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Unlocking Central America's Export Potential

1. Export Performance

Finance and Private Sector Development Department

Central America Country Management Unit

Latin America and the Caribbean Region

The World Bank

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

October 2012

Acknowledgements

The trade outcomes assessment was done by Jose Daniel Reyes (International Trade Department), with guidance from Jose Guilherme Reis and Thomas Haven and assistance from Deborah Winkler, Guillermo Arenas, and Milagros Deza. The DR-CAFTA tariff reductions impact analysis was done by Cristian Ugarte, Maurizio Bussolo and Leonardo Iacovone. The overall report was directed by Thomas Haven and Sunita Varada; and Qahir Dhanani helped integrate comments from peer reviewers. We gratefully acknowledge financial support from the Trade Facilitation for Regional Integration in Central America Trust Fund and the Spanish Trust Fund for Latin America and the Caribbean.

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Summary

This section includes a comprehensive assessment of export performance to understand how both the Central America region and each individual country has fared in recent years. UN COMTRADE data for all countries and firm-level export data for Guatemala, El Salvador, and Nicaragua is used. The firm-level data allows for an assessment of the impact of tariff reductions due to the Dominican Republic-Central America Free Trade Agreement (DR-CAFTA). Examples of findings include:

- Overall, exports are concentrated in relatively low-value added products, such as textiles, coffee, sugar, ignition wiring sets (auto part), and shrimp.
- The bulk of regional exports originate from foreign owned firms located in Special Economic Zones (SEZs), with a concentration in the clothing and auto parts sectors.
- Export growth is driven by existing products in existing markets. Very little introduction of new products in new markets is observed.
- DR-CAFTA tariff reductions had limited impact on exporters in Guatemala and El Salvador in increasing exports to new markets, suggesting that a complementary agenda beyond tariff reductions is necessary to achieved sustainable export gains.[1]
- There is untapped potential to increase trade to South America, BRICs (Brazil, Russia, India, and China), and Mexico. Intra-regional trade appears to be close to its potential.

The analysis completed here serves as a first step in understanding the region's export potential. The results indicate that transformation of exports to higher value-added products and to new markets are necessary for sustainable export growth. Additional analysis, completed in part in other sections of the *Unlocking Central America's Export Potential* report, identify the capabilities needed to overcome the market failures that are hindering this transformation.

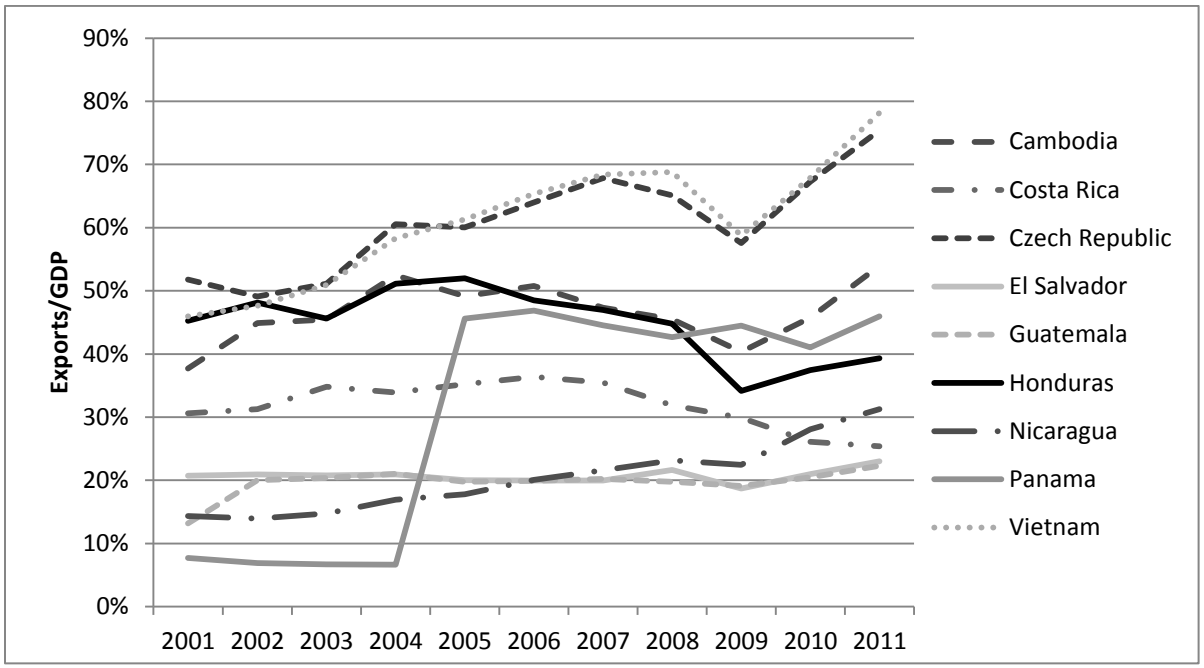
Introduction

The Central America region is a small market. The region contains around 43 million inhabitants (0.6% of total world population) who generate around 0.25% of the world's GDP. While the region has successfully embarked on a regional integration agenda and has strong commercial links with the US, extra-regional trade—mainly with large fast-growing emerging economies—remains a challenge. Countries in the region are relatively more open to trade than other

[1] A caveat here is that the bulk of Central America's exports to the US market were covered under different phases of the original Caribbean Basin Initiative, which gave nearly tariff free access to most of the goods exported by these countries. The key goal of DR-CAFTA in these areas was to make the tariff reductions permanent (as the preferences were only unilateral and renewed by the US every 4 or 5 years).

countries of similar income levels. While in itself positive for long term growth, this result has been mainly fueled by imports. **Figure 1** shows the evolution of exports as a percentage of GDP. The performance is mixed, and growth is below comparator countries such as Vietnam, Cambodia, and Czech Republic, particularly in recent years.

Figure 1: Export Performance Measured by Exports/GDP



Source: World Development Indicators

In this context, analyzing the competitiveness of the export sector is important to better understand its performance and constraints, and to suggest policy options aimed at ensuring that international trade is an engine of economic growth and that the benefits of international trade translate into welfare gains for the people of Central American, including those living in poverty.

This section sets the stage to reach this goal by presenting the country-specific trade outcomes of the region. By nature, this exercise is fully descriptive but still useful to differentiate country-specific outcomes versus regional trade patterns. Based on these results, this report lays out some key issues in the form of policy questions that need to be further evaluated with formal statistical analysis and fieldwork aimed at discovering the causal relationships between trade outcomes and supply or demand factors. The results of this report allow policy makers to identify key areas to explore in the overall discussion of export competitiveness in the Central American region.

The trade outcomes analysis is intended to guide a systematic generation of hypotheses about countries' export performance, prospects, and challenges. By design, this is a country-specific analysis. Export performance is analyzed along three dimensions that, together, give a fairly comprehensive picture of competitiveness: (i) The composition, orientation and growth of the export basket; (ii) the degree of export diversification across products and markets; and (iii) the

level of sophistication and quality of their main exports. This analysis allows exports dynamics at the different margins of trade (intensive, extensive, and quality) to be evaluated and individual countries' to be benchmarked with peers in the Central American region. The principal data source of the analysis is the UN COMTRADE database available through the World Integrated Trade Solutions (WITS) platform, unless otherwise stated.[2] Information about countries' exports is obtained from mirror data.[3]

Based on a trade outcome analysis for each of the six Central American countries, this section highlights regional patterns and discusses main constraints to export competitiveness in the region. Regional outcomes are common attributes shared by exports of El Salvador, Honduras, Guatemala, Nicaragua, and net exports of Panama.[4] Four main policy questions are examined. First, what factors impede greater regional integration? Second, are there key missing export markets for the region and, if so, what are the barriers impeding trade to them? Third, what type of policies can create meaningful linkages between firms operating in SEZs and local firms? Fourth, what and how sustainable are the sources of comparative advantage in the clothing and textiles industry? We do not attempt an exhaustive examination of these issues, but rather offer some initial insights as a prelude to more in-depth analyses undertaken in other sections of the report—as is the case for SEZs—or as potential areas for future analysis.

This paper relates to the literature on challenges and opportunities that trade liberalization can bring to the Central American region. Much of the recent literature focuses on the role of the free trade agreement negotiated by Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras, and Nicaragua, with the US (DR-CAFTA). Some relevant papers include Jaramillo and Lederman (2005), which provides a preliminary assessment of the expected economic impact of DR-CAFTA, Lederman et al. (2007), which identifies the lessons learned from NAFTA for Latin-America and the Caribbean, and López and Shankar (2011), which explores options on how to maximize the free trade agreements in the region and ensure that their benefits permeate to all segments of the population. Our analysis builds on this literature by providing a detailed account of the current trade performance of the region and by identifying key constraints that hamper regional competitiveness.

The remainder of this analysis is structured as follows: Section 1 presents the main regional trade outcomes, poses key policy questions, and highlights some possible explanations. Section 2 summarizes the main finding of each country trade outcomes analysis. Section 3 uses firm-level

[2] http://wits.worldbank.org/wits/

[3] This technique infers export data by using partner-import data. That is, rather than requesting export data as being reported by country *i*, one requests import data reported from each country in the world as being imported from country *i*. This technique is commonly used to minimize the risk of underreporting due to the fact that customs agencies usually monitor imports more closely than exports.

[4] Panama majority of exports are re-exports originated in the Colón Free Trade Zone (see section 3). Net exports are Panama's exports net of re-exports. As Costa Rica is a hub for high technological products, it is not included in the regional outcomes. Costa Rica specific trade outcomes are presented in section 3.

data to assess the impact of DR-CAFTA tariff reductions on exports for Guatemala, Nicaragua, and El Salvador. Annex 1 provides the complete set of country trade outcomes analyses.

1. Central-America: Regional Trade Outcomes

This section presents the main regional trade outcomes. The issues presented here apply to all net exports of the countries in the region, with the exception of Costa Rica. Country-specific outcomes are summarized in section 2.

1.1Trade Balances and Regional Integration

Countries in the Central American region are relatively more open to trade than other countries of similar income levels. Figure 2a presents the relative position of Central-American countries along per-capita income (x axis) and openness to trade (y-axis).[5] This figure includes more than 180 countries (each dot) and Central American countries are labeled by their 3-digit ISO codes.[6] The dotted curve shows a concave relationship between trade openness and per capita income: countries tend to trade more as incomes rise, but at a decreasing rate.[7] Results indicate that Honduras, Nicaragua, Costa Rica, and Panama trade more than countries of similar income whereas Guatemala and El Salvador trade less than what is expected. The overall message is that Central America seems to have an openness to trade that is close to what is expected given its economic development. Yet, imports rather than exports are the main source of this trade openness.[8] Figure 2b shows the evolution of each country's trade balance using five year snapshots over the last two decades. While Nicaragua runs historically the highest trade deficit in the region (near 30% of GDP in 2010), Honduras and El Salvador's trade deficits are also high (around 20% of GDP in 2010). In some cases, substantial remittance flows have helped offset these trade deficits.

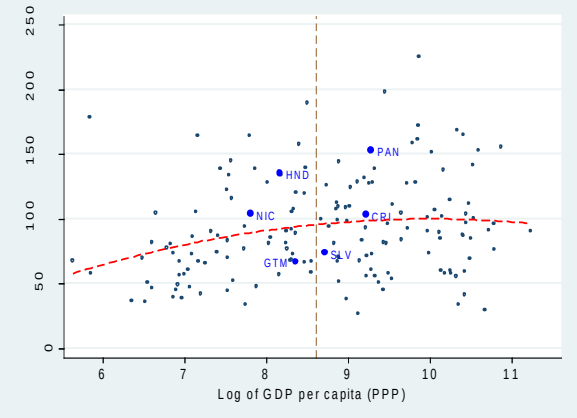
[5] Openness to trade is defined as the ratio of a country's trade (export plus imports) to its GDP. It is one of the most basic indicators of openness to foreign trade and economic integration. It weighs the combined importance of exports and imports of goods and services in an economy. The ratio gives an indication of the dependence of domestic producers on foreign demand and of domestic consumers and producers on foreign supply.

[6] Costa Rica (CRI), Guatemala (GTM), Honduras (HND), Nicaragua (NIC), Panama (PAN), and El Salvador (SLV).

[7] The curve is fitted by OLS using a quadratic polynomial. The curve shows the expected openness to trade given different levels of per capita income. Therefore, a country located above (below) the curve is said to trade more (less) than what is expected given its per-capita income. The turning point is around exp(10) which is US$22,000 at PPP. The vertical dotted line reflects the average worldwide per capita income, which is around exp(8.7), or US$6,000 at PPP.

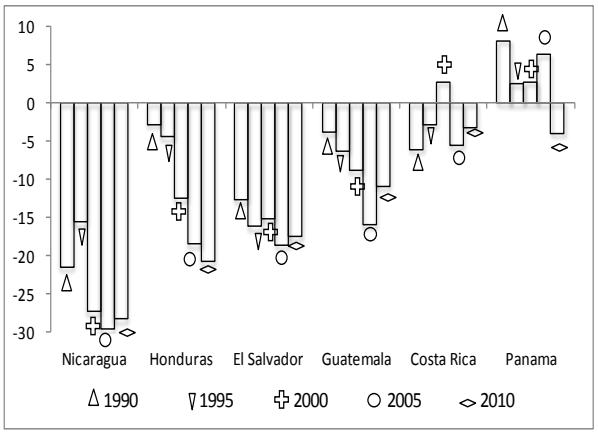
[8] Illescas and Jaramillo (2011) focus on exports to examine the gap between observed outcomes and predicted values. Employing an econometric exercise that controls for per capita income, population, geographical area, ocean access, and the relative importance of oil in each country export basket; the authors find that El Salvador, Nicaragua, and Guatemala export less than what is predicted by the empirical model. Conversely, Panama, Honduras, and Costa Rica seem to export more than what is expected. With the exception of Nicaragua where imports greatly outweigh exports, these results are in line with our findings.

Figure 2a. Openness to International Trade (Average 2006-2008)



Source: World Development Indicators

Figure 2b. Trade Balance (% of GDP) (1990 – 2010)



Source: World Development Indicators

Studying the competitiveness situation of regional exports is important to better understand performance and constraints, and to suggest policy options aimed at ensuring that the region takes better advantage of the benefits of international trade.

Assessing the destination composition of regional exports is important to identify key missing markets. Table 1 shows the main regional markets and identifies the most important countries within each region. Central American has historically been strongly dependent on export relationships with the United States, which strengthened with the CAFTA-DR Free Trade Agreement (FTA) signed in August 2004.[9] Exports to the U.S. represented 55.5% of total regional exports in the period 2006-2008. Concurrently, Central-American deepened regional integration by unifying external tariffs and removing duties on most products being traded among the member countries.[10] This policy led to an increase in intra-regional trade, which now is the second most important market with 21.0 percent of total exports. The European Union (EU) is the third most important market with a share of 9% of total exports. In 2010, the region signed an FTA with the EU. Exports to Mexico, the fourth major trade partner, represent only

[9] CAFTA-DR signatory countries are the US, Costa Rica, Nicaragua, El Salvador, Guatemala, Honduras, and Dominican Republic. Panama is not a signatory in this agreement.

10 Greater regional integration was framed within the Central American Integration System (SICA) institutional framework. In 1991 SICA included Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica and Panama. Belize joined in 2000 as full member, while the Dominican Republic became an associated state in 2004. More recently, Mexico, Chile and Brazil became part of the organization as regional observers; while the Republic of China, Spain, Germany and Japan became extra-regional observers.

4% of overall exports. The region has a low presence in the South-American region (1.5% of total exports) and barely trades with BRIC countries (0.9% of total exports).

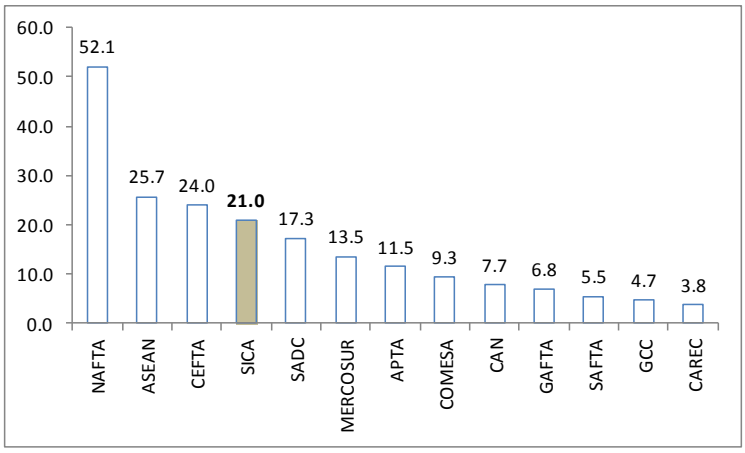
Table 1. Export Basket: Market Destinations (Average 2006-2008)

Destination	Share in Total Exports (%)
United States	**55.5**
Intra-Region	**20.7**
Salvador	6.2
Honduras	4.3
Guatemala	4.3
Costa Rica	2.4
Nicaragua	2.2
Panama	1.3
Europe – 27	**8.9**
Germany	2.4
Spain	1.4
Netherlands	1.1
Belgium	1.0
Rest	3.0
Mexico	**4.0**
South America*	**1.5**
Chile	0.3
Venezuela	0.3
Colombia	0.3
Ecuador	0.3
Peru	0.2
Rest	0.1
BRIC Countries	**0.9**
China	0.4
Russia	0.3
India	0.1
Brazil	0.1
Rest of the World	**8.5**

Note: This table shows the market destination of Central American exports for the average period of 2006-2008. It sums up exports of Nicaragua, Guatemala, Honduras, El Salvador, and net exports of Panama.
Source: COMTRADE

As greater regional integration is achieved, one wonders to what extent the region has succeeded in exploiting the Central American market. Figure 3 sheds light on some limited evidence regarding this question. It ranks the intra-region export share of the most important regional trade agreements in the period 2006-2008. It shows that intraregional trade in Central America is the fourth highest within our sample of regional trade agreements. Of course, the intra-region share of exports depends on the deepness of regional integration but, still, the region ranks higher than other regional agreements that are perceived as deeper, such as the Southern Common Market (MERCOSUR) and the Andean Community of Nations (CAN).

Figure 3. Intra-Region Export Shares within Regional Trade Agreements (Average 2006-2008)



Note: The Intra-Region export share of Central America is the ratio of exports from Central American countries to Central America divided by exports from Central America to the world, including Central America.
Source: COMTRADE

From a policy perspective, it is still important to investigate key barriers to enhanced regional integration. In particular, exploring the role of trade facilitation and logistics as well as the pervasiveness of Non-Tariffs Measures (NTMs) may prove useful to advance this agenda.[11] It is important to clarify that figure 3 does not evaluate observed regional trade versus its potential. We offer a preliminary look at trade potentials, not only with the region but also with other important trading partners, by estimating a "gravity" model using average bilateral export values between 2006 and 2008. This analysis allows comparing pair-wise export relationships with the potential value predicted from the model (see box 1).

[11] Currently, the World Bank is leading an effort to collect NTMs data and analyze their role in fostering or hindering regional integration.

Box 1. Methodology Used to Assess Central America Observed Bilateral Exports Against their Potential

We use a theory-grounded gravity model to evaluate pair-wise export relationships of Central American countries with their trading partners. Specifically, we regress 2006-08 bilateral exports on the following bilateral characteristics: distance, contiguity, common language, colony, common colonial power, as well as log of GDP, and log of GDP per capita. We also incorporate three innovations to the standard model. *First*, a measure of remoteness is computed by summing distances weighted by the share of GDP of the destination in world GDP. This is to take note of the fact that relative distances matter greatly, alongside absolute distances. *Second*, we control for zero trade flows with the use of Heckman sample selection correction method. When observations with non-existent bilateral trade are dropped, as OLS does, our dependent variable is not really measuring bilateral trade, but one *contingent* on a relationship existing. An important variable left out of the model therefore is the probability of being included in the sample, i.e. having a non-zero trade flow. To the extent that the probability of selection is correlated with GDP or distance, this has the potential to bias OLS estimates. *Third*, we address heterogeneity of firms, following Helpman, Melitz and Rubinstein (2008), by controlling for firm heterogeneity without using firm-level data utilizing the fact that the features of marginal exporters can be inferred from the export destinations reached.

While the gravity model is grounded on modern trade theory two caveats are in order. First, the analysis aggregates bilateral exports up at the pair country level, so we cannot access the role of sectoral dynamics when benchmarking bilateral export relationships. Second, this methodology provides a static benchmarking of bilateral export performance, no information about the dynamics of bilateral exports can be inferred.

Figure 4 plots actual bilateral relationships versus potential values for a set of 181 countries over the average period of 2006-2008. The first panel, upper left corner, shows all bilateral trade relationships in our dataset (light grey dots) and benchmarks Central America bilateral exports (black X) with respect to export relationships between the rest of countries in the world. If an observation is above (below) the 45-degree line, the observed export relationship in the period 2006-2008 is more (less) than what the gravity model predicts and the exporter is said to be over-trading (under-trading) with its trading partner. Additionally, if the observation is above (below) the band parallel to the 45-degree line, the exporter is said to be significantly over-trading (under-trading).[12] Controlling for size of the trading partners, trade frictions, sample selection, and firm heterogeneity; this analysis depicts a very heterogeneous set of bilateral export relationships in the Central American region. In order to shed light on what types of trade relationships offer more potential to the region, panels two through four of figure 4 highlight intraregional exports, regional exports to South American, and regional exports to BRIC countries and Mexico. In these graphs the light grey dots represent now the complete set of Central American bilateral exports whereas the black "X's highlights the specific bilateral export relation with the region of interest. Results indicate that intra-regional trade is close to its potential (second panel, upper right corner)[13]. Looking at exports to South America (third panel,

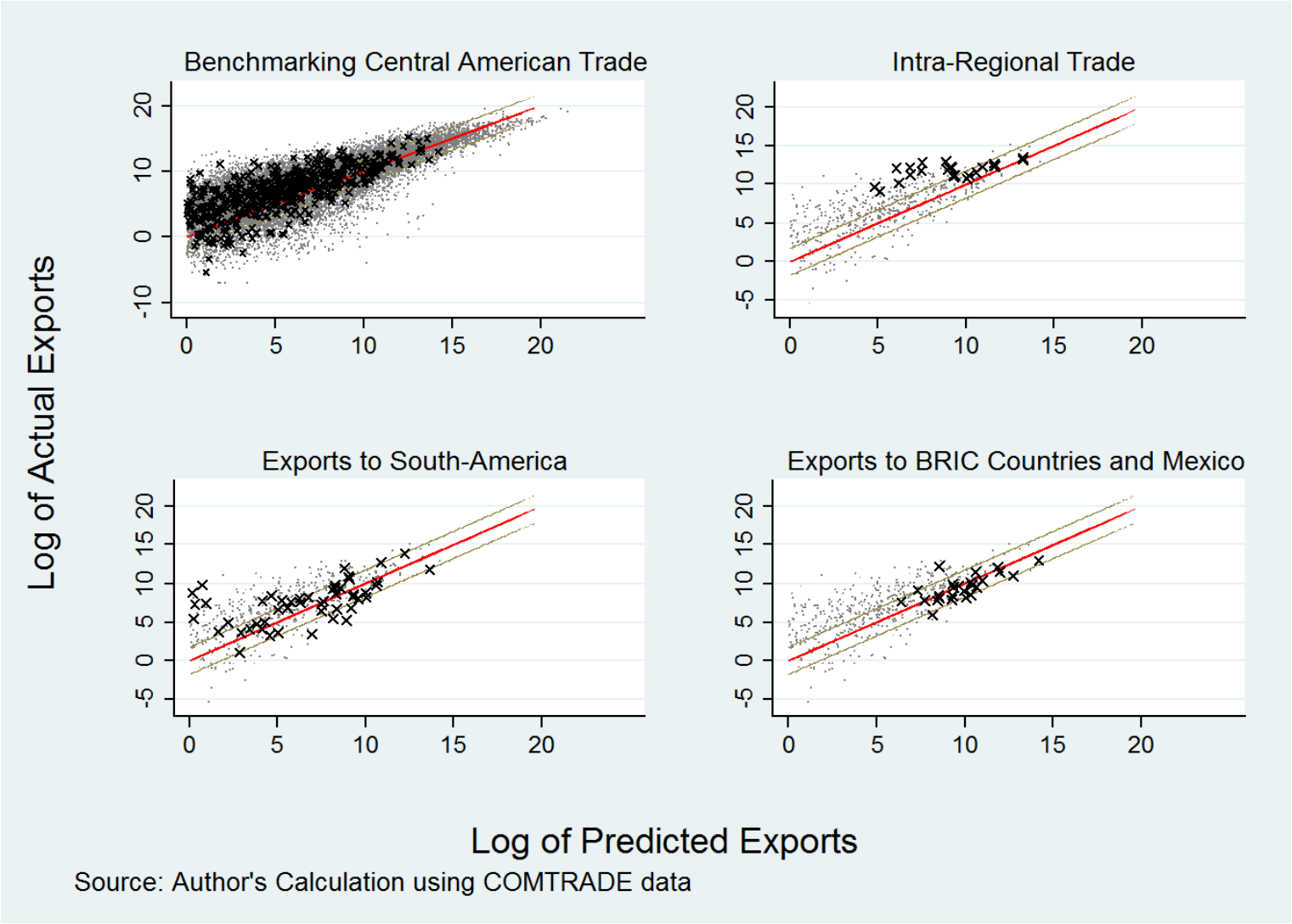
12 Confidence intervals are computed at the 10% level.

13 Gordillo et at (2010) use a region-centered gravity model to conclude that "intra-regional trade in Central America does not behave like it does in a highly spatially-integrated region". Estimating a gravity model for the region and another one for the EU, the authors find that the region has the potential of doubling intraregional exports

bottom left corner), we observe that there is untapped potential to increase exports to the region. Argentina and Colombia appear to be key markets with which the region significantly under-trades. The fourth panel (bottom right corner) presents bilateral export relationships with the BRIC countries and Mexico. Each country in the region under-trades with Brazil and China. There is also evidence of potential to increase exports to Mexico, especially for Guatemala and El Salvador

if Central America could achieve the trade costs of a truly integrated region (the EU). Their model is different than the one estimated here not only because we estimate a cross country gravity model for all countries in the world but also because the policy question assessed by the model is different. While their objective is to estimate how much the region can gain by decreasing existing barriers to trade to the European level, our intention is to benchmark export performance based on the "average" trade costs observed between countries of similar bilateral characteristics.

Figure 4. Actual Bilateral Exports Against Potential Outcomes
(Average 2006-2008)



Source: Author's Calculation using COMTRADE data

Given that the region is under-trading with its southern trading partners and with the BRIC countries, the natural concern is that the goods that are produced by Central America are different than those demanded by these countries in international markets. We shed light on this issue by computing trade complementarity indices for the Central American region and three big markets: the US, Europe, and BRICS (table 2). The results indicate that the regional market, the US and the EU have import baskets that are more similar to Central American export basket than the BRICS import basket (for all countries with the exception of Costa Rica), which partly explains the high concentration of exports in the region and in the US market. Yet, there are some degrees of trade overlapping with BRIC countries that are not exploited by the region.

Table 2. Central-America Trade Complementarity Indexes (2009)

		IMPORTER							
		Costa Rica	Guatemala	Honduras	Nicaragua	El Salvador	US	EU27	BRICS
EXPORTER	Costa Rica	X	31.2	30.9	28.5	31.2	45.1	40.9	44.6
	Guatemala	40.9	X	35.5	36.2	39.9	33.6	36.8	28.6
	Honduras	29.5	21.3	X	21.7	26.2	25.6	25.9	21.5
	Nicaragua	30.1	21.3	22.0	X	27.8	25.1	26.7	21.1
	El Salvador	41.7	35.8	38.1	35.1	X	31.6	35.6	25.7

Note: This table shows the trade complementarity indexes among countries within the Central-American region, excluding Panama. In addition, it presents the complementarity indexes between Central American countries and the US, the EU, and the BRICS countries. This indexes measure the degree to which the export pattern of one country matches the import pattern of another. A high degree of complementarity indicates more favorable prospects for successful trade integration.

What factors prevent Central America from expanding into these large fast-growing markets? The recent economic crisis did not help the region to diversify into these new growth poles as some large developing countries enacted various trade restrictions to protect domestic industries over this period of time (e.g. non-automatic import permits in Argentina, new standards for agricultural products in Indonesia, and cumbersome import licensing rules in Brazil). Increased competition from China and India (Facchini et al. 2007) as well as the current uncertainty about the global economy also exacerbates the prevalence of these protectionist measures (Datt et al. 2011). In this context, the agenda for Central America is not only centered on supply-side factors but also on market access restrictions in large developing markets. A policy aimed at securing stable and preferential rules of market access by means of deep preferential trade agreements with key partners is important for the agenda of export diversification. In addition of preferential tariffs, deep preferential trade agreements include provisions on technical barriers to trade, services, intellectual property, and trade-related investment measures. These provisions are important to promote trade in sectors linked to international production networks that require a governance structure beyond low tariffs.

1.2 Sectoral Composition, Foreign Direct Investment, and Export Sophistication

One of the first measures of competitiveness is the sectoral structure of the export basket (Table 2). The first column sorts the five most important economic sectors in terms of export value. They comprise almost 80% of overall exports in the period 2006-2008. The most important sector is textiles and clothing (37.8%), followed by fruit and vegetable products (19.9%), foodstuffs (11.3%), machinery and electrical products (5.0%), and animal products (4.4%). The second column shows the 5 most important products within each sector while the third column indicates individual share in the total export basket. Around 16% of total exports of the region are represented by two garment items: cotton jerseys and T-shirts. Coffee and bananas represent a little more than 10% of exports. Melons, palm oil, sugar, ethyl alcohol, and frozen shrimp are also important products, each representing between 1% and 2% of total exports.

Table 3. Export Basket Sectoral Composition and Revealed Comparative Advantage (Average 2006-2008)

Sectors (2-digits HS Codes)	Products (6-digits HS Codes)		Share in Total Exports (%)	Revealed Comparative Advantage
Clothing (50-63)	611020	Jerseys, pullovers, etc, of cotton, knitted or	8.7	
	610910	T-shirts, singlets and other vests, of cotton,	7.2	
	620342	Men's or boys' trousers, breeches, etc, of cott	1.8	
	611030	Jerseys, pullovers, etc, of man-made fibres, kn	1.8	
	610711	Men's or boys' underpants and briefs of cotton,	1.2	
Fruits and Vegetable Products (06-15)			**19.9**	**7.2**
	090111	Coffee, not roasted or decaffeinated	8.2	
	080300	Bananas, including plantains, fresh or dried	3.5	
	080710	Melons and watermelons, fresh	1.2	
	151110	Crude palm oil	1.0	
	090830	Cardamoms	0.7	
Foodstuffs (16-24)			**11.3**	**4.2**
	170111	Raw cane sugar, in solid form	2.5	
	220710	Undenatured ethyl alcohol, of alcoholic strengt	1.2	
	240210	Cigars, cheroots and cigarillos containing toba	0.8	
	170199	Cane or beet sugar, in solid form, nes	0.6	
	220210	Waters (incl. mineral and aerated), with added	0.5	
Machinery and Electrical (84-85)			**5.0**	**0.2**
	854430	Ignition wiring sets and other wiring sets of	2.8	
	853221	Electrical capacitors, fixed, tantalum, nes	0.3	

	841850	Other refrigerating or freezing chests,cabinets	0.2	
	850611	Manganese dioxide primary cells&batt of an exte	0.2	
	854459	Electric conductors, for a voltage >80V but not	0.1	
Animals and Animal Products (01-05)			**4.4**	**2.6**
	030613	Frozen shrimps and prawns	1.1	
	030611	Frozen rock lobster and other sea crawfish	0.5	
	020130	Fresh or chilled boneless bovine meat	0.4	
	020230	Frozen boneless bovine meat	0.4	
	030410	Fresh or chilled fish fillets	0.3	
Others			**21.5**	

Note: This table shows the sectoral composition of Central American exports for the average period of 2006-2008. It sums up exports of Nicaragua, Guatemala, Honduras, El Salvador, and net exports of Panama. Revealed Comparative Advantage is computed according to the Balassa (1965) Index. An index greater than unity means that the country has a comparative advantage in the sector. Some product names are truncated to reduce clutter.
Source: COMTRADE.

The region has a revealed comparative advantage in the clothing, vegetable, food, and animals sectors (column 4, table 2).[14] These sectors draw their comparative advantage not only from the geographic location of the country but also from inexpensive labor, the abundance and quality of the land, preferential market access in the U.S. and SEZs regimes conducive to attracting FDI. While the machinery and electrical products are the fourth most important sector in terms of export value, the region does not have a comparative advantage on this sector. Around half of the exports from this sector are represented by ignition wiring harness sets for automobiles.[15] This is an indication that the region is moving towards integration into global production networks, increasing trade in parts and components.

SEZ regimes are a centerpiece in the structure of regional exports. They were established in the 1970s with the objectives of generating employment, attracting FDI, diversifying the export basket, and acquiring new technologies. Currently, the vast majority of clothing and ignition wiring harness set exports are produced by FDI firms located in SEZs throughout the region. The linkages between these firms and the domestic economy are, nevertheless, limited to their impact on the labor market through the demand for low skill labor as these processes are highly labor-intensive.[16] Other key exported products in the vegetable and food sectors are also produced within SEZs by local firms, as well as some service exports, such as Business Process Outsourcing services.

[14] The RCA index measures the relative advantage or disadvantage of a certain country in a certain industry as evidenced by trade flows. An index value above the number one indicates that a country's share of exports in that sector exceeds the global export share of the same sector. If this is the case, we infer that the country has a comparative advantage in that sector. Since high export volumes can results from subsidies or other incentives provided, including under-valued exchange rates, the RCA index has been argued to be a misnomer in the sense that it captures competitiveness rather than comparative advantage (Siggel, 2006).
[15] An ignition wiring harness set is a set of cables, connectors, and terminals serving spark plugs of reciprocating engines and which carry high-voltage current from the magnetos or electronic ignition to the various spark plugs.
[16] According to International Labor Organization data, as much as 75 to 90 percent of SEZ employees are women.

The FDI inflows into SEZs in the region are devoted almost entirely to exports. Figure 5 benchmarks Central American countries' FDI inflows with respect to the rest of the world along two dimensions: the level of inward FDI stock in 2007 (x-axis) and the compound annual growth rate between 2007-2009 of inward FDI flows (y-axis). Each point represents a country in the world and the line confirms the expected negative relationship between the level of inward FDI stock and its growth rate. Central American countries are labeled by their 3-digit ISO codes. Results indicate that the region is located around the middle point worldwide in terms of recipients of FDI. Although the available aggregated data do not allow us to identify the share of FDI that is directed to establish plants in the region as an export platform, the figure is helpful in benchmarking Central America inward FDI stock worldwide.

Attracting inflows of FDI offers the potential for raising the quality of exports in developing countries. This effect can occur through two main channels. First, FDI firms using the host country as an export platform are generally engaged in producing more sophisticated or higher quality products than those previously exported by the local market. Second, the presence of foreign firms can lead to knowledge spillovers to local firms in the same industry or to local firms in the supplying sector, which in turn can facilitate product upgrading. Figure 6, shows the evolution of the level of sophistication of regional exports during the last decade. The y-axis shows the EXPY, a proxy for export sophistication, while the x-axis shows the level of per capita income.[17] This analysis suggests that the region has not exploited the potential of FDI as an engine of export sophistication (EXPY has decreased in Nicaragua, Honduras, Guatemala, and El Salvador).

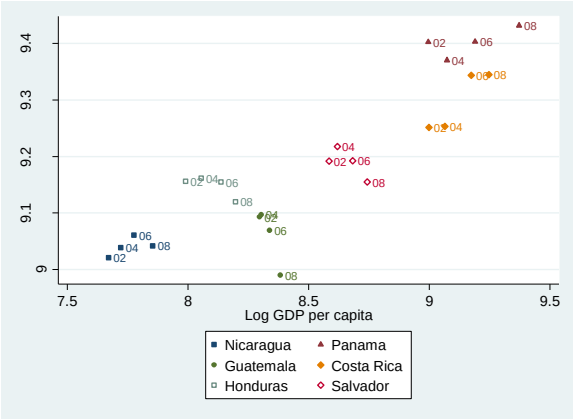
Further investigation of the reasons for the apparent disconnection between FDI firms using the region as an export platform, mainly in the clothing and auto parts sectors, and the lack of advances in the sophistication of the overall export basket could prove useful to improve the export competitiveness of the region. Likewise, analysis of domestic regulations and how they affect competition and performance can help understand questions around market access restrictions, price controls, restrictions on firm structure, among others. Such regulations can play an important role in overall competitiveness.

[17] Haussmann, Hwang and Rodrik (2006) suggest that the level of sophistication of products matters for economic growth. Countries that have a more sophisticated export basket enjoy accelerated subsequent growth, while those with less sophisticated export baskets tend to lag behind. On the other hand, Lederman and Maloney (2012) find that the level of export sophistication does not matter of economic growth once they control for export concentration and the level of investment in the country.

Figure 5. Inward FDI Inflows (2007-2009)

Source: International Trade Center, Investment Bank

Figure 6. Export Sophistication (2002-2008)



Source: Computation of the authors.

One alternative to explore is the possibility for the region to gradually focus on more technological advanced FDI. This has been already adopted by Costa Rica, and can make sense, from an economic point of view, given the extensive use of incentives under SEZs regimes to attract these investments. Increasing the potential of spillover effects through the attraction of FDI in more technologically advanced sectors is key to make the SEZs scheme a true development instrument. Otherwise, the benefits of FDI will be restricted mainly to job creation. While this is valuable in its own right, the cost of such job creation in terms of incentives offered might not be justifiable.

Another factor worth exploring in this discussion is the lack of linkages from FDI firms to the local economy. In fact, the only sizeable impact of firms operating in SEZs in the local economy happens through the labor market. In general, firms prefer to use imported inputs rather than relying on local suppliers for those inputs that may also be available locally, such as cotton, yarn, and wires. The natural question is then what type of policies can be implemented to increase the linkages of FDI firms with the local economy.

A policy option to explore is the development (or the strengthening) of domestic suppliers programs to permit local firms to reach the volume and quality demanded by multinational companies. These local industry upgrading programs have been used in countries such as Singapore, Malaysia, the Philippines, Japan, Czech Republic, and, in the region, Costa Rica. These cases provide useful lessons for the region and would surely be an interesting policy option to deepen linkages between FDI firms and local firms through supply links and collaborations with the ultimate purpose of achieve higher economic growth by producing –and

eventually exporting– higher quality products. Box 2 presents a description of the Costa Rican and Czech Republic programs.

Box 2. Backward Linkages between FDI firms and Local Firms

Costa Rica

Since Intel's decision to invest in Costa Rica in 1996, the case of the global electronics giant choosing the tiny country to locate its US$300 million semiconductor assembly and test plant has been widely recounted. Intel employs around 3,000 direct employees and generates another 2,000 indirect jobs through its purchases from domestic suppliers.

The Supplier Development Project for High-Technology Multinational Companies was established by the Costa Rican Government in 1999 with the objective of improving the technology capacity of SMEs to help them become local suppliers to multinational corporations (indirect exporters) and, afterwards, to export to foreign markets. Originally, this project had three key components: a Pilot Procurement Program; a Comprehensive Information System; and the creation of a domestic supplier intelligence office ("Costa Rica Provee"). Costa Rica Provee identifies the needs of specific inputs and intermediate goods and services from multinational companies, maps local business opportunities, and recommends registered suppliers that meet the MNCs standards (production volume, technical and quality specifications and product characteristics).

Between the years 2001 and 2006 the number of backward linkages (business transactions) registered by Costa Rica Provee increased from 1 to near 140 (from US$0.8 millions to US$3.2 millions). In the medium term, Costa Rica Provee expects that at least 25% of the MNC's goods and services needs would be supplied by domestic companies. Currently, the percentage of MNC´s purchases in the domestic market (related to their total purchases) is very low (less than 1 percent).

Czech Republic

In December 2001, the Japanese automotive giant Toyota Motor Corporation, together with the French automotive company, PSA Peugeot Citroen, announced the Toyota Peugeot Citroen Automobile project – a joint factory to manufacture an entirely new class of passenger car in the Czech Republic. With an investment budget of EUR 1.5 billion, this venture represented the largest investment project in Central Europe. Over the last ten years, the Czech Republic saw the completion of 235 foreign investment projects, mobilizing US$7.3 billion in FDI and creating approximately 65,000 jobs. Yet, multinational investors imported 90-95% of their components in order to meet their production requirements, driven by world-class standards and global competition.

The country's investment promotion agency (CzechInvest -CI) launched the Pilot Supplier Development Program in the electronics sector, the Czech Republic's fastest growing and second-largest FDI sector after automotive. The program's overall objective was to equip participating suppliers with the information and skills to meet investors' requirements and win more and higher value-added contracts. From a database of supplier company profiles that CI created, 45 committed companies were identified as potential candidates to expand their businesses and supply foreign manufacturers based in the Czech Republic. These companies outlined the areas of support they needed, and then were provided with training by Czech and international experts in the first phase of the program. After seven months, the companies were reevaluated. The 20 suppliers that were found to have shown the most improvement in their performance were invited to participate in the Program's second phase of individually tailored assistance.

CI's evaluation of the program showed promising results. Fifteen suppliers had landed new, renewable contracts, amounting to more than US$46 million for the period 2000-2003. Participating suppliers especially valued improvements in their strategic management, management of customer relationships and communications. The experience suggested that government assistance could help an important segment of Czech firms compete for

contracts that otherwise might be won by new foreign suppliers or sourced abroad. Based on these results, CI subsequently rolled out the program, extending the scheme to the aeronautics, automotive, pharmaceutical and engineering sectors.

Besides the relationship between FDI inflows and export sophistication, the literature establishes three possible spillovers of FDI in the host country: i) the supply chain of linkages effect (Paus and Gallagher 2008), ii) the human capital or labor turnover effect (Hoekman and Javorcik 2006), and iii) the demonstration effect (Gallagher and Zarsky 2007). Additionally, evidence from China shows that when FDI firms in SEZs focus on acquiring new technology the spillover effects are larger than when SEZs are used purely as an export platform (Abraham et al. 2010). Exploring the magnitude of these spillover effects in Central America would also be important for the region.

1.3 Sources and Sustainability of Comparative Advantages in the Clothing Industry

The ability of the clothing sector to successfully compete in international markets is important for Central American export competitiveness. The textile and apparel industry represents one of the main productive activities for the region, both in terms of export value (table 2) and in terms of employment generation. Production takes place in maquilas that direct nearly all production to the U.S. market.[18] Currently, about 250,000 people –mostly young women– are employed in the sector in Central America. A review of the sources of comparative advantages in the sector as well as an assessment of their sustainability in the short run must be a central part in studying export competitiveness in the Central American region.

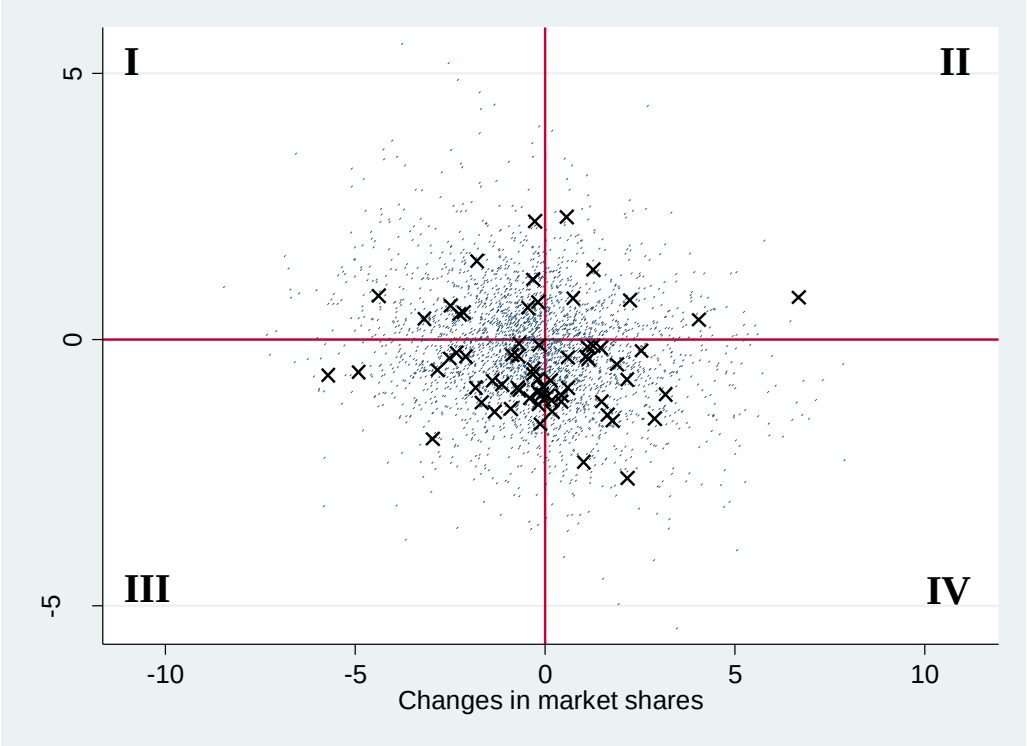
On January 1, 2005, the quota system that restricted textile and apparel imports in the United States and other nations –the Multi Fiber Agreement (MFA)– ended for all member countries of the World Trade Organization (WTO). The expected impact of this trade liberalization was that exports from low wage countries in general, and China in particular, would grow rapidly, virtually wiping out many other established suppliers. In reality, the phase out of the MFA increased China and India global market shares while some middle income countries, such as Mexico, Tunisia, Morocco, Thailand and Romania, experienced declining market share.

To see the response of the Central American exports to this trade liberalization, Figure 7 depicts the changes in the competitiveness situation of each product (6 digit HS code) imported by the US between 2000 and 2008 in the textiles and clothing sector (HS chapters 50-63) along two main attributes: i) changes in market share in the U.S market (x-axis), and ii) changes in the

[18] A maquila is a manufacturing operation in which a factory imports materials and equipment, perform assembly or manufacturing processes, and then re-exports the finished products to other countries. These factories usually operate in a duty free environment.

quality of the product being sold in the U.S. market (y-axis).[19] Each small dot in the figure represents a product that was imported by the U.S. from any trading partner in the world. Products imported from Central American countries are marked with an X. The figure is divided in four quadrants that give us some indication of the dynamics of product competition. Products located in quadrant "I" upgraded their relative quality (i.e. sell at higher prices) but lost market share in the US. This is not necessarily a bad sign for competitiveness as these may be niche products that are made and marketed for a particular buyer in a profitable way. Products located in quadrant "IV" reduced their quality (i.e. sell at lower prices) but gained market share. This is evidence that competition takes places through low quality products that sell at lower prices. Quadrant "II" contains products that gained market shares and upgraded their quality, whereas quadrant "III" includes products that lost market shares and reduce their relative quality. Products located in quadrant "III" are said to be losing competitiveness in the U.S. market.

Figure 7. Textiles: Dimensions of Competitiveness in the U.S. Market (Changes from 2000 to 2008)



Note: This picture shows the changes in the relative measure of quality and in market shares in the U.S. market between 2000 and 2008. Each dot is a product and exports of Central-American countries are marked with an X.
Source: Authors computations based in CEPII data.

[19] One way a country can increase the absolute amount of export per capita is by augmenting the quality of exports and thus the value of export per unit. Using a new worldwide database of Trade Unit Values made available by the French Centre for Research and Studies on the World Economy (CEPII) [Berthou, Emlinger. (2011), "The Trade Unit Values Database", CEPII Working Paper N°2011-10, April 2011.], we construct a measure of the relative quality of each exported product. See Annex 2 for details on how this relative measure is compute.

The phasing-out of the Multi-Fiber Agreement had a mixed impact on Central American exports to the U.S. On the one hand, around 42% of the products exported by Central American countries lost competitiveness (quadrant III). On the other hand, the most important products in terms of export value gained market share but decreased their relative quality (quadrant IV). These products are directly competing with Chinese exports in the U.S. market.

An important caveat of figure 7 is that it hides some heterogeneity of the changes in the competitiveness situation of individual countries in the region. When individual Central American countries are identified in this analysis, we find that Nicaragua and El Salvador's main exported products are located in quadrant IV while Guatemala and Honduras' main products are mostly located in quadrant III. This is in line with the findings in the country notes that show that the importance of the textile sector is growing in Nicaragua and El Salvador.

The overall picture indicates that studying the sources and sustainability of comparative advantages in the clothing industry is important to identify main constraints to export competitiveness in the Central American region. Sources of comparative advantage may be divided into four main categories. First, the proximity to the largest market for clothing in the world allows the region to deliver products in a timely matter and with a lower transportation cost than many of its competitors, including China. Second, "factor conditions", including labor costs and electricity costs, which compared to other competitors are low in the region but not as low as the Chinese levels. Third, the SEZ regimes are key to competitiveness as most production takes places in maquilas operating in SEZs. Fourth, market access policies in the form of U.S. preferential treatment laid out in the CAFTA-DR free trade agreement.[20]

Recent analytical pieces produced by the World Bank shed light on policy options for low income countries (LIC) in a post quota world. Staritz (2011) identifies seven policy recommendations to increase the competitiveness of LIC clothing exports, to sustain or accelerate their clothing exports, and to secure a sustainable impact of clothing exports on export diversification, industrial development, and economic growth. These policies are: i) improve productivity, skills, and capabilities; ii) increase backward linkages; iii) improve physical and bureaucratic infrastructure; iv) improve labor and environmental compliance; v) diversify into fast-growing emerging markets; vi) increase regional integration; and vii) build locally embedded clothing industries. Lopez Acevedo and Robertson (forthcoming) study how the phase-out of the MFA affected nine countries —Bangladesh, Cambodia, Honduras, India, Mexico, Morocco, Pakistan, Sri Lanka, and Vietnam—with the broader aim of better understanding the links between globalization and poverty in the developing world. They find

[20] While in the CAFTA-DR agreement countries must adhere to the "yarn forward rule", Nicaragua was granted a Tariff Preference Level (TPL) that allows apparel made of certain cotton and man-made fiber to enter the U.S. duty free if it is assembled in Nicaragua, regardless of the origin of the fabrics. Other countries must obtain their fabrics in one or more CAFTA-DR countries.

that while some large Asian apparel exporter countries managed to increase production, apparel exports and employment fell in other countries. Apparel employment rose in Bangladesh, India, Pakistan, and Vietnam between 2004 and 2008. In Honduras, Mexico, Morocco, and Sri Lanka, however, apparel employment fell. Some of the change in employment is explained by upward movement through the apparel value chain, as in Sri Lanka and Bangladesh. Other countries remained suppliers of low-end products with almost no involvement in the other stages of production. In terms of policies, the countries that had larger increases in apparel exports were those that promoted apparel sector upgrading; those that did not promote upgrading had smaller increases or even falling exports.

2. Summary of Country-Specific Trade Outcomes

Costa Rica

The behavior of Costa Rican exports and imports has followed a similar path in the last two decades. Exports and imports started to increase continuously since the beginning of the nineties from 30 and 36 percent of GDP respectively. Although both declined by the end of the last decade, the fall was more acute for the imports. Compared to the region, the country runs a small trade deficit, which has remained stable around 5% of the GDP over the last five years.

Costa Rica's sectoral composition of exports changed significantly over the last decade. The composition of the export basket changed from fruits, vegetables and textiles to high technology sectors such as integrated circuits, computer parts and medical appliances and instruments. Precisely, these emerging industries now account for almost half of Costa Rica's exports.

While that is a result of a successful policy of FDI attraction and of linkages of FDI firms with the domestic economy, there have been two different consequences. On the one hand, product diversification has worsened (unlike market diversification) but on the other hand, the technological content of exports improved significantly between 1998 and 2008, with the share of high-tech exports growing from 19% to 48% and the share of low-tech and primary exports declining.

In terms of destinations, the EU-27 remains an important trade partner with a participation of one third in total exports between 2006 and 2008. Trade relationships with BRIC countries have improved and now represent a share 15%.

El Salvador

The annualized export growth rate of El Salvador over the last decade is the lowest in the region. This modest export performance resulted in El Salvador losing market shares in important products and destinations. In addition, the country runs very large trade deficits, approximately 20% of GDP. (Remittances help offset large trade deficits.)

El Salvador diversified in terms of products and markets over the last decade. The importance of traditional export sectors, such as textiles/clothing and fruits/vegetables, is declining, although textiles still represent more than 40% of the total export basket (2006-2008). Vegetable products reduced their participation by half while electrical capacitors gained importance (1.7%). The country shows the third highest level of export sophistication in the region, after Costa Rica and Panama.

Diversification in terms of destination markets was important as the country is now less dependent on the US and EU-27 (from a joint 71% participation in 1996-98 to 56% in 2006-08) and more dependent on Central America (from 22% to 32% in the same period).

Guatemala

Guatemala's openness to trade was relatively moderate, especially during the 2000s. Although Guatemala had lower trade deficits than most Central American counterparts, this has increased since 1990 and now is around 10% of GDP.

Regarding its sectoral composition, textiles and vegetable products accounted for almost half of total exports in 2006-2008. Gold was also an important export product, with a share of 2% during the same period. Guatemala increased its dependence on resource-based exports and – in more recent years – also primary products. Higher intra-regional trade almost entirely compensated for Guatemala's reduced reliance on the US and EU-27 markets.

