic growth. A one percent increase in the fiscal balance as a share of GDP is associated with about a 0.1 percent increase in annual growth. Finally, the political and civic freedom index is positively related to economic growth, but is not statistically significant.

The choice to liberalize or, in other words, the period in which a regional FTA is implemented, is associated with additional higher real GDP growth—about the same effect as that of the number liberalizations—0.8 percent of annual growth, but is not statistically significant due partly to multicollinearity (by definition, an increase in the number of liberalizations is always associated with the choice to liberalize). Taken together, the longer-term effect of the number regional trade agreements variable and the shorter term initial impact, indicate that the near-term effects may be about twice as high as the longer-term impacts on growth.

Additional exercises not reported here utilized ten-year growth periods in the time-series dimension, rather than the five-year growth periods. This reduces the number of observations in the time-series dimension by nearly one half, but the effects of the regional trade agreement

⁴⁰ Berthelon (2003) estimates the effects of regional free trade agreements on growth using a dummy variable for the period a country enters a regional free trade agreement weighted by the size of the share of world GDP represented by the FTA trading partners. He also creates another variable that takes the value of this variable but measures it relative to the size of the country's own share of world GDP. While he finds a significant positive value for this variable, we do not find significant results utilizing a similarly weighted variable, nor do we find that the effects of regional FTAs are significantly stronger between countries in the North (developed) and countries in the South (developing) or for any other types of regional FTA partners (South-South or North-North). While we do find that growth effects are larger for North-South FTAs, they are not significantly different than South-South or North-North. Our inability to replicate Berthelon's results may be due to the fact that our data sets are not identical in time periods or countries and that we have different control variables in the regression (including world growth and other variables).

variable is only slightly smaller (about 0.6 percent compared to 0.7 percent) and is still statistically significant at the 95 percent level or higher when including all the control variables. The signs of the control variables are broadly similar to the five-year regressions, but, in general, the significance of the control variables drops below the 90 percent level when including the fiscal balance as a share of GDP into the regression equation. The fiscal balance as a share of GDP is significant at the 99 percent level and appears to dominate the impact of the other control variables that affect growth in the shorter time horizon shown in Table 1r. Over a longer period of time, a more prudent fiscal policy may be a much stronger proxy for policies that effect economic growth (outside of investment and trade policies) than any of the other control variables by themselves. Finally it is worth noting that further econometric exercises that rely on the Arellano and Bond (1991) estimator indicate that the results concerning the average growth effect of FTAs were unaffected by the change in methodology, thus suggesting that results discussed thus far are quite robust.

Selectivity bias in the choice to liberalize

In this section we take into consideration the possibility that regional trade agreements might be chosen during periods of above normal growth, and, as a consequence, may be the result of, and not the cause of higher growth. A problem with the empirical analyses above—as well as that used in numerous other studies on trade and economic growth—is that they rest on the implicit assumption that the choice to enter into a free trade agreement is exogenous and does not depend on the state of the economy or other factors that, in turn, may be related to growth. But, this assumption may be too restrictive. Indeed, during periods of economic expansion, import competing interests may be less apt to lobby against freer trade if they see the overall economic pie growing. Labor in the import sectors may find employment and wages rising and may also be less likely to actively oppose freer trade—even though their gains may not be as large other sectors. In the literature on the political economy of protectionism it has been observed that protectionist pressures are the highest during periods to economic contractions; the corollary to this is that protectionist pressures are the lowest during periods of expansion (see, for example, Lederman 2005 and literature cited therein).

In other words, the choice to enter into a free trade agreement may be endogenously determined by the economy and prospects for future growth. It may simply be the case that free trade agreements are signed during periods of higher than average economic growth and are not the cause of that growth. Those countries with prior economic reforms, international financial support, and better prospects for economic growth may be the most likely to pursue free trade negotiations due to the support of exporters and the lack of strong protectionist pressures from import competing interests. In those countries experiencing weaker economic growth, contraction, and/or diminished prospects, internal political dynamics and protectionism may be much more difficult to overcome.

If the decision to enter into a free trade agreement is endogenous, how will the correction for this potential endogeneity affect the estimated impact of regional FTAs on economic growth? To address this question a simple framework for analyzing growth and policy choice is presented and then the econometric techniques used to estimate such a model are discussed.

Specification of the Selectivity model

Equations (3) through (5) describe the benchmark growth model with the endogenous choice of entering into an FTA. The model assesses whether output growth differs significantly between those periods during which a free trade agreement is signed. It departs from the previous analysis in that the choice to liberalize is modeled as endogenous and selectivity bias is explicitly addressed. The model is specified as:

$$\hat{Y}_{it} = \alpha Y_{it-1} + \beta D_{it} + \gamma X_{it} + \delta n_i + \varepsilon_{it} \quad (2)$$

$$d_{is} = aZ_{is} + cn_i + \eta_{is} \quad (3)$$

$$D_i = 1 \text{ if } d_{is} > 0; D_i = 0 \text{ if } d_{is} < 0. \quad (4)$$

In equation (2), real GDP growth in each period is a function of initial GDP, a dummy variable indicating whether country i signed a free trade agreement during the period, D_{it} , a vector of internal and external country environmental characteristics, X_{it} , such as world growth, fiscal balance, and black market premium, a vector of country specific dummy variables n_i (fixed effects) to account for country-unique trend growth differences, and an error term which includes unobservable country-specific growth factors (more discussion on this below) and random disturbances. Equations (3) and (4) specify the policy choice decision: a country signs a particular regional free trade agreement in period s if the latent variable d_{is} rises above zero. This policy choice equation is based on the notion that the choice to enter into a regional free trade agreement depends on the net benefit a country expects to receive from freer trade and the lobbying efforts of domestic interest groups. The latent variable is a function of a vector of characteristics, Z_{is} , which include lagged variables such as real GDP per capita growth, initial level of GDP per capita, world GDP growth per capita, trade share of GDP, political freedom index, dummy variables to account for unspecified “free trade trends” in the 1980s and 1990s, and a vector of country-specific dummy variables (fixed effects).

Table 15 shows the results of the model that explicitly takes into consideration the potential selectivity bias in the choice of trade liberalization. Maximum likelihood and two-step estimation techniques are shown, but the results are broadly similar. In short, selectivity bias does not appear to be a significant problem the estimated hazard variable (selectivity bias) in both equations (\hat{H}) is not estimated to be statistically significant. Despite prior years of slower than normal growth and higher than normal world growth being a good predictor of the signing of a regional free trade agreement, in neither estimation procedure (the maximum likelihood or the two-step procedure) are the estimated coefficients, nor the significance of the regional trade agreements variables, diminished substantially. Consequently, the evidence suggests that endogeneity in the choice of liberalization does not appear to be a significant problem and does not change the finding that regional free trade agreements tend to boost economic growth.

Table 15: Treatment Effects Model, 1970-2000 (5 year averages)*		
	Maximum Likelihood Estimates	Two Step Estimates
<u>Current per capita real GDP growth</u>		
Log Initial real GDP p.c. (\$)	-0.039	-0.039
	(-2.90)	(-3.88)
Log secondary school enrollment (%)	-0.0003	-0.0004
	(-0.05)	(-0.06)
Log of investment share of GDP (%)	0.007	0.007
	(0.46)	(1.02)
World GDP growth (%)	0.0063	0.006
	(2.57)	(2.60)
Trade share of GDP (%)	0.00003	0.00003
	(0.19)	(0.19)
Black market premium (%)	-0.00001	-0.00001
	(-0.57)	(-0.94)
Government share of consumption (%)	0.0003	0.0003
	(0.91)	(0.84)
Fiscal balance as share of GDP (%)	0.001263	0.001
	(2.62)	(2.28)
Choice to liberalize	0.0103	0.011
	(1.39)	(1.45)
Number of Regional FTAs	0.006	0.006
	(2.48)	(2.42)
<u>Choice to liberalize</u>		
Lagged per capita real GDP growth	-9.701	-9.569
	(-1.7)	(-2.11)
2-period lagged per capita real GDP growth	-14.511	-14.322
	(-2.11)	(-2.77)
Lagged log level of real GDP per capita	2.42493	2.420
	(2.18)	(3.01)
Lagged world real GDP growth per capita	0.427	0.434
	(2.28)	(2.61)
Lagged trade share of GDP	-0.017	-0.017
	(-1.39)	(-1.62)
Lagged freedom index	0.455	0.454
	(1.46)	(1.59)
Dummy for 1980	-0.821	-0.818
	(-2.25)	(-2.48)
Dummy for 1990	-0.047	-0.042
	(-0.11)	(-0.13)
Hazard (<i>H</i>)	-0.001	-0.002
	(-0.20)	(-0.32)
Observations	297	297
Wald Chi Square	...	325.59
Log pseudo-likelihood	552.11	...
<i>* Z statistics in parenthesis.</i>		

Potential Impact on the Poor

Having established that the effect of an FTA on annual per capita growth is an increase in the per capita growth rates of 0.6 percentage points a year, the repercussions on poverty rates can be roughly estimated using elasticities of poverty to changes in economic growth. Such elasticities allow for the calculation of changes in poverty rates that result from economic growth, holding other factors constant (including income distribution) and are available for most Central American countries from recent World Bank studies. Table 16 presents the estimated changes in poverty and extreme poverty rates five years after implementation of the DR-CAFTA, assuming that the estimated growth effect materializes for all five countries. Results suggest that overall poverty reductions would vary by country, ranging from 0.6 percentage points in Costa Rica to 1.6 in Guatemala. The corresponding range for extreme poverty rates goes from 0.3 percentage points in Costa Rica to 1.3 in Honduras. This translates into an absolute reduction in the total number of poor in five years of about 530,000 adding the five countries involved, and nearly 380,000 for the extreme poor.

Table 16: Five Year Poverty Reduction Effects of FTA for Central American Countries

	Headcount Poverty Rate		Difference	Extreme Poverty Rate		Difference
	2005	2010		2005	2010	
Costa Rica	20.4	19.8	-0.6	6.0	5.7	-0.3
El Salvador	36.4	35.0	-1.4	14.7	14.1	-0.6
Guatemala	55.9	54.3	-1.6	15.5	14.4	-1.1
Honduras	63.1	61.9	-1.2	45.7	44.4	-1.3
Nicaragua	45.6	44.7	-0.9	14.9	14.2	-0.7

Note: 2005 poverty rates are Bank estimates based on most recent official data. 2010 estimates assumes per capita growth rate of 0.6 percent per year and poverty elasticities taken from most recent World Bank Poverty Assessment studies. Elasticities for Costa Rica derived using results from Lopez and Serven (2005).

4. Conclusions and Policy Priorities for the DR-CAFTA Beneficiaries

This chapter reviews various analyses undertaken to assess the potential impacts of DR-CAFTA on the developing countries of Central America. It begins by highlighting that standard theoretical treatments of the gains from trade indicate that such gains depend on an economy's capacity to change its productive structure. Otherwise, the gains are limited to the gains on the consumption side, which allow domestic agents to consume a bundle of goods that is larger in economic value than the one without trade reforms. The gains from productive transformation can be substantially higher than the gains from enhanced consumption alone. These conclusions refer to static analyses of the gains from trade.

Regarding empirical analyses of the potential static gains from trade, the evidence reviewed in the chapter highlights two key complementary factors, namely, the infrastructure that affects international transport costs and the regulatory environment. There is strong evidence suggesting that exports to the U.S. market will benefit from the shift from unilateral preferences (CBI) to a free trade agreement, but perhaps more importantly, international transport costs (freight, insurance) have a robust and large effect on the value of exports,

regardless of the type of preferential treatment. Also, the evidence reviewed suggest that the gains from trade in terms of increases in GDP per capita is intermediated by the regulatory environment that determines how quickly firms and workers can change their sectors of operation and employment. Thus a complementary agenda to enhance the impact of the DR-CAFTA should consider these factors, even when concerned about the static gains from trade.

Partial equilibrium analyses of the potential sectoral effects of DR-CAFTA suggested that the main short-term winners of the agreement would be concentrated in the apparel industries, abstracting from any impact of the elimination of world quotas in this sector. Nevertheless, these analyses suffer from an inability to capture the potential effects on sectors that are relatively small, since the effects predicted by these models are proportional to the initial level of exports. In addition, they have difficulty dealing with technical issues such as the restrictiveness of rules of origin. Furthermore, such partial-equilibrium models do not consider the effects of the trade reforms in the economy as a whole since they do not consider inter-sector interactions through factor and goods markets.

This chapter also presents the simulation results from a so-called “Computable General Equilibrium” (CGE) model for Nicaragua linked to household data. The simulation relates the macroeconomic results of the model to changes in the returns to unskilled labor to poverty outcomes. Indeed, under a restrictive set of conditions (e.g., segmented labor markets, no dynamic effects, effective transmission of tariff reductions to relative producer prices, and no further unilateral trade reforms) DR-CAFTA could have an overall modest positive effect on Nicaragua’s welfare (income per capita) but with a very small (positive) effect on poverty, and the potential for poor rural households to be negatively affected. Thus, as with the other static analyses, these results further support the contention that DR-CAFTA might not be enough to reduce poverty, although these results need to be interpreted with caution, as they are obviously limited by key theoretical and empirical assumptions.

The rest of the chapter is dedicated to understanding the potential dynamic gains from DR-CAFTA. The first part covers evidence concerning the potential effect of free trade agreements (FTAs) - and trade more generally - on foreign investment, corruption, and innovation. Existing evidence suggests that FDI responds to FTAs indirectly, by enhancing the effect of exports and GDP on FDI. The evidence also indicates that trade might not have a direct effect on corruption, and thus we should not expect large dynamic gains from DR-CAFTA to come from the impact of international trade on the quality of public institutions. The process of democratic consolidation seems much more important, although certain aspects of DR-CAFTA that put pressure on governments to improve the enforcement of their own laws could also be helpful. The existing literature on innovation and economic discovery suggests a mixed picture. On the one hand, innovation efforts might not be related to the incidence of international trade. On the other hand, the probability of observing episodes of “economic discovery” seems to be positively correlated with overall export growth.

This chapter also reviews the econometric challenges and results by investigating the empirical link between FTAs and subsequent economic growth in a large sample of countries. The main result is that the growth rate of GDP per capita is positively associated with a country’s participation in FTAs. This finding is robust to the inclusion of various control

variables and econometric methods. Unlike the evidence presented in previous work, the new evidence reviewed does not find that the increase in GDP growth of about 0.6 percent per year was sensitive to the type of partner in the FTA. In contrast, a previous empirical study using a different set of control variables and specifications of the empirical models, did find that access to larger markets has a larger effect on growth than FTAs with smaller partners. In any case, there seems to be substantial evidence that FTAs might help accelerate the pace of economic development, at least for the first five years subsequent to implementation. In the long-run, the steady-state level of income will be determined by a plethora of other factors and as economies get richer, their pace of growth will tend to decline. Consequently, there does not seem to be a silver bullet, and DR-CAFTA is unlikely to be the solution to all development challenges faced by Central America.

The evidence reviewed should make clear that ex-ante analyses of the potential effects of DR-CAFTA (and trade reforms in general) remain an art rather than a science, since the results are highly sensitive to theoretical assumption and empirical methods. Chapters V, VI and VII of this report provide more guidance regarding the “complementary agenda”, which includes policies that can help DR-CAFTA beneficiaries overcome the challenges posed by the adjustment process as well as the long-term challenge of economic development in the context of DR-CAFTA.

Technical Appendix: The Gains from Trade for Small Economies and the Underlying Assumptions

The purpose of this appendix is to summarize a textbook model of the gains from trade by highlighting the role of the gains due to consumption and the gains due to the productive transformation of a small open economy. The starting point is the standard simplifying assumption, whereby we assume that the economy produces two broad categories of products, 1 and 2. Furthermore, each good is produced with labor and sector-specific technology, which determines the amount of labor required to produce a unit of each good. Thus equations (1) and (2) below represent the production functions of each good, where a_1 and a_2 represent the out per unit of labor for each sector, and L_1 and L_2 represent the number of workers dedicated to producing each good.

$$(1) \quad Q_1 = a_1 \cdot L_1$$

$$(2) \quad Q_2 = a_2 \cdot L_2$$

Consequently the economy's total labor force (L) is simply the sum of workers in sectors 1 and 2, as expressed in equation (3). This assumption also implies that the labor participation rate does not change, or that the economy maintains a constant level of employment equal to L . As argued in this chapter and subsequently in chapter 5, government policies designed to help the process of adjustment can be instrumental in maintaining a given level of total employment as relative prices change due to trade policies (DR-CAFTA).

$$(3) \quad L = L_1 + L_2$$

Hence the economy's production frontier, which represents the quantities of both goods that it can produce when all labor (L) is employed in production, can be expressed as the quantity of good 1 (Q_1) that can be obtained if all labor is employed in that industry and the quantity of good 2 (Q_2) that can be produced if all labor were in this sector. In other words, the production frontier for the economy in this simple model is the line joining both of these maximum production possibilities. This production frontier is formally expressed in equation (4):

$$(4) \quad Q_1 = a_1 \cdot L - \left(\frac{a_1}{a_2} \right) \cdot Q_2.$$

In this framework, the composition of production depends on available technologies in this economy compared to the technologies of production in the rest of world (or in the economy's trading partners). Here we assume that the economy under consideration can produce good 1 relatively more efficiently than good 2 when compared to its trading partners:

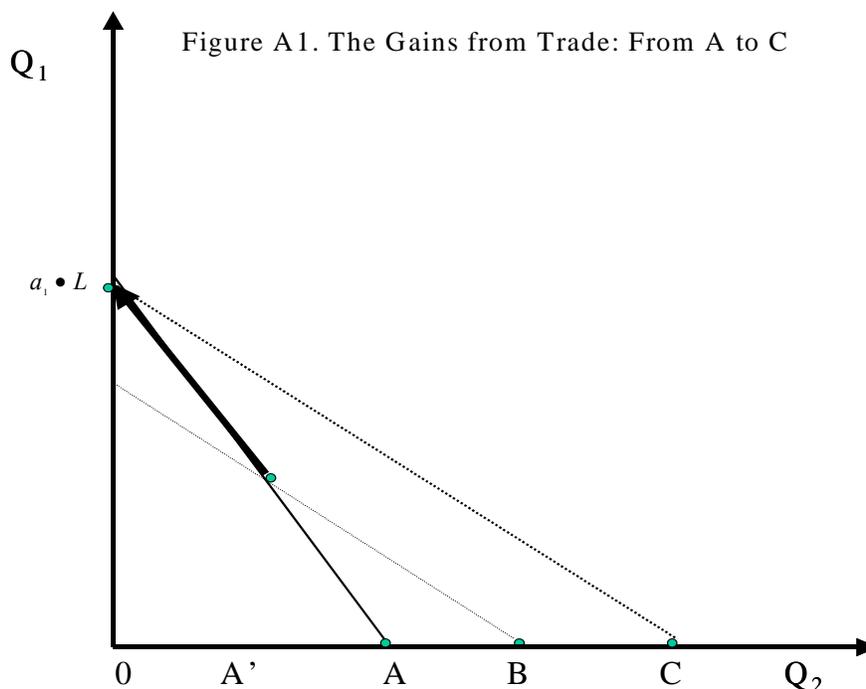
$$(5) \quad \frac{a_1}{a_2} > \frac{a_1^*}{a_2^*}.$$

Thus we assume that this economy has a comparative advantage in the production of good 1. Note that it can have lower labor productivities in both sectors, but it would still have a comparative advantage.

Figure A1 illustrates the economy's production frontier as the downward-sloping line that goes from point $a_1 \cdot L$ on the vertical axis to point A in the horizontal axis. As mentioned, point $a_1 \cdot L$ is the maximum quantity of good 1 that can be produced if all labor were employed in that sector, whereas point A is equal to $a_2 \cdot L$. The slope of this line is equal to the negative ratio of a_1 over a_2 , as shown in equation (4) above.

Now assume that the initial structure of production is represented by some point along the production frontier. In this case, the value of this production mix based on the economy's trading partners' relative efficiencies is given by the consumption frontier portrayed by the dotted line that goes through the production point and extending down to point B in the horizontal axis. In terms of the quantity of good 2 that the economy can consume, the gains from trade without changes in the structure of production are given by the distance between points A and B in Figure A1. That is, with trade, consumers in this economy can consume larger quantities of good 2 than would be possible without free trade, because in autarky consumption must lie on the production frontier.

The gains from trade become larger if the economy is able to change its production structure. In the graph, this entails a movement of the production point from the previous point to the point on the vertical axis where all of the economy's labor is dedicated to production in sector 1. In turn, the consumption frontier shifts outward from point B to C on the horizontal axis. Consequently, the gains from trade depend on the ability of the economy to change its production structure even if the so-called dynamic gains from trade are not considered. This report argues that the capacity of the economy to be transformed will depend on key public policies and thus the gains from trade are not automatic.



Appendix Tables

Table A1: Costa Rica - Estimated effects of U.S. tariff elimination in partial equilibrium

Product HS Code and Description	Actual Exports 2001 (\$ 000)	DR-CAFTA* Potential Gain (\$ 000)	Percentage Change
Total	731,448	197,550	27.01
HS.61 Art of apparel & clothing access, knitted or croc	396,414	139,893	35.29
HS.62 Art of apparel & clothing access, not knitted/cro	293,864	52,198	17.76
HS.02 Meat and edible meat offal	26,176	2,446	9.34
HS.42 Articles of leather; saddlery/harness; travel goo	3,529	1,276	36.14
HS.64 Footwear, gaiters and the like; parts of such art	1,730	708	40.91
HS.56 Wadding, felt & nonwoven; yarns; twine, cordage,	4,045	371	9.17
HS.58 Special woven fab; tufted tex fab; lace; tapestri	1,840	177	9.61
HS.55 Man-made staple fibres.	1,175	159	13.55
HS.54 Man-made filaments.	568	138	24.36
HS.16 Prep of meat, fish or crustaceans, molluscs etc	379	70	18.60
HS.59 Impregnated, coated, cover/laminated textile fabr	517	50	9.67
HS.17 Sugars and sugar confectionery.	515	20	3.92
HS.21 Miscellaneous edible preparations.	428	15	3.53
HS.94 Furniture; bedding, mattress, matt support, cushi	98	8	8.07
HS.65 Headgear and parts thereof.	56	7	11.86
HS.63 Other made up textile articles; sets; worn clothi	32	6	19.83
HS.52 Cotton.	38	5	12.54
HS.57 Carpets and other textile floor coverings.	9	2	17.22
HS.18 Cocoa and cocoa preparations.	29	1	2.35
HS.51 Wool, fine/coarse animal hair, horsehair yarn & f	2	1	35.18
HS.19 Prep.of cereal, flour, starch/milk; pastrycooks'	4	0	1.60

Source: Estimations using SMART, exports from UNCOMTRADE, tariffs from TRAINS, adjusted by utilization rates of CBI's preferential tariffs.

* DR-CAFTA estimated as an unilateral tariff elimination by the US to Central American countries

Table A2: El Salvador - Estimated effects of U.S. tariff elimination in partial equilibrium

<u>Product Description</u>	<u>HS Code</u>	<u>Actual Exports 2001 (\$ 000)</u>	<u>DR-CAFTA potential gain</u>	<u>Pct. Chg.</u>
Total		1,664,350	355,512	21.4
Art of apparel & clothing access, Total	61	1,209,455	181,827	15.0
Art of apparel & clothing access, n Total	62	408,666	160,667	39.3
Other made up textile articles; set Total	63	22,246	5,716	25.7
Footwear, gaiters and the like; par Total	64	7,698	2,988	38.8
Articles of leather; saddlery/harne Total	42	4,772	2,023	42.4
Cotton. Total	52	7,580	1,319	17.4
Knitted or crocheted fabrics. Total	60	1,309	683	52.2
Man-made filaments. Total	54	626	180	28.7
Manufactures of straw, esparto/other Total	46	1,037	51	4.9
Headgear and parts thereof. Total	65	195	23	11.8
Miscellaneous edible preparations. Total	21	469	17	3.5
Man-made staple fibers. Total	55	18	7	37.5
Wadding, felt & non-woven; yarns; tw Total	56	70	5	7.4
Sugars and sugar confectionery. Total	17	88	3	3.9
Prep.of cereal, flour, starch/milk; Total	19	89	1	1.6
Furniture; bedding, mattress, matt Total	94	13	1	8.1
Cocoa and cocoa preparations. Total	18	15	1	3.6
Special woven fab; tufted tex fab; Total	58	4	0	10.7
Impregnated, coated, cover/laminate Total	59	1	0	8.2
Other vegetable textile fibers; pap Total	53	1	0	11.8

Source: Estimations using SMART with trade data from UNCOMTRADE and Tariffs from TRAINS

Table A3: Guatemala - Estimated effects of U.S. tariff elimination in partial equilibrium

Product HS Code and Description	Actual Exports 2001 (\$ 000)	DR-CAFTA Potential Gain	Change (%)
Total	1,652,343	777,969	47.08
HS.61 Art of apparel & clothing access, knitted	880,543	514,248	58.40
HS.62 Art of apparel & clothing access, not knitted	743,844	255,137	34.30
HS.24 Tobacco, manufactured tobacco substitutes	8,185	4,673	57.09
HS.63 Other textile articles; sets; worn clothing	5,223	1,322	25.32
HS.64 Footwear, gaiters and the like	2,954	1,241	42.02
HS.42 Articles of leather; saddlery/harness	863	282	32.67
HS.52 Cotton	1,063	232	21.85
HS.65 Headgear and parts thereof.	1,599	188	11.77
HS.55 Man-made staple fibers	540	170	31.41
HS.54 Man-made filaments.	470	162	34.39
HS.21 Miscellaneous edible preparations.	3,120	110	3.53
HS.17 Sugars and sugar confectionery.	2,387	87	3.65
HS.56 Wadding, felt & nonwoven; yarns; twine	1,005	74	7.34
HS.58 Special woven fab; ace; tapestry	116	22	18.52
HS.46 Manufactures of straw, esparto/	192	9	4.92
HS.18 Cocoa and cocoa preparations.	164	5	3.21
HS.94 Furniture; bedding, mattress, matt support	37	3	8.01
HS.51 Wool, fine/coarse animal hair, horsehair yarn	8	2	21.13
HS.57 Carpets and other textile floor coverings.	13	1	5.15
HS.59 Impregnated, coated, cover/laminated textile	6	1	10.27
HS.39 Plastics and articles thereof.	6	0	2.81
HS.19 Prep.of cereal, flour, starch/milk; pastry	5	0	1.57

Source: Estimations using SMART with trade data from UNCOMTRADE and Tariffs from TRAINS

Table A4: Honduras - Estimated effects of U.S. tariff elimination in partial equilibrium

Product HS Code and Description	Actual Exports 2001 (\$ 000)	DR-CAFTA* Potential Gain (\$ 000)	Change (%)
Total	2,235,949	559,178	25.01
HS.61 Art of apparel & clothing access, knitted or croc	1,757,745	431,312	24.54
HS.62 Art of apparel & clothing access, not knitted/cro	459,781	121,411	26.41
HS.24 Tobacco and manufactured tobacco substitutes	11,163	5,699	51.05
HS.63 Other made up textile articles; sets; worn clothi	1,755	369	21.00
HS.02 Meat and edible meat offal	1,285	120	9.32
HS.17 Sugars and sugar confectionery.	3,012	108	3.57
HS.65 Headgear and parts thereof.	563	66	11.78
HS.56 Wadding, felt & nonwoven; yarns; twine, cordage,	297	30	9.93
HS.54 Man-made filaments.	84	23	26.79
HS.55 Man-made staple fibres.	58	18	31.60
HS.64 Footwear, gaiters and the like; parts of such art	8	8	95.71
HS.42 Articles of leather; saddlery/harness; travel goods	18	6	34.75
HS.58 Special woven fab; tufted tex fab; lace; tapestri	38	3	7.95
HS.52 Cotton.	7	2	29.22
HS.46 Manufactures of straw, esparto/other plaiting mat	35	2	4.87
HS.21 Miscellaneous edible preparations.	44	2	3.54
HS.19 Prep.of cereal, flour, starch/milk; pastrycooks'	56	1	1.63

Source: Estimations using SMART with trade data from UNCOMTRADE and Tariffs from TRAINS

Table A5: Nicaragua - Estimated effects of U.S. tariff elimination in partial equilibrium

Product HS Code and Description	Actual Exports 2001 (\$ 000)	DR-CAFTA* Potential Gain (\$ 000)	Change (%)
Total	384,027	153,653	40.01
HS.62 Art of apparel & clothing access, not knitted/cro	248,174	90,035	36.28
HS.61 Art of apparel & clothing access, knitted or croc	96,647	57,182	59.17
HS.12 Oil seed, oleagi fruits; miscell grain, seed, fru	5,515	3,031	54.96
HS.02 Meat and edible meat offal	31,195	2,913	9.34
HS.24 Tobacco and manufactured tobacco substitutes	666	373	56.06
HS.63 Other made up textile articles; sets; worn clothi	208	45	21.77
HS.56 Wadding, felt & nonwoven; yarns; twine, cordage,	438	37	8.44
HS.04 Dairy prod; birds' eggs; natural honey; edible pr	748	14	1.86
HS.21 Miscellaneous edible preparations.	393	14	3.54
HS.64 Footwear, gaiters and the like; parts of such art	6	4	63.04
HS.42 Articles of leather; saddlery/harness; travel goo	16	4	22.90
HS.17 Sugars and sugar confectionery.	16	1	4.05
HS.46 Manufactures of straw, esparto/other plaiting mat	3	0	4.93
HS.58 Special woven fab; tufted tex fab; lace; tapestri	2	0	6.47

Source: Estimations using SMART with trade data from UNCOMTRADE and Tariffs from TRAINS

* DR-CAFTA estimated as an unilateral tariff elimination by the US to Central American countries

Table A6:					
Summary Statistics (1960-2002) of Variables Used by Gould and Gruben in estimation of growth effects of Free Trade Agreements					
	Obs	Mean	Std. Dev.	Min	Max
Current per capita real GDP growth	1122	0.020492	0.035773	-0.2306	0.235846
Log real per capita GDP (\$)	1122	8.115969	1.043246	5.773635	10.41356
Log secondary school enrollment (%)	744	3.592764	0.968234	0.113329	5.079913
Log of investment share of GDP (%)	1124	2.608961	0.689849	0.081122	4.044216
Regional trade agreement index	1076	0.60855	0.827527	0	5
Regional Integration Agreements (Share of world GDP)	1009	0.051133	0.107988	0	0.608453
Economic Freedom of the World	621	5.726087	1.207982	2.3	9.1
World GDP growth (%)	1009	1.857951	1.018959	0.568824	3.667349
Trade share of GDP (%)	1124	62.06638	42.38338	5.244616	393.7483
Black market premium (%)	834	65.47042	458.6325	-9.93	11662.38
Government share of consumption (%)	1124	18.18883	10.38591	1.430759	70.71793
Fiscal balance as share of GDP (%)	831	-3.02481	4.239407	-43.499	19.19231
Choice to liberalize	1009	0.126858	0.332979	0	1
Freedom	835	2.103772	0.773869	1	3
Number of Observations: 743					

Chapter V. Policy Approaches to Managing the Economic Transition: Ensuring that the Poor Can Benefit from DR-CAFTA

Abstract

While the vast majority of people in Central America are expected to benefit from DR-CAFTA in the medium to long-term, there are at least some people who are at risk of bearing the costs of trade-related economic adjustment in the short-term. In particular, the introduction of more trade competition for sensitive agricultural commodities under DR-CAFTA can be expected to lead to lower domestic prices for sensitive commodities in each country. The analysis presented in this chapter indicates that 90 percent of Nicaraguan households, 84 percent of Guatemalan households, and 68 percent of Salvadoran households, respectively, were found to be net consumers of the basket of sensitive agricultural commodities and thus can be expected to benefit from DR-CAFTA-related price changes. Only about 9 percent of Nicaraguan households, 16 percent of Guatemalan households, and 5 percent of Salvadoran households were found to be net producers of the basket of sensitive commodities and, thus, would be expected to experience welfare losses. For El Salvador, a further 27 percent were estimated to remain unaffected. The average estimated size of losses to net producers are relatively low – about 2.2-2.3 percent of per capita consumption/income in Guatemala and El Salvador – although such impacts may not be trivial for the poorest Central Americans.

DR-CAFTA has built into it considerable grace periods, safeguards and extended phase-out periods for eliminating tariffs and quotas that provide reasonable protection to producers of sensitive crops over a prolonged adjustment period. In addition, potential income losses can be mitigated through a variety of additional policy options: (i) “decoupled” income support payments to farmers of sensitive crops (e.g., Mexico’s Procampo program), (ii) technical assistance programs to farmers of sensitive crops, (iii) conditional cash transfers (CCTs) to rural families, effective only as poor families make investments in their children’s education, health, and nutrition, and (iv) provision of public goods (e.g., economic infrastructure, basic education, rural financial services, technical assistance) targeted to households and/or regions that are expected to be particularly affected by DR-CAFTA. The choice of which type of support program would be more appropriate should be made on the basis of country-specific factors, taking into account institutional capacity, characteristics and regional concentration of vulnerable populations, the need to provide incentives for productive diversification and overall fiscal constraints.

