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Trade and Logistics in Central America

A Survey of Recent Analytical Work Sponsored by The World Bank[1]

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Central America's trade has increased significantly in the past decade, in great part as a result of strong efforts to reduce tariffs within the region, as well as improvements in market access due to the entry into force of important Free Trade Agreements. However, the growth of Central America's trade has not been as impressive from a global perspective and there is growing evidence that the gains from trade agreements and liberalization policies have been limited by transport and logistics barriers. Studies sponsored by The World Bank reveal that high domestic transportation costs, along with bottlenecks at land border crossings, continue to present large hurdles to intra and extra regional trade. Key factors that impede commerce include the lack of good-quality paved secondary roads, expensive trucking services, and lengthy border crossing procedures. Coordinated efforts to address these bottlenecks could help improve significantly the growth impacts of international trade in the region.

[1] The survey focuses on studies on trade, logistics and infrastructure developed since 2010 by World Bank staff and consultants listed at the end. The studies are available at www.worldbank.org/centralamerica and at www.bancomundial.org/centroamerica.

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Central America's Trade Policy: Some Context

Central America has put international trade at the center of its development agenda in recent years. In the past decade, the region has witnessed the successful conclusion of negotiations for a significant number of free trade agreements (FTAs), aimed at reducing duties and barriers to trade, as well as creating rules and conditions to increase investment, including from abroad. Some of these FTAs have taken the form of bilateral agreements (for example, Costa Rica with Canada, Chile, Mexico, Panama, China, and Singapore; Honduras with Mexico, Nicaragua with Mexico and Chile), whereas others have been negotiated as a block. These include the historic Dominican Republic–Central America Free Trade Agreement (DR-CAFTA) between Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and the Dominican Republic with the United States and, more recently, the Association Agreement of the CA-6 (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama) with the European Union. The push for FTAs has also been associated with major advances in the reduction of tariff barriers within Central America, as the region has gradually made progress towards the target of creating a Customs Union that would offer investors an enlarged regional market in addition to broad access to markets beyond the region.

The signing of FTAs is not the end of the road, but rather the opening of new opportunities that requires complementary actions. Trade agreements create possibilities for greater commerce and investment but do not guarantee results. This was an important conclusion of two World Bank studies, one prepared to look at the potential future benefits of DR-CAFTA for the region (Jaramillo and Lederman, 2005) and the second to assess early results (Lopez and Shankar, 2011). Indeed, the benefits associated with trade agreements can be improved if actions are taken to improve the quality of institutions, human capital, infrastructure, and the process of technological upgrading. In other words, countries can get the most out of FTAs by improving the policy and institutional environment that provides favorable conditions for the production and distribution of goods and services as well as for strengthening the investment climate.

Assessing Trade Policy Results: Trade Expanding -- but Achieving Potential?

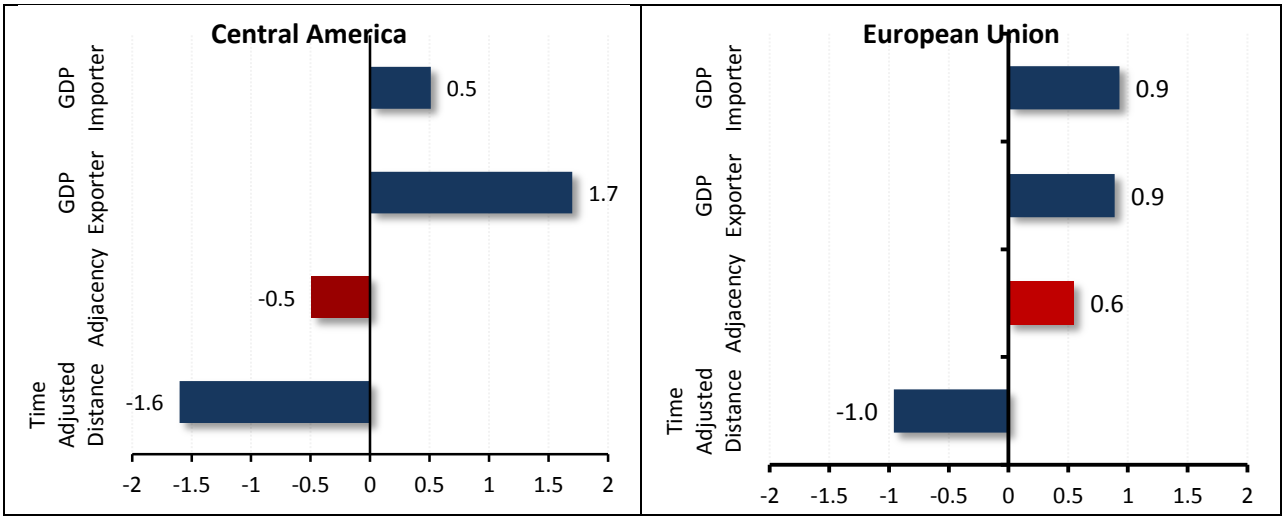
Central America's trade has expanded significantly since the early 2000s. As a result of this dynamism, trade openness for the region (i.e., exports and imports as a share of GDP) increased by nearly 8 percentage points between 2000 and 2011. Intra-regional trade (e.g., between Central American countries) has grown faster than commerce with non-regional partners. The Central America region has now become the second largest export market for most countries of the region, averaging 26 percent of total exports by 2011, up from 23 percent in 2000.