Honduras

Honduras had a negative trade balance for most of the last two decades, reaching a maximum of almost 20% of GDP in 2010, up from less than 5% 20 years ago. The country relies on textiles/garments for half of its exports and these exports are growing at very modest rates.

There are some signs of new dynamic products, for example exports of ignition wiring sets for automobiles that grew roughly three times faster than world exports of the same product in the last decade and now represent 6% of total exports. As a result, the importance of low-tech exports declined since 2004 while medium-tech exports increased.

Honduras has the lowest market diversification: the United States absorbed two thirds of Honduran exports over the last decade. Moreover, the growing importance of intra-regional trade means that Honduras relies on the NAFTA/Central America block for 80 percent of its exports.

Nicaragua

The export performance of Nicaragua over the last decade was mediocre, but some encouraging signs were observed. Today Nicaragua is more open to international trade than it was a decade ago, but exports have grown well below imports resulting in the largest trade deficit in the Central American region (around 30% of GDP).

Nicaragua's sectoral composition of exports has changed little over the last decade. It is still dominated by textiles (which gained export share) and animal and vegetable products, which together accounted for around 70% of the total export basket in both 1996-98 and 2006-08. At the same time, the country entered into the global production of auto-parts by exporting ignition wiring sets for automobiles, which tripled its share during the same period. While that is a positive sign, the country still shows the lowest level of export sophistication in the Central-American region.

Nicaragua is the only country in the region that reduced its market diversification during the last ten years. In fact, the last decade yielded an increased concentration of exports to the U.S. market (62%) and the Central-American region (17%) at the expense of the European market. The strong trade relationship with Venezuela is also worth noting.

Panama

Panama's openness to trade is extremely high due to the Colón Free Trade Zone (FTZ) - the second largest FTZ in the world. The Colón FTZ accounted for more than 92 percent of Panama's exports and 65 percent of its imports in 2010. The country's gross exports and imports showed a similar path in the last two decades but since 1990 the export share has been greater than the import share making the country the only one among its Central American peers that consistently had a trade surplus.

The FTZ is reflected in Panama's share of re-exports in gross exports. Re-exports made up around 88 percent of gross exports over the period 2006-2008. To detect Panama's domestic export performance, the focus should be on net exports, i.e. gross exports minus re-exports. Panama's net exports are mainly driven by primary products such as animal and vegetable products – each of which represents around 40% of the net export basket during 2006-2008. Net exports heavily rely on the US and the EU-27 (39% and 33% respectively during 2006-2008), while gross exports are destined to neighboring regions.

The Colón FTZ is used as a hub to re-export mainly medium- and low-tech goods, so while the majority of Panama's gross exports are medium-tech exports, net exports are heavily dominated by primary products.

3. Impact of DR-CAFTA tariff reductions on exports: firm-level analysis

Recent developments in trade theory focus in explaining the behavior of the "basic unit" of trade flows across borders, the exporting firm. In the theoretical framework outlined by Melitz (2003)[21], firms differ in marginal costs of production which determines their profitability of exports in the foreign market. A direct implication is that the reduction of trade costs (including

[21] Melitz (2003) is probably the most successful attempt in explaining heterogeneity of exporters but many other authors have addressed heterogeneity of exporters e.g. Bernard et al. (2003).

tariff cuts) will increase the number of new exporters since a larger number of firms would be able to achieve profits in foreign markets. For firms already exporting, the reduction of trade costs implies a higher profitability of sales and, consequently, a higher propensity to remain in the market and a lower probability to exit the market. Furthermore, Bernard et al. (2010) show that multi-product firms tend to reallocate resources in order to attain the highest productivity by launching and/or dropping products.

In an extended version of Melitz (2003), Besedes and Prusa (2011) show that imperfect information implies a higher rate of exit of exporters since the latter would only learn the cost of exporting once an export relationship is started. In fact, exporters do not only pay a fixed cost to enter the export market but have also to cover a per-period fixed cost. Once exporters discover their productivity in the foreign market, they decide to keep exporting or to exit the market. If tariff reductions lead to a lower level of uncertainty for exporters starting a new export relationship, the survival rate of export flows should be higher when duty reductions are observed.

The analyses of this sectionare related with recent works on the need of some capabilities (such as access to detailed market information and to infrastructure, amongst others) to become successful exporters. In fact, exporting is a complex chain of activities that requires firms to overcome different risks and difficulties. Cadot et al. (2010) find that information spillovers in these activities determine the success of new exporters and Freund et al. (2010) provide evidence that lack of infrastructure would be a constraint for exports. This study is also linked to the literature on financial constraints at the firm level (Bricogne et al. (2011), Besedes et al. (2011)) and support evidence of higher exit rates for financially constrained firms but also better growth perspectives for those achieving to establish their production in foreign markets.

This section has two main objectives: first, to present a detailed descriptive analysis of the dynamics of exporting firms in this region and, second, to assess the impact of tariff reductions under the DR-CAFTA on the performance of exporters, specifically for three Central American countries, namely Guatemala, Nicaragua and El Salvador[22].

Note that the Caribbean Basin Initiative has been covering the bulk of the Central American exports to the US during past decades and that applied tariffs have been giving nearly free access in the US market. However, a key benefit of the DR-CAFTA treaty is to make this market access certain and permanent, and thus reducing the uncertainty connected with the exporting activity.

In addition, even if access to the US markets – in terms of US tariff reduction – remained almost unchanged after the treaty signature, the same is not true for tariffs levied by the DR and the Central American countries on goods imported from the US and from other members of the treaty. Indeed our analysis shows that, beyond the certainty and permanence of the market access to the US, the treaty created opportunities of trading within the Central American and the

[22] The note also includes the patterns observed in Dominican exporters.

DR region. Market access has considerably increased among CA countries and we think it is worth to consider this aspect.

Finally, our analysis does not only consider *faced* tariff but also the increased competitiveness of national exporters due to lower input prices. These lower costs are proxied by the reduction of the weighted average tariff (at HS6 sector/commodity level) where the weights are represented by the value of imported inputs in each sector. Here again, changes are relatively large. And our econometric results show that most of the benefits of the reduction of costs of imported inputs, and thus of increased competitiveness, accrued to incumbent exporters.

All the analyses employ a novel datasets covering the period 2003-2011 and where the disaggregation of data enables distinguishing trade flows at the firm, product and destination level. Our records contain all custom transactions for these Central American countries and we build a similar analysis to Molina, Bussolo and Iacovone (2009) who using Dominican custom data at the firm-level provided some evidence of the effects of these reductions on exporters. However, given that before the agreement Dominican Republic was not really integrated to other Central American countries as a trade partner, it is not straightforward to extend the results observed in this country to the Central American countries. In fact, market access facilitation was not homogenously distributed between Central American countries and Dominican Republic due to the ex-ante export orientation.

This section is organized as follows. The section 3.1 presents the data and shows trends observed in aggregate exports as well as changes in some firm characteristics. Section 3.2 analyzes the evolution of exports taking into account the different markets served and gives a particular focus to export trends to countries members of the trade agreement. It also describes the most important changes in exports at the sectoral level to selected partners. Section 3.3 gives an overview of the entry and exit of exporters, the survival rate of exporters and the dynamics of firms exporting to countries included in the agreement with a particular focus on the extensive margin. We estimate the impact of tariff reductions on the extensive and the intensive margin of exports at the firm level in Section 3.4. Finally, we summarize our main results in Section 3.5.

3.1 The data and trends on aggregate exports

The custom data on export transactions were provided by custom authorities in countries[23] members of the agreement and cover imperfectly the period 2002-2011[24]. In all countries, the

[23] The data providers are Superintendencia de Administration Tributaria (SAT) of Guatemala, Direccion General de Aduanas (DGA) of El Salvador, Dirección General de Servicios Aduaneros (DGA) de Nicaragua and Direccion General de Aduanas de Republica Dominicana.

[24] Nicaragua provided data for every year whereas Salvadorian data only cover the period 2003-2009. Data for 2011 were not available for Dominican Republic and Guatemala and the Guatemalan dataset begins in 2003.

data contain transactions by product at the SAC 8-digit level[25] and by destination for all exporters[26]. A deeper disaggregation at the product level might be available in some countries but we consider the 8-digit level to homogenously differentiate products across countries. We calculate aggregates values for these firms-level datasets in order to compare them with other sources and verify that these data describe well the pattern of aggregate exports[27].

Given that the last year of Salvadorian data (2009) presents a break in the general tendency observed during previous years in that country, it would be misleading to compare this information with values after the recovery from the 2008-9 global financial crisis by other countries. In consequence, some of our comparisons and conclusions in this Section will be based on information previous to the financial crisis (2008) for El Salvador. Three important caveats must be highlighted. First, Nicaraguan export data do not report operations under the Maquila regime before 2006[28] and therefore our data are a subsample of all export transactions in this country. The second caveat concerns Salvadorian exports that were reported in CIF (cost, insurance and freight) values instead of FOB (free on board) values as in all other countries. Consequently, we will avoid comparing values between countries and we prefer using the relative changes of these values to describe the evolution observed during this period. The third caveat is related to destinations recorded by customs in El Salvador. "Out-of-customs territory" is considered as a destination and given that not further information is available, we cannot match it to specific countries even though most of these transactions might be shipped to major partners in Central America. Table 3 presents some descriptive statistics for datasets in selected years.

Table 4: Summary statistics

	Dominican Republic				El Salvador			
	2003	2006	2008	2010	2003	2006	2008	2009
Exports by firm (10^6 US$)								
Mean	1.37	1.78	1.91	1.72	1.29	1.6	2.09	1.71
standard deviation	9.04	9.88	11.22	10.69	9.59	13.76	19.25	15.91
Products by firm								
Mean	5.26	4.67	5.62	5.51	7.17	7.91	7.83	8.32
standard deviation	8.58	8.5	11.22	10.99	15.54	16.96	17.2	18.23
Markets by firm								
Mean	2.13	2.31	2.43	2.3	2.14	2.29	2.42	2.46
standard deviation	2.66	3.16	3.36	3.17	2.04	2.18	2.73	2.87
Number of firms	2,796	2,391	2,638	2,985	2,784	2,559	2,763	2,727
Number of products	1,356	1,351	1,849	1,896	3,254	3,269	3,403	3,413

[25] The first 6 digits of the SAC (Sistema Arancelario Centroamericano) classification correspond to the 6-digit classification of the Harmonized System.
[26] Exporters are identified through a unique and anonymous identification number.
[27] Total volume of exports and volume of exports disaggregated at the HS 2-digit level were compared mainly with UN Comtrade (mirrored and self reported).
[28] Transactions under the Maquilla regime are recorded in 2007 and onwards, but in order to keep coherence with the first half of the period we exclude them from our analysis.

Number of markets	130	116	136	137	97	97	116	118
Total exports (10^6 US$)	3,819	4,264	5,029	5,143	3,584	4,082	5,781	4,672
	Guatemala				Nicaragua			
	2003	2006	2008	2010	2003	2006	2008	2010
Exports by firm (10^6 US$)								
Mean	1.04	1.37	1.64	1.76	0.52	0.9	1.22	1.62
standard deviation	6.1	8.28	10.92	14.48	2.18	4.13	5.97	8.17
Products by firm								
Mean	7.49	8.18	8.77	8.83	4.82	5.29	6.64	6.99
standard deviation	20.97	21.67	20.99	20.18	8.87	11.44	22.05	26.02
Markets by firm								
Mean	2.35	2.43	2.5	2.51	1.81	1.99	2.1	2.22
standard deviation	2.55	2.6	2.82	2.92	1.81	2.12	2.31	2.64
Number of firms	4,187	4,239	4,653	4,630	1,174	1,185	1,288	1,227
Number of products	3,900	3,983	4,119	4,034	1,724	1,773	2,250	2,287
Number of markets	135	130	130	148	63	77	89	89
Total exports (10^6 US$)	4,363	5,807	7,634	8,156	604	1,064	1,569	1,991

Note: Total number of firms regardless if they export under one or more custom regimes. Products are differentiated at SAC 8-digit level.

Export volumes have clearly followed an increasing pattern during last years in these countries. In 2008, these volumes are 61% higher than in 2003 for El Salvador and they increased until 2010 for the rest. The largest increases are in Nicaragua (230%) and Guatemala (87%) whereas Dominican exports show a rather moderate increase of 34%. A slight acceleration in this pattern occurs after the regional trade agreement came into force in 2006[29]. Since the end 2006, the export flows have grown by 20-40% for some countries which points out an acceleration of export growth in countries being part of a regional trade agreement[30]. At the aggregate level, Dominican and Nicaraguan export bundles have diversified in the product dimension (33-46% increases in the number of products) whereas the other two partners remained exporting the same number of products (+4%). However, these differences might be explained by higher levels of diversification at the beginning of the period for Guatemala and El Salvador which also are considerably more diversified in 2010.

Diversification through exports to new markets is more significant except for the Dominican Republic and, on average, each country exports its products to 20 additional markets[31]. For most of countries, the market diversification starts after the implementation of the DR-CAFTA. The number of exporters increases continuously in all countries since the entry into force of the

[29] The entry into force of the agreement was March 1st, 2006 for El Salvador, April 1st for Nicaragua and July 1st, 2006 for Guatemala. Dominican Republic implemented the agreement on March 1st, 2007 and the agreement took effect in Costa Rica on January 1st, 2009.

[30] The decline of exports due to the financial crisis in 2008-09 had severe consequences in the region and the largest decline in the region is in El Salvador where exports decreased by 20%. On average, 2009 export volumes lower by 10% with respect to their levels in 2008.

[31] Nicaragua presents the higher level of diversification but it should be carefully considered given that firms operating under the Maquila regime are not included in the sample.

agreement especially in Dominican Republic (+25%). In Central American countries, the increase of exporters is rather moderate (+6.4%)[32].

The significant increase of exports combined with the moderate increase of exporters implies that the value of exported goods by firm has risen in recent years. For the period 2003-2008, the increases of average sales per firm ranges from 0.54 to 0.80 US$ million. Moreover, increases in average sales are accompanied by an increase of the volatility of sales. In contrast to Dominican firms, Central American exporters seem to succeed diversifying at the product level. In 2008, Central American exporters send on average 1.25 products more than in 2003. Salvadorian exports show a temporary increase of products exported by firm in 2009 which is evidence of higher survival rate of firms with higher diversification at the product level. This observation is consistent with Bernard et al. (2010) where multi-product firms have higher chances to cope with negative shocks. Market diversification is less evident at the firm level and on average, one every four firms starts exporting to a new destination regardless of the source country.

The universe of firms in each country for the whole period is about 2.6-3.4 times the number of firms observed in the last year. This is a sign of continuous turnover that exists among exporters particularly for Nicaragua (3.4) and Dominican Republic (3.1)[33]. Only 5-10% of firms operate over the whole period in each country but given a higher rate of entrance and exit, this share is lower in Nicaragua and Dominican Republic. 55-60% of exporters are multi-product firms exporting more than one product at the 8-digit level for at least one year in the sample and about one third of firms export to more than a single market for at least one year in the sample. In Guatemala, 24% of firms are single-product single-market exporter while in other countries this type of exporters represents 35-41% of all exporters. One of every three firms in these economies is a multi-product multi-market exporter. Only 3-6% of exporters export a single product to several destinations at least for one year.

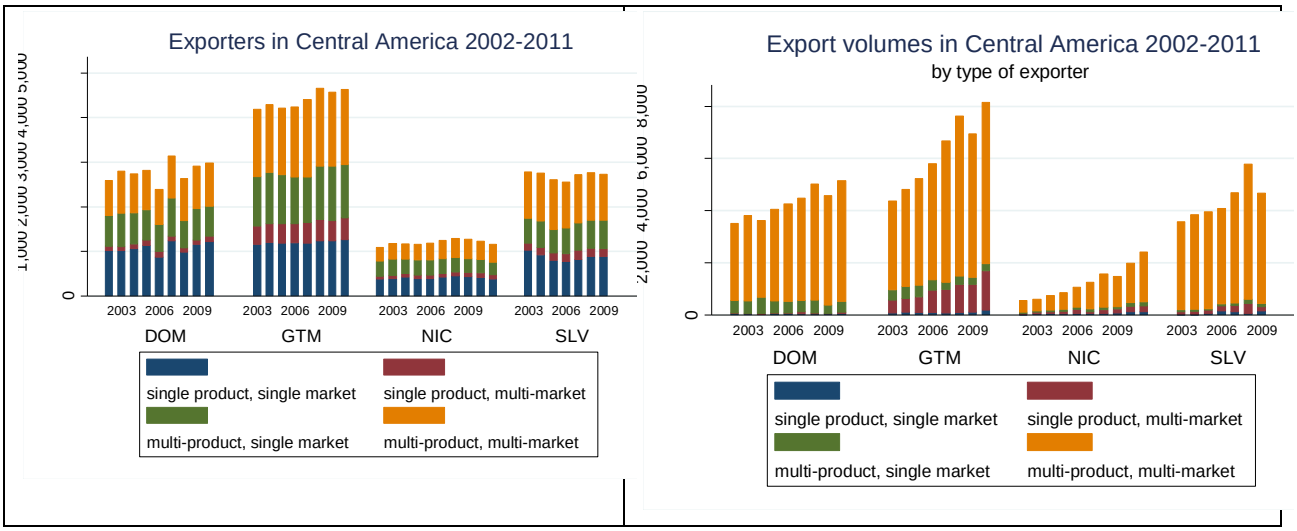
On a yearly basis, 60 % of firms in each year are multi-product exporters and 35% of firms exports different products to different markets. Single-product single-market firms represent around one third of the total number of firms each year and on average, single-product multi-market firms are between 4 and 10% of the total number of firms every year. The highest frequency of single-product multi-market exports is observed in Guatemala as opposed to the Dominican Republic where this type of exporter is almost inexistent. Figure 8a and 8b show the yearly decomposition following this disaggregation and the volume of exports by type of exporters.

Differences between countries are more pronounced when shares of export volumes are considered for each type of exporters. Multi-product multi-market firms account for almost 80% of Guatemalan and Nicaraguan exports. For the two other countries, this share ranges between

[32] In El Salvador and Dominican Republic, the number of exporters recovers from a decreasing tendency and it shows a limited rebound with respect to 2003.
[33] In Guatemala and El Salvador, the proportion is equal to 2.6.

87-92%. However, this share shows different patterns in these countries, it is increasing over time in Dominican Republic and decreasing in El Salvador. Single-product multi-market firms' share differs substantially across countries, it is near to 12% in Guatemala and Nicaragua and almost 4% in El Salvador. In Dominican Republic, exports by this type of exporter represent less than 1% of total exports. Multi-product single-market firms have a large share of Dominican exports (11%) while this type of exporters concentrates 6-7% of Guatemalan and Nicaraguan sales. In El Salvador, its share on total exports is lower than 2%. Exports by single-product single-market exporters are almost insignificant in values. Its share is less than 2% in most of countries except Nicaragua (5%).

Figure 8: Exporters and export volumes by type of exporting firms

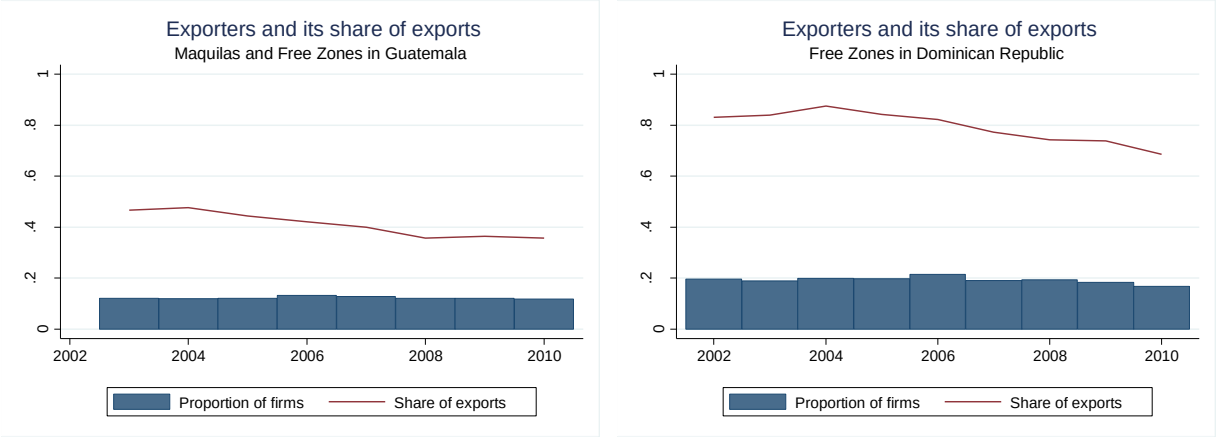


Multi-product firms tend to generate the most of export flows (in values) and they concentrate at least 85% of total exports. This observation is in line with Bernard et al. (2010) who find that multi-product firms are more productive and tend to become larger than single-product exporters. In El Salvador and Dominican Republic, a higher concentration of exports by multi-product exporters is observed. Considering diversification at the product level, firms whose export bundle contains less than ten products represent more the half or more of the total exports[34]. However in El Salvador, this group of less diversified exporters represents around 25% of total volumes. Highly diversified exporters with 50 or more products concentrate around 30% of Salvadorian exports while the share of these exporters rarely exceeds 8% in other countries.

[34] In Guatemala, this share is particularly high and on average, the less diversified exporters account for 65% of total exports.

Dominican and Guatemalan data allow us to distinguish the custom regime applied to transactions: ordinary, maquilas and free zones.[35] In Dominican Republic, the maquila regime does not exist. Similar conclusions to those observed in multi-product firms can be drawn with respect to firms operating under these regimes and Molina et al. (2009) provide this evidence for Dominican exporters. Maquiladoras and firms in free zones in Guatemala are relatively few (12%) with respect to the total number of firms. Nonetheless, they represent an important share of total exports and on average 40% of exports are generated by firms in free zones and maquilas. In Dominican Republic, 20% of firms which operate in a free zone are the source of 80% of exports. However, this share has a downward tendency over time and in 2010 only 68% of exports were originated in free zones. The disaggregation by custom regime is shown in Figure 9. However, the expansion of exports under the ordinary regime in both countries is substantial and it gains importance over the period. Actually, its evolution explains most of increases of total export values observed in these economies.

Figure 9: Exporters by location in Central America



In summary, aggregate exports have increased over the whole period, a mild acceleration of this growth can be observed after the implementation of the DR-CAFTA agreement and some signs of product- and market-diversification are detected. Multi-product and multi-market firms represent the largest share of exports and an important rate of exporters' turnover is observed in each country.

[35] Firms do not operate exclusively under one of these regimes. In consequence, a firm can generate export flows under more than one regime and the count of firms taking into account this disaggregation is higher than a simple count of firms.

3.2 Export trends with selected partners

El Salvador, Guatemala, Honduras and Nicaragua[36]are among the seven top export destinations for each country individually[37] and the US market is the major destination for all countries, including, in this case, also the Dominican Republic.

As the biggest partner of Guatemala, the US market accounts for more than the next four most important destinations combined. Besides, El Salvador and Honduras, the two other major destinations for exports of this country are Mexico and Costa Rica which will be considered together with the Central American and Caribbean countries. In the case of El Salvador, the Central American members of the agreement have a bigger importance in terms of volumes and for instance, Guatemala and Honduras considered together have a similar weight than the US market. The fourth most important destination is Out-of-custom Territory[38] and the fifth destination is Nicaragua. For Nicaragua, the major destinations other than the US are El Salvador, Canada, Honduras and Costa Rica. Guatemala is also an important partner (7th). Besides the US, the most important destinations for Dominican Republic are Puerto Rico, Haiti, Netherlands and the United Kingdom. Among Central American members of the agreement, Honduras is the first destination for Dominican flows but only the 11th among all destinations and the volume exported is less than 1% of volumes exported to the US market. This highlights the lack of connectedness between Central American countries and Dominican Republic in terms of trade flows.

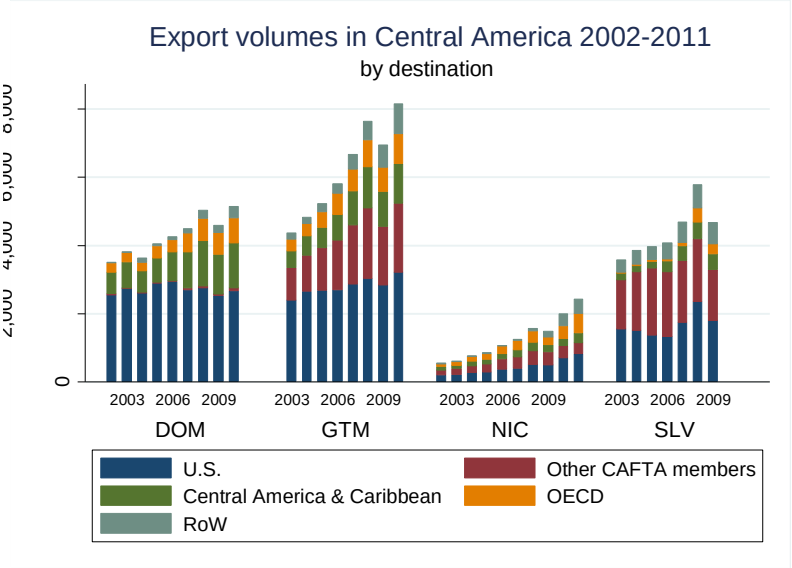
Figure 10 shows the importance of the DR-CAFTA agreement for exporters in the region. The partners included in this agreement absorb most of export flows: 70% in Guatemala and El Salvador, and around 63% in Dominican Republic and Nicaragua. However, this share decreases continuously in all economies over the whole period, especially after 2006 and for example it goes from 83% in 2003 to 70% in 2009 for Salvadorian exports.

A closer look into these patterns sheds some light on the (re)orientation of exporters while exporting to the region. The Salvadorian growth rate of exports in the region is driven by the expansion of exports to the US market which increases by a half between 2002 and 2008 while flows into other countries in the agreement expand by 26% for the same period. In Guatemala, exports to United States grow by 33% over the period and exports to other members of the DR-CAFTA are more than doubled. Under the ordinary regime, Nicaraguan exports to the US are multiplied by four and exports to the CAFTA region double. Dominican exports to the US increased marginally (4%) and exports to the region which sum up to 32 USD million in 2002 increase by 190% until 2010.

[36] Costa Rica who joined the trade agreement on January 1st, 2009 is excluded from the group of CAFTA members.
[37] On average, Dominican Republic is the 9th destination for Guatemala, the 11th destination for El Salvador exports and the 22nd for Nicaragua.
[38] It accounts for 444 US$ million of exports on average. Exports to this destination will be considered within the rest of the world (RoW).

Other Caribbean and Central American countries are the next preferred destination of Guatemalan and Dominican exports. The third preferred destination of Nicaraguan exports is the group of OECD countries, and for El Salvador is the rest of the world. In all countries, the growth rate of exports to other destinations exceeds the performance of exports to the region and provides evidence of significant changes of market diversification. Guatemalan exports to OECD countries almost triple during the same period, those to other Central American countries rise by 136% and flows to the rest of the world are five times their value in 2003. In El Salvador and comparing values in 2008 with those at the beginning of the period, exports to other countries in the Caribbean and Central America region increase by 161%, exports to the OECD countries are fifteen times higher and exports to the rest of the world increase by 185%. In Nicaragua, exports in 2010 to the rest of the world are almost twenty times larger, those to the OECD countries are multiplied by four and, finally, those to other countries in the region increase by 129% with respect to their levels in 2002.

Figure 10: Export flows by destination

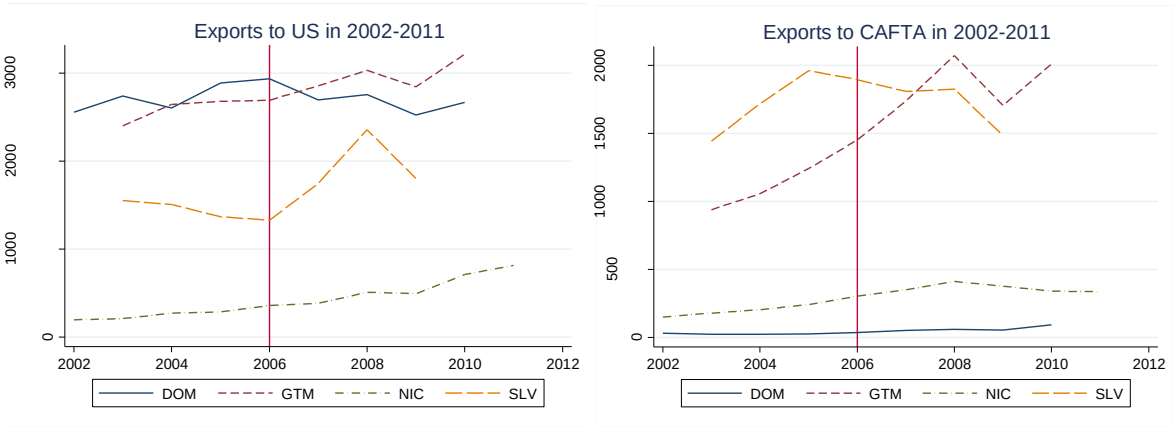


Guatemalan and Salvadorian patterns of exports to the US show a period of stagnation previous to the implementation of the agreement. It seems that exporters do not expand their exports to this market before knowing the potential benefits of the agreement. In fact, all the growth observed for exports to this market for these two countries seems to be a consequence of the duty reductions granted by US to Central American exporters in the agreement. Nicaraguan exports show a positive trend in exports to US during the whole period whereas Dominican exports have an erratic pattern.

Exports to other CAFTA countries depict two different scenarios for the exporting countries considered here. Salvadorian exports to other CAFTA countries grow between 2003 and 2005 probably as anticipation to the agreement but since then the pattern is reversed. In fact, the previous growth vanishes during the financial crisis and the volume of exports in 2009 is not

significantly different to the value observed at the beginning of the sample for this country. This is some evidence of lower diversification of the country's exports and missed opportunities to enlarge the export capacity of firms in favorable conditions. On the other hand, export patterns of the remaining countries show a positive and continuous trend in exports to other members in the agreement.

Figure 11: Exports to other CAFTA members



Considering each signatory country separately, Salvadorian exports to Guatemala, its second most important partner, go down by 7 % between 2003 and 2008. Meanwhile, exports to Honduras increase by 33%, flows to Nicaragua triple and Dominican Republic which was not a major destination for exports in 2003 becomes the 10th destination in 2008[39]. On the other hand, exports from Guatemala to the CAFTA region grow significantly (136%) between 2003 and 2010[40] and the most marked surge of exports is also related to Dominican Republic (233% from 2003 to 2010) which reaches similar levels to those exported to Nicaragua in 2003. The most important partner in the region is El Salvador and exports to this destination almost double during the period. Similar performances are observed to the other two partners in this region (118% Nicaragua and 136% Honduras). During this period, Guatemala becomes the second larger exporter of goods within the agreement. Nicaraguan exports to El Salvador, their preferred destination in the region, were doubled (125%) and those to Guatemala and Dominican Republic increased substantially (202% and 289% respectively). Guatemala becomes the second market of Nicaraguan exports given that export growth to Honduras was mitigated (54%). The volume of Dominican exports to the region was around 30 USD million and 75% of it was shipped to Honduras. Therefore, growth rates are extremely high and even exports to Honduras were easily doubled during the period[41].

All exporters suffer from the negative effect of the global crisis in 2008-09 and its effects are clearly reflected in the previous tables and figures, however Dominican and Nicaraguan

[39] Export volumes to Dominican Republic in 2008 were 10 times volumes in 2003.
[40] This result is independent to the final year considered and holds for any of the last 3 years in the sample.
[41] For the rest of destinations, growth rates ranges between 260 and 600%.

exporters were better prepared to counter this adverse situation in their major markets and contraction are less than 10% in all cases[42]. A similar figure is drawn by Guatemalan exports to the US but those to the region drop by 18% in 2009. Drops in El Salvador are even more important than in any other country in the region (US: -23% and CAFTA:-19%).

3.3. Trends at the goods/commodities level

Growth of exports to the US is very heterogeneous and around half of goods (at HS 2 digit classification level) exported by Central American countries experiences a negative growth during the period. In Dominican Republic, two thirds of exported goods have positive growth. Most of positive and negative changes are concentrated in few good categories. In general, the expansion of exports at the sectoral level is robust over the whole period and is not affected by the implementation of the agreement. Conversely, negative growth by certain categories of goods is mainly due to changes occurred after the entry into force of the DR-CAFTA.

Consider first changes of exports to the US market. In Guatemala, two sectors account for an increase of US$ 601 million in export volumes since 2007 (ores slash and ash: US$ 422 million and edible fruits: US$ 179 million). The next four sectors account for a total of US$ 176 million (coffee, sugar, edible vegetables, and electrical machinery). In El Salvador, five sectors account for an increase of US$ 488 million and the largest increase is by knitted apparels and clothing (US$ 334 million). The other sectors are pearls and stones (US$ 54 million), coffee (US$ 44 million), sugar (US$ 28 million) and not-knitted apparels and clothing (US$ 28 million). Not-knitted apparels and clothing (US$ 156 million), pearls and stones (US$ 101 million), coffee (US$ 96 million) and meat (US$ 82 million) are also among most growing sectors in Nicaragua. Dominican exports of pharmaceutical products (US$ 65 million), plastics (US$ 59 million), optical and medical instruments (US$ 57 million), sugar (US$ 42 million), footwear (US$ 41 million) and tobacco (US$ 40 million) account for the largest positive changes.

Guatemalan exports recording the most significant reductions are two sectors related to textiles and their joint reduction is US$ 278 million. Other sectors experiencing decreases in exports are 34 (US$ 17 million), fish and crustaceans (US$ 13 million) and 90 (US$ 12 million). Salvadorian exports of beverages reduce the most between the implementation of the agreement and 2009 shrinking by US$ 93 million. All other reductions are for less than US$ 5 million. Nicaraguan exports show limited losses in this market and in fact, only three sectors (edible fruits, ceramic products and fish and crustaceans) reduce their exports by more than US$ 5 million summing up to US$ 21 million. In contrast, some Dominican exports show significant reductions since the agreement. Not-knitted apparels and clothing reduces its volume by US$ 480 million and other important reductions are observed in pearls and stones (US$ 82 million),

[42] Nonetheless, Nicaraguan exports to the CAFTA region follow a decreasing pattern since the end 2008 and consequently, they haven't yet recovered to previous levels.

boilers and machinery (US$ 41 million), knitted apparel and clothing (US$ 31 million), and iron and steel (US$ 24 million).

Concerning exports to CAFTA, export growth is more equally distributed among sectors however the evolution differs by country. Very few and particularly small reductions are observed in Guatemala and Dominican Republic. Changes in exports to the CAFTA region are smaller than changes to the US market except for El Salvador. In Guatemala, the sectors expanding the most are: knitted or crocheted fabrics (US$ 72 million), mineral fuels, mineral oils and products of their distillation (US$ 55 million), animal or vegetable fats, oils and waxes (US$ 44 million), aluminum (US$ 36 million) and miscellaneous edible preparations (US$ 30 million) and. Only 3 other sectors (oil and resinoids, rubbers and articles thereof, and sugar) reduce their volumes of exports by more than US$ 5 million (total US$ 26 million). On the other hand, the distribution of export growth between Salvadorian sectors is very heterogeneous and large increases and decreases are observed. The largest expansions occur in plastics and articles thereof (US$ 62 million), paper and articles of paper (US$ 45 million) and beverages (US$ 32 million). The most important contraction is in apparel and clothing, knitted and not-knitted (-US$ 456 million). Coffee exports also reduce significantly by US$ 118 million during the same period. Nicaraguan exports of dairy increase by US$ 57 million to the region and by US$ 12 million in miscellaneous edible preparations. The most notorious contractions were meat (-US$ 22 million) and live animals (-US$ 20 million). Not a single Dominican sector reduces its volume to the region by more than US$ 5 million and the two most significant increases are mineral fuels (US$ 32 million) and cotton (US$ 13 million).

To sum up, the extent to which countries have benefited from favorable conditions of market access to the US market and the CAFTA region differs significantly. At the aggregate level, Nicaragua and Guatemala exporters perform well into both markets. On the other hand, Salvadorian exporters focus mainly in the US market and are less active in Central America. In all countries, exports to non-members have expanded more rapidly than to the two main markets. Concerning changes at the sectoral level, they are mainly concentrated in few sectors and the most relevant are related to exports to the US. Specialization within the agreement is taken place since some of the largest reductions of a country might be the largest increases of another one.

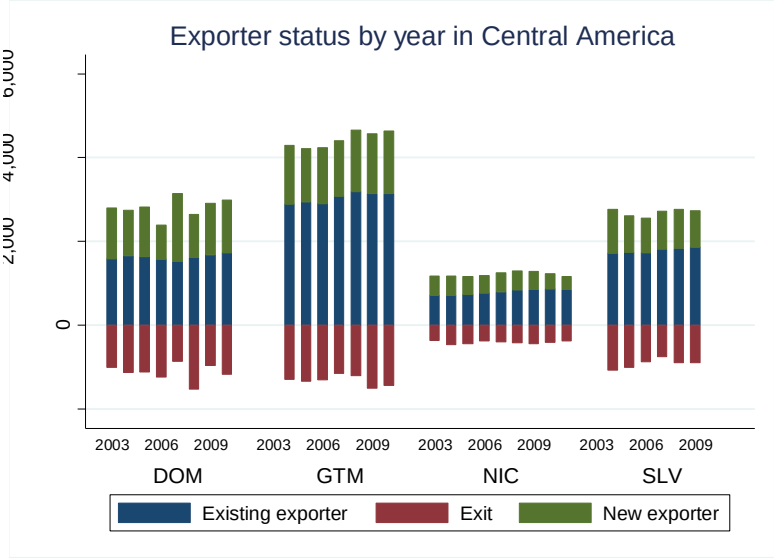
3.4. Firm-level extensive and intensive margin patterns

In order to evaluate the entrance of new exporters and their survival, firms are classified into three different statuses: new, existing and exit[43]. A *new* firm is a firm that exports in year *t* but does not export in year *t-1*, an *existing* firm exports in both years *t* and *t-1* and a firm that *exits*

[43] Firms are classified using information in the current and previous years. Information beyond those years is not used. In consequence, a firm might be considered in several periods as a new firm if it enters and exits the market continuously.

the market is a firm that exports in year *t-1*, but not in year *t*. For all countries, the number of firms entering, remaining and exiting the market every year is shown in Figure 12.

Figure 12: Exporters by status[44]



Nicaragua shows a smaller number of exporters compared to its partners however this number is a downwards estimate given that only a fraction of total exports is considered for this country. The turnover of firms is high and on average, one third of exporters will not continue exporting from one year to the next one. The highest rates of exit are in Dominican Republic (42%) and Guatemalan exporters show a lower probability of exit than exporters from other countries (30%). In all countries, the entry into force of the agreement is accompanied by a drop in the proportion of firms that exit the market which is a sign that exporters tried to remain active. In Dominican Republic, the proportion of exiting firms increases significantly in 2007 (49%) and the current proportion remains at levels similar to those at the beginning of the period. On the other hand, Salvadorian and Nicaraguan exporters have continuously improved their survival rate[45].

In Guatemala, there is an increase in the number of newly exporting firms since DR-CAFTA took effect and the number of new exporters reaches 1,500 for the first time in 2010. In Nicaragua, this is declining over time and in the two remaining countries, there is no evidence of higher entrance despite some sharp movements around 2006.

Higher survival rates in El Salvador and Nicaragua and higher number of entrance in Guatemala has led to an increase in the number of exporting firms that remain active between two periods. The 2008-2009 financial crisis implies a slowdown in the number of exporters remaining active

[44] As no information on firms starting exporting in 2002 is available, the classification cannot be applied for 2003.
[45] Even though the proportion is lower in 2006 and 2007, Guatemalan exit rate of exporters is similar to levels observed in the beginning of the period. Nonetheless, it is still the lowest value among these countries.

given less entries and higher number of exits but there is no sign of a break or change in the tendency. Besides Dominican Republic, the number of exporters remaining active increases by 8-18% during the period and most of it is observed after the introduction of the DR-CAFTA.

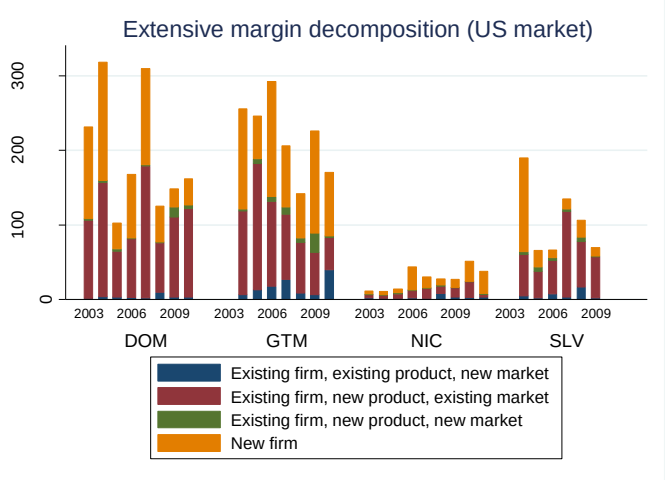
Concerning the growth of extensive margin of exports at the firm-level, we will distinguish exports at the firm-, market- and product-level and we will take into account if the firm is an existing or a new exporter. We consider 4 different types of growth at the extensive margin:

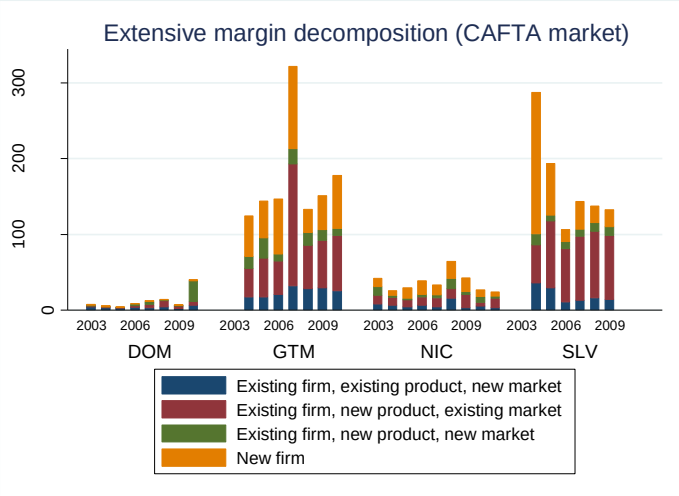
- Exports of products that were not exported previously to a given market, but the firm were already exporting the same product to another destination in year *t-1*.
- Exports of a new product to a market already served by the firm but the product weren't previously exported by the firm in year *t-1*.
- Exports of a new product to a new market where the firm weren't exporting in year *t-1*.
- Exports of a new exporting firm that starts exporting a new product to a new market in year *t*.

Figure 13 13 shows the extensive margin for the two most important markets for exports using the above disaggregation. The extensive margin to the US market is more important for Guatemala and Dominican Republic while the importance of the extensive margins in the two markets seems to be more equilibrated for Nicaragua and El Salvador. The two graphs point out a common conclusion: most of the growth in the extensive margin is due to the entrance of new exporting firms and the diversification, in terms of new products, of existing exporters. Some exporters in Guatemala were attracted by the favorable conditions of the DR-CAFTA and launch products to these destinations where they did not export in the past (blue bars) but export growth is not driven by this firms' behavior. A similar phenomenon can be observed for Salvadorian exports but limited to the CAFTA market.

At the beginning of the period, export flows generated by new entrants represent a significant share of the extensive margin in El Salvador and thereafter the launch of new products by existing firms in existing markets is the largest component. Dominican Republic shows a similar composition in the extensive margin to the US whereas the extensive margin by Dominican exporters to the CAFTA region is very limited. In Guatemala and Nicaragua, the volumes generated by entry of new exporters to these markets remain an important component of the extensive margin all over the period. However, it seems that the potential of the extensive margin is decreasing in the US market, especially for Salvadorian, Nicaraguan and Guatemalan exporters. On the other hand, the extensive margin to the CAFTA region seems to be a more stable source of growth and becomes a reliable and larger source of opportunities for Central American exporters.

Figure 13: Extensive margin by market and origin country





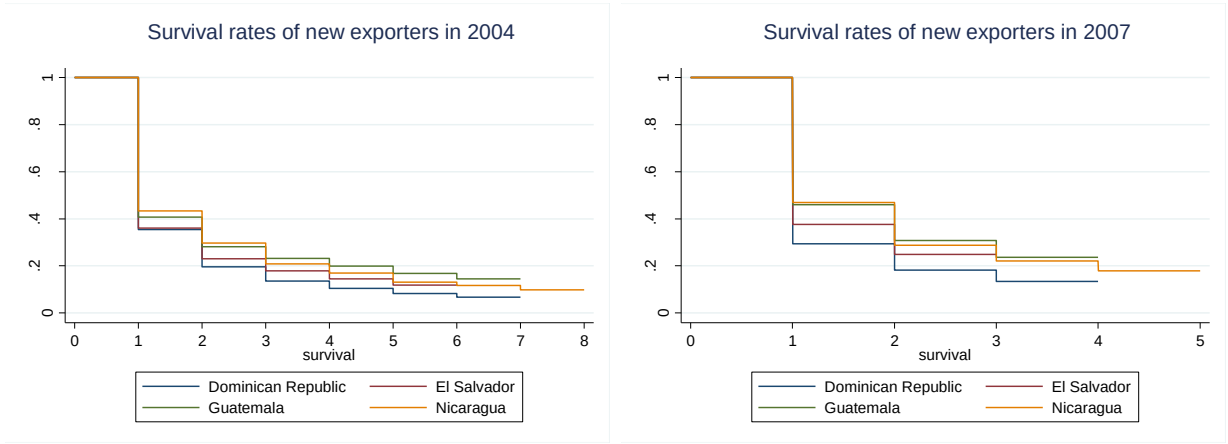
Undoubtedly, the regional trade agreement implied new opportunities for exporters and a clear sign of its benefits is the effect observed on the extensive margin in 2007 when firms already exporting to the region were able to start exporting new products to these destinations and new firms started exporting to these markets. However, only few firms active in other destinations expand their exports to the DR-CAFTA members (blue and green bars) and we can conclude that diversification of existing exporters is mostly concentrated at the product dimension for firms already active in these markets.

In the case of new exporters, it is appropriate to evaluate their chances of remaining active for next periods. This is a sign of the competitiveness and productivity of national exporters in foreign market and the next Figure shows the survival rate of new exporters as a share of number of new exporters in a specific year. Exit rates among new exporters are known to be high and only one every four new exporters in El Salvador and Dominican Republic will still export two years after its entrance. In the other two countries, the exporter survival rate after two periods is

around 30%. Compared to results by Besedes and Prusa (2006) where the median duration of exporters in the US market was between two and four years, survival rates in the region are substantially lower.

At the medium term, Guatemala is the country that shows the better performance, one fifth of its new exporters will continuously export for five subsequent periods. Nicaragua and El Salvador show a lower rate and 15% of new exporters will still export in year *t+4*. Dominican survival rate after 4 periods is barely higher than 10%.

Figure 14: Survival rates of new exporters in Central America



Comparing survival rates before and after the entry into force of the agreement cannot be easily done given that the number of observed periods changes and decreases from year to year. Nonetheless, it is clear that Nicaragua and Guatemala are the two countries where the chances of survival are highest in the region. Dominican Republic shows a drop in its survival rate in 2007 but there is no clear pattern in this country and rates differ substantially from one year to another. A temporary improvement of the survival rate is observed in almost all countries for entries in 2006, but it vanishes in following years and there is not a significant difference between rates at the beginning and at the end of the period.

Another relevant aspect to study is the evolution of the intensive margin after the implementation of the agreement. In fact, the intensive margin which refers to already established relationships at the firm, product and destination levels will be considerably affected by the ease of exporting procedures adopted by signatory countries. Indeed, many scenarios might be possible at the intensive margin e.g. specialization of countries within the region for a given good will increase exports of that good for the specializing country at the expense of volume reductions by other countries.

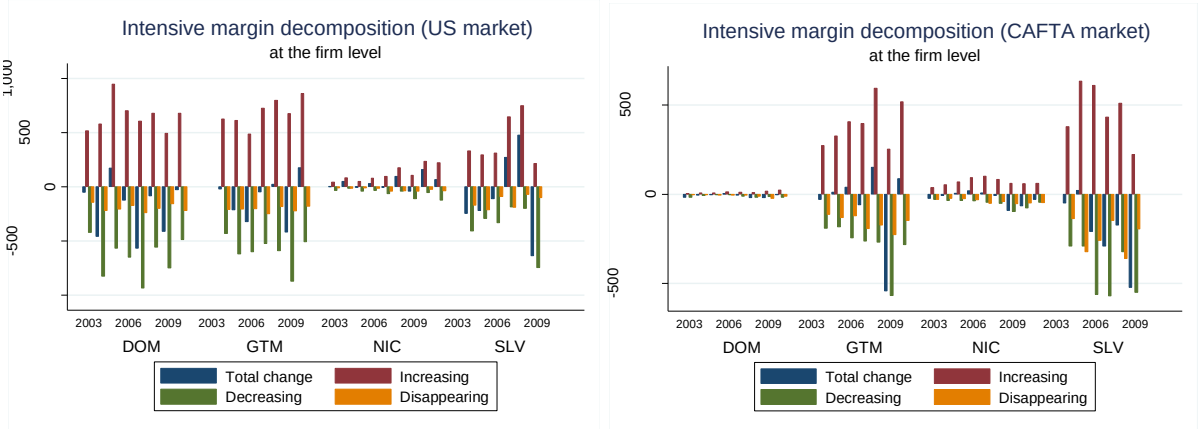
In order to disentangle the different changes that might be occurring at the intensive margin, we decompose it into three categories:

- Export relationships whose volumes increases between year *t* and year *t-1*
- Export relationships whose volumes decreases between year *t* and year *t-1*
- Export relationships that were active in year *t-1* but are not longer exported in year *t*

Figure 15 shows this decomposition of the intensive margin for the US market and the CAFTA market. As expected, changes in the intensive margin are, by far, more important and each of the first two components of the intensive margin by itself concerns higher volumes than the entire extensive margin except for exports to the CAFTA region in some years. The intensive margin in the US market is almost twice the changes in the CAFTA market. The volume implied by disappearing relationships remains relatively unchanged in both markets. In fact, the negative impact of the financial crisis is clearly observed but it is mostly concentrated by decreasing export volumes than by disappearance of exporters. This is result is consistent with Bernard et al. (2009) finding that the intensive margin changes accounts for most of US exports' decline during the 1997 Asian crisis.

In some cases, exports of signatory countries to members of the agreement significantly decrease after 2006 as shown by Salvadorian and Guatemalan exports to the CAFTA region or Dominican exports to the US market. Specialization of "neighbors" might partially explain the exit of less efficient exporters. These reductions/losses might be significant in terms of export growth and for example, in the case of Salvadorian exports to the CAFTA region and Dominican exports to the US market, large decreases in exports jointly with volumes of firms exiting export relationships in those countries dominate the positive effects at the intensive margin.

Figure 15: Extensive margin by market and origin country



Positive changes at the intensive margin are becoming larger over time in almost all cases analyzed here and when all destinations are considered, this trend becomes clearer[46]. However, little evidence of the benefits of the agreement can be detected at the intensive margin by considering total changes. Nicaraguan and Salvadorian exporters to the US market and

[46] See Figure A2.

Guatemalan exporters to the CAFTA region seem to benefit of enlarged access granted by members but gains are very limited.

3.5 Quantitative analysis and results

First, we are interested in testing if duty reductions granted by regional partners implied new export opportunities for Central America in terms of entrance of new exporters and increase of market and product coverage by incumbent exporters. Moreover, we will also evaluate the impact of the agreement on exporters' survival. Thirdly, we will consider relative changes in volumes of export flows by considering the extensive and intensive margins together in order to verify the impact of duty reductions on flows.

Changes at the extensive margin

Our first empirical test is on *durable* entries by new exports after tariff reductions and we define a durable entry as a product-market relationship started by new exporter in year *t* which remains active at least for the next two consecutive periods. Conditioning on durable entries shrinks the sample used in the empirical analysis because the condition cannot be verified for entries in the last two years in each country. Nevertheless, our condition enables us to talk about exporters that succeed exporting a product and our results do not mix successful entries by firms with the behavior of exporters that enter a market in order to learn about their profitability and cost of exporting.

We run the following regression separately for each source country:

$$NewExporters_{jpt} = \beta_1 \Delta tariff_{jp(6)t} + \alpha Controls + \gamma_{kt} + \delta_{jt} + \varepsilon_{jpt} \quad \text{Eq.(1)}$$

where the dependent variable is the number of new entrants exporting product p (at the HS 8-digit level) to country j in year t and $\Delta tariff_{jp(6)t}$ is the absolute value of the relative duty reduction (in percentage points) granted by partner j in its tariff schedule for year t (averaged at the HS 6-digit level)[47] [48]. If tariff cuts implied lower costs of trade and therefore increased market access after the implementation of the agreement, the expected sign for β_1 is positive. γ_{kt} and δ_{jt} are sector-year[49] and destination-year fixed effects in our specification and all the regressions included them unless specified differently. Errors are clustered by product and destination as an attempt to control for autocorrelation of residuals in that dimension given that it ensures an averaged error by product and destination equal to zero.