1. Introduction

While the vast majority of people in Central America are expected to benefit from DR-CAFTA in the medium- to long-term, there are at least some people who are at risk of bearing the costs of trade-related economic adjustment in the short-term. For example, although the Central American economies are already relatively open, due to the unilateral trade liberalization efforts undertaken in the 1990s described in Chapter II, a handful of “sensitive” agricultural commodities (e.g., maize, beans, dairy, and poultry) still have significant levels of protection. This protection will be reduced or eliminated as a result of DR-CAFTA, as described in Chapter III, potentially resulting in short-term employment and income losses to those who currently produce those goods. Especially if those adversely affected are among the poor or near poor, then some kind of trade adjustment assistance or social safety net may be warranted to ensure that those negatively impacted are able to maintain a minimum level of welfare while making the transition to new and more remunerative economic opportunities arising from the Agreement.

The main objectives of this chapter are to: (i) analyze *ex-ante* the potential impacts on household welfare arising from DR-CAFTA; and (ii) examine policy approaches that may be useful in enabling trade adjustment and mitigating any negative impacts of the Agreement. The chapter focuses on the five original parties to the DR-CAFTA – Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua – and explores approaches to ensure that those who might bear the cost of trade adjustment in the short-term are able and equipped to take advantage of opportunities arising from DR-CAFTA in the medium-to-long term. Because the largest changes in trade protection are expected to affect a handful of so-called “sensitive agricultural commodities,” this chapter focuses predominantly on the effects of liberalizing trade in these commodities. To fulfill its objectives:

- Section 2 outlines briefly the state of trade protection on sensitive agricultural goods in Central America, as well as the types of trade reforms negotiated under the DR-CAFTA
- Section 3 lays out a framework for assessing the welfare impacts of DR-CAFTA *ex-ante*, focusing on how price changes are transmitted to households and how households manage risk in the face of changing economic circumstances
- Section 4 presents new case evidence of the expected welfare impacts of DR-CAFTA in El Salvador, Guatemala, and Nicaragua, based on analysis of these national household survey data in these countries
- Section 5 examines two broad policy approaches to addressing possible negative impacts of DR-CAFTA, comparing the relative benefits of phasing out trade protection as negotiated under the Agreement versus an approach that couples quick trade reform with compensatory measures targeted toward adversely affected groups
- Section 6 reviews specific possible policy instruments for mitigating short-term costs of DR-CAFTA under a “quick liberalization” scenario, as well as approaches to facilitating trade adjustment among those who might be adversely affected by terms of trade changes.

This section includes review of selected transfer programs, as well as interventions to enhance people's economic mobility and public information efforts that can help facilitate adjustment.

- The chapter concludes with an assessment of the relative strengths and weaknesses of different policy alternatives with respect to enabling a successful economic transition and ensuring that the poor are equipped and prepared to benefit from the DR-CAFTA.

2. Liberalization of Sensitive Agricultural Commodities under the DR-CAFTA

Unilateral trade liberalization on the part of the Central American countries during the 1990s, left trade protection levels low, with the exception of a handful of so-called *bienes sensibles agrícolas*, or sensitive agricultural commodities, including corn (maize), beans (frijol), milk and other dairy items, rice, sugar, beef, pork, and poultry meat.

As can be seen in Table 1, pre-DR-CAFTA levels of tariff protection on these sensitive commodities were often quite high in the five Central American countries.¹ As of 2001, tariffs on the import of poultry meat was as high as 170 percent in Nicaragua, 150 percent in Costa Rica, 50 percent in Honduras, and 45 percent in Guatemala. Tariff rates were as high as 65 percent on milk (Costa Rica), 62 percent on rice (Nicaragua), and 55 percent on sugar (Nicaragua). Table 1 also shows that the dispersion of tariff rates on sensitive agricultural goods were high within individual countries and highly variable across the 5 countries.

Table 1: Tariffs on Key “Sensitive” Commodities in DR-CAFTA Countries¹

Country	Crop							
	Milk	Maize (Yellow)	Rice	Beans	Sugar	Bovine Meat	Pork	Poultry
Costa Rica	65%	1%	35%	30%	50%	15%	48%	150%
El Salvador	40%	0-15% ²	0-40%	20%	40%	15%	0-40%	20/164% ³
Guatemala	15%	5-35%	6-36%	15%	20%	0-30%	15%	15-45%
Honduras	15%	1-45%	0-45%	15%	40%	15%	15%	35-50% ³
Nicaragua	40%	0-30%	62%	10%	55%	15%	15%	170%

Sources: Monge-González, Loría-Sagot, and González-Vega (2003), Portner (2003), Marques (2005); Marques (for Honduras, personal correspondence).

Notes: ¹ Data from latest available year, 2001-2005. ² Where tariff ranges are indicated this signifies tariff levels for imports of products within and outside established quota levels. ³ In the case of poultry imports to El Salvador, tariffs are 20 percent for non-Central American Common Market (*Mercado Común Centroamericano*, MCCA) countries, except for the U.S., from which poultry imports carry a tariff level of 164 percent. For both El Salvador and Honduras, the tariff levels also differ depending on the type of poultry meat.

¹ This is true at least for trade outside the Central American Common Market (*Mercado Común Centroamericano*, MCCA). Within the MCCA, imports generally carry lower and often zero percent tariff levels.

In addition to tariffs, several of the countries also had non-tariff barriers of various kinds. For example, there is a system of tariff-rate quotas (TRQs) – sometimes called “within-quota” and “out-of-quota” tariffs – that results in different levels of protection depending on the quantity of imports. This is illustrated in Table 1 by the tariff ranges shown for several specific commodities. This system enables a limited quantity of sensitive commodity imports to come into a country at relatively low tariff rates. Any imports above quota levels, however, come in at elevated tariff levels. In the case of yellow maize, for instance, tariff levels rise from 0 percent to 15 percent in El Salvador, 5 percent to 35 percent in Guatemala, and from 0 percent to 30 percent in Nicaragua once imports exceed nationally established quota levels (Table 1). Likewise, tariffs on rice rise from 0 percent to 40 percent in El Salvador and from 6 percent to 35 percent in Guatemala once imports exceed quota levels (Table 1).

In addition, several commodities face sanitary and phyto-sanitary restrictions. For example, both milk and poultry meat face trade-related health and safety restrictions within the Central American Common Market (*Mercado Común Centroamericano*, MCCA); whereas trade in beef faces health and safety-related restrictions with countries outside the MCCA (e.g., related to hoof-and-mouth disease, mad cow disease, etc.).²

Reduction or elimination of tariff and non-tariff protections under the DR-CAFTA would thus be expected to lead to lower domestic prices for sensitive commodities in each country.³ Given the high levels of protection on some of these goods, the expected price declines on these goods could be considerable in some countries. For this reason, DR-CAFTA includes a wide range of provisions (described in Chapter III) for dealing with the liberalization of sensitive goods, including grace periods for initiating liberalization, extended phase-out periods for tariffs, interim quotas and/or phase-downs of TQRs, as well as special safeguard measures to protect local farmers from undue harm. The exact provisions were negotiated country-by-country and, therefore, differ somewhat across the regions. Overall, however, the Central American countries were successful in negotiating generous timetables for reducing protection on their *bienes sensibles agrícolas* as demonstrated in Chapter III. Phase-out periods are, for some commodities, as long as 20 years and, at least for a few countries, white maize, an important staple crop produced by the poor, was exempted from liberalizing (Box 1).

In sum, while the specifics differ from country-to-country, the DR-CAFTA has built into it a prolonged and predictable period over which these *bienes sensibles agrícolas* can be liberalized, providing for an extended period over which producers can, at least in principle, adapt to expected price declines in these commodities. These provisions in themselves represent important protections for producers of sensitive crops, giving them an extended timeframe over which to undertake the necessary economic adjustments.

² Monge-González, Loría-Sagot, and González-Vega (2003); see Table (Cuadro) 33, p. 46.

³ In turn, these price reductions would reflect themselves in a fall in national consumer prices indexes, which would depend on the level of tariffs and non-tariff barriers and on the share of these sensitive commodities in the bundle of consumption goods used to calculate such prices indexes. Such an exercise is difficult to undertake due to the problems in predicting the exact magnitude of the domestic price reductions, especially when quotas are in place and when the price-transmission between border price changes and producer prices within countries is imperfect.

3. Framework for Analyzing Welfare Impacts of the DR-CAFTA

The literature on trade reform identifies a number of channels through which trade reforms can impact people's welfare, including through: (i) changes in the prices and availability of goods; (ii) changes in factor prices, employment, and incomes; (iii) changes in government tax revenues and transfers (which may be affected by changes in revenues from trade-related taxes); (iv) improved incentives for investment and innovation, which strengthen prospects for long-run economic growth; (v) and increased exposure to external shocks, in particular, through changes in the terms of trade; (vi) the costs of adjusting to changes economic environment.⁴

Box 1: DR-CAFTA Schedules for Liberalizing Sensitive Agricultural Commodities: The Cases of Honduras and El Salvador

The Central American countries have, overall, negotiated generous timetables for liberalizing sensitive agricultural commodities under the DR-CAFTA, including grace periods, extended timetables for tariff reduction or elimination, phasing down of TRQs, and various safeguard provisions. While the exact reform schedules were negotiated country-by-country, the broad parameters are similar in many ways, as can be seen in the context of liberalization in Honduras and El Salvador.

In Honduras:

- tariff reductions on *Rice* are allowed to be phased over an 18-year period, following a 10-year grace period.
- Tariff reductions on *Pork* are allowed to be phased over a 15-year period, following a 6-year grace period.
- While the US will receive immediate market access for high-quality cuts of *Bovine Meat* (e.g., choice, prime), lower quality cuts of beef will be liberalized over a 15-year period.
- Tariff reductions on *Poultry Meat* are allowed to take place over an 8-year period, starting in 2015.
- Tariff reductions on *Dairy Products* are allowed to be phased over a 20-year period.
- Tariff reductions on *Yellow Maize* are allowed to be phased over a 15-year period, following a 6-year grace period.

In El Salvador:

- Tariffs on imports of *Beans* will to be phased out in equal installments over a 15-year period with no grace period.
- Tariffs on *Rice* for imports exceeding (the currently high) quota levels will be phased out over 7 years, following a 10-year grace period.
- Tariffs on *Poultry* is be phased out over 7 years, following a 10-year grace period.
- The current TRQ on *Pork* will increase by 10 percent a year, while tariffs are to be phased out over an 8-year period starting in year 7.
- While prime beef parts already enter duty free, TRQs on all other *Bovine Meat* will increase by 5 percent a year; tariffs will be phased out over a 12-year period, following 2-year grace period.
- Tariffs on *Milk* and *Cheese* are to be phased out over 10 years, following a 10-year grace period.

In an important exception, in both Honduras and El Salvador, *White Maize* – a key staple produced and consumed by the country's rural poor – will be exempted indefinitely from liberalization. Moreover, for all the sensitive products, special Safeguard Measures have been agreed upon to ensure against unforeseen harm to local producers caused by rapid increases in imports from the U.S.

Sources: Government of Honduras (2003), Marques (2005).

⁴ Winters (2001) and Hertel and Reimer (2004) as cited in Marques (2005).

Early concerns about the impacts of DR-CAFTA focused on the short-term price effects of liberalization and, in particular, what they would mean for producers of sensitive agricultural crops in Central America. For this reason, this section focuses largely on the effects of border price changes expected to occur from liberalizing sensitive agricultural commodities in Central America – although other channels of impact, for example, related to growth prospects and the role of transfers, are discussed later in the chapter in the context of public policy responses. Specifically, the section lays out a framework for understanding the pathways through which border price changes are transmitted to households and how households manage relative price changes (or “shocks”).

A key message of applying this framework is that the effect on households of a price change on household welfare (such as the kind resulting from liberalizing the *bienes sensibles agrícolas* will be smaller – sometimes significantly so – than the change in the market price. This is due to the fact that households:

- have diverse consumption bundles and often have multiple income sources,
- at least in rural areas, are often both consumers and producers of key goods (and that the consumption and production effects of price changes work in opposite directions),
- adjust their consumption and production patterns in response to relative price changes, and
- Employ a number of *ex-ante* and *ex-post* strategies to manage price and income risks.

This section examines each of these factors in turn.

Multiple Consumption Goods, Sources of Income

Households, whether rich or poor, consume a diverse bundle of goods. They also often have multiple sources of income. This multiplicity of consumption goods and income sources serves, among other things, to moderate the short-term effects on household well-being – both positive and negative – of good-specific price changes. Analysis of household consumption patterns using Nicaragua’s 2001 national household survey, the *Encuesta de Medición del Nivel de Vida* (EMNV) indicates, for example, that commodities such as maize and rice make up between 3 and 6 percent of households’ consumption bundles, on average, and between 7 and 8 percent of the consumption bundle of Nicaragua’s poorest 20 percent of households (Table 2). Together, the group of sensitive agricultural commodities makes up about 54 percent of all food consumption, on average, and about 31 percent of total household consumption. Price declines for these goods will thus have a positive impact in households’ ability to purchase these goods for consumption, with the largest effects being felt in the bottom half of the welfare distribution. At the same time, increase in purchasing power will be less than if the bundle of sensitive agricultural commodities (whose prices are expected to decline) made up a larger proportion of total household consumption – say 50, 80 or even 100 percent.

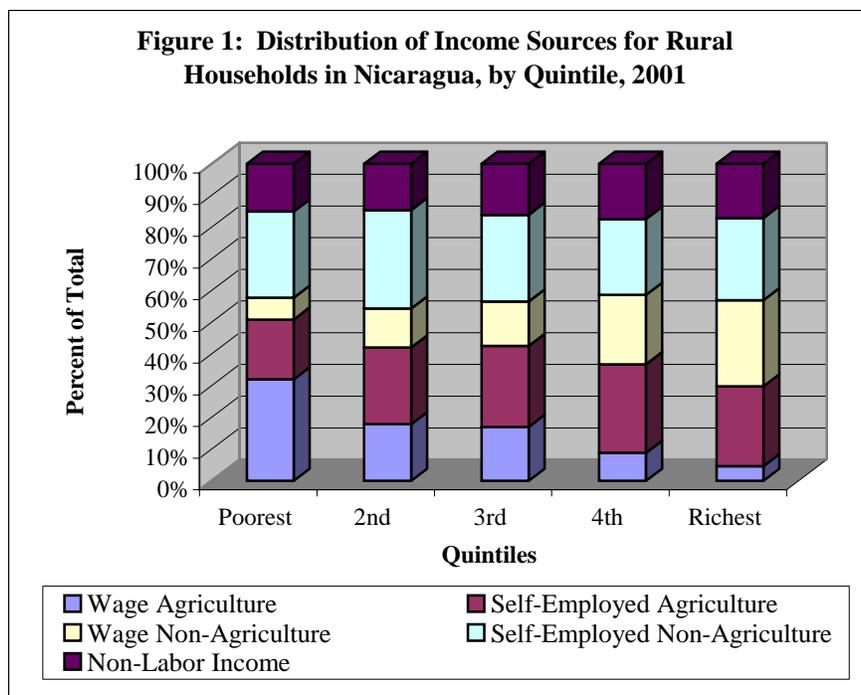
Table 2: Consumption Shares of Key Commodity Groups, Nicaragua, 2001

Share of Household Consumption (National)	Quintiles				
	1	2	3	4	5
Food Consumption	0.61	0.60	0.57	0.51	0.36
Sensitive Commodities (all)	0.32	0.32	0.31	0.23	0.15
Rice	0.08	0.07	0.06	0.04	0.02
Maize	0.07	0.04	0.03	0.01	<0.01
Tortilla	0.01	0.01	0.01	0.01	<0.01
Milk and Cheese	0.07	0.13	0.11	0.08	0.05
Sugar	0.05	0.04	0.03	0.03	0.01
Poultry	0.03	0.02	0.03	0.03	0.03
Bovine Meat	0.01	0.02	0.03	0.03	0.03
Non-food Consumption	0.39	0.40	0.43	0.49	0.64
Sensitive Commodities as a share of Household Food Consumption	0.53	0.54	0.54	0.45	0.42

Source: Adapted from Monge, Saavedra, and del Socorro Vallecillo (2003), based on analysis of Nicaragua's national household survey, *Encuesta de Medición del Nivel de Vida* (EMNV), 2001.

The same data set shows that households also tend to have a diversified set of income sources (or income “portfolios”). As can be seen in Figure 1, income from self-employed agricultural enterprises such as production of maize, beans, and rice – or chickens and cows in the case of smallholder farm households – makes up about 19 percent of the income, on average, among of the poorest rural households in Nicaragua and about 28 percent of incomes among rural households in the fourth quintile.⁵ In contrast to the case of consumption, declines in the prices of the sensitive agricultural commodities will act to reduce the incomes of households producing these goods. Nonetheless, the fact that households generally have multiple income sources means, however, that the negative income effect operates only on a portion of households’ total income portfolio, again serving to moderate the impact of the price change.

⁵ These quintile averages conceal potentially important variation in the share of sensitive agricultural commodities in total income of specific households within a quintile. Nonetheless, even the least diversified households tend to have multiple sources of income, both in terms of crops, and in terms of a mix of wage and self-employed income within and outside of agriculture. Although not shown in Figure 1, the income share of income derived from self-employed agriculture (and thus from sensitive agricultural commodities) is much lower among urban than rural households in Nicaragua.



Source: World Bank Staff Estimates, using the EMNV 2001

Households as Both Consumers and Producers of Key Goods

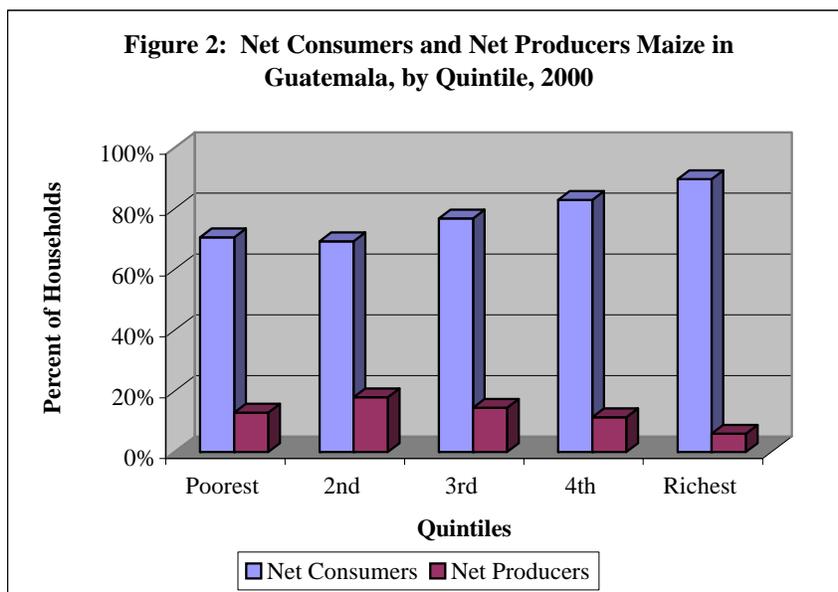
The fact that households, particularly in rural areas, are often both consumers and producers of key goods also served to soften the impact of a price change on family welfare. This is because the effect of a price change has the opposite effect on consumption and production. If, for example, a household were to consume exactly the same amount of a particular good – say maize – as it produces, then a decline in the border price would have no net impact on household welfare, as the purchasing power benefits of consuming less expensive maize would be exactly offset by the loss in income associated with lower producer prices for maize. If a household were to consume more maize than it produced, then a reduction in the maize price would, on net, benefit the welfare of that household. However, the benefits would only equal the amount of the price decline multiplied by the excess of maize consumption over maize production (i.e., the net amount of maize purchased from the market). In contrast, if a household were to produce more maize than it consumed, then it would experience a welfare loss as a result of a decline in the maize price. In this case, the loss would be the amount of the price changes multiplied by the excess of maize production over consumption (i.e., the net amount of maize sold into the market). Similarly, offsetting price effects would occur with any other sensitive commodities that households both consumed and produced.

The economics literature terms households that consume more than they produce of a good “net consumers” of that good, whereas those households that produce more than they consume of a good “net producers” of that good.⁶ Stated simply, net consumers of a good would be expected to benefit from a decrease in the price of that good (at least at the margin),

⁶ See Deaton (1997).

while net producers would be expected to lose from a price decline. Conversely, a price increase for a particular good would be expected to benefit net producers of that good and negatively impact the welfare of net consumers.

Analysis of household survey data from Guatemala (ENCOVI 2000) shows that the vast majority of Guatemalans are *net consumers* of maize – about 80 percent of households overall. This compares with only about 12 percent of Guatemalan households, in all, that are *net producers* of maize. The remaining roughly 8 percent of households are neither net consumers nor net producers of maize; they consume and produce equal amounts. It should be noted that the percentage of households that are net consumers (net producers) of maize varies somewhat across the welfare distribution, however (Figure 2). For example, about 71 (17) percent of the poorest households are net consumers (net producers) of maize, while about 92 (4) percent of the wealthiest households are net consumers (net producers).⁷ The share of households that are net consumers of maize also varies significantly across regions of Guatemala. Roughly 69 (18) percent of rural households are net consumers (net producers) of maize, whereas 91 (5) percent of urban households are net consumers (net producers).⁸



Source: World Bank Staff Estimates, using the ENCOVI 2000

⁷ This net consumer-net producer framework is extended to all the sensitive agricultural commodities and used (below) to estimate the potential welfare impacts of liberalizing these goods in El Salvador, Guatemala, and Nicaragua.

⁸ In none of these cases does the percentage of net consumers and net producers of maize sum to 100, due to the fact that in each category at least a small proportion of households consume and produce exactly the same quantities of maize, according to the ENCOVI (2000) data set.

Adjustment to Relative Price Changes

It is important to highlight that households are not simply passive recipients of price changes. Rather, households often adjust their consumption and production practices in response to changes in relative prices to help make the most of their limited resources and mitigate adverse price and income shocks (Deaton 1997). On one hand, households adjust to take the best advantage of favorable changes in prices. For example, if the price of chicken goes down, households tend to increase their consumption of this protein-rich food, all prices being constant. On the other hand, households adjust their consumption and production patterns in ways to help to mitigate the effects of negative price shocks. For example, when world coffee prices fell dramatically between 1997 and 2001, coffee farmers in El Salvador and Nicaragua reduced their production or abandoned coffee production, shifting their work effort toward more remunerative economic activities within and outside of agriculture (Kruger, Mason, and Vakis 2003, Beneke de Sanfelú and Shi 2004, Trigueros and Avalos 2004).

It is worth noting that while there is extensive empirical evidence from developed and developing countries showing that households adjust to changing prices, such adaptations may neither be smooth nor instantaneous, especially with respect to production. In general, households' abilities to adjust their consumption will be greater in the short-term than their ability to adjust their production patterns. The fact that households' consumption bundles tend to be more diverse than their production/income portfolios and that, at least some portion of household consumption can be purchased in markets, makes substituting one consumption good for another (at the margin) relatively easy. On the production side, however, households may face a variety of constraints to adjusting their income portfolio, at least in the short-term. For example, for poor rural households that are relatively specialized in agricultural production, the agronomic potential of their farmland, seasonal or weather-related constraints on crop production, absence of irrigation or other production technologies, and/or limited availability of credit (or other forms of working capital) may serve to limit households' ability to adjust their income portfolios quickly. Such production-side constraints tend to loosen over the longer-term, and can be reduced through strategic investments in education and training and in infrastructure and technology that reduces agronomic constraints, lowers transactions costs, and increases the profitability alternative rural enterprises.⁹

Household Risk Management Strategies

Central American households employ a number of strategies to manage risk in uncertain and changing economic environments. Indeed, empirical evidence from Central America and

⁹ In cases where long geographic distances or lack of communication or transport infrastructure result in high transactions costs, households may not be well connected to markets and, thus, may not experience very strong price signals to which to adjust. In such cases, infrastructure and other investments to reduce transactions costs and strengthen poor farmers' ability to benefit from markets represent important long-run challenges for policymakers. It should be noted, however, that such a lack of connection to the market would mean that households would not experience very strong price signals – either positive or negative – as a result of the type of domestic price changes that will likely be induced by DR-CAFTA. This relative absence of price signals appears to have been the case for some households in southern Mexico following NAFTA. Largely self-sufficient farmers in remote rural areas appear not to have been significantly affected – either for better or for worse – by NAFTA-related price changes in commodity prices (de Ferranti et al 2004).

beyond indicates that having a relatively diversified income “portfolio” (*ex-ante*) and adjusting to price changes (*ex-post*) are but two strategies that Central American households – and those in neighboring countries – seem to employ. In Guatemala, for example, the recent World Bank Poverty Assessment (2003) found that households not only adjust their consumption patterns in response to shocks, but also increase their hours worked and/or draw down financial savings and other assets to protect their income and consumption levels. Evidence from Mexico also indicates that households send additional household members into the labor force in response to a real or expected employment shock (Cunningham 2001). In El Salvador, migration and remittances have also been a key element of household risk management – both *ex-ante* and *ex-post* (Arias 2004, Beneke de Sanfelú and Shi 2004). In Nicaragua, evidence indicates that households also rely in important ways on informal social networks, including through memberships in community, religious, or neighborhood organizations, that can provide an alternative source of resources – as loans or gifts – in the event of an adverse shock (Klugman, Kruger, and Withers 2003).

A new empirical study of the impacts of the coffee crisis in four Central American countries also illustrates how households in the region have managed recent changes in relative prices (World Bank 2005, forthcoming). In El Salvador, in response to declines in the coffee price – and related labor demand in the coffee sector – many wage earning households increased their hours devoted to non-agricultural enterprises. These sectoral shifts in employment – along with remittances – have helped Salvadoran families involved the coffee economy to mitigate significantly the effect on household income of the significant fall in the world coffee price (Trigueros and Avalos 2004; Beneke de Sanfelú and Shi 2004). In Honduras, evidence also indicates that coffee sector families increased their labor supply in an attempt to offset effects of the coffee price decline (Coady, Olinto, and Caldes 2004).

Some household risk management strategies, such as developing diversified income earning portfolios (*ex-ante*), or increasing adult labor supply or drawing down financial savings (*ex-post*), may be seen as appropriate responses to price and income risk. Others strategies, however, such as engaging in distress sales of productive assets such as land, withdrawing children from school, or deferring utilization of preventative or curative health services may create other risks – to long-term family welfare. Indeed, there is evidence that, in Nicaragua and Guatemala, some coffee farmers sold off assets – such as land or livestock – as a means of coping with the lower coffee prices (Vakis 2004; Vakis, Kruger, and Mason 2004). In addition, smallholder coffee farmers in Nicaragua appear to have withdrawn children from school – or delayed their enrollment – and employed child labor in an effort to deal with declines in their coffee sector incomes (Vakis, Kruger, and Mason 2004). Taking children out of school is of particular concern, however; evidence from Mexico suggests that children who are removed from school in response to a shock are one-third less likely ever to continue school than those who are allowed to continue during a shock (Sadoulet, Finan, de Janvry, and Vakis 2004). Thus, this risk management mechanism can result in long-term losses in their productivity, adversely affecting both their economic productivity and increasing the likelihood of intergenerational transmission of poverty.

A number of recent empirical studies – within and outside Latin America – have tried to measure how effectively households smooth their consumption – or “self-insure” – in the face of adverse income shocks. While the specific findings differ from country to country, these

studies find that households are partially – but not fully – effective at mitigating the impacts of shocks to household income. Overall, the evidence suggests that households, on average, are able to protect between 60 and 90 percent of their consumption per capita in the face of changes in income (Table 3). That is, a 10 percent “shock” to household per capita income translates into a roughly 1 to 4 percent change in per capita consumption. In general, poor households seem to have fewer instruments available – and are less successful – in insuring themselves against risk than non-poor households. In China, for example, the wealthiest households only experienced a 1 percent decline in per capita consumption in the face of a 10 percent decline in per capita income; in contrast, the poorest households experienced a 4 percent decline in consumption response to the same decline in income (Table 3).

Table 3: Household Consumption Smoothing in Developing Countries – Recent Evidence

Country	Change in Household Per Capita Consumption Resulting from a 10 Percent Change in per capita Income (Percent)	Source
Mexico (rural)	3.7	Skoufias (2002)
Nicaragua (all country)	2.5	Klugman, Kruger, and Withers (2003)
Peru (Urban)	3.0-3.6	Glewwe and Hall (1998)
China (Rural)		Jalan and Ravallion (1999)
Poorest	4.0	
Richest	1.0	
India (Rural)	1.2-4.6	Ravallion and Chaudhuri (1997)

Together, the evidence suggests that public social protection programs have an important part of a country’s not only to ensure a minimum level of well-being among a country’s population in the event of shocks, but by helping to protect human capital investments and other productive assets of the poor in the event of shocks, safety nets can play an important role in a country’s long-term strategy for economic development and poverty reduction.¹⁰

4. The Expected Impacts of Liberalizing the Sensitive Agricultural Commodities: New Evidence from El Salvador, Guatemala and Nicaragua.

Given the above, what might a policymaker expect to be the impacts of liberalizing trade in sensitive agricultural commodities under the DR-CAFTA? Three new empirical studies – Pörtner (2003), Monge, Castro, and Saavedra (2004), and Marques (2005) – commissioned for this report, shed light on this issue. All three studies use nationally representative household survey data and apply a *net consumer-net producer* framework to assess likely first-order impacts on household welfare of eliminating quotas and reducing to zero tariffs on

¹⁰ Several approaches to providing social protection as a means to manage the short-term adjustment costs as well as the economic transition associated with DR-CAFTA are outlined below.

several *bienes sensibles agrícolas*, including on maize, beans, milk, poultry meat, bovine meat, pork, wheat, and rice.¹¹

As discussed above, a decrease in the price of any of these commodities can be expected to benefit net consumers of that good and have a negative impact on well-being of net producers of that good. One difference between the analysis the discussion of net consumers and producers above and the analysis presented here is that this section focuses largely on the net welfare impacts of liberalizing the entire basket of sensitive commodities in each country – although the role and importance of several specific commodities on household welfare are discussed below. (For additional information on the methodology used in the country case studies, see Box 2.¹²)

The analyses presented here present expected impacts *as if* all tariffs and quotas were going to be removed completely and immediately under the DR-CAFTA. While this is obviously not what was ultimately negotiated under the DR-CAFTA, the approach provides useful insights into the first-order impacts of liberalizing the sensitive commodities. As will be discussed further below, this approach is also a useful baseline from which to discuss policy options, as well as some important policy trade-offs associated with the gradual liberalization that was negotiated versus an approach in which liberalization is undertaken quickly and combined with targeted transfers to negatively affected households.

¹¹ For Nicaragua, Monge et al (2004) use the 2001 *Encuesta de Medición del Nivel de Vida* (EMNV); for Guatemala, Pörtner (2003) uses the 2000 Living Standards Measurement Survey (ENCOVI); for El Salvador, Marques (2005) uses the 2003 *Encuesta de Hogares para Propósitos Múltiples* (EHPM).

¹² For additional technical detail on the methodology, see Deaton (1997), McColloch (2002), Pörtner (2003), Monge, Castro, and Saavedra (2004), and Marques (2005).

Box 2: Analyzing the Expected Impacts of Liberalizing Sensitive Agricultural Commodities in El Salvador, Guatemala and Nicaragua: A Net Consumer-Net Producer Approach

The case studies presented in this chapter apply a partial equilibrium approach, sometimes known as a *net consumer-net producer* approach. This approach enables analysts to estimate the first-order effects of a price change on household welfare. The theoretical underpinnings for the approach used here are described in Deaton (1997), McCulloch (2002), and Chen and Ravallion (2003). The approach assumes that each household has a utility function that fulfills certain requirements such as the separability between consumption and production and between leisure and other consumption. Given a set of (small) price changes the gain or loss to the household can be calculated by the money metric change in the household utility and is simply equal to the price change multiplied by total sales of the product minus the price change multiplied by the total consumption of the product.

Households can be divided into *net producers* and *net consumers* of a given product. If with the implementation of DR-CAFTA there is a reduction in the import tariff of that product and of its domestic price, then all households who are net producers of that product would experience a loss, while all households who are net consumers of that product would experience a gain. There may also be households who neither produce nor buy the product or that produce only for self-consumption; in these cases, under this framework, there would be no change in welfare. Note that the framework abstracts away from transport cost and/or intermediaries margins.

The estimation procedure requires calculating the price changes brought about by the DR-CAFTA. Here, expected price changes following the elimination of tariffs under the DR-CAFTA are calculated as weighted average (by quantity) of the tariffs applied at the within- and out-of-quota levels. Estimates of expected changes in the prices of sensitive agricultural commodities in El Salvador, Guatemala, and Nicaragua, due to the DR-CAFTA are presented in Annex 1.

Other approaches – such as computable general equilibrium models (CGEs) – exist for estimating the welfare impacts of trade reform. In principle, these models can account for several different channels through which welfare effects are transmitted, although CGEs are considerably more demanding in terms of data and computational costs. Moreover, as Hertel and Reimer (2004) note in their review of the various approaches to analyzing the poverty impacts of trade, CGEs models can be quite complex, making it hard to distinguish “the extent to which results are driven by particular modeling assumptions or whether they are robust to model specification and largely data-driven”.

That said, the “comparative static” results presented here should be interpreted with several caveats in mind. First, the approach assumes that in the “short run” households neither adjust their production or consumption patterns in response to price changes nor engages in any other household risk management strategies. Second, the estimates do not attempt to incorporate any longer-term benefits associated with increased labor demand that might be associated with the increased foreign investment, expansion of exports, or increased economic growth expected to accompany.