However, the growth of Central America's trade has not been as impressive from a global perspective. Despite the achievements cited above, the growth of commerce has not matched that of many other countries and regions. This is demonstrated by the region's declining share of global trade, which has gone from 0.36 percent in 2000 to about 0.30 percent in 2011. In addition, evidence based on key predictors of improvements in productivity and benefits of trade reveal disappointing results. Diversification indicators suggest that neither the number of

products exported nor the number of markets served have changed significantly. Tariff reductions seemed to have a positive but very small effect on the number of new exporters as well as on the behavior of incumbent firms (Molina, Bussolo, & Iacovone, 2011). These findings may be suggesting that barriers that remain to be tackled have limited the potential gains to be made from trade agreements and liberalization policies.

While traditionally trade tends to be boosted by proximity, the presence of a border between two Central American countries can represent a burden rather than an advantage for trade. In most of the world, trade between neighboring countries tends to be higher than that predicted by distance and income drivers. However, Marcelo, Stokenberga, and Schwartz (2010) found that in Central America, adjacency (e.g., sharing a border) has a negative impact on the amount of goods and services exchange by countries (Figure 1). This is likely due to infrastructural deficiencies, time consuming procedures and border congestion that create bottlenecks to trade, even for short distances. This is further suggestive evidence that there continue to be significant barriers to trade within Central America, despite the significant tariff reductions achieved in recent years.

Figure 1: Elasticity of Bilateral Trade with Respect to Select Drivers



Source: Marcelo, Stokenberga, and Schwartz (2010)

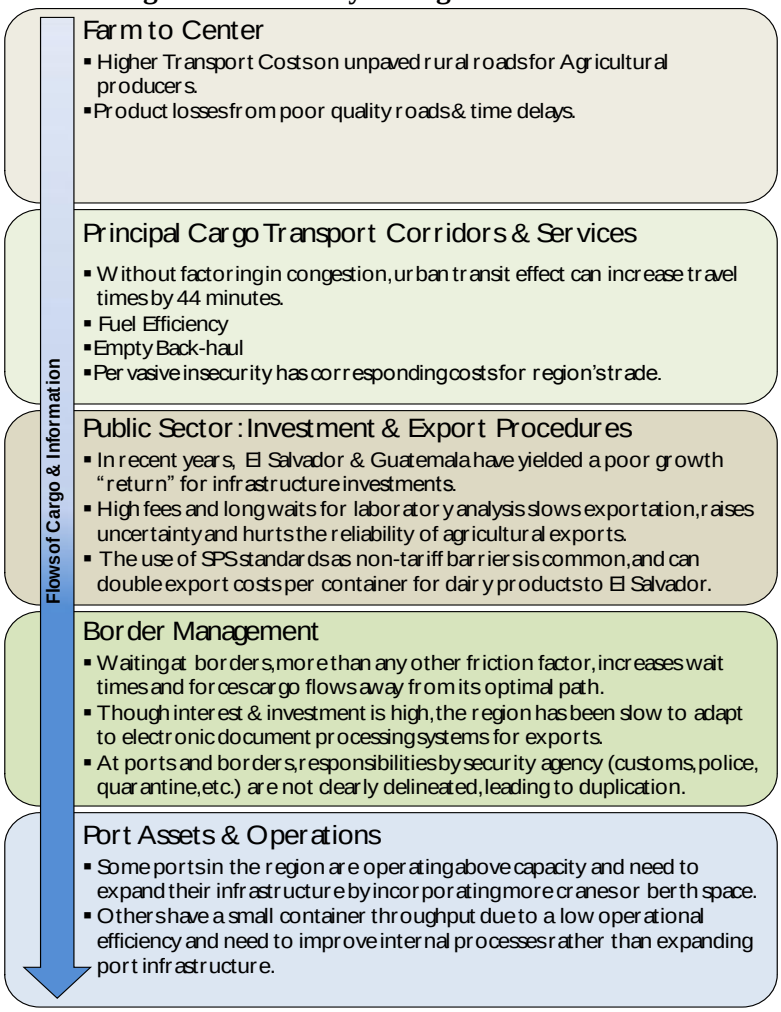
The Impact of Transport and Logistics on Trade

Transport and logistics costs create major structural bottlenecks to trade competitiveness in Central America. Regional studies on the share of logistics costs in the final price of goods reveal that they represent a greater barrier to trade than import tariffs, particularly at a time when formal tariffs have been lowered substantially. While ad valorem tariffs for food imports range from 3 to 12 percent of product value, transport and logistics costs, in contrast, measured by the international maritime and road haulage components alone, can total more than 20 percent of the free-on-board value of goods (Lopez & Shankar, 2011). In addition, evidence from detailed supply chain analyses indicates that transport and logistics costs are a higher burden for small

firms, putting them at a disadvantage vis-à-vis larger firms in benefitting from trade opportunities.