[47] We consider that tariffs vis-à-vis Central American countries and Dominican Republic remain unchanged and therefore, the variable equals to zero for export flows to all other destinations beyond the DR-CAFTA members.

[48] Absolute tariff reductions in percentage point and a dummy variable in case of duty reductions were also considered to check the robustness of our results. Qualitative results are the same and results are available upon request.

[49] Sectors are defined at the HS 2-digit level otherwise most of our control variables would be excluded by fixed effects.

We include several controls in particular to take into account capacity and information spillovers, import tariff reductions of inputs and comparative advantage. Capacity spillovers are captured by the number of exporters of the same product *p* to the same destination in year *t-1* which might be seen as a sign of potential profitability by new exporters. This variable indicates the spread of broad knowledge in the production, export requirements and sales of a good among different firms in the country which is a complex chain of activities where proficiency in each task is crucial[50]. The nonexistence of these capabilities will substantially constrain the likelihood of exports. Cadot et al. (2010) find evidence on information spillovers of incumbent exporters which deter the success and survival of new exporters in four African countries. Spillovers are product specific and go beyond the knowledge required for creating the good[51]. The import tariff cut weighted by intermediate needs of inputs will account for the potential benefits of duty reductions granted by exporting countries which allow national exporters to have access to inputs at lower costs in international markets and therefore improve the productivity by lowering production costs. This variable is specific at the HS 6-digit level and it is calculated using the coefficients in the most recent versions of input-output tables of the Global Trade Analysis Project (GTAP)[52] as weights. We also add a normalized measure of comparative advantage (NRCA)[53] which will help us distinguishing whether exporters are entering into products that are not intensively exported by each country or prefer to remain trying to export more traditional goods. The NRCA is a transformation of the traditional Revealed Comparative Advantage (RCA)[54] index whose values range between zero and infinity: $NRCA = (RCA - 1)/(RCA + 1)$. The NRCA is calculated at the HS 4-digit level for every year in the sample using UN Comtrade data, it is symmetric around zero ranging between -1 and 1 and positive values indicates that the country has a revealed comparative advantage in that good given that the share of total exports for that good is higher that the share of that good in world exports. We also include interactions between variables to capture potential competition effects and non-monotonic effects of duty reductions. Fixed effects included in our regression will control for any particular shock in any destination country or in a particular sector such as temporary demand shocks in goods or aggregate demand shocks in a given destination market.

The three first columns of Table 2 show the results of this specification using controls previously mentioned and interactions as explanatory variables. The coefficient of duty reductions is statistically significant in all regressions but its negative estimate is opposite to the expected

[50] In fact, exporting implies a network of activities which is likely to affect the magnitude and nature of trade patterns (Bernard et al. (2010)).

[51] For example, Freund and Rocha (2010) focus on the impact of infrastructure on African exports' performance.

[52] The input-output table for Guatemala was originally created by the Secretaria General de Planificacion de Guatemala for 2001. For El Salvador, we use the input-output table made available by GTAP for rest of Central America given that a specific table for El Salvador was unavailable.

[53] See Laursen (1998).

[54] The Revealed Comparative Advantage index for product k in country i and year t is calculated using the following formula: $RCA_{ikt} = (x_{ikt}/X_{it})/(x_{wkt}/X_{wt})$ where x_{ikt} are exports of country *i* in year *t* of product *k*, X_{it} are total exports of country *i* in year *t* and the subscript *w* denotes world values.

sign. However, its interpretation should be done in light of the full derivative with respect to duty reductions:

$$\frac{\partial NewExporters}{\partial\, \Delta tariff} = \beta_1 + \beta_3 Log(exporters_{t-1})$$

given that this interaction is statistically significant in our results. In reason of opposite signs of estimates, our results imply that tariff reductions have a positive effect on the entrance of new exporters in product-market relationships whenever countries have cumulated some favorable conditions in the production of goods, in its export procedures to those markets and certainly in the sales capacity or knowledge of goods to those markets. Otherwise, duty reductions per se are not a sufficient condition to stimulate entries of new exporters.

The presence of incumbent exports is seen by new exporters as a sign of potential gains however all marginal effects on this variable are decreasing on the number of exporters given that increased competition makes entries less likely. Furthermore, attractiveness is marginally increased by tariff reductions and higher (lower) in sectors where the country has (has not) a comparative advantage. The negative coefficient of its interaction with import tariff cuts might be interpreted as a competition effect of incumbent exporters on new exporters. Indeed, incumbent exporters are much more aware on how to take advantage of cheaper inputs and they can reduce their production costs much quicker than new exporters.

Entry in sectors where the country has a comparative advantage is positively affected by import tariff cuts as these reductions accrue potential profits but as mentioned before, incumbent exporters might capture most of these benefits.

Last but not less important is the estimate related to revealed comparative advantage. It shows that new exporters would prefer to start exporting product not intensively exported by others in the past, probably because the export market of traditional products is overcrowded. This is a sign of diversification at the product level for new exporters. Import tariff cuts do not reach statistical significance in all countries and some little evidence of its positive effect is observed in Dominican Republic.

In the last three columns of Table 2, a measure of exposure to external financial dependence at the HS 2-digit level is included[55]. Bricongne et al. (2010) calculated this measure using French firm level data and it takes into account the needs for external investment in HS sectors à la Rajan and Zingales (1998). Given that fixed effects already control for variability at the sectoral level in our empirical analysis, we interact this measure with the two tariff reductions (faced and import). We would expect that faced and import tariff reductions will imply less financial constraints for firms and consequently, that reductions will reduce the financial tightness of new

[55] In fact, Iacovone and Zavacka (2009) show that sectoral performance in previous crises is affected by financial exposure.

exporters. Our results do not show any significant results in this sense for any of these countries[56].

Our second test is on the number of durable launches started by incumbent exporters during a given year and our specification is analogous to Equation (1):

$$AdditionalExporters_{jpt} = \beta_1 \Delta tariff_{jp(6)t} + \alpha Controls + \gamma_{kt} + \delta_{jt} + \varepsilon_{jpt} \qquad \text{Eq. (2)}$$

where the dependent variable is the number of additional export relationships launched by incumbent exporters in product *p* (at the HS 8-digit level) to country *j* in year *t* and $\Delta tariff_{jp(6)t}$ is the absolute value of relative duty reduction (in percentage points) granted by partner *j* in its tariff schedule for year *t* (averaged at the HS 6-digit level). The expected sign for β_1 is positive given that lower costs of trade induces incumbent exporters to launch new product or to try out new markets. γ_{kt} , δ_{jt} and controls variables are those included in the previous specification.

Table 3 shows the results of our regressions of Equation (2). The variable for duty reductions which is our main interest has rarely an impact on the number of new relationships started by incumbent exporters. In fact, the regression for Guatemalan exporters is the only one where the variable achieves standard levels of significance and the pattern shown in this country is similar to the one observed in new exporters. The total effect might be positive only in presence of certain level of capabilities in the production of good *p* to be sold in country *j* at year *t*.

Capability and knowledge spillover is the most significant variable while explaining the decision of incumbent exporters to launch new products. Its total effect depends on the comparative advantage by sectors and the reduction of input costs by lowering import duties:

$$\frac{\partial AddExporters}{\partial\, \Delta tariff} = [\beta_2 + \beta_4\, NRCA + \beta_6 Imp.Tariff\ cut] \times \frac{1}{exporters_{\mathrm{t-1}}}$$

In all cases, β_4 is positive which means that spillovers are amplified in sectors where competitiveness is very relative high and reduced in case of low performance. The change of sign in β_6 between countries points out that an incumbent exporter in Central America has fewer chances to benefit from cheaper inputs than a firm in Dominican Republic. Dominican exporters already present in that market do not absorb all benefits of import duty reductions and in consequence, they do not discourage launches by incumbent exporters in other markets as they do with new exporters.

Incumbent exporters launching new export relationships are less tempted to enter markets where the country has a comparative advantage in order to avoid tougher survival conditions imposed by incumbent in those markets. Import tariff cuts have positive incentives on entries into export relationships known by their international competitiveness. The joint effect of financial

[56] Bricongne et al. (2010) find that being exposed to credit constraints has been an aggravating factor to French exporters during the financial crisis and it had an impact in both margins which is not the case in our sample.

constraints and import tariff reductions is not homogenous across countries and in cases of duty reductions, entries in financially constrained sectors are more likely to occur in Dominican Republic.

Survival rates on new export flows

If lower faced tariffs imply lower uncertainty for national exporters in term of sales in foreign markets as proposed in Besedes and Prusa (2011), we would expect that tariff reductions will increase the survival probability of export flows. Our third test considers the likelihood of producers to exit an export relationship. Before considering this issue, some caveats need to be clarified. Given left censorship in firms' export spells, only relationships started within the period of our sample are included in this analysis. Indeed, only export flows that were considered as new in at least one year of the period 2003-2010[57] are considered here[58]. Right censorship impedes us of knowing if export flows remain active after the last year observed. In consequence, data for the last year cannot be used here.

We run a linear probability model on a dummy variable which takes the value 1 if the firm stops exporting in that relationship after this year and zero otherwise. We include different measures as control variables and they are intended to capture the exporter's experience at the product and market level. Market experience is proxied by the number of products exported in year *t-1* to country *j* and product experience is given by the number of markets where the firm exported the same product *p* in year *t-1*. We also include a measure considering the core products of a firm where the exporter would show fewer tendencies to exit the market. Core products are proxied by exports of product *p* in year *t-1* with respect to total exports in *t-1*. Other controls include the number of years as an exporter and a dummy variable for multiproduct firms in year *t-1*. The last two controls were found as relevant explanatory factors for explaining a lower probability of exiting in Bernard et al. (2003). In a second stage, we include our proxy for comparative advantage and an interaction of it with the duty reduction granted by the partner. Equation (3) shows the specification used here:

$$Prob\left[exit_{ijpt} = 1\right] = \beta_1 \Delta tariff_{jp(6)t} + \alpha Controls + \gamma_{kt} + \delta_{jt} + \varepsilon_{jpt} \quad \text{Eq. (3)}$$

Table 4 presents the results of the probability of exiting a product-market relationship by a firm. Except duty reductions, all coefficients are statistically significant and have the expected sign. Firms are more likely to remain active in their core competencies. The experience acquired by exporting other products to the same destination has not a major role in the decision of remaining active in an export relationship. Product experience is an important determinant of the likelihood of exit and it points out that firms that are highly competitive for a specific good in several markets will have less tendency to exit foreign markets. The cumulated years as an exporter have

[57] We cannot determine if a firm exporting in 2003 was a new exporter or not, so all firms active in 2003 are excluded from this framework.
[58] The periods considered are 2004-2008 in El Salvador and 2004-2009 for Guatemala and Dominican Republic.

an impact on the probability of exiting and its effect becomes stronger as the firm cumulates international experience. It shows that established exporters are able to overcome difficulties in new relationships and that exporters keep learning and improving their own profitability. Finally, multi-product exporters manage to cope better with risks associated to each relationship and on average, their probability of exit is 4.9% lower. The latter variable and the product experience are the most relevant covariates in the decision of exit by the firm. The number of years as an exporter is a second-order determinant of the likelihood of exit however its importance increases continuously over an exporter's life.

Goods whose competitiveness is confirmed beyond national borders have better chances of remaining active in that market and therefore firms' trials into "new opportunities" out of traditional exports imply a higher risk. The number of exporters already established in the market has also a positive and significant effect on the chances of survival of new flows. This effect might be explained by the availability and/or acquisition of necessary capabilities in activities related to the export of good *p* to destination *j*. In Table 5, we include import tariff cuts as controls and their estimates are insignificant which might be explained by a lower likelihood of new exporters to incorporate lower input costs.

In order to estimate the financial dependence of each firm, we create a weighted measure where weights are given by the share of firm's exports in each HS sector. It shows that firms that are financially dependent activities will face higher constraints and risks and therefore, their export survival will be lower. A last control variable i.e. *shadow of growth* included in the analysis of survival of exports is the median growth rate[59] at the flow level measured between periods *t-2* and *t-1* if the flow was observed for those periods and zero otherwise. It is supposed to capture the performance at the flow level and export relationships with a positive growth rate are less prone to be dropped. Our results confirm this fact in all countries.

Changes at the flow level

As shown in the descriptive analysis, changes at the extensive margin are less important in terms of volumes compared to change at the intensive margin. This is the reason why we will try to develop in this subsection framework that enables us to consider all changes at the flow level. Therefore, we follow the methodology recently used by Bricongne et al. (2010) and we calculate the median growth rate (MGR) of flows at the firm-product-destination level:

$$MGR_{f,p,j,t} = \frac{x_{f,p,j,t} - x_{f,p,j,t-1}}{\frac{1}{2} \times (x_{f,p,j,t} + x_{f,p,j,t-1})}$$

The MGR allows us to consider all changes simultaneously and it ranges between -2 for a flow disappearing in year *t* and 2 for a new flow. We evaluate the impact of duty reductions and all

[59] The calculation of the median growth rate is detailed in subsection 5.3.

controls included in our previous specifications in the aim of explaining the variability of growth at the flow level.

The first three columns of Table 6 show the results using mainly product and market information. Results using this information are similar to those obtained while working uniquely at the extensive margin. Duty reductions are negatively correlated with higher levels of growth probably given that competition is increasing in the destination country. Nevertheless, firms might grow after duty reduction if a sufficiently large spread of capabilities to the product-market exists in the exporting country. A larger number of competitors in the same product-market imply fewer possibilities of growth for each competitor. Import tariff cuts have a positive impact on growth perspectives but the incumbent exporters can quickly seize all the potential benefits. Products where the comparative advantage of the country is more pronounced have a higher growth potential in international markets. The weighted EFD is the only firm-related information that we include at this stage and given that its estimate changes for extended versions of the specification, we avoid interpreting it here in reason of a possible omitted variable bias.

Our second step is to include firm characteristics to our specification. The most relevant feature of this extended version is the increase in the explanatory power. Indeed, information related to the firm experience is the most relevant explanatory dimension to be considered while explaining exporters' performance. All variables that we use to proxy different types of exporters' experience affect negatively the growth rate at the flow level. In fact, exporters that have cumulated experience in different markets and products might have already covered most of their expansion possibilities and growth expectations are relatively low in these markets. Multi-product exporters are also less flexible and reactive as a consequence of complex production and decision structures which might have a substantial cost in term of growth at the flow level.

Our last version includes the measure of growth in previous period if the flow exists during all those periods, otherwise the variable equals zero. The negative estimate points a cyclical pattern of growth where increases or decreases at the flow level tend to slow down in the following period. Finally, exporters subject to higher financial dependence are more likely to have higher rate of growth. Besedes et al. (2011) find that more constrained exporters tend to grow faster once they managed to establish their presence in foreign markets. In fact, entry size of these firms is relatively small and therefore growth perspectives are higher for firms remaining active in the market[60].

[60] This result might also be explained by the fact that innovating exporters are those who might be exposed to higher financial dependence. Furthermore, access to external finance demands a developed business plan and therefore better knowledge of the activity and its profitability.

3.6 Firm-level analysis conclusions

Studying the exports' dynamics of signatory countries of the DR-CAFTA we found that Central American (and Dominican) aggregate exports have increased during the last decade. Some evidence on the acceleration of this expansion and on product- and market-diversification is observed after the implementation of the agreement. But, despite favorable conditions in the most important export markets for these countries, we believe DR-CAFTA countries have not fully exploited all the benefits. Salvadorian exports to Central American countries have been disappointing and these exporters seem to focus exclusively on the US market. On the other hand, Guatemalan and Nicaraguan exporters have significantly increased their export volumes to all signatory countries. The most significant changes at the HS 2-digit are concentrated in the US market and while analyzing changes at the sectoral level, some concentration/specialization of countries into some products is detected.

Considering the extensive margin decomposition of export growth, we notice that product diversification of incumbent exporters – those already serving countries in the agreement – and new exporters are the most important source of growth of this margin. Furthermore, the extensive margin in the CAFTA region has gained importance over the period and currently, it has a weight similar to the extensive margin in US market. Nonetheless, Central American exporters have failed to attain higher survival rates and exit rates for new exporters remain at high levels besides a temporary improvement in 2007. For all countries, changes at the intensive margin are much more important than those at the extensive margin and that is the reason for considering both margins in the scope of our quantitative analysis.

Our empirical results show that duty reductions granted by partners are not a sufficient condition for increased market penetration and their impact will depend on capabilities already developed by incumbent exporters. In fact, positive spillovers of incumbent exporters active within the same market and product will allow new entrants to benefit from better conditions to export and in that case, faced tariff reductions might be accompanied by *durable* entries of new exporters. Duty reductions have no impact on the diversification decision of incumbent exporters (launch of new products or entry into new markets). For new and incumbent exporters, we find evidence of diversification into non-traditional goods and import tariff reductions have little impact on the entry decision probably because incumbent exporters are the most likely to capture all benefits coming from lower input prices. In both cases, the presence of incumbent exporters is seen a sign of potential profitability by outsiders to the product-market relationship.

Duty reductions granted through the DR-CAFTA have almost no impact on survival rates of new export flows and therefore uncertainty related to exports has not been affected by the implementation of the trade agreement. These rates are mainly explained by the export experience and firm characteristics. The revealed comparative advantage of the exported good will significantly increase the survival of the export relationship. Furthermore, firms with a higher exposure to external financial dependence have a higher rate of exit.

Considering both margins together in the median growth rate of export flows, we find little impact of duty reductions and when statistically significance is achieved, its effect depend on the existence of product-market capabilities within the country. Import tariff cuts have a positive effect on growth perspectives and the number of incumbent exporters is a sign of tougher competition. Financial dependent firms might grow rapidly if they manage to establish their products in foreign markets. However, the most important explanation of growth perspectives at the flow level is related to firm- and product-information.

Our findings call for the establishment of economic policies by national governments that allow new and incumbent exporters to exploit the favorable conditions generated by the DR-CAFTA. It is necessary that countries create capabilities that make possible the export of goods which involves a network of activities beyond production e.g. export services, sales capacity in foreign markets or transport infrastructure. It is also important that countries promote export diversification and consequently support higher risks associated with these activities i.e. firms entering non-traditional export relationships or facing challenges related to financial exposure of the production. Diversification is the only way to avoid volatility related to narrow export bundles and it is a necessary condition for the discovery of new and most profitable goods that ensure sustained export growth.

Annex 1: Complete Trade Outcomes Analyses

A. Costa Rica

PART I: ORIENTATION AND GROWTH

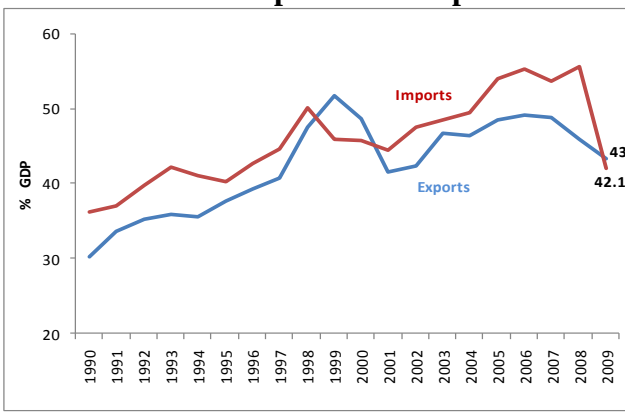
1.1. Exports, Imports and Trade Balance

Costa Rica's exports of goods and services as percentage of GDP increased from 30 percent in 1990 to 51.7 percent in 1999, sharply declined between 1999 and 2001 (from 51.7% to 41.5% of GDP), and then recovered reaching 48.8% of GDP at the onset of the financial crisis in 2008. Imports of goods and services increased from 36.3 percent in 1990 to 55.6 percent in 2008 and had a higher share of GDP than exports over the period with the exception of 1999 and 2000. Both exports and imports declined severely in 2009 with the latter decreasing more steeply to result in the third yearly trade balance surplus in two decades (Figure A1, left panel).

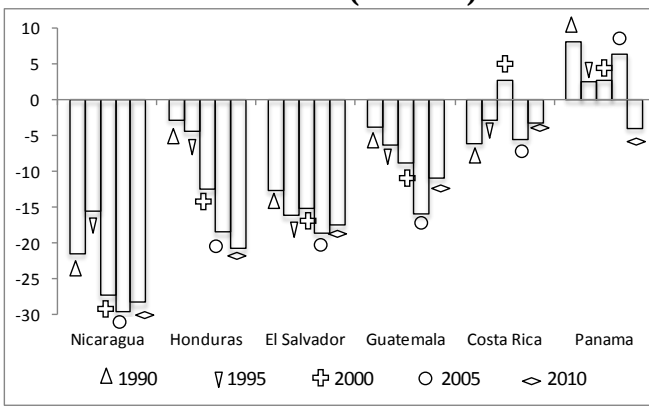
Although Costa Rica had a negative trade balance for the most part of the last two decades, the deficit remained low and stable (on average 3.5% for the last two decades) and unlike other countries did not expand constantly (Figure A1, right panel). With the exception of Panama, Costa Rica is the only country in the region without consistent two digit trade deficits.

Figure A1

Costa Rica: Exports and Imports



Trade Balance (% GDP)



Source: World Development Indicators

1.2. Openness to Trade

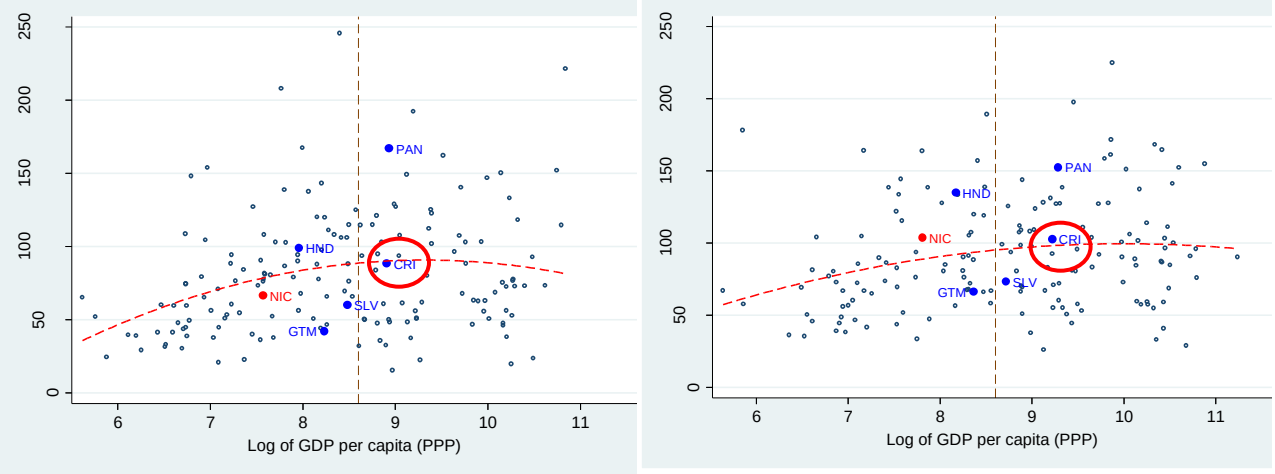
The trade-to-GDP ratio is one of the most basic indicators of openness to foreign trade and economic integration. It weighs the combined importance of exports and imports of goods and services relative to GDP in an economy. The ratio gives an indication of the dependence of

domestic producers on foreign demand and of domestic consumers and producers on foreign supply. There is a concave relationship between trade openness and per capita income: countries tend to trade more as incomes rise, but at a decreasing rate.

Costa Rica's relative position along the predicted curve in 1996-1998 indicates that openness to trade was just what was expected given the country's income per-capita level, i.e. on average, countries of similar income showed about the same trade participation over GDP[61] (Figure A2, left panel). During 2006-2008 that indicator didn't change that much as Costa Rica's relative position just above the predicted curve shows.

Figure A2

Openness to Trade (Average 1996-1998) **Openness to Trade (Average 2006-2008)**



Source: World Development Indicators

1.3. Composition of Exports

Costa Rica's distribution of goods exports across broad sectors shifted heavily from fruits/vegetables and textiles towards more technology-intensive sectors like computer parts and medical instruments between 1996-98 and 2006-08 (Table A1).[62] Exports were concentrated in vegetables, textiles and clothing, and food products in 1996-98, which made up two thirds of the country's total export basket. In 2006-08, this export share had fallen to one third, reflecting relatively low annualized growth rates of vegetable exports and negative growth rates for the textiles/clothing exports (their value declined by 50 percent over this period). On the other hand, Costa Rica increased its reliance on more sophisticated products, such as machinery/electronics and miscellaneous (medical instruments). These two sectors and the vegetable[63] and foodstuff

[61] In figure 9 the dotted line represents the world average GDP per capita (in logs) in each period. In both periods of time, the world average per capita income was around exp (8.6) which is US$6000 at PPP.
[62] In order to avoid one year spikes that might skew our data, we use three year averages (1996-98 and 2006-08) of export values.
[63] This category includes vegetables and fresh and dried fruits.

sectors are the only ones in which Costa Rica currently has revealed comparative advantage (RCA).[64]

Table A1. Costa Rica: Export Basket and revealed Comparative Advantage

		Average 1996-1998			Average 2006-2008			
	Sector	**Exports**	**% of total**	**RCA**	**Exports**	**% of total**	**RCA**	**Average Annual Growth Rate**
01-05	**Animal**	153.7	3.0	1.1	217.4	1.3	0.8	3.5
06-15	**Vegetable**	2,160.5	42.0	10.2	3,792.8	22.8	8.7	5.8
16-24	**Food products**	342.9	6.7	1.7	842.9	5.1	2.0	9.4
25-27	**Minerals**	8.8	0.2	0.0	45.6	0.3	0.0	17.9
28-38	**Chemicals**	148.8	2.9	0.3	408.9	2.5	0.3	10.6
39-40	**Plastic / Rubber**	135.0	2.6	0.5	461.2	2.8	0.7	13.1
41-43	**Hides, Skins**	43.2	0.8	0.8	63.0	0.4	0.7	3.9
44-49	**Wood**	91.9	1.8	0.4	267.1	1.6	0.6	11.3
50-63	**Textiles, Clothing**	888.4	17.3	2.2	476.6	2.9	0.7	-6.0
64-67	**Footwear**	22.6	0.4	0.3	2.3	0.0	0.0	-20.3
68-71	**Stone / Glass**	99.5	1.9	0.5	187.7	1.1	0.4	6.6
72-83	**Metals**	96.9	1.9	0.2	374.5	2.3	0.3	14.5
84-85	**Mach/Elec**	799.1	15.5	0.5	8,408.6	50.6	2.0	26.5
86-89	**Transportation**	26.6	0.5	0.0	29.6	0.2	0.0	1.1
90-97	**Miscellaneous**	126.3	2.5	0.3	1,052.0	6.3	1.2	23.6
	Total	**5,144.2**	**100.0**		**16,630.1**	**100.0**		**12.4**

Note: Exports are in millions of US dollars. RCA is the revealed comparative advantage.

Source: COMTRADE

Costa Rica's top ten export goods in 2006-08 confirm the country's strong reliance on two sectors: machinery/electronics and fruits/vegetables (Table A2). The top ten products made up 68.1 percent of the total export basket, reflecting a very high export concentration (see sect. Among the top ten, three products that represent 26.3% of exports belong to the integrated circuits industry cluster and a fourth to the computer industry representing an extra 18.1%. Thus, the integrated circuit and computer parts industry accounts for almost half of Costa Rica's exports in 2006-08. Finally, medical instruments and appliances and several fruit products like

[64] The RCA index measures the relative advantage or disadvantage of a certain country in a certain industry as evidenced by trade flows. An index value above the number one indicates that a country's share of exports in that sector exceeds the global export share of the same sector. If this is the case, we infer that the country has a comparative advantage in that sector. Since high export volumes can results from subsidies or other incentives provided, including under-valued exchange rates, the RCA index has been argued to be a misnomer in the sense that it captures competitiveness rather than comparative advantage (Siggel, 2006).

bananas, coffee, pineapples, and melons and watermelons round out the list of top ten exported products.

Among the products that lost importance in the last decade are 'Men's or boys' cotton trousers' and 'Brassieres' which reflects the decline of the textiles/garments sector in the country.

Table A2. Top Ten Products Exported by Costa Rica (Average 2006-2008)

Rank	HS6	Product	% of total	Rank 96-98
1	**854211**	Monolithic integrated circuits, digital	22.4	6
2	**847330**	Parts and accessories of automatic data process	18.1	3
3	**080300**	Bananas, including plantains, fresh or dried	9.0	1
4	**080430**	Pineapples, fresh or dried	7.3	5
5	**901890**	Instruments and appliances used in medical or veterinary	3.8	15
6	**854219**	Monolithic integrated circuits, nes*	2.4	109
7	**090111**	Coffee, not roasted or decaffeinated	1.7	2
8	**854220**	Hybrid integrated circuits	1.5	169
9	**080710**	Melons and watermelons, fresh	1.0	8
10	**210690**	Other food preparations, nes*	0.9	31
Total			**68.1**	

*Source: COMTRADE. *Not elsewhere specified*

Costa Rica's services exports were dominated by travel in 1996-98. The importance of the travel industry in services exports was significantly higher than in the rest of Central America – which speaks to the early importance given to the tourism sector in Costa Rica. A decade later, in 2006-08, all other countries in the region increase their reliance on travel services exports while Costa Rica began shifting towards computer and information and other business services while still maintaining robust travel sector exports as the electronics and computers industries exports took off. This trend in increased importance of ICT and business services is not present in any other country in the region.

Table A3. Share in Total Exports of Services (BoP)

Sector	Average 1996-1998						Average 2006-2008					
	CRI	GTM	HND	NIC	PAN	SLV	CRI	GTM	HND	NIC	PAN	SLV
Transport	15.2	12.7	17.3	14.3	52.6	31.3	8.9	11.8	5.7	11.6	53.9	24.2
Travel	67.1	44.3	42.8	49.2	21.6	29.1	56.5	59.5	68.9	68.2	24.0	57.1
Other services	17.8	42.9	39.8	36.5	25.8	39.6	34.6	28.7	25.4	20.1	22.2	18.7
Communications	6.9	6.9	22.4	15.2	2.5	18.6	1.2	14.6	18.6	8.2	4.1	10.2
Construction	-	0.2	-	-	-	0.7	-	0.2	-	-	0.0	2.3
Insurance	-0.1	2.0	5.5	1.7	1.1	7.5	-	1.2	3.7	1.0	1.3	2.3
Financial services	0.4	2.4	0.3	-	5.5	1.6	0.4	0.6	0.8	-	7.3	0.2
Computer and information	0.1	0.5	0.1	-	-	-	14.9	0.7	0.1	-	0.4	0.1
Royalties and license fees	0.1	-	-	-	-	-	0.0	0.6	-	-	-	0.0
Other business services	9.2	23.8	6.2	-	6.2	2.3	17.1	3.9	1.8	-	7.8	1.3
Personal, cultural and recreational services	0.0	-	0.0	-	-	-	0.0	1.3	0.4	-	-	-
Government services, n.i.e.*	1.1	7.2	5.4	19.6	10.6	9.6	1.0	7.1	1.6	10.9	1.2	2.3

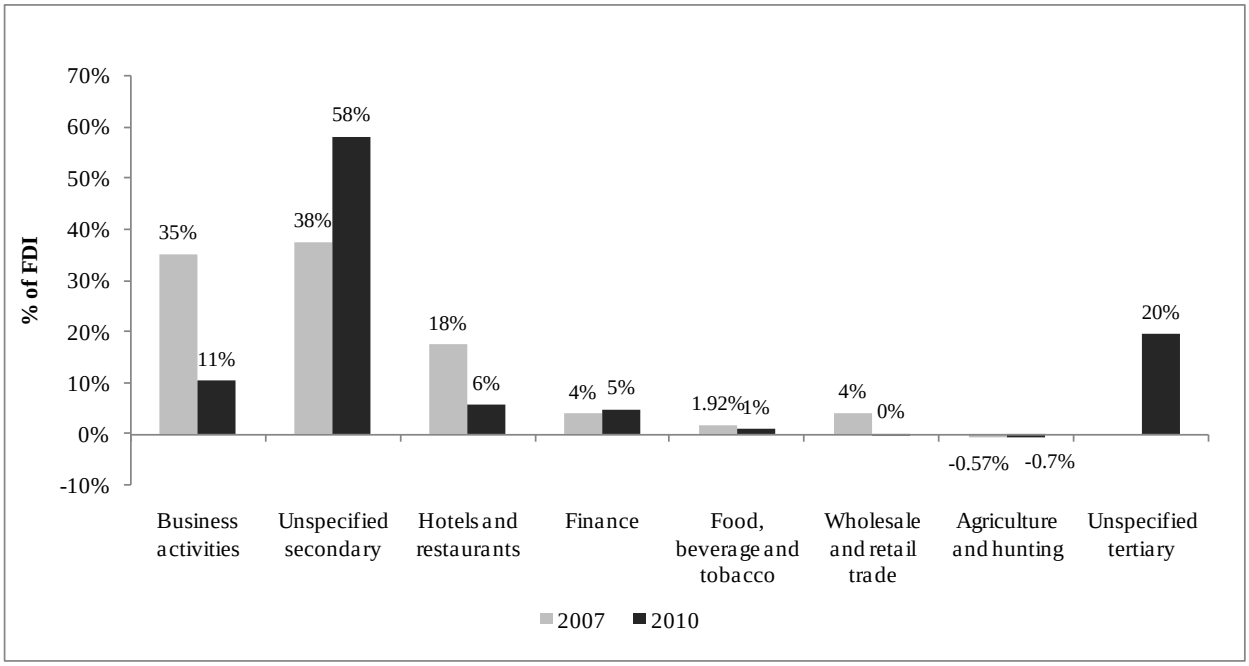
*Source: UNCTADSTAT database. *Not included elsewhere.*

1.4. Foreign Direct Investment

Foreign Direct Investment (FDI) has been considered a catalyst for growth and development due to possible spillovers in the local economy, especially in countries with low capital accumulation. Such spillovers can range from innovation (through faster transfer of know-how and state-of-the-art technologies), increases in productivity, sophistication and competitiveness (through increased competition), and a broader choice of products for consumers, among others.

The inward FDI stock in Costa Rica reached 13.5 billion USD in 2010. The secondary and tertiary sectors had the greatest share of total FDI inflows in 2010 and experienced a considerable increase compared to 2007. Business activities and hotels and restaurants decreased their shares in the last three years. Given that 29 percent of Costa Rica's exports are food-related, this low percentage of FDI stock seems surprising and probably reflects the fact that these sectors are rather land- and/or labor-intensive, rather than capital intensive.

Figure A3. FDI Inward Flow in Costa Rica



Source: Investment Map, International Trade Centre.

1.5. Trading Partners

Unlike many Central American countries, with the exception of Panama, Costa Rica managed to diversify the destination of its exports over the last decade. Although the United States is the main single destination for Costa Rica's goods exports, its importance decreased significantly at the same time that other countries became important partners like China and the Netherlands. Intra-regional trade remained almost at the same level and trade with South America is nearly non-existent.

Table A4. Costa Rica: Trading Partners

	Average (1996-1998)	Average (2006-2008)
United States	**48.3**	**24.2**
Regional	**10.5**	**9.8**
Nicaragua	2.6	1.8
Salvador	2.4	1.6
Guatemala	2.3	2.5
Panama	1.9	2.2
Honduras	1.3	1.7
Mexico	**1.8**	**4.2**
EU-27	**26.7**	**30.1**
Germany	5.4	3.7
United Kingdom	4.4	5.7
Belgium	3.6	3.3
Netherlands	2.5	11.8
Spain	1.9	0.7
Rest EU-27	9.0	4.9
South America*	**1.9**	**1.1**
Chile	0.4	0.1
Venezuela	0.3	0.2
Colombia	0.3	0.3
Rest	0.8	0.5
BRIC Countries	**1.1**	**15.0**
Russia	0.6	0.3
China	0.3	13.5
Brazil	0.2	0.8
India	0.0	0.4
Rest of the World	**9.7**	**15.4**

* Excluding Brazil

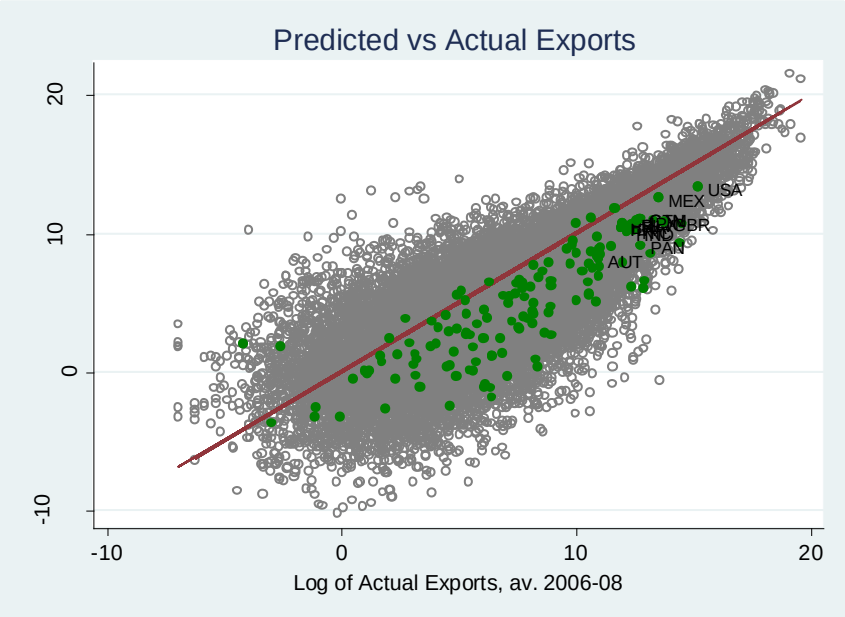
Source: COMTRADE

1.6 How "natural" are they?

Next, we assess whether a country's export products are "natural" by estimating a gravity model. Based on a theory-grounded model[65], this exercise allows us to compare actual bilateral export relationships of a country with all its trading partners with the predicted export values from the gravity equation. The gravity model is based on average bilateral export values in 2006-08.

Figure A4 shows all bilateral trade relationships in our dataset of 181 countries (grey dots). Costa Rica's bilateral exports are colored and key trading partners are labeled. For export destinations below the 45-degree line, Costa Rica's actual export value in 2006-08 is higher than what the gravity model would have predicted, i.e. Costa Rica "over-trades" with these countries. These countries include many high-income countries (e.g. Canada, France, Germany, the Netherlands, and the US) as well as its Central American neighbors (El Salvador, Mexico, Nicaragua, and Panama).

Figure A4. Gravity Model



Source: COMTRADE

[65] We regress 2006-08 bilateral exports (using mirror data) on the following bilateral characteristics: distance, contiguity, common language, colony, common colonial power, as well as log of GDP, log of GDP per capita, etc. We also incorporate three innovations. First, a measure of remoteness is computed by summing distances weighted by the share of GDP of the destination in world GDP. This is to take note of the fact that relative distances matter greatly, alongside absolute distances. Second, we control for zero trade flows using the Heckman sample selection correction method, since OLS drops observations with non-existent bilateral trade. If the probability of selection is correlated with GDP or distance, OLS estimates would be biased. Third, following Helpman, Melitz and Rubinstein (2008), control for firm heterogeneity (without using firm-level data) relying on the fact that the features of marginal exporters can be inferred from the export destinations reached. With these steps, the gravity results are better grounded in modern trade theory.

PART II: DIVERSIFICATION

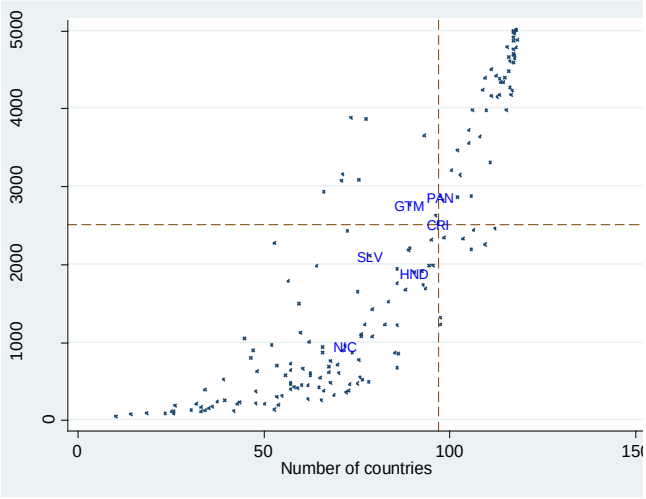
2.1. Number of Products and Markets

Export diversification across markets and products reduces the risk of the country's export portfolio to partner-specific shocks and volatility in export prices. One simple way of detecting a country's product and market diversification is to count its number of exported products and export destinations. Figure A5 shows the number of a country's export destinations (x-axis) and the number of a country's export products (y-axis) for 1996-98 (left panel) and 2006-08 (right panel). The dashed lines mark the number of export products and markets for Costa Rica, so that countries to the right of the vertical line export to more countries than Costa Rica and countries above the horizontal line export more products.

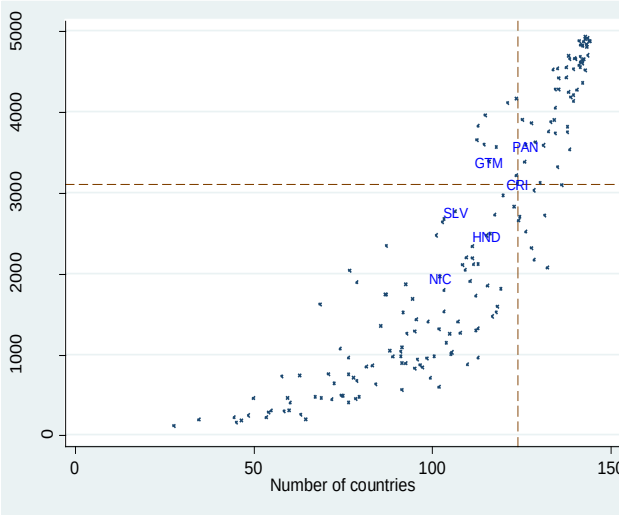
All Central American countries increased the number of export markets and products over the period. Compared to its regional peers, Costa Rica remained at the third position behind Panama and Guatemala in terms of number of export products (3,109 products). On the other hand, Costa Rica ranks second in terms of number of export destinations (124 markets) in 2006-08 – only behind Panama.

Figure A5

Export Relationships (Average 1996-1998)



Exports Relationships (Average 2006-08)



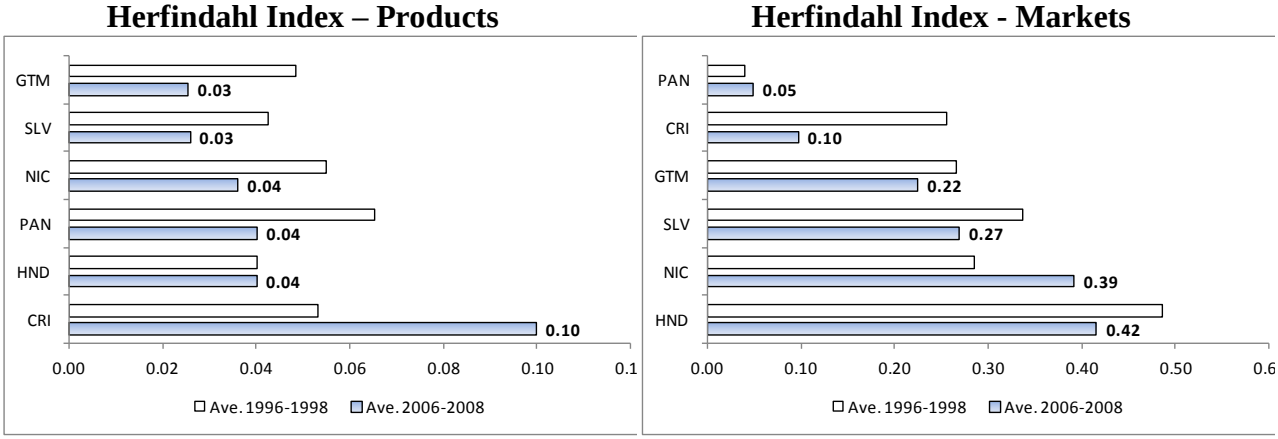
Source: COMTRADE

2.2. Concentration Index

Next, we look at the Herfindahl-Hirschman index (HHI) as a more sophisticated measure of export diversification.[66] Figure 13 shows the HHI of product (left panel) and market concentration of exports (right panel) for Central-American countries in 1996-98 versus 2006-08. Costa Rica is the only country in the region to increase its concentration in export products over the period, confirming the results of section 2.1. In a regional comparison, Costa Rica is by far the country with the highest concentration of exports in 2006-08, a result of the rapid increase of its electronics and medical equipment exports over the last decade. Furthermore, Lederman et. al (2011) found that two big multinational companies, INTEL and Abbott Labs, accounted for 26 percent of Costa Rica's exports during 1997-2007.

On the other hand, Costa Rica increased its export diversification across markets over the same period. Comparing Costa Rica with its regional peers, the country showed the second highest diversification of export markets after Panama in 2006-08.

Figure A6



Source: COMTRADE

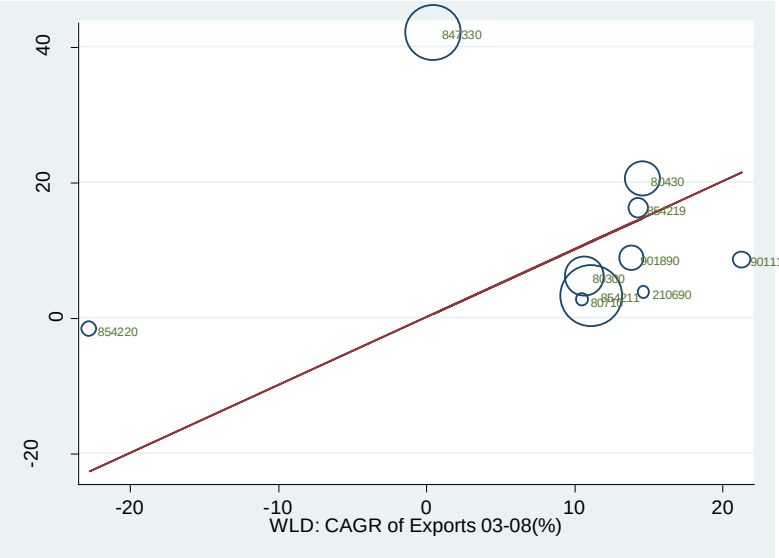
2.3. Growth Orientation of Products and Markets

We now compare the top ten products exported by Costa Rica – as identified in section 1.3 – with worldwide exports of the same products (Figure A7). The y-axis plots export growth for Costa Rica's top ten products between 2003 and 2008, while the x-axis shows world export growth for same goods over the same period. The circle size indicates the relative importance of the product in Costa Rica's export basket over 2006-08. Products above the 45-degree line experienced higher export growth in Costa Rica compared to all countries, while products below the line were characterized by lower growth than the world. In other words, products above the 45-degree line gained in world market share, while products below the line lost market share.

[66] The HHI is computed as the sum of squared shares of each product (market) in total export. A country with a perfectly diversified export portfolio in terms of products (markets) will have an index close to zero, whereas a country with only one export product (market) will have a value of 1.

Between 2003 and 2008, Costa Rica lost world market share in six of its top ten export products, most importantly in bananas (080300), coffee (090111), and melons and watermelons (080710), but also in more high tech sectors like medical instruments and appliances (901890) and monolithic integrated circuits (854211). In fact, besides two products that showed mild gains like monolithic integrated circuits (854219) and pineapples (080430), the only product that gained significant world market share during this period was parts and accessories of automatic data process machines (847330) that grew an outstanding 41.8% over the period even though the world trade in that products only grew 0.6% per year.

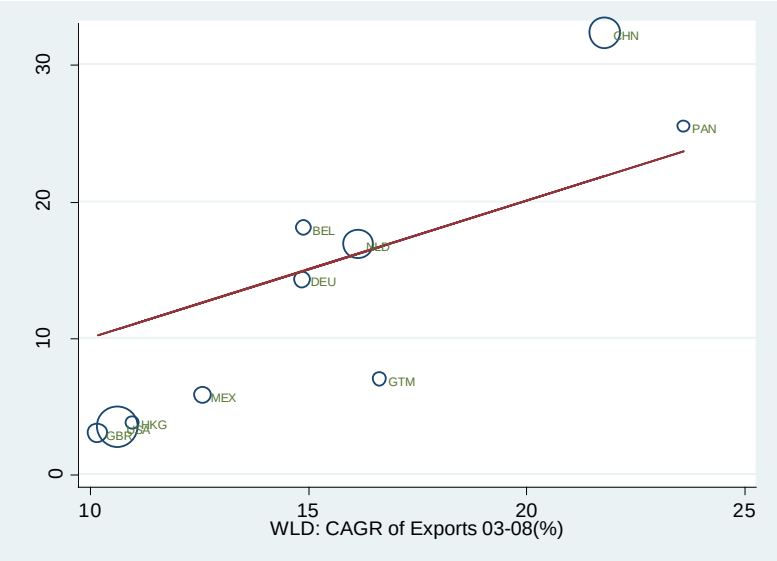
Figure A7. Growth Orientation of Products
(Top 10 Products)



Source: COMTRADE

Analogously, we compare Costa Rica's export growth in the country's top ten export destinations with worldwide export growth in the same export destinations (Figure A8). Between 2003 and 2008, Costa Rica's exports gained market share in China, Panama and Belgium, while maintaining it in the Netherlands. At the same time, the country lost world market share in most regional partner countries and the US.

Figure A8. Growth Orientation of Destinations
(Top 10 Markets)



Source: COMTRADE

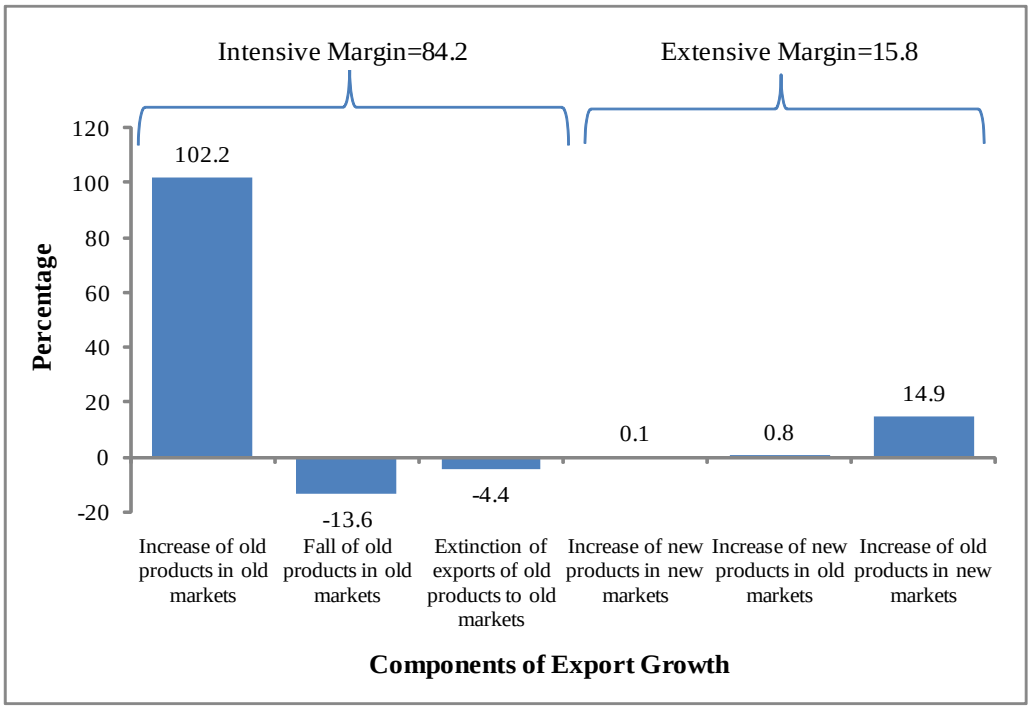
2.4. Intensive and Extensive Margins of Growth

Export growth can take place at the intensive margin, i.e. selling existing products to existing markets, or at the extensive margin, i.e. selling existing products to new markets, new products to new markets, and new products to existing markets.

We decompose Costa Rica's export growth between 1998 and 2008 into export growth (i) at the intensive margin, i.e. increase, fall, or extinction of old export products in old markets, and (ii) export growth at the extensive margin, i.e. increase of new export products in new and old markets and increase of old export products in new markets.

Figure A9 shows that the intensive margin explains 85 percent of Costa Rica's export growth between 1998 and 2008, while the extensive margin explains about 15 percent. Export growth at the intensive margin was driven by export growth of old products in old markets (102 percent), which compensated for negative export growth or even an extinction of old products in old markets (combined -18 percent). Export growth at the extensive margin was driven by old products in new markets (15 percent) while new products in either old or new markets did not play a significant role in export growth (0.9 percent).

Figure A9. Decomposition of Export Growth
Average (1998-2008)



Source: COMTRADE

At the regional level, Costa Rica's export growth performed slightly better than the Central American regional average for old products in old markets (Table A5). However, the country's export growth performs worse for new products (in both old and new markets) and significantly worse in old products in new markets. The revealed low importance of the extensive margin, as measure here, in Costa Rica is in line with export dynamics in other countries of similar economic development such as Chile where the extensive margin accounts for 15.2% of total export growth.