Third, the analysis assumes implicitly that tariffs are eliminated at once and that the price impact is immediate. Therefore, consumers would realize an immediate gain and the producers would experience an immediate loss. However, DR-CAFTA has been negotiated to include long phase-out periods, often following an initial grace period. In this context, the impact of prices changes would only be felt over a much longer period of time.

Fourth, even if elimination of tariffs were immediate, there are reasons why the price changes experienced by households might be lower than those suggested by nominal tariff changes. For example, remote and isolated rural communities may only have weak links to commercial markets and, thus, households in those areas may experience only weak price effects relative to those living in urban or “well-connected rural areas. Indeed, recent empirical analyses of local price changes resulting from border price changes find that the transmission effect is commonly less than one-to-one (Winters, McCulloch and McKay 2004). Moreover, the fact that Central American trade is already highly integrated – with zero tariffs on intra-regional trade for many sensitive commodities and, probably, some contraband – may also mean that price effects arising from DR-CAFTA may be somewhat muted. For these and related reasons, the types of estimates presented here are generally referred to in the “net consumer-net producer literature as “worst case” scenarios of impacts (McCulloch 2002).

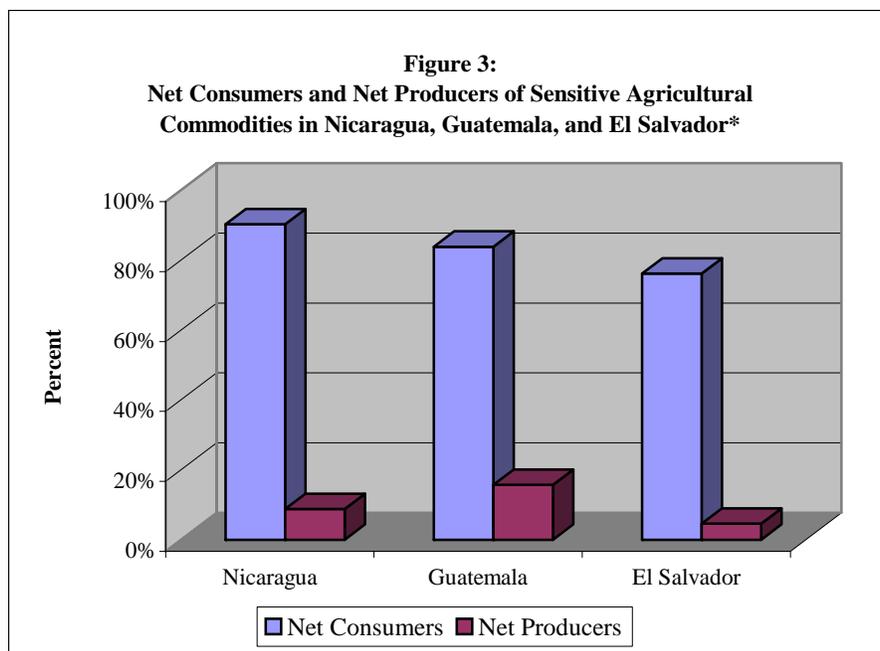
It is important to note, however, that there are also factors that could work in the opposite direction in terms of actual versus estimated impacts. For example, capital allocation away from adversely affected sectors could serve to reduce the marginal product of labor in those sectors, compounding the static losses faced by net producers of affected goods. Indeed it is possible, at least in principle, to imagine a longer-run “worst-case” scenario in which the dynamic gains from DR-CAFTA are low and where returns to unskilled labor fall economy-wide due both to the direct price effects and the indirect effects of reallocation of capital from adversely affected sectors. A final caveat is that, strictly speaking, partial equilibrium analysis is valid only for small price changes. As can be seen in Annex 1, the expected price changes are substantial some cases.

Despite these caveats, the net consumer-net producer approach is useful in helping policy makers identify the expected “first-order” effects of the DR-CAFTA, including which types of households are most likely to gain or lose as a result of liberalizing the sensitive agricultural commodities, as well as the likely size of the impacts. In doing so, it provides an important analytical base on which to develop policy and programmatic responses to support those likely to be adversely affected by reforms.

Identifying Prospective “Winners” and “Losers” from the Reforms

To assess who is likely to win and who is likely to lose from the liberalization of the sensitive agricultural commodities, the analysis first examines whether households are net consumers or net producers of each sensitive commodity, as in the case of maize in Guatemala highlighted above (Figure 2). It then estimates the per capita consumption gains to “winners” and losses to “losers” associated with liberalization of each good. Finally, it calculates the net welfare impact for each household of removing tariffs and non-tariff barriers on the basket of sensitive commodities in each country. As can be seen in Figure 3, the vast majority of people in Nicaragua, Guatemala, and El Salvador are net consumers of the *basket* of sensitive commodities.

Specifically, the evidence indicates that 90 percent of Nicaraguan households, 84 percent of Guatemalan households, and 68 percent of Salvadoran households are net consumers of the basket of sensitive agricultural commodities and, thus, on net, can be expected to benefit from the sum of the price changes expected to occur when sensitive agricultural commodities are liberalized. Conversely, about 9 percent of Nicaraguan households, 16 percent of Guatemalan households, and 5 percent of Salvadoran households are net producers of the basket of sensitive commodities and would, thus, be expected to experience (static) welfare losses arising from the price changes induced by DR-CAFTA. Some proportion of households, perhaps as high as 19 percent in the case of El Salvador, would neither benefit nor lose as a result of DR-CAFTA-related price changes, due either to the fact that they neither consume or produce the sensitive commodities, or that they consume and produce them in roughly equal amounts.



Sources: Pörtner (2003), Monge, Castro, and Saavedra (2004), and Marques (2005)

* Note that for data reasons, in the case of El Salvador, the proportion of both net consumers and net producers may both be underestimated.

It is important to note here that in the case of El Salvador it is likely that both the proportion of net consumers and net producers is underestimated. Both the Nicaraguan EMNV and the Guatemalan ENCOVI surveys are designed as consumption, expenditure, and income surveys, which also include detailed data on food prices. As such, they are ideally suited for undertaking the type of net consumer-net producer analysis presented here. In contrast, El Salvador's EHPM survey is designed primarily as an income and employment survey. The EHPM does contain information on agricultural production, self-consumption, as well as data on purchase of food items – although in practice these latter data have rarely been used. Review of the EHPM modules suggest that both agricultural production for own consumption and household consumption expenditures may be under-reported, with some households (especially many poor households) reporting no such production or consumption spending. This is reflected in the fact that the proportion of both net producers and net consumers is lower in the El Salvador analysis than in the cases of Nicaragua and Guatemala.

The El Salvador findings must, thus, be interpreted with some caution, especially in the case of the disaggregated results reported by region (rural vs. urban) and by welfare quintile which are analyzed using smaller data cell sizes and where measurement problems among a single or small group of households could significantly influence the results. In this context, it should be noted that Marques (2005) conducts some tests of the robustness of the findings to outliers in the data. He finds that the results are robust to outliers, although that is no guarantee that there are missing data reports, especially among poor households, that might have altered the findings somewhat. That said, the overall patterns of net consuming and net producing households for El Salvador are very consistent with those from Nicaragua and Guatemala,

giving some level of confidence that they reflect real income and consumption patterns on the ground.¹³

Rural-Urban Differences. While the majority of Nicaraguans, Guatemalans, and Salvadorans are likely to benefit even in the short-term from price declines in sensitive agricultural commodities, the distribution of beneficiaries differs somewhat across rural and urban areas (Table 4). In Nicaragua and Guatemala, for example, the evidence indicates that a higher proportion of households in urban areas will benefit than in rural areas. In Nicaragua, 97.6 percent of urban households are expected to benefit compared with 78.8 percent in rural areas. The pattern is similar in Guatemala; 93.6 percent of urban households are expected to benefit from price changes under DR-CAFTA compared to 75.1 percent in rural areas. Note that while the proportion who are expected to benefit in rural areas is lower in rural than in urban areas, the percentage is still high – three-quarters or more in those two countries are expected to benefit.

Table 4: Net Consumers and Net Producers of the Basket of Sensitive Agricultural Commodities in Nicaragua, Guatemala, and El Salvador, by Rural-Urban and by Quintile

Group	Nicaragua		Guatemala		El Salvador	
	Net Consumers (Benefits)	Net Producers (Loses)	Net Consumers (Benefits)	Net Producers (Loses)	Net Consumers (Benefits)	Net Producers (Loses)
	(in percent)					
All Country	90.2	8.8	83.8	15.7	68.2	4.1
Rural	78.8	19.4	75.1	24.5	72.1	4.1
Urban	97.6	1.8	93.6	5.8	65.2	4.1
Poorest Quintile	85.7	12.4	78.5	20.8	22.1	7.5
2 nd Quintile	86.5	11.8	75.4	24.1	76.6	4.1
3rd Quintile	91.1	8.5	81.2	18.6	82.1	2.8
4th Quintile	92.9	6.5	85.5	14.2	81.4	3.1
Richest Quintile	94.8	4.7	92.0	7.5	79.0	2.8

Sources: Pörtner (2003), Monge, Castro, and Saavedra (2004), and Marques (2005)

Conversely, the proportion of net producers – households expected to experience negative impacts of DR-CAFTA-related price changes – is considerably higher in rural areas than in

¹³ As will be discussed further below, El Salvador is a less rural country, with less of its economy based on agriculture than either Nicaragua or Guatemala. Since urban areas in Nicaragua and Guatemala have higher concentrations of net consumers than do rural areas, one would expect a higher proportion of net consumers in El Salvador than in the other two countries, all other things being equal. This, too, provides some confidence that the El Salvador analysis does not grossly overstate the likely beneficiaries or understate those who may be adversely affected by price changes under DR-CAFTA.

urban areas. In the case of Nicaragua, for example, nearly 20 percent of the rural households are expected to be negatively affected by DR-CAFTA-related price changes, compared with less than 2 percent in urban areas. In Guatemala, nearly a quarter of rural households are expected to be adversely by price changes associated with liberalizing sensitive agricultural commodities under DR-CAFTA; this compares with just under 6 percent in urban areas. It is important to note, moreover, that there is likely to be considerable variation in the impacts of DR-CAFTA *within* rural and urban areas in Central American, due to considerable heterogeneity in production and consumption patterns. For example, data from Nicaragua indicate that about 34 percent of rural households in the Atlantic region are net producers of the basket of *bienes sensibles agrícolas*, considerably higher than the rural average; for Guatemala, the data suggest that over 60 percent of households in the Peten region may, in fact, be net producers.¹⁴

The data from El Salvador tell a slightly different story regarding rural versus urban impacts, with a slightly higher proportion of rural households being net consumers than urban households: 72.1 versus 65.2 percent. It is not completely clear why this is the case – as in general rural households would be expected to produce a greater share of sensitive agricultural commodities than urban households – and/or whether this pattern might be related to the limitations of the data mentioned above. El Salvador is a country in which the economic importance of agriculture has declined dramatically in recent years. One possibility, then, is that Salvadoran households, whether rural or urban, now tend to be net consumers of the basket of sensitive agricultural commodities.

Another possibility could be related to how rural and urban are defined in the EHPM survey. El Salvador is a geographically compact and densely populated country, which may limit the usefulness of the traditional, administrative definitions of rural and urban used in the survey. Potentially compounding this problem is that El Salvador has not had a population census since 1992. Combined, the EHPH identification of rural versus urban, based on administrative definitions and a series of post-1992 assumptions about populations dynamics, may have led to a blurring of functional rural-urban differences in the data.¹⁵ The main message from the El Salvador data, however, as in the other countries, is that the proportion of households that are net consumers – and, thus, that are expected to benefit from price changes induced by the DR-CAFTA – still greatly out-number the proportion of households that are net producers, both in rural and in urban areas.

¹⁴ It is possible that in remote areas such as Peten, the transmission of price effects may be extremely weak, due to high transactions costs and relatively weak integration with markets. In the case, of Peten, some analysts have also argued that due to its proximity to Mexico, households may have already experienced some (or all) of the impact they will feel from liberalization, through the effects of NAFTA and informal cross-border trade of staple crops.

¹⁵ The Salvadoran statistical agency, DIGESTYC, estimates that approximately 55 percent of El Salvador's population is now urban, based on their population projections and using traditional administrative definitions of rural versus urban. In contrast, a new World Bank study on rural development in Latin America and the Caribbean (2005) that the European Union's definition of rural and urban, based on population density and geographic distance from major urban centers, estimates that roughly 80 percent of the Salvadoran population could be classified as urban.

Differences Across the Welfare Distribution.

The country case studies also indicate a common pattern of likely “winners” and “losers” across the welfare distribution; specifically, a higher percentage of the non-poor are expected to benefit than the poor. In Nicaragua, for example, 94.8 percent of households in the wealthiest quintile are net consumers, as compared to 85.7 percent of households in the poorest quintile (Table 4). In Guatemala, the 92.0 percent of households in the wealthiest quintile are net consumers, as opposed to 78.5 percent in the poorest quintile. The mirror image of these patterns is that a higher proportion of poor households are net producers and, thus, likely to be adversely affected by DR-CAFTA-related price changes. In Guatemala, for example, 20.8 percent of households in the poorest quintile are net producers, compared with only 7.5 percent of households in the wealthiest quintile.

In El Salvador, this pattern is less strong on the net consumer side, with the highest proportion of net consumers found in the third and fourth quintiles. Nonetheless, the pattern is still seen clearly among net producers; at 7.5 percent, the percentage of net producing households in the poorest quintile is roughly 1.5 times higher than the percentage of net producing households in the wealthiest households. Again, it is important to highlight that non-responses in the production for home consumption as well as the consumption expenditures module appears to be affecting the point estimates of net consumers and net producers in El Salvador – although probably not the overall qualitative findings. This problem appears to be the strongest among households in the poorest quintile where the data seem to suggest that over 70 percent of all households are neither net consumers nor net producers (i.e., neither positively nor negatively affected by price changes in sensitive agricultural commodities).

Prospective Gains to Net Consumers and Losses to Net Producers

Due to differences in household patterns of consumption and production, net consumers (net producers) stand to gain (lose) different amounts across countries – and within different sub-groups in a particular country. This can be seen clearly in Table 5, which presents the estimated gains to net consumers and estimated losses to net producers in Nicaragua, Guatemala, and El Salvador. Expected gains and losses are presented at the national level, for rural and urban areas and across the welfare distribution.¹⁶ In Nicaragua, it is estimated that if all *bienes sensibles agrícolas* were liberalized instantaneously, the 90.2 percent of households that are net consumers would experience a benefit of 3.8 percent of per capita consumption on average. This compares with a an expected benefit of only 0.5 percent of per capita consumption for net consumers in Guatemala (83.8 percent of households), and an intermediate benefit of 2.0 percent of per capita income predicted among net consumers in El Salvador (no less than 68.2 percent of Salvadoran households).

¹⁶ Monge, Castro-Leal, and Saavedra (2004) present estimated gains to net consumers and losses to net producers at the national level, as well as for rural and urban areas. They do not, however, report expected gains and losses by quintile.

Table 5: Estimated Gains by Net Consumers and Losses by Net Producers of the Basket of Sensitive Agricultural Commodities in Nicaragua, Guatemala, and El Salvador, by Rural-Urban and by Quintile

Group	Nicaragua		Guatemala		El Salvador	
	Estimated Gains by Net Consumers (% of p/c consumption)	Estimated Losses by Net Producers (% of p/c consumption)	Estimated Gains by Net Consumers (% of p/c consumption)	Estimated Losses by Net Producers (% of p/c consumption)	Estimated Gains by Net Consumers (% of p/c income)	Estimated Losses by Net Producers (% of p/c income)
All Country	3.8	-0.8	0.5	-2.3	2.0	-2.2
Rural	3.3	-1.7	0.6	-2.3	2.0	-2.3
Urban	4.2	-0.2	0.4	-2.3	2.0	-2.1
Poorest Quintile	n/a	n/a	0.8	-2.2	1.4	-3.4
2 nd Quintile	n/a	n/a	0.6	-2.0	2.0	-2.2
3rd Quintile	n/a	n/a	0.5	-1.8	2.2	-1.9
4th Quintile	n/a	n/a	0.4	-2.8	2.0	-1.0
Richest Quintile	n/a	n/a	0.2	-3.2	1.8	-0.7

Sources: Pörtner (2003), Monge, Castro, and Saavedra (2004), and Marques (2005)

Note: n/a = not reported

Expected losses among net producers also differ across countries. In the case of Nicaragua, expected losses are relatively low, on average: only 0.8 percent of per capita consumption, on average (for the 8.8 percent of households who are net consumers). This compares with estimated losses of between 2.2 and 2.3 percent of per capita consumption (or income) among net producers in Guatemala (15.7 percent of households) and El Salvador (4.1 percent of households), respectively.

Patterns of gains and losses differ somewhat across rural and urban areas within a country as well (Table 5). The clearest example of this appears to be in Nicaragua where gains to net consumers are estimated to be as high as 4.2 percent of per capita consumption in urban areas, compared with 3.3 percent in rural areas. At the same time, prospective losses to net producers are expected to be higher among rural than among urban households. Indeed, net producers in rural areas are expected to lose the equivalent of 1.7 percent of per capita consumption on average, due to DR-CAFTA-related price changes, compared to only 0.2 percent of per capita consumption among net producers in urban areas. Differences in gains and losses across rural and urban inhabitants are estimated to be much smaller, and at times non-existent, in Guatemala and El Salvador. Moreover, in contrast to Nicaragua, the small differences in estimated benefits to net consumers in Guatemala slightly favor rural households. In all three countries, gains to “winners” and losses to “losers” vary noticeably

across different locations within rural and urban areas – again due to location-specific differences in production and consumption patterns.¹⁷

While no data is reported for Nicaragua on the expected size of gains by net consumers and losses by net producers across quintiles, the Guatemala and El Salvador case studies do not show somewhat different patterns of gains and losses as a function of wealth. In Guatemala, the largest expected benefits – albeit still relatively small – are expected to accrue to the poorest net consumers, while in El Salvador the data suggest that middle-income net consumers stand to benefit most. In contrast, while the data from El Salvador suggest that the poorest net producers stand to lose the most, the Guatemalan data indicate that net producing households in the top two quintiles stand to lose the most as a percentage of their per capita consumption. Whether across regions or across quintiles, the precise nature of expected gains and losses by households in Nicaragua, Guatemala, and El Salvador are determined – sometimes in quite complex ways – by country- and location specific patterns of household production and consumption. In this context, the contrasting distributional impacts of liberalizing trade of maize and poultry are shown in Box 3.

**Box 3: The Distribution of Losses and Gains to Different Sensitive Commodities in Guatemala:
The Differential Impacts of Corn versus Poultry Liberalization**

Pörtner (2003) examines the predicted effects of individual commodities by consumption percentile for Guatemala to better understand: (i) the distributional effects of liberalizing sensitive agricultural commodities and (ii) the role for public intervention to mitigate the poverty and social impacts of the DR-CAFTA. His analysis points to a tremendous heterogeneity of impacts across different commodities. It also points to the political economy of reform of different commodities.

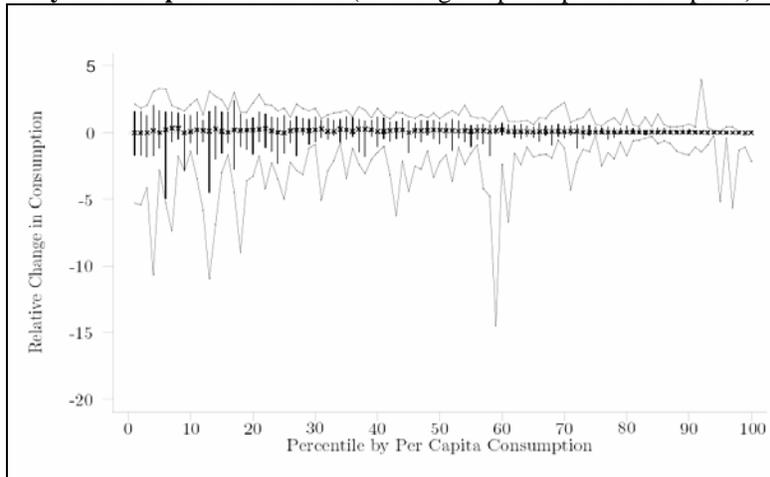
Box Figures 1 and 2 present contrasting patterns of estimated impacts on per capita consumption associated with liberalizing two different commodities – maize and poultry meat – in Guatemala.¹⁸ These figures show, by percentile of per capita consumption, (i) the median effect on per capita income (shown by the x-s); (ii) the interval between the 5th and 95th percentile of effects (indicated by the solid vertical lines); and (iii) the maximum and minimum predicted effects of removing trade protection (indicated with the upper and lower solid lines, respectively).

As can be seen from the x-s in Box Figure 1, the average estimated effect of eliminating trade protection on maize is positive across the consumption distribution – although the size of the net impact is very small, on the order of 0.10 percent of per capita consumption. At the same time, the graph shows that there is considerable heterogeneity of expected outcomes across net consumer and net producer households, even among the poor. For example, among the poorest 30 percent of households in the consumption distribution, there are a substantial number of households that are net consumers of maize, that are predicted to experience significant gains relative to their current per capita consumption. Indeed, the expected gains to per capita consumption due to maize liberalization, at least in percentage terms, are actually largest among the poorest households. At the same time, however, a considerable number of the poorest households are net producers of maize who seem likely to experience relatively large losses. Indeed, the largest losses (as a percentage of per capita consumption) appear likely to be experienced by the poorest 20 percent of households. These findings frame a central challenge for policy makers – how to assist net producers households deal with declining producer prices, without forfeiting the benefits to be accrued by the majority of net consuming households.

¹⁷ See Pörtner (2003), Monge, Castro, and Saavedra (2004), and Marques (2005) for details.

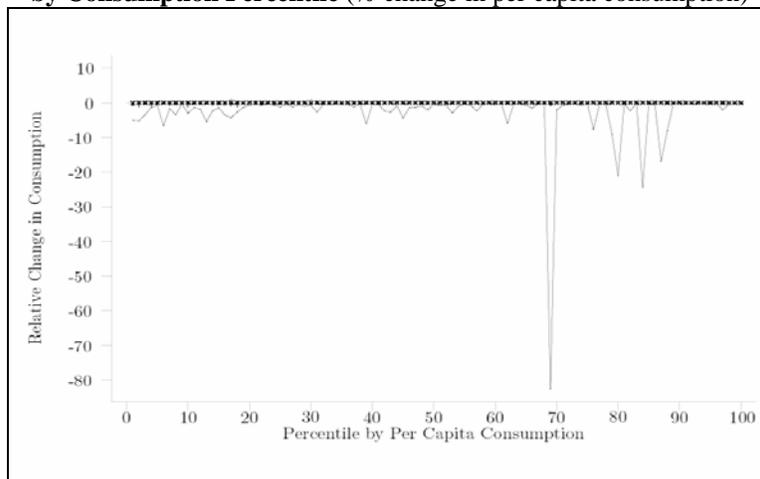
¹⁸ It should be noted that because Guatemala data do not allow one to differentiate between the production and consumption of yellow and white maize, Pörtner (2003) examines the effects of liberalizing trade in all maize. As such, Pörtner's calculations will overestimate (to an undetermined degree) the impacts of maize price changes due to DR-CAFTA among those households that produce and/or consume white maize.

Box Figure 1: Estimated Gains and Losses of Liberalizing Maize, by Consumption Percentile (% change in per capita consumption)



In contrast to the situation for maize, analysis of eliminating trade protection for poultry meat provides a striking picture of production specialization (Box Figure 2). On average, positive welfare gains to liberalizing trade in poultry are predicted – although, again, the magnitude is very small (on the order of 0.01 percent of per capita consumption). Indeed, the vast majority of households will neither gain nor lose significantly from liberalization of poultry. At the same time, the large downward spikes pictured at the 70th percentile and above, suggest there are a few, relatively wealthy producers of poultry who stand to lose significantly from liberalization of poultry. (Similar patterns are also seen in the case of beef.) While these patterns of large losses among a handful of relatively wealthy households may not call for trade adjustment assistance on poverty or basic welfare grounds, it does suggest that for some commodities there may be small numbers of (potentially politically influential) producers who will be opposed to liberalization, who might try to lobby for extending grace or liberalization periods as grace periods end, or for other types of special support.

Box Figure 2: Estimated Gains and Losses of Liberalizing Poultry Meat, by Consumption Percentile (% change in per capita consumption)

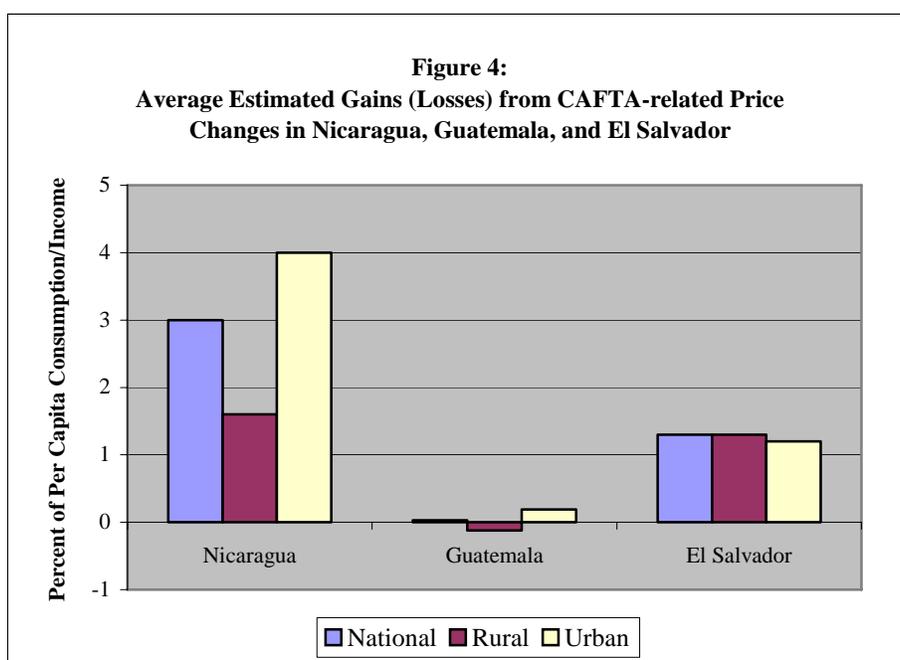


Source: Pörtner (2003).

Average Impacts

Adding up and averaging the expected gains among net consumers and expected losses among net producers in each country, it can be that these societies will benefit overall as a result of the price changes associated with DR-CAFTA. The size of the average gains differ considerably across countries and, sometimes, socio-economic groups within countries. This reflects both the composition of net consumers and net producers in each society as well as sizes of gains and losses among these groups.

Benefits related to price changes are expected to be greatest in Nicaragua – equivalent to 3.0 percent of per capita consumption, on average (Figure 4). Average benefits are estimated to be higher in urban than in rural areas, equivalent to 4.0 and 1.6 percent of per capita consumption, respectively. Static, price-related benefits are estimated to be much smaller in Guatemala, equivalent to only 0.03 percent of per capita consumption on average. Indeed, households in rural areas are expected to experience small welfare losses – about 0.12 percent of per capita consumption, on average. Estimated average gains in El Salvador are also small, although considerably larger than those estimated for Guatemala. Average gains are expected to be about 1.3 percent of per capita income, with average gains to rural and urban households being nearly identical.¹⁹



Sources: Pörtner (2003), Monge, Castro, and Saavedra (2004), and Marques (2005)

The ways in which DR-CAFTA affects different socio-economic groups across the income/consumption distribution, on average, also differs across countries – although not necessarily in ways that would be predicted, *ex-ante*. In Nicaragua, for example, there is no

¹⁹ As noted above, it is not clear the extent to which similarities in benefit patterns in rural and urban El Salvador are due to actual similarities on the ground as opposed to limitations of the data set and the current administrative definitions of urban and rural.

clear pattern of average benefits across the welfare distribution. Average benefits in the poorest quintile are slightly above the national level, and essentially equal to those in the 3rd and 4th quintiles (Table 6). In contrast, in Guatemala, expected benefits are largest, on average, among households in the lowest quintile, and they are *slightly negative* among households in the highest two quintiles. (The latter, while quite small as a percentage of per capita consumption, reflects mostly expected losses among relatively wealthy producers of poultry and beef.) In El Salvador, with the exception of the poorest quintile, for whom average gains appear to be close to zero, there are no obvious patterns in the size of benefits across the welfare distribution. And, as discussed earlier, it is not clear the extent to which the benefit figure for the poorest quintile reflects real benefits as opposed to under-reporting (or non-reporting) problems in the data.

Table 6: Average Estimated Gains (Losses) in Nicaragua, Guatemala, and El Salvador, by Rural-Urban and by Quintile

	Nicaragua	Guatemala	El Salvador
Group	Average Gain/Loss (% of p/c consumption)	Average Gain/Loss (% of p/c consumption)	Average Gain/Loss (% of p/c income)
All Country	3.0	0.03	1.3
Rural	1.6	-0.12	1.3
Urban	4.0	0.19	1.2
Poorest Quintile	3.3	0.21	0.1
2 nd Quintile	2.5	0.01	1.4
3 rd Quintile	3.3	0.08	1.7
4 th Quintile	3.3	-0.06	1.6
Richest Quintile	2.8	-0.01	1.4
Sources: Pörtner (2003), Monge, Castro, and Saavedra (2004), and Marques (2005)			

Summary

New analysis of the first-order welfare impacts of DR-CAFTA in Nicaragua, Guatemala, and El Salvador indicates that the vast majority of households in these countries stand to gain from the price changes associated with liberalizing trade in the so-called sensitive agricultural commodities. More specifically, 90 percent of Nicaraguan households, 84 percent of Guatemalan households, and 68 percent of Salvadoran households, respectively, were found to be *net consumers* of the basket of sensitive agricultural commodities who can be expected to benefit from DR-CAFTA-related price changes. Only about 9 percent of Nicaraguan households, 16 percent of Guatemalan households, and 5 percent of Salvadoran households

were found to be *net producers* of the basket of sensitive commodities and, thus, would be expected to experience welfare losses.

While the vast majority of people in these three countries stand to gain from liberalization of the sensitive agricultural commodities, the evidence suggests that the number of people who could be adversely affected by DR-CAFTA-related price changes is not trivial – at least in the absence of measures to mitigate those impacts. The proportion of *net producers* estimated for each country implies, for example, that roughly 260,000 (out of 6.5 million) Salvadorans, 484,000 (out of 5.5 million) Nicaraguans, and 1.9 million (out of 12.3 million) Guatemalans would be negatively affected by price effects of DR-CAFTA.

The analysis also suggests that specific sub-groups face higher-than-average risks of experiencing negative impacts of price changes in the absence of complementary policy measures. In Nicaragua, for example, nearly 20 percent of the rural households are expected to be negatively affected by DR-CAFTA-related price changes, while nearly a quarter of rural households are expected to experience adverse impacts in Guatemala. Even these averages conceal considerable variation in the impacts of DR-CAFTA *within* rural areas. In the Atlantic Region of Nicaragua, for instance, roughly 34 percent of rural households are *net producers* of the basket of *bienes sensibles agrícolas* and will, thus, experience negative impacts arising from their liberalization; in rural Peten, in Guatemala, over 60 percent of households may be exposed to negative price effects, on net.

While the average estimated size of losses to net producers are relatively small – about 2.2-2.3 percent of per capita consumption/income in Guatemala and El Salvador – such impacts may not be trivial for the poorest Central Americans. Moreover, at least in El Salvador, the evidence suggests that those losses among net producing households in the poorest quintile could be as much as 3.4 percent of per capita income. As with patterns of net consumers and net producers, the actual size of gains and losses that households experience will be determined in important ways by local patterns of production and consumption. Hence, despite similarities in patterns of impacts across the Central American countries, it will be important to take local circumstances into account in designing policies and programs to ensure that all Central Americans will be able to benefit from DR-CAFTA in the medium-to long run. This point will be discussed at further length in the following section.

Finally, the country case evidence suggests that while the average gains associated with liberalizing the sensitive agricultural commodities is positive in all three countries, the static gains associated with the price changes may not be large. The largest static gains appear likely in Nicaragua, where average gains are estimated at 3.0 percent of per capita consumption. At an estimated 1.3 percent of per capita income, the estimated gains in El Salvador are smaller. They are even smaller in Guatemala, where average gains are estimated to be less than one-tenth of one percent of average per capita consumption. The general-equilibrium static analysis of Nicaragua discussed in the previous chapter and conducted by Bussolo and Niimi (2005) also predicted rather small effects on both average incomes and poverty rates. These analyses thus suggest that the largest benefits from DR-CAFTA are likely to come from dynamic gains associated with increased foreign direct investment and related improvements in technology and productivity, increased employment, and higher levels of economic growth

(see Chapter 4). This in turn highlights the prospective importance not only of working to mitigate any negative impacts of DR-CAFTA-related price changes, but also of investing in people and places in Central America so as to maximize all people's ability to participate in emerging opportunities arising from the DR-CAFTA.

5. Alternative Approaches to Mitigating the Adverse Impacts of DR-CAFTA

As discussed in Section 2, DR-CAFTA includes a wide range of provisions for dealing with the liberalization of sensitive agricultural commodities, including grace periods for initiating liberalization, extended phase-out periods for tariffs, interim quotas and/or phase-downs of TQRs, and special safeguard measures to protect local farmers from undue harm due to increased agricultural imports under the Agreement. While the exact provisions were negotiated country-by-country and, therefore, differ somewhat across the region, collectively the Central American countries were successful in negotiating generous timetables for reducing production on their *bienes sensibles agrícolas*. As shown earlier (Box 1), phase-out periods are as long as 20 years in some cases. DR-CAFTA has, thus, built into the Agreement itself a type of safety net for those who might be adversely affected by liberalization of sensitive agriculture commodities: a prolonged and predictable timeframe over which producers can undertake the necessary economic adjustments.