The World Bank has sponsored a number of studies since 2010 aimed at understanding key logistical barriers, quantifying associated costs, and pinpointing areas for potential policy action. By combining supply chain analysis for different goods and routes in the region with a more in depth analysis of different logistics and transport segments, analysts identified challenges to trade inside and outside the region. Figure 2 summarizes some of the findings from the studies.

Figure 2: Summary of Logistics Bottlenecks



Source: Schwartz (2012)

A key finding that emerges from several of the studies is that high domestic transportation costs, along with bottlenecks at land border crossings, present the biggest hurdles to both intra and extra regional trade. The lack of good-quality paved secondary roads, especially for linking farms with cities, impedes intraregional commerce notwithstanding the relatively good condition of the major transit arteries. Trucking services are also expensive for international standards, partially due to high rates of empty backhauls and fuel cost. Once the product reaches

the border, lack of adequate risk management systems, border infrastructure, and the harmonization of SPS standards and procedures lead to wait times that can almost double total time spent in transit. Coordinated efforts to address these bottlenecks could help improve significantly the growth impacts of international trade in the region.

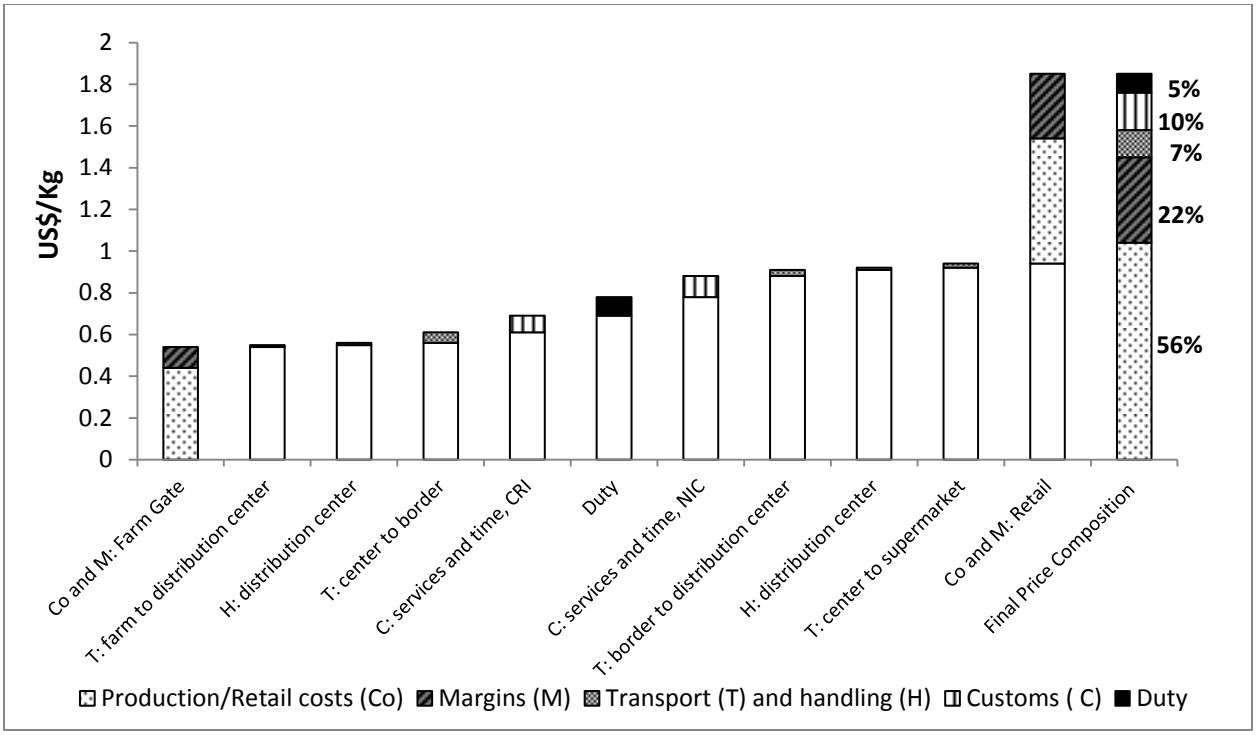
The remainder of this note summarizes key aspects of the relevant studies on logistic and related issues in Central America sponsored by the World Bank. First, it discusses the overall logistics cost and time effects as obstacles to trade in the region. Then, it identifies bottlenecks at each segment of the logistic chain. Lastly, final remarks discuss policy options and efforts that could address these bottlenecks and catalyze the gains from intra and extra regional trade.