Table A5. Comparative Decomposition of Export Growth

Margin	Components of Export Growth	Costa Rica	Simple Regional Average	Chile
Intensive		**84.2**	**61.3**	**84.8**
	Increase of old product in old markets	102.2	97.8	91.1
	Fall of old products in old markets	-13.6	-24.1	-3.9
	Extinction of exports of old products to old markets	-4.4	-12.4	-2.4
Extensive		**15.8**	**32.7**	**15.2**
	Increase of new products in new markets	0.1	0.2	0.0
	Increase of new products in old markets	0.8	7.3	1.8
	Increase of old products in new markets	14.9	31.2	13.3

Source: COMTRADE

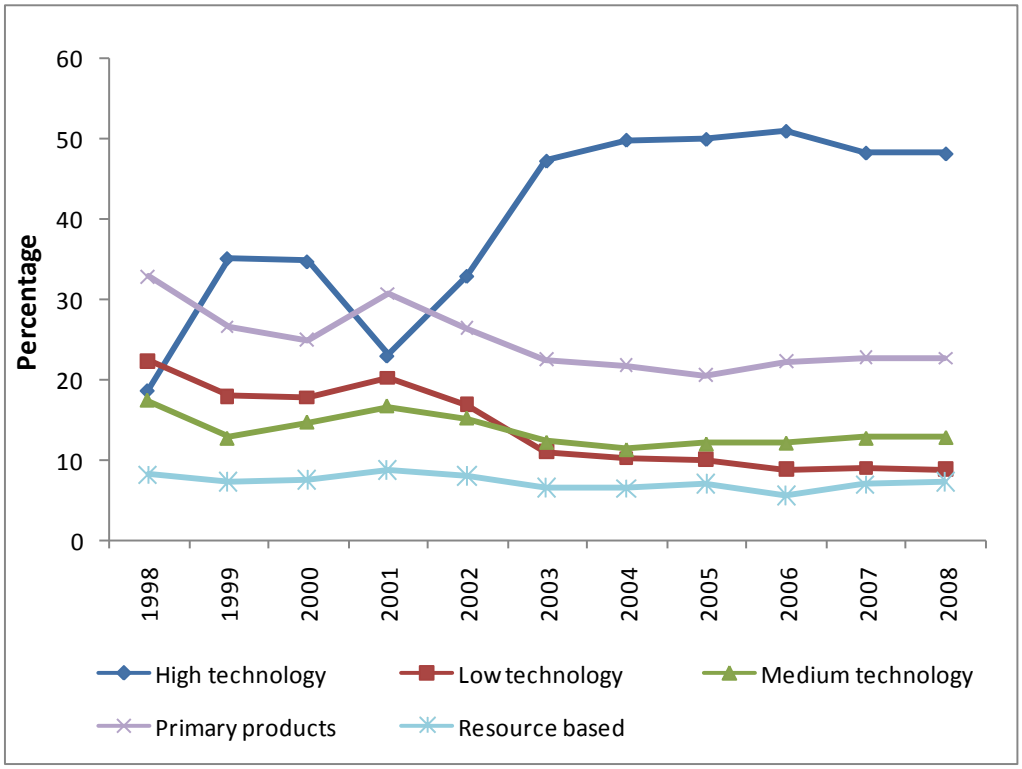
PART III: SOPHISTICATION

This section focuses on export sophistication and quality. The type of export products and inputs embodied in these products matter for export-led growth and economic upgrading. High-quality goods in terms of ingenuity, skills, and technology fetch higher prices in world markets. Countries specializing in the production of more sophisticated goods compared to what their income levels would suggest tend to see higher rates of future economic growth. Upgrading product quality, therefore, can be considered a source of both export and economic growth.

3.1. Technological Classification and Sophistication of Exports

The technological content of Costa Rica's exports has improved significantly between 1998 and 2008 with the share of high-tech exports growing from 19 to 48 percent and the share of low-tech and primary exports declining during the period. Since 2003 about half of exports are in high technology products, a result that is unusual in Central America, where only in Panama do high tech exports account for more than 10 percent.

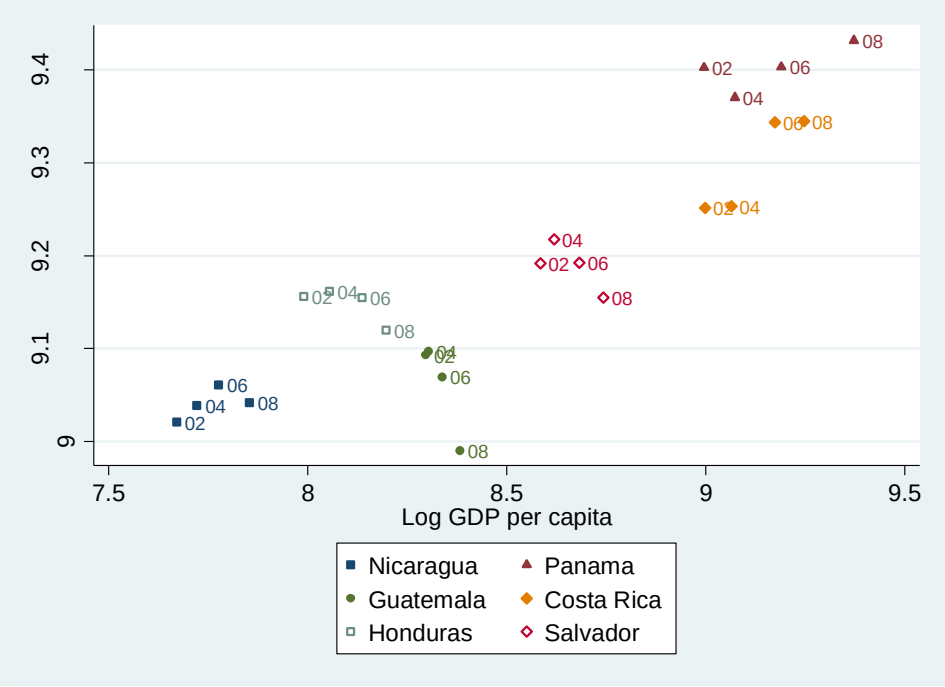
Figure A10. Technological Classification of Exports: Costa Rica



Source: COMTRADE

Hausman, Hwang and Rodrik (2006) argue that the level of product sophistication matters for economic growth. Countries that have a more sophisticated export basket, proxied by a measure named EXPY (see Annex 2), enjoy accelerated subsequent growth while those with less sophisticated export baskets tend to lag behind – in essence, countries become what they export. Figure A11 shows the sophistication of exports (y-axis) and per-capita GDP (x-Axis) for all Central American countries over time. The sophistication of Costa Rica's export basket has improved substantially over time, reflecting the emerging electronics products.

Figure A11. Change in Export Sophistication



Source: Author's computations

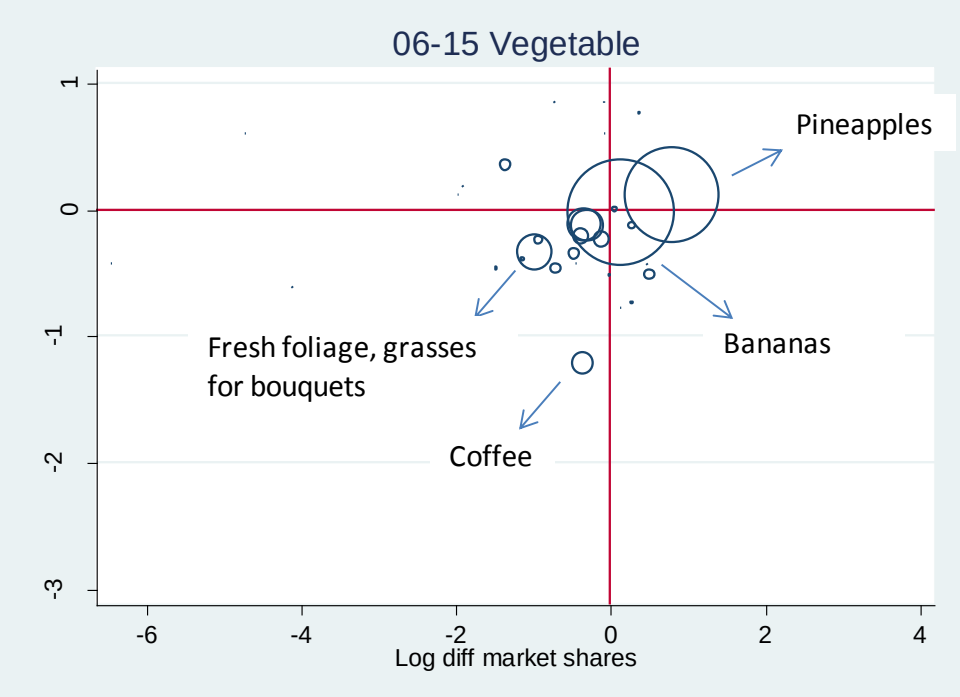
3.2 Quality

One way a country can increase the absolute amount of exports per capita is by augmenting the quality of exports and thus the value of exports per unit. Using a highly detailed database of unit values of exports to the EU, we construct a measure of the relative quality of each exported product to the EU (see Annex 3). The figure below presents the relationship between growth in the relative quality measure and changes in market shares of Costa Rica's exports to the EU market.[67] Each bubble represents a product, defined by an 8-digit Combined Nomenclature code. The x-axis shows the growth rate of market share (log difference of market shares) between 1996-08 and 2006-08. The y-axis represents the growth rate of the average quality measure between the same periods of time. The size of each bubble is the importance of each product in Costa Rica's export basket in 2006-08. We present the analysis for products within the second most important export sector to the EU: Vegetables. [68] In this case, we chose the second most important export sector because the most important, 84-85 Machines and Electronics, relies heavily on INTEL.

[67] Given data availability, we cannot do the same analysis for the US.

[68] The vegetable sector encompasses HS codes from chapter 06 to chapter 15. It includes live trees (Ch. 06), edible vegetables (Ch. 07), edible fruits & nuts (Ch. 08), coffee (Ch. 09), cereal (Ch. 10), milling industry (Ch. 11), oil seeds (Ch. 12), gums, and resins (Ch. 13), vegetable plaiting materials (Ch. 14), and animal or vegetable fats, oils and waxes (Ch. 15)

Figure A12. Change in Relative Quality and in Market Shares in the European Market (Ave.06-08/Av.96-98)



Source: COMTRADE

Four important products are labeled: i) bananas, which is still the most important exported product to the EU in 1996-98 and now (2006-08); ii) pineapples which increased dramatically its participation; iii) Fresh foliage and grasses which reduce market shares and decreased relative quality; and iv) coffee which not only reduced its share, probably due to the increased importance of pineapples in the EU market in the last years, but also reduced its relative quality.

B. El Salvador

PART I: ORIENTATION AND GROWTH

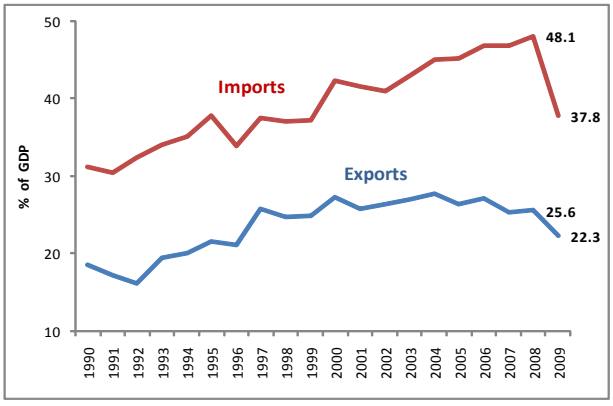
1.1. Exports, Imports and Trade Balance

El Salvador's exports of goods and services as a percentage of GDP increased from 18.6 percent in 1990 to 27.4 percent in 2000, and then remained flat for the first half of the decade before declining after 2004. Imports of goods and services increased from 31.2 percent in 1990 to 48.1 percent in 2008 before a precipitous drop in 2009 (Figure A13, left panel).

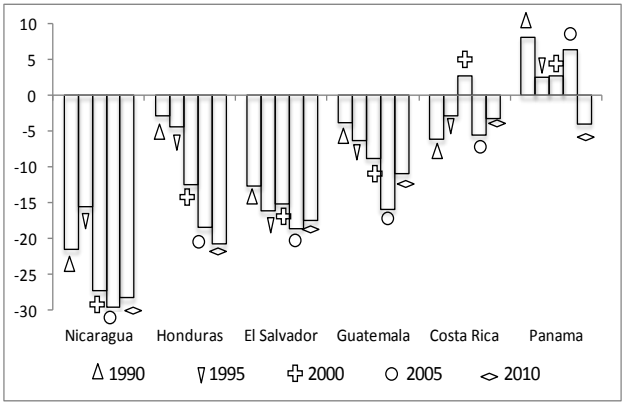
El Salvador had a negative trade balance for the most part of the last two decades. In Central America, Nicaragua, Honduras and El Salvador have consistently recorded two-digit trade deficits. However, El Salvador's trade balance deficit remained stable around 15% of GDP over the last two decades while deficits in Nicaragua and Honduras increased over the same period.

Figure A13

El Salvador: Exports and Imports



Trade Balance (% GDP)



Source: World Development Indicators

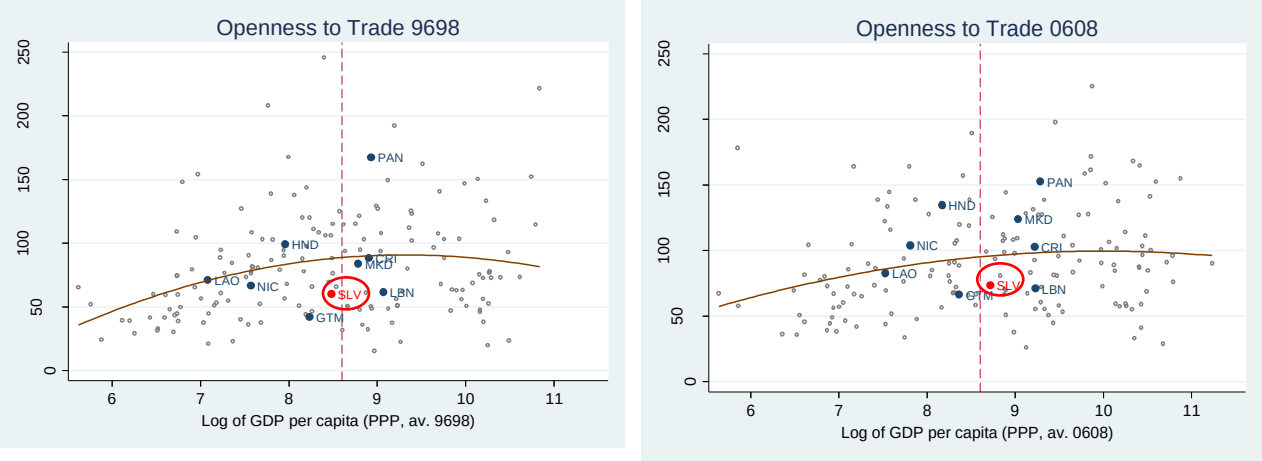
1.2. Openness to Trade

The trade-to-GDP ratio is one of the most basic indicators of openness to foreign trade and economic integration. It weighs the combined importance of exports and imports of goods and services relative to GDP in an economy. The ratio gives an indication of the dependence of domestic producers on foreign demand and of domestic consumers and producers on foreign supply. There is a concave relationship between trade openness and per capita income: countries tend to trade more as incomes rise, but at a decreasing rate.

El Salvador's relative position below the predicted curve in 2006-2008 indicates that openness to trade was lower than expected given the country's income per-capita level[69], i.e. on average, countries of similar income showed higher trade participation (Figure A14, left panel).

Figure A14

Openness to Trade: Average 1996-1998 **Openness to Trade: Average 2006-2008**



Source: World Development Indicators

1.3. Composition of Exports

Although El Salvador's export basket still relies heavily on textiles/clothing—which accounted for 41.8 percent of total exports in 2006-08—the relative importance of this sector in the country's export basket has declined slightly since 1996-98. Over this period, the sector showed lower annualized growth rates (4.5%) than total exports (5.5%). The biggest change in the distribution of goods exports in El Salvador's export basket between 1996 and 98 and 2006-08 happened between the fruits/vegetables and foodstuff/agro-processed sectors (Table 8).[70] Exports of fruits/vegetables accounted for 19.4% of total exports in 1996-98 but only 8.4% in 2006-08, while the opposite was true of foodstuff/agro-processed exports that increased from 8.4% to 16.7% of total exports over the same period. The three main export sectors in 1996-98 have shown different annualized growth rate trajectories over the last decade: negative in vegetables (-3.0%), positive but modest in textiles/clothing (4.5%) and strong in the foodstuff sector (13.0%). Outside the fruits/vegetables and foodstuff sectors, relative export shares changed little over the last decade.

[69] In figure 21 the dotted line represents the world average GDP per capita (in logs) in each period. In both periods of time, the world average per capita income was around exp (8.6) which is US$6000 at PPP.
[70] In order to avoid one year spikes that might skew our data, we use three year averages (1996-98 and 2006-08) of export values.

Table A6. El Salvador: Export Basket and revealed Comparative Advantage

Sector		Average 1996-1998			Average 2006-2008			
		Exports	% of total	RCA	Exports	% of total	RCA	Average Annual Growth Rate
01-05	**Animal**	70.2	2.8	1.6	55.9	1.3	0.7	-2.3
06-15	**Vegetable**	477.2	19.4	7.3	352.7	8.4	2.7	-3.0
16-24	**Food products**	207.3	8.4	3.3	701.8	16.7	5.4	13.0
25-27	**Minerals**	4.0	0.2	0.0	89.1	2.1	0.1	36.5
28-38	**Chemicals**	127.8	5.2	0.9	211.6	5.0	0.5	5.2
39-40	**Plastic / Rubber**	32.8	1.3	0.4	177.7	4.2	0.9	18.4
41-43	**Hides, Skins**	10.5	0.4	0.6	14.0	0.3	0.5	2.9
44-49	**Wood**	73.8	3.0	1.0	222.5	5.3	1.7	11.7
50-63	**Textiles, Clothing**	1,128.0	45.8	9.2	1,752.8	41.8	8.8	4.5
64-67	**Footwear**	19.7	0.8	0.9	37.0	0.9	1.0	6.5
68-71	**Stone / Glass**	9.9	0.4	0.2	40.6	1.0	0.3	15.2
72-83	**Metals**	83.5	3.4	0.6	246.5	5.9	0.6	11.4
84-85	**Mach/Elec**	89.9	3.6	0.2	219.1	5.2	0.2	9.3
86-89	**Transportation**	109.6	4.4	0.5	16.3	0.4	0.0	-17.4
90-97	**Miscellaneous**	20.1	0.8	0.2	60.5	1.4	0.2	11.7
	Total	**2,464.2**	**100.0**		**4,198.1**	**100.0**		**5.5**

Note: Exports are in millions of US dollars. RCA is the revealed comparative advantage.
Source: COMTRADE

El Salvador's top ten export goods in 2006-08 included several products belonging to the textiles/clothing industry, which accounted for about 20% of total exports and largely consisted of cotton t-shirts and vests (HS 610910), cotton jerseys, pullovers (HS 611020), and cotton men's or boys' underpants (HS 610711). Interestingly, three of the top ten products do not belong to either the textiles/clothing or foodstuffs sector: undenatured ethyl alcohol (HS 220710), toilet paper (HS 481810), and electrical capacitors (HS 853221). The top ten products made up 39.6 percent of total export, reflecting a relatively low export concentration.

Table A7. Top Ten Products Exported by El Salvador (Average 2006-2008)

rank	HS6	Product	% of total	Rank 96-98
1	610910	T-shirts, singlets and other vests, of cotton,	10.5	2
2	611020	Jerseys, pullovers, etc, of cotton, knitted	6.5	4
3	90111	Coffee, not roasted or decaffeinated	5.3	1
4	220710	Undenatured ethyl alcohol, of alcoholic strength	4.3	23
5	610711	Men's or boys' underpants and briefs of cotton,	2.8	22
6	170111	Raw cane sugar, in solid form	2.7	6
7	481810	Toilet paper	2.1	53
8	160414	Prepared or preserved tuna, skipjack and bonito	1.9	1433
9	611030	Jerseys, pullovers, etc, of man-made fibres, knitted	1.7	12
10	853221	Electrical capacitors, fixed, tantalum, nes	1.7	42
Total			**39.5**	

Source: COMTRADE

El Salvador's services exports show an increased dependency on travel (by 27 percentage points) in comparison with 1996-98. The importance of the travel industry in services exports in 2006-08 is similar to Costa Rica and Guatemala but below the level reported in Honduras and Nicaragua. This trend towards relatively more important travel services exports can be observed in all other countries in Central America except Costa Rica and Panama.

Table A8. Share in Total Exports of Services (BoP)

Sector	Average 1996-1998						Average 2006-2008					
	CRI	**GTM**	**HND**	**NIC**	**PAN**	**SLV**	**CRI**	**GTM**	**HND**	**NIC**	**PAN**	**SLV**
Transport	15.2	12.7	17.3	14.3	52.6	31.3	8.9	11.8	5.7	11.6	53.9	24.2
Travel	67.1	44.3	42.8	49.2	21.6	29.1	56.5	59.5	68.9	68.2	24.0	57.1
Other services	17.8	42.9	39.8	36.5	25.8	39.6	34.6	28.7	25.4	20.1	22.2	18.7
Communications	6.9	6.9	22.4	15.2	2.5	18.3	1.2	14.6	18.6	8.2	4.1	10.2
Construction	..	0.2	..	..	..	0.7	..	0.2	..	..	0.0	2.3
Insurance	-0.1	2.0	5.5	1.7	1.1	7.5	..	1.2	3.7	1.0	1.3	2.3
Financial services	0.4	2.4	0.3	..	5.5	1.6	0.4	0.6	0.8	..	7.3	0.2
Computer and information	0.1	0.5	0.1	..	..	..	14.9	0.7	0.1	..	0.4	0.1
Royalties and license fees	0.1	..	..	..	..	..	0.0	0.6	..	..	..	0.0
Other business services	9.2	23.8	6.2	..	6.2	2.3	17.1	3.9	1.8	..	7.8	1.3
Personal, cultural and recreational services	0.0	..	0.0	..	..	..	0.0	1.3	0.4	..	..	..
Government services, n.i.e.*	1.1	7.2	5.4	19.6	10.6	9.6	1.0	7.1	1.6	10.9	1.2	2.3

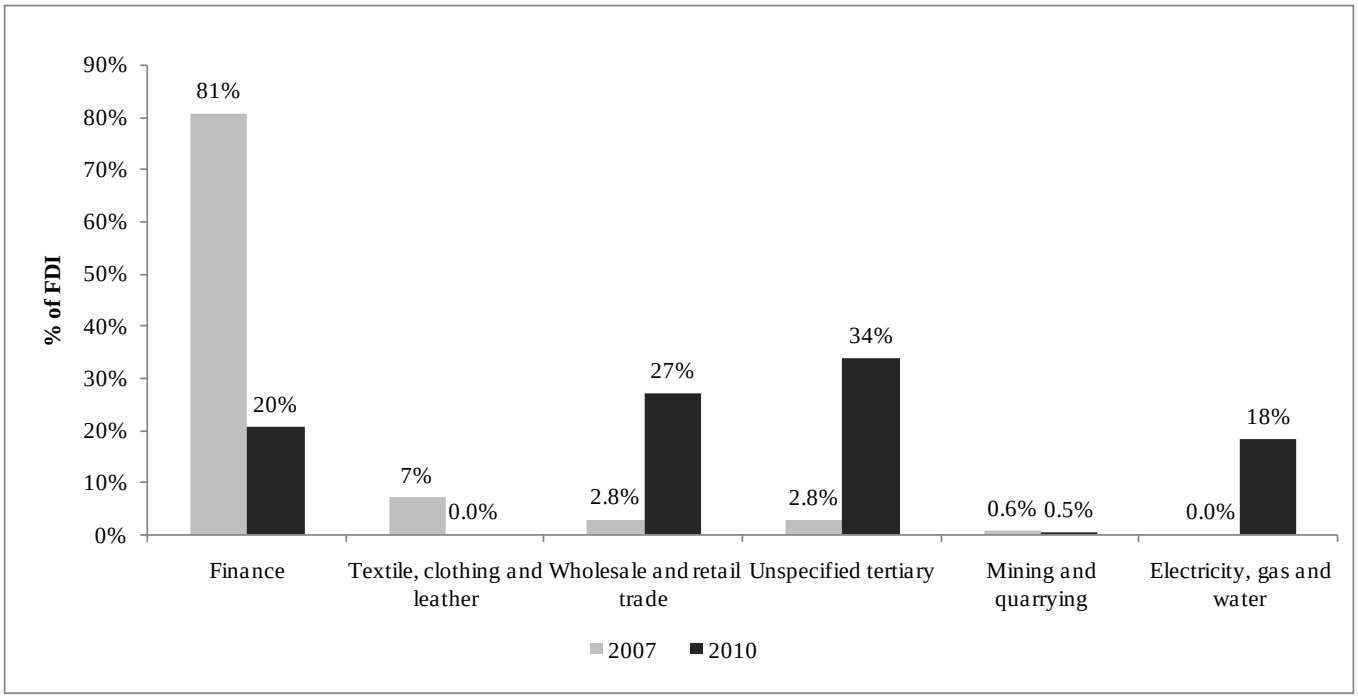
*Source: UNCTADSTAT database. *Not included elsewhere.*

1.4. Foreign Direct Investment

Foreign Direct Investment (FDI) has been considered a catalyst for growth and development due to possible spillovers on the local economy, especially in countries with low capital accumulation. Such spillovers can range from innovation (through faster transfer of know-how and state-of-the-art technologies), increases in productivity, sophistication and competitiveness (through increased competition), and broader product choice for consumers, among others.

Just the finance sector made up 81 percent of El Salvador's flow of inward FDI in 2007. However, three years later, this sector lost almost two thirds of its share largely due to increases in other sectors that were almost nonexistent in 2007, such as wholesale and retail trade, electricity, gas and water and unspecified tertiary. In 2012, these three sectors jointly represented the same share that Finance did in 2007.

Figure A15. FDI Inward Flow of El Salvador



Source: Investment Map, International Trade Centre.

1.5. Trading Partners

El Salvador still relies on the US as its main export destination (49% of exports in 2006-08). Nevertheless, the US export share declined by 7 percentage points since 1996-98. Analogously, the export share of the EU-27 fell by almost 7 percentage points over the same period – with the decline in exports to Germany accounting for almost 6 percentage points. Higher intra-regional trade compensated for this decline in the importance of US and EU-27 trade, as the Central American region accounted for 32.7% of exports in 2006-08 (up from 22%

in 1996-98). Guatemala and Honduras, in particular, have become important trade partners and were responsible for 23.1% of El Salvador's exports in 2006-08.

Table A9. El Salvador: Trading Partners

	Average (1996-1998)	Average (2006-2008)
United States	**56.5**	**49.0**
Regional	**22.0**	**32.7**
Guatemala	9.2	15.3
Honduras	4.6	7.8
Costa Rica	4.6	3.3
Nicaragua	2.6	4.2
Panama	1.0	2.1
Mexico	**1.1**	**1.6**
EU-27	**15.0**	**7.8**
Germany	8.6	2.8
France	1.3	0.4
Netherlands	0.9	0.8
Spain	0.0	2.1
Czech Republic	0.0	0.4
Rest EU-27	3.9	1.3
South America*		
Venezuela	0.2	0.3
Chile	0.2	0.2
Colombia	0.1	0.2
Rest	0.6	0.4
BRIC Countries		
Russia	0.7	0.7
Brazil	0.2	0.1
India	0.0	0.2
China	0.0	0.1
Rest of the World	**3.5**	**8.3**

* Excluding Brazil

Source: COMTRADE

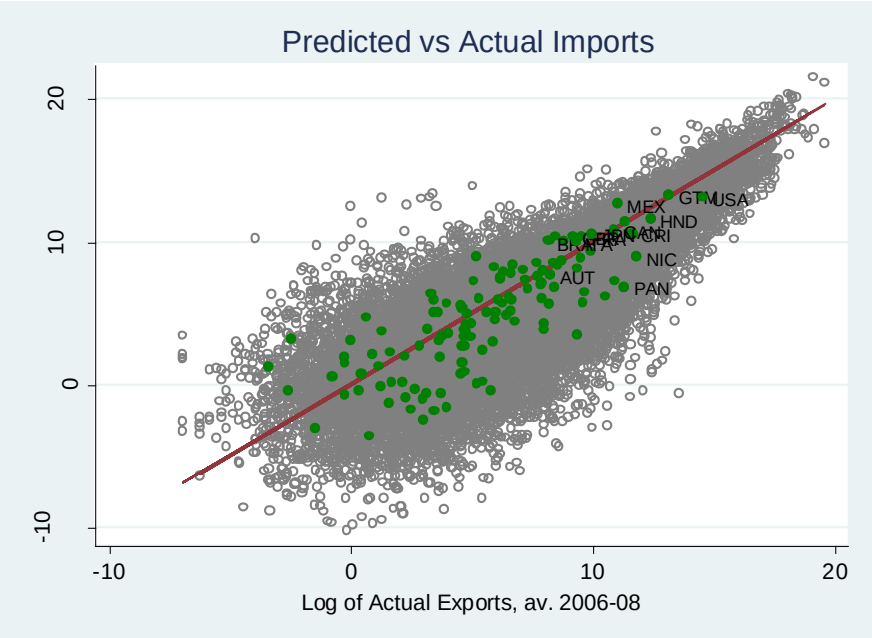
1.6 How "natural" are they?

In the next step, we assess whether a country's export products are "natural" by estimating a gravity model. Based on a theory-grounded model[71], this exercise allows us to compare actual bilateral export relationships of a country with all its trading partners with the predicted export values from the gravity equation. The gravity model is based on average bilateral export values in 2006-08.

Figure A16 shows all bilateral trade relationships in our dataset of 181 countries (grey dots). El Salvador's bilateral exports are colored and key trading partners are labeled. For export destinations below the 45-degree line, El Salvador's actual export value in 2006-08 is higher than what the gravity model would have predicted, i.e. El Salvador "over-trades" with these countries. These countries include many high-income countries (e.g., the US) as well as its Central American neighbors (Costa Rica, Honduras, Nicaragua, and Panama). Analogously, El Salvador "under-trades" with countries located above the 45-degree line like Mexico, which indicates potential untapped market opportunities.

[71] We regress 2006-08 bilateral exports (using mirror data) on the following bilateral characteristics: distance, contiguity, common language, colony, common colonial power, as well as log of GDP, log of GDP per capita, etc. We also incorporate three innovations. First, a measure of remoteness is computed by summing distances weighted by the share of GDP of the destination in world GDP. This is to take note of the fact that relative distances matter greatly, alongside absolute distances. Second, we control for zero trade flows using the Heckman sample selection correction method, since OLS drops observations with non-existent bilateral trade. If the probability of selection is correlated with GDP or distance, OLS estimates would be biased. Third, following Helpman, Melitz and Rubinstein (2008), control for firm heterogeneity (without using firm-level data) relying on the fact that the features of marginal exporters can be inferred from the export destinations reached. With these steps, the gravity results are better grounded in modern trade theory.

Figure A16. Gravity Model



Source: COMTRADE

PART II: DIVERSIFICATION

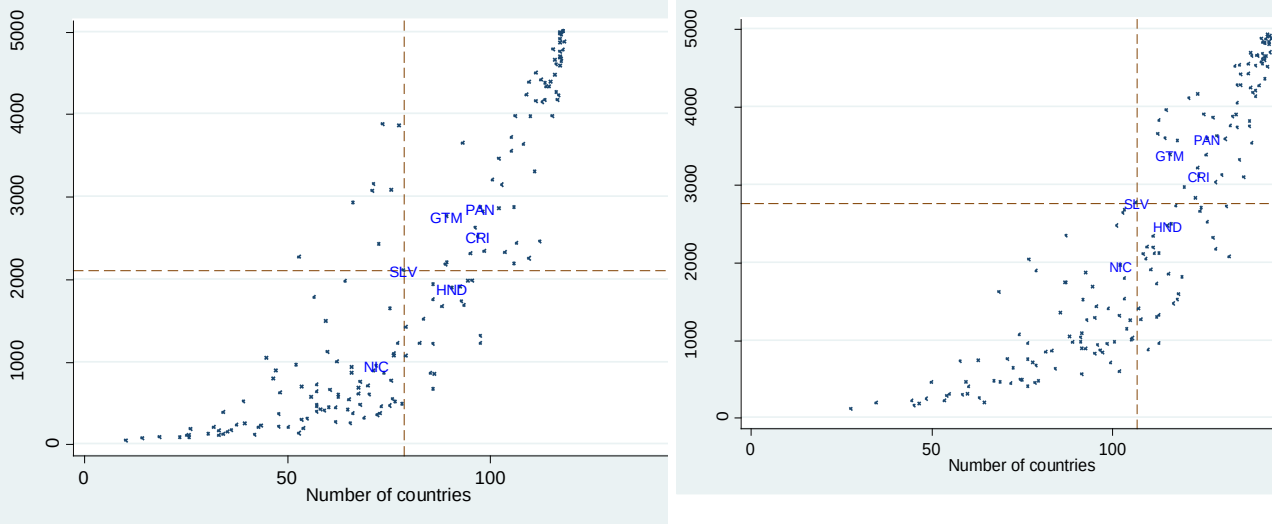
2.1. Number of Products and Markets

Export diversification across markets and products reduces the risk of the country's export portfolio to partner-specific shocks and volatility in export prices. One simple way of detecting a country's product and market diversification is to count its number of exported products and export destinations. Figure A17 shows the number of a country's export destinations (x-axis) and the number of a country's export products (y-axis) for 1996-98 (left panel) and 2006-08 (right panel). The dashed lines mark the number of export products and markets for El Salvador, so that countries to the right of the vertical line export to more countries than El Salvador and countries above the horizontal line export more products.

All Central American countries increased the number of export markets and products over the period. Compared to its regional peers, El Salvador does not perform well as the country only exports to more markets than Nicaragua and more products than Nicaragua and Honduras.

Figure A17

Export Relationships (Average 1996-1998) **Export Relationships (Average 2006-2008)**



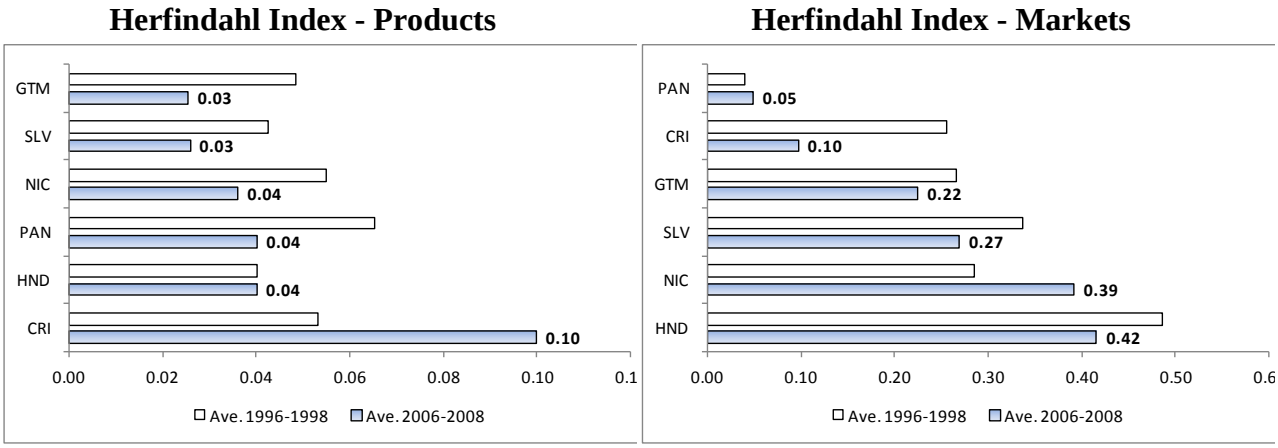
Source: COMTRADE

2.2. Concentration Index

In a next step, we look at the Herfindahl-Hirschman index (HHI) as a more sophisticated measure of export diversification.[72] Figure A18 shows the HHI of product (left panel) and market concentration of exports (right panel) for Central-American countries in 1996-98 versus 2006-08. El Salvador increased its diversification in both products and markets over the last decade, confirming the results of section 1.3 and 1.5. In a regional comparison, El Salvador is the second most diversified country in terms of export products and the fourth in terms of markets, because it still relies heavily on the US as an export destination.

[72] The HHI is computed as the sum of squared shares of each product (market) in total export. A country with a perfectly diversified export portfolio in terms of products (markets) will have an index close to zero, whereas a country with only one export product (market) will have a value of 1.

Figure A18



Source: COMTRADE

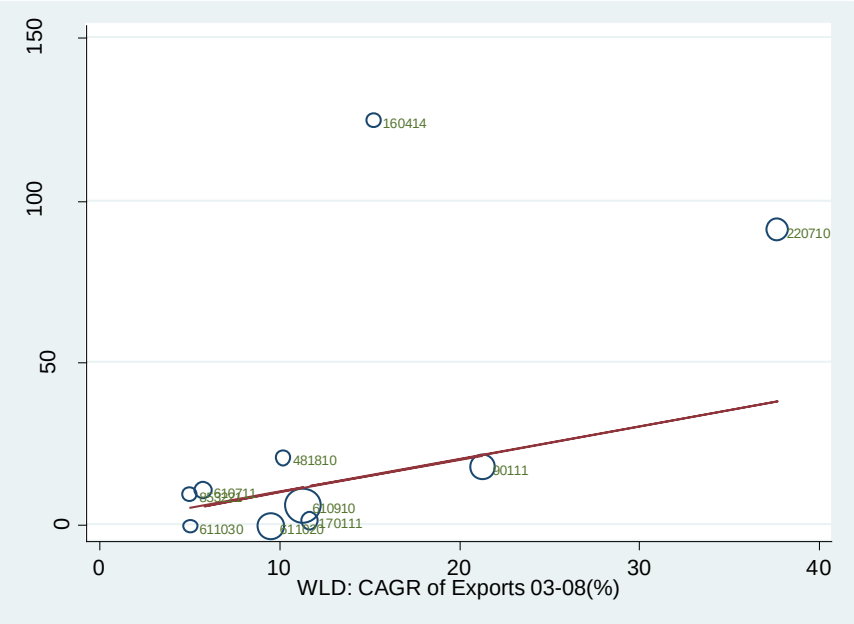
2.3. Growth Orientation of Products and Markets

We now compare the top ten products exported by El Salvador – as identified in section 1.3 – with worldwide exports of the same products (Figure 26). The y-axis plots export growth for El Salvador's top ten products between 2003 and 2008, while the x-axis shows world export growth for same goods over the same period. The circle size indicates the relative importance of the product in El Salvador's export basket over 2006-08. Products above the 45-degree line experienced higher export growth in El Salvador compared to all countries, while products below the line were characterized by lower growth than the world. In other words, products above the 45-degree line gained in world market share, while products below the line lost market share.

Between 2003 and 2008, El Salvador lost market share in half of its top ten products showed in Table A7. All but one of its textiles/clothing products in the top ten lost world market share as well as two resource-based exports, namely, raw sugar cane (170111) and coffee (090111). This may be indicating the countries declining comparative advantage in those sectors. Conversely, products outside the traditional sectors like undenatured ethyl alcohol (220710), electric capacitors (853221) and prepared tuna (160414) are gaining world market share.

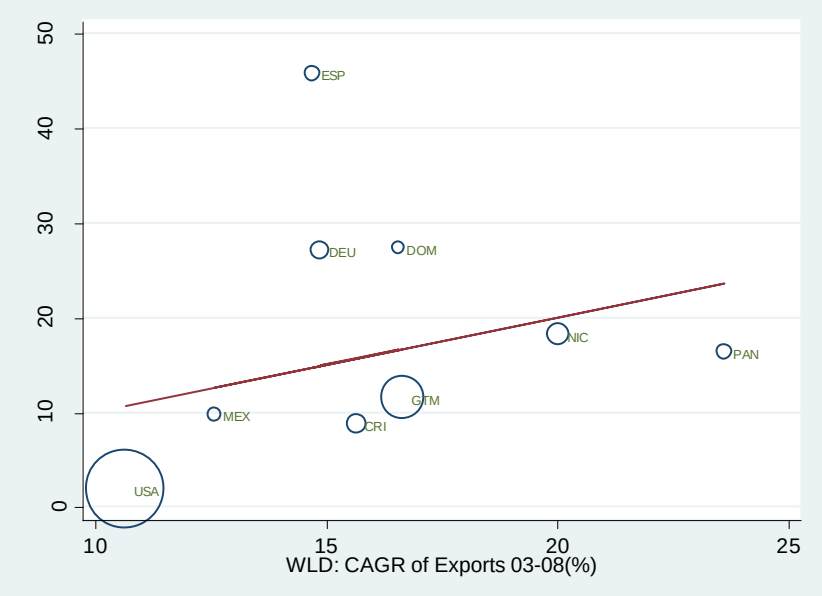
Analogously, we compare El Salvador's export growth in the country's top ten export destinations with worldwide export growth in the same export destinations (Figure A19). Between 2003 and 2008, El Salvador's exports lost market share in all its regional partners and the US while only gaining market share in Spain, Germany and the Dominican Republic.

Figure A19. Growth Orientation of Products (Top 10 Products)



Source: COMTRADE

Figure A20. Growth Orientation of Destinations (Top 10 Markets)



Source: COMTRADE

2.4. Intensive and Extensive Margins of Growth

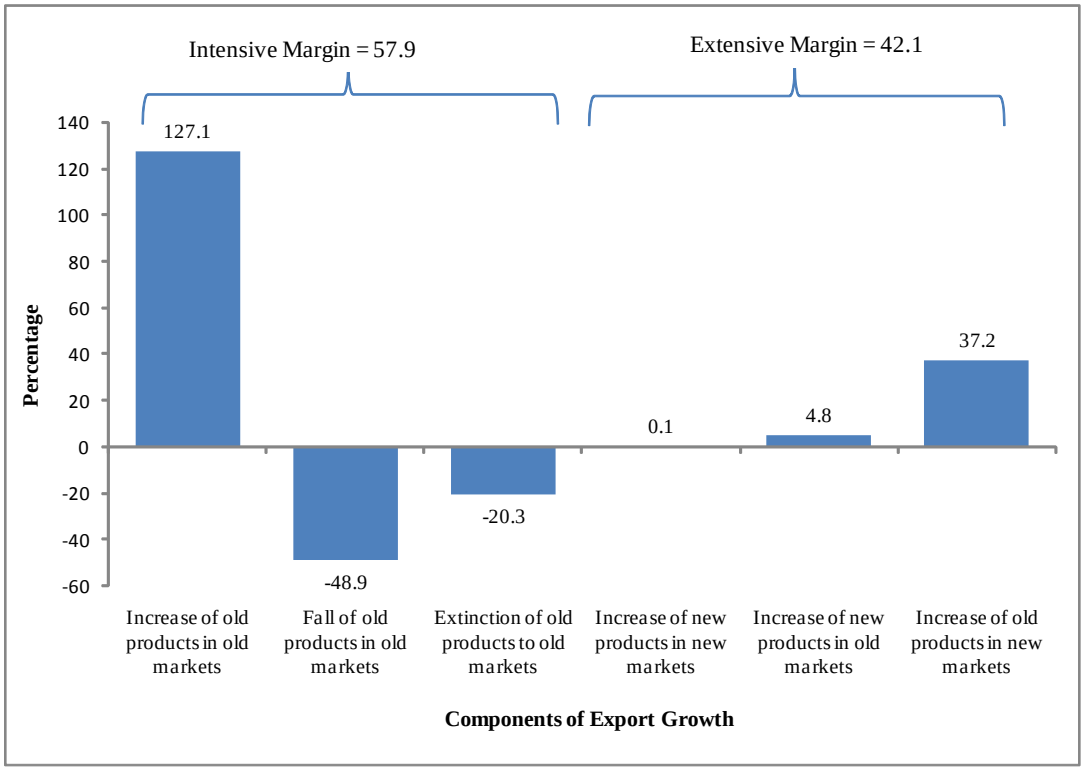
Export growth can take place at the intensive margin, i.e. selling existing products to existing markets, or at the extensive margin, i.e. selling existing products to new markets, new products to new markets, and new products to existing markets. This subsection explores to what

extent El Salvador has been able to add new, economically significant products and markets into its export portfolio.

In this section, we decompose El Salvador's export growth between 1998 and 2008 into export growth (i) at the intensive margin, i.e. increase, fall, or extinction of old export products in old markets, and (ii) export growth at the extensive margin, i.e. increase of new export products in new and old markets and increase of old export products in new markets.

Figure A21 shows that the intensive margin explains 58 percent of El Salvador's export growth between 1998 and 2008, while the extensive margin explains about 42 percent. Export growth at the intensive margin was driven by export growth of old products in old markets (127 percent), which compensated for a relatively high negative export growth or extinction of old products in old markets (combined -69 percent). Export growth at the extensive margin was high compared to other Central American countries and driven by old products in new markets (37.2 percent) and to a lesser extent by new products in old markets (4.8 percent).

Figure A21. Decomposition of Growth (Average 1998-2008)



Source: COMTRADE

At the regional level, El Salvador's export growth performed better than in the Central American region for old products in old markets but this was compensated by a bigger fall of old products in old markets (Table A10). However, the country's export growth performs better than the regional average on the extensive margin – especially for old products in new markets (37.2%

versus 31.2% for the region). This relatively large contribution of the extensive margin to export growth is a common feature of low middle-income countries. A similar exercise performed for Chile and Peru, more economic advanced countries, shows a smaller role for the extensive margin.

Table A10. Comparative Decomposition of Export Growth

Margin	Components of Export Growth	El Salvador	Simple Regional Average	Chile	Peru
Intensive		**57.9**	**61.3**	**84.8**	**63.3**
	Increase of old product in old markets	127.1	97.8	91.1	70.1
	Fall of old products in old markets	-48.9	-24.1	-3.9	-2.6
	Extinction of exports of old products to old markets	-20.3	-12.4	-2.4	-4.1
Extensive		**42.1**	**32.7**	**15.2**	**36.7**
	Increase of new products in new markets	0.1	0.2	0.0	0.0
	Increase of new products in old markets	4.8	7.3	1.8	8.2
	Increase of old products in new markets	37.2	31.2	13.3	28.5

Source: COMTRADE

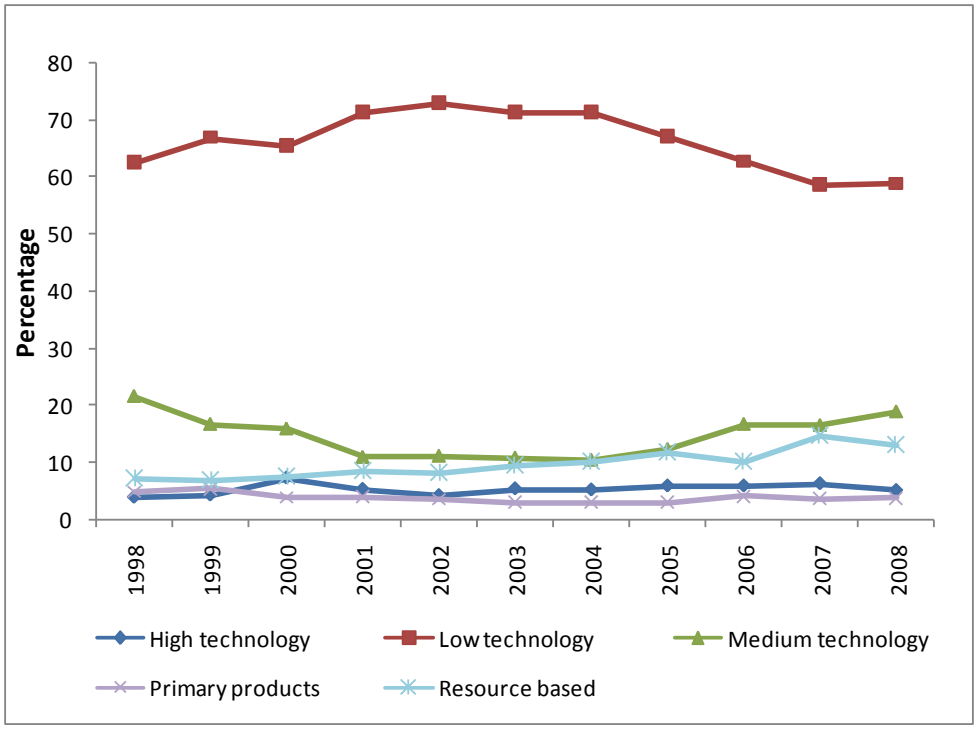
PART III: SOPHISTICATION

This section focuses on export sophistication and quality. The type of export products and inputs embodied in these products matter for export-led growth and economic upgrading. High-quality goods in terms of ingenuity, skills, and technology fetch higher prices in world markets. Countries specializing in the production of more sophisticated goods compared to what their income levels would suggest tend to see higher rates of future economic growth. Upgrading product quality, therefore, can be considered a source of both export and economic growth.

3.1. Technological Classification and Sophistication of Exports

The evolution of the technological content of El Salvador during the decade showed an interesting u-shaped for medium tech and inverse u-tech for low tech exports.

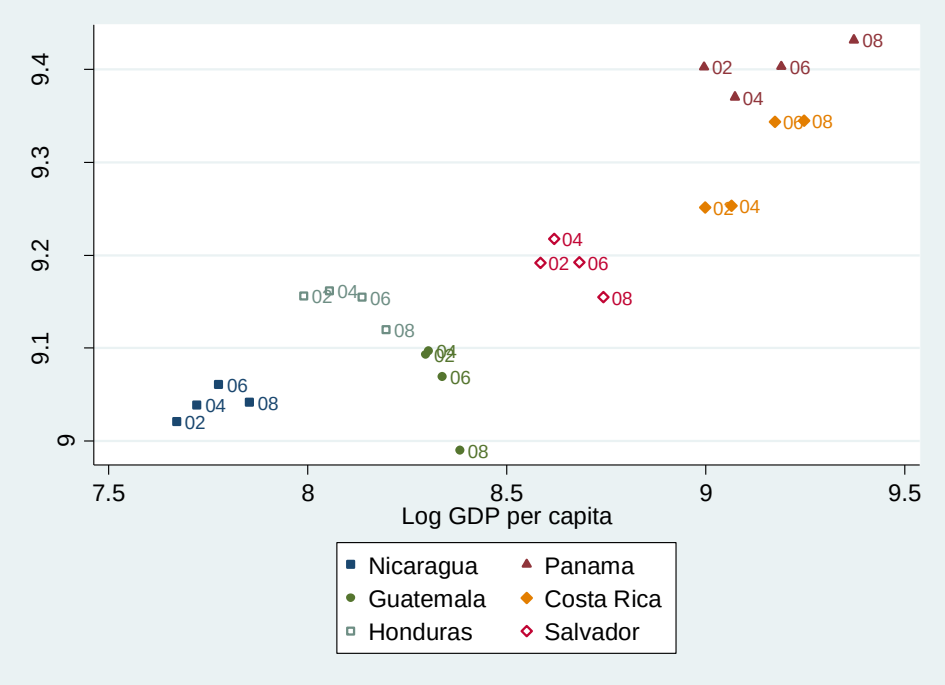
Figure A22. Technological Classification of Exports



Source: COMTRADE

Hausman, Hwang and Rodrik (2006) argue that the level of product sophistication matters for economic growth. Countries that have a more sophisticated export basket, proxied by a measure named EXPY (see Annex 2), enjoy accelerated subsequent growth while those with less sophisticated export baskets tend to lag behind – in essence, countries become what they export. Figure 30 shows the sophistication of exports (y-axis) and per-capita GDP (x-Axis) for all Central American countries over time. The sophistication of El Salvador's export basket grew steadily from 1998 to 2003 and then declined each year until 2008. This decline meant not only that part of the gains in sophistication during the first part of the decade were lost but also that other countries like Nicaragua and Honduras started to close the gap in sophistication with El Salvador.