Quick Liberalization Combined with Compensatory Transfers vs. Phased Reduction of Trade Protection: Can Countries Do Better?

While the grace periods and extended phase-out periods for tariffs and quotas do provide reasonable protection to producers of sensitive crops, the approach negotiated under DR-CAFTA also has some economic costs. Specifically, although phasing of reforms has the benefit of giving producers an extended period to make the necessary economic adjustments, it also deprives consumers for that same extended time period, the benefits associated with lower prices for key agricultural staples.

One alternative to the negotiated approach would simply be to liberalize trade in the sensitive agricultural quickly as assumed in the case studies above. This would provide immediate benefits to consumers, but as discussed above would impose costs on net producers of sensitive goods, many of whom are poor staple crop farmers in rural areas of Central America. Given the painstaking negotiations undertaken to provide for phasing of trade reform, specifically to protect these groups, it is unlikely that this approach would be taken in practice. So, is there an alternative which would allow consumers to benefit quickly while producers were given a reasonable period for making the economic adjustment? Indeed. Such an approach would involve quick liberalization of trade in the sensitive agricultural commodities, coupled with the provision of compensatory transfers, for some finite time period, to those who are expected to be negatively affected by DR-CAFTA in the short-term.

In principle, quick liberalization coupled with transfers targeted to households affected negatively by DR-CAFTA, would be more efficient economically than the approach actually negotiated under the Agreement, as consumers would not have to wait up to 20 years to reap

the full benefits of lower prices. Indeed, real food prices have already been declining in Central America in recent years, and these declines in prices have themselves contributed in important ways to poverty reduction in Nicaragua and El Salvador (see, for example, World Bank 2003; World Bank 2004). Coupling well-designed transfer programs with quick liberalization would thus be a way to enhance households' purchasing power – with important welfare impacts on the poor – while simultaneously providing producers with financial support to help them manage the economic transition.

To be effective in practice, several conditions have to hold, however. First, implementing a program of compensatory transfers requires budgetary resources (that are not required to implement the approach negotiated under the DR-CAFTA). To ensure that producers of sensitive commodities are protected and that consumers reap the benefits of lower staple prices would require a commitment of fiscal resources. Second, to be effective and efficient, it would require that the county-level institutions have adequate administrative capacity to implement a transfer programs, as well as the ability to target effectively interventions to adversely affected households. And, third, since the objective point of any trade-related compensatory transfer program would be to provide *temporary* assistance, there would have to be transparently and clearly communicated “rules-of-the-game”, including a finite time-horizon for assistance, to ensure that the transfers function as support for trade adjustment rather than becoming a “permanent” rural entitlement program.

Options for Compensatory Transfers

If the DR-CAFTA countries in Central America were to pursue quick liberalization coupled with a system of compensatory transfers, there is a wide range of possible compensation and safety net-type programs which countries could choose from including, for example, “decoupled” income support payments to farmers, conditional cash transfers (CCTs), cash-for-work or food-for work (i.e., workfare) program, or single compensation payments, among others (Casteñeda 2004). Indeed, several of these programs have been or are currently being implemented with some success in Latin America and beyond:

- Decoupled income payments to farmers, which de-link payments from current production and prices, have been used recently in several countries including in the European Union (EU), the United States (US), Turkey, and Mexico. Mexico's decoupled income support program, PROCAMPO, was initiated in 1994 to provide support to farmers who were expected to adversely affected by price changes occurring under NAFTA.
- Conditional cash transfer programs, which condition cash payments on family investments in children's human capital development, have been recently introduced in a number of Latin American and Caribbean countries including Brazil, Colombia, Honduras, Mexico, Nicaragua, Jamaica, as well as outside the region, for example, in Turkey.
- Workfare programs have been implemented worldwide to address problems of unemployment, including over an extended period of time in Argentina and in response to periodic employment shocks (e.g., during the recent coffee crisis in Nicaragua).²⁰

²⁰ *SPectrum*, Fall 2003; World Bank 2005.

Not all possible categories of support provide equal protection or show equal promise in the context of DR-CAFTA, however. While workfare has been a staple of social assistance in many developing countries, such programs are better suited for employment than income shocks. Yet, given that most of the sensitive agricultural commodities are staple crops produced on family farms, the income effects should significantly dominate employment effects, weakening the likely impacts of workfare type interventions (World Bank 2005b). Similarly, to be effective, support should enhance a household's ability to make the necessary economic transition, which in many cases will take a multiple production seasons to complete. In this context, and in the absence of strong rural capital markets in Central America, one-time payments are unlikely to provide sufficient support to successfully implement the necessary transition. While decoupled income payments to farmers and conditional cash transfers to households respond to somewhat different needs of poor, rural households, each intervention shows some promise to assist households in weathering the economic transition associated with DR-CAFTA.

Decoupled income support payments.

“Decoupling” can be defined broadly as the replacement of agricultural support programs that are based on current or future production and prices with direct payments that are based on clearly defined and fixed historical measures (Baffes and de Gorter 2003). In principle, decoupling income transfers avoids creating the economic distortions caused by many traditional agricultural support programs through their influence on domestic prices, input use, technology choice, or current or future production decisions. By not distorting production and, in turn, trade, properly designed decoupled transfer programs also fall into the “Green Box category of income support programs as agreed under WTO rules (Box 4).

Box 4: Ensuring the Compensation Measures are Consistent with WTO Agreements

If appropriately designed and implemented, decoupled direct income payments to farmers as well as income safety net programs like conditional cash transfers conform to allowable (“Green Box”) interventions under existing multilateral trade agreements. To be allowable under WTO rules, such programs are required to adhere to the following criteria:

Decoupled Direct Income Payments. Under the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) in 1994 there was an agreement about reduction in and expenditure limits on domestic agricultural subsidies, with some exemptions. The exemptions included domestic support measures that have no, or at most minimal, distorting effects on trade and production. If support is provided via public funding and not via transfers from consumers, and if it does not have the effect of providing price support to producers, then direct payments to producers can then be used if they meet the following conditions:

- Eligibility for such payments shall be determined by clearly-defined criteria such as income, status as a producer or landowner, factor use or production level in a defined and fixed base period;
- The amount of such payments in any given year shall not be related to, or based on, the type or volume of production (including livestock units) undertaken in any year after the base period;
- The amount of such payment in any given year shall not be related to, or based on, the prices, domestic or international, applying to any production undertaken in any year after the base period;

- The amount of such payment in any given year shall not be related to, or based on, the factors of production employed in any year after the base period;
- No production shall be required in order to receive such payments (WTO 1994).

Safety Net Programs. According to Annex 2 of GATT rules, another type of direct payments that is permitted includes government financial participation in income insurance and income safety-net programs. These programs must meet the following criteria:

- Eligibility for such payments shall be determined by an income loss, taking into account only income derived from agriculture, which exceeds 30 percent of average gross income or the equivalent in net income terms (excluding any payments from the same or similar schemes) in the preceding three-year period or a three-year average based on the preceding five-year period, excluding the highest and the lowest entry. Any producer meeting this condition shall be eligible to receive the payments.
- The amount of such payments shall compensate for less than 70 percent of the producer's income loss in the year the producer becomes eligible to receive this assistance.
- The amount of any such payments shall relate solely to income; it shall not relate to the type or volume of production (including livestock units) undertaken by the producer; or to the prices, domestic or international, applying to such production; or to the factors of production employed.
- Where a producer receives in the same year payments under income insurance/safety-net provisions and under provisions for relief from natural disasters, the total of such payments shall be less than 100 per cent of the producer's total loss.

Source: WTO (1994), IATRC (2001), as cited in Casteñeda (2004).

Using decoupled income supports to farmers is, in essence, the approach Mexico adopted under NAFTA. Although Mexico, like the DR-CAFTA countries, had negotiated extended grace and phase-out periods for protection of sensitive agricultural commodities, the Government has never invoked those provisions, opting rather for a *de facto* quick liberalization and transfers. Specifically, in 1994, Mexico introduced a “decoupled” income support program, PROCAMPO, to assist farmers who were expected to be adversely affected as a result of agricultural sector liberalization undertaken under NAFTA. The program was designed as a 15-year transition and is expected to be terminated in 2008.

PROCAMPO provides eligible agricultural producers with a fixed payment per hectare. Eligible producers are those that cultivated one or more of nine crops – corn, sorghum, beans, wheat, barley, cotton, cardamom, soybeans, or rice – in one of the three agricultural cycles (autumn-winter or spring-summer) *prior to* August 1993. Payment goes to whoever is cultivating the property, regardless of whether it is the owner, a renter, or sharecropper. Producers with less than one hectare are paid for one hectare, and there is a maximum eligibility of 100 hectares for irrigated land and 200 hectares for rain-fed land. Since producers on irrigated land can cultivate for up to two seasons per year, they are eligible for payments up to twice a year; producers on rain-fed land are eligible for only one payment per year.²¹ Payments are decoupled from current cultivation – although PROCAMPO does impose a restriction that land must either be used in crops, livestock or forestry, or be part of an approved environmental program (beneficiaries are free to choose among these options).

²¹ In 1997, payments averaged US \$67 per hectare and US \$317 per recipient (Cord and Wodon 2001)..

In addition to conforming to WTO rules, decoupled transfer payments have the benefit of addressing specifically the income “shock” resulting from liberalization of sensitive agricultural commodities. If implemented for a limited time period, decoupled transfers also provides a clear and predictable timeframe under which producers can, in principle, make the necessary economic adjustments (as under the phased liberalization negotiated under DR-CAFTA). Recent impact evaluation of PROCAMPO in Mexico also indicates that the program has conferred a number of positive impacts – protecting recipients against negative income effects, generating positive income multipliers for many farm families, and raising household consumption and nutritional status. These in turn have contributed to lower poverty rates among *ejido* sector households (Box 5).

Box 5: PROCAMPO: Positive Impacts on Income, Consumption, and Poverty

Recent impact analysis of PROCAMPO indicates that the program has had a number of positive benefits – from increasing household incomes and protecting recipients from negative income shocks, to increasing household consumption, to contributing to poverty reduction among rural agricultural households. For example:

Income effects. PROCAMPO payments appear to have generated income multiplier effects among many of its recipients, apparently due to its effect on increasing liquidity among agricultural producers. The analysis indicates that, on average, for every peso received, households generate incomes that are 1.5 to 2.6 times higher (Sadoulet, de Janvry, and Davis 2001; Cord and Wodon 2001). Multipliers are highest among households with medium and large farms, non-indigenous households, households with fewer adults, and those farming on irrigated land. PROCAMPO also appears to provide a good counter-cyclical tool in the face of economic downturns. In 1994, for instance, incomes of PROCAMPO recipients increased by about 18 percent, while incomes of otherwise similar households that did not receive PROCAMPO declined by about 4 percent (Sadoulet de Janvry, and Davis 2001).

Poverty and Income Distribution. Given its special acreage provisions, PROCAMPO appears to provide relatively larger benefits to poor farmers – as a percentage of household income (Cord and Wodon 2001). While in 1997 transfers represented 8 percent of household income in the *ejido* sector as a whole, it represented 40 percent of household income among those in the poorest decile. Moreover, analysis of panel data indicate that PROCAMPO payments reduced the probably of being poor among the *ejido* population by 10 percent (Cord and Wodon, 2001). A recent World Bank Poverty Assessment for Mexico found, as well, that in spite of high land concentration in Mexico, the benefit-incidence of PROCAMPO is slightly progressive overall (World Bank, 2003).

Food Consumption and Nutrition: Evidence also indicates that PROCAMPO has contributed to increased food consumption among recipients, raising households’ calorie intake and nutritional diversity (Ruiz-Arranz et al 2002; Davis et al 2002).

At the same time, the evidence suggests that PROCAMPO has not contributed to significant improvements in farm sector efficiency (World Bank 2003), nor has it been particularly effective in inducing farmers – at least smallholders and producers of rain-fed crops – to make the necessary economic transition to more remunerative means of production (Sadoulet, de Janvry, and Davis 2001). This appears to be due, in part, to the fact that the poorest recipients have tended to use transfers disproportionately for consumption purposes rather than for investment. The relative lack of impact on pattern of rural production also appears to be due to insufficient reforms and investments in complementary factors of production (e.g., energy, transportation infrastructure, etc.) that affect the cost structure and competitiveness of the rural sector more broadly (World Bank 2003).

Conditional cash transfers.

Among the fastest growing – and most successful – category of rural poverty alleviation programs in Latin America (and elsewhere) are conditional cash transfers (CCTs). CCTs provide cash transfers to poor families residing in selected rural areas, conditional on these families making specific investments in their children’s human development – e.g., sending school-age children to school, obtaining regular health check-ups, ensuring that children under five years of age are vaccinated, etc. The rationale for this is that *poor rural* families, even if they recognize the long-term benefits of education and (preventative) health measures, do not have the resources to cover the costs of school (e.g., books, uniforms, etc) or healthcare and/or can not afford to afford the opportunity cost of schooling for school-age children. Cash transfers thus have the dual objective of providing immediate short-term assistance to families to improve their basic consumption, health, and nutrition *and* of supporting long-term human development children to reduce the chances of the inter-generational transmission of poverty.

Although CCT-related transfers focus on *consumption* and *human capital investment* rather than *production* support for rural families, they may be appropriate for compensating rural households for loss of employment or income resulting from tariff reductions and the loss of trade protection associated with DR-CAFTA. Decoupled payments, such as those provided under PROCAMPO, compensate farm managers, but not necessarily hired labor, who may also be affected by the loss of trade protection. Moreover, decoupled producer supports function best where there are good records of land ownership or use (Baffes and de Gorter 2003; Castaneda 2004). Where hired labors as well as self-employed farmers are affected by trade liberalization, or where records regarding ownership or use of land are weak or non-existent, appropriately targeted CCTs may provide a viable alternative approach to supporting affected households. In addition, in the case of DR-CAFTA countries, CCT programs already exist; two countries – Nicaragua and Honduras – already have targeted programs operating and a third – El Salvador – is in the process of developing one. In this context, using CCTs to compensate DR-CAFTA-affected households might have the additional benefit of being able to build on existing programs, rather than requiring development from scratch of a new transfer program (and related institution).

As with PROCAMPO, recent impact evaluations undertaken for CCT programs in Mexico and Nicaragua show that they have important benefits to recipient families – increasing families’ consumption and nutrition, increasing children’s school enrolments, and improving preventative health outcomes (Box 6).

**Box 6: Conditional Cash Transfer Programs –
Strengthening Education, Health, and Nutrition Outcomes among the Poor**

Recent evaluation results from two conditional cash transfer programs in Latin America – PROGRESA (Oportunidades) in Mexico and the *Red de Protección Social* (RPS) in Nicaragua, show that conditional cash transfers are an effective instrument for improving and protecting consumption while increasing the human capital of poor in poor households. Specifically:

Increasing and Protecting Consumption. Evidence indicates that consumption have grown faster for households participating in conditional cash transfer programs than for similar households who did not participate. In Mexico, for example, the average consumption level in PROGRESA households increased rapidly (14 percent), after more than a year of program operation median food expenditure was 11 percent higher in program participant than in control group households. In Nicaragua, control households experienced a sharp decline in consumption due in part to low coffee prices and a drought, whereas the RPS provided some measure of protection in the face of a shock; average per capita household expenditures in RPS areas did not change over the same period.

Improving Education. Conditional cash transfer programs have raised enrollment rates for both boys and girls. In Mexico, primary school enrollment rates increased around 1 percentage point from a high pre-program level of about 90 percent. At the secondary school level, enrollment rates rose 7.2–9.3 percentage points for girls from baseline enrollment rates of 67 percent and from 3.5–5.8 percentage points for boys from a baseline of 73 percent. In Nicaragua, program impacts are even more impressive. Average enrollment rates of children ages 7–13 in grades 1 to 4 in treatment areas increased nearly 22 percentage points as a result of the program, from a low starting point of around 70 percent. Program impact on attendance rates are more mixed. In Nicaragua, the RPS produced an increase of 30 percentage points in the share of children who had fewer than six unexcused absences during a two-month period.

Strengthening Child Health and Nutrition. Evaluations show improvement in health and nutrition too. Growth-monitoring visits of PROGRESA beneficiaries up to three-years-old have increased between 30–60 percent, and beneficiaries up to six years old have a 12 percent lower incidence of illness compared with control group children. In Nicaragua, around 60 percent of children under three-years-old participated in nutrition monitoring before the RPS was implemented. After a few months of program operation, more than 90 percent of children in RPS areas benefited from nutrition monitoring compared with 67 percent in control areas. The RPS increased timely immunization among children 12–23 months old by 18 percentage points.

Source: Rawlings and Rubio (2003). World Bank 2005b

As in the case of PROCAMPO in Mexico, it is not clear the extent to which CCTs are well suited to support the economic transition that will be necessary under the DR-CAFTA. A recent evaluation of the impacts of the *Red de Protección Social* (RPS) during the recent coffee crisis in Central America suggests that the effects of such programs on promoting structural change in rural production may be limited. While the evaluation of the RPS did show that the program has performed like a crisis safety net, the evidence on whether the RPS enabled coffee households to reallocate their resources in ways that are consistent with the historical downward trends in coffee prices is more mixed (Maluccio 2004). Program beneficiaries who worked in the coffee sector as laborers were more likely to exit the industry, but self-employed coffee producers were less likely to exit. At the same time, although program beneficiaries living in coffee growing regions reduced total hours worked in agriculture, they increased the role of agriculture in their portfolio—to the detriment of non-agricultural activities.

As in the case of decoupled income support payments, it would be important that in the context of DR-CAFTA, program benefits to affected households be made only for a limited and clearly specified time horizon, to ensure the greatest possible incentives for households to make the necessary economic adjustments. Moreover, as in the case of decoupled income supports, to be maximally effective, it would be important for CCTs to be accompanied by a complementary set of policies and investments that will enable affected families and their children to take the best advantage of new opportunities arising out of the DR-CAFTA.²²

The Potential Fiscal Costs of Compensating those Adversely Affected by CAFTA

If it were possible to identify *net producer* households and the extent of their losses and to target compensation perfectly, then the fiscal costs of compensating those negatively affected would not be high. Indeed, estimates of the aggregate annual value of losses to *net producers* in El Salvador, Guatemala, and Nicaragua range from 0.01 percent of GDP in the case of El Salvador to 0.13 percent of GDP in the case of Guatemala. These relatively low figures reflect two main factors: first, the share of *net producers* in each country is relatively small (from 4.1 percent in El Salvador to 15.7 percent in Guatemala; Table 4); and, second, the average value of losses by *net producers* in each country is relatively low (from 0.8 percent in Nicaragua to 2.3 percent in Guatemala; Table 5).

The actual fiscal costs of implementing a compensatory transfer program is likely to be considerably higher than 0.13 percent of GDP however – at least if it entails creating a new program. This is due to multiple factors, including: (i) that it is impossible, in practice, to identify and target program beneficiaries perfectly (i.e., without “leakage” of resources to recipients who are not intended beneficiaries), and (ii) experience from recent decoupled income support and conditional cash transfer programs suggest that the size of the program benefits may be larger than the average losses of net producers, at least if regional norms are followed. In addition, any new program entails at least some administrative costs.

For a variety of data-related and administrative reasons, it is impossible to identify and target *net producers* perfectly. Indeed, targeted programs commonly make important errors of exclusion and inclusion in targeted programs; some people are excluded from the program who rightfully deserve to receive benefits, while others are included who are not part of the intended beneficiary population. In practice, when efforts are made to minimize errors of exclusion, errors of inclusion tend to increase, raising the costs of a program (Coady, Grosh, and Hoddinott 2004). Targeted programs often risk transferring considerable resources to people outside the group of intended beneficiaries, especially when the targeted group is geographically dispersed or the targeting criteria are hard to observe, as is the case with *net producers* of sensitive agricultural commodities in Central America. To illustrate leakage in a targeted program, consider the Mexican experience: The benefits of the PROGRESA/Oportunidades program in Mexico, which uses a combination of geographic and household criteria for targeting poor households, are highly progressive, and the program is considered a well-targeted. Nonetheless, in 2002, 28 percent of households receiving benefits

²² See Section VI, “Policies and Investments to Ensure the Poor Can Benefit from DR-CAFTA,” below.

were outside the bottom three income deciles, the program's target population (World Bank 2005a).²³

While average losses among net producers are estimated at no more than 2.3 percent of per capita consumption/income in the three countries analyzed, regional norms regarding benefits from decoupled income support and CCT programs are generally larger. In 1997, for example, transfers from PROCAMPO in Mexico averaged 8 percent of household per capita income in the target population as a whole (Table 7; Box 5). As can be seen in Table 7, the size of conditional cash transfers relative to household consumption (income) varies considerably across programs and countries. While transfers average less than 5 percent of per capita income in the case of the PRAF program in Honduras, they are as high as 21 percent of per capita expenditure in PROGRESA/Oportunidades in Mexico.

Table 7: Size of Transfers in Selected Transfer Programs – Decoupled Income Support and Conditional Cash Transfers – in Latin America

Program/Country	Number of Beneficiaries (in thousands)	Subsidy per family per year (US \$)	Transfer (as a percent of household per capita spending)	Program Budget (in US \$ and as a percent of GDP)
Decoupled Income Supports				
PROCAMPO	3,000	367	8	\$1.1 billion (0.17% of GDP, 2001)
Conditional Cash Transfer				
Progres/Oportunidades (Mexico)	4,200	380	21	\$2.3 billion (0.32% of GDP, 2001)
Familias en Acción (Colombia)	315	260	15 (of MW)	\$83 million (0.12% of GDP)
Red de Protección Social (Nicaragua)	10	236	18	\$5 million (0.02% of GDP)
PRAF (Honduras)	51	110	<5	\$8 million (0.2% of GDP)

Note: MW = Minimum Wage

Source: Adapted from Castañeda (2004).

What might this imply for the fiscal costs of a program to compensate *net producers* adversely affected by DR-CAFTA in El Salvador, Guatemala, and Nicaragua? On one level, this question is impossible to answer, as the costs of a program are dictated by any number of political and institutional factors, including decisions about the size of the transfer, the country's capacity to target, its tolerance for program leakage (errors of *both* exclusion and inclusion), and whether the government wants to launch a new program or to build on an existing initiative. Nonetheless, recent experience in the region can provide some guide on the costs of these types of programs, given its size, the size of benefits, and so on (Table 7). Moreover, building on this and some assumptions about benefit sizes and leakages, it is possible to undertake illustrative calculations regarding the possible fiscal costs of a transfer

²³ Consistent with this finding, a recent study on targeting transfers in developing countries found that 62.6 percent of program transfers went to the poorest 40 percent of the population, while 37.4 percent went to the wealthiest 60 percent (Coady, Grosh, and Hoddinott 2004).

program to compensate those adversely affected by DR-CAFTA. For example, if program benefits were set at 10 percent of household per capita consumption/income (roughly the middle of the range of benefits of programs listed in Table 7), all households that were adversely affected by DR-CAFTA received benefits, and there was no program leakage, then the estimated annual fiscal costs of the transfer program would be roughly 0.03 percent of GDP in El Salvador, 0.55 percent of GDP in Guatemala, and 0.66 percent of GDP in Nicaragua. If program benefits were set at 10 percent of household per capita consumption/income, all adversely affected households received benefits, and for reasons of targeting error, 28 percent of all program beneficiaries had not been adversely affected by DR-CAFTA (i.e., levels of program leakage were similar to those found in PROGRESA/Oportunidades), then the estimated fiscal costs would reach about 0.05 percent of GDP in El Salvador, 0.76 percent of GDP in Guatemala, and 0.92 percent of GDP in Nicaragua.²⁴

Decoupled Income Support vs. Conditional Cash Transfers – Does One Program Approach Dominate the Other?

The choice of one or the other type of transfer program would depend on a number of factors that are both economic and institutional in nature, and which may differ across countries. Decoupled programs have the benefit of being designed specifically as producer-side interventions, providing income support directly in response to expected income losses associated with trade liberalization. Given the nature of the sensitive agricultural commodities to be liberalized under DR-CAFTA, and the fact that these commodities are commonly produced by self-employed farmers (as opposed to wage laborers), decoupled transfers are also likely to be appropriate and potentially effective in reaching their target constituency. Nonetheless, implementation (targeting) of decoupled programs requires good cadastral records, and if such records do not exist then efforts would need to be undertaken to establish them, while the transfer program itself would provide incentives in favor of land titling.²⁵ Also, in spite of the evidence on the positive impacts of PROCAMPO on beneficiary-household incomes, the track record on implementation in Mexico and elsewhere is mixed (Baffes and de Gorter, 2003, Castañeda, 2004). One issue is that decoupled programs, by themselves, do not appear to have contributed significantly to economic adjustment among agricultural producers in line with trade-related or other economic changes. This suggests that decoupled programs, if implemented, ought to be undertaken along with other measures – whether technical assistance or complementary investments – that would help to diversify income sources among DR-CAFTA-affected producers.

In contrast, CCTs have not traditionally been used to support trade adjustment or in response to terms of trade shocks. Rather, they have been implemented to foster household investments in human capital among the poor and, through that, long-term poverty reduction.

²⁴ These calculations do not include the administrative costs of such a program. Moreover, they assume the implementation of new programs rather than the expansion of existing programs, such as the Red de Protección Social in Nicaragua.

²⁵ Strengthening a country's land rights and landholding records may be an important development objective in its own right, and production-decoupled transfers can provide incentives for farmers and other agents to formalize their property titles since such transfers would require proof of sensitive-crop cultivation in the past.

Nonetheless, while CCTs have not been designed to provide assistance to poor farmers during transitory adjustments, recent evidence suggests that these programs can be effective in protecting households from the worst effects of terms-of-trade or related income shocks, including negative effects on household consumption and investments in children's education, health, and nutrition (World Bank, 2005). As is well-documented in the literature, short-term shocks to children's human capital development can have detrimental long-run impacts on children's well-being, productivity as adults, and on poverty. Moreover, as CCTs are implemented – or are soon to be so – in several Central American countries, they may have the advantage of providing an existing programmatic and institutional infrastructure upon which policymakers can build. Indeed, to the extent that *net producers* of basic grains are already targeted by existing CCTs, it would likely be efficient to build on those programs, both in terms of the targeting mechanisms and the fiscal costs of the program.²⁶

In short, each type of program brings with it its own particular strengths (and weaknesses) in the context of DR-CAFTA. Should the DR-CAFTA countries choose to pursue an approach of quick trade liberalization, the choice between a decoupled transfer program vs. a conditional cash transfer would likely hinge in part on very practical considerations – that is, on the specific institutional environments in each country and the pre-existing administrative capacity to implement one type of program or another. Does the country have good cadastral records of land ownership and/or usage, or can they be developed with a reasonable period of time? Does it have (or can it develop quickly) the capacity and systems to target the programs to DR-CAFTA-affected households in such a way to minimize targeting errors – i.e., the exclusion of adversely affected households and inclusion of non-affected households? In Nicaragua, Honduras, and El Salvador, where CCTs are being operated or under development, can building on the existing programs provide the basis for effective intervention while containing the marginal fiscal costs of efforts to assist DR-CAFTA affected households?

6. Policies and Investments to Ensure the Poor Can Benefit from DR-CAFTA

Whether or not DR-CAFTA countries choose to pursue quick liberalization coupled with compensatory transfers, it will be important for the Central American governments to implement a core set of complementary policies and investments if they are to ensure that those adversely affected by liberalization of sensitive agricultural commodities – and especially those among the poor – are able to benefit from emerging opportunities arising out of the DR-CAFTA. These policies and investments mirror closely the complementary agenda outlined elsewhere in this report – although here the focus is on more deliberate policies and investments that are targeted to households and regions that are either expected to be particularly affected by DR-CAFTA or that is particularly poor at the outset of the agreement. These policies and investments would focus on facilitating greater economic progress in poor

²⁶ To the extent that countries in the region do not currently operate CCTs, but would benefit from them in terms of their long-term impacts, DR-CAFTA may provide a window of opportunity for putting in place a conditional cash transfer program that focus first on DR-CAFTA-affected households, and then scales up over time to meet its longer-term objectives of reducing structural poverty.

regions and greater economic mobility among poor or adversely affected households, including:

- Strengthening access and quality to basic education
- Targeting investments in economic infrastructure to poor areas that lowers households' transactions costs and increases poor people's economic competitiveness and access to markets
- Deepening of rural financial services (both savings and credit) to enable investments in rural enterprises
- Technical assistance to promote innovation and higher productivity in agriculture as well as diversification of rural enterprises
- Public information campaigns, to promote widespread understanding of DR-CAFTA-related reforms and to create greater certainty in the investment climate

These areas of emphasis are highlighted by several recent World Bank studies on poverty reduction and on trade. For example, a recent World Bank study of the impacts of NAFTA in Mexico found that the poorer, less developed southern states of Mexico have not benefited from to the same degree that the more developed northern and central states (Lederman, Maloney, and Serven 2005). Empirical analysis of the reasons behind these regional differences in benefits suggests that the southern states of Mexico have been less prepared to benefit due to the relatively low levels of education, economic infrastructure, and low quality of local institutions. These findings for Mexico mirror in important ways the findings of recent World Bank Poverty Assessments that examine why the poorest Central Americans are often not able to benefit from economic progress in the region. Poor families commonly lack the education necessary to take advantage of new or emerging economic opportunities (World Bank 2004, World Bank 2005). Moreover, poor rural families often lack sufficient access to markets as well as to rural financial services, either due to large physical distances or to a relative paucity of economic infrastructure in poor areas.

Yet, investments in quality education for the poor and in basic economic infrastructure, along with efforts to deepen rural financial services in poor, rural areas would go far to strengthen the capacity of the poor to take advantage of new and emerging opportunities arising out of DR-CAFTA – through increasing their capabilities, by reducing transactions costs and by increasing economic competitiveness of poor people's enterprises in rural areas. In addition, it will be important for the region's governments to carry out information and communication campaigns to promote widespread understanding of DR-CAFTA-related reforms – especially among the poor and those who are likely to be adversely affected by DR-CAFTA in the short-term. Making clear the nature of the forthcoming economic changes and the timeline for implementation would help enormously in creating greater certainty in the investment climate as well as in establishing a known timeframe and appropriate expectations for undertaking the inevitable economic adjustments.

7. Summary and Conclusion

While the vast majority of people in Central America are expected to benefit from DR-CAFTA in the medium to long-term, there are at least some people who are at risk of bearing the costs of trade-related economic adjustment in the short-to-medium term. Specifically, although the Central American economies are already relatively open, due to unilateral efforts at lowering barriers to trade undertaken in the 1990s (Chapter II), a handful of sensitive agricultural commodities (e.g., maize, beans, dairy, and poultry) still have significant levels of protection. Chapter V focuses on quantifying the size of the potentially affected population and the magnitude of the potential effects. It additionally examines alternative policy approaches on how to best assist vulnerable groups to ensure that they can benefit from emerging opportunities arising out of the DR-CAFTA.

Given current levels of protection, the introduction of more trade competition for sensitive agricultural commodities under DR-CAFTA can be expected to lead to lower domestic prices for sensitive commodities in each country – in some cases significantly lower prices. For this reason, DR-CAFTA includes a wide range of provisions (described in Chapter III) for dealing with the easing of trade restrictions on sensitive goods, including grace periods for initiating the removal of tariffs, extended phase-out periods for tariffs, interim quotas and/or phase-downs of tariff-rate-quotas, as well as special safeguard measures to protect local farmers from undue harm. Indeed, the Agreement includes extended timetables for reducing protection on sensitive agricultural crops. Phase-out periods are, for some commodities, as long as 20 years and, at least for a few countries, white maize, an important staple crop produced by the poor, was exempted from the commitments to eliminate tariffs. These provisions in themselves represent important protections for producers of sensitive crops, giving them an extended timeframe over which to undertake the necessary economic adjustments.

Given this, what might policymakers expect to be the impacts of removing barriers to trade in sensitive agricultural commodities under the DR-CAFTA? Three new empirical studies using nationally representative household survey data from Nicaragua, Guatemala, and El Salvador help shed light on this and related policy issues. All three studies apply a comparable *net consumer-net producer* framework to assess likely first-order impacts on household welfare of eliminating quotas and reducing to zero tariffs on several sensitive agricultural products, including maize, beans, milk, poultry meat, bovine meat, apples, pork, wheat, and rice. Despite the phasing out of trade protection negotiated under the DR-CAFTA, these analyses examine expected impacts *as if* all tariffs and quotas were going to be removed completely and immediately under the DR-CAFTA. The approach provides useful insights into the first-order impacts of introducing more competition in the markets for sensitive commodities. It also provides a useful baseline from which to examine policy options – including some important policy trade-offs implicit in the gradual approach to easing trade barriers negotiated under the Agreement.

This analysis on Nicaragua, Guatemala, and El Salvador indicates that the vast majority of households in these countries stand to gain from the price changes associated with removing trade barriers for the "sensitive" agricultural commodities. More specifically, 90 percent of Nicaraguan households, 84 percent of Guatemalan households, and 68 percent of Salvadoran

households, respectively, were found to be *net consumers* of the basket of sensitive agricultural commodities, and as such, can be expected to benefit from DR-CAFTA-related price changes. Only about 9 percent of Nicaraguan households, 16 percent of Guatemalan households, and 5 percent of Salvadoran households were found to be *net producers* of the basket of sensitive commodities and, thus, would be expected to experience welfare losses. For El Salvador, a further 27 percent were estimated to remain unaffected due to their essentially negligible gains or losses. Even though potential losers are thus relatively small minorities, nonetheless appropriate attention needs to be paid to ensure that anticipated losses do not harm the poorest and most vulnerable groups, for which targeted programs aimed at those that may suffer significant welfare losses may be justified.

While DR-CAFTA has built into it considerable grace periods and extended phase-out periods for eliminating tariffs and quotas that provide reasonable protection to producers of sensitive crops over a prolonged adjustment period, this approach is not without its own economic and social trade-offs. While phasing of reforms provides producers an extended period to make the necessary economic adjustments, it also deprives consumers for that same extended time period of the benefits associated with lower prices for important agricultural staples. In this context, an alternative (and some might argue more efficient) approach might involve a shorter period of removal of trade barriers for the sensitive commodities, coupled with transfers targeted to those adversely affected by DR-CAFTA in the short-term. In principle, a shorter liberalization period combined with targeted transfers is more efficient economically than phased removal of barriers, as consumers do not have to wait up to 20 years to reap the full benefits of lower prices. Coupling well-targeted transfer programs with quick easing of trade restrictions could thus enhance households' welfare in the short-term on the consumption side while providing producers with a reasonable period of support to make the economic transition.

Regardless of whether the DR-CAFTA countries in Central America choose to pursue this alternative approach, it is important to understand the broad options that policy makers can use to mitigate potential income losses arising from declines in commodity prices if extended phase-outs and safeguards are deemed insufficient: (i) "decoupled" income support payments to farmers of sensitive crops (e.g., as in Mexico's Procampo program), (ii) technical assistance programs to farmers of sensitive crops, (iii) conditional cash transfers (CCTs) to rural families, effective only as poor families make investments in their children's education, health, and nutrition, and (iv) provision of public goods (e.g., economic infrastructure, basic education, rural financial services, technical assistance) targeted to households and/or regions that are either expected to be particularly affected by DR-CAFTA.

These options can be viewed from two different perspectives. The first is the institutional sophistication required to implement support programs, recognizing that different approaches will tax the implementation capacity of Central American countries to different degrees. This criteria recognizes that effective programs will require, inter alia, a viable method of targeting vulnerable populations, a minimum degree of know-how among the civil servants of the implementing public sector agency, the creation of new government organizations (or transformation of old ones) and a minimum degree of independence to ensure the application of technical criteria and avoid political interference. The second dimension is related to

whether the program provides incentives (or other support) for broad production diversification, including strengthening the capacity of families to exploit new income opportunities for off-farm and/or non agricultural activities – which may be critical to ensure greater economic mobility among poor households.

Table 8: Options for support programs to potentially affected populations by DR-CAFTA

		Incentives/support for production diversification	
		Low	High
Institutional capacity	Low	Decoupled transfers	Public goods
	High	Technical assistance	CCTs

The classification is useful to assess the requirements and objectives that may be relevant in each country, as the choice of which type of support program would be more appropriate should be made on the basis of country-specific factors (See Table 8). Decoupled transfers require relatively low institutional sophistication but offer few incentives for farmers to seek new income opportunities, as demonstrated by the Procampo experience in Mexico. Technical assistance programs place a greater burden on the capacities of government agencies, while giving incentives for productive diversification (or upgrading), but only within agriculture. Public goods programs require less institutional sophistication by relying on existing institutions for program delivery, while creating conditions for rural inhabitants to diversify economic activities – although programs of this type may require a strong regional concentration of potentially affected poor households in order to make economic sense. CCTs require relatively sophisticated new institutional capacity (especially in countries where programs of this type are not currently being implemented, such as in Costa Rica, Guatemala and El Salvador), although by strengthening families' human capital, they offer broad support for production diversification.

Annex 1: Effective Tariff Rates Used in Ex-Ante Impact Analyses for El Salvador, Guatemala, and Nicaragua

**Table A1.1: Nominal and Effective Tariffs for Sensitive Commodities in Nicaragua
(in percent)**

Products	Nominal Tariffs	Effective Tariffs
Milk	20%	20%
Rice	62%	38%
Beans	10%	10%
White Maize	10%	10%
Bovine Meat	15%	15%
Poultry Meat	170%	170%

Source: Monge, Ricardo, Florencia Castro, and Diana Saavedra, 2004, based on tariff and trade data from the Nicaraguan Ministry of Industrial Development and Trade (*Ministerio de Fomento Industrial y Comercio*)

Table A1.2: Tariff Rates and Levels of Imports of Sensitive Crops in Guatemala, 2001

Sensitive Crop	Tariff Rates (in percent)		Global Quota (MT)	Imports (MT)	Weighted Average Tariff
	Within-Quota	Out-of-Quota			
Apples	12.0	25.0	9,100	8,481	12.0
Beans	15.0	15.0	No quota		15.0
Bovine Meat	0.0	30.0	1,595	10,595	25.5
Maize (Yellow)	5.0	35.0	501,820	515,912	5.8
Milk	15.0	15.0	No quota		15.0
Pork	15.0	15.0	No quota		15.0
Poultry Meat	15.0	45.0	7,000	14,915	30.9
Rice	6.0	36.0	33,435	42,165	12.2
Wheat	1.2	6.0	391,322	407,470	1.4

Source: Portner 2003.

Table A1.3: Effective Tariff Reduction in El Salvador, 2003

Products	SAC 1/	Quota MTs	Tariff		Imports Volume (2003)		Effective Tariff Rate
			Within Quota	Outside Quota	Origin	MTs	
Wheat 2/	1001100	N/a	0	0	Total	254,587	0
					USA	229,698	
					Other	24,889	
					CA	0	
White Corn	10059030	36288	15		Total	10419	6.5
				20	USA	4499	
				20	Other	0	
				0	CA	5920	
Beans	713	n/a	n/a		Total	1161	3.3
				20	USA	147	
				20	Other	44	
				0	CA	970	
Rice,	10061090	83915	0		Total	86810	0.8
Rough				40	USA	85676	
				40	Other	0	
				0	CA	1134	
Rice,	10062000	n/a	n/a		Total	3651	
Milled	10063010			40	USA	0	
	10063090			40	Other	0	
	10064000			0	CA	3651	
Poultry	020713- 020714-	n/a	n/a		Total	1934	19.3
				164.4	USA	33	
				20	Other	1593	
				0	CA	308	
Pork	0203-	955	0		Total	1399	6.9
				40	USA	967	
				40	Other	229	
				0	CA	203	
Bovine meat	0201-	n/a	n/a		Total	15030	0.3
				30	USA	99	
				30	Other	29	
				0	CA	14902	
Milk, Liquid	040110000-	n/a	n/a		Total	5514	11.2
	040120000-			40	USA	18	
	040130000-			40	Other	6	
				0	CA	5490	
Milk, powder	04021000/2111	n/a	n/a		Total	11405	
	04022112/2121			20	USA	47	
	04022122/2900			20	Other	9350	
				0	CA	2008	
Cheese	04062010-	750	15		Total	9669	8.6
	04061000/2090			40	USA	897	
	04063000/9010			40	Other	1650	
	04069020/9090			0	CA	7122	

Source: Marques 2005.

1/ Central America Tariff Classification

2/ In 2003, wheat flour was imported from Guatemala (19,558 MT), Nicaragua (4,763), Honduras (44 MT), and Costa Rica (20 MT) at zero tariff. The 10 percent tariff on U.S. imports will be eliminated during a five-year period under DR-CAFTA.

Chapter VI. Macroeconomic Policy Implications of DR-CAFTA

Abstract

This paper examines two macroeconomic issues related to DR-CAFTA. The first is a short- to medium-term issue related to the potential revenue losses associated with the reduction of import taxes (tariffs) that signatories will have to implement. The existing calculations of the potential revenue losses are small as a fraction of GDP, but there might be losses nonetheless that would need to be compensated in order to maintain revenues at existing levels, even without considering the fiscal costs of the so-called complementary agenda. Estimates of the losses are even smaller when the potential dynamic effects of DR-CAFTA are considered, although such gains remain a prediction rather than a fact. Moreover, even in the dynamic growth case, the tariff reductions will represent a decline in the level of fiscal revenues as a share of GDP. The second issue concerns macroeconomic management in the long-term. That is, DR-CAFTA might have an impact on the nature of the synchronization of business cycles across Central American countries as well as with respect to the U.S. If DR-CAFTA were to lead to increases in intra-industry trade (as opposed to further specialization across countries and rising inter-industry trade) then this could justify efforts to coordinate monetary policies among DR-CAFTA countries and perhaps with the U.S. The existing empirical evidence suggests that this is unlikely to occur due to the low current levels of business-cycle synchronization and low levels of intra-industry trade between the U.S. and Central America. These structural factors, however, might change with time as a consequence of CAFTA. Nevertheless, the choice of Central American monetary policies in the coming years might be dictated by financial considerations, including the extent of dollarization of financial assets and liabilities.

1. Introduction

It is common knowledge that trade reforms can have important implications for macroeconomic policies in developing countries, and DR-CAFTA is not an exception. Such reforms entail the reduction of trade taxes; especially import tariffs, which are often an important source of financing for the public sector, especially in countries with limited revenue-raising capacity through direct domestic taxes, such as income and property taxes. In fact, this concern has been long recognized by the welfare theory of commercial policies as one of the exceptions to the idea that freer trade is always superior to the imposition of trade taxes (Corden 1974).

A second policy issue is related to the long-term consequences of trade liberalization in general and DR-CAFTA in particular. Since these policies will probably affect the structure of production within the beneficiary countries, especially those from Central America that are small economies relative to the U.S., then how the economies change over time will affect the costs and benefits of pursuing the coordination of macroeconomic policies. That is, if the economies of Central America become more similar to each other, then the probability that they will face common macroeconomic shocks will increase and thus the benefits of having independent monetary policies will decline. The same logic applies with respect to coordinating monetary policies with the U.S., which in this case can be narrowed to possibility of adopting the U.S. dollar, as El Salvador has already done. In a previous publication, Lederman, Perry, and Suescún (2004) concluded that DR-CAFTA might in fact lead to further business cycle synchronization and thus to the need to coordinate monetary policies, thus leaving fiscal policy as the main shock-adjustment policy tool available in the long-run for Central American countries.

This chapter revisits relevant empirical evidence that address both macroeconomic policy issues. Section II, therefore, focuses on the potential implications of DR-CAFTA in terms of its impact on fiscal revenues. Section III turns to the issue of how the structure of trade affects business cycle synchronization across countries, reviews the evidence on cycle synchronization across Central American and with respect to the U.S., and provides new evidence on the role of intra- versus inter-industry trade in affecting the extent of business-cycle synchronization across countries. Section IV summarizes the main findings and policy implications.

2. Potential Fiscal-Revenue Losses from DR-CAFTA

The implementation of DR-CAFTA will lower fiscal revenues in Central American countries. Due to the sharp reduction of tariffs that has taken place since the late 1980s in the region (see Chapter II) and the associated reduced importance of trade taxes, fiscal losses associated with further tariff reductions should not pose as large a cost as in other liberalization experiences. For the case of Central America, revenues from trade taxes fell from a range of 3-6 percent of GDP in the 1980s to only 0.5-2 percent of GDP in the early 2000s (Barreix et al. 2004). In 2000-01, trade taxes accounted for an average 1.6 percent of GDP in Central America, somewhat above the regional LAC average of 0.9 percent, with the share of total tax revenues ranged from a low of 8 percent in Costa Rica to a high of 14 percent in Honduras (Table 1).

Table 1: Import Tax Revenues, 2000-2001

Country	Share of GDP %	Share of total Tax revenues %
Costa Rica	1.03	8
El Salvador	1.07	10
Guatemala	1.23	12
Honduras	2.37	14
Nicaragua	1.38	10
CA average	1.55	11
LAC average	0.90	5

Source: Barreix, A.; L. Villela y J. Roca (2004).

Estimates of the permanent direct fiscal loss that would be incurred once all tariffs on imports from the U.S. are eliminated suggest that under most scenarios, it should not surpass 1 percent of GDP. Four recent estimates (including one commissioned for this study) suggest a range from 0.5 to 0.8 percent of GDP for the Central American average (Table 2). The estimates reported in Table 2 take into account the effect of lower tariffs on a constant volume of imports (direct effect) and the effect on revenues from value added or excise taxes (indirect effect) which incorporate tariff modified prices as part of the tax base. These are the only potential effects that do not require strong assumptions about potential responses in the economy to the lowering of tariffs, such as the effect of potential changes in volumes due to tariff changes, the effect of changes in tariff and other revenues from imports from third countries, and the change in overall revenues from general equilibrium changes in production and consumption structures. While there is significant heterogeneity among countries, results from different sources are also different. Most studies suggest that Honduras would suffer the largest losses (0.9 to 1.6 percent of GDP) with other countries suffering losses ranging from 0.3 to 0.8 of GDP.

**Table 2: Alternative estimates of fiscal losses from DR-CAFTA
(% of GDP)**

	(1)	(2)	(3)	(4)
Costa Rica	0.65	0.33	0.30	0.38
El Salvador	0.39	0.32	0.41	0.78
Guatemala	0.39	0.50	0.46	0.60
Honduras	1.59	0.85	0.86	1.47
Nicaragua	0.39	0.39	0.47	0.57
Average	0.68	0.48	0.50	0.76

(1) Barreix, A.; L. Villela y J. Roca (2005).

(2) Bronchi and Keen (2004).

(3) Paunovic (2004).

(4) Authors' calculations.

Fiscal losses for the first years will be lower than those incurred once the treaty is fully implemented, as a result of the gradual phase out of tariffs that Central American countries negotiated. On average, only 55 percent of all imports from the U.S. will become duty-free in the first year of the treaty (Bronchi and Keen, 2004). Results for the first year from studies reported in Table 3 indicate that the average loss will range from 0.2 to 0.5 percent of GDP. In two studies, the first year losses for Nicaragua, El Salvador and Guatemala are very small (under 0.16 percent of GDP). By contrast, Costa Rica's first years losses tend to be closer to the full implementation losses, as it will liberalize most of its trade with the U.S. in the first year.

**Table 3: Alternative estimates of fiscal losses from DR-CAFTA in the first year
(% of GDP)**

	(1)	(2)	(3)
Costa Rica	0.39	0.32	0.28
El Salvador	0.15	0.09	0.38
Guatemala	0.15	0.16	0.43
Honduras	0.29	0.22	0.82
Nicaragua	0.11	0.05	0.42
Average	0.22	0.17	0.47

(1) Barreix, A.; L. Villela y J. Roca (2005).

(2) Bronchi and Keen (2004).

(3) Paunovic (2004).

A more comprehensive calculation of fiscal revenue changes from DR-CAFTA would require an assessment of the changes in production and consumption structure that could be induced by the treaty, including the impact of greater investment levels and growth. While such estimates are beyond any of the studies that have been made for the case of DR-CAFTA, Table 4 reports results from two studies (including our own estimates) which have attempted to quantify the potential effects of greater growth on fiscal losses. As expected, the growth effect generates compensatory revenues that diminish the fiscal impact.

The study by Paunovic (2004) uses estimates of the growth trajectories of the DR-CAFTA countries provided by Hinojosa-Ojeda (2003), which predict GDP growth due to CAFTA of 0.76 percent for Costa Rica, 1.59 percent for El Salvador, 2.32 percent for Guatemala, 0.89 percent for Honduras, and 1.49 percent for Nicaragua. In turn, Paunovic added these predicted growth rates (allegedly to be caused by CAFTA) to his organization's (UNECLAC) growth projections, multiplied the resulting growth rates times estimates of the elasticity of imports with respect to GDP growth, which was then multiplied by the author's estimate of the gain in indirect taxes charged on imports (i.e., VAT taxes). Consequently Paunovic (2005) contemplates a revenue-recovery effect that is limited only to the potential effect of CAFTA through growth on indirect taxes paid by rising imports.

Our calculations assume that the growth effect of DR-CAFTA will be around 0.6-0.8 percent per year, which is the range of the estimations provided by Gould and Gruben (2005) and discussed in Chapter IV of this report. Moreover, we assume that the long-term relationship

between GDP and fiscal revenues is exactly one. That is, we assume a unitary elasticity of revenues, so that when GDP grows by one percentage point, revenues rise proportionately by one percent as well. This assumption seems generous, since the empirical evidence for various Latin American and Central American countries suggests that the correlation between short-term indicators of GDP and tax revenues per capita are below one – see Table 5. Moreover, tax revenues in Central American countries are heavily dependent on consumption-related taxes rather than on progressive income or property taxation, as shown in Table 6. Economic logic dictates that more progressive tax systems can generate higher revenues for each improvement in GDP as the average marginal tax rate would tend to rise as people become richer. This revenue augmenting effect would undoubtedly be small or nonexistent in economies where the structure of taxation is not progressive and focused on income taxes or property taxes. This is not necessarily a critique of the Central American tax systems, but these are undoubtedly important elements in assessing the validity of our assumptions regarding the potential revenue-recovery effect of CAFTA. In any case, it should be acknowledged that the assumption of a unitary elasticity of revenues with respect to long-term GDP changes implies that the ratio of tax revenues over GDP will remain constant after the DR-CAFTA tariff reductions. Thus even these calculations imply a permanent reduction of the revenue-GDP ratio, in spite of the rise of revenues driven by DR-CAFTA's dynamic effects. This growth-related revenue compensation varies per country but can reach as much as 0.5 percent of GDP for the case of Honduras.

**Table 4: Alternative estimates of fiscal losses from DR-CAFTA
Including growth effects (% of GDP)**

	(1)	(2)
Costa Rica	0.21-0.26	0.00-0.15
El Salvador	0.22-0.32	0.43-0.59
Guatemala	0.27-0.37	0.25-0.40
Honduras	0.78-0.83	0.92-1.17
Nicaragua	0.31-0.40	0.09-0.31

(1) Paunovic (2004).

(2) Authors' calculations.

Table 5: Correlations between macroeconomic and fiscal variables and GDP in Latin American countries

	Disposable Income	Consumption	Investment	Trade Balance to GDP	Government Spending	Tax Revenue	Government Debt to GDP
Argentina	0.97	0.93	0.91	-0.88	0.68	0.59	-0.94
Bolivia	0.90	0.74	0.43	0.02	0.15	0.40	-0.48
Brazil	0.91	0.30	0.83	-0.64	0.38	0.51	-0.55
Chile	0.97	0.93	0.72	-0.90	0.51	0.60	-0.91
Colombia	0.96	0.84	0.68	-0.49	-0.01	0.18	-0.79
Costa Rica	0.97	0.83	0.87	-0.64	0.63	0.23	-0.87
Dominican Republic	0.91	0.53	0.69	-0.26	0.61	0.53	-0.67
Ecuador	0.91	0.86	0.68	-0.44	0.51	0.01	-0.92
El Salvador	0.98	0.89	0.84	-0.65	0.36	0.78	-0.59
Guatemala	0.95	0.98	0.67	-0.24	0.66	0.52	-0.88
Mexico	0.98	0.95	0.85	-0.66	0.62	0.76	-0.46
Nicaragua	0.88	0.27	0.59	-0.17	0.34	0.47	-0.48
Panama	0.98	0.51	0.83	-0.60	0.63	0.85	-0.88
Paraguay	0.98	0.64	0.92	-0.52	0.52	0.69	-0.94
Peru	0.97	0.95	0.70	-0.51	0.80	0.56	-0.71
Uruguay	0.95	0.92	0.91	-0.79	0.54	0.73	-0.86
Venezuela	outlier	0.82	0.82	-0.55	0.56	-0.03	-0.81
Average	0.95	0.76	0.76	-0.52	0.50	0.49	-0.75
Median	0.96	0.84	0.77	-0.53	0.53	0.53	-0.80
Max	0.98	0.98	0.92	0.02	0.80	0.85	-0.46
Min	0.82	0.27	0.43	-0.90	-0.01	-0.03	-0.94

Disposable income = GDP-taxes revenue; consumption = household final consumption; investment = gross capital formation; trade balance = exports of goods and services - imports of goods and services. All variables except net exports and government debt are in per capita terms and in logarithms; all variables filtered with the Hodrick-Prescott filter. Output correlation is the contemporaneous correlation with GDP. Tax data are from the IMF Government Finance Statistics database. Government debt figures are constructed as indicated in the text. The remaining data are taken from the World Development Indicators database.

Source: Suescún 2005, Table 9

Table 6: Revenue Composition of Latin American Tax Systems: Revenues by Source as Share of Total Revenues (average 1990-2000)

	Consumption Taxes*	Social Security Contributions	Taxes on Income	Other Taxes
Argentina	46.7	36.9	11.5	4.9
Bolivia	65.6	13.1	8.2	13.1
Brazil	33.5	28.4	19.5	18.6
Chile	66.0	8.0	21.3	4.8
Colombia	56.4	0.0	41.8	1.8
Costa Rica	54.2	32.4	12.3	1.1
Dominican Republic	76.1	4.2	18.3	1.4
Ecuador	41.4	0.0	56.7	1.9
El Salvador	70.5	0.0	26.7	2.9
Guatemala	73.5	0.0	22.9	3.6
Mexico	56.0	11.9	30.2	1.9
Nicaragua	70.5	13.4	13.4	2.8
Panama	39.5	27.7	27.1	5.6
Paraguay	65.4	6.5	16.8	11.2
Peru	64.9	10.1	17.6	7.4
Uruguay	44.0	32.1	11.1	12.7
Venezuela	36.9	4.7	55.7	2.7
mean	56.5	13.5	24.2	5.8
median	56.4	10.1	19.5	3.6

*Consumption taxes = Taxes on goods and services + Taxes on international trade

Source: Own calculations based on Government Finance Statistics database (IMF), World Development Indicators cited in Suescún (2005).

3. DR-CAFTA, Trade Structure and Business-Cycle Synchronization

With deeper trade integration between Central America and the U.S., it is expected that there will be closer links in business cycles among Central America and the U.S. From a theoretical point of view, the impact of trade integration on business cycle synchronization is not clear, as increased trade can lead business cycles to convergence or divergence: if trade integration leads to increased inter-industry trade as a part of a specialization process, then business cycles are likely to become less similar as shocks specific to particular industries will become responsible for shaping business cycles. On the other hand, if trade integration leads to a higher share of intra-industry trade, business cycles will become more similar, as industry-specific shocks affect trading partners in a similar way.

Assessing business cycle synchronization between Central America and the U.S. is not only important for a better understanding of the influence of important trading partners on the business cycle fluctuations in the domestic economies. Information about the degree of business cycle synchronization is important as it provides information on the necessity of

independent fiscal and monetary policy. If the business cycles are similar and shocks are common, then a coordination of macro policies can become desirable, with a common currency as the ultimate form of policy coordination. On the other hand, if shocks are predominately country-specific - resulting in a low degree of business cycle synchronization - then, the ability to conduct independent monetary and fiscal policy is generally seen as important in helping an economy adjust to a new equilibrium.

A. Business-cycle synchronization - Data and methodology

As shocks are not observed directly, empirical studies rely on econometric methods for their identification. Helg et al. (1995) and Bayoumi and Eichengreen (1993) adopt a structural VAR approach, whereas Artis and Zhang (1995) develop an identification scheme based on cyclical components. Rubin and Thygesen (1996), Beine and Hecq (1997) and Beine, Candelon and Hecq (2000) use a cointegration framework. Filardo and Gordon (1994), Beine, Candelon and Sekkat (1999) and Krolzig (2001) use a Markov Switching VAR model. This empirical work demonstrates that it is important to distinguish between short and long-run effects. Bayoumi and Eichengreen (1993), Helg et al. (1995) and Rubin and Thygesen (1996) use differenced variables in the VAR representation. However, such a specification does not allow for long-run relationship between the variables. Beine et al. (2000) overcome this by investigating simultaneously common trends and common cycles, where evidence of a common European cycle is taken as evidence of perfect synchronization of shocks. Breitung and Candelon (2001) use a frequency domain common cycle test to analyze synchronization at different business cycle frequencies.

The key variable in our study is the degree of business cycle synchronization between countries i and j . To measure this variable, we follow Frankel and Rose (1998) and compute the correlation between the cyclical component of the output in countries i and j , where a higher correlation implies a higher degree of business cycle synchronization. The cyclical component of output is obtained using different de-trending methods. Given the lack of consensus on the optimal procedure and the sensitivity of the cycle to the de-trending method, this approach should provide a robustness check of our results. For annual data we use first-differencing and band-pass filtering (Baxter and King, 1999). Spectral analysis is used to assess business cycle synchronization with monthly data.

Data availability for Central America seriously limits the scope for any econometrical analysis. To provide some inference about the level of business cycle synchronization and the link between trade structure and business cycle synchronization in Central America we make use of annual data on GDP from 1965 to 2002 and monthly data on economic activity from 1995 to 2003.

B. Synchronization results with annual data

Band pass filtered data, our preferred method for business cycle extraction in this section, shows that in Central America business cycle synchronization is highest between Costa Rica, Guatemala, El Salvador and Honduras. Nicaragua and Panama appear to follow a different

cycle, as correlation across business cycles is in most cases even negative, though not statistically significant.¹ These results are reported in Table 7 below.

Interestingly, the correlation with the U.S. business cycle is also high. In the case of Costa Rica, El Salvador and Honduras business cycle synchronization with the U.S. appears even higher than among regional neighbors, indicating that bilateral relationships with the U.S. through trade and remittances are more important than regional effects. Somewhat surprisingly, business cycle synchronization between U.S. and Panama, which adopted full dollarization in 1904, appears to be much lower than in the rest of Central America, with the exception of Nicaragua.² It appears that based on business cycle synchronization, the rest of Central America would be better candidates for a currency union with the U.S. than Panama. In fact, business cycle synchronization between the U.S. and Costa Rica, Guatemala, Honduras and El Salvador is even higher than the EU average (0.43).

Business cycle synchronization in the two Mercosur countries, Argentina and Brazil, is below the levels of Costa Rica, El Salvador and Guatemala. While business cycle synchronization is also substantial between the U.S. and Canada, it is however surprisingly low between the U.S. and Mexico. The finding of low business cycle synchronization between the U.S. and Mexico, as well as Brazil and Argentina is partly explained by long time period (1965-2002) under consideration, but the next section shows that there has been a substantial increase in business cycle synchronization in the more recent past.

Table 9 shows business cycle synchronization between Central American countries after controlling for common impact of the U.S. business cycle.³ Once the common impact of the U.S. business cycle is removed, it appears that only Costa Rica and Guatemala, Costa Rica and El Salvador and Guatemala and Honduras are affected by common factors other than the U.S. business cycle. As these countries also account for the largest share of intra-regional trade, this finding can be taken in support of the often postulated positive relationship between trade intensity and business cycle symmetry.

¹ Results based on first-differences are not reported here but are available in Fiess (2004).

² Panizza et al. (2000) report a similar result.

³ Table 8 reports the correlation between the cyclical components of band pass filtered GDP series orthogonal to the US business cycle.

Table 7: Business Cycle Synchronization – Band pass filter – Central America

bandpass	Central America					
	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Panama
Costa Rica	1.000					
El Salvador	0.604	1.000				
Guatemala	0.632	0.238	1.000			
Honduras	0.524	0.442	0.590	1.000		
Nicaragua	-0.214	0.015	-0.142	-0.157	1.000	
Panama	-0.007	-0.062	-0.087	-0.011	0.088	1.000
Argentina	0.354	0.111	0.187	0.043	-0.086	0.148
Brazil	0.350	0.028	0.407	0.174	-0.162	-0.001
Mexico	0.151	-0.335	0.395	0.168	-0.255	0.323
Canada	0.621	0.276	0.492	0.359	-0.214	-0.336
USA	0.687	0.506	0.463	0.679	-0.163	-0.148
France	0.239	0.113	0.394	0.152	-0.170	-0.138
Germany	0.167	0.107	0.308	0.107	-0.138	0.280
Portugal	0.124	-0.088	0.540	0.423	-0.127	-0.085
Spain	0.175	0.136	0.389	0.057	0.167	-0.218
UK	0.402	0.479	0.241	0.459	-0.268	-0.323

Table 8: Business Cycle Synchronization – Other FTAs

	Merco Sur		NAFTA			EU				
	Argentina	Brazil	Mexico	Canada	USA	France	Germany	Portugal	Spain	UK
Costa Rica	0.354	0.350	0.151	0.621	0.687	0.239	0.167	0.124	0.175	0.402
El Salvador	0.111	0.028	-0.335	0.276	0.506	0.113	0.107	-0.088	0.136	0.479
Guatemala	0.187	0.407	0.395	0.492	0.463	0.394	0.308	0.540	0.389	0.241
Honduras	0.043	0.174	0.168	0.359	0.679	0.152	0.107	0.423	0.057	0.459
Nicaragua	-0.086	-0.162	-0.255	-0.214	-0.163	-0.170	-0.138	-0.127	0.167	-0.268
Panama	0.148	-0.001	0.323	-0.336	-0.148	-0.138	0.280	-0.085	-0.218	-0.323
Argentina	1.000	0.202	0.093	-0.095	-0.033	-0.212	0.273	-0.091	-0.067	-0.100
Brazil		1.000	0.122	0.514	0.283	0.080	0.070	0.209	0.223	0.320
Mexico			1.000	0.161	0.086	-0.007	0.156	0.159	0.013	-0.209
Canada				1.000	0.771	0.338	-0.088	0.170	0.370	0.607
USA					1.000	0.338	0.104	0.292	0.329	0.727
France						1.000	0.372	0.656	0.711	0.482
Germany							1.000	0.328	0.348	-0.044
Portugal								1.000	0.559	0.431
Spain									1.000	0.429
UK										1.000

Table 9: Business Cycle Synchronization – orthogonal to US business cycle.

	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua
Costa Rica	1.000				
El Salvador	0.409	1.000			
Guatemala	0.488	0.006	1.000		
Honduras	0.104	0.157	0.421	1.000	
Nicaragua	-0.141	0.115	-0.076	-0.063	1.000
Panama	0.134	0.014	-0.021	0.118	0.065

C. Synchronization results with monthly data

The business cycle is usually defined in the range of 6 to 32 quarters, and thus low-frequency annual data might be insufficient to fully assess the degree of business cycle synchronization. In this section we therefore complement our analysis from the previous section with an analysis of monthly data, where output is proxied by seasonally adjusted monthly indices of industrial production and economic activity.

We use spectral analysis to estimate the correlation at different frequencies and use the average “coherence” at business cycle frequency (6 to 32 quarters) of year-over-year changes in economic activity as a summary measure of business cycle synchronization (Garnier 2003). The advantage of using cross-spectral densities over simple correlations in the analysis of business cycle synchronization is twofold. First, spectral analysis avoids possible business cycle distortions due to filtering, because it is well known that the cycles change with the de-trending method (Canova 1998). Second, contemporaneous correlation is unable to take lagged co-movement into account. As coherence measures the correlation between two series in the frequency domain (i.e., within each time window) and provides information on leads and lags it provides a richer analysis of business cycle dynamics. While coherence measures the extent to which two business cycles are dominated by the same frequency, the phase lag shows how elements with the same frequency are related over time (lags). In sum, a high degree of business cycle synchronization implies a high coherence and a low phase lag.

Table 10 shows the average coherence at business cycle frequency between year-over-year growth rates of economic activity during 1995 and 2003. The results broadly confirm the findings of the previous section.

Table 10. Average coherence at business cycle frequency.

	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Argentina	Mexico	Canada
Costa Rica			0.381					
El Salvador	0.524		0.534					
Guatemala	0.381	0.534						
Honduras	0.456	0.340	0.381					
Nicaragua	0.393	0.510	0.421	0.554				
Mexico	0.332	0.453	0.242	0.366	0.288	0.537	1.000	0.361
USA	0.454	0.427	0.336	0.421	0.322	0.486	0.468	0.554
Brazil	0.318	0.322	0.382	0.319	0.272	0.500	0.608	0.467

Within Central America, business cycle synchronization is found to be again highest between Costa Rica and El Salvador, El Salvador and Guatemala, El Salvador and Nicaragua, and Honduras and Nicaragua. With respect to the U.S., business cycle synchronization is highest for Costa Rica, El Salvador and Honduras, however, at levels lower than those prevailing among members of NAFTA and MERCOSUR.⁴

D. Trade Structure, Exchange Rate Stability and Business Cycle Synchronization

The impact of trade liberalization on business cycle synchronization is theoretically ambiguous. Standard trade theory (Heckscher-Ohlin) predicts that the removal of trade

⁴ We abstain from reporting the phase lag as the phase lag is very poorly estimated if the coherence is small, which is the case for most country pairings in Table 10.

barriers leads to an increasing specialization in production, leading to inter-industry trade patterns. As industry-specific specialization increases, industry-specific shocks, e.g. a shock to commodity prices, will make business cycles more dissimilar and hence decrease the degree of business cycle synchronization.

Experience from industrial countries show a trend towards intra- rather than inter-industry trade. If intra-industry trade is vertical, i.e. particular countries are specializing on different production stages of the same good, then industry-specific shocks will make business cycles more similar. The same results if intra-industry trade is horizontal, i.e. countries trade and compete with the same products. In that case industry-specific shocks are also expected to increase business cycle synchronization.