Figure A23. Change in Export Sophistication



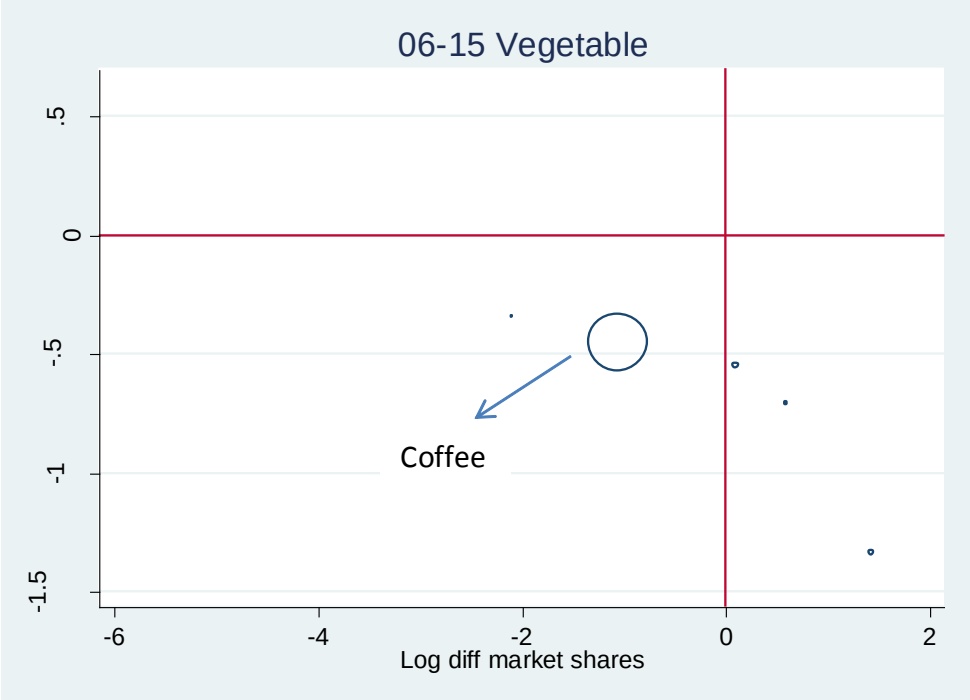
Source: Author's computation

3.2 Quality

One way a country can increase the absolute amount of exports per capita is by augmenting the quality of exports and thus the value of exports per unit. Using a highly detail database on unit values of exports to the EU, we construct a measure of the relative quality of each exported product to the EU (see Annex 3). The figure below presents the relation between growth in the relative quality measure and changes in market shares of El Salvador's exports to the EU market.[73] Each bubble represents a product, defined by an 8-digit Combined Nomenclature code. The x-axis shows the growth rate of market share (log difference of market shares) between 1996-08 and 2006-08. The y-axis represents the growth rate of the average quality measure between the same periods of time. The size of each bubble is the importance of each product in El Salvador's export basket in 2006-08. We present the analysis for products within the most important export sector to the EU: Vegetables.

[73] Given data availability, we cannot do the same analysis for the US.

Figure A24. Change in Relative Quality and in Market Shares in the European Market (Ave.06-08/Av.96-98)



Source: COMTRADE

While vegetable products are nowadays the most important export sector to the EU, representing 45% on average during 2006-2008, they are down considerably compared to 1996-1998, when vegetables represented more than 90% of the total Salvadorian export basket to EU. Regarding products, coffee (labeled in Figure A24) used to represent almost the totality of the vegetable exports during the first period, however its relative importance decreased by over 50% due to the progress of other vegetable products.

C. Guatemala

PART I: ORIENTATION AND GROWTH

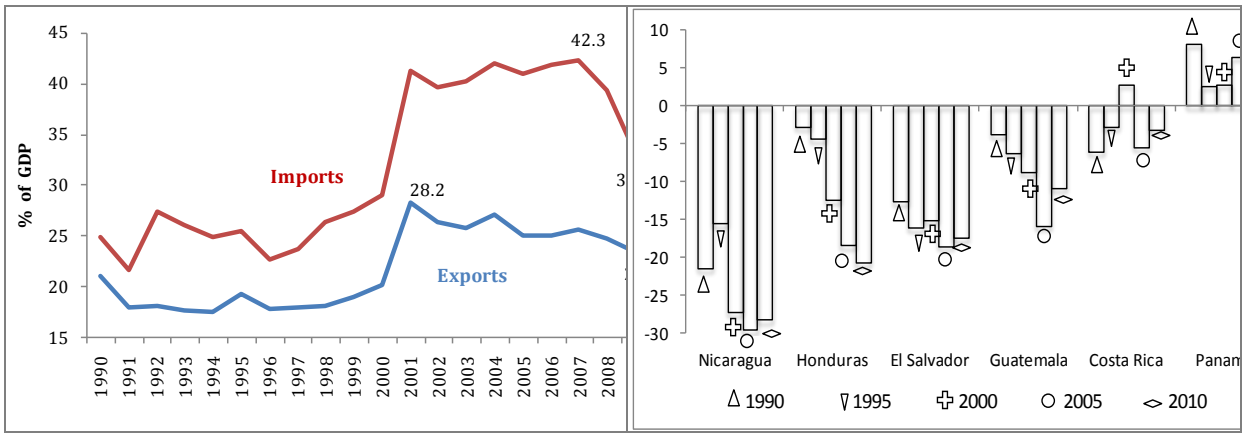
1.1 Exports, Imports, and Trade Balance

Guatemala's exports of goods and services as a percentage of GDP increased from 21 percent in 1990 to 28 percent in 2001, but constantly declined since then to only 23 percent in 2009. Imports of goods and services had a higher share of GDP over the period 1990-2009, climbing from 25 percent in 1990 to 41 percent in 2001. Since 2001, the import share has plateaued at around 42 percent before declining sharply to 39 and 33 percent in 2008 and 2009, respectively (Figure A25, left panel).

The higher percentage of imports in Guatemala's GDP is reflected in the negative trade balance as a percentage of GDP which expanded constantly over the period, but declined somewhat since the recent crisis (Figure A25, right panel). In comparison with its Central American counterparts, Guatemala shows lower trade deficits than Nicaragua, Honduras, and El Salvador, but higher ones than Costa Rica, while Panama is the only country with a positive trade balance.

Figure A25

Guatemala: Exports and Imports | **Trade Balance (% GDP)**



Source: World Development Indicators

1.2 Openness to Trade

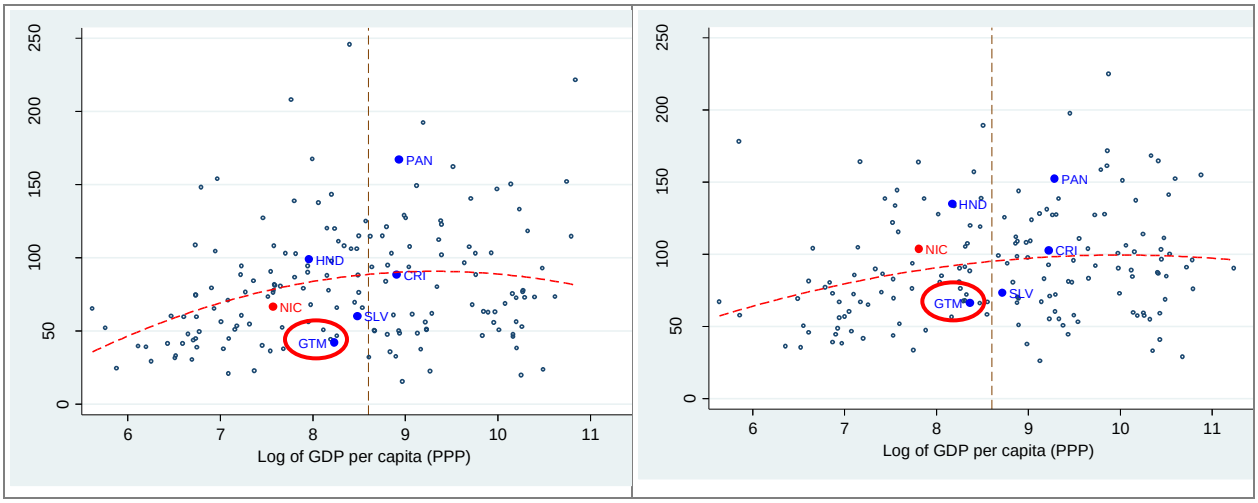
The trade-to-GDP ratio is one of the most basic indicators of openness to foreign trade and economic integration. It weighs the combined importance of exports and imports of goods and services relative to GDP in an economy. The ratio gives an indication of the dependence of domestic producers on foreign demand and of domestic consumers and producers on foreign

supply. There is a concave relationship between trade openness and per capita income: countries tend to trade more as incomes rise, but at a decreasing rate.

Guatemala's relative position below the predicted curve in 1996-98 indicates that openness to trade was lower than what was expected given the country's income per-capita level[74], i.e. on average, countries of similar income showed higher trade participation (Figure A26, left panel). One decade later (2006-08), Guatemala's relative position had only improved slightly, but still was lower than the predicted trade share (Figure A26, right panel). Guatemala's higher relative trade position in 2006-08 is mainly driven by an improved relative position in imports as share of GDP, while it only improved slightly in exports.

Figure A26

Openness to Trade (Average 1996-1998) **Openness to Trade (Average 2006-2008)**



Source: World Economic Indicators

1.3 Composition of Exports

Guatemala's distribution of goods exports across broad sectors shifted slightly towards more resource-intensive sectors between 1996-98 and 2006-08 (Table A11).[75] Exports were concentrated in vegetables, textiles and clothing, and food products in 1996-08, which made up three quarters of the country's total export basket. In 2006-08, this export share had fallen to 65 percent, reflecting relatively low annualized growth rates of these exports compared to other

[74] In figure 33 the dotted line represents the world average GDP per capita (in logs) in each period. In both periods of time, the world average per capita income was around exp (8.6) which is US$6000 at PPP.

[75] In order to avoid one year spikes that might skew our data, we use three year averages (1996-98 and 2006-08) of export values.

sectors, especially in vegetables and textiles and clothing. The top three export sectors are in line with the revealed comparative advantage (RCA) index.[76]

Guatemala expanded its reliance on natural-resource intensive sectors, such as chemicals, minerals, plastics and rubbers, stone and glass, and metals from 17 to 26 percent between 1998-98 and 2006-08, while its export share of more sophisticated products, such as machinery/electrical equipment and transportation, grew marginally from 2.1 to 2.3 over the same period of time.

Table A11. Guatemala: Export Basket and revealed Comparative Advantage

		Average 1996-1998			Average 2006-2008			
	Sector	**Exports**	**% of total**	**RCA**	**Exports**	**% of total**	**RCA**	**Average Annual Growth Rate**
01-05	**Animal**	57.16	1.4	0.74	115.07	1.5	0.80	7.2
06-15	**Vegetable**	1,363.45	34.1	12.11	2,060.86	27.3	8.96	4.2
16-24	**Food products**	590.35	14.8	5.46	1,115.60	14.8	4.91	6.6
25-27	**Minerals**	95.13	2.4	0.39	380.94	5.1	0.26	14.9
28-38	**Chemicals**	295.78	7.4	1.14	584.07	7.7	0.78	7.0
39-40	**Plastic / Rubber**	121.85	3.0	0.88	357.39	4.7	1.00	11.4
41-43	**Hides, Skins**	17.12	0.4	0.57	34.94	0.5	0.69	7.4
44-49	**Wood**	68.81	1.7	0.52	175.63	2.3	0.75	9.8
50-63	**Textiles, Clothing**	1,080.83	27.0	5.07	1,751.91	23.2	5.07	4.9
64-67	**Footwear**	21.75	0.5	0.60	31.87	0.4	0.52	3.9
68-71	**Stone / Glass**	60.19	1.5	0.58	350.24	4.6	1.39	19.3
72-83	**Metals**	108.44	2.7	0.47	331.04	4.4	0.46	11.8
84-85	**Mach/Elec**	62.44	1.6	0.07	144.53	1.9	0.07	8.8
86-89	**Transportation**	23.02	0.6	0.06	25.58	0.3	0.03	1.1
90-97	**Miscellaneous**	34.79	0.9	0.18	82.64	1.1	0.18	9.0
	Total	4,001.11	100.0		7,542.29	100.0		6.5

Note: Exports are in millions of US dollars. RCA is the revealed comparative advantage.
Source: COMTRADE

Guatemala's top ten export goods in 2006-08 confirm the country's strong reliance on vegetables, foodstuff, and clothing (Table A12). The top ten products made up 41 percent of the

[76] The RCA index measures the relative advantage or disadvantage of a certain country in a certain industry as evidenced by trade flows. An index value above the number 1 indicates that a country's share of exports in that sector exceeds the global export share of the same sector. If this is the case, we infer that the country has a comparative advantage in that sector. Since high export volumes can results from subsidies or other incentives provided, including under-valued exchange rates, the RCA index has been argued to be a misnomer in the sense that it captures competitiveness rather than comparative advantage (Siggel, 2006).

total export basket, reflecting a relatively low export concentration (see section 2.2). Among the top ten, vegetables had an export share of 19 percent, of which coffee was the main export good, followed by bananas, cardamoms, and melons. The last two even managed to increase their rank compared to 1996-98.

While textiles and clothing among the top ten export products only cover knit pullovers and cardigans of cotton as well as T-shirts, singlets and other vests of cotton, they made up almost 10 percent of the total export basket in 2006-08. Both remarkably improved their rank over the preceding decade. Interestingly, exports of gold were ranked 779 in 1996-98, but became the seventh largest export good in 2006-08.

Table A12. Top Ten Products Exported by Guatemala (Average 2006-2008)

rank	HS6	Product	% of total	Rank 96-98
1	**090111**	Coffee, not roasted, not decaffeinated	9.0	1
2	**611020**	Pullovers, cardigans etc of cotton, knit	7.6	10
3	**080300**	Bananas, including plantains, fresh or dried	6.4	3
4	**170111**	Raw sugar, cane	4.3	2
5	**270900**	Petroleum oils, oils from bituminous minerals, crude	4.1	8
6	**610910**	T-shirts, singlets and other vests, of cotton, knit	2.2	21
7	**710812**	Gold in unwrought forms non-monetary	2.0	779
8	**090830**	Cardamoms	1.9	11
9	**080710**	Melons (including watermelons), fresh	1.9	16
10	**170199**	Refined sugar, in solid form, nes*, pure sucrose	1.6	7
Total			**40.9**	

*Source: COMTRADE. *no elsewhere specified*

Guatemala's services exports show that the country has strongly increased its dependence on travel by 15 percentage points between 1996-98 and 2006-08, at the cost of other business services which dropped by 20 percentage points. At the same time, the export share of communication services more than doubled to almost 15 percent in 2006-08. Interestingly, the shift towards travel can be observed in all other Central American countries except Costa Rica.

Table A13. Share in Total Exports of Services (BoP)

Sector	Average 1996-1998						Average 2006-2008					
	CRI	GTM	HND	NIC	PAN	SLV	CRI	GTM	HND	NIC	PAN	SLV
Transport	15.2	12.7	17.3	14.3	52.6	31.3	8.9	11.8	5.7	11.6	53.9	24.2
Travel	67.1	44.3	42.8	49.2	21.6	29.1	56.5	59.5	68.9	68.2	24.0	57.1
Other services	17.8	42.9	39.8	36.5	25.8	39.6	34.6	28.7	25.4	20.1	22.2	18.7
Communications	6.9	6.9	22.4	15.2	2.5	18.6	1.2	14.6	18.6	8.2	4.1	10.2
Construction	-	0.2	-	-	-	0.7	-	0.2	-	-	0.0	2.3
Insurance	-0.1	2.0	5.5	1.7	1.1	7.5	-	1.2	3.7	1.0	1.3	2.3
Financial services	0.4	2.4	0.3	-	5.5	1.6	0.4	0.6	0.8	-	7.3	0.2
Computer and information	0.1	0.5	0.1	-	-	-	14.9	0.7	0.1	-	0.4	0.1
Royalties and license fees	0.1	-	-	-	-	-	0.0	0.6	-	-	-	0.0
Other business services	9.2	23.8	6.2	-	6.2	2.3	17.1	3.9	1.8	-	7.8	1.3
Personal, cultural and recreational services	0.0	-	0.0	-	-	-	0.0	1.3	0.4	-	-	-
Government services, n.i.e.*	1.1	7.2	5.4	19.6	10.6	9.6	1.0	7.1	1.6	10.9	1.2	2.3

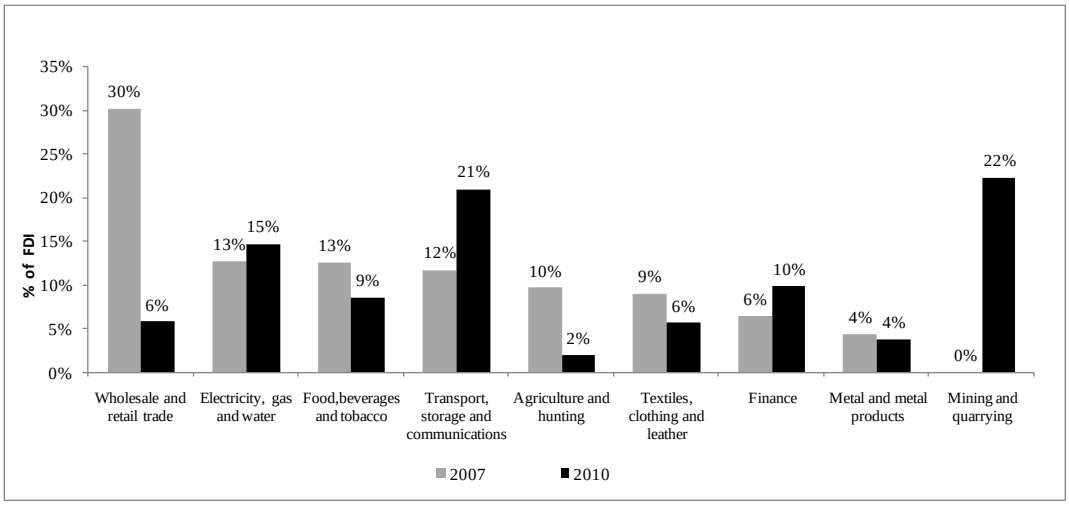
*Source: UNCTADSTAT database. *Not included elsewhere.*

1.4 Foreign Direct Investment

Foreign Direct Investment (FDI) has been considered a catalyst for growth and development due to possible spillovers on the local economy, especially in countries with low capital accumulation. Such spillovers can range from innovation (through faster transfer of know-how and state-of-the-art technologies), increases in productivity, sophistication and competitiveness (through increased competition), and broader product choice for consumers, among others.

Average FDI inflows over the period 2008-10 reached US$717.6 million in Guatemala. The top four sectors receiving FDI inflows over this period were all non-manufacturing sectors and made up 60 percent of total average FDI inflows to Guatemala (Figure A27), namely mining and quarrying (11 percent), wholesale and retail trade (18 percent), electricity, gas, and water (14 percent), and transport, storage, and communications (16 percent). In manufacturing, food, beverages and tobacco (11 percent) and textiles, clothing, and leather (7 percent) had the largest share, reflecting the export structure of the country. FDI in agriculture and hunting (6 percent) also played an important role.

Figure A27. FDI Inward Flow of Guatemala



Source: Investment Map, International Trade Centre.

1.5 Trading Partners

As in many Central American countries, the United States is the main destination for Guatemala's goods exports. Nevertheless, the US export share declined by 5 percentage points to 45 percent between 1996-98 and 2006-08. This is to a large part driven by a decline in coffee exports to the US which fell by 6.5 percentage points over the period, but also a decline in many articles of apparel and clothing (not knitted/crocheted).

Analogously, the export share to the EU-27 – especially to Germany – fell by almost 5 percentage points to seven percent. As in the US, this is to a large part driven by a decline in coffee exports to the Germany which fell by more than 12 percentage points over the period. Exports of other vegetables and bananas to Germany also fell by 6 percentage points, respectively.

Higher intra-regional trade almost entirely compensated for Guatemala's reduced reliance on the US and EU-27 markets, rising from less than a quarter in 1996-98 to almost a third of the country's export basket in 2006-08. Trade with Mexico and Honduras, in particular, rose by more than 6 percentage points. Among the BRICs, China became the largest export destination, but still only plays a minor role with less than 1 percent of the export basket. Despite its geographical ties, Brazil only absorbs 0.2 percent of Guatemala's exports.

Table A14. Guatemala: Trading Partners

	Average (1996-1998)	Average (2006-2008)
United States	**50.8**	**45.5**
Regional	**20.3**	**25.9**
Salvador	8.2	9.9
Honduras	4.4	7.1
Costa Rica	3.4	3.5
Nicaragua	2.7	2.9
Panama	1.4	1.9
Mexico	**2.3**	**6.0**
EU-27	**11.8**	**7.2**
Germany	3.5	1.3
Netherlands	1.6	1.4
France	1.3	0.7
Spain	0.5	1.0
Italy	1.1	0.8
Rest EU-27	3.8	2.0
South America*	**2.8**	**2.7**
Chile	0.6	0.8
Peru	1.0	0.6
Rest	1.2	1.3
BRIC Countries	**1.1**	**1.1**
Russia	1.0	0.1
India	0.0	0.0
China	0.0	0.8
Brazil	0.1	0.2
Rest of the World	**11.0**	**12.1**

* Excluding Brazil

Source: COMTRADE

1.6 How "natural" are they?

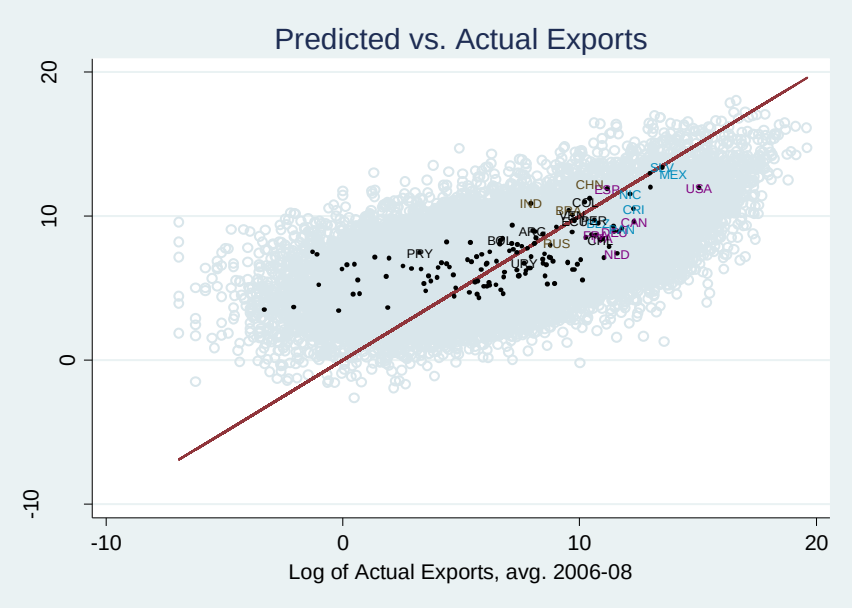
In a next step, we assess whether a country's export products are "natural" by estimating a gravity model. Based on a theory-grounded model[77], this exercise allows us to compare actual

[77] We regress 2006-08 bilateral exports (using mirror data) on the following bilateral characteristics: distance, contiguity, common language, colony, common colonial power, as well as log of GDP, log of GDP per capita, etc. We also incorporate three innovations. First, a measure of remoteness is computed by summing distances weighted

bilateral export relationships of a country with all its trading partners with the predicted export values from the gravity equation. The gravity model is based on average bilateral export values in 2006-08.

Figure A28 shows all bilateral trade relationships in our dataset of 181 countries (light grey dots). Guatemala's bilateral exports are black and key trading partners are labeled. For export destinations below the 45-degree line, Guatemala's actual export value in 2006-08 is higher than what the gravity model would have predicted, i.e. Guatemala "over-trades" with these countries. These countries include many high-income countries (e.g. Canada, France, Germany, Netherlands, US) as well as its Central American neighbors (Belize, Costa Rica, El Salvador, Mexico, Nicaragua, and Panama). Analogously, Guatemala "under-trades" with countries above the 45-degree line. Such countries include most BRICs (Brazil, China, India), many South-American countries (Argentina, Bolivia, Colombia, Paraguay), but also Spain, pointing towards the existence of untapped trade potential.

Figure A28. Gravity Model



Source: COMTRADE

by the share of GDP of the destination in world GDP. This is to take note of the fact that relative distances matter greatly, alongside absolute distances. Second, we control for zero trade flows using the Heckman sample selection correction method, since OLS drops observations with non-existent bilateral trade. The probability of being included in the sample, i.e. having a non-zero trade flow, would be left out in the model. If the probability of selection is correlated with GDP or distance, OLS estimates would be biased. Third, following Helpman, Melitz and Rubinstein (2008), control for firm heterogeneity (without using firm-level data) relying on the fact that the features of marginal exporters can be inferred from the export destinations reached. With these steps, the gravity results are better grounded in modern trade theory.

PART II: DIVERSIFICATION

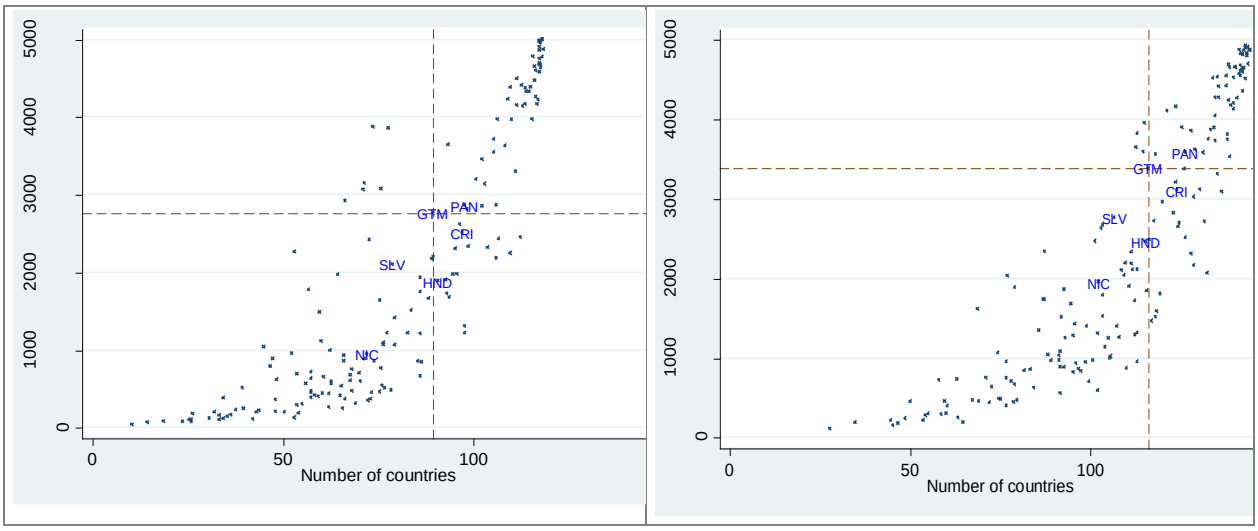
2.1 Number of Products and Markets

Export diversification across markets and products reduces the risk of the country's export portfolio to partner-specific shocks and volatility in export prices. One simple way of detecting a country's product and market diversification is to count its number of exported products and export destinations.[78] Figure A29 shows the number of a country's export destinations (x-axis) and the number of a country's export products (y-axis) for 1996-98 (left panel) and 2006-08 (right panel).

All Central American countries increased the number of export markets over the period. In addition, all Central American countries increased their number of export products. Compared to its regional peers, Guatemala remained at the second position behind Panama in terms of number of export products. On the other hand, Guatemala managed to catch up in terms of number of export destinations from rank five in 1996-98 to rank four in 2006-08. Despite the increase in both export goods and destinations, Guatemala still has some untapped potential.

Figure A29

Export Relationships (Average 1996-1998) **Export Relationships (Average 2006-2008)**



Source: COMTRADE

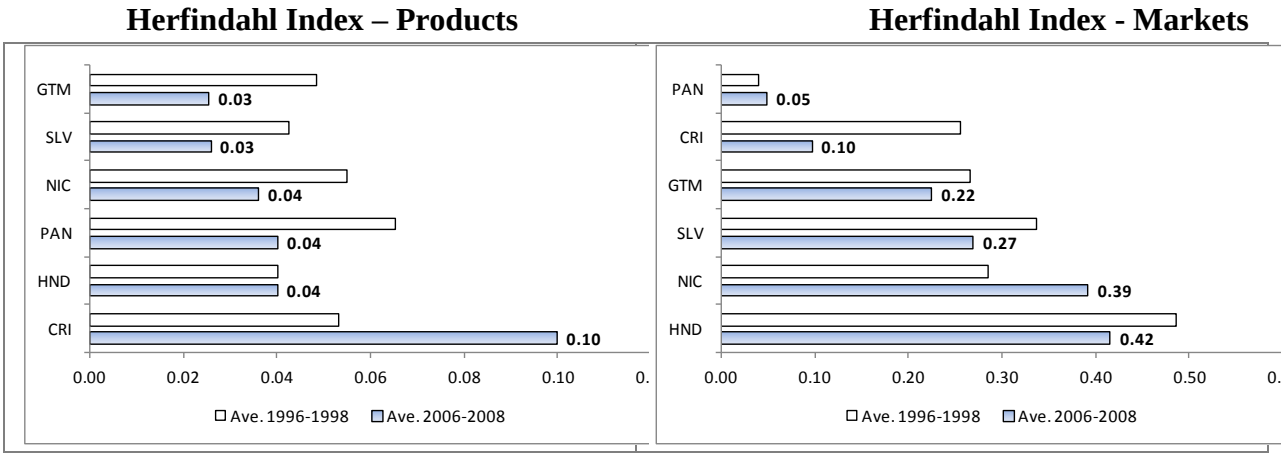
[78] Note that both indicators are imperfect measures of dynamics at the extensive margin of trade.

2.2 Concentration Index

In a next step, we look at the Herfindahl-Hirschman index (HHI) as a more sophisticated measure of export diversification.[79] Figure A30 shows the HHI of product (left panel) and market concentration of exports (right panel) for Central-American countries in 1996-98 versus 2006-08. Guatemala as well as El Salvador, Nicaragua, and Panama all increased their diversity in export products over the period, whereas Costa Rica showed a higher product concentration of exports, confirming the results of section 2.1. In a regional comparison, Guatemala was one of the countries with the lowest product concentration of exports in 2006-08.

Second, all Central American countries except for Panama and Nicaragua increased their export diversification across markets over the period. Comparing Guatemala with its regional peers, the country showed the third highest diversification of export markets after Panama and Costa Rica in 2006-08.

Figure A30



Source: COMTRADE

2.3 Growth Orientation of Products and Markets

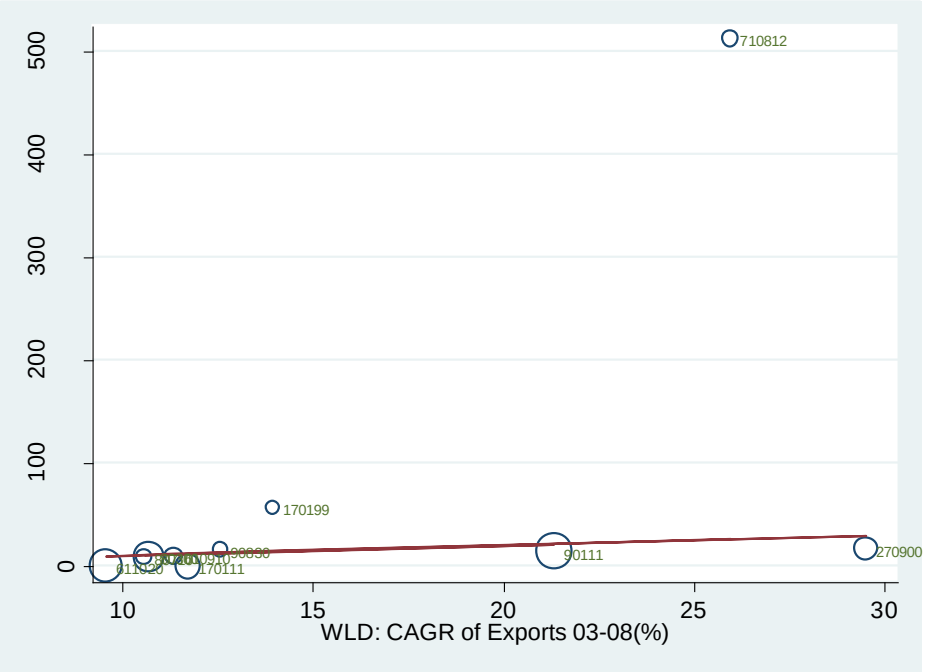
We now compare the top ten products exported by Guatemala – as identified in section 1.3 – with worldwide exports of the same products (Figure A31). The y-axis plots export growth for Guatemala's top ten products between 2003 and 2008, while the x-axis shows world export growth for same goods over the same period. The circle size indicates the relative importance of the product in Guatemala's export basket over 2006-08. Products above the 45-degree line experienced higher export growth in Guatemala compared to all countries, while products below

[79] The HHI is computed as the sum of squared shares of each product (market) in total export. A country with a perfectly diversified export portfolio in terms of products (markets) will have an index close to zero, whereas a country with only one export product (market) will have a value of 1.

the line were characterized by lower growth than the world. In other words, products above the 45-degree line gained in world market share, while products below the line lost market share.

Between 2003 and 2008, Guatemala lost world market share in seven of its top ten export products, most importantly in coffee (090111), the most important export good over 2006-08, and petroleum oils (270900), the fifth most important export good. However, Guatemala gained world market share in three export goods, namely gold (710812), sugar (170199), and cardamom (090830).

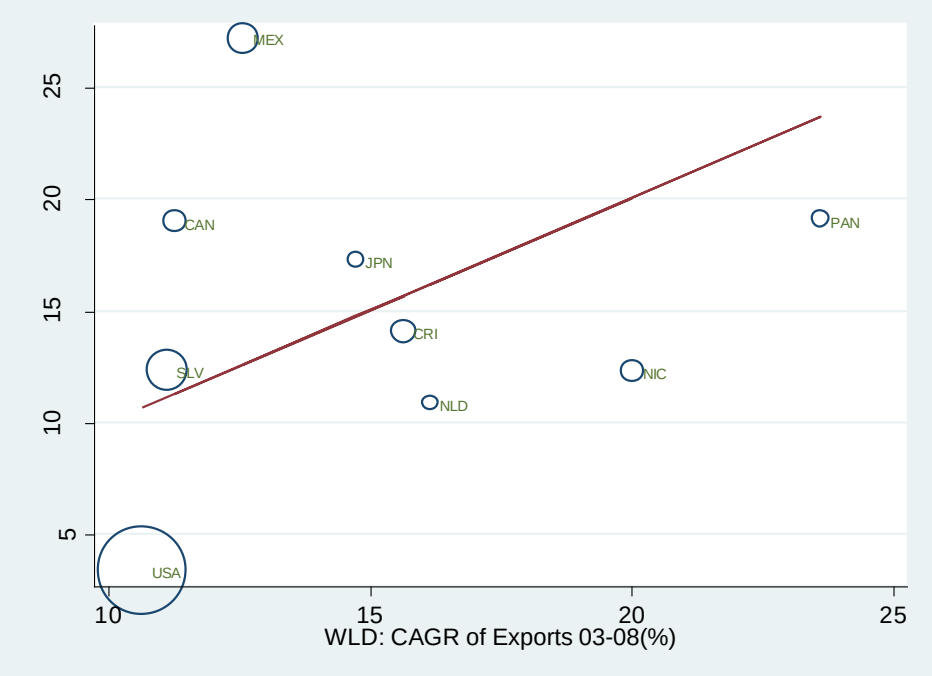
Figure A31. Growth Orientation of Products
(Top 10 Products)



Source: COMTRADE

Analogously, we compare Guatemala's export growth in the country's top ten export destinations with worldwide export growth in the same export destinations (Figure A32). Between 2003 and 2008, Guatemala's exports gained market share in Mexico and El Salvador, two important trading partners, and also in Canada and Japan. At the same time, the country lost world market share in regional partner countries, namely Panama, Nicaragua, and Costa Rica, but also in the Netherlands and, most importantly, the US – the country's largest trading partner.

Figure A32. Growth Orientation of Destinations
(Top 10 Markets)



Source: COMTRADE

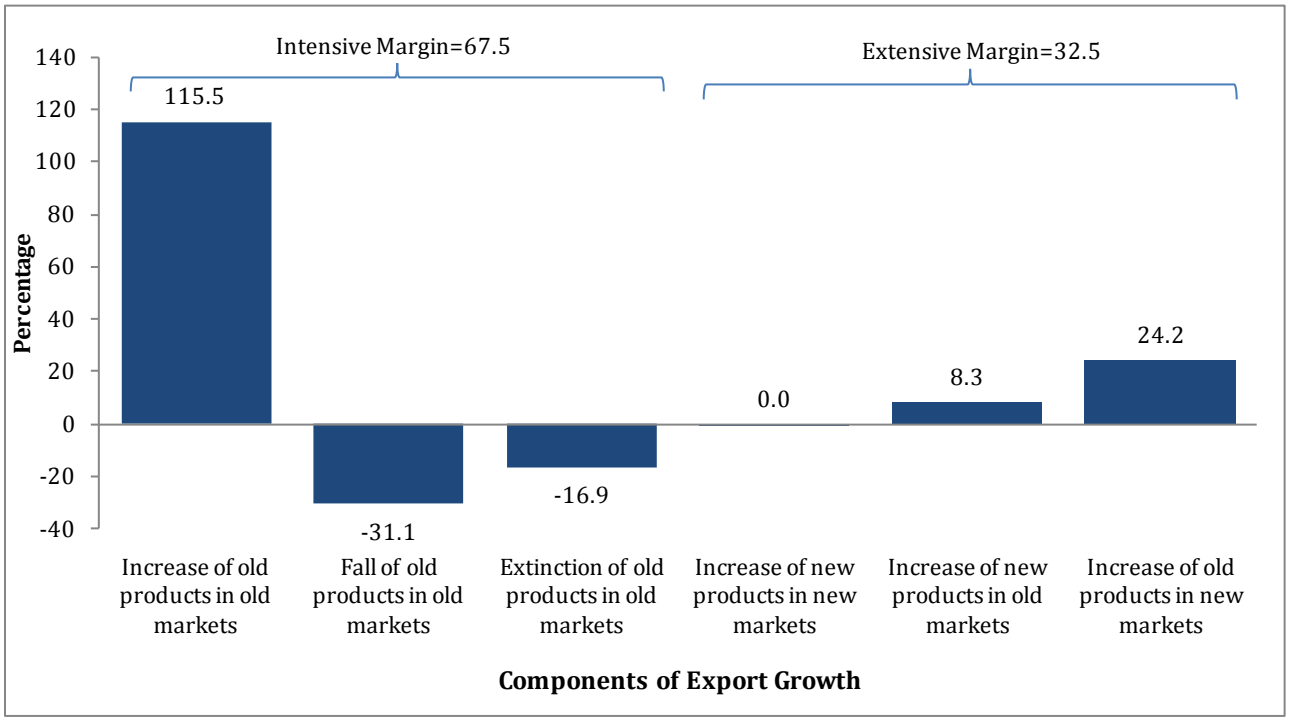
2.4 Intensive and Extensive Margins of Exports

Export growth can take place at the intensive margin, i.e. selling existing products to existing markets, or at the extensive margin, i.e. selling existing products to new markets, new products to new markets, and new products to existing markets. This subsection explores to what extent Guatemala has been able to add new, economically significant products and markets into its export portfolio.

In this section, we decompose Guatemala's export growth between 1998 and 2008 into export growth (i) at the intensive margin, i.e. increase, fall, or extinction of old export products in old markets, and (ii) export growth at the extensive margin, i.e. increase of new export products in new and old markets and increase of old export products in new markets.

Figure A33 shows that the intensive margin explains two thirds of Guatemala's export growth between 1998 and 2008, while the extensive margin explains one third. Export growth at the intensive margin was driven by export growth of old products in old markets (116 percent), which compensated for negative export growth or even an extinction of old products in old markets (combined -48 percent). Export growth at the extensive margin was driven by old products in new markets (24 percent) and to a lesser extent also by new products in old markets (8 percent).

Figure A33. Decomposition of Export Growth
(Average 1998-2008)



Source:COMTRADE

At the regional level, Guatemala's export growth performed better than in the Central American region for old products in old markets as well as for new products in old markets (Table A15). However, the country's export growth performed worse for old products in new markets and showed a stronger decline and extinction of old products in old markets. Comparing Guatemala with more advanced countries such as Chile, we observed that the role of the intensive margin in export growth is relatively smaller. This is explained by a large participation of the reduction of export of old products in old markets.

Table A15. Comparative Decomposition of Export Growth

Margin	Components of Export Growth	Guatemala	Simple Regional Average	Chile
Intensive		**67.5**	**61.3**	**84.8**
	Increase of old product in old markets	115.5	97.8	91.1
	Fall of old products in old markets	-31.1	-24.1	-3.9
	Extinction of exports of old products to old markets	-16.9	-12.4	-2.4
Extensive		**32.5**	**32.7**	**15.2**
	Increase of new products in new markets	0.0	0.2	0.0
	Increase of new products in old markets	8.3	7.3	1.8
	Increase of old products in new markets	24.2	31.2	13.3

Source: COMTRADE

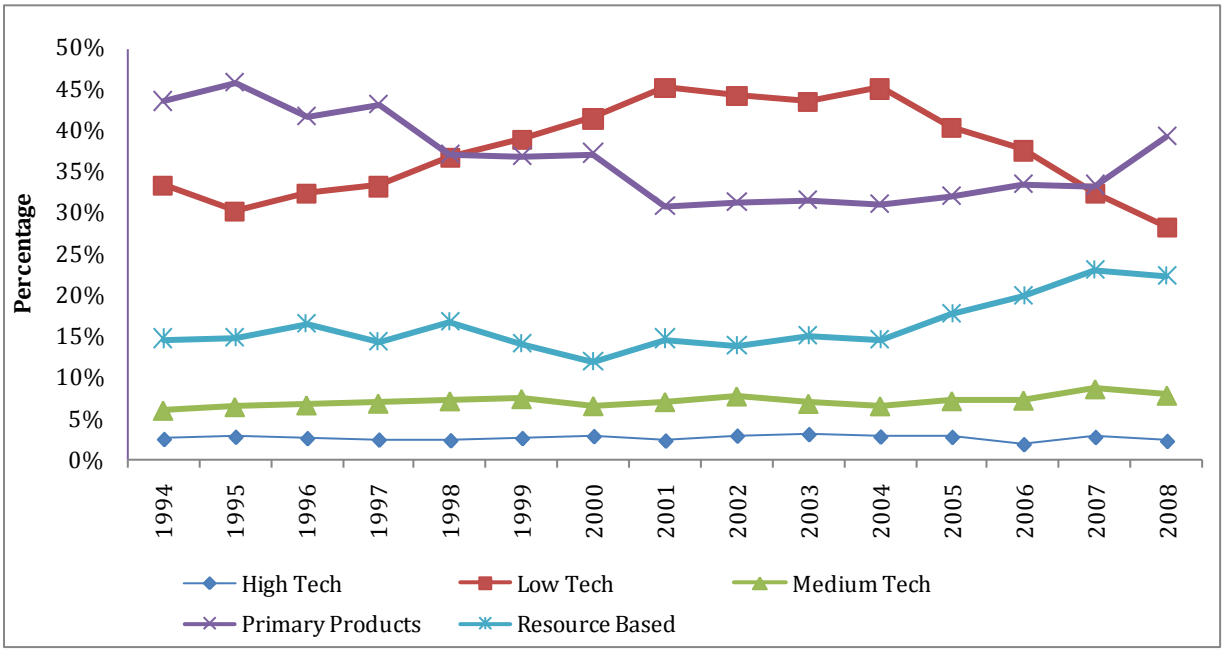
PART III: SOPHISTICATION AND QUALITY

This section focuses on export sophistication and quality. The type of export products and inputs embodied in these products matter for export-led growth and economic upgrading. High-quality goods in terms of ingenuity, skills, and technology fetch higher prices in world markets. Countries specializing in the production of more sophisticated goods compared to what their income levels would suggest tend to see higher rates of future economic growth. Upgrading product quality, therefore, can be considered a source of both export and economic growth.

3.1 Technological Classification and the Sophistication of Exports

The technological content of Guatemala's exports has only improved slightly between 1994 and 2009 with the share of high-tech exports remaining constant at around 2 percent and the share of medium-tech exports rising from 6 to 8 percent. Low-tech exports, however, followed an inverse U-shaped pattern over the period. On the other hand, Guatemala increased its dependence on resource-based exports from 15 to 22 percent of the export basket. Exports of primary products declined from 44 to 31 percent between 1994 and 2001, but climbed back to 39 percent in 2008.

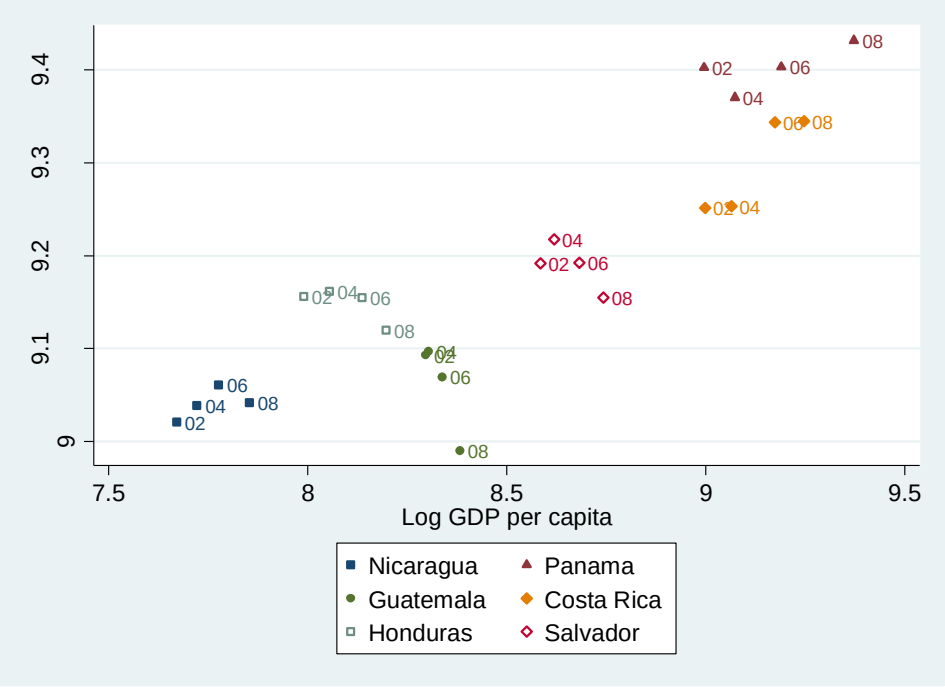
Figure A34. Technological Classification of Exports



Source: COMTRADE

Hausman, Hwang and Rodrik (2006) argue that the level of product sophistication matters for economic growth. Countries that have a more sophisticated export basket, proxied by a measure named EXPY (see Annex 2), enjoy accelerated subsequent growth while those with less sophisticated export baskets tend to lag behind – in essence, countries become what they export. Figure A35 shows the sophistication of exports (y-axis) and per-capita GDP (x-Axis) for all Central American countries over time. The sophistication of Guatemala's export basket has clearly deteriorated over time, reflecting the stronger dependence on primary and resource-based goods. Moreover, Guatemala showed the lowest level of export sophistication among its regional peers in 2008.

Figure A35. Change in Export Sophistication



Source: Author's computations

3.2 Quality

Countries can increase the absolute amount of exports per capita, for example, by augmenting the quality of exports and subsequently the value of exports per unit. Using a highly disaggregated database on unit values of exports by sector to the EU, we construct a measure of the relative quality of each exported product (see Annex 3).

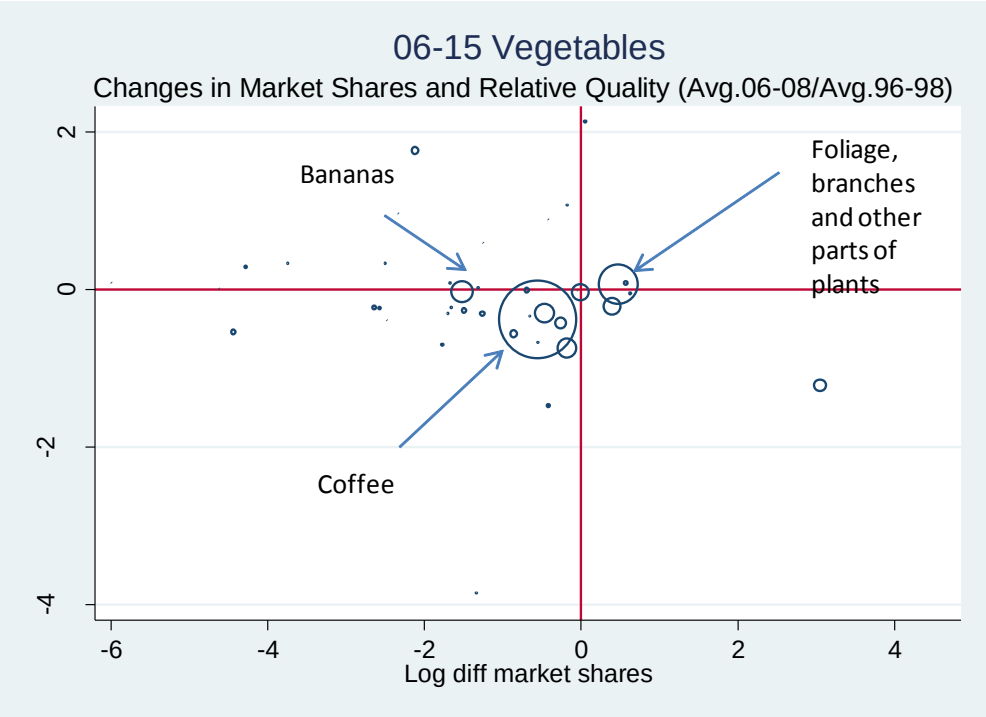
Figure A36 puts changes in the relative quality measure in relation to changes in market shares of Guatemala's exports to the EU.[80] The x-axis shows the growth rate of market share (log difference of market shares) between 1996-08 and 2006-08. The y-axis represents the growth rate of the average quality measure over the same period. Each circle represents a product, defined by an 8-digit Combined Nomenclature code, while its size represents the relative importance of each product in Guatemala's export basket in 2006-08.

We only focus on vegetables in Figure 43, as these made up almost 60 percent of Guatemala's exports to the EU in 2006-08. Coffee, the most important product over the period, not only lost market share in the EU between 1996-98 and 2006-08, but also declined in relative quality. However, coffee still represented almost a third of the total export basket to the EU. Foliage and branches for bouquets, the second most important export product in 2006-08, however, slightly increased in both market share and relative quality over the period. Bananas, which were the

[80] Because of data constraints, we cannot replicate the analysis for the US.

second most important export product in 1996-98, strongly lost in market share, but were still ranked seventh in 2006-08. Moreover, exported bananas maintained their relative quality.

Figure A36. Change in Relative Quality and in Market Shares in the European Market (Ave. 06-08/Ave. 96-98)



Source: COMTRADE

D. Honduras

PART I: ORIENTATION AND GROWTH

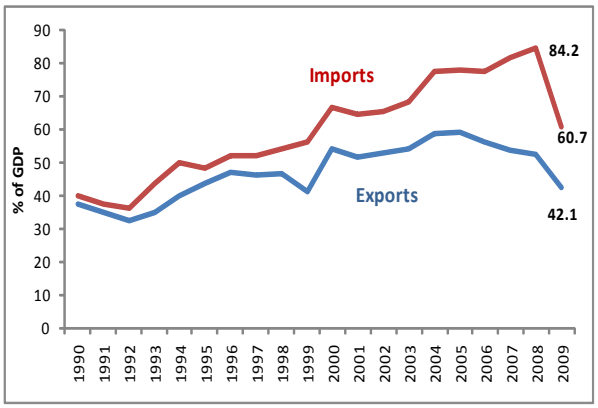
1.1. Exports, Imports and Trade Balance

Honduras's exports of goods and services as a percentage of GDP increased from 37.2 percent in 1990 to 53.9 percent in 2000, and then remained rather flat for the first half of the decade before declining after 2005. Imports of goods and services increased from 39.9 percent in 1990 to 84.2 percent in 2008 before a precipitous drop in 2009 (Figure A37, left panel).

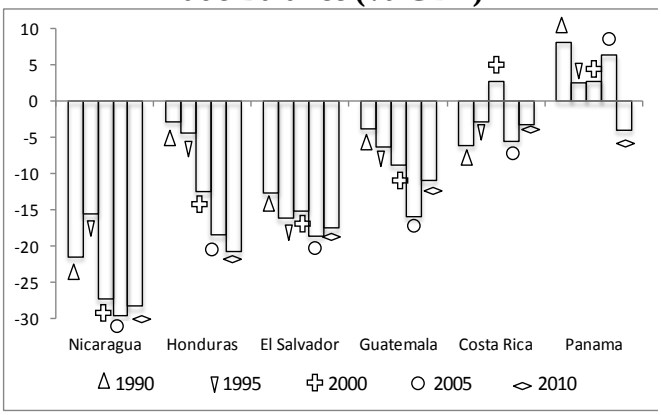
Honduras had a negative trade balance for the most part of the last two decades. Although Nicaragua, Honduras and El Salvador consistently reported two-digit trade deficits over the last decade, Honduras's trade deficit was significantly smaller in the 1990s when it remained below 5% of GDP – a level similar to Costa Rica's trade deficit during that decade.

Figure A37

Honduras, Exports and Imports



Trade Balance (% GDP)



Source: World Development Indicators

1.2. Openness to Trade

The trade-to-GDP ratio is one of the most basic indicators of openness to foreign trade and economic integration. It weighs the combined importance of exports and imports of goods and services relative to GDP in an economy. The ratio gives an indication of the dependence of domestic producers on foreign demand and of domestic consumers and producers on foreign supply. There is a concave relationship between trade openness and per capita income: countries tend to trade more as incomes rise, but at a decreasing rate.

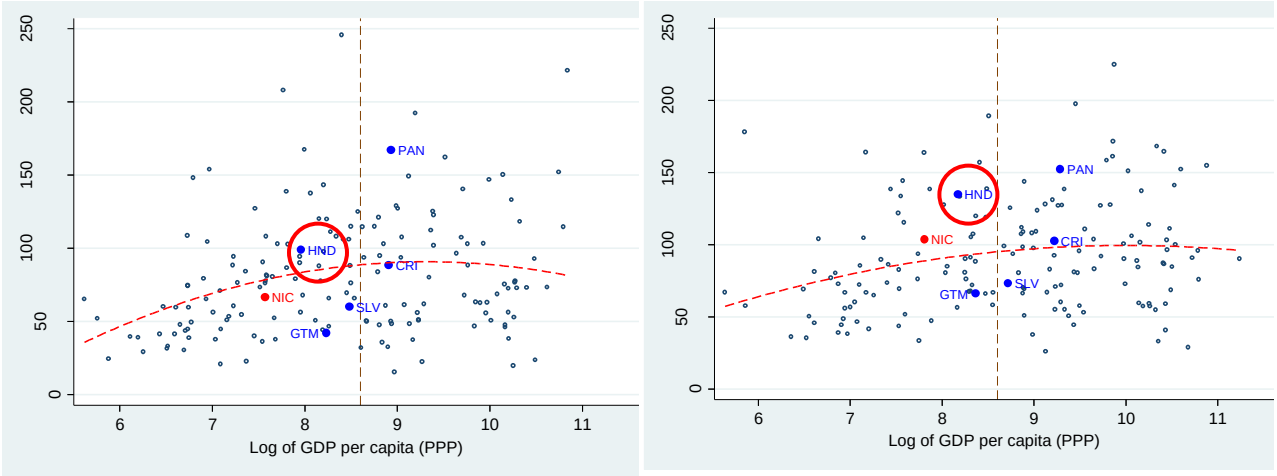
Honduras' relative position above the predicted curve in 2006-2008 indicates that openness to trade was higher than expected given the country's income per-capita level[81], i.e. on average,

[81] In figure 45 the dotted line represents the world average GDP per capita (in logs) in each period. In both periods of time, the world average per capita income was around exp (8.6) which is US$5400 at PPP.

countries of similar income showed lower trade participation (Figure 45, left panel). In fact, Honduras increased its trade to GDP ratio by about 40 percentage points over the last decade.

Figure 45

Openness to Trade (Average 1996-1998) **Openness to Trade (Average 2006-2008)**



Source: World Development Indicators

1.3. Composition of Exports

Honduras export basket relies heavily on textiles/clothing which account for half of total exports in 2006-08 – about the same share it had in 1996-98. As in some other countries in Central America, animal and fruits/vegetables exports grew at very modest rates between 1996-98 and 2006-08 while the foodstuff/agro-processed exports were more dynamic (Table A16).[82] Another sector that showed high growth rates over the same period was the machinery/electronics exports which grew at rates four times higher than the overall export basket and now represents 7.6% of total exports –up from 1.8% in 1996-98.

[82] In order to avoid one year spikes that might skew our data, we use three year averages (1996-98 and 2006-08) of export values.

Table A16. Honduras: Export Basket and revealed Comparative Advantage

		Average 1996-1998			Average 2006-2008			
Sector		Exports	% of total	RCA	Exports	% of total	RCA	Average Annual Growth Rate
01-05	Animal	247	7.3	3.9	271	4.3	2.3	1.0
06-15	Vegetable	830	24.5	8.8	1,152	18.5	6.0	3.3
16-24	Food products	161	4.8	1.8	343	5.5	1.8	7.9
25-27	Minerals	39	1.1	0.2	258	4.1	0.2	20.9
28-38	Chemicals	84	2.5	0.4	121	1.9	0.2	3.8
39-40	Plastic / Rubber	24	0.7	0.2	64	1.0	0.2	10.6
41-43	Hides, Skins	6	0.2	0.2	4	0.1	0.1	-3.5
44-49	Wood	77	2.3	0.7	112	1.8	0.6	3.8
50-63	Textiles, Clothing	1,708	50.5	9.6	3,097	49.6	10.8	6.1
64-67	Footwear	23	0.7	0.8	11	0.2	0.2	-6.9
68-71	Stone / Glass	6	0.2	0.1	112	1.8	0.5	33.5
72-83	Metals	32	1.0	0.2	89	1.4	0.2	10.6
84-85	Mach/Elec	59	1.8	0.1	473	7.6	0.3	23.1
86-89	Transportation	23	0.7	0.1	64	1.0	0.1	10.8
90-97	Miscellaneous	62	1.8	0.4	72	1.2	0.2	1.4
	Total	**3,380**	**100.0**		**6,243**	**100.0**		**6.3**

Note: Exports are in millions of US dollars. RCA is the revealed comparative advantage.
Source: COMTRADE

The list of Honduras' top ten export goods in 2006-08 is dominated by textile/clothing products. The six textiles/clothing products in the top ten list account for about a quarter of total exports and include cotton t-shirts and vests (610910), cotton jerseys, pullovers (611020), brassieres (621210), hosiery (611592), and cotton men's or boys' underpants (610711). Three of the remaining top ten products are traditional vegetable/fruit exports, namely, coffee (090111), bananas (080300), and palm oil (151110). The only product in the top ten that is not textiles or vegetables/fruits is ignition wiring sets (854430).

Table A17. Top Ten Products Exported by Honduras (Average 2006-2008)

Rank	HS6	Product	% of total	Rank 96-98
1	**610910**	T-shirts, singlets and other vests, of cotton,	11.2	2
2	**611020**	Jerseys, pullovers, etc, of cotton, knitted or	10.1	4
3	**090111**	Coffee, not roasted or decaffeinated	8.2	1
4	**854430**	Ignition wiring sets & other wiring sets of a kind	6.0	34
5	**080300**	Bananas, including plantains, fresh or dried	3.6	3
6	**611030**	Jerseys, pullovers, etc, of man-made fibers, knitted	3.3	25
7	**621210**	Brassieres	2.1	8
8	**611592**	Hosiery and footwear, of cotton, knitted or crocheted	1.8	193
9	**610711**	Men's or boys' underpants and briefs of cotton	1.8	9
10	**151110**	Crude palm oil	1.8	58
Total			**50.0**	

Source: COMTRADE

Honduras services exports show an increased dependency on travel (by 26 percentage points) in comparison with 1996-98. The importance of the travel industry in services exports in 2006-08 is the highest in Central America. This trend towards relatively more important travel services exports can be observed in all other countries in Central America except Costa Rica and Panama.

Table A18. Share in Total Exports of Services (BoP)

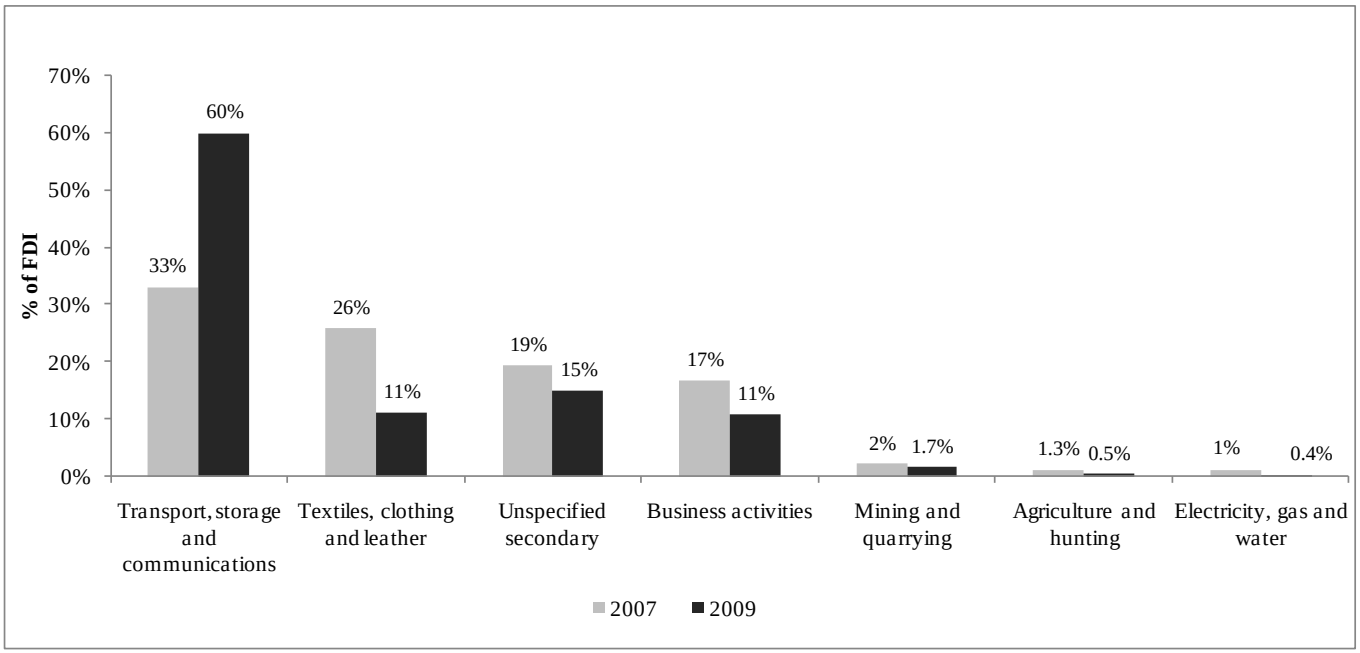
Sector	Average 1996-1998						Average 2006-2008					
	CRI	GTM	HND	NIC	PAN	SLV	CRI	GTM	HND	NIC	PAN	SLV
Transport	15.2	12.7	17.3	14.3	52.6	31.3	8.9	11.8	5.7	11.6	53.9	24.2
Travel	67.1	44.3	42.8	49.2	21.6	29.1	56.5	59.5	68.9	68.2	24.0	57.1
Other services	17.8	42.9	39.8	36.5	25.8	39.6	34.6	28.7	25.4	20.1	22.2	18.7
Communications	6.9	6.9	22.4	15.2	2.5	18.3	1.2	14.6	18.6	8.2	4.1	10.2
Construction	..	0.2	..	..	..	0.7	..	0.2	..	..	0.0	2.3
Insurance	-0.1	2.0	5.5	1.7	1.1	7.5	..	1.2	3.7	1.0	1.3	2.3
Financial services	0.4	2.4	0.3	..	5.5	1.6	0.4	0.6	0.8	..	7.3	0.2
Computer and information	0.1	0.5	0.1	..	..	..	14.9	0.7	0.1	..	0.4	0.1
Royalties and license fees	0.1	..	..	..	..	..	0.0	0.6	..	..	..	0.0
Other business services	9.2	23.8	6.2	..	6.2	2.3	17.1	3.9	1.8	..	7.8	1.3
Personal, cultural and recreational services	0.0	..	0.0	..	..	..	0.0	1.3	0.4	..	..	..
Government services, n.i.e.*	1.1	7.2	5.4	19.6	10.6	9.6	1.0	7.1	1.6	10.9	1.2	2.3

*Source: UNCTADSTAT database. *Not included elsewhere.*

1.4. Foreign Direct Investment

Foreign Direct Investment (FDI) has been considered a catalyst for growth and development due to possible spillovers in the local economy, especially in countries with low capital accumulation. Such spillovers can range from innovation (through faster transfer of know-how and state-of-the-art technologies), increases in productivity, sophistication and competitiveness (through increased competition), and broader product choice for consumers, among others.

Figure A39. FDI Inward Flow in Honduras



Source: Investment Map, International Trade Centre

The distribution of FDI inward flows to Honduras shifted towards foreign investments in services sectors. This shift is mainly due to a strong rise in transport, storage and communications, which received 60 percent of total FDI inward flows that year, compared to 33 percent two years earlier. However, this was the only sector that grew between 2007 and 2009; the others such as textiles and business activities decreased their share of total Honduras' FDI.

1.5. Trading Partners

The United States was the destination of about two thirds of Honduras exports in both 1996-98 and 2006-08. This is the highest level of dependence on the US of any country in the region. Nevertheless, the US export share declined by 4.5 percentage points since 1996-98. Intra-regional trade also increased its importance over the same period and now accounts for 16.4 percent of total exports. Central American and NAFTA countries account for 80 percent of Honduras exports, which makes the country vulnerable to any shocks to these economies.

Table A19. Honduras: Trading Partners

	Average (1996-1998)	Average (2006-2008)
United States	**68.5**	**64.0**
Regional	**8.4**	**13.4**
Salvador	2.8	5.2
Guatemala	2.4	5.1
Nicaragua	1.8	1.5
Costa Rica	1.0	1.0
Panama	0.4	0.6
Mexico	**0.3**	**3.0**
EU-27	**14.1**	**11.6**
Germany	3.8	3.5
Belgium	1.6	2.4
Netherlands	0.7	1.2
Rest EU-27	8.0	4.5
South America*	**0.1**	**0.4**
Colombia	0.1	0.1
Venezuela	0.0	0.2
Ecuador	0.0	0.1
Rest	0.0	0.0
BRIC Countries	**0.2**	**0.6**
Russia	0.1	0.1
China	0.1	0.4
India	0.0	0.1
Brazil	0.0	0.1
Rest of the World	**8.3**	**6.9**

* Excluding Brazil

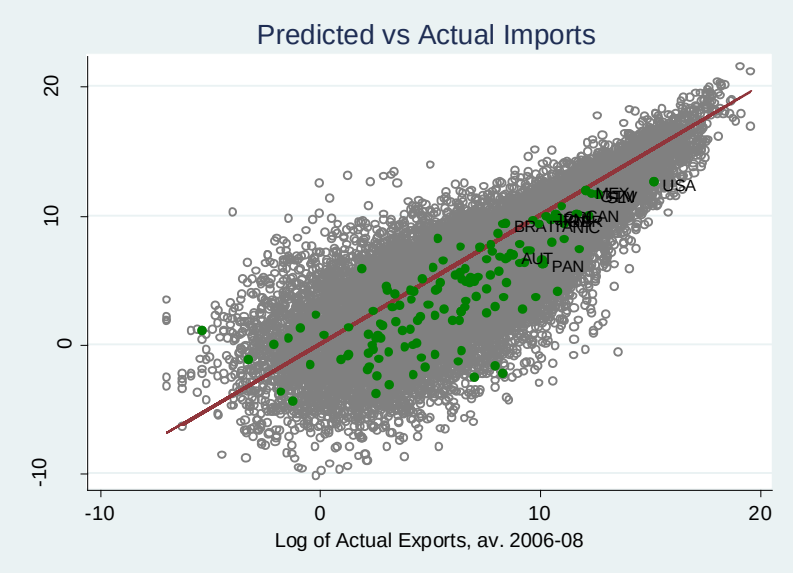
Source: COMTRADE

1.6 How "natural" are they?

In the next step, we assess whether a country's export products are "natural" by estimating a gravity model. Based on a theory-grounded model[83], this exercise allows us to compare actual bilateral export relationships of a country with all its trading partners with the predicted export values from the gravity equation. The gravity model is based on average bilateral export values in 2006-08.

Figure A40 shows all bilateral trade relationships in our dataset of 181 countries (grey dots). Honduras bilateral exports are colored and key trading partners are labeled. For export destinations below the 45-degree line, Honduras actual export value in 2006-08 is higher than what the gravity model would have predicted, i.e. Honduras "over-trades" with these countries. These countries include many Central American neighbors (Costa Rica, Nicaragua, and Panama). Analogously, Honduras "under-trades" with countries located above the 45-degree, which indicates potential untapped market opportunities. Interestingly, Honduras seems to overtrade significantly with the US, its main export partner.

Figure A40. Gravity Model



Source: COMTRADE

[83] We regress 2006-08 bilateral exports (using mirror data) on the following bilateral characteristics: distance, contiguity, common language, colony, common colonial power, as well as log of GDP, log of GDP per capita, etc. We also incorporate three innovations. First, a measure of remoteness is computed by summing distances weighted by the share of GDP of the destination in world GDP. This is to take note of the fact that relative distances matter greatly, alongside absolute distances. Second, we control for zero trade flows using the Heckman sample selection correction method, since OLS drops observations with non-existent bilateral trade. If the probability of selection is correlated with GDP or distance, OLS estimates would be biased. Third, following Helpman, Melitz and Rubinstein (2008), control for firm heterogeneity (without using firm-level data) relying on the fact that the features of marginal exporters can be inferred from the export destinations reached. With these steps, the gravity results are better grounded in modern trade theory.

PART II: DIVERSIFICATION

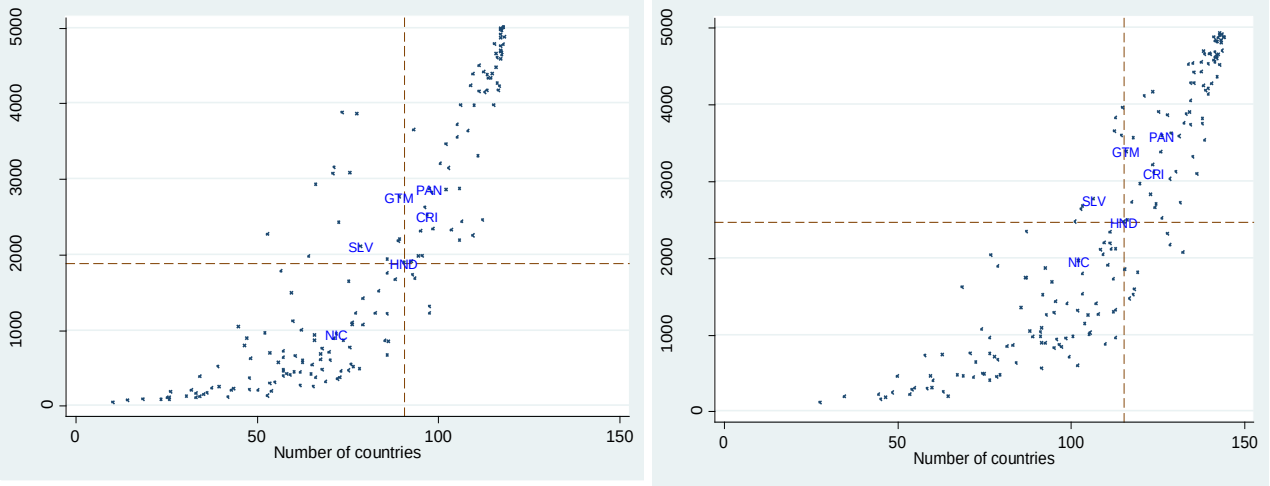
2.1. Number of Products and Markets

Export diversification across markets and products reduces the risk of the country's export portfolio to partner-specific shocks and volatility in export prices. One simple way of detecting a country's product and market diversification is to count its number of exported products and export destinations. Figure A41 shows the number of a country's export destinations (x-axis) and the number of a country's export products (y-axis) for 1996-98 (left panel) and 2006-08 (right panel). The dashed lines mark the number of export products and markets for Honduras, so that countries to the right of the vertical line export to more countries than Honduras and countries above the horizontal line export more products.

All Central American countries increased the number of export markets and products over the period. Compared to its regional peers, Honduras underperforms somewhat, as the country only exports to more markets than Nicaragua and El Salvador and more products than Nicaragua.

Figure A41

Export Relationships (Average 1996-1998) **Export Relationships (Average 2006-2008)**



Source: COMTRADE

2.2. Concentration Index

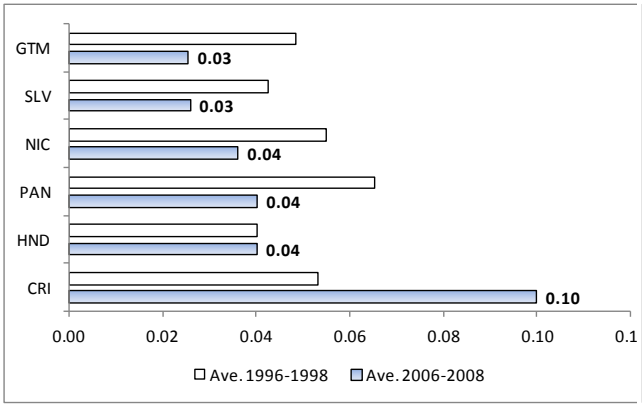
In this section we look at the Herfindahl-Hirschman index (HHI) as a more sophisticated measure of export diversification.[84] Figure A42 shows the HHI of product (left panel) and market concentration of exports (right panel) for Central-American countries in 1996-98 versus 2006-08. Although Honduras increased its diversification in markets over the last decade, it is

[84] The HHI is computed as the sum of squared shares of each product (market) in total export. A country with a perfectly diversified export portfolio in terms of products (markets) will have an index close to zero, whereas a country with only one export product (market) will have a value of 1.

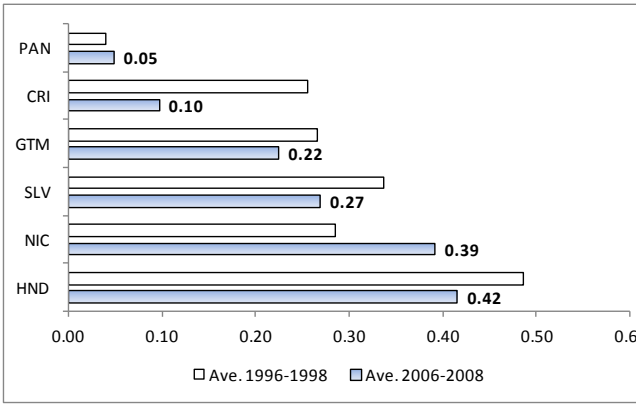
the least diversified country in the region, a result that confirms previous evidence from section 1.4. Honduras is one of two countries in the region that did not make significant progress diversifying its product basket – the other being Costa Rica which actually increased its concentration in export products.

Figure A42

Herfindahl Index - Products



Herfindahl Index - Markets

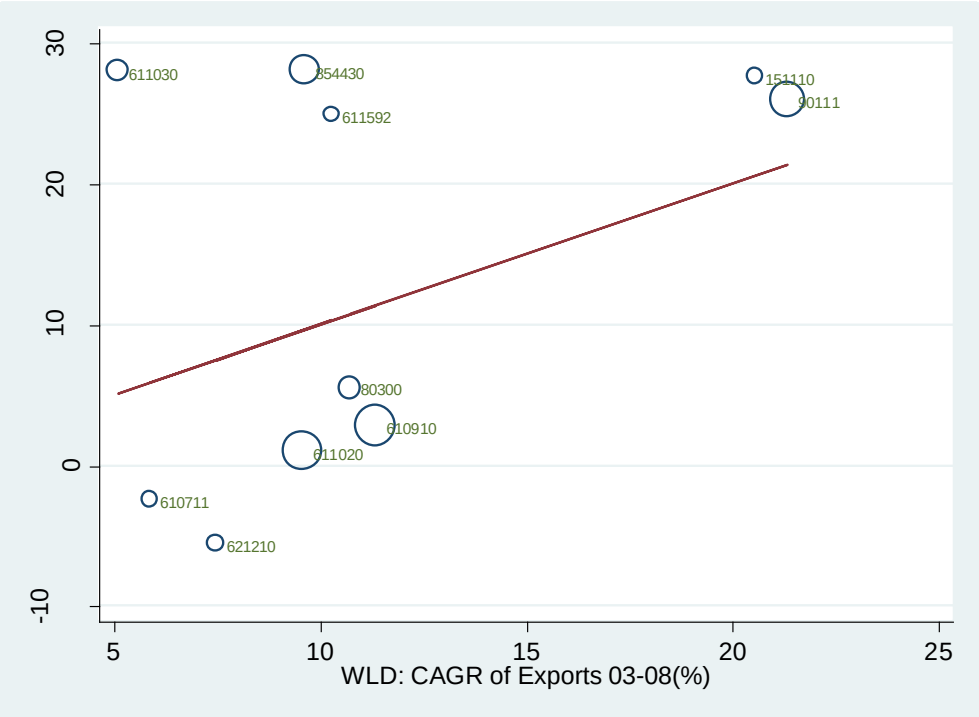


Source: COMTRADE

2.3. Growth Orientation of Products and Markets

We now compare the top ten products exported by Honduras – as identified in section 1.3 – with worldwide exports of the same products (Figure A43). The y-axis plots export growth for Honduras' top ten products between 2003 and 2008, while the x-axis shows world export growth for same goods over the same period. The circle size indicates the relative importance of the product in Honduras' export basket over 2006-08. Products above the 45-degree line experienced higher export growth in Honduras compared to all countries, while products below the line were characterized by lower growth than the world. In other words, products above the 45-degree line gained in world market share, while products below the line lost market share.

Figure A43. Growth Orientation of Products
(Top 10 Products)

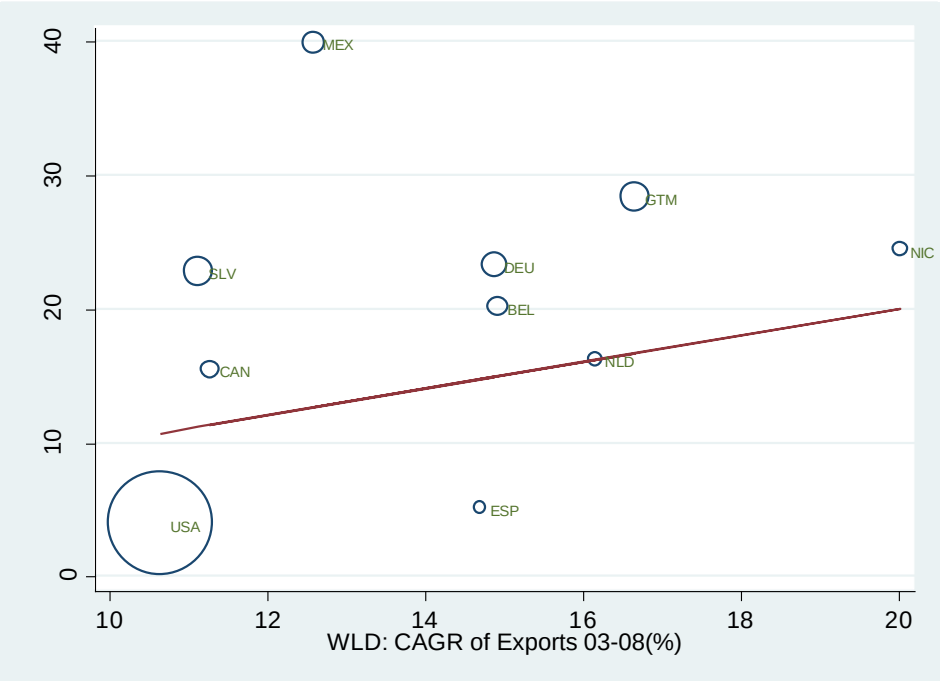


Source: COMTRADE

Between 2003 and 2008, Honduras lost market share in four of its six textiles/clothing products in the top ten. The only other top ten product in which Honduras lost world market share was bananas (080300). Interestingly, Honduras gained world market share in two textiles/clothing products—hosiery (611592) and synthetic fibers jerseys and pullovers (611030)—at the same time it was losing market share in cotton jerseys and pullovers (611020). Finally, Honduras exports of ignition wiring sets (854430) grew roughly three times faster than world exports of the same product during the same period (28% versus 9.6% respectively).

Analogously, we compare Honduras export growth in the country's top ten export destinations with worldwide export growth in the same export destinations (Figure A44). Between 2003 and 2008, Honduras exports gained market share in all but two of its top ten partners, namely the US and Spain.

Figure A44. Growth Orientation of Destinations (Top 10 Markets)



Source: COMTRADE

2.4. Intensive and Extensive Margins of Growth

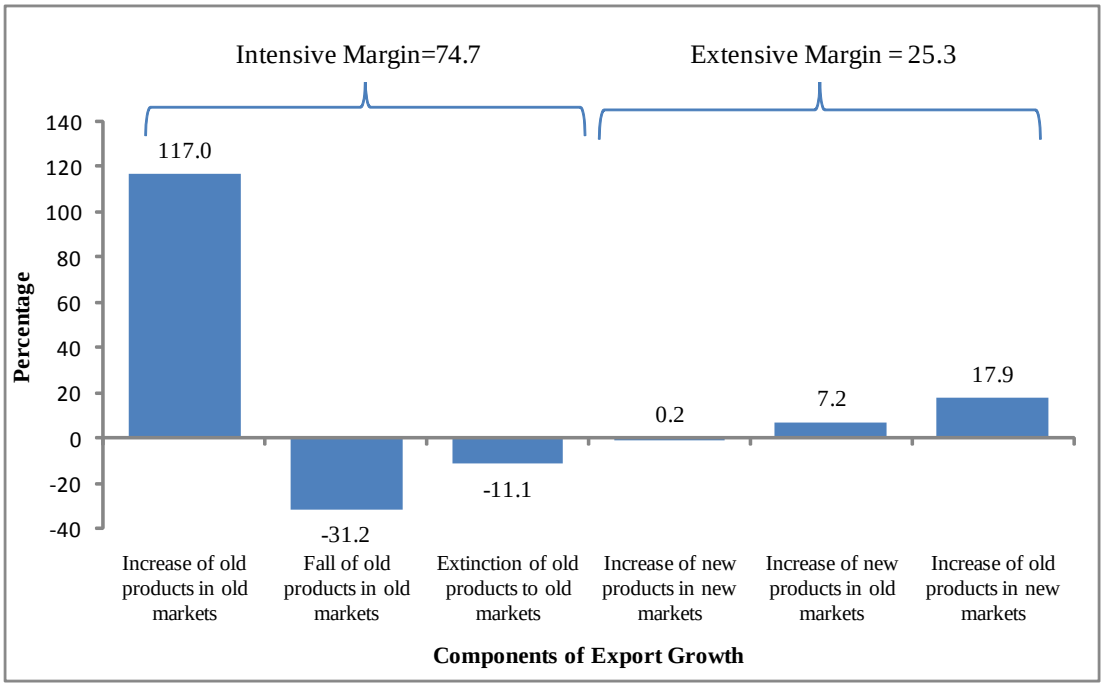
Export growth can take place at the intensive margin, i.e. selling existing products to existing markets, or at the extensive margin, i.e. selling existing products to new markets, new products to new markets, and new products to existing markets. This subsection explores to what extent Honduras has been able to add new, economically significant products and markets into its export portfolio.

We decompose Honduras' export growth between 1998 and 2008 into export growth (i) at the intensive margin, i.e. increase, fall, or extinction of old export products in old markets, and (ii) export growth at the extensive margin, i.e. increase of new export products in new and old markets and increase of old export products in new markets.

Figure A45 shows that the intensive margin dominates, explaining 75 percent of Honduras export growth between 1998 and 2008, while the extensive margin explains about 25 percent. Export growth at the intensive margin was driven by export growth of old products in old markets (117 percent), which compensated for a relatively high negative export growth or extinction of old products in old markets (combined -42 percent). Export growth at the extensive margin was low compared to other Central American countries and driven by old products in new markets (17.9 percent) and to a lesser extent by new products in old markets (7.2 percent).

Compared to more advanced economies, such as Chile, Honduras shows a relatively low participation of the intensive margin of trade in export growth.

Figure A45. Decomposition of Export Growth (Average 1998-2008)



Source: COMTRADE

Table A20. Comparative Decomposition of Export Growth

Margin	Components of Export Growth	Honduras	Simple Regional Average	Chile
Intensive		**74.7**	**61.3**	**84.8**
	Increase of old product in old markets	117.0	97.8	91.1
	Fall of old products in old markets	-31.2	-24.1	-3.9
	Extinction of exports of old products to old markets	-11.1	-12.4	-2.4
Extensive		**25.3**	**32.7**	**15.2**
	Increase of new products in new markets	0.2	0.2	0.0
	Increase of new products in old markets	7.2	7.3	1.8
	Increase of old products in new markets	17.9	31.2	13.3

Source: COMTRADE

At the regional level, Honduras' export growth performed better than the Central American average for old products in old markets but this was compensated by a bigger fall of old products in old markets (Table A20). The country's export growth performs better than the regional average on sales on new products in old markets (7.2% versus 6.1%, respectively).

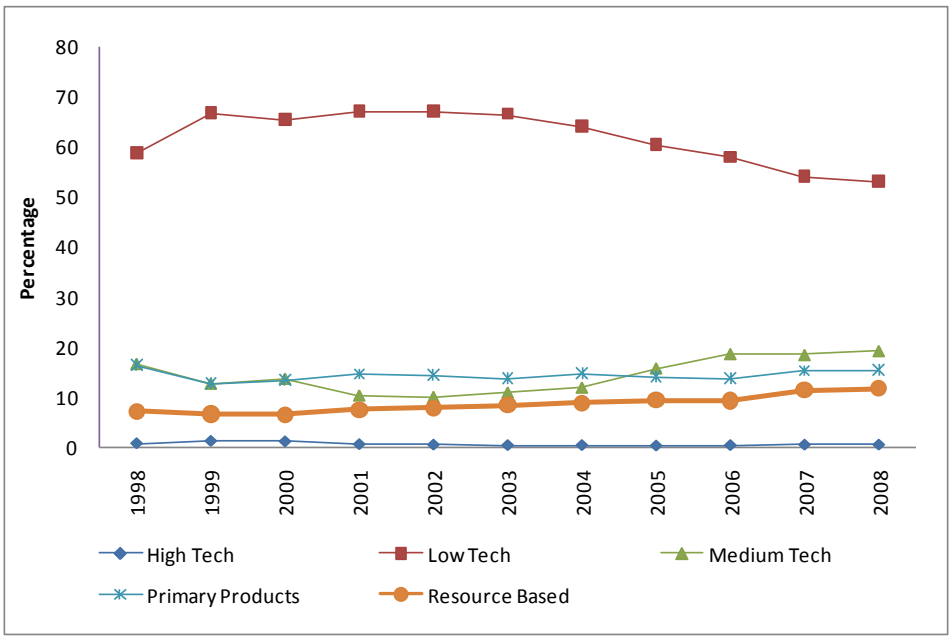
PART III: SOPHISTICATION

This section focuses on export sophistication and quality. The type of export products and inputs embodied in these products matter for export-led growth and economic upgrading. High-quality goods in terms of ingenuity, skills, and technology fetch higher prices in world markets. Countries specializing in the production of more sophisticated goods compared to what their income levels would suggest tend to see higher rates of future economic growth. Upgrading product quality, therefore, can be considered a source of both export and economic growth.

3.1. Technological Classification and Sophistication of Exports

The importance of low technology exports in Honduras export basket has remained almost constant during 1998-2008 but is worth noting that the share of medium technology exports increased continuously since 2002 from 10% to 20%.

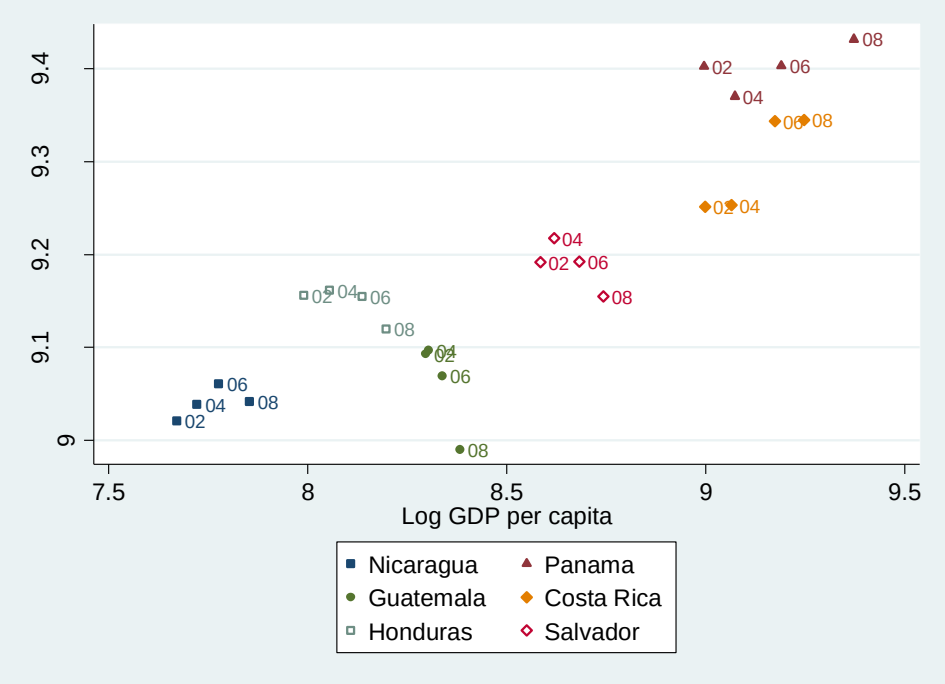
Figure A46. Technological Classification of Exports



Source: COMTRADE

Hausman, Hwang and Rodrik (2006) argue that the level of product sophistication matters for economic growth. Countries that have a more sophisticated export basket, proxied by a measure named EXPY (see Annex 2), enjoy accelerated subsequent growth while those with less sophisticated export baskets tend to lag behind – in essence, countries become what they export. Figure A47 shows the sophistication of exports (y-axis) and per-capita GDP (x-Axis) for all Central American countries over time. The sophistication of Honduras' export basket grew from 1998 to 1999 and then basically remained flat for the rest of the period resulting in countries like Guatemala and El Salvador starting to close the gap in sophistication with Honduras.

Figure A47. Change in Export Sophistication



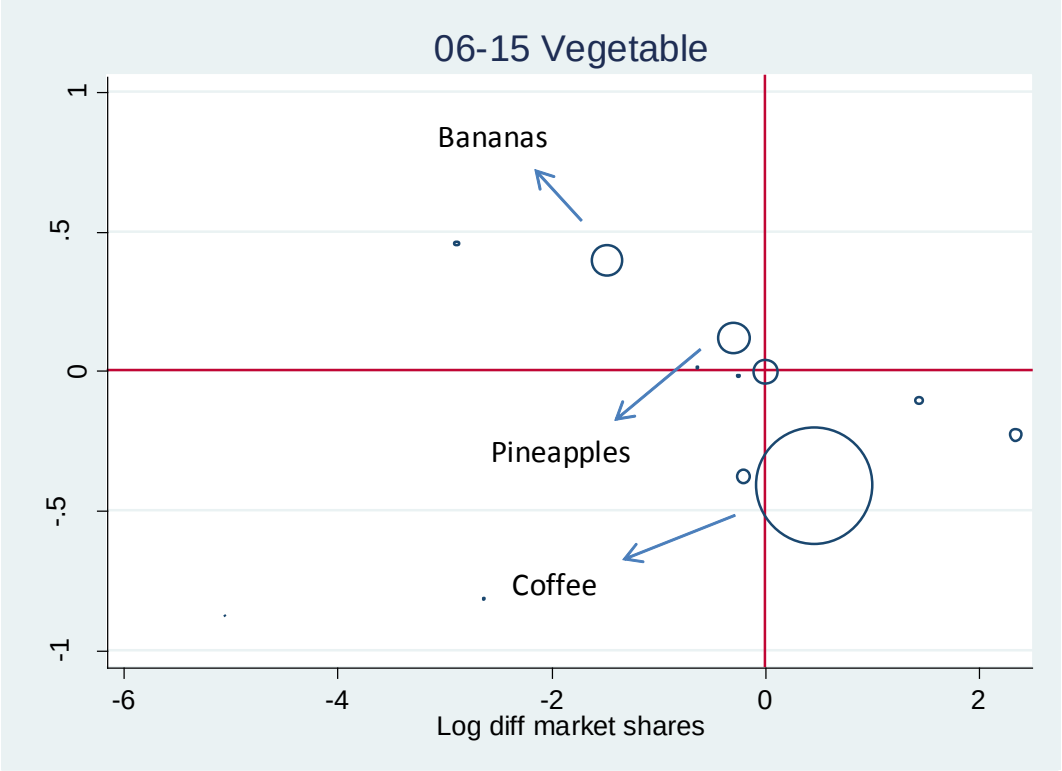
Source: Author's computation

3.2 Quality

One way a country can increase the absolute amount of exports per capita is by augmenting the quality of exports and thus the value of exports per unit. Using a highly detailed database on unit values of exports to the EU, we construct a measure of the relative quality of each exported product to the EU (see Annex 3). The figure below presents the relation between growth in the relative quality measure and changes in market shares of Honduras' exports to the EU market.[85] Each bubble represents a product, defined by an 8-digit Combined Nomenclature code. The x-axis shows the growth rate of market share (log difference of market shares) between 1996-08 and 2006-08. The y-axis represents the growth rate of the average quality measure over the same periods of time. The size of each bubble is the importance of each product in Honduras' export basket in 2006-08. We present the analysis for products within the most important export sector to the EU: Vegetables.

[85] Given data availability, we cannot do the same analysis for the US.

Figure A48. Change in Relative Quality and in Market Shares in the European Market (Ave.06-08/Av.96-98)



Source: COMTRADE

Three important products are labeled: i) coffee, which was and is still the top export product to the EU, comprising about 50% of the export basket; ii) bananas, which was the second biggest export in 1996-1998 and now is the fifth after decreasing its share by almost 80%; and iii) pineapples which slightly increased its relative quality.

E. Nicaragua

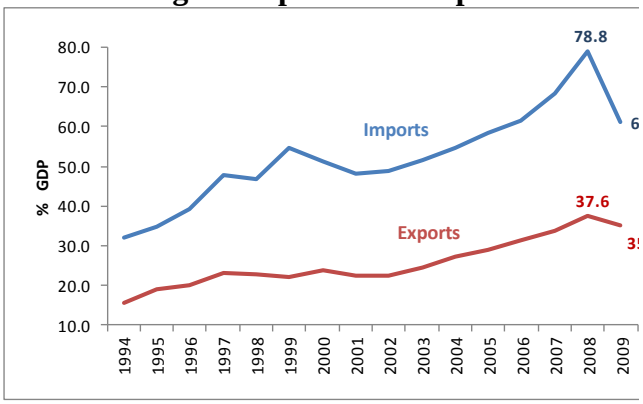
PART I: ORIENTATION AND GROWTH

1.1 Exports, imports, and trade balance

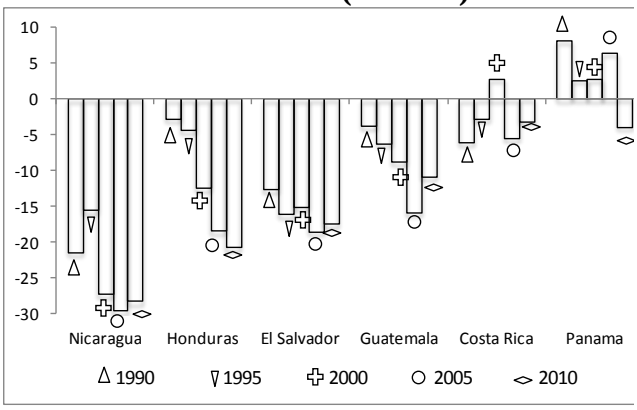
Trade as a proportion of GDP has been expanding in Nicaragua, indicating a move along the free-market growth path that the country embarked on at the beginning of the nineties. Exports as a share of GDP have increased over time, but imports have increased disproportionately, resulting in an increasing trade deficit over time. Compared to the Central American region, the country has historically run the highest trade deficit in the region (figure A49).

Figure A49

Nicaragua: Exports and Imports



Trade Balance (% GDP)



Source: World Development Indicators

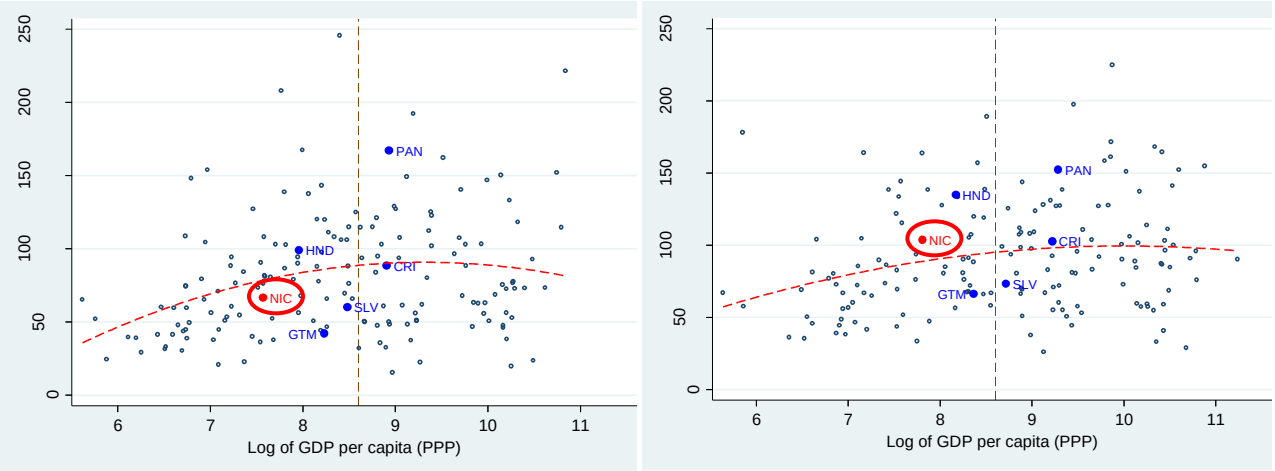
1.2 Openness to Trade

The Trade-to-GDP ratio is one of the most basic indicators of openness to foreign trade and economic integration. It weighs the combined importance of exports and imports of goods and services in an economy. The ratio gives an indication of the dependence of domestic producers on foreign demand and of domestic consumers and producers on foreign supply. There is a concave relationship between trade openness and per capita income: countries tend to trade more as incomes rise, but at a decreasing rate. A decade ago (1996-98), Nicaragua's position below the predicted line indicated that openness to trade was lower than what was expected given its income per-capita level (i.e. on average, countries of similar income had a higher participation in international markets). Now (2006-08), the country's position above the predicted line implies

that it trades more compared to countries at comparable levels of per-capita income[86]. The increased in openness to trade is mostly explained by the import boom.

Figure A50

Openness to Trade (Average 1996-1998) **Openness to Trade (Average 2006-2008)**



Source: World Development Indicators

1.3 Composition of Exports

The composition of exports at the sectoral level changed little between 1996-98 and 2006-08.[87] Nicaragua's exports are dominated by textiles, animal, vegetables, and food products. In 1996-98 these sectors represented 83.7 percent of the overall export basket, while in 2006-08 their share decreased to 78.6 percent. These export sectors are in line with the revealed comparative advantage (RCA) index. [88] Within these sectors, the country has concentrated in textiles and diverged away from vegetables. The mineral sector grew at a very high compound annual rate but this is very likely due to re-exports of oil. Finally, the country has increased the share of more sophisticated products, like Machinery and Electrical Equipment, which accounted for 2.1% in 1996-98 and reached 7.4% in 2006-08.

[86] In figure 57 the dotted line represents the world average GDP per capita (in logs) in each period. In both periods of time, the world average per capita income was around exp (8.6) which is US$6000 at PPP.

[87] In order to avoid one year spikes that might skew our data, we use three year averages (1996-1998 & 2006-2008) of export values

[88] The RCA index is a measure for calculating the relative advantage or disadvantage of a certain country in a certain industry as evidenced by trade flows. An index above the unit indicates that a country's share of exports in that sector exceeds the global export share of the same sector. If this is the case we infer that the country has a comparative advantage in that sector. However, because high export volumes can results from subsidies or other incentives provided, included under-valued exchange rates, RCA have been argued to be a misnomer in the sense that they are a better measure of competitiveness than comparative advantage (Siggel, 2006).

Table A21. Nicaragua: Export Basket and Revealed Comparative Advantage

		Average 1996-1998			Average 2006-2008			
	Sector	**Exports**	**% of total**	**RCA**	**Exports**	**% of total**	**RCA**	**Average Annual Growth Rate**
01-05	**Animal**	154.21	18.1	6.3	467.77	16.6	10.2	11.7
06-15	**Vegetable**	228.64	26.8	6.4	471.99	16.8	6.5	7.5
16-24	**Food products**	120.72	14.1	3.5	264.62	9.4	3.7	8.2
25-27	**Minerals**	9.18	1.1	0.1	165.09	5.9	0.4	33.5
28-38	**Chemicals**	8.98	1.1	0.1	38.47	1.4	0.2	15.7
39-40	**Plastic / Rubber**	5.69	0.7	0.1	11.34	0.4	0.1	7.1
41-43	**Hides, Skins**	6.68	0.8	0.7	14.06	0.5	0.9	7.7
44-49	**Wood**	14.07	1.6	0.3	18.69	0.7	0.3	2.9
50-63	**Textiles, Clothing**	210.88	24.7	3.1	1,008.62	35.8	9.2	16.9
64-67	**Footwear**	2.48	0.3	0.2	2.00	0.1	0.1	(2.1)
68-71	**Stone / Glass**	57.52	6.7	1.7	89.41	3.2	1.1	4.5
72-83	**Metals**	6.35	0.7	0.1	32.68	1.2	0.1	17.8
84-85	**Mach/Elec**	17.98	2.1	0.1	209.47	7.4	0.3	27.8
86-89	**Transportation**	5.68	0.7	0.1	10.68	0.4	0.0	6.5
90-97	**Miscellaneous**	4.97	0.6	0.1	11.97	0.4	0.1	9.2
	Total	**854.03**	**100.0**		**2,816.85**	**100.0**		**12.7**

Note: Exports are in millions of US dollars. RCA is the revealed comparative advantage.
Source: COMTRADE

The following table shows the top 10 exported products in 2006-08 (6-digit HS codes), their export value, share in total exports, and their export rank a decade ago. Altogether they sum up to roughly one half of total export value. Products belonging to the garment sector, in this top 10 list alone, represent around one fifth of the total export basket. Another important product is coffee which has always been a key export driver. In the last few years, however, it has lost the top position to cotton sweaters. Meat and shrimp are the top exported products in the Animal sector. An interesting product is ignition wiring sets, which were not exported a decade ago and now are the fourth most important product. This indicates that the country is entering the automotive industry global value chain.

Table A22. Top Ten Products Exported by Nicaragua (Average 2006-2008)

rank	HS6	Product	% of total	Rank 96-98
1	**611020**	Sweaters, Pullovers, Sweatshirts, Waistcoats (Vests), Knitted or Crocheted	9.8	15
2	**090111**	Coffee (Not Roasted, Not Decaffeinated)	8.2	1
3	**620342**	Men's or Boys' Trousers, Overalls, Breeches, of Cotton	6.4	2
4	**854430**	Ignition Wiring Sets & Other Wiring Sets, for Vehicles, Aircraft or Ship	6.3	--
5	**271000**	Petroleum Oils, Oils Obtained from Bituminous Minerals, Preparations thereof	5.2	36
6	**610910**	T-shirts, Singlets, Other Vests, Knitted or Crocheted, of Cotton	4.5	28
7	**020130**	Bovine cuts boneless, fresh or chilled	2.9	9
8	**170111**	Cane Sugar (Raw Sugar Not Added Flavouring or Coloring Matter)	2.9	3
9	**020230**	Bovine cuts boneless, Processed	2.6	14
10	**030613**	Shrimps and prawns	2.3	4
Total			**51.0**	

Source: COMTRADE

The analysis of the composition of services exports is more complicated, mainly due to a lack of consistent and reliable data. Nevertheless, the data available in the UNCTADSTAT database shows the evolution and composition of exports across different types of services. As is the case in all Central American countries, travel is by far the most important item among the services exported by Nicaragua in terms of value. Travel services' share of total services exports increased by almost 20 percentage points between 1996-98 and 2006-08. The shares of all other services exports (ICT, insurance, transport, and other) decreased over time, indicating that the country is focusing on the development of the tourism sector. Nevertheless, it is worth noting that government services, which includes all government and international organizations' transactions, as a proportion of the total exports of services in Nicaragua is high when compared with its regional peers.