Exchange rate stability is often considered important for trade integration. While volatile exchange rates increase transaction costs, misaligned exchange rates create unfair competitive advantages for the trading partner with the undervalued currency and generate political backlash against free trade in the countries confronted with an import surge. Exchange rate stabilization and monetary coordination are therefore often seen as an effective tool to contain the political pressure against further trade integration. However, as Eichengreen and Taylor (2003) point out, the vertical-versus-horizontal structure of trade is also decisive in shaping the competitive impact of bilateral exchange rate fluctuations. If trade and production are predominately vertical, i.e. producers specialize in different stages of the production process - as in the case of NAFTA, where Mexican producers provide inputs and assembly operations for manufacturers designed and marketed in the U.S. - the exchange rate fluctuations are less likely to increase competition. The case is reversed if intra-industry trade is predominately horizontal. In this case, the impact of undervalued exchange rates is likely to be much larger. This effect is amplified further, if the goods in question cannot be relocated to a third market (regional goods, i.e. they are uncompetitive outside the regional trade area. (Fernandez-Arias, Panizza and Stein, 2002)). To summarize, intra-industry trade, vertical or horizontal, is expected to increase business cycles synchronization; exchange rate instability can become a concern for further trade integration if intra-industry trade is horizontal rather than vertical.

Tables 11 and 12 provide information about Central America's trade structure. Trade patterns of NAFTA and some countries in EU and MERCOSUR are again provided for comparison. Unlike for NAFTA, EU and MERCOSUR members, trade, measured as bilateral exports over total exports, in Central America is not predominantly intra-regional. Even within the so-called Northern Triangle (Guatemala, El Salvador and Honduras), and between El Salvador and Nicaragua, bilateral exports as a ratio of total exports barely exceed 10 percent. The U.S. is by far Central America's most important trading partner; although trade with the EU is also of some significance. As there appears to be some underreporting of exports to the U.S., imports from Central America to the U.S. as reported by the U.S. are provided as an alternative measure. These data indicate that exports to the U.S. account for more than 60 percent in the cases of Costa Rica, El Salvador and Guatemala.

Table 11: Central America's Trade Structure: Bilateral Exports/Total Exports

Bilateral Exports / Total Exports (average: 1995-2001)									
	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Argentina	Mexico	Canada	France
Costa Rica		4.4%	3.5%	1.1%	4.8%	0.1%	0.2%	0.0%	0.0%
El Salvador	2.3%		9.9%	3.1%	11.1%	0.1%	0.2%	0.0%	0.0%
Guatemala	3.2%	12.4%		2.5%	2.8%	0.1%	0.4%	0.0%	0.0%
Honduras	1.7%	6.8%	2.0%		5.3%	0.0%	0.1%	0.0%	0.0%
Nicaragua	2.9%	3.8%	3.1%	2.2%		0.0%	0.1%	0.0%	0.0%
Mexico	1.1%	0.7%	2.3%	0.3%	2.8%	1.2%		0.5%	0.4%
Brazil	0.1%	0.0%	0.0%	0.0%	0.0%	26.9%	0.5%	0.4%	0.7%
USA	21.3%	11.1%	50.7%	61.1%	38.0%	9.4%	87.1%	85.3%	7.3%
Germany	3.6%	6.1%	3.3%	3.8%	9.9%	2.3%	0.9%	0.9%	15.7%
European Union	16.0%	10.7%	10.4%	12.2%	23.1%	18.5%	3.6%	4.9%	61.6%
Memo:									
Free trade zone	39.1%	54.5%							
USA reported imports CIF	62.4%	68.1%	66.3%						

Note: Interpretation of this table is as follows. The table should be read column-wise, where each row represents the share in total column-countries exports. As an example, the top-left figure indicates that exports from Costa Rica to El Salvador represent 2.3 percent of Costa Rica's total exports.

Source: Direction of Trade Statistics, IMF.

Table 12: Central America's Trade Structure: Bilateral Exports/GDP

Bilateral Exports / GDP (average: 1995 - 2001)									
	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Argentina	Mexico	Canada	France
Costa Rica		0.8%	0.7%	0.6%	1.2%	0.01%	0.05%	0.01%	0.01%
El Salvador	0.8%		1.8%	1.5%	2.9%	0.01%	0.05%	0.00%	0.01%
Guatemala	1.1%	2.3%		1.2%	0.7%	0.01%	0.11%	0.01%	0.00%
Honduras	0.6%	1.3%	0.4%		1.4%	0.00%	0.03%	0.00%	0.00%
Nicaragua	1.0%	0.7%	0.6%	1.1%		0.00%	0.01%	0.00%	0.00%
Mexico	0.4%	0.1%	0.4%	0.2%	0.7%	0.1%		0.2%	0.1%
Brazil	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%	0.1%	0.1%	0.1%
USA	7.1%	2.1%	9.5%	30.1%	9.8%	0.8%	24.1%	30.3%	1.6%
Germany	1.2%	1.1%	0.6%	1.9%	2.6%	0.2%	0.3%	0.3%	3.3%
European Union	5.3%	2.0%	1.9%	6.0%	5.9%	1.6%	1.0%	1.7%	13.2%
Memo:									
Free Trade Zone (USA - Intel)	13.0%	10.1%							
USA reported imports CIF	19.4%	11.8%	11.7%						

Note: Interpretation of this table is as follows. The table should be read column-wise, where each row represents the share of bilateral exports in the column-countries GDP. As an example, the top-left figure indicates that exports from Costa Rica to El Salvador represent 0.8 percent of Costa Rica's GDP.

Source: Direction of Trade Statistics, IMF.

Table 13 provides information on the importance of intra-industry trade in Central America based on the adjusted Grubel-Loyed intra-industry trade index.⁵ This index can take values between 0 (no intra-industry trade) to 1 (all trade is intra-industry). There appears to be some importance of intra-industry trade within Central America, however, with the exception of Costa Rica (0.3) there is virtually no evidence of intra-industry trade with the U.S. For El Salvador and Guatemala intra-industry trade appears to be quite high with Mexico and Brazil.

⁵ Where X and M are exports and imports of industry respectively. The adjusted Grubel Llyod index makes an adjustment for trade imbalances.

$$AIIT = \frac{\sum_i^n (X_i + M_i) - \sum_i^n |X_i - M_i|}{\sum_i^n (X_i + M_i) - \left| \sum_i^n X_i - \sum_i^n M_i \right|}$$

Table 13: Intra-Industry Trade Index

	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Argentina	Mexico	Canada	France
El Salvador	0.36								
Guatemala	0.38	0.45							
Honduras	0.40	0.27	0.33						
Nicaragua	0.34	0.15	0.21	0.15					
Mexico	0.18	0.43	0.42	0.11	0.02	0.26		0.49	0.57
Brazil	0.08	0.43	0.51	0.03	0.28	0.39	0.51		0.11
USA	0.30	0.05	0.05	0.06	0.02	0.10	0.46	0.66	0.56
Germany	0.06	0.02	0.01	0.02	0.01	0.13	0.79	0.33	0.70

Source: Own calculation based on trade data from UN COMTRADE for the year 2001. A 5 digit level of disaggregation is used for this exercise.

E. Business Cycle Synchronization and Trade

Empirical evidence on trade integration and business cycle synchronization is somewhat mixed. While Frankel and Rose (1998), Choe (2001), Calderon, Chong and Stein (2002) and Calderon (2003) find that a higher trade intensity tends to increase business cycle synchronization, Shin and Wang (2003) find that increasing trade itself does not necessarily lead to more synchronized business cycles, evidence for East Asia suggests that only the expansion of intra-industry trade had such an effect. However, Garnier (2003) finds only weak or no relations between intra-industry trade and business cycle synchronization for 16 industrialized countries and concludes that intra-industry trade at most only partially explains business cycle transmission; the low correlations reported by Calderon, Chong and Stein (2002) would suggest a similar interpretation for trade intensity and business cycle synchronization.

Using the statistics calculated in the previous section, we attempt to contribute to this debate. Figure 1 shows a cross-plot of bilateral export/GDP ratios and average coherence at business cycle frequency with respect to the U.S.^{6,7} We are able to identify a positive relationship between trade intensity and business cycle synchronization. We further find that slope of the regression line is quite flat as most countries appear to fall into a relatively narrow range of business cycle synchronization (0.4 to 0.5), independent of their level of trade intensity. As an example, despite a big difference in trade intensity, France and Mexico have a similar degree of business cycle synchronization with the U.S.⁸ This seems to support Shin and Wang's (2003) and Garnier's (2003) claims that business cycle symmetry is only partly explained by

⁶ We find similar results if bilateral exports/ total exports are used as a measure of trade intensity.

⁷ Figure A1 in the appendix expands the analysis to all countries covered in Tables 7 and 8.

⁸ Argentina's relatively high level of BCS despite low trade intensity appears to be linked to dollarization and capital flow integration.

trade intensity. In other words, for El Salvador to reach Mexico’s level of BCS with the U.S. – which is only slightly higher - in GDP terms El Salvador would have to more than double its exports to the U.S. As in Shin and Wang (2003) and Garnier (2003), the link between intra-industry trade and business synchronization is found to be stronger.

Thus the evidence suggests that the effects of DR-CAFTA on the structure of trade are unlikely to change the costs and benefits of macro policy coordination in the foreseeable future. Consequently, the choice of monetary and fiscal policies along the business cycle of these economies will continue to be driven by none trade issues, such as the extent of financial asset and liability dollarization in the region.

Figure 1: Business Cycle Synchronization and Trade with the US

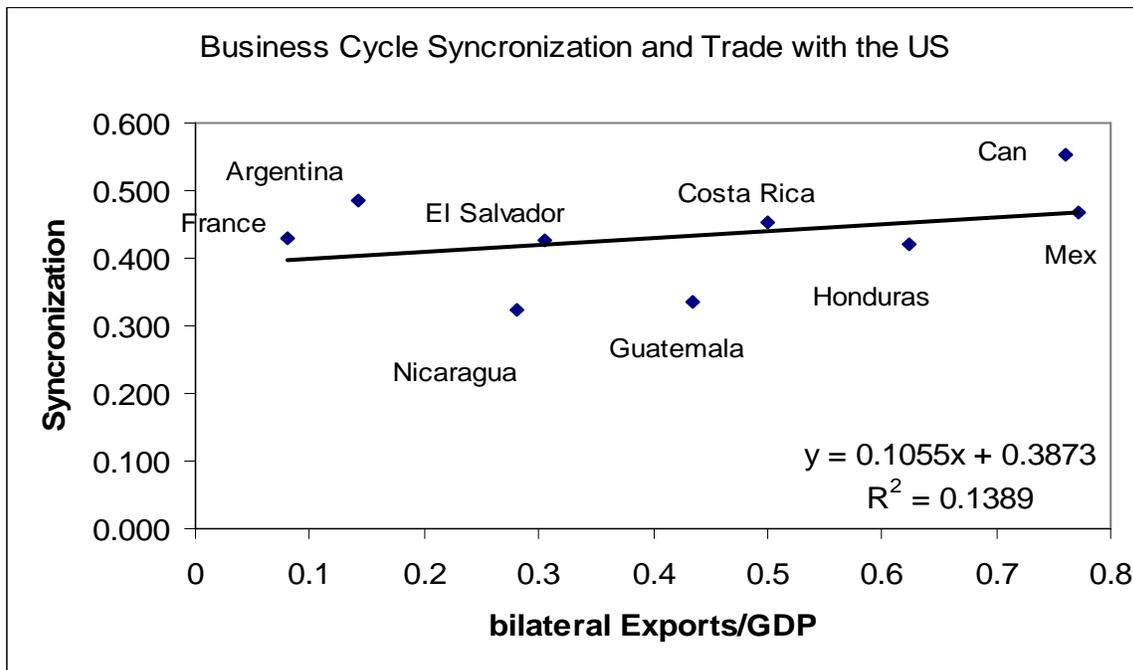
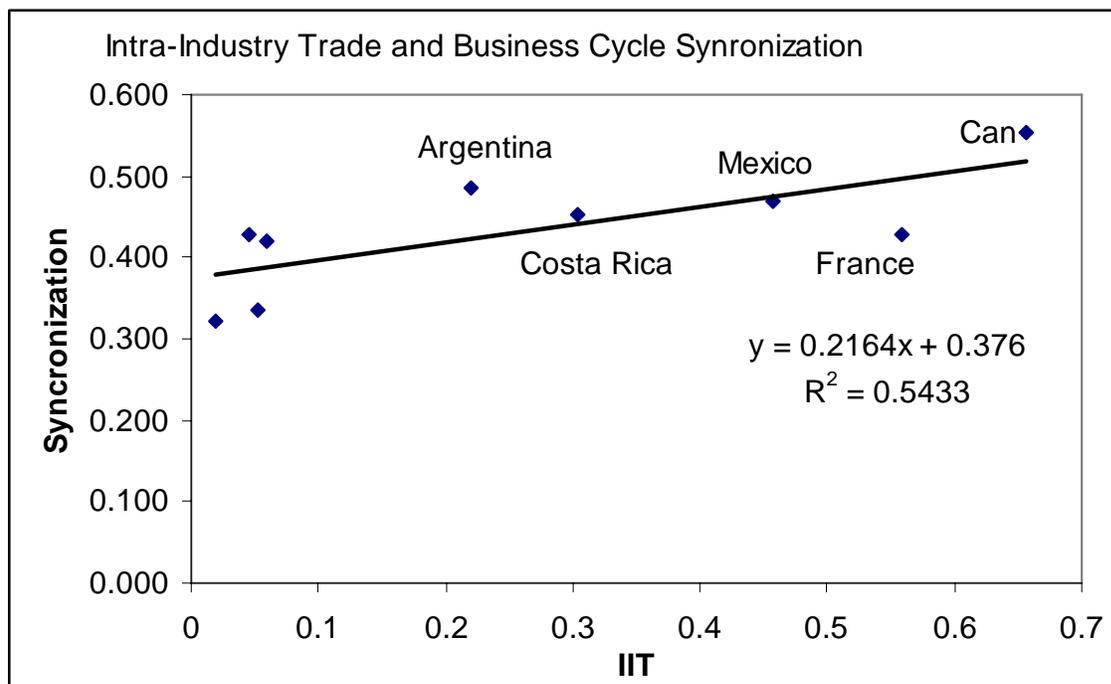


Figure 2: Business Cycle Synchronization and Intra-industry trade



The evidence discussed thus far on the structure of trade and business-cycle synchronization is less than conclusive. Other research by Calderón et al. (2002) and Calderón (2003) looked at the relationship between bilateral-trade intensity across countries and over time for a large sample of over 100 countries during 1960-1999. The econometric evidence discussed by these authors seems consistent with the ongoing discussion: They find that the positive relationship between BCS and bilateral-trade intensity is highest among pairs of industrialized (high-income) countries than among pairs of developing countries or developing-industrialized countries. Since the incidence of intra-industry trade among high-income countries is higher than among developing countries, then this evidence is consistent with our findings that BSC among Central America and with the U.S. are relatively low, but that it would tend to rise if intra-industry trade were to increase. Calderón (2003) also finds that FTAs tend to increase the magnitude of the effect of bilateral-trade intensity on BSC across pairs of countries, but this effect is still lower for developing countries than for industrialized economies.⁹ Hence the international evidence suggests that DR-CAFTA could lead to more intra-industry trade with the U.S. and thus to higher BSC, but these structural changes could be quite modest. Consequently, the potential effects of DR-CAFTA on the costs and benefits of dollarization or other forms of monetary policy coordination among the Central American and U.S. economies could be small relative to the relevance of other factors, such as the extent of financial (asset and liability) dollarization, which could lead countries to maintain stable dollar exchange rates to shield the financial system from sudden changes in the exchange rate (see Lederman, Perry, and Suescún 2004).

⁹ Calderón (2003, 2) reports that a “one standard deviation increase in bilateral trade intensity will increase output correlation from 0.53 to 0.64 among industrial country pairs with FTA in the 1990s, from 0.21 to 0.29 among developing country pairs with FTAs.”

4. Summary and Policy Recommendations

This chapter reviews evidence related to two macroeconomic policy issues. The first concerns the potential revenue losses that might be produced by DR-CAFTA's removal of import taxes. The other topic is related to the treaty's potential effect on the patterns of business-cycle synchronization (BCS) that could be affected by changes in the structure of international trade.

The fiscal losses that DR-CAFTA is likely to create need to be compensated in all Central American countries to avoid further deterioration of public finances. At present, all Central American countries with the exception of Guatemala exhibit relatively high debt indicators and require tight fiscal stances to maintain or decrease indebtedness. However, relatively small losses in the first years allow for some flexibility in the timing of the fiscal response in some of the countries -- particularly as some time may be needed for adequate political conditions to emerge.

A more comprehensive fiscal response to DR-CAFTA requires efforts to raise revenues above and beyond fiscal losses, as some of the key measures needed to optimize its effect require increases in public investments (e.g., infrastructure, education, institutional strengthening, and transitional adjustment programs). While some of these expenditures may be temporary and could arguably be financed by greater indebtedness, this may be difficult in practice due to high current debt levels.

The fiscal response to DR-CAFTA should be adapted to the fiscal situation of each country. For the cases of El Salvador and Guatemala, where tax revenue ratios are low (below 13 percent of GDP), the ideal fiscal response would be actions that go significantly beyond recovering direct losses, in order to finance additional social and infrastructure investments that are needed to boost growth and that are made more urgent and productive by the opportunities of DR-CAFTA. In Costa Rica, where the tax ratio is higher but still short of the level needed to guarantee debt sustainability, the ideal response should also involve going beyond compensation for the relatively low projected losses, making improvements in the efficiency and allocation of public expenditures, as well as attracting private financing to fund some of the most significant infrastructural needs. Honduras and Nicaragua, which have benefited recently from the Heavily Indebted Poor Countries Initiative (HIPC), will likely require additional fiscal revenues, improvements in expenditure efficiency and attraction of private financing to respond to the opportunities of DR-CAFTA. In all countries, an essential element of efforts to improve fiscal performance should include the institutional strengthening of tax agencies and their collection capacity, as well as the elimination of exonerations from VAT and income taxes.

DR-CAFTA implementation should also be used to deepen regional coordination efforts in the realm of tax policy. Going forward, a regional coordination agenda should include gradual harmonization of VAT and excise rates, fiscal incentives for foreign investors, information exchange for tax enforcement efforts, double taxation treaties and transference prices.

Regarding the prospects for macroeconomic policy coordination among Central American countries and perhaps with the U.S., business cycle synchronization within Central America is quite low compared to NAFTA and EU, but not when compared to MERCOSUR. In fact, synchronization in Central America is highest between Costa Rica and El Salvador, El Salvador and Guatemala, El Salvador and Nicaragua and Honduras and Nicaragua. Costa Rica and Honduras have a higher degree of co-movement with the U.S. than with any other Central American country. Yet synchronization with the US is still below the levels among NAFTA and even MERCOSUR members.

Furthermore, unlike NAFTA, EU and MERCOSUR, trade in Central America is not predominantly intra-regional. The US is by far Central America's most important trading partner. With the exception of Costa Rica, there is virtually no evidence of intra-industry trade between Central America and the U.S. The level of intra-industry trade within Central America is comparable to that of MERCOSUR, but below the levels of NAFTA (Canada and the US) and EU (Germany and France). Finally, the degree of business cycle synchronization seems only weakly related to trade intensity and trade structure (intra-industry trade), although the relationship between intra-industry trade and synchronization is slightly stronger, which is consistent with existing international evidence. As such, the gain in synchronization through trade expansion could be modest.

In sum, at present neither Central America's trade structure nor its degree of business cycle synchronization make a compelling case for macro coordination within Central America or between Central America and the U.S. Clearly, trade integration is a dynamic process and as trade intensities and compositions of trade flows change so will business cycle patterns. To fully assess the consequences of closer trade integration for the conduct of macroeconomic policies, information about the future evolution of trade structures in DR-CAFTA are needed. If trade becomes more intra-industry (vertical or horizontal), business cycles are expected to become more similar and independence of macro policy will be less of a concern. However, if trade integration takes the form of higher inter-industry trade then business cycles are likely to diverge from current levels and the ability to conduct independent macro policies will grow more important. In the meantime, other factors that are not directly related to the structure of international trade will remain more important considerations for the design of macroeconomic policies over the business cycle in Central America. One important consideration, for example, is the extent of dollarization of financial assets and liabilities. Hence the macro agenda in the light of DR-CAFTA should remain focused, at least in the short-run, on fiscal consolidation.

Chapter VII. Obtaining the Payoff from DR-CAFTA: Priorities for the Complementary Agenda

Abstract

This paper highlights key issues for the complementary agenda for DR-CAFTA, with emphasis on those weaknesses of each country in the areas of trade facilitation, institutional and regulatory reforms, and innovation and education. The main challenges for Costa Rica are improving road quality, port and customs efficiency, boosting financial depth, and improving the quality and coverage of secondary education. For El Salvador, priorities should focus on increasing road quality, reducing shipping costs, battling corruption, as well as improving the quality and coverage of secondary education. Both countries need to devote more public resources to R&D, strengthen public private partnerships for innovation and enhance the institutional capacity to enforce intellectual property rights laws. In addition to tackling weaknesses in most of the areas identified for Costa Rica and El Salvador, Guatemala needs to continue to build on recent accomplishments in improving customs administration, coverage and quality of primary education, and road density, as well as devoting some attention to fostering the development of new export products.

The challenges for Honduras, and Nicaragua are likely to encompass a broader set of policy issues, as they face more limitations due to their lower development level. Both countries need to battle corruption, work on improving the coverage and quality of primary education, improving the operational efficiency of ports and increasing the quality of roads and their density. They also need to improve their capacity to absorb knowledge from abroad, strengthen institutions in charge of innovation policy and increase linkages public R&D programs with the needs of the private sector. Honduras also needs to upgrade customs administration and reduce the costs and times to establish new business ventures.

All Central American countries share a regional agenda which should focus on achieving a Customs Union and strengthening policy and regulatory coordination in several areas.

1. Introduction

The benefits from DR-CAFTA will depend on the ability of the Central American economies to pursue a complementary policy agenda, as was explained in Chapter IV. DR-CAFTA by itself is unlikely to lead to substantial developmental gains without parallel efforts in certain key areas. This chapter presents a review of the remaining areas of the complementary agenda for DR-CAFTA, in addition to those related to the management of the transition presented in Chapter V and the macroeconomic implications covered in Chapter VI. The goal is to provide a brief assessment of the key policy priorities for Central American countries.¹

While virtually all public policies can in a sense be complementary and affect future economic development, this chapter focuses on three policy areas that have obvious interactions with international trade, some of which were highlighted in Chapter IV. These include, first, trade facilitation infrastructure and institutions, such as ports, roads and customs procedures. The second policy area concerns other institutional and regulatory reforms that affect the ability of firms and workers to seek out new opportunities created by DR-CAFTA and the consequent expected increase in trade and investment flows. The third area concerns innovation and education policies, which will affect Central America's ability to adopt and adapt technologies embodied in imported goods and to introduce new export products and services.

The analyses contained in the following sections provide estimates of where the Central American economies are located relative to each other and relative to countries of similar levels of development. While this type of benchmarking admittedly does not say much about the potential social returns that can be obtained from specific policy interventions, it reveals where the different countries seem to be lagging behind expectations in terms of intermediate development outcomes, such as the coverage and quality of infrastructure, regulations, and innovation. The purpose is to provoke public discussion about what each country can do to improve their performance in these policy areas that are most likely to determine the extent of the gains from DR-CAFTA in the long-run.

We acknowledge that while the chapter tries to identify deficiencies and areas of "weaknesses", virtually all Central American nations have made substantial strides in reforming their policies since at least the early 1990s. Details about the advances made in most areas can be found in the Bank's recent country-specific studies on the challenges of the growth agenda.² However, here we focus on what remains to be done. At the end, we conclude the chapter by briefly stating what seem to be the most pressing future priorities for each Central American country, derived from the evidence reviewed here.

¹ The assessment and recommendations summarized draw from recent CEM/DPR studies performed in El Salvador (2004), Honduras (2004), Nicaragua (2004) and Guatemala (2005), as well as Investment Climate (IC) Assessments in Honduras (2004), El Salvador (2005), Nicaragua (2004) and Guatemala (2004). IC comparisons do not include Costa Rica, as data from this survey will only be available in the second half of 2005. Useful attempts to outline some of the challenges of the complementary agenda include Salazar-Xirinachs and Granados (2004), Lizano and González (2003) and Rodlauer and Schipke (2005).

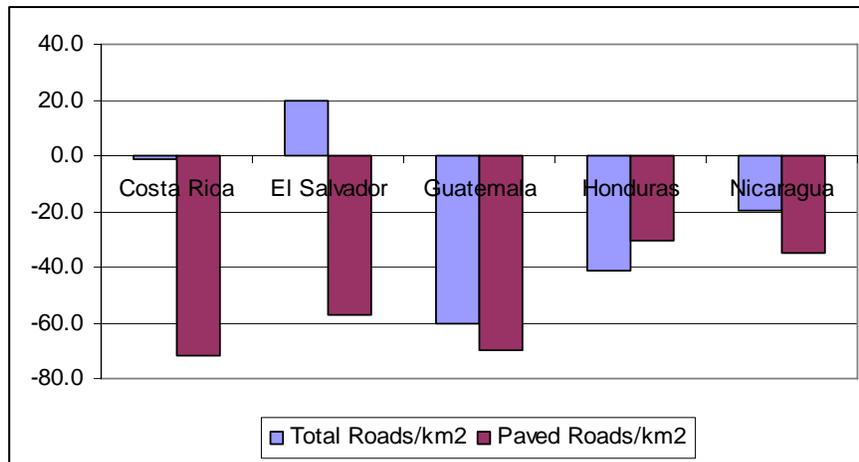
² See for example the references included in the previous footnote.

2. Trade Facilitation

Roads

Despite progress in recent years, indicators of road access still show significant deficiencies in Guatemala, Nicaragua and Honduras. In comparisons with countries of similar income per capita, road density is furthest from expected values for Guatemala (near 70 percent), while Nicaragua and Honduras fall short by about 30 percent. By contrast, El Salvador's performs 20 percent beyond expectations due to the large investments of recent years, while Costa Rica comes out at the predicted level for its level of income (Figure 1).³

**Figure 1: Road Access and Quality in Central America
Deviations from Predicted Levels (%)**



Source: Own calculations.

Road quality indicators for Central American countries are lower than predicted by their levels of development. Costa Rica, Guatemala and El Salvador exhibit the largest shortfalls in the share of paved roads with respect to GDP levels (Figure 1). The overall poor quality of roads implies mobility is low and costly, and affects the potential trade competitiveness of goods produced in rural areas.

Low fiscal availability and inadequacies in the legal framework for private sector participation are key limitations to improvement in coverage and quality. The low fiscal base in most countries of Central America constrains investment in roads. Tight fiscal situations in recent years have led to contractions of public capital formation, which has contributed to a slow down in construction and upkeep of regional infrastructure. While there are examples of private sector participation in all segments of transport activities (construction, rehabilitation and maintenance of infrastructures, and operation of transport services), the significant potential in this area has not been developed yet mainly due to deficient and uncertain legal frameworks and poor institutional capacity of the entities in charge of regulations.

³ In comparisons of road availability per inhabitant, El Salvador joins Guatemala and Honduras among lagging countries, while Nicaragua surpasses comparators due to its relatively low population.

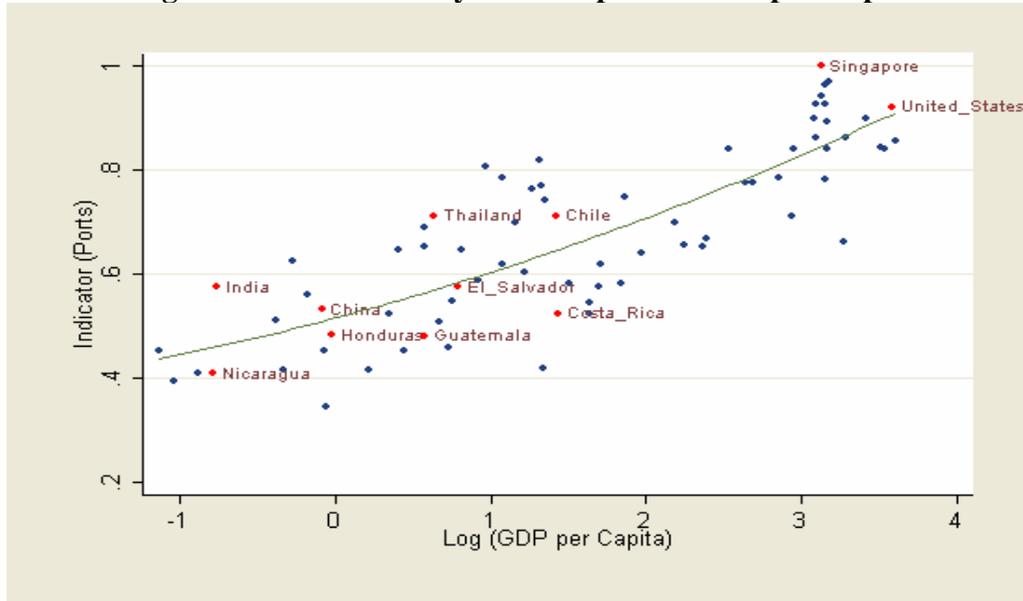
Improving access to roads and their quality to boost competitiveness and attract investment requires actions in several fronts:

- Coverage of the road network should be extended selectively within a strategy aiming at strengthening rural-urban linkages, developing trade corridors and incorporating a regional perspective, by *inter alia* strengthening the regional road network (Red Internacional de Carreteras Mesoamericanas). This is particularly important for reducing trade costs in countries such as El Salvador and Nicaragua, which rely on access to ports in neighboring countries for significant shares of their trade.
- Road quality needs to be improved by designing institutional mechanisms to assign funds for road maintenance.
- Regulatory frameworks need to be strengthened (esp., concession legislation) as well as the institutional capacity to attract private sector participation in the construction, operation and maintenance of transport infrastructure.
- Public investments in those areas where private financing is unlikely (e.g., rural roads and rural telecoms) must be protected.
- Planning capacity at both central and local levels must be reinforced and stronger coordination efforts are required for significant cross country road developments with other Central American countries.

Ports

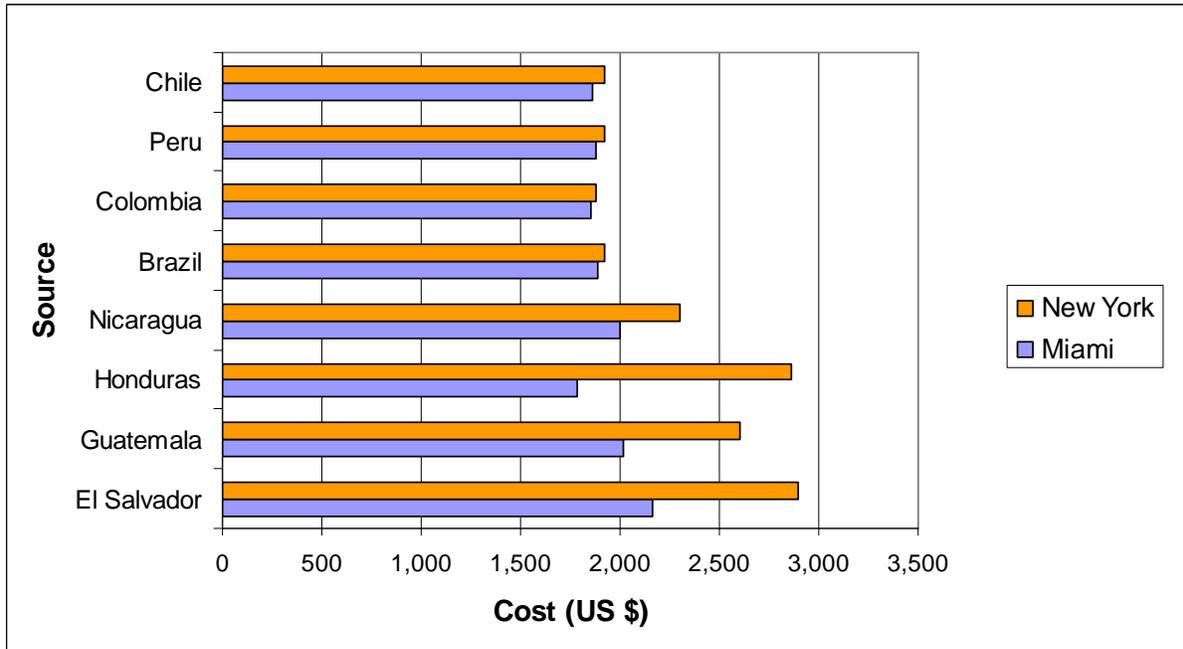
The quality and productivity of ports services in Central American is low by international standards according to a variety of sources. Figure 2 displays a benchmarking exercise using a port efficiency indicator designed to measure the quality of maritime and air ports facilities (Wilson, Otsuki and Mann, 2003).⁴ All Central American countries perform short of the benchmark by at least 5 percent, with the exception of El Salvador which falls short only by 1 percent. Most notable are the deviations of over 10 percent for Costa Rica, Guatemala and Nicaragua. A parallel exercise in which the benchmarking takes place using the value of trade per capita yields similar results, with deviations of over 15 percent for all countries, with the exception of El Salvador.

⁴ The indicator is an average of three indexes. The first (port efficiency index) is taken from Maritime Transport Costs and Port Efficiency, World Bank Group, and the second (port facilities and inland waterways) and third (air transport) are taken from the Global Competitiveness Report. See Wilson, Otsuki and Mann (2003).

Figure 2: Port Efficiency with Respect to GDP per Capita

Source: Calculated from data compiled for Wilson, Mann and Otsuki (2003).

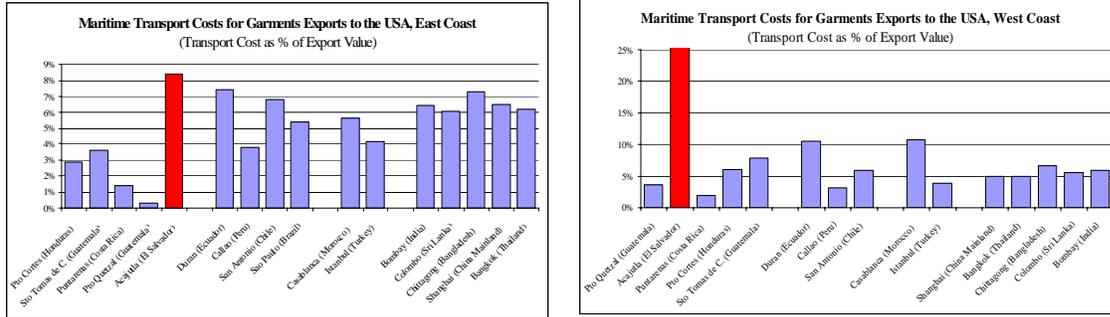
High costs for Central American ports have been attributed to low volumes, poor management by public agencies, and lagging infrastructure. In many cases, these problems have been compounded by slow customs procedures, security problems and poor human resource management (Londoño-Kent and Kent, 2003; World Bank, 2004). Puerto Cortés in Honduras exemplifies well many of the typical problems. In this port, container ships lie idle 22 percent of the time spent in port, compared to an international standard of 5 percent. General cargo is moved at the rate of 24-55 tons per hour, substantially below the international standard of 90 tons per hour, while dry cargo in bags moves at 89 tons per hour versus the international standards of 1,000 tons per hour. As a result of these problems and relatively low volumes, shipping costs to major U.S. destinations are higher from Central American ports than from ports in South American competitors (Figure 3).

Figure 3: Shipping Costs per 20 foot container

Source: Pizarro (2005).

Low quality and productivity in Central American ports contribute to higher maritime transport costs. According to data from the U.S. Department of Transportation for garment exports, maritime transport costs from Central American ports compare favorably (except for Acajutla, El Salvador) with global competitors in shipments to the East Coast of the U.S. However, Acajutla, Puerto Cortes (Honduras) and Santo Tomas (Guatemala) do not compare as well in shipments to the West Coast, even in relation to ports as far away as Turkey, China and Thailand (Figure 4). More evidence on this is provided in Table 1, in which the shipping costs of textiles and apparel to the U.S. for Central American countries is compared to those of other developing countries. While most countries of the region have relatively low shipping costs due to their geographic proximity to the U.S., it is notable that Colombia and even Mexico have highly competitive shipping costs. Port inefficiencies are likely to play a role, as well as other factors that can also raise freight values, such as the size of the ships and containers used and higher fixed costs from lower trade volumes. More in depth analysis in this area is required in order to determine the relative weight of these factors in explaining higher maritime transport costs from ports in Central America.

Figure 4: Maritime transport costs to the U.S. from selected ports as share of export value



Source: U.S. Department of Transportation as quoted in El Salvador ICA.

Table 1: Use of Shipping Modes to the U.S. for Textile and Apparel Industry

Country	Average Charge (% f.o.b.)		% Shipped by Air
	Ocean	Air	
Central and South America			
El Salvador	2.0	5.9	6.5
Guatemala	2.5	8.1	10
Honduras	1.9	8.0	2.7
Nicaragua	2.8	4.8	11.1
Costa Rica	2.4	4.7	7.6
Argentina	6.9	11.8	33.4
Brazil	7.0	10	39.3
Colombia	1.6	4.3	56.3
Ecuador	5.0	15.3	36.3
Mexico	2.2	5.6	2.0
Peru	2.6	7.2	41.5
Asia			
Bangladesh	5.3	22.9	11.3
China	3.6	11.1	24.3
Hong Kong	2.8	12.4	24.0
Indonesia	4.2	17.0	17.0
Africa			
Kenya	4.5	20.3	19.3
Lesotho	4.3	18.5	16.5
Mauritius	4.1	14.4	27.6
South Africa	5.1	17.1	18.3

Source: Londoño-Kent and Kent (2003).

Stagnant port development in recent years is due to outdated legal and institutional frameworks which have hindered trade expansion prospects in the region. Concessioneering or

privatization attempts have been limited, partly due to a lack of stable regulatory environment (e.g., lack of adequate concession legislation). Progress is under way in El Salvador (Acajutla) and Costa Rica (Caldera) where upcoming private participation is expected to improve infrastructure and port efficiency. In Guatemala, the only port in private hands (Puerto Barrios) is perceived by private users as more efficient, while *Santo Tomas*, where private sector involvement has been minimal, is still considered by users as the least efficient (Guatemala ICA, 2004). In the latter, plans now underway for private participation through the construction of a new private warehousing facility which is expected to improve the situation. More broadly for the region as a whole, the absence of strong and efficient regulatory bodies, state-owned port operators (*empresas portuarias*) have become powerful and heavily politicized institutions, reducing opportunities for reform.

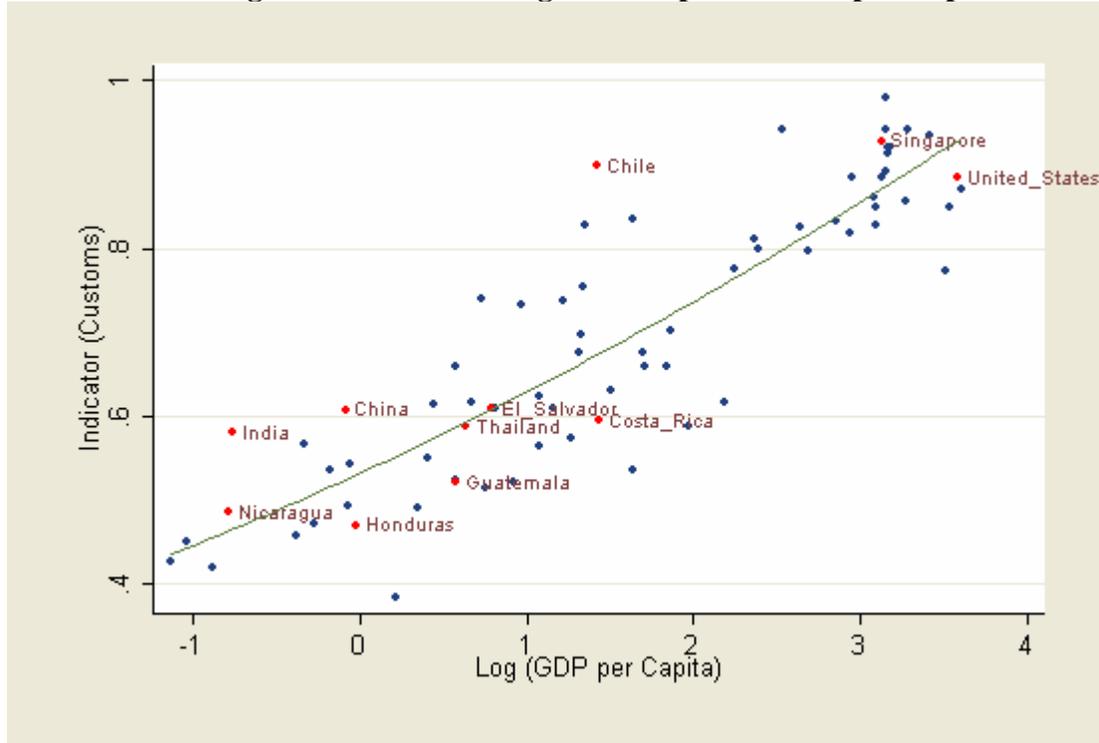
Key actions to improve the efficiency of ports in Central America include:

- Implement regulatory and institutional reforms to facilitate private participation in ports with the aim of upgrading infrastructure and improving administration.
- Improve public administration where ports cannot be privatized, including actions to foster greater transparency, improved management (including human resources), reduction of political interference, greater participation by users in the executive boards and strengthened financial discipline.
- Include port development in a coordinated regional transportation strategy for Central America, to ensure rational use of resources to facilitate trade within the region and with external partners. Reduction of the costs and times at border crossings are imperative, particularly to resolve bottlenecks faced by Nicaragua and El Salvador in reaching ports in the Atlantic.

Customs

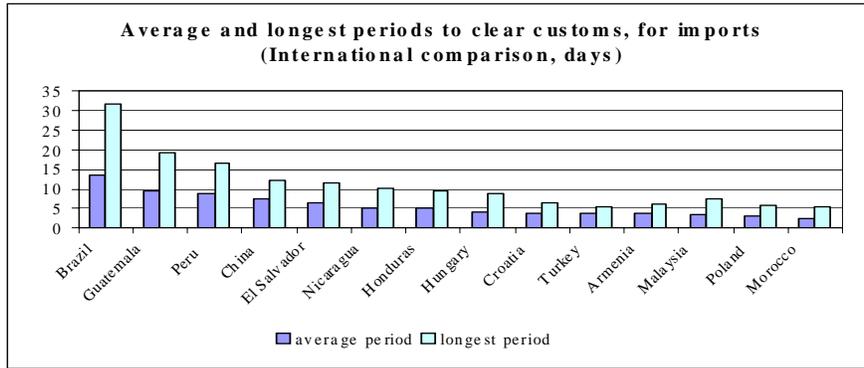
Customs performance in the region has been traditionally considered deficient by international standards and custom procedures have often been considered a major obstacle for business operations in the region. Figure 5 displays a benchmarking exercise using a customs environment indicator designed to measure the administrative transparency of customs and border crossings (Wilson, Otsuki and Mann, 2003).⁵ In this exercise, Nicaragua and El Salvador perform well, just above of the benchmark value, while the remaining countries fall short of the values predicted by their level of income by 10-13 percent. The performance is less satisfactory for all countries (except for El Salvador) in a similar exercise benchmarking by the value of trade per capita.

⁵ The indicator is the average of five indexes. The first three (irregular payments, import fees are low and hidden import barriers) are drawn from the Global Competitiveness Report, the fourth (bribery and corruption) are taken from IMD Lausanne's World Competitiveness Yearbook and the fifth (corruptions perceptions index) is from Transparency International. See Wilson, Otsuki and Mann (2003).

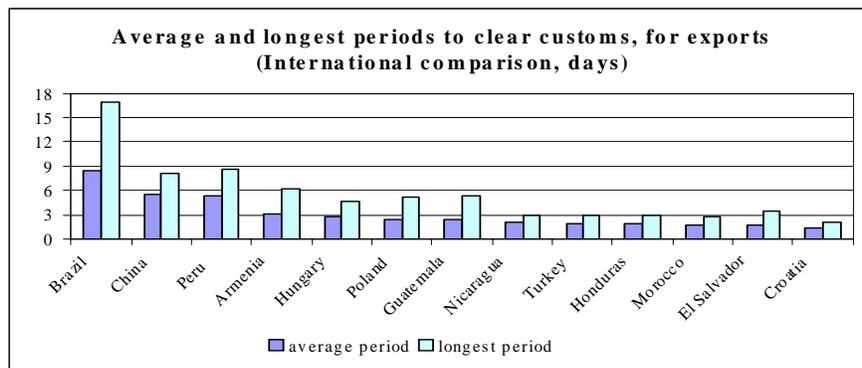
Figure 5: Benchmarking with Respect to GDP per Capita

Source: Calculated from data compiled for Wilson, Mann and Otsuki (2003).

An alternative assessment of actual port operation delay times caused by customs procedures is given by the results of recent investment climate surveys. Figure 6 displays results on the average and longest delays reported by importers for a sample of countries. The Central American countries for which the information is available perform near the sample average (with the exception of Guatemala), better than Brazil, Peru and China, but worse than Hungary, Croatia, Turkey, Malaysia, Poland and Morocco. This is also confirmed for the case of delays faced by exporters (Figure 7). This good performance is a likely reflection of recent modernization and simplification efforts. However, despite the progress achieved, interviews with private custom agents and freight transporters reveal there is still room for improvement. The reduction in clearance times achieved with the internet based system is sometimes offset by the delays caused by stringent physical controls conducted by security agencies aimed at fighting smuggling and drug trafficking. Other problems arise as a result of the use of excessive discretion by officials, the lack of an adequate and enforceable code of conduct, the importance of the political affiliation of candidates when filling positions, the lack of modern risk analysis techniques and appropriate equipment for non-intrusive inspections and faster turnaround of laboratory sample testing.

Figure 6: Custom delays for Imports (Investment Climate data)

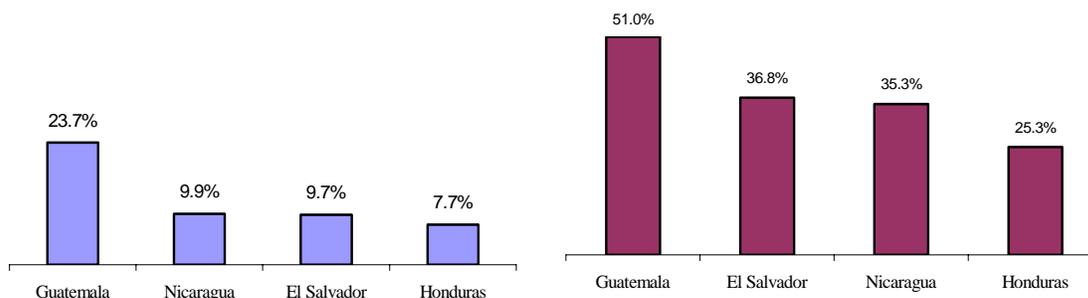
Source: Investment Climate Surveys.

Figure 7: Custom delays for Exports (Investment Climate data)

Source: Investment Climate Survey.

Custom-related constraints were a greater concern in Guatemala than in other Central American countries, and tend to acquire much greater importance in the context of DR-CAFTA. While less than 10 percent of the firms surveyed in Nicaragua, El Salvador and Honduras reported that they face major or very severe constraints in the area of customs (Figure 8), this percentage is much higher for Guatemala (23.7 percent).⁶ The concerns are significantly higher when firms are asked whether problems at customs could constrain their ability to benefit from DR-CAFTA: 51 percent of Guatemalan firms report major or very severe constraints, compared to about 37 percent for El Salvador, 35 percent for Nicaragua and 25 percent for Honduras (Figure 9). In addition, importers are more likely to report customs concerns than exporters.

⁶ The World Bank 2003 Guatemala ICA's results indicated that, among the infrastructure variables, customs regulations are the major obstacle to business operation and growth for large enterprises. These results may have reflected a deterioration in the business environment which had intensified towards the end of the Portillo administration. Prior to this period Guatemala had made strong gains in the efficiency of customs procedures, when customs were integrated in the modern and autonomous *Superintendencia de Administracion Tributaria* (SAT), and computerization allowed streamlining 90 percent of custom declarations. These efforts are getting renewed impetus under the Berger administration.

Figure 8: Firms Constrained by customs (%) **Figure 9: Firms Constrained by customs if DR-CAFTA**

Source: Investment Climate Survey.

Source: Investment Climate Survey

The implementation of Central American customs unions is the key next step to facilitate trade in the region. The elimination of border crossings between countries would allow substantial reduction in transportation costs and times, while fostering the economies of scale and greater efficiency that would be derived from a true regional market. While important advances have been made over the past year towards this goal -- including the preparation of a unified customs' regulation (CAUCA) and its *reglamento* (RECAUCA), as well as the creation of unified customs between El Salvador, Guatemala and Honduras - Central American nations need to adopt the remaining steps needed to abolish all border controls between them. Key steps include elimination of tariffs on a few pending goods for intra-regional trade, full agreement on the common external tariff schedule, and procedures to facilitate the distribution of VAT and tariff revenues among member nations. Temporary arrangements may be needed to deal with differential external tariffs arising from bilateral treaties that were signed by different CACM members with third countries, as well as with differences in DR-CAFTA tariff phase out periods and excluded goods. In the short run, key actions are the implementation of the *manual unico de procedimientos de aduanas*, and the full integration of binational customs procedures in order to have only one control post at each border.

Central American countries should deepen modernization efforts, with a focus on reducing costs and delays faced by importers. This requires pressing forward with recent modernization processes, intensifying training, and implementing quality-based management – a good initiative is that of the ISO 9,000 certifications in El Salvador. Remaining deficiencies in customs procedures and operations could be addressed by facilitating inspections through the incorporation of modern equipment and risk analysis techniques, as well as by increasing the professionalization of the customs agencies.

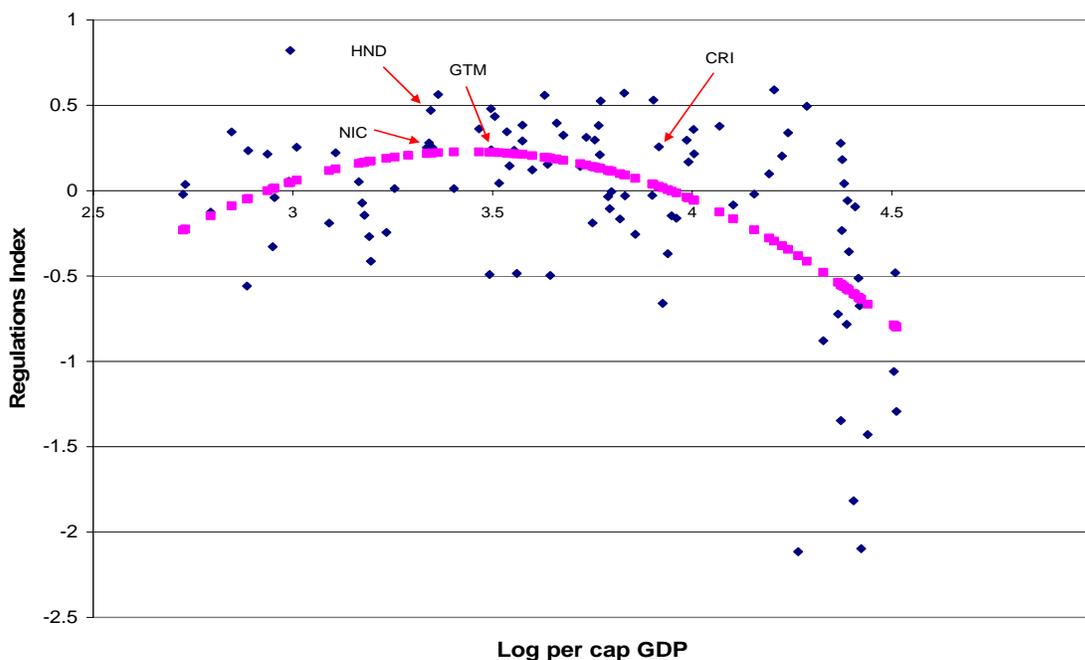
3. Institutions and regulations

Certain institutions and regulations are essential to ensure that trade opportunities arising from DR-CAFTA materialize and are eventually translated into higher growth levels. As argued in Chapter IV, most relevant for this connection are indicators of the ease with which firms and factors can be redeployed to take advantage of new productive opportunities. Other important areas that can create unnecessary costs to the reallocation of productive resources are those

related to administrative corruption (which also affects the attractiveness to foreign investors) and those which reduce access to credit.

Excessive levels of regulation across Central American countries in comparison to those elsewhere in Latin America and among other developing countries suggest that regulatory reform should be a key priority in the complementary agenda. Using the labor and firm entry index of regulations constructed by Bolaki and Freund⁷ - available for Costa Rica, Honduras, Nicaragua and Guatemala – all Central American countries fall short of their expected levels by income, with Costa Rica and Honduras lagging furthest behind (see Figure 10).

Figure 10: Regulations Index



Source: Own calculations based on Bolaki and Freund (2003).

Labor regulations

An assessment of the labor regulations component of the regulations index of Bolaki and Freund (2003) reveals significant levels of underperformance for all Central American countries (6 percent to 11 percent of predicted values) with Guatemala and Nicaragua exhibiting the widest gaps.⁸ While this may be reflecting some excess regulations in formal norms, in economies in which the informal sector accounts for a large size of employment it is unknown how costly these regulations may be. While the partial evidence available does not

⁷ The index of regulations is a weighted average of an index of labor regulations and an index of firm entry regulations, with weights determined by factor analysis (Bolaki and Freund, 2003). Higher values of this index reflect a greater degree of regulation both in the labor market and the business sector. Due to delays in data collection, El Salvador is not included in this analysis.

⁸ The labor regulations index is the sum of an employment laws index and an industrial relations law index. See Bolaki and Freund (2003) for further details.

suggest that labor turnover rates – firing and hiring rates – are abnormally low in Central American countries, more in depth studies of labor markets in Central America are required.⁹

Firm entry

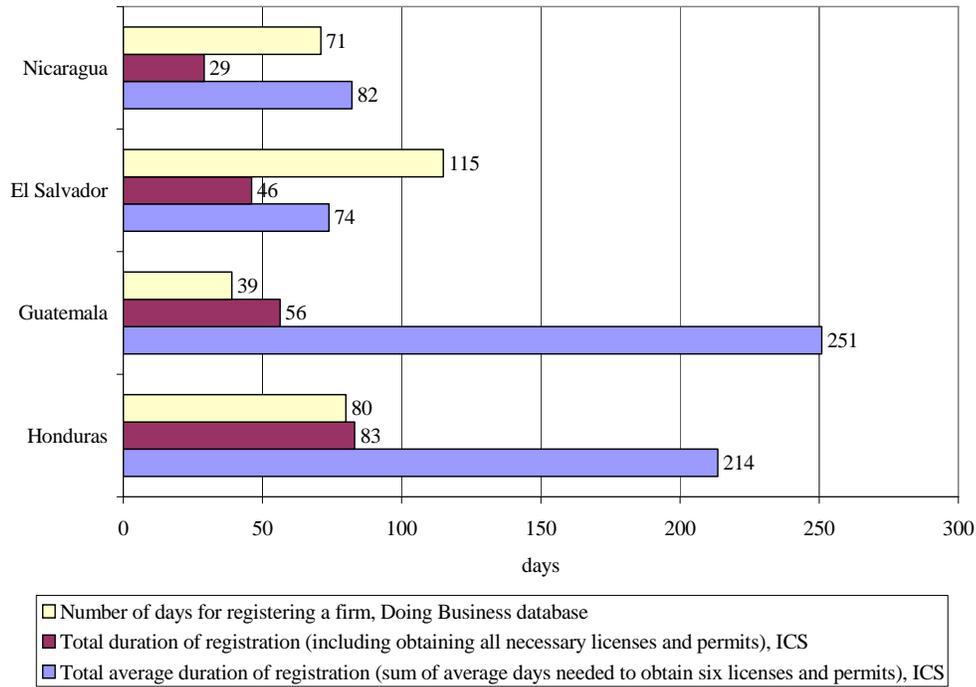
Excessive regulations for firm entry are an issue in some countries in Central America, as measured by the number of days required by respondent manufacturing firms to register for the first time. According to World Bank's Doing Business surveys, a typical firm in Nicaragua takes 29 days to register compared to 46 days in El Salvador, 56 days in Guatemala and 83 days in Honduras (Figure 11). Summing up the average number of days required to go through six different types of registration procedure leads to 74 days in El Salvador, 82 in Nicaragua, 251 in Guatemala and 215 in Honduras.¹⁰ Figure 11 compares the available data on registration times from the investment climate surveys and the World Bank's Doing Business database.¹¹ A benchmarking exercise using the firm entry component of the regulations index of Bolaki and Freund (2003) finds that Honduras exhibits the largest lag with respect to the predicted value for its level of income per capita (entry procedures take almost 3 times longer to be completed compared to the rest of the world). Costa Rica exhibits only a modest gap, while Guatemala and Nicaragua are near levels predicted for their respective levels of income.¹²

⁹ Preliminary evidence from recent investment climate surveys suggests that Salvadoran firms appear to be the least constrained by labor regulations, while those from Guatemala are the most constrained within the Central American context. In addition, a larger percentage of (formal) firms in Honduras pointed to laws and regulations regarding dismissal of workers as a significant factor affecting employment levels.

¹⁰ The six registration processes are draft of constitution of the firm, inscription of the firm in the Public Registry, registration with the tax authority, operating license, registration with the Health Ministry, and environmental permits.

¹¹ The Doing Business database finds that the registration of a limited liability company in San Salvador takes 115 days on average (or close to four months) which seems to contradict ICS results. This could be attributed to Doing Business relating to only limited liability companies, and reflecting the answers of only one law firm, which supplies the data on duration of business registration. In contrast, the ICS covers more than 400 firms in each country, of different legal status, and the respondents are the firm managers.

¹² The index of entry regulations uses data on the number of procedures and the time it takes to start a business in each country (Bolaki and Freund, 2003).

Figure 11: Number of Days to Register a Firm

Source: World Bank Investment Climate Surveys and World Bank Doing Business Database.

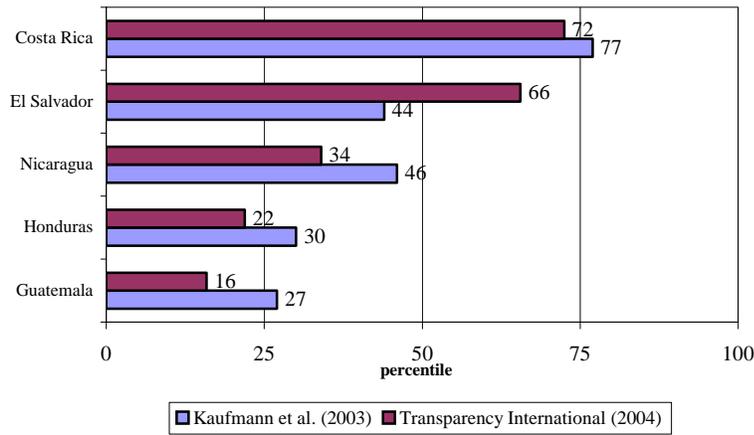
Administrative Corruption

The prevalence of corruption is a significant issue of concern in several Central American countries. Administrative corruption can have a deleterious effect on the costs faced by private firms in doing business and affect the country's attractiveness to foreign investors. Moreover, corruption and weak rule of law can also make any regulatory environment exert unintended consequences when legal norms and regulations are not applied accordingly.

Transparency International's Corruption Perception Index (CPI) places Costa Rica and El Salvador respectively in the 72th and 66th percentiles of a sample of 145 countries, compared to the 24th percentile, on average, for Guatemala, Honduras and Nicaragua. A similar ordering can be derived from the World Bank Institute's 2004 indicator of the control of corruption, although El Salvador falls further behind Costa Rica and is actually surpassed by Nicaragua (Figure 12).¹³

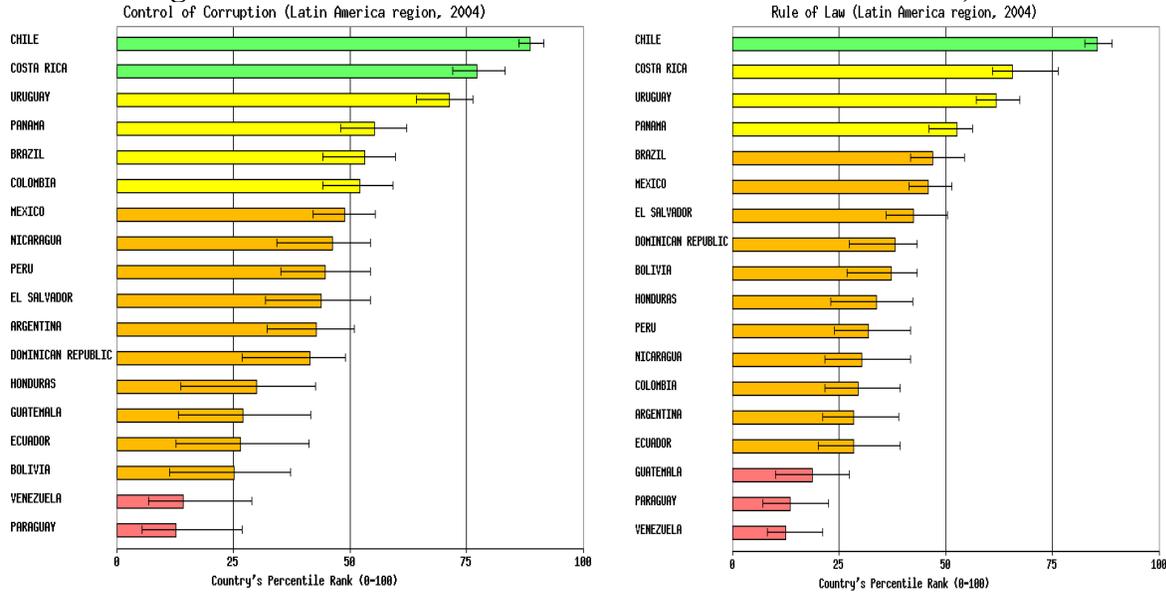
¹³ In the larger sample of 195 countries used in WBI's indicator of control of corruption El Salvador is placed only at the world's 34th percentile, compared to the 77th for Costa Rica, and the average 34rd percentile for Guatemala, Honduras and Nicaragua. This may be related to poor perceptions in the areas of judicial independence and organized crime, according results from the World Economic Forum's Growth Competitiveness Index, as El Salvador performs quite well in the indexes of corruption in public services, corruption in foreign trade and corruption in tax collection.

Figure 12: International Transparency rankings of Central American countries



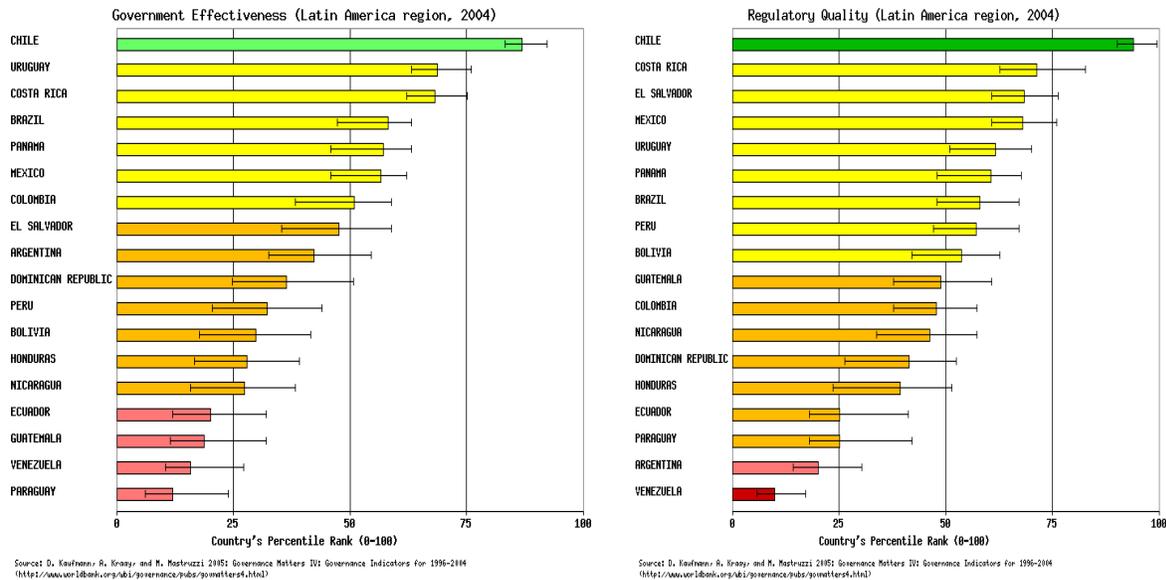
Similar rankings with respect to Central American countries are obtained for other governance indexes covering the prevalence of the rule of law, government effectiveness and regulatory quality. Indeed, as seen in Figure 13, El Salvador systematically ranks below Costa Rica, but above Guatemala, Honduras and, with the exception of the index for corruption, also above Nicaragua.

Figure 13: WBI Governance Indicators for Central America, 2004



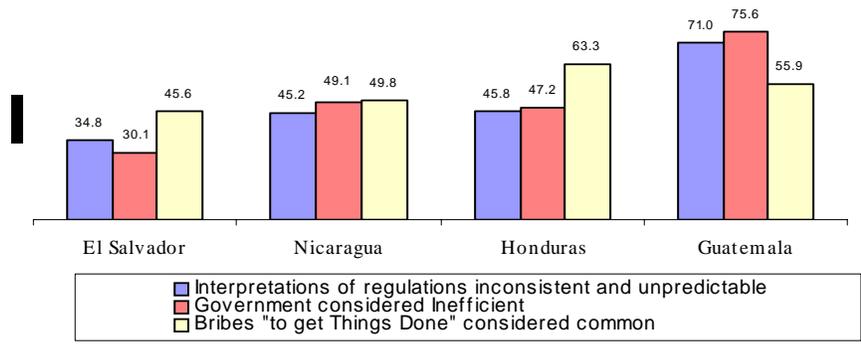
Source: D. Kaufmann, A. Kraay, and M. Mastruzzi 2005 Governance Matters III: Governance Indicators for 1996-2004 (<http://www.worldbank.org/ind/governance/pubs/govmatter4.html>)

Source: D. Kaufmann, A. Kraay, and M. Mastruzzi 2005 Governance Matters III: Governance Indicators for 1996-2004 (<http://www.worldbank.org/ind/governance/pubs/govmatter4.html>)



Source: World Bank.