Table A23. Share in Total Exports of Services (BoP)

Sector	Average 1996-1998						Average 2006-2008					
	CRI	GTM	HND	NIC	PAN	SLV	CRI	GTM	HND	NIC	PAN	SLV
Transport	15.2	12.7	17.3	14.3	52.6	31.3	8.9	11.8	5.7	11.6	53.9	24.2
Travel	67.1	44.3	42.8	49.2	21.6	29.1	56.5	59.5	68.9	68.2	24.0	57.1
Other services	17.8	42.9	39.8	36.5	25.8	39.6	34.6	28.7	25.4	20.1	22.2	18.7
Communications	6.9	6.9	22.4	15.2	2.5	18.6	1.2	14.6	18.6	8.2	4.1	10.2
Construction	-	0.2	-	-	-	0.7	-	0.2	-	-	0.0	2.3
Insurance	-0.1	2.0	5.5	1.7	1.1	7.5	-	1.2	3.7	1.0	1.3	2.3
Financial services	0.4	2.4	0.3	-	5.5	1.6	0.4	0.6	0.8	-	7.3	0.2
Computer and information	0.1	0.5	0.1	-	-	-	14.9	0.7	0.1	-	0.4	0.1
Royalties and license fees	0.1	-	-	-	-	-	0.0	0.6	-	-	-	0.0
Other business services	9.2	23.8	6.2	-	6.2	2.3	17.1	3.9	1.8	-	7.8	1.3
Personal, cultural and recreational services	0.0	-	0.0	-	-	-	0.0	1.3	0.4	-	-	-
Government services, n.i.e.*	1.1	7.2	5.4	19.6	10.6	9.6	1.0	7.1	1.6	10.9	1.2	2.3

*Source: UNCTADSTAT database. *Not included elsewhere.*

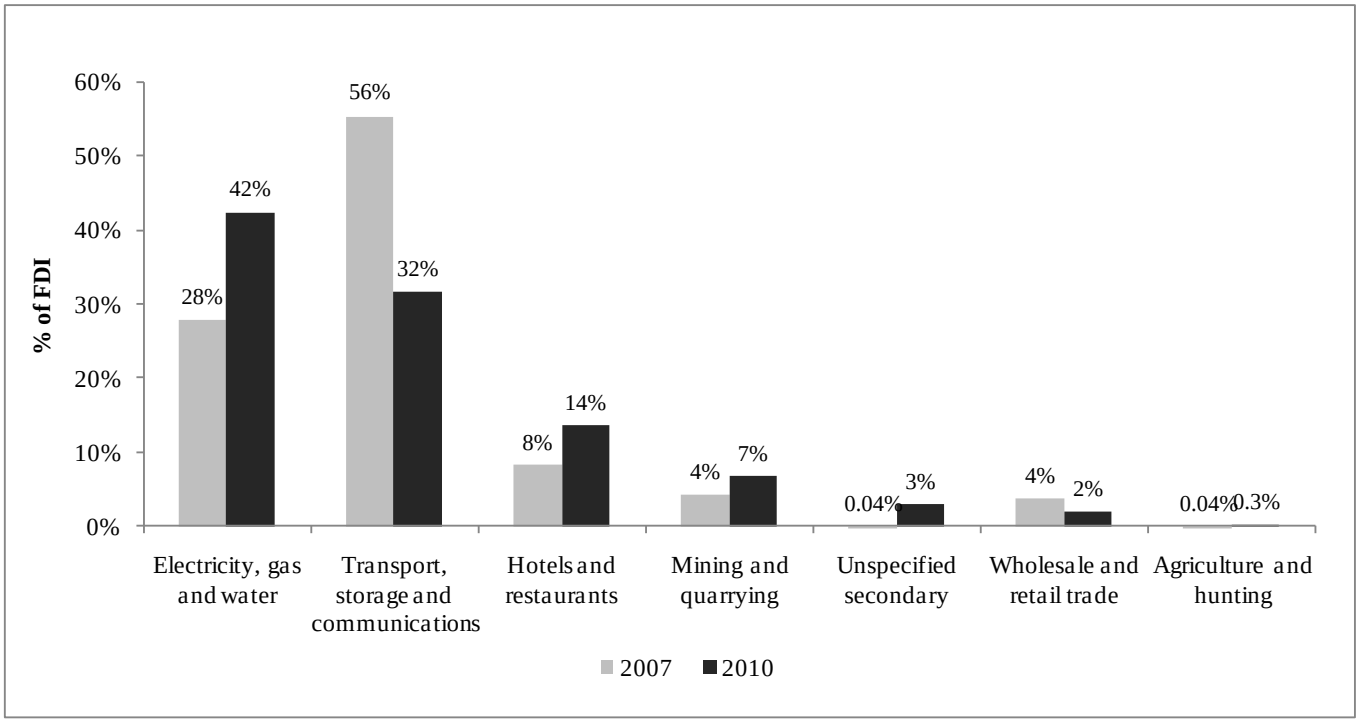
1.4 Foreign Direct Investment

Foreign Direct Investment (FDI) is a catalyst for socio-economic development and one of the most important elements in the global economy nowadays. The positive, direct and indirect, externalities deriving from FDI include: higher levels of productivity, faster transfer of know-how and state-of-the-art technologies, broader choice for consumers, and increased competition, among others. FDI is particularly relevant for countries where capital accumulation still represents an underlying requirement to trigger development.

Nicaragua's FDI inflow grew steadily since the beginning of the decade, with a climax in 2008, followed by a drop due to the global crisis. The main recipient sectors are energy and transport. Foreign investment in the tourism sector has also increased considerably in the last few years. In 2008, FDI equaled approximately 20% of exported goods and services.[89]

[89] Much of the new FDI is coming from Venezuela through Albanisa, a private company jointly managed by the two governments whose investment interest range from zinc roofs and livestock to subsidized bus travel.

Figure A51. FDI Inward Flow in Nicaragua



Source: Investment Map, International Trade Centre

1.5 Trading Partners

As many other Central American countries, Nicaragua's export relationships are strongly dependent on the United States, which accounted for 62.1% of the country total exports in the period 2006-2008. Despite some political tensions between the two countries, Nicaragua's high reliance on exports to the U.S. has increased over time. The European Union and Central America account for the vast majority of Nicaragua's remaining exports. Exports to South America and BRIC countries are very small.

Looking at the evolution of exports across trading partners over time, three key issues are worth mentioning. First, there was a sharp reduction of the share of exports to the European market. This phenomenon happened in most European countries but was particularly important in Germany: 1996-98 exports to Germany represented around 8% of the Nicaragua's total exports; now (2006-08) they represent only 1.2% (this behavior is mostly explained by the reduction of coffee exports). Second, exports to Venezuela have greatly increased over the last decade, indicating the strong political ties between these two countries. It is also important to note the relative importance of Russia as a trading partner (on average, Russians bought around US$16 million of Nicaraguan merchandise in 2006-08). Third, this picture suggests that Brazil is a key

lost market for Nicaragua and may be a good bet to diversify exports in a large fast-growing economy[90].

Table A24. Nicaragua: Trading Partners

	Average (1996-1998)	Average (2006-2008)
United States	**52.7**	**62.1**
Regional	**14.8**	**17.2**
Salvador	6.7	6.3
Honduras	2.6	3.8
Costa Rica	3.5	3.5
Guatemala	1.7	3.0
Panama	0.4	0.4
Mexico	**1.6**	**3.5**
EU-27	**21.3**	**8.6**
Spain	2.9	1.9
Netherlands	1.2	1.3
Germany	8.2	1.2
United Kingdom	1.7	0.9
France	2.7	0.8
Rest EU-27	4.7	2.5
South America*	**1.3**	**1.9**
Venezuela	0.1	0.9
Colombia	0.2	0.6
Rest	1.1	0.3
BRIC Countries	**0.6**	**1.0**
Russia	0.6	0.6
India	0.0	0.2
China	0.0	0.1
Brazil	0.0	0.0
Rest of the World	**7.6**	**5.8**

* Excluding Brazil

Source: COMTRADE

[90] The large trade deficit can be partially explained by the unbalanced trade relationship with South America and the BRIC countries.

Nicaragua is member of many multilateral and regional trade agreements. It was among the 51 states that signed the United Nations Charter[91] and is strongly integrated in the Central American region with regional treaties (CAMC, CAFTA) and several bilateral trade agreements (Dominican Republic, Mexico, Panama, Colombia, Venezuela)[92] .

1.6 How "natural" are they?

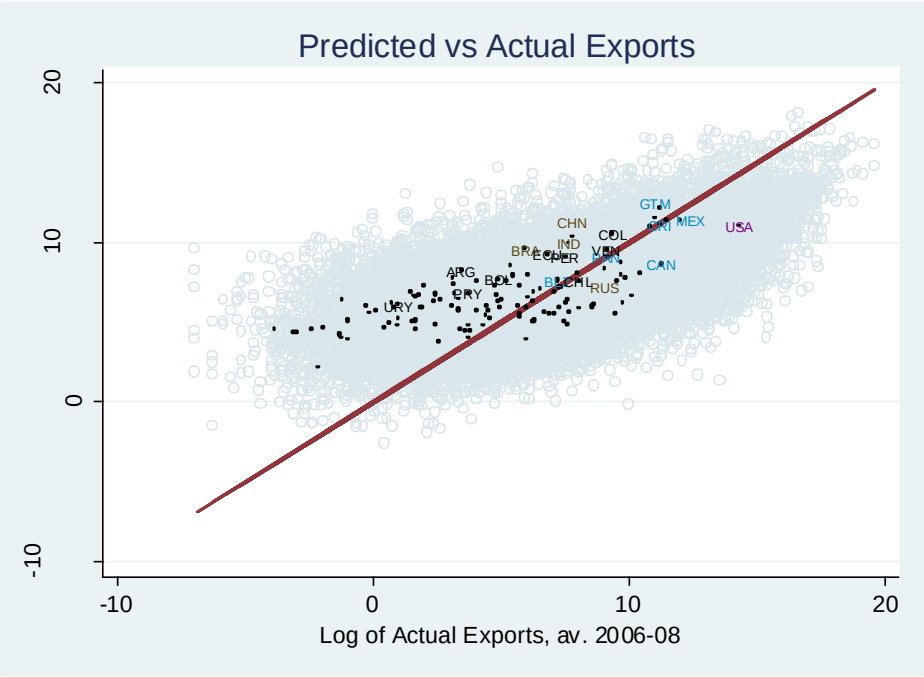
We try to assess this question by estimating a "gravity" model using average bilateral export values between 2006 and 2008. Based on a theory-grounded model[93], this exercise allows us to compare pair-wise observed export relationships with the predicted value from the gravity equation. The next figure shows all bilateral trade relationships in our dataset of 181 countries (light grey dots). Nicaragua's bilateral exports are colored in black and key partners are labeled. If an observation is above (below) the 45-degree line, the observed export relationship in the period 2006-2008 is less (more) than what the gravity model predicts. Controlling for size of the trading partners, trade frictions, sample selection, and firm heterogeneity; this analysis suggests that the country is slightly over-trading with North America and Russia. On the other hand, Nicaragua trades less than what the model predicts with the other BRIC countries and with many of the South American countries. This analysis suggests the existence of untapped potential to increase exports to several countries that play an important role on global markets.

[91] Foundational treaty of the United Nations signed in 1945.

[92] Source of data on Trade Agreements: Organization of American States (OAS)

[93] We regress 2006-08 bilateral exports (using mirror data) on the following bilateral characteristics: distance, contiguity, common language, colony, common colonial power, as well as log of GDP, log of GDP per capita, etc. We also incorporate three innovations. *First*, a measure of remoteness is computed by summing distances weighted by the share of GDP of the destination in world GDP. This is to take note of the fact that relative distances matter greatly, alongside absolute distances. *Second*, we control for zero trade flows with the use of Heckman sample selection correction method. When observations with non-existent bilateral trade are dropped, as OLS does, our dependent variable is not really measuring bilateral trade, but one *contingent* on a relationship existing. An important variable left out of the model therefore is the probability of being included in the sample, i.e. having a non-zero trade flow. To the extent that the probability of selection is correlated with GDP or distance, this has the potential to bias OLS estimates. *Third*, we address heterogeneity of firms, following Helpman, Melitz and Rubinstein (2008), by controlling for firm heterogeneity without using firm-level data utilizing the fact that the features of marginal exporters can be inferred from the export destinations reached. With these steps, the gravity results are better grounded on modern trade theory.

Figure A52. Gravity Model



Source: COMTRADE

PART II: DIVERSIFICATION

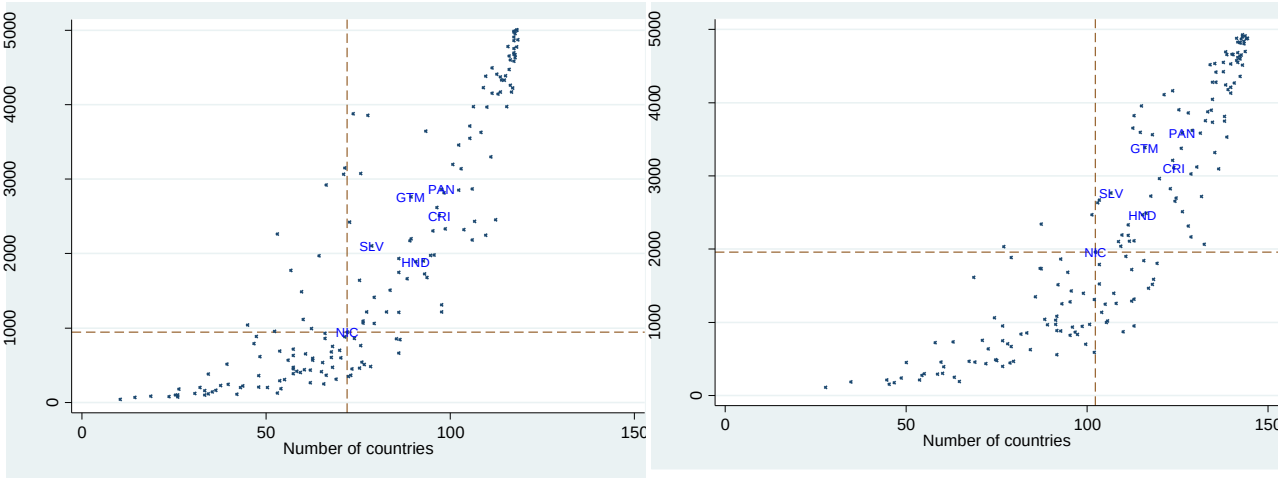
2.1 Number of Products and Markets

Diversifying exports across markets and products is important because it reduces the exposure of the country's export portfolio to partner-specific shocks and volatility in export prices. Nowadays, market diversification may prove crucial to cope with the widespread unease about the global economy. Looking at the number of exported products and markets over time provides a glimpse of product/market diversification.[94] The next two graphs present these two indicators for all countries in the world in our two time periods. Nicaragua is in the center of the dotted lines and the rest of Central American countries are labeled.

[94] Both indicators are imperfect measures of dynamics at the extensive margin of trade.

Figure A53

Export Relationships (Average 1996-1998) **Export Relationships (Average 2006-2008)**



Source: COMTRADE

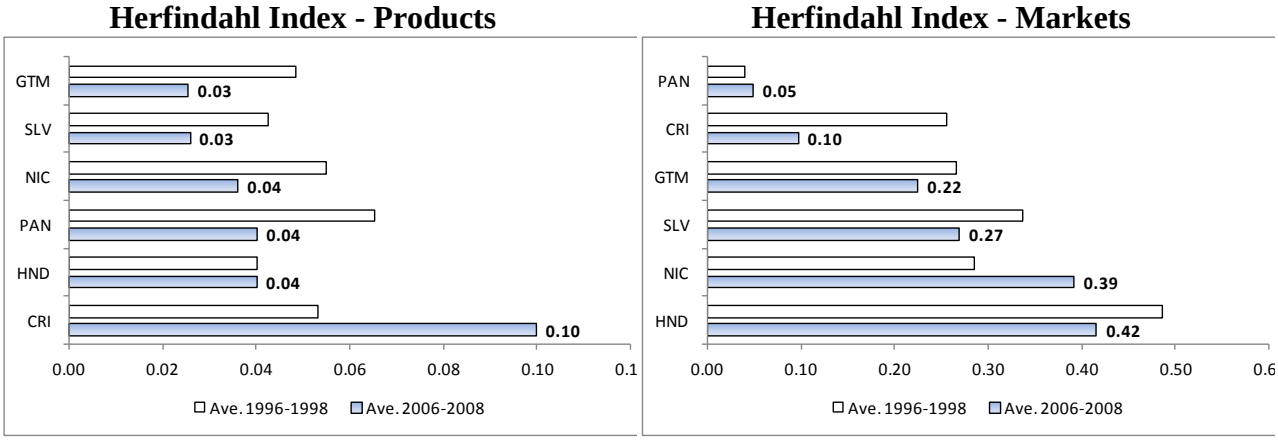
The message is clear: while the country has increased the number of products and markets in its export basket during the last decade, it is still the worst performer along these dimensions compared with regional peers.

2.2 Concentration Index

The concentration of exports (lack of diversification) can be gauged by looking at the Herfindahl index (HH) of products and markets.[95] The next figures present the HH index for the Central-American region for 1996-98 and 2006-08. This analysis shows that the concentration of products in Nicaragua has decreased in the last decade indicating the fact that new products, such as ignition wiring sets and T-shirts, have become important in terms of export value at the same time that traditional exports, such as coffee, are still well represented in the overall export basket. Note that product diversification happens across the region, with the exception of Costa Rica.

[95] The HH index is computed as the sum of squared shares of each product (market) in total export. A country with a perfectly diversified export portfolio will have an index close to zero, whereas a country which exports only one export (market) will have a value of 1 (least diversified).

Figure A54



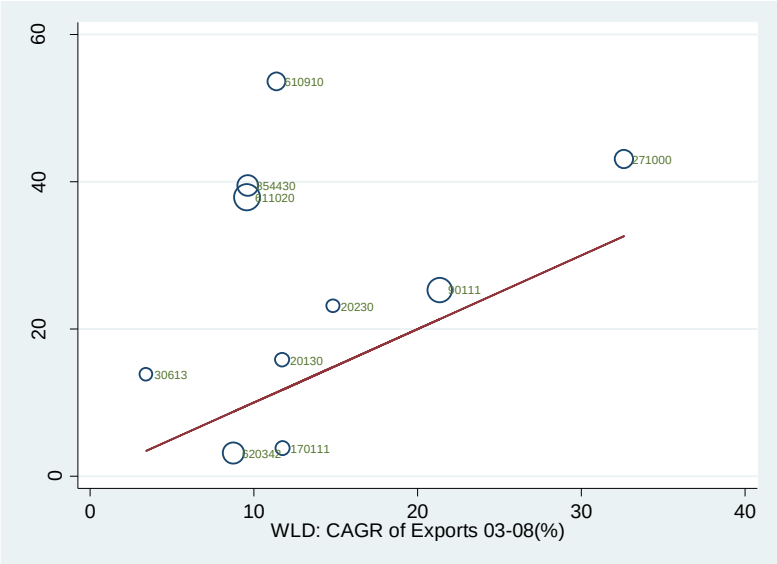
Source: COMTRADE

Regarding market diversification, Nicaragua shows a trend to concentration that is not observed at the regional level: All Central-American countries, with the exception of Nicaragua and Panama, diversified export markets in the last decade. Nicaragua shows the second highest concentration level in the region and is one of the only two countries (the other is Panama) whose concentration index increased between 1996-98 and 2006-08. High market concentration in the last decade is explained by the decline of exports to the European market, and the increased participation of the U.S. and the region in the Nicaraguan exports.

2.3 Growth Orientation of Products and Markets

This analysis focuses on how the products exported by Nicaragua are faring in international competition. The following figure depicts Nicaragua's top 10 exported products in the period 2006-08 (section 1.3). On the X-axis is the product export growth in world markets between 2003 and 2008 and on the y-axis is Nicaragua's exports growth for that product over the same period. The size of the bubble represents how important the product was for the country's export portfolio in 2006-08. If a product is above (below) the 45 degree line, then Nicaragua's exports of that product are increasing at a higher (lower) pace than exports of the same product by other world producers, indicating that the country is gaining (losing) market share in world markets.

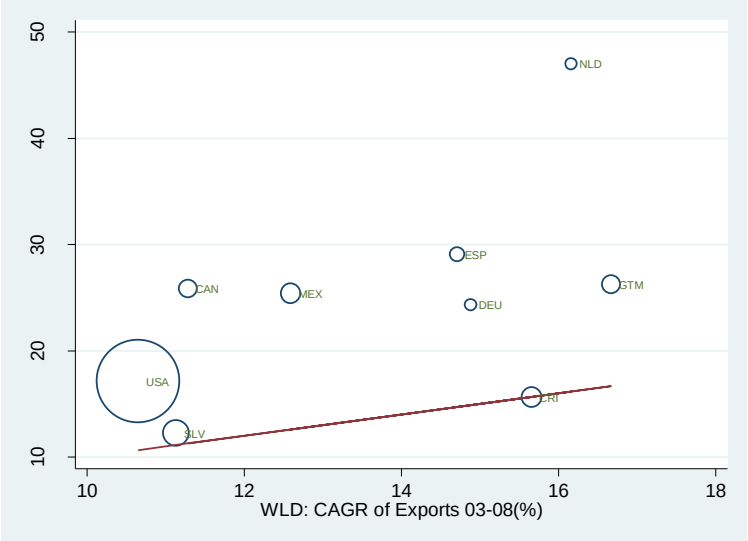
Figure A55. Growth Orientation of Products (Top 10 Products)



Source: COMTRADE

This analysis indicates that Nicaragua is gaining shares in world markets in most of its top-10 exported products. This is the case especially for the garment sector (cotton t-shirts (610910) and pullovers (611020)), and ignition wiring sets (854430). Interestingly, exports of men's trouser made of cotton (620342) and exports of cane sugar (170111) are growing slower than the average annual export growth rate for the rest of the world. Moreover, Nicaragua is gaining market share in its major trading partners (observations above the 45 degree line in Figure A56) compared to exports from all exporting countries to that particular destination.

Figure A56. Growth Orientation of Destinations (Top 10 Markets)

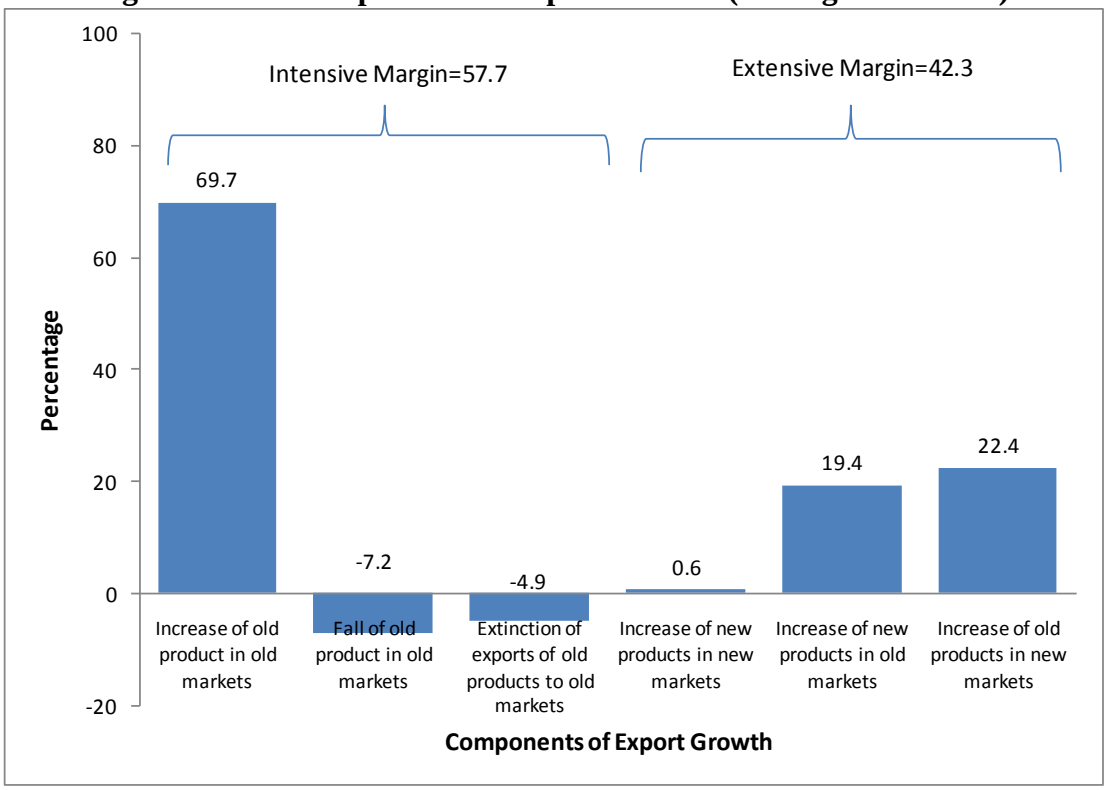


Source: COMTRADE

2.4 Intensive and Extensive Margins of Exports

Export growth can take place at the intensive margin (selling existing products to existing markets) or at the extensive margin (selling existing products to new markets, new products to new markets, and new products to existing markets). We decompose the observed exported growth between 1998 and 2008 into its components: i) changes in established export relationships (intensive margin) and ii) changes in new export relationships (extensive margin). In Nicaragua, the intensive margin roughly explains 60% of the export growth between 2000 and 2008: almost 70% of total export growth is explained by increases of exports of old products in old markets, which is partially offset by a reduction of exports of old products in existing markets (-7.2%) and by an extinction of old products in existing markets (-4.9%). The dynamism at the extensive margin (explains 40% of the observed export growth) is driven by increasing of exports to new markets (22.4%) and by increase of new products in existing markets.

Figure A57. Decomposition of Export Growth (Average 1998-2008)



Source: COMTRADE

A positive sign is that, comparing these figures with regional countries, it is evident that Nicaragua is the only country increasing markedly new products in existing markets (19.4%), much more than the other regional peer countries. This proves that the country has been carrying out a process of diversification mostly at the product level, which is reflected in the indexes presented above.

Table A25
Comparative Decomposition of Export Growth

Margin	Components of Export Growth	Nicaragua	Simple Regional Average
Intensive		**57.7**	**61.3**
	Increase of old product in old markets	69.7	97.8
	Fall of old products in old markets	-7.2	-24.1
	Extinction of exports of old products to old markets	-4.9	-12.4
Extensive		**42.3**	**32.7**
	Increase of new products in new markets	0.6	0.2
	Increase of new products in old markets	19.4	7.3
	Increase of old products in new markets	22.4	31.2

Source: COMTRADE

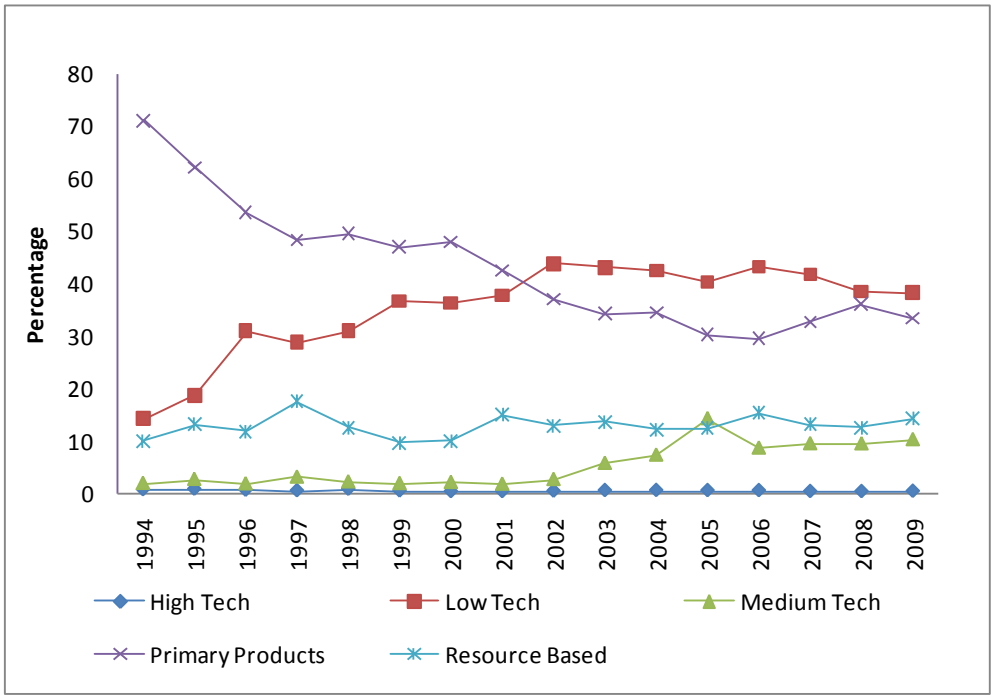
PART III: SOPHISTICATION AND QUALITY

What products countries produce, and how they produce them, matter for export-led growth. All else equal, goods that embody greater value-added in terms of ingenuity, skills, and technology fetch higher prices in world markets. Countries that produce goods that are more sophisticated than what their income levels would suggest tend to see higher rates of future economic growth. Upgrading product quality, therefore, can be a secure source of both export and economic growth. This section assesses the "income" and "factor" contents of exports to see if what Nicaragua exports is sophisticated and of high-value.

3.1 Technological Classification and the Sophistication of Exports

The technological content of Nicaragua's exports has improved slightly over the last decade with the reduced importance of primary products and the growing importance of medium tech exports. In the following graphs, we used Lall (2000) classification to decompose exports into technological levels.

Figure A58. Technological Classification of Exports

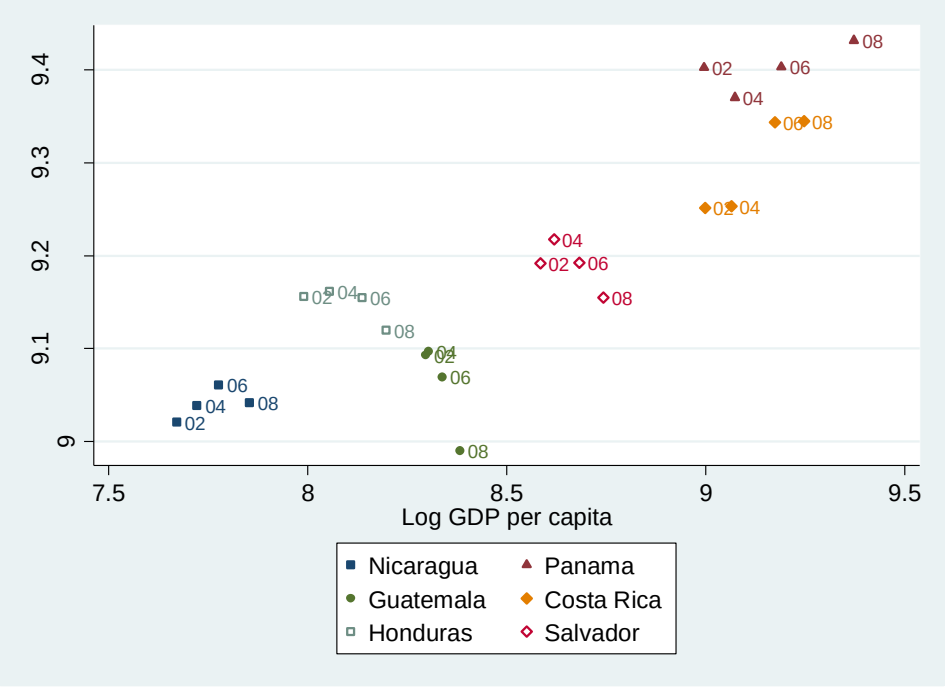


Source: COMTRADE

Over the last decade, about 40 percent of Nicaragua's export value has been in low tech industries. Medium tech industries passed from almost zero to representing approximately 10 percent of total exports in 2009 with a slow but consistent growth rate. This is explained by the growing importance of autoparts exports, mainly ignition wiring sets.

Haussmann, Hwang and Rodrik (2006) show that the level of "sophistication" of products matters for economic growth. Countries that have a more sophisticated export basket, proxied by a measure named EXPY (see Annex 2), enjoy accelerated subsequent growth while those with less sophisticated export baskets tend to lag behind –in essence, countries become what they export. The next figure shows the evolution of the sophistication of exports (Y-axis) and the evolution of the per-capita GDP (X-Axis) for all Central American countries. Although the sophistication of Nicaragua export basket has improved over time, the country shows the lowest level of export sophistication among regional economies.

Figure A59. Change in Export Sophistication



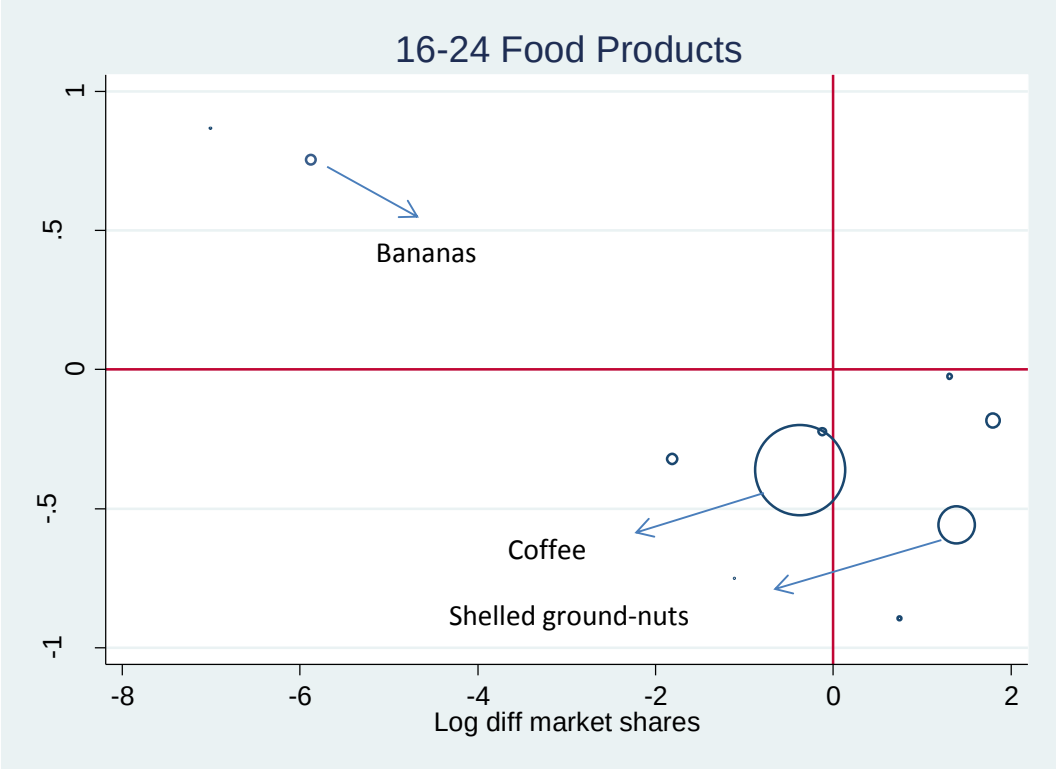
Source: Author's computations

3.2 Quality

One way a country can increase the absolute amount of exports per capita is by augmenting the quality of exports and thus the value of exports per unit. Using a highly detailed database on unit values of exports to the EU, we construct a measure of the relative quality of each exported product to the EU (see Annex 3). The figure below presents the relation between growth in the relative quality measure and changes in market shares of Nicaragua's exports to the EU market.[96] Each bubble represents a product, defined by an 8-digit Combined Nomenclature code. The x-axis shows the growth rate of market share (log difference of market shares) between 1996-08 and 2006-08. The y-axis represents the growth rate of the average quality measure between the same periods of time. The size of each bubble is the importance of each product in Nicaragua's export basket in 2006-08. We present the analysis for products within the most important export sector to the EU: Food Products.

[96] Given data availability, we cannot do the same analysis for the US.

Figure A60. Change in Relative Quality and in Market Shares in the European Market (Ave.06-08/Av.96-98)



Source: COMTRADE

Overall, and in line with the evidence that Nicaragua's exports are diverging away from the EU market, the most important products have lost market share. On top of that, a factor of concern is the lack of quality upgrading observed across food products. Three important products are labeled: i) bananas, which was the third most important exported product to the EU in 1996-98 and now (2006-08) is not even in the top 100 list of exported products; ii) coffee which has reduced dramatically its participation –mainly in the German market- at the same time that there seems to be a downgrading in terms of quality; and iii) shelled ground nuts, which seems to be gaining competitiveness in the European market.

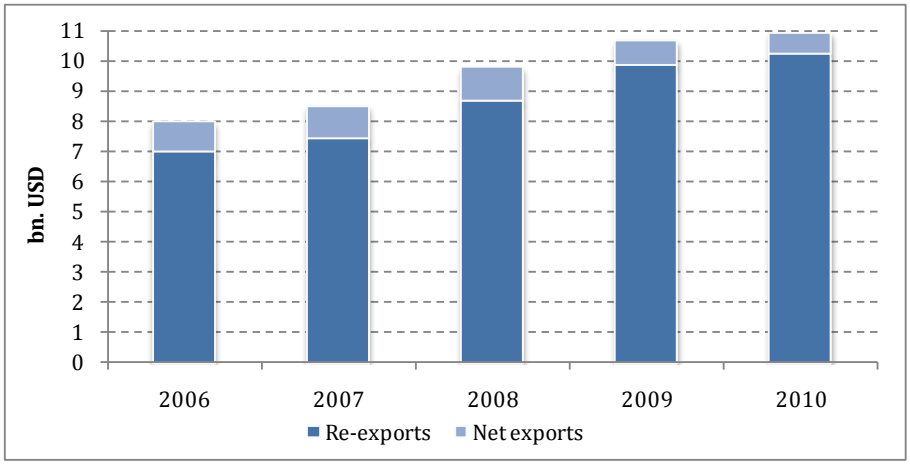
F. Panama

PART I: ORIENTATION AND GROWTH

1.1 Exports, Imports, and Trade Balance

The Colón Free Trade Zone (FTZ), the second largest FTZ in the world, accounted for more than 92 percent of Panama's exports and 65 percent of its imports in 2010[97]. This unique scenario sets this trade outcome analysis apart from the other Central American countries. This is reflected in Panama's share of re-exports in gross exports, ranging from 87 percent in 2006 and 2007 to 93 and 94 percent in 2009 and 2010 (see Figure A61). Unfortunately, the UN COMTRADE database only differentiates between net exports and re-exports for Panama in more recent years.[98] This constitutes a caveat, as we cannot factor out re-exports in many of the following analyses, especially the ones that focus on changes over time. In the Panama section, we will indicate whether we refer to gross exports, i.e. including re-exports, or net exports, i.e. excluding re-exports. Box 1 provides further background information on the FTZ and data availability on net exports in UN COMTRADE.

Figure A61. Panama: Gross Exports



Source: COMTRADE

Panama's gross exports and imports of goods and services as a percentage of GDP don't show a clear trend between 1990 and 2009. Following five years of growth, Panama's exports as a percentage of GDP declined from 100 percent in 1995 to 64 percent in 2003, but constantly increased since then to 77 percent in 2009. Imports of goods and services as a percentage of GDP followed a similar pattern of slight increase, strong decline and subsequent recovery over the

[97] Based on an analysis of figures from the Colón zone management and estimates of Panama's trade by the United Nations Economic Commission for Latin America and the Caribbean.
[98] Since data coverage of re-imports and net imports is even more incomplete, using mirror data is not an option when focusing on net exports.

period, although the recent economic crisis has led to a strong fall of the country's import share to 61 percent in 2009. Over the period 1990-2009, Panama's export share has exceeded its import share except for 1998-99 (Figure 69, left panel).

Box 2: Colón Free Trade Zone and Net Exports

The Colón Free Trade Zone (FTZ), the second largest FTZ in the world, was created in 1948 and is located at the Caribbean entrance of the Panama Canal. Offering complete tax exemption on imports and re-exports as well as zero import duties for firms located in the FTZ (among other incentives), the Colón FTZ accounted for 94 percent of Panama's exports and 65 percent of its imports in 2010. In 2010, the FTZ's goods exports reached around US$11.4 billion, the majority of which represented re-exports that are transshipped to other countries.

Most exports from the Colón FTZ are transshipped to serve the regional market. The largest destinations include Colombia, Venezuela, and Panama, but also include Guatemala, Ecuador, Costa Rica, Dominican Republic, the United States, Chile, Cuba, Honduras, Peru, Brazil, Nicaragua and El Salvador, absorbing around 83% of all exports from the FTZ. Imports to the FTZ largely come from Hong Kong (China), Taiwan, and the United States, followed by Japan, Korea, France, Mexico, Italy, Puerto Rico, Switzerland, United Kingdom, Malaysia and Germany. Imported goods include electric appliances, apparel, watches, perfumes and cosmetics, textiles, gold jewelry, liquors, and cigarettes (http://www.businesspanama.com/investing/opportunities/cfz.php).

Given the large share of re-exports, it would make sense to replicate the standard analysis based on net exports only, i.e. gross exports minus re-exports, in order to detect Panama's domestic export performance. However, the UN COMTRADE database only makes a reliable distinction between net exports and re-exports in Panama from 2006 onwards*. This constitutes a caveat, as we cannot factor out re-exports in many of the following analyses, especially the ones that focus on changes over time (e.g. changes of market shares, changes of export concentration, changes of intensive and extensive margins, decomposition of export growth, export survival, etc.).

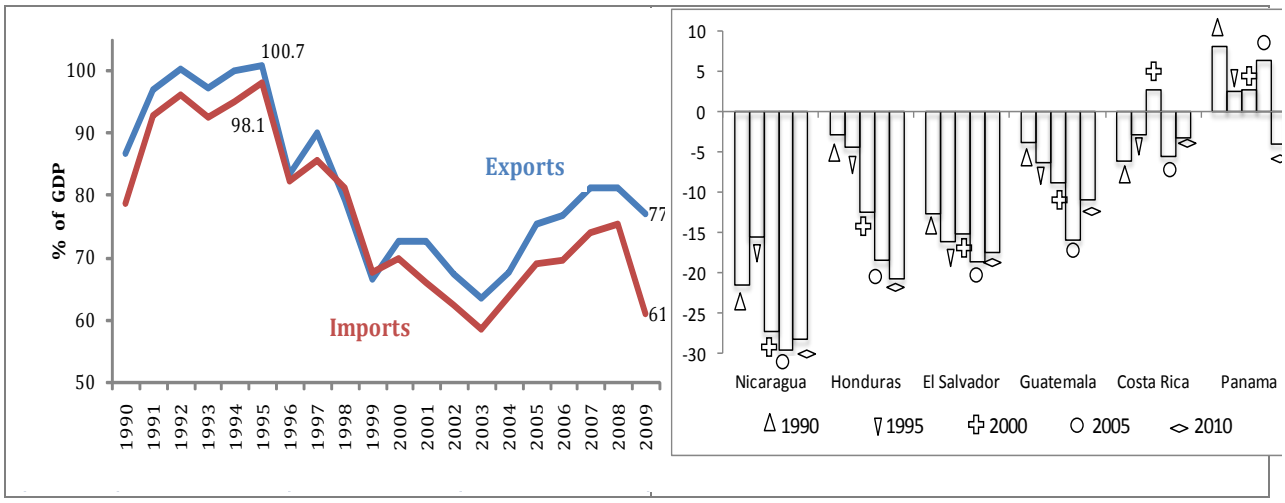
In other cases, limited availability of net exports for many other countries restricts us from replicating cross-country analyses based on net exports only (e.g. bilateral trade balance or the gravity model). We also checked whether re-exports constitute an important share in other Central American countries. Only Honduras reports such data for the period 2000-2005, but re-exports only represent 2 to 3 percent of gross exports and can therefore be neglected (UN COMTRADE). In the Panama section, we indicate whether we refer to gross exports, i.e. including re-exports, or net exports, i.e. excluding re-exports.

* Note that available data for Panama for 2001 and 2002 don't seem to be trustworthy, as re-exports are extremely low, making up only 0.6 percent of the average re-export value in 2006-2008.

The higher percentage of gross exports in Panama's GDP is reflected in the trade surplus as a percentage of GDP over the period (Figure A62, right panel). The trade surplus expanded particularly since the recent economic crisis, reaching 16 percent in 2009 compared to 6 percent in 2005. In comparison with Guatemala, Honduras, El Salvador, and Nicaragua, who show growing trade deficits, Panama is the only country among its Central American peers with a clearly positive trade balance. This can certainly be linked to the Colón FTZ.

Figure A62

Panama: Gross Exports and Imports **Trade Balance (% GDP)**



Source: World Development Indicators

1.2 Openness to Trade

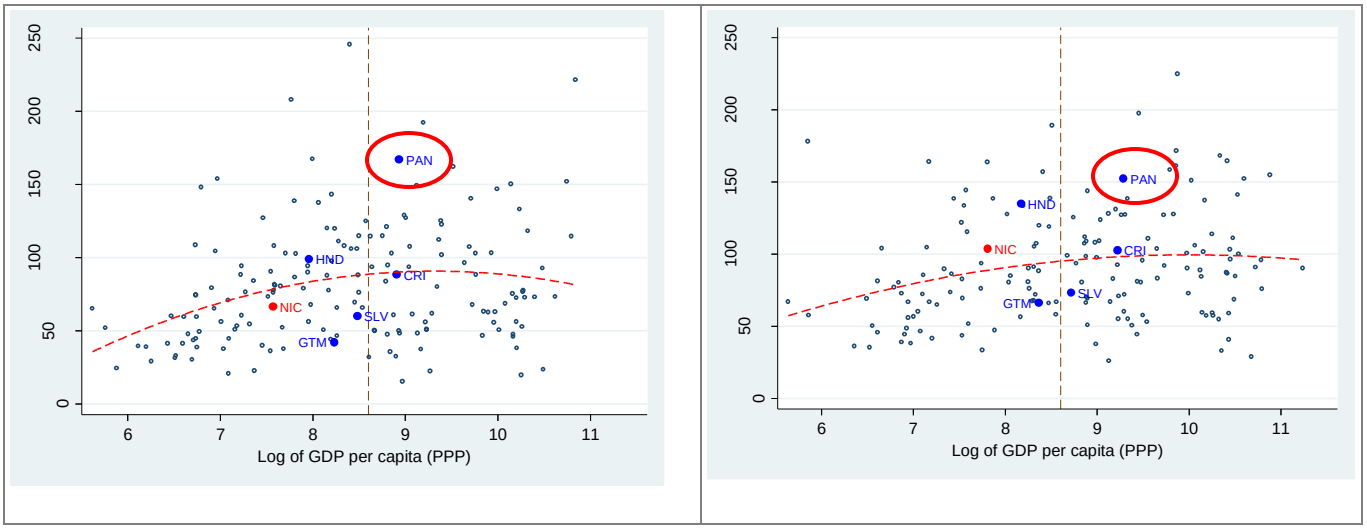
The trade-to-GDP ratio is one of the most basic indicators of openness to foreign trade and economic integration. It weighs the combined importance of exports and imports of goods and services relative to GDP in an economy. The ratio gives an indication of the dependence of domestic producers on foreign demand and of domestic consumers and producers on foreign supply. There is a concave relationship between trade openness and per capita income: countries tend to trade more as incomes rise, but at a decreasing rate.

Panama's relative position in 1996-98, which is clearly above the predicted curve, indicates that openness to goods trade was much higher than what was expected given the country's income per-capita level[99], i.e. on average, countries of similar income showed lower trade participation (Figure A63, left panel). One decade later (2006-08), Panama's relative position had declined slightly, but continues to exhibit clearly higher trade openness than the predicted trade share (Figure A63, right panel). This effect can certainly be linked to the Colón FTZ. Both exports and imports contributed to the slight decline in Panama's relative trade openness position in 2006-08 compared to 1996-98.

[99] In figure 69 the dotted line represents the world average GDP per capita (in logs) in each period. In both periods of time, the world average per capita income was around exp (8.6) which is US$6000 at PPP.

Figure A63

Openness to Trade (Average 1996-1998) **Openness to Trade (Average 2006-2008)**



Source: World Economic Indicators

1.3 Composition of Exports

Panama's distribution of gross exports across broad sectors shifted towards the more sophisticated machinery sector, but also the minerals sector between 1996-98 and 2006-08 (Table A26).[100] In 1996-98, more than a third of the country's gross exports were concentrated in transportation goods, followed by vegetables, which together made up half of the country's total export basket. Machinery, animal products, and chemicals were other important sectors making up almost a quarter of total good exports.

Despite its decline to 31 percent, the export share of transportation goods continued to remain the most important sector in 2006-08. Interestingly, machinery and minerals increased their respective export shares to almost 15 and 10 percent, which is reflected in the highest compound annual growth rates (CAGR) of 13 and 16 percent, respectively, over the period. The role of vegetables and animal products, on the other hand, significantly declined.

As a consequence of the Colón FTZ, we observe some mismatch between Panama's revealed comparative advantage (RCA) index and its relative sector importance. Except for transportation, Panama shows the highest RCA index in sectors that are either small (shoes) or have been strongly declining over the past ten years (vegetables, animal products).[101] On the other hand, Panama shows a relatively low RCA for machinery and equipment, the second largest sector.

[100] In order to avoid one year spikes that might skew our data, we use three year averages (1996-98 and 2006-08) of export values.

[101] The RCA index measures the relative advantage or disadvantage of a certain country in a certain industry as evidenced by trade flows. An index value above the number one indicates that a country's share of exports in that

Table A26. Panama: Gross Export Basket and revealed Comparative Advantage

		Average 1996-1998			Average 2006-2008			
Sector		Exports	% of total	RCA	Exports	% of total	RCA	Average Annual Growth Rate
01-05	**Animal**	255.11	7.8	3.74	319.59	4.6	2.50	2.3
06-15	**Vegetable**	491.40	15.1	4.92	586.54	8.4	2.88	1.8
16-24	**Food products**	84.81	2.6	0.88	123.84	1.8	0.61	3.9
25-27	**Minerals**	157.21	4.8	0.73	685.82	9.8	0.52	15.9
28-38	**Chemicals**	244.46	7.5	1.06	484.95	6.9	0.73	7.1
39-40	**Plastic / Rubber**	40.60	1.2	0.33	92.55	1.3	0.29	8.6
41-43	**Hides, Skins**	25.47	0.8	0.96	72.45	1.0	1.60	11.0
44-49	**Wood**	39.64	1.2	0.34	92.19	1.3	0.45	8.8
50-63	**Textiles, Clothing**	200.77	6.2	1.06	488.80	7.0	1.59	9.3
64-67	**Footwear**	51.35	1.6	1.60	199.79	2.9	3.66	14.6
68-71	**Stone / Glass**	73.34	2.3	0.80	144.06	2.1	0.65	7.0
72-83	**Metals**	66.50	2.0	0.32	216.85	3.1	0.34	12.5
84-85	**Mach/Elec**	290.96	8.9	0.35	1,012.93	14.5	0.52	13.3
86-89	**Transportation**	1,137.89	35.0	3.58	2,187.56	31.3	2.95	6.8
90-97	**Miscellaneous**	95,.14	2.9	0.55	271.94	3.9	0.65	11.1
	Total	**3,254.66**	**100.0**		**6,979.85**	**100.0**		**7.9**

Note: Exports are in millions of US dollars. RCA is the revealed comparative advantage.
Source: COMTRADE

Panama's distribution of net exports across broad sectors for 2006-08 in Table 29 underlines the country's dependence on natural resource-based exports. The two major sectors are animal goods and vegetables making up more than 80 percent of the country's net export basket. These are also the sectors showing a very high RCA index based on gross trade flows (see Table A27). The third and fourth most important sectors are foodstuff and metals. The analysis clearly shows that the FTZ serves as a hub to export especially transportation and machinery/electronic products originating from other countries.

sector exceeds the global export share of the same sector. If this is the case, we infer that the country has a comparative advantage in that sector. Since high export volumes can results from subsidies or other incentives provided, including under-valued exchange rates, the RCA index has been argued to be a misnomer in the sense that it captures competitiveness rather than comparative advantage (Siggel, 2006).

Table A27. Panama: Net Export Basket

		Average 2006-2008	
Sector		Exports (US$ '000)	% of total
01-05	**Animal**	448,296	42.6
06-15	**Vegetable**	402,545	38.2
16-24	**Foodstuffs**	61,025	5.8
25-27	**Minerals**	7,457	0.7
28-38	**Chemicals**	25,014	2.4
39-40	**Plastic / Rubber**	7,085	0.7
41-43	**Hides, Skins**	12,785	1.2
44-49	**Wood**	11,402	1.1
50-63	**Textiles, Clothing**	3,754	0.4
64-67	**Footwear**	26	0.0
68-71	**Stone / Glass**	14,345	1.4
72-83	**Metals**	56,942	5.4
84-85	**Mach/Elec**	451	0.0
86-89	**Transportation**	436	0.0
90-97	**Miscellaneous**	1,908	0.2
	Total	**1,053,470**	**100.0**

Source: COMTRADE

Panama's top ten gross export products in 2006-08, shown in Table A28, made up 47.8 percent of the total export basket, reflecting a relatively low export concentration (see section 2.2). The top ten export goods confirm the country's strong reliance on transportation goods, which made up almost 28 percent of total goods exports. Cargo vessels and tankers alone showed an export share of 14.9 and 8.7 percent, respectively. Bananas, the only vegetable product among the top 10, were still the country's third most important export product. The strong increase in minerals over the period was mainly driven by exports of oils petroleum (bituminous, distillates, except crude) which ranked fourth compared to 36th one decade earlier.

The picture drastically changes when we focus on net exports only (see Table A29). The top 10 export goods are all exclusively animal products or vegetables and make up almost two thirds of the country's net export basket. In 2006-08, melons represented Panama's top net export good (18 percent), followed by bananas (10 percent), fish filet (8 percent) and tuna (7.5 percent). Again, the predominance of transportation products among the top ten gross exports (Table A30) is a result of the Colón FTZ alone, as these products originate from other countries and constitute mainly re-exports.