Figure 14: Inconsistency and unpredictability of regulations, government inefficiency and bribery

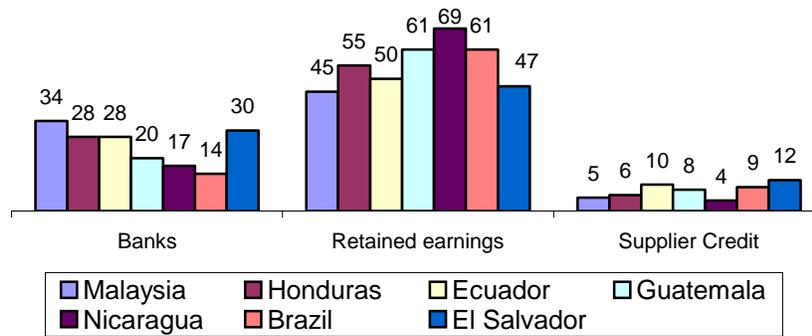


Honduras firms lead the region in the perception that bribes are required “to get things done” (Figure 14). In 2003, Guatemalan firms were more likely than their peers to describe the government as inefficient and to state that government regulations are interpreted in an inconsistent and unpredictable way – although this result may be partly attributable to the intense conflict that existed between the private sector and the government under the Portillo administration. At the other end, Salvadoran firms have more confidence in public officials than do their counterparts from other Central American countries: only 35 percent of the firms state that public officials do not interpret government regulations in a consistent and predictable way, compared to about 45 percent in Honduras and Nicaragua, and 71 percent in Guatemala. However, while lower than in neighboring countries, administrative corruption seems to affect almost half of the firms surveyed in El Salvador.

Regulations and Access to Credit

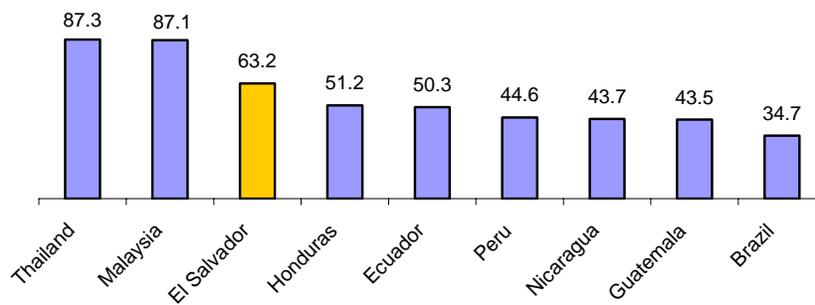
Sufficient access to credit is important for firms to respond to new investment opportunities arising from DR-CAFTA. While the level of access to credit varies across Central American countries, firms seem to face significant credit constraints in all. One sign of credit constraints is the intensive usage of retained earnings to fund new investments. This source supplies over half of the funds for firms in Honduras, Nicaragua and Guatemala (Figure 15).¹⁴ Credit constraints may be much higher than in global competitors: according to investment climate survey data, the share of firms with access to loans in Central America ranged between 43 percent and 63 percent, in comparison with 87 percent for countries like Thailand and Malaysia (Figure 16). Within Central America, the share of firms facing constraints is lower in El Salvador (17 percent) than in Guatemala (28.1 percent) and Honduras (27.8 percent), with Nicaragua lagging behind (36.2 percent).

Figure 15: Main Sources of finance for investment capital, by country (%)



Source: Investment Climate Survey.

Figure 16: Share of Firms with Loans (%), International Comparison

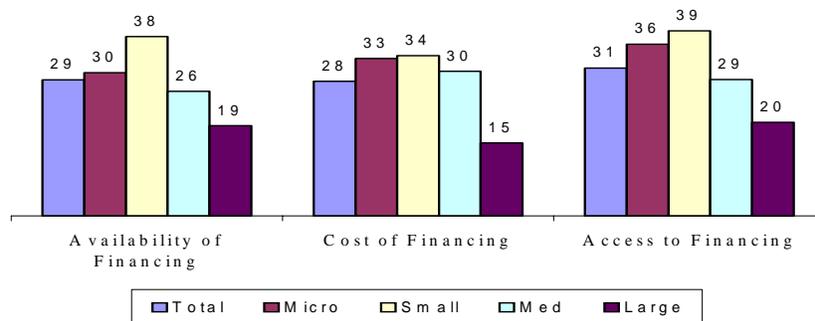


Source: Investment Climate Survey.

¹⁴ A large body of research has shown that investment decisions of smaller firms depend on the availability of internal funds (e.g., retained earnings), thus suggesting that they are credit-constrained (Fazzari, Hubbard and Petersen, 1988). For applications to countries in Latin America see Galindo and Schiantarelli (2003). A recent study by Beck, Demirgüç-Kunt and Maksimovic (2002) showed, using data on firms from 54 countries, that financial constraints in terms of access and cost of funds exert an influence on firm growth and that smaller firms are most adversely affected by those constraints.

Smaller firms face more restrictions in accessing credit. Within El Salvador, for example, the fraction of credit constrained enterprises decreases with firm size: only 6 percent of large and 10 percent of medium sized firms are in that status, compared to 30 percent and 23 percent respectively for micro and small firms (Figure 17).¹⁵ The low share of finance constrained firms among the large is explained by their overall easier access including to external finance. In addition, access to formal credit in rural areas tends to be low, despite high repressed demand (Guatemala CEM, 2005).

Figure 17: El Salvador. Firms reporting major or severe obstacles related to finance, by size



Source: Investment Climate Survey.

Measured by broader indexes of financial depth, Guatemala and Costa Rica underperform their peers relative to their level of development. By contrast, El Salvador, Honduras and Nicaragua perform above expected levels, using private sector credit as a share of GDP.¹⁶ In addition, interest rate spreads are very low in El Salvador – due to the dollarized regime and a more efficient banking sector - while those in Costa Rica are among the highest in Latin America (see Table 2).

¹⁵ Credit constraints are prevalent when firms with viable investment projects do not have access to credit. This means that it is difficult to conclude that firms are constrained when they report obstacles to access finance. This is particularly important when assessing the constraints by firm size, because if scale matters for profitability of investment projects, then naturally small firms will be less likely to access credit than large firms, not because there is something wrong in the credit market, but because their investment projects might not be profitable. Thus the analyses reported here and in other studies need to be complemented with subsequent analyses that directly assess credit constraints in a more rigorous fashion.

¹⁶ Results from a benchmarking exercise of private sector credit as share of GDP against log GDP per capita and a squared term. Results for Honduras may be affected by a potential undervaluation of its true GDP.

Table 2: Banking Systems in Central America, end-2003
(In percent, unless otherwise indicated)

	Assets (US\$, bln) 2/	Assets relative to GDP	Credit to private sector relative to GDP	Deposits relative to GDP	Real lending rate 3/	Interest rate spreads
Costa Rica	8.2	56.9	36.0	43.4	16.1	15.2
El Salvador	9.8	68.7	49.6	42.7	4.4	3.2
Guatemala	6.5	26.6	18.0	22.1	9.5	10.2
Honduras	4.0	59.3	37.6	43.1	13.1	9.3
Nicaragua 1/	2.1	56.9	26.4	41.0	9.2	9.9
Average	6.1	53.7	33.5	38.5	10.5	9.6

Source: Nicaragua Development Policy Review (World Bank, 2004).

1/ Data for El Salvador, Costa Rica, and Nicaragua relative to GDP are for 2002.

2/ Total of claims excluding fixed and other assets.

3/ The real lending rate is calculated as the average lending rate reduced by CPI inflation.

Credit access limitations in Central America are linked to key institutional and regulatory weaknesses such as weak enforcement of creditor rights, slow and politicized judiciaries, inoperative bankruptcy procedures and poor registry systems for property rights, and weaknesses in banking supervision and regulation. Key actions of an agenda aimed at improving access to credit should include:

- Strengthen creditor's rights by making enforcement procedures of secured and unsecured claims shorter and more efficient.
- Improve the efficiency and independence of the judiciary, including judges' experience with and knowledge of commercial law in order to bring more certainty to the resolution of commercial disputes.
- Modernize and unify registry systems for both immovable and moveable assets, and continue with efforts to clarify property rights for real estate and their formal registration.
- Upgrade bankruptcy and reorganization procedures to facilitate speedy reorganization of viable insolvent enterprises as well as the efficient liquidation of non-viable ones.
- Develop credit information systems to reduce the high operational costs of micro-finance institutions.
- Strengthen banking regulations and supervision.

To cope with the increasing integration of Central America's financial sectors, which is likely to speed up with DR-CAFTA, actions should be taken to consolidate supervision. The increasing regional nature of most financial groups in Central America allows for the quick cross-border transmission of shocks originating in any one country. DR-CAFTA is also likely to make industrial and commercial operations more regionalized in Central America. While many commercial banks have quickly adjusted by organizing themselves on a regional basis, the region's supervisory authorities have not. Efforts to develop a coordinated strategy for

effective regional consolidated supervision and regulation are required to avoid the limitations of the current individual country approach.¹⁷

4. Innovation and Education

As explained in chapter IV, DR-CAFTA offers opportunities for Central American countries to boost long term productivity by increasing imports of capital goods and adapting foreign technology. However, adopting existing technology is not without cost and an enabling environment requires a well functioning national innovation system (NIS) as well as complementary actions on the education front (World Bank, 2003). This section provides a preliminary assessment of how Central American countries perform in these areas by concentrating in three themes. First, we benchmark some Central American countries on their enabling environment for innovation, by reporting data on innovation outcomes, inputs and the efficiency of R&D. Second, we assess the recent performance of Central American countries with respect to discoveries of new export products, a key outcome that has been linked in the recent literature to growth and productive investments. Third, we provide a quick assessment of educational performance in Central America, with special emphasis on those areas that are required for the functioning of a successful NIS. At the end, we offer some recommendations are presented.

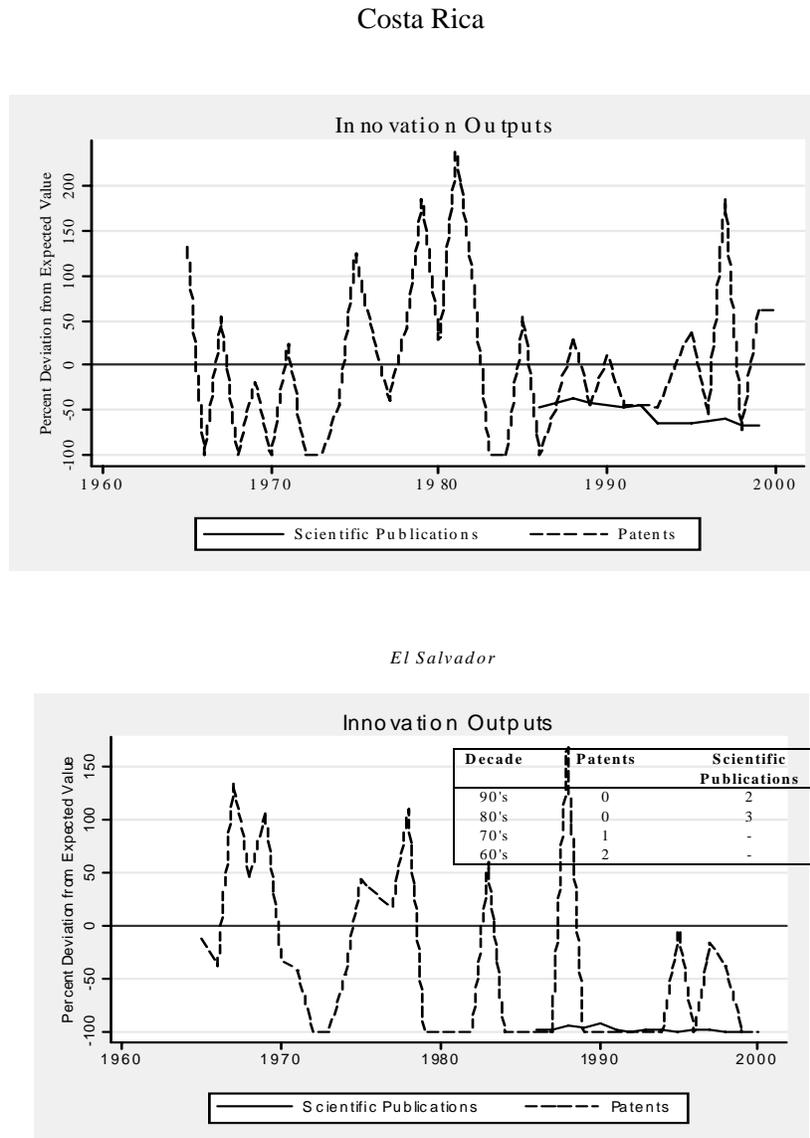
Innovation: outputs, inputs and efficiency

Central America's success in intermediate innovation outcomes across time can be tracked by following two common measures: the number of patents granted by the U.S. patenting authority, and the number of scientific publications. Figure 18 benchmarks performance by researchers residing in Costa Rica and El Salvador in each dimension, comparing them with the average of those in countries with the same levels of GDP, the same size labor force, and the same value of merchandise exports to the U.S. since the 1960s.¹⁸ The graph shows how far these countries are from the average of similar economies (the zero line). A negative number on the vertical axis is evidence of under performance. Because the predicted number of patents are relatively small (1 or 2) the performance of Costa Rica in terms of patents appears to be erratic. Nonetheless, one could say that Costa Rica does not seem to under perform systematically. Conversely, the outcome of scientific publications is around 50 percent below average. El Salvador has historically underperformed in scientific publications by about 95 percent, although this can only be taken as suggestive since in absolute numbers are quite small. The picture for patents is ambiguous, again due to the small absolute numbers, although Figure 18 suggests certain deficiencies in patent achievement.

¹⁷ This is the subject of an important recent report by the IMF for Central America (IMF, 2005).

¹⁸ To answer this question we use data collected by Lederman and Saenz (2003) on patents granted by the U.S. Patent Office to innovators residing around the globe and the number of scientific publications provided by the U.S. National Research Foundation. The series plotted are the residuals from a regression on GDP and Population and their squares. See Bosch, Lederman, and Maloney (2005) for technical details about the methodologies and data.

Figure 18: Do Costa Rica and El Salvador Underperform in Innovation Outputs?



Source: Lederman and Saenz (2003).

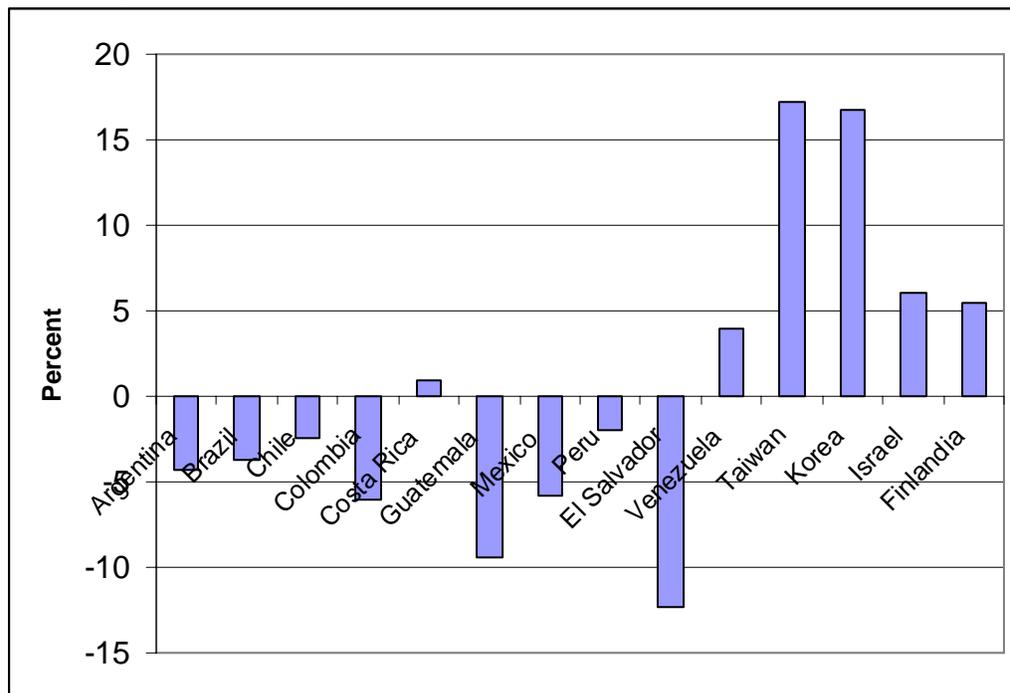
Similar benchmarking can be done with two indicators of innovation inputs: expenditures on research and development (R&D) and payments for licensing of new foreign technologies, again with respect to GDP and labor force. The former extends beyond investment in “cutting edge” technologies to most expenditure in adoption and adaptation of technologies. Not only does the share of GDP dedicated to R&D in the average country increase with income per capita, but several high growth comparator countries - Finland, Korea and Israel - had dramatic take-offs relative to this benchmark, a path which China and India appear to be

attempting to follow (Lederman and Maloney 2003). Disappointingly, the average effort of 5 Latin American countries for which data exists (Argentina, Brazil, Chile, Costa Rica and Mexico) is substantially below trend.

Costa Rica's under performance in the outcomes of innovation is partly due to lackluster performance in innovation investments, at least in R&D expenditures. Costa Rica's R&D effort has been weak compared to countries of similar size. On the other hand, the share of GDP Costa Rica devoted to licensing does not show significant gaps with respect to the proper benchmark. This is not because of low private and social returns to R&D, as Lederman and Maloney (2003) estimate that the economic returns to R&D and to licensing for countries of Costa Rica's level of income are high at around 65 percent. More likely, Costa Rica's low investments in this area are probably linked to deficiencies in the areas of financial depth, protection of intellectual property rights, ability to mobilize government resources, and the quality of research institutions, which have been shown to be key determinants of R&D effort across countries. As a result, not only is Costa Rica not experiencing a take off in innovation effort such as those seen in dynamic economies such as Finland, Korea, or Israel, it is below the "average" performer.

Low levels of innovation outcomes may also arise from inefficiencies in the way in which existing innovation-related resources are utilized through the NIS. One way of estimating the efficiency of a NIS is by examining how R&D investments translate into commercial patents and how the "elasticity" of patents with respect to R&D investment compares to the world average.¹⁹ Figure 19 shows the elasticity or sensitivity of patents with respect to R&D in Costa Rica, El Salvador, and several comparator countries. Costa Rica's positive value can be interpreted as an indication of the extent to which the country performs in patenting efficiency relative the OECD average. In fact, Costa Rica together with Venezuela, are the only two Latin America and the Caribbean (LAC) countries that perform better than the OECD average. Additional statistical exercises showed that Costa Rica's privileged position compared to the rest of the LAC countries is due to higher quality of research institutions and greater collaboration with private firms.

¹⁹ Bosch et al. (2005) discuss in detail how these elasticities are estimated and how they vary across regions of the world.

Figure 19: Efficiency of R&D Expenditures Compared to the OECD

Source: World Bank.

El Salvador is more inefficient in innovation outcomes than the average of LAC countries. A good share of this inefficiency is likely related to the lack of collaboration between the private sector and research organizations such as universities, which is the main explanation found for the case of Latin American and the Caribbean by Bosch, Lederman, and Maloney (2005).²⁰

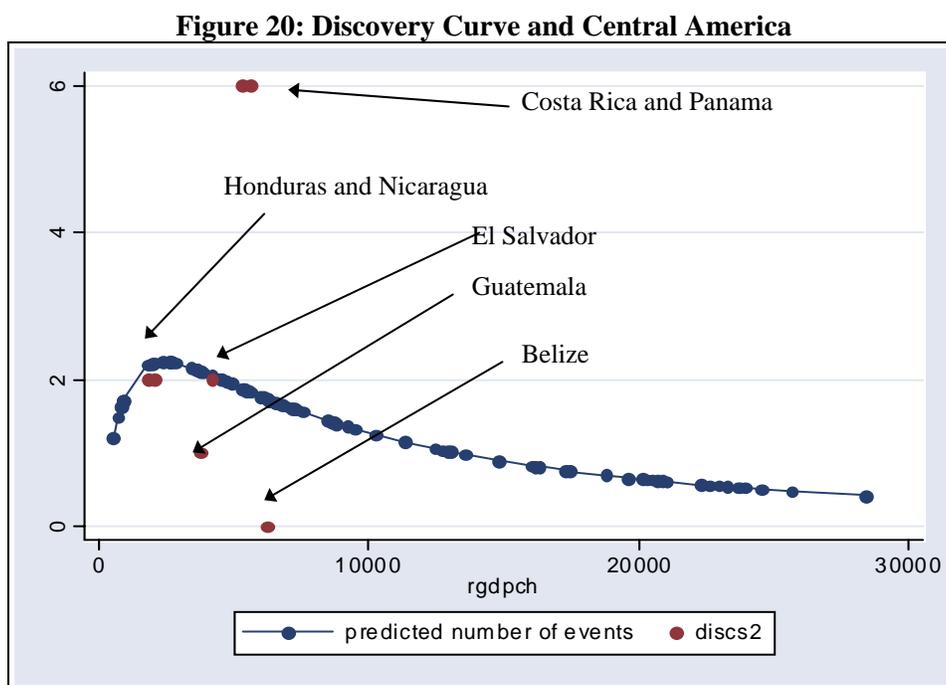
Discovering new export products

Recent attention has been given to the linkage between the appearance of new export products and economic growth. Some authors have argued that public sector policies are needed to provide incentives for entrepreneurs to invest in discovering new and potentially profitable businesses, due to problems with externalities and private appropriation of rents similar to those that hinder innovation and technology adaptation (Hausmann and Rodrik, 2003a). In fact, for the case of El Salvador, Hausmann and Rodrik (2003b) argue that public sector subsidies for the introduction of new products may be needed to revitalize economic growth. Furthermore, Klinger and Lederman (2004) do find evidence suggesting the market failures

²⁰ This result was derived by estimating a patenting function that includes the interaction between R&D investment and a dummy variable for Latin American and Caribbean countries (LAC). In turn, the same function was estimated but including additional explanatory variables. Among these, the variables from the Global Competitiveness Report on the private sector's perception of the quality of research institutions and the extent of collaboration between private firms and universities were the ones that eliminated the statistical significance of the LAC variable interacted with R&D. See Bosch et al. (2005) for details.

might in fact impede economic discovery, and Khan (2004) finds that the introduction of new products does affect economic growth by stimulating productive investment.

Among Central American countries, Guatemala has been the main underachiever in terms of discovery of new export products. Figure 20 shows the predicted and the observed number of export discoveries in the 1990s, which are a function of the level of development (GDP per capita) of each country.²¹ El Salvador, Honduras and Nicaragua show only slight levels of underperformance while Costa Rica is a strong overachiever. Given this evidence, policies to stimulate economic discoveries should not be a strong priority over other policy needs, with the only possible exception of Guatemala.



Education for innovation and growth

Innovation and technological change require a strong education base. This is the key conclusion of the innovation and education flagship (World Bank, 2003) which highlighted how technological innovation and educational levels (particularly skills and ability to learn) are complementary and reinforce each other's contribution to economic growth. The study showed the need to coordinate and sequence both education and technology absorption policies. It also argued that there must be a sharp acceleration in educational attainment in order to benefit from the knowledge economy and from the growth enhancing potential of technology transfers through FDI and trade.

²¹ A discovery is defined as a good exported for less than \$10,000 in 1995, but for more than \$1,000,000 in 2000, 2001, and 2002, based on disaggregated export data classified at the 6-digit level of the Harmonized System. See Klinger and Lederman (2004).

DR-CAFTA and the greater flows of foreign investment that should accompany its introduction are likely to increase the demand for secondary and skilled workers. Investors are likely to require higher skills (including bilingual skills) to function in an increasingly globalized market and to use new imported inputs. Local firms willing to take advantage of new DR-CAFTA-related opportunities will also likely demand new skills to adapt innovations and improve productivity levels. Most countries of Central America, with the only exception of Costa Rica, are likely to face shortages of appropriately skilled workers to meet these demands. The absence of a considerable mass of secondary educated workers in most countries of Central America is due to the slow expansion of educational opportunities and its unbalanced pattern. Most countries have not followed an orderly and sequential growth between educational levels as reflected in the fact that from 1960 to 2000, the ratio of workers with university education to those with secondary education almost quadrupled in El Salvador, Costa Rica and Guatemala, and tripled in Honduras. The result is high labor force inequities: most workers only have minimum literacy and math skills; very few have skills in quantitative analysis, communication and other basic competencies provided by secondary education; but a larger percentage has university education. This tendency may be reversing in Costa Rica and El Salvador, given recent persistent increments in secondary education investment.

Coverage and quality of secondary education is still a weakness in all Central American countries, while inefficiencies of resource use are more acute in Honduras and Nicaragua. This is a concern, as higher levels of secondary schooling are crucial to facilitate the technological upgrading of local manufacturers, to attract FDI with high technological content, and to benefit from the potential spillovers of those investments to the rest of the economy. Coverage of the secondary cycle is low (around 55-60 percent) or very low (around 30-37 percent) in all countries (Table 3). Quality is still low at all educational levels, as illustrated by the still high repetition rates and the unsatisfactory results reported at the standardized national exams (di Gropello, 2004). Inadequate curricula and textbooks, combined with insufficient learning times and teacher quality are identified as being among the main contributing factors to low educational achievement in the region. Inefficiency of resource use is a problem in Honduras due to the excessive share of spending on salaries relative to non-salary expenditures, combined with lack of effective teacher incentives. Inefficiencies in Nicaragua relate to excessive central administration costs.

**Table 3: Gross Enrollment Rate at the Secondary Level
(2001 or 2002)**

	%
Costa Rica (1999)	57
El Salvador	58
Guatemala	33
Honduras	37
Nicaragua	62

Source: Di Gropello, 2005.

Central American firms use in-house and external skills training to upgrade and complement the educational profile of their workforce. While there may be some reasons to believe that markets may underprovide training relative to the social optimum (due to the externalities

associated with a higher skilled workforce), public provision of training has been characteristically inefficient and unresponsive to private sector needs across Central America. For instance, returns to public training programs in Guatemala have been shown to be very low, while they are positive for privately provided and funded training (World Bank, Guatemala CEM, 2004). Recent reforms to INSAFORP in El Salvador have removed it from directly providing training, a key factor in the improvement of training services in that country (see Box 1).

Box 1: The Positive Experience of Reform of VET system in El Salvador

The organization primarily finances training solicited by companies and provided by private training centers. Only when no private provider exists, does INSAFORP provide direct training. This structure seems to avoid at least one of the two common pitfalls of many training systems in Latin America: (i) provision of irrelevant training with little impact on productivity and wages; and (ii) inefficient public provision of training. Whether the creation of INSAFORP led to additional skill formation, or instead it simply substituted for firm payment of training is uncertain. However, with the high levels of training achieved in 2001, it seems plausible that the introduction of the training levy raised the level of training beyond the pure market solution and thus successfully addressed some of the market failures involved in the provision of training.

INSAFORP is facing issues of financial sustainability: The rapid increase in funded courses has outpaced revenue growth, and as a consequence INSAFORP used accumulated reserves during 2001 to accommodate high demand. Hence, the current high level of firm training is unsustainable in the medium to the long run without additional funds or efficiency savings.

World Bank, El Salvador CEM, 2004.

Areas for action

For lower income countries such as Honduras and Nicaragua, national innovation systems should focus on facilitating primarily technology absorption. Priority actions should include:

- Improve the capacity to absorb new technologies from the external stock of knowledge, by simplifying processes to import capital goods and to license foreign technologies.
- Strengthen the institution in charge of innovation policy and its coordination with private sector needs. Improve the quality of the information on R&D.
- Improve the efficiency of low R&D public spending by increasing linkages with private sector, and increasing the accountability of the use of these resources.

For middle income countries such as Costa Rica, El Salvador and Guatemala, national innovation systems should support technology adaptation and generation. Priority actions include:

- Strengthen public-private partnerships by increasing linkages between public research centers and private firms, aligning incentives for research in universities and improving the accountability of R&D performed with public resources.
- Promote output-based/market-oriented R&D in public research institutes and universities, by gradually reducing their access to earmarked funds and – at the same time— expanding their autonomy to look for new sources of funding, particularly through different partnerships with the private sector; and by introducing flexibility in the regulation ruling the assignment of property rights over inventions generated in these institutions, possibly allowing main researchers and their institutions to benefit from their discoveries;
- Gradually increase public R&D funding, preferably through an innovation fund to finance experimental development (as opposed to basic research) by matching grants/competitive subsidies directed to commercial applications.
- Strengthen the governance of technology policy, by defining an explicit technology and innovation policy, enhancing the policy making role of a public-private board, and by simplifying the concessions of public funds for research and development.
- Enhance institutional capacity to enforce IPR laws, possibly by up-grading the registries, investing in process simplification and staff training.

Sequencing of education policies with the stage of development and innovation policies is important. For those countries farthest away from the technological frontier -such as Honduras and Nicaragua— the best technology policy is likely to be simply sound education policy. The agenda for countries that require education levels to adapt relatively simple technologies should be aimed at achieving completion of universal primary education, with gradual expansion of secondary education. In the more advanced settings of Costa Rica and El Salvador, where adaptation and creation of new technologies is more important, issues of education quality and completion of secondary schooling are more important.

In vocational training policy, Central American countries should change the existing public-private balance towards greater in-service training and introducing competition in the provision of training services. Training policy should be viewed not just subsidizing or providing training, but also increasing the demand for training through appropriate technology policy, and increasing the trainability of workers through appropriate education policy. For this, it is important to build partnerships between the private sector and universities or technical schools, as well as encourage apprenticeships.

While it is important to ensure that appropriate supply for tertiary education is available, the justification for public funding is weak, as high private returns already create high demand.

Public policies towards expansion of tertiary should focus on facilitating private investment through regulation that would improve functioning of the market for higher education. These initiatives could include (i) increase information available to students; (ii) maintain flexible accreditation system and (iii) greater cost recovery in public universities.²²

Universal primary completion remains an important unfinished agenda in Guatemala, Honduras and Nicaragua. In order to compete in a globalized economy, ensuring quality universal primary education for all boys and girls of all ethnicities, and ensuring that they acquire basic cognitive skills of literacy and numeracy must be the top priorities in education in Central America. The trends for Honduras and Nicaragua, and Guatemala indicate that they need to redouble efforts to achieve MDG for universal completion in 2015. Except for Guatemala, these countries are already spending a high proportion of national budget on education. Thus, reforms and external support are essential for these countries to achieve universal primary completion.

5. Summarizing priorities for countries

The chapter reviews recent evidence in the areas of trade facilitation, institutional and regulatory reforms, and innovation and education, in order to identify key priorities for the complementary agenda for DR-CAFTA. The main challenges identified for Costa Rica include improving road quality, port and customs efficiency, boosting financial depth, and improving the quality and coverage of secondary education. For El Salvador, priorities focus around increasing road quality, reducing shipping costs, and tackling governance challenges, as well as improving the quality and coverage of secondary education. Both countries need to devote more public resources to R&D (with monitoring and evaluation efforts put in place to assess results over time), strengthen public private partnerships for innovation, and enhance the institutional capacity to enforce intellectual property rights laws. In addition to tackling weaknesses in the areas identified for Costa Rica and El Salvador, Guatemala also needs to continue to build on recent accomplishments in improving customs administration, coverage and quality of primary education, and road density, as well as devoting some attention to fostering the development of new export products.

The challenges for Honduras and Nicaragua are likely to encompass a broader set of policy issues, as they face more limitations due to their lower development level. Both countries need to address governance, and work on improving the coverage and quality of primary education, improving the operational efficiency of ports and increasing the quality of roads and their density. They also need to improve their capacity to absorb knowledge from abroad, strengthen institutions in charge of innovation policy and increase linkages between public R&D programs and the needs of the private sector. Honduras also needs to upgrade customs administration and reduce the costs and time to establish new business ventures.

All Central American countries share a regional economic agenda which needs to focus urgently on achieving a Customs Union, which is critical to reduce transaction costs to trade

²² Holm-Nielsen, Lauritz, Andreas Blom and Patricia Zuniga Garcia, "The World Bank in Tertiary Education in LAC", En Breve, No. 18, World Bank, Washington DC.

within the region. In addition, efforts should be deepened to coordinate the development of infrastructure that benefits from a regional perspective, including major road networks, and the development of ports. Mechanisms to formulate a common regional trade policy need to be strengthened, to ensure coherence of future bilateral, regional and global commitments with the new framework provided by DR-CAFTA. In addition, improved coordination of key regulatory policies (e.g., financial supervision, competition, fiscal incentives) may be needed to establish the basis of a deeper and more integrated regional market in the future.

All of the elements of the complementary agenda mentioned here are also components of the broader agenda to boost economic growth in the region. Recent analytical work produced by the World Bank to prioritize actions for broad-based growth in the nations of Central America has highlighted the high return that would be obtained from improvements in the areas of infrastructure, education and governance. DR-CAFTA enhances the social return to these actions and makes them more urgent. Hopefully, this important agreement serves as a useful tool to rally support for consolidating policy reforms of recent years and pushing forward with new energy in the areas in which weaknesses remain, in order to boost the pace of growth and poverty reduction across Central America.

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