Table A28. Top Ten Gross Exports by Panama (Average 2006-2008)

rank	HS6	Product	% of total	Rank 96-98
1	**890190**	Cargo vessels other than tanker or refrigerated	14.9	1
2	**890120**	Tankers	8.7	3
3	**080300**	Bananas, including plantains, fresh or dried	5.9	2
4	**271000**	Oils petroleum, bituminous, distillates, except crude	4.7	36
5	**270900**	Petroleum oils, oils from bituminous minerals, crude	3.9	4
6	**300490**	Medicaments nes*, in dosage	3.4	6
7	**890110**	Cruise ships, excursion boats, ferry boats	2.1	7
8	**852810**	Color television receivers/monitors/projectors	1.9	8
9	**890520**	Floating, submersible drilling or production platform	1.2	18
10	**890400**	Tugs and pusher craft	1.1	12
Total			**47.8**	

*Source: COMTRADE. *Not elsewhere specified*

Table A29. Top Ten Net Exports by Panama (Average 2006-2008)

rank	HS6	Product	% of total
1	**080710**	Melons (including watermelons), fresh	18.0
2	**080300**	Bananas, including plantains, fresh or dried	9.9
3	**030410**	Fish fillet or meat, fresh or chilled, not liver, roe	8.0
4	**030342**	Tunas(yellowfin) frozen, whole	7.5
5	**030219**	Salmonidae, not trout or salmon, fresh or chilled whole	5.4
6	**030613**	Shrimps and prawns, frozen	4.5
7	**080430**	Pineapples, fresh or dried	3.6
8	**030749**	Cuttle fish, squid, frozen, dried, salted or in brine	2.8
9	**030420**	Fish fillets, frozen	2.2
10	**070990**	Vegetables, fresh or chilled nes*	2.1
Total			**64.0**

*Source: COMTRADE. *Not elsewhere specified*

Transportation services make up more than half of Panama's services exports, and this dependence slightly increased between 1996-1998 and 2006-08 (see Table A30). Among the Central American countries, Panama is the only country in which travel is not the major services export, although we still observe a slight shift towards more travel. This is likely to be a result of the Colón FTZ with huge trade flows seemingly having a positive impact on the domestic transportation sector. The expansion of transportation services, as well as travel and business

services, happened at the cost of government services, which dropped by more than 9 percentage points over the period.

Table A30. Share in Total Exports of Services (BoP)

Sector	Average 1996-1998						Average 2006-2008					
	CRI	GTM	HND	NIC	PAN	SLV	CRI	GTM	HND	NIC	PAN	SLV
Transport	15.2	12.7	17.3	14.3	52.6	31.3	8.9	11.8	5.7	11.6	53.9	24.2
Travel	67.1	44.3	42.8	49.2	21.6	29.1	56.5	59.5	68.9	68.2	24.0	57.1
Other services	17.8	42.9	39.8	36.5	25.8	39.6	34.6	28.7	25.4	20.1	22.2	18.7
Communications	6.9	6.9	22.4	15.2	2.5	18.6	1.2	14.6	18.6	8.2	4.1	10.2
Construction	-	0.2	-	-	-	0.7	-	0.2	-	-	0.0	2.3
Insurance	-0.1	2.0	5.5	1.7	1.1	7.5	-	1.2	3.7	1.0	1.3	2.3
Financial services	0.4	2.4	0.3	-	5.5	1.6	0.4	0.6	0.8	-	7.3	0.2
Computer and information	0.1	0.5	0.1	-	-	-	14.9	0.7	0.1	-	0.4	0.1
Royalties and license fees	0.1	-	-	-	-	-	0.0	0.6	-	-	-	0.0
Other business services	9.2	23.8	6.2	-	6.2	2.3	17.1	3.9	1.8	-	7.8	1.3
Personal, cultural and recreational services	0.0	-	0.0	-	-	-	0.0	1.3	0.4	-	-	-
Government services, n.i.e.*	1.1	7.2	5.4	19.6	10.6	9.6	1.0	7.1	1.6	10.9	1.2	2.3

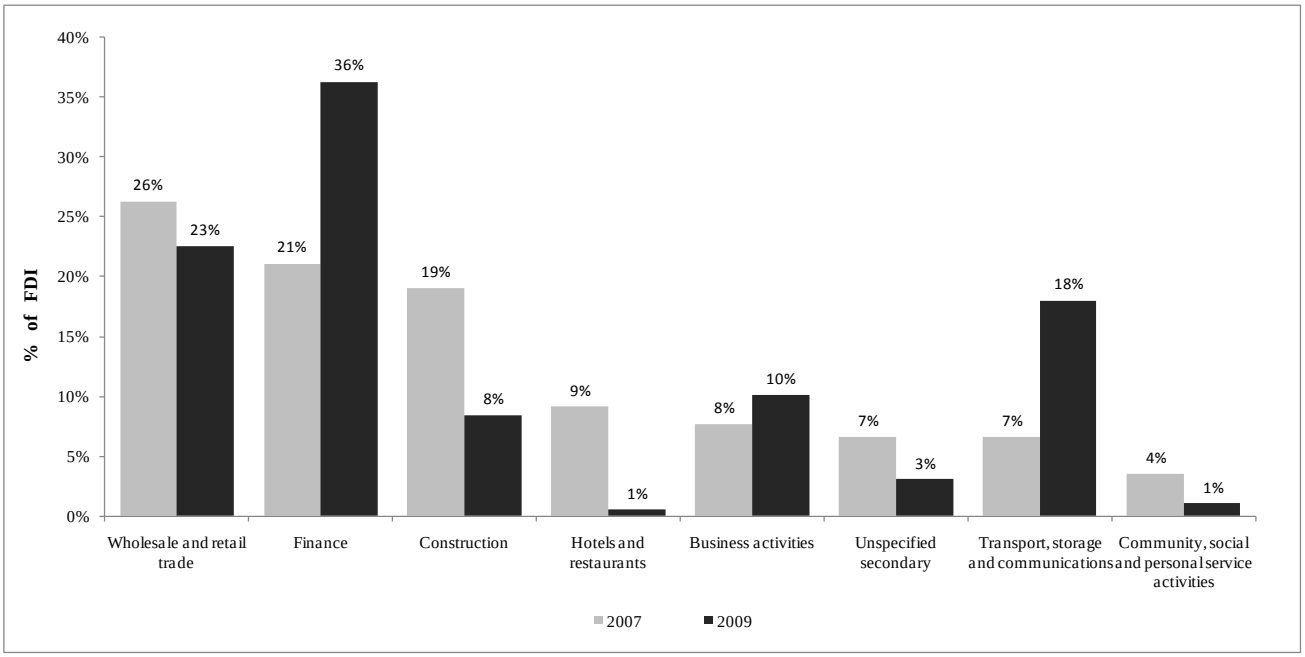
*Source: UNCTADSTAT database. *Not included elsewhere.*

1.4 Foreign Direct Investment

Foreign Direct Investment (FDI) has been considered a catalyst for growth and development due to possible spillovers on the local economy, especially in countries with low capital accumulation. Such spillovers can range from innovation (through faster transfer of know-how and state-of-the-art technologies), increases in productivity, sophistication and competitiveness (through increased competition), and broader product choice for consumers, among others.

The four sectors with the highest FDI inward flow in 2009 were all services sectors and made up more than 75 percent of total inward FDI inflow in Panama (Figure A64), namely finance (36.3 percent), wholesale and retail trade (22.6 percent), and transport, storage, and communications (18 percent).

Figure A64. FDI Inward Flow in Panama



Source: Investment Map, International Trade Centre.

1.5 Trading Partners

Panama's main destination for gross goods exports is Venezuela whose share increased strongly from 5.8 percent in 1996-98 to 16.4 percent in 2006-08 (see Table A31). The overall export share to South America more than doubled from 12.8 to 26.2 percent over the same period, replacing the EU-27 as the largest export destination for Panama. Venezuela replaced South Korea as the largest export destination in 1996-98 (more than 10 percent). However, South Korea still had an export share of 7.8 percent one decade later, making the country the second largest destination for Panama's gross exports.

Panama's export share to the EU-27, now the second largest region, remained relatively stable over the period at around 22 percent. Among the EU-27 trading partners, Germany managed to expand its share slightly to 5.7 percent in 2006-08, replacing Spain as the largest trading partner whose export share fell to 3.9 percent.

Table A31. Panama: Trading Partners
(Gross Exports)

	Average (1996-1998)	Average (2006-2008)
United States	**10.2**	**4.9**
South Korea	**10.8**	**7.6**
Regional	**17.1**	**15.5**
Salvador	5.3	3.2
Guatemala	3.6	5.9
Nicaragua	3.2	0.4
Costa Rica	3.0	3.2
Honduras	2.0	2.7
Mexico	**0.4**	**1.5**
EU-27	**22.8**	**22.3**
Spain	5.9	3.9
Germany	4.6	5.7
Greece	3.3	1.4
Poland	2.2	2.0
Italy	0.6	2.4
Rest EU-27	6.3	6.9
South America*	**12.8**	**26.2**
Venezuela	5.8	16.4
Ecuador	4.0	5.3
Rest	3.0	4.5
BRIC Countries	**3.8**	**5.6**
Russia	0.6	0.3
India	1.4	4.2
China	0.1	0.7
Brazil	1.7	0.4
Rest of the World	**22.2**	**16.5**

* Excluding Brazil

Source: COMTRADE

A similar observation can be made for Panama's export share to other Central American countries whose share remained at around 16 percent over the period. Among these countries,

Guatemala is the largest trading partner showing an export share of 5.9 percent, followed by Costa Rica and El Salvador with export shares of 3.2 percent. Trade with Nicaragua, however, declined strongly by almost 3 percentage points.

Unlike many Central American countries, the United States is not the main destination for Panama's gross exports. Moreover, Panama's export share to the United States halved from 10 to 5 percent between 1996-98 and 2006-08. Despite its geographical ties, Brazil – the largest trading partner among the BRICs in 1996-98, fell behind India and China and only absorbed 0.4 percent of Panama's gross exports in 2006-08. The export share to India, on the other hand, tripled from 1.4 to 4.2 percent, making it the largest export destination among the BRICs in 2006-08.

In a next step, we show the distribution of Panama's net exports by destination in Table A32. The picture clearly changes, showing that in 2006-08 the United States was the top export destination for Panama's net export goods with an export share of almost 39 percent. More than a third of Panama's net exports went to the EU-27, in particular the Netherlands (9.4 percent), Spain (6.1 percent), Sweden (5.6 percent) and the United Kingdom (4.9 percent). Central America and Mexico absorb almost 12 percent of Panama's net exports, above all Costa Rica (5.2 percent). Among the BRICs, China is the main trading partner absorbing 4 percent of Panama's net exports in 2006-08. However, South America and Brazil played a subordinate role for Panama's net exports.

Comparing Panama's gross and net exports clearly shows that third countries use the Colón FTZ as a hub to re-export goods to South and Central American countries (especially Venezuela), South Korea and probably other destinations. These three destinations alone represented half of Panama's gross exports in 2006-08, but only 14 percent of Panama's net exports.

Table A32. Panama: Trading Partners
(Net Exports)

	Average (2006-2008)
United States	**38.8**
South Korea	**0.3**
Regional	**10.8**
Costa Rica	5.2
Guatemala	1.8
Honduras	1.7
Nicaragua	1.3
Salvador	0.8
Mexico	**0.9**
EU-27	**22.8**
Netherlands	9.4
Spain	6.1
Sweden	5.6
United Kingdom	4.9
Netherlands	9.4
Rest EU-27	7.5
South America*	**2.3**
Colombia	1.5
Venezuela	0.2
Ecuador	0.2
BRIC Countries	**4.9**
Russia	0.0
India	0.6
China	4.0
Brazil	0.2
Rest of the World	**8.5**

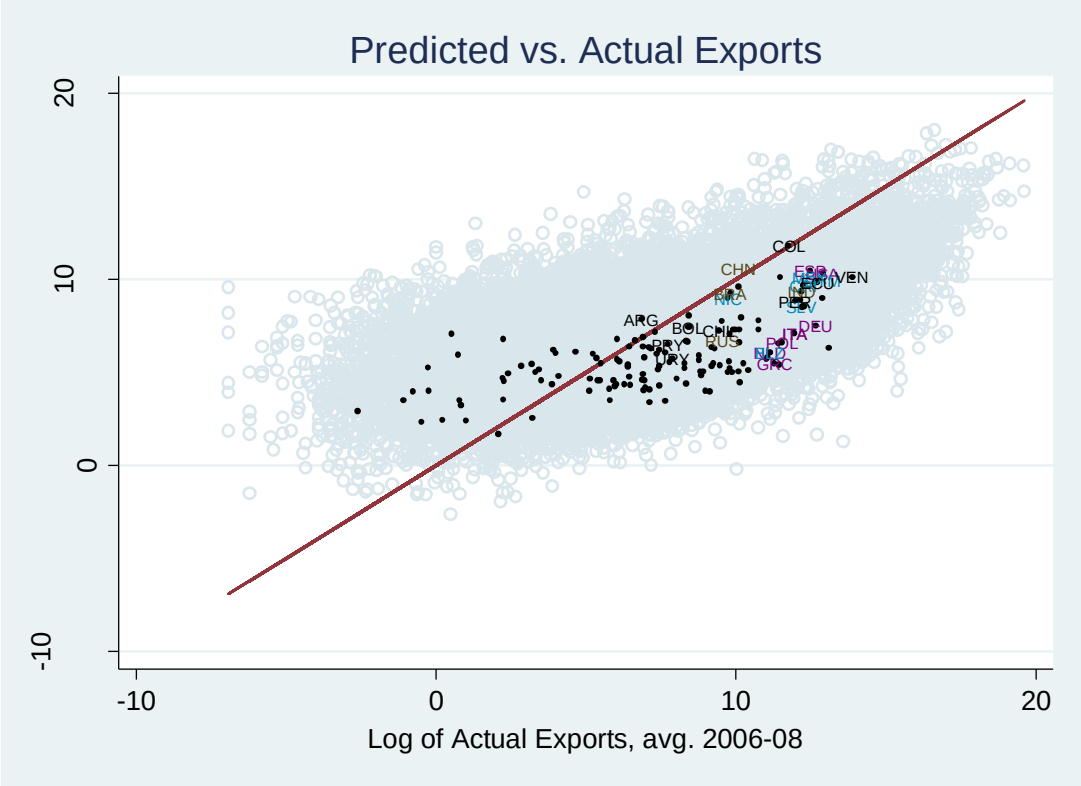
* Excluding Brazil

Source: COMTRADE

1.6 How "natural" are they?

In a next step, we assess whether a country's export products are natural by estimating a gravity model. Based on a theory-grounded model[102], this exercise allows us to compare actual bilateral export relationships of a country with all its trading partners with the predicted export values from the gravity equation. The gravity model is based on average bilateral gross export values in 2006-08.

Figure A65. Gravity Model, Based on Gross Exports



Source: COMTRADE

[102] We regress 2006-08 bilateral exports (using mirror data) on the following bilateral characteristics: distance, contiguity, common language, colony, common colonial power, as well as log of GDP, log of GDP per capita, etc. We also incorporate three innovations. First, a measure of remoteness is computed by summing distances weighted by the share of GDP of the destination in world GDP. This is to take note of the fact that relative distances matter greatly, alongside absolute distances. Second, we control for zero trade flows using the Heckman sample selection correction method, since OLS drops observations with non-existent bilateral trade. The probability of being included in the sample, i.e. having a non-zero trade flow, would be left out in the model. If the probability of selection is correlated with GDP or distance, OLS estimates would be biased. Third, following Helpman, Melitz and Rubinstein (2008), control for firm heterogeneity (without using firm-level data) relying on the fact that the features of marginal exporters can be inferred from the export destinations reached. With these steps, the gravity results are better grounded in modern trade theory.

Figure A65 shows all bilateral trade relationships in our dataset of 181 countries (light grey dots). Panama's bilateral exports are black and key trading partners are labeled. For export destinations below the 45-degree line, Panama's actual export value in 2006-08 is higher than what the gravity model would have predicted, i.e. Panama over-trades with these countries. These countries include major high-income countries such as the US and all EU-27 countries as well as its Central American neighbors (Belize, Costa Rica, El Salvador, Guatemala, Mexico, and Nicaragua), all South-American countries except for Argentina and Colombia, and the BRICs. The fact that Panama over-exports with these countries, especially in the region, can be related to the Colón FTZ.

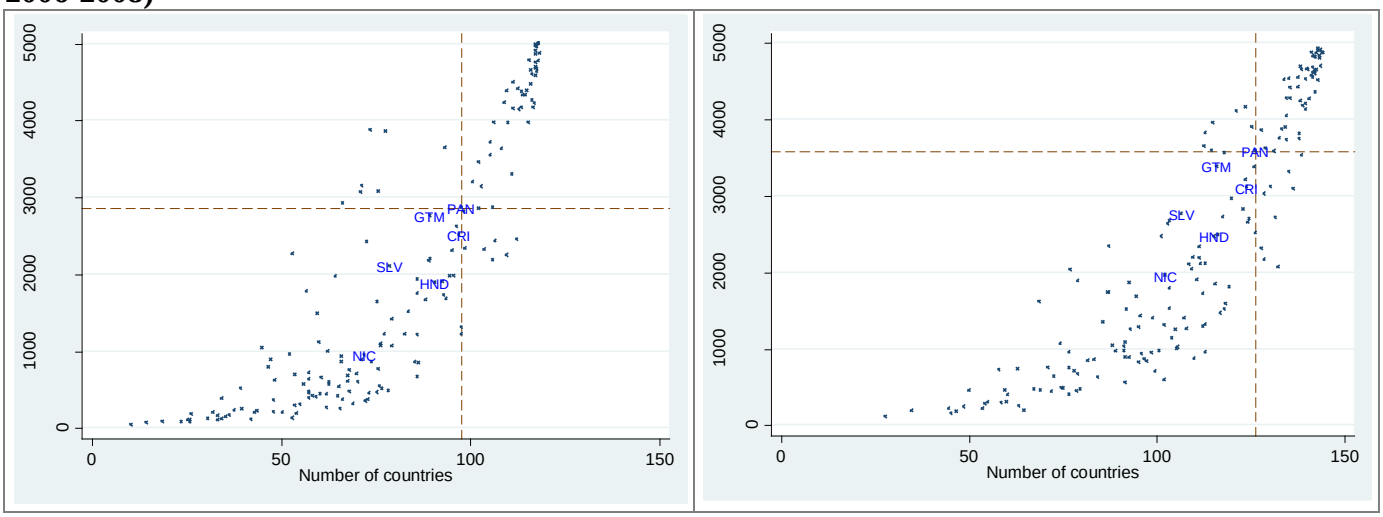
PART II: DIVERSIFICATION

2.1 Number of Products and Markets

Export diversification across markets and products reduces the risk of the country's export portfolio to partner-specific shocks and volatility in export prices. One simple way of detecting a country's product and market diversification is to count its number of exported products and export destinations.[103] Figure A66 shows the number of a country's export destinations (x-axis) and the number of a country's export products (y-axis) for 1996-98 (left panel) and 2006-08 (right panel).

Figure A66

Export Relationships (Average 1996-1998) **Export Relationships (Average 2006-2008)**



Source: COMTRADE. NB: Analysis based on gross exports.

[103] Note that both indicators are imperfect measures of dynamics at the extensive margin of trade.

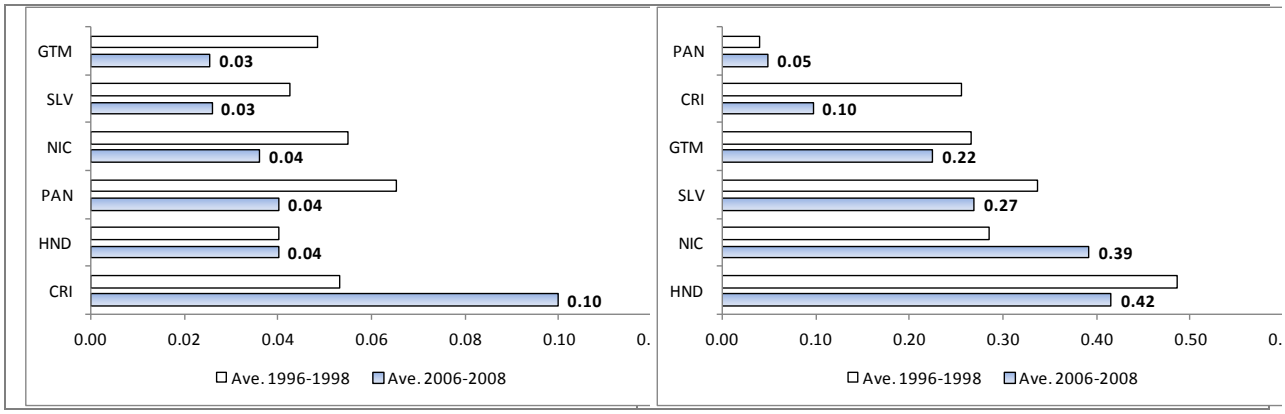
All Central American countries increased the number of export markets over the period. In addition, all Central American countries increased their number of export products. Compared to its regional peers, Panama remained at the second position behind Mexico in terms of both number of export products and markets. Moreover, Panama managed to close the gap to Mexico between 1996-98 and 2006-08, especially in its number of export markets, but also of export products. Again, this could be a result of the Colón FTZ. However, if we exclude re-exports from the analysis, Panama's position drastically worsens. In 2006-08, Panama only exported around 630 products to 95 countries compared to more than 3,500 products to more than 120 countries if we include re-exports.

2.2 Concentration Index

In a next step, we look at the Herfindahl-Hirschman index (HHI) as a more sophisticated measure of export diversification.[104] Figure A67 shows the HHI of product (left panel) and market concentration of exports (right panel) for Central-American countries in 1996-98 versus 2006-08. Panama as well as El Salvador, Guatemala, and Nicaragua, all increased their diversity in export products over the period, whereas Costa Rica showed a higher product concentration of exports. Compared to the other countries in the region, Panama had a medium product concentration of exports in 2006-08. Excluding re-exports yields a HHI of product concentration of 0.065 in 2006-08, which is higher than for gross exports. That is, Panama's net exports are more concentrated than the country's gross exports which can be related to the country's strong concentration in animal products and vegetables.

Figure A67

Herfindahl Index – Products **Herfindahl Index - Markets**



Source: COMTRADE

[104] The HHI is computed as the sum of squared shares of each product (market) in total export. A country with a perfectly diversified export portfolio in terms of products (markets) will have an index close to zero, whereas a country with only one export product (market) will have a value of 1.

Second, Panama and Nicaragua were the only two countries among the Central American countries to reduce their export diversification across markets over the period. Despite the higher concentration of export markets, Panama by far showed the highest diversification of export markets in 2006-08, again a likely result of the Colón FTZ. When we exclude re-exports, we obtain a HHI of market concentration of 0.18 for 2006-08, i.e. net exports are more concentrated in terms of markets than gross exports. However, the market concentration of net exports is still lower than that of gross exports in most other Central American countries.

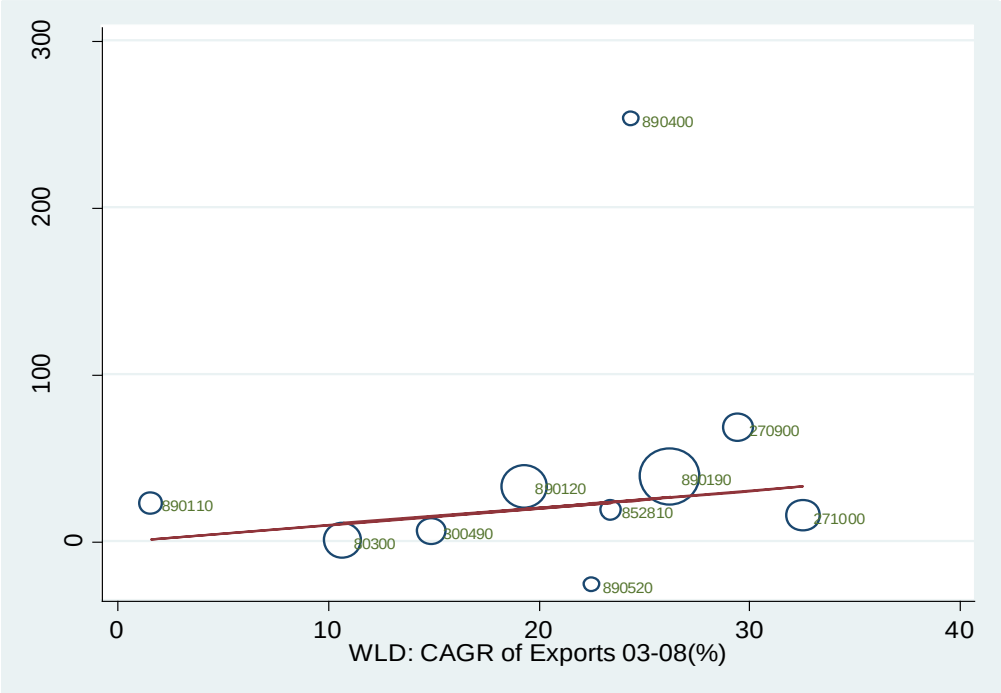
2.3 Growth Orientation of Products and Markets

We now compare Panama's top ten gross exports – as identified in section 1.3 – with worldwide exports of the same products (Figure A68). The y-axis plots export growth for Panama's top ten products between 2003 and 2008, while the x-axis shows world export growth for same goods over the same period. The circle size indicates the relative importance of the product in Panama's export basket over 2006-08. Products above the 45-degree line experienced higher export growth in Panama compared to all countries, while products below the line were characterized by lower growth than the world. In other words, products above the 45-degree line gained in world market share, while products below the line lost market share.

Between 2003 and 2008, Panama lost world market share in five of its top ten gross export products, most importantly in oils petroleum (bituminous, distillates, except crude) (27100), the fourth most important export good over 2006-08, and floating, submersible drilling or production platform (890520), the ninth most important export good. However, Panama gained world market share in five export goods, most importantly tugs and pusher craft (890400), but also in its two major export products cargo vessels (890190), and tankers (890120).

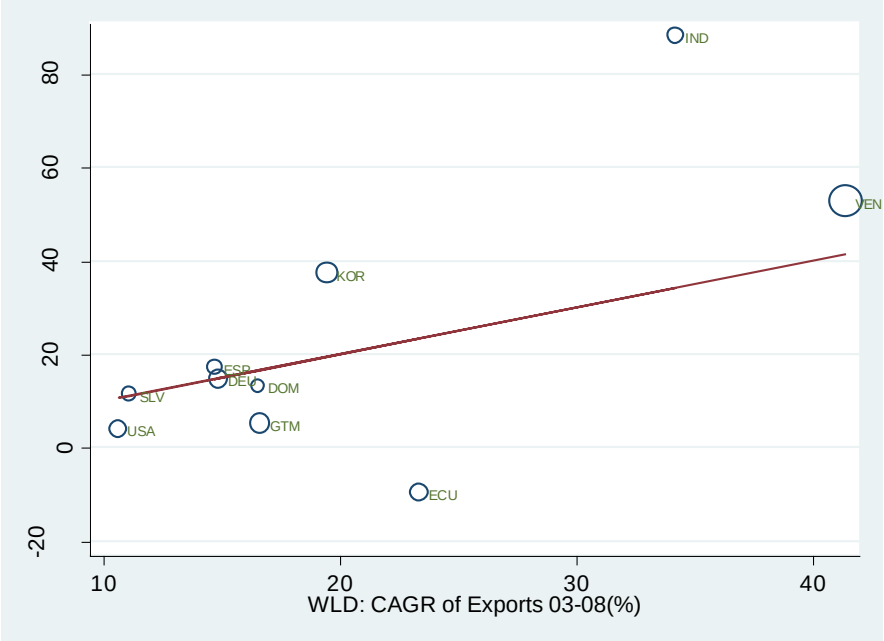
Analogously, we compare Panama's export growth in the country's top ten export destinations with worldwide export growth in the same export destinations (Figure A69). Between 2003 and 2008, Panama's exports gained market share in Venezuela, its largest trading partner, and in India, South Korea, and Spain. At the same time, the country lost world market share in Ecuador, Guatemala, the United States, and the Dominican Republic.

Figure A68. Growth Orientation of Products (Top 10 Products)



Source: COMTRADE

Figure A69. Growth Orientation of Destinations (Top 10 Markets)



Source: COMTRADE

2.4 Intensive and Extensive Margins of Exports

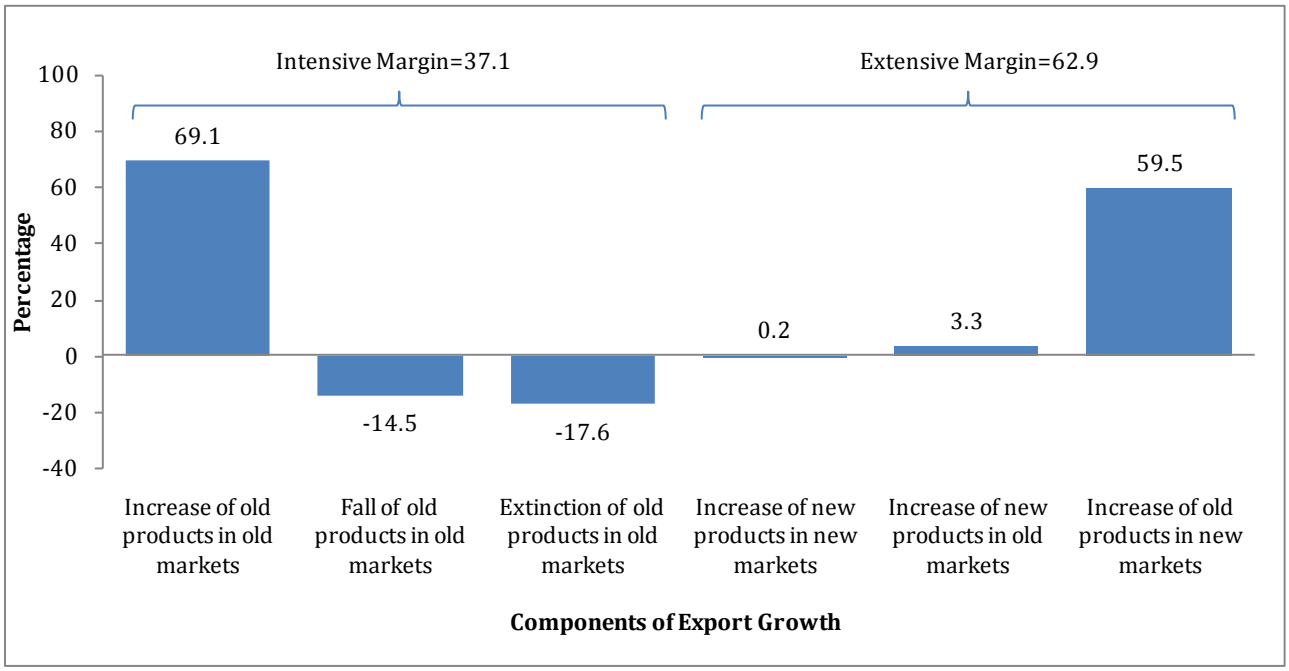
Export growth can take place at the intensive margin, i.e. selling existing products to existing markets, or at the extensive margin, i.e. selling existing products to new markets, new products to new markets, and new products to existing markets. This subsection explores to what extent Panama has been able to add new, economically significant products and markets into its export portfolio.

In this section, we decompose Panama's gross export growth between 1998 and 2008 into export growth (i) at the intensive margin, i.e. increase, fall, or extinction of old export products in old markets, and (ii) export growth at the extensive margin, i.e. increase of new export products in new and old markets and increase of old export products in new markets.

Figure A70 shows that the extensive margin explains more than 63 percent of Panama's export growth between 1998 and 2008, while the intensive margin explains only 37 percent. Export growth at the intensive margin was driven by export growth of old products in old markets (69 percent), which compensated for negative export growth or even an extinction of old products in old markets (combined -32 percent). Export growth at the extensive margin was driven by old products in new markets (59.5 percent) and to a much lesser extent also by new products in old markets (3.3 percent).

At the regional level, Panama's gross export growth performed better than in the Central American region for old products in new markets (Table A33). The fall of old export products in old markets was also lower for Panama. However, the country's export growth performed worse for old and new products in old markets. Moreover, the extinction of old products in old markets was higher in Panama compared to the Central American region. Overall, the country shows a very low participation of the intensive margin of trade. This is of course affected by the large volume of re-exports originating in the Colon Free Trade Zone.

Figure A70. Decomposition of Gross Export Growth



Source: COMTRADE

Table A33. Comparative Decomposition of Gross Export Growth

Margin	Components of Export Growth	Panama	Simple Regional Average	Chile
Intensive		**37.1**	**61.3**	**84.4**
	Increase of old product in old markets	69.1	97.8	91.1
	Fall of old products in old markets	-14.5	-24.1	-3.9
	Extinction of exports of old products to old markets	-17.6	-12.4	-2.4
Extensive		**62.9**	**32.7**	**15.2**
	Increase of new products in new markets	0.2	0.2	0.0
	Increase of new products in old markets	3.3	7.3	1.8
	Increase of old products in new markets	59.5	31.2	13.3

Source: COMTRADE

PART III: SOPHISTICATION AND QUALITY

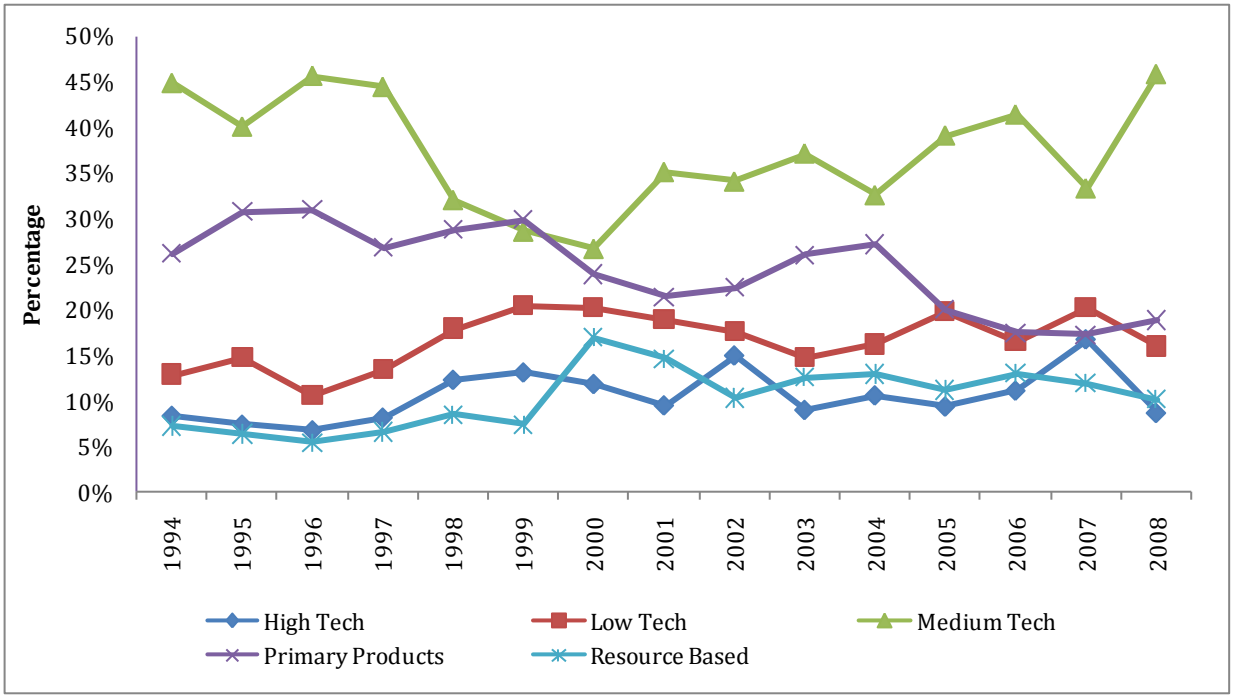
This section focuses on export sophistication and quality. The type of export products and inputs embodied in these products matter for export-led growth and economic upgrading. High-quality goods in terms of ingenuity, skills, and technology fetch higher prices in world markets. Countries specializing in the production of more sophisticated goods compared to what their

income levels would suggest tend to see higher rates of future economic growth. Upgrading product quality, therefore, can be considered a source of both export and economic growth.

3.1 Technological Classification and the Sophistication of Exports

The Colón FTZ is used as a hub to re-export mainly medium- and low-tech goods. The majority of Panama's gross exports are medium-tech exports which declined over the period 1994-2000 but recovered since then, reaching a share of 45 percent in 2008 (Figure A71). The second most important category is primary products, which declined from 26 to 10 percent over the period. At the same time, the share of low-tech exports expanded from 13 to 16 percent and is likely to become the second most important product category in the near future. The share of high-tech products showed a slight increase over the period, but fell back to 8 percent in 2008.

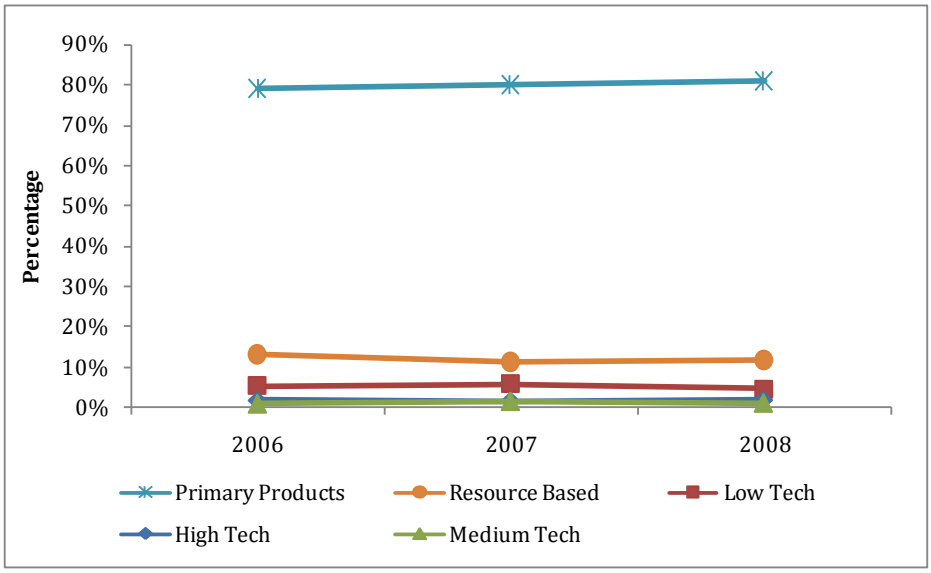
Figure A71. Technological Classification of Gross Exports



Source: COMTRADE

In stark contrast to the technological content of gross exports, the technological content of Panama's net exports for 2006-08 was heavily dominated by primary products (Figure A72). As noted earlier, around 80 percent of net exports consisted of primary products. Resource-based products represent another 10 percent of the net export basket. Among manufactured products, low-tech exports played the biggest role with an export share of around 5 percent.

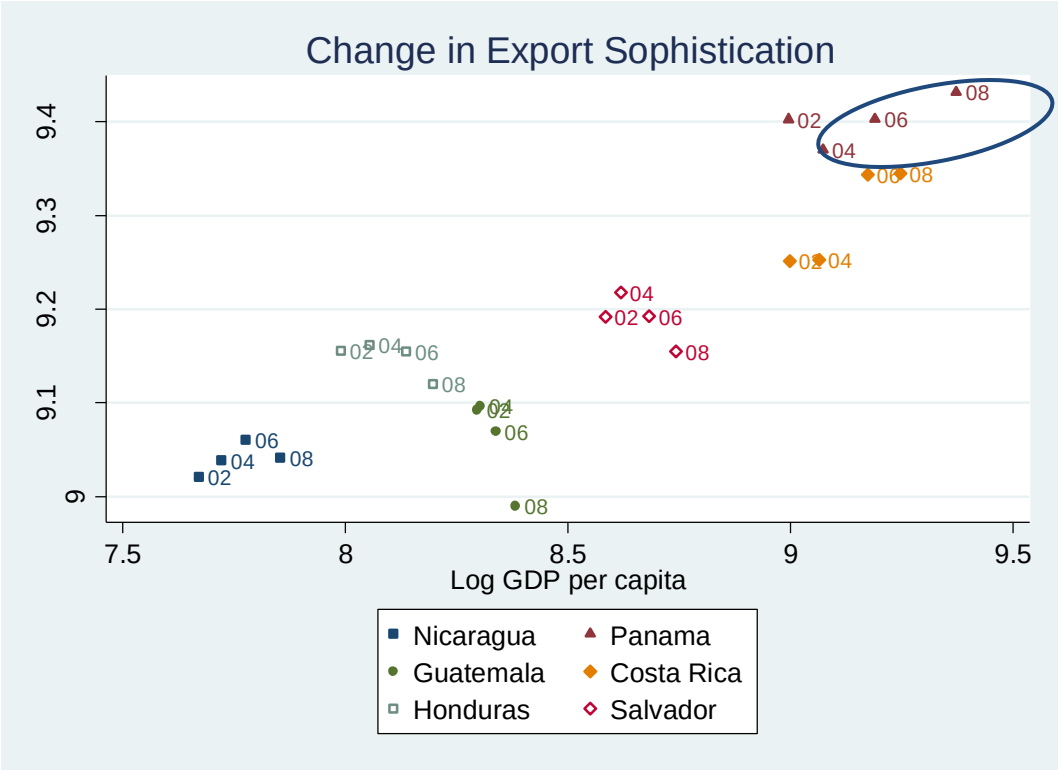
Figure A72. Technological Classification of Net Exports



Source: COMTRADE

Hausman, Hwang and Rodrik (2006) argue that the level of product sophistication matters for economic growth. Countries that have a more sophisticated export basket, proxied by a measure named EXPY (see Annex 2), enjoy accelerated subsequent growth while those with less sophisticated export baskets tend to lag behind – in essence, countries become what they export. Figure A73 shows the sophistication of exports (y-axis) and per-capita GDP (x-Axis) for all Central American countries over time. The sophistication of Panama's export basket has somewhat improved between 2006 and 2008. Moreover, Panama showed the highest level of export sophistication among its regional peers in all years. Given that this analysis is based on gross exports and that 80 percent of the country's net exports consist of primary products, these results are clearly related to the Colón FTZ.

Figure A73. Export Sophistication, Based on Gross Exports



Source: author's computations

3.2 Quality

Countries can increase the absolute amount of exports per capita, for example, by augmenting the quality of exports and subsequently the value of exports per unit. Using a highly disaggregated database on unit values of exports by sector to the EU, we construct a measure of the relative quality of each exported product (see Annex 3).

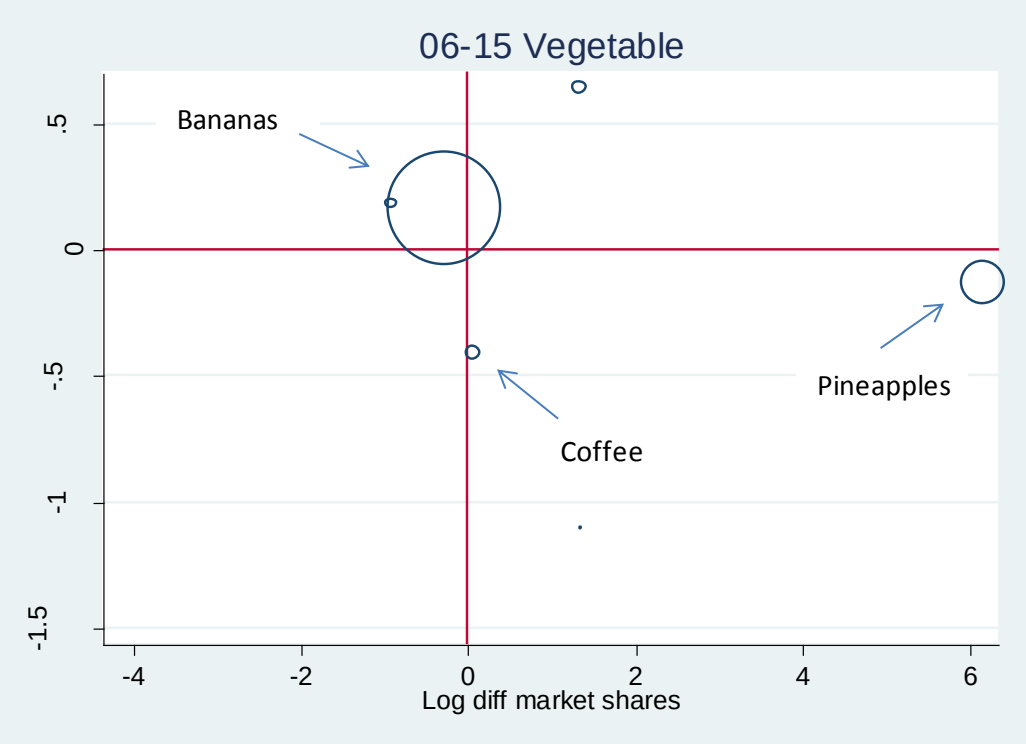
Figure A74 puts changes in the relative quality measure in relation to changes in market shares of Panama's exports to the EU.[105] The x-axis shows the growth rate of market share (log difference of market shares) between 1996-08 and 2006-08. The y-axis represents the growth rate of the average quality measure over the same period. Each circle represents a product, defined by an 8-digit Combined Nomenclature code, while its size represents the relative importance of each product in Panama's export basket in 2006-08.

We only focus on vegetable exports in Figure 81, as these made up 30 percent of Panama's exports to the EU in 2006-08. Bananas, the most important product over the period lost market share in the EU between 1996-98 and 2006-08, but slightly improved in relative quality.

[105] Because of data constraints, we cannot replicate the analysis for the US.

However, other vegetable products such as coffee and specially pineapples increased significantly its presence in the EU market but at a lower quality.

Figure A74. Change in Relative Quality and in Market Shares in the European Market (Based on Gross Exports)



Source: COMTRADE

Annex 2: Measuring export sophistication

Calculating export sophistication, denoted by EXPY, is a two-stage process. The first stage is to measure the income level associated with each product in the world, termed PRODY. The PRODY of a particular product is the GDP per capita of the typical country that exports that good. Typical GDP is calculated by weighting the GDP per capita of all countries exporting the good. The weight assigned to each country is based on revealed comparative advantage, defined as the share of its exports that comes from that good relative to the average country. The PRODY for a single product is calculated by weighting the GDP per capita of all countries exporting that product. Therefore, a product that typically makes up a large percentage of a poor country's export basket will have stronger weights towards poor countries' GDP per capita. This will be less the case for a product that makes up a small percentage of a poor country's exports but is a significant component of many rich countries' export baskets.

The second stage is to measure the income associated with a country's export basket as a whole; this is its EXPY. From the first step, each product that a country exports to will have a PRODY. The EXPY is calculated by weighting these PRODY by the share that each good contributes to total exports. If butter makes up 15 per cent of a country's exports, its PRODY will be given a weight of 0.15. Countries whose export baskets are made up of rich-country goods will have a higher EXPY, while export baskets made up of poor-country goods will have a lower EXPY.

$$PRODY_k = \sum_j \frac{\left(\frac{x_{jk}}{X_j}\right)}{\sum_j \frac{x_{jk}}{X_j}} Y_j \qquad \textit{and} \qquad EXPY_i = \sum_k \left(\frac{x_{ik}}{X_i}\right) PRODY_k$$

Annex 3: Measuring relative quality of exports using highly disaggregated trade data

We rely on the COMEXT database from EUROSTAT to characterize the relative unit values of imports in each EU member country. Following Schott (2004), unit values were calculated simply as the quotient of general imports values and quantities. Within any product (8-digit Combined Nomenclature code) for any given year, we then have a distribution of unit values of imports from the different source countries. For each good i and exporting country c in year t we generate a measure of relative quality R as:

$$R_{itc} = \frac{uv_{itc}}{uv_{it}^{90}}$$

where u_{itc} denotes the unit value of the good and u_{it}^{90} the value at the 90th percentile of the unit value distribution across countries for that product. R_{itc} is the relative quality of the country's exports of that good compared to other countries exporting the same good.

The 8-digit Combined Nomenclature code consists of 99 product categories which can be aggregated into the following 16 product groups: 01-05 Animal; 06-15 Vegetable; 16-24 Foodstuffs; 25-27 Minerals; 28-38 Chemicals; 39-40 Plastic/Rubber; 41-43 Hides, Skins; 44-49 Wood; 50-63 Textiles, Clothing; 64-67 Footwear; 68-71 Stone/Glass; 72-83 Metals; 84-85 Mach/Elec; 86-89 Transportation; 90-97 Miscellaneous; 98-99 Special.

Annex 4. Firm-level analysis supporting tables

Table A4.1: Survival rates in Central America

Survival rates of new exporters in Dominican Republic

Period	2003	2004	2005	2006	2007	2008	2009
1	36.80%	35.45%	31.82%	41.03%	29.34%	40.37%	32.77%
2	19.84%	19.56%	17.80%	22.47%	18.20%	25.46%	
3	13.52%	13.59%	11.67%	15.75%	13.35%		
4	10.49%	10.47%	9.49%	13.06%			
5	7.95%2	8.26%	8.23%				
6	6.56%	6.70%					
7	5.90%						

Survival rates of new exporters in Guatemala

Period	2003	2004	2005	2006	2007	2008	2009
1		40.73%	38.62%	45.43%	45.99%	35.77%	35.50%
2		28.13%	28.18%	32.94%	30.83%	23.69%	
3		23.19%	22.30%	24.83%	23.71%		
4		19.90%	17.97%	20.82%			
5		16.82%	15.38%				
6		14.46%					

Survival rates of new exporters in Nicaragua

Period	2003	2004	2005	2006	2007	2008	2009	2010
1	39.14%	43.38%	48.04%	45.82%	46.87%	45.69%	43.74%	42.78%
2	24.95%	29.72%	31.41%	29.12%	28.73%	29.31%	28.02%	
3	18.92%	20.82%	20.79%	19.57%	22.03%	19.61%		
4	14.84%	16.92%	16.40%	15.51%	17.93%			
5	12.26%	13.02%	14.32%	14.32%				
6	9.89%	11.71%	11.78%					
7	8.60%	9.76%						
8	7.31%							

Survival rates of new exporters in El Salvador

Period	2003	2004	2005	2006	2007	2008
1		36.14%	37.05%	43.49%	37.62%	37.06%
2		23.04%	23.48%	26.64%	24.86%	
3		17.97%	17.72%	19.47%		
4		14.44%	14.96%			
5		11.85%				

Figure A4.1. Extensive margin decomposition to the rest of the world

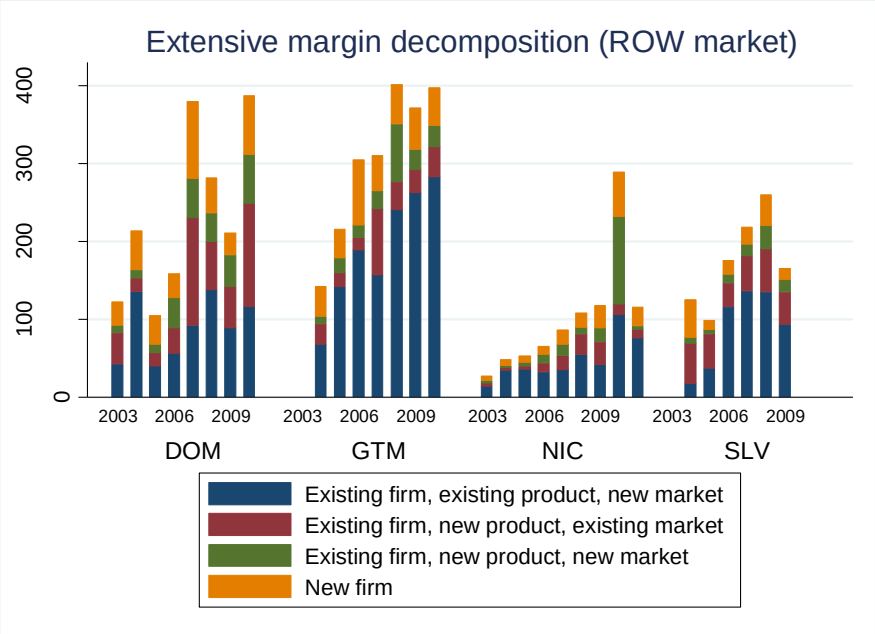
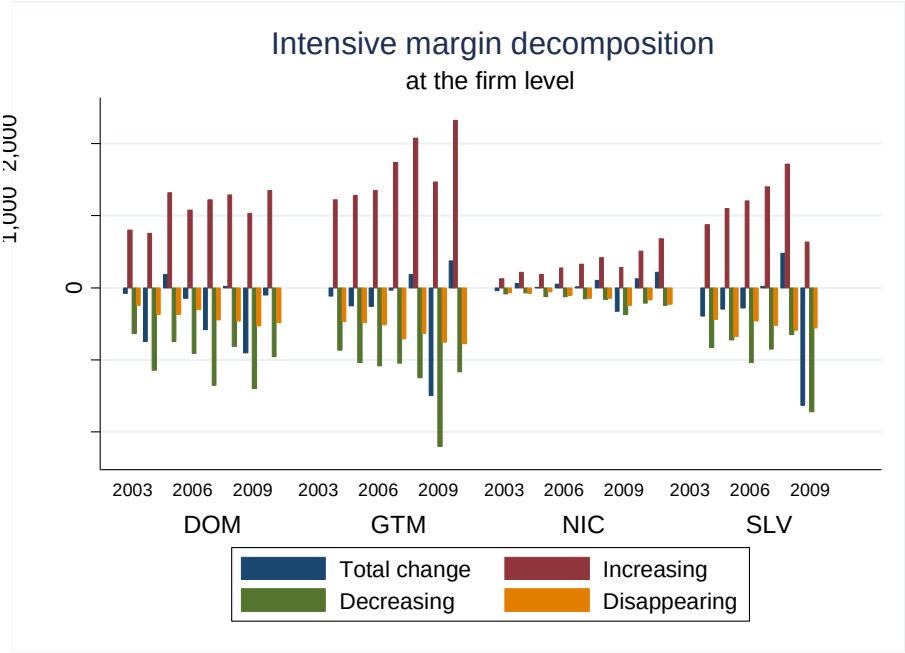


Figure A4.2. Intensive margin decomposition to the world



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