Logistics Costs in Central America

Overall logistic costs can add to more than 50 percent of the final price of goods traded in Central America, affecting both imports and exports. In order to identify potential logistics bottleneck and assess impacts of this bottleneck into costs and prices, the studies by Fernández, Gómez, Souza, and Vega (2011) and Fries (2012) presented analyses of 12 supply chains, which track specific goods from their production address until their delivery to final consumption markets[3]. The analyses consider high and low value agro-products, following different intra and extra regional routes and destinations. Studied cases included the Costa Rica's exports of tomatoes to Nicaragua, U.S. exports of rice, wheat, and corn to Nicaragua and Honduras, pineapple Exports to Europe from Costa Rica, frozen ground beef exports from Nicaragua to the U.S., and snow peas from Guatemala to the U.S. Total logistic costs can range from 11 percent for higher value goods such as beef exported by Nicaragua, to 52 percent. Figure 3 presents the cost decomposition for tomato exports from Costa Rica.

Figure 3: Costs faced by a large Costa Rican tomato producer exporting to Nicaragua

[3] (Hynes, Varada, Kim, DAI Consulting, & Haven, 2012) analyzes other supply and value chains for the Central America.



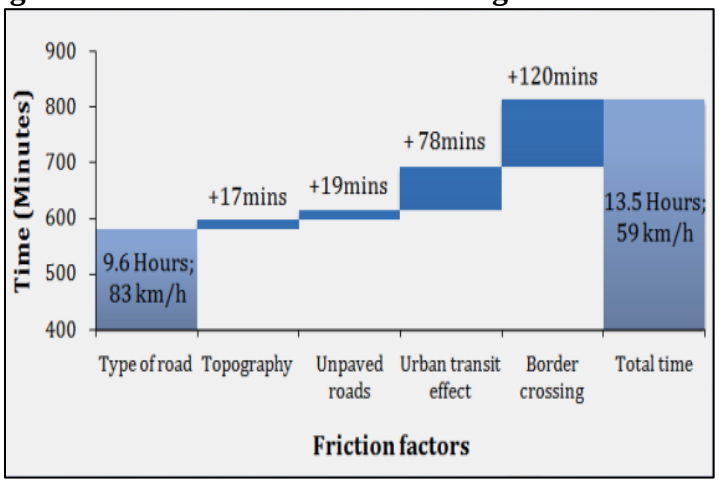
Source: Fernández, Gómez, Souza, & Vega (2011)

In the case of Tomato exports from Costa Rica to Nicaragua, for example, logistic cost vary from 22 percent of the final price for large producers to up to 41 percent for small producers. Transportation costs are the main factor explaining this difference in costs, ranging from 7 percent for large to 23 percent for small producers. Small producers pay 3 times more to bring the product from farm gate to the border and spend five times more and handling, reflecting poor quality of roads, larger distance and scale issues. Customs is the second most important element of logistics costs. At approximately 10 percent of the final price, customs reflect service fees for both countries and loss due to waiting time. In a congested day can be up to 10 hours to crossing the border. Finally, duties account for around 5 percent of final prices and reflect tariffs and procedures involved in the export process. In the case of a perishable good, such as tomato, phytosanitary (SPS) procedures must take place in both countries.

In addition to monetary costs, logistics bottlenecks can significantly affect the overall transit time and, as a consequence, the quality of the delivered good. Using geo-referencing, it is possible to identify the optimal route to transport goods from production center to ports or regional markets, taking into account the existing infrastructure and geographic characteristics. This optimal path analysis can identify the extra-time generated by different logistics bottlenecks. For the 5 Central American routes studied, logistics bottlenecks can increase between 21 percent (Panama) and 60 percent (Nicaragua and El Salvador) the time it takes to go from a production center to the closest Atlantic port. Figure 4 illustrate the path between Nueva Guinea (Nicaragua) and Puerto Limón. Only taking into consideration the road infrastructure and topography, this route is expect to be completed in approximately 10 hours. Poor road quality, detour caused by the poor quality of bridges, and urban traffic add an hour and 40 minutes to the route. Finally, waiting time on the border adds no less than two additional hours, bringing the total travel time to 13 hours and 30 minutes. For goods exported outside the region, extra time

may affect the ability to connect with shipping transportation; for intraregional trade, delays can affect quality, especially for perishable goods.

Figure 4: Extra time associate with logistics bottlenecks



Source: Marcelo (2012)

From the firm gate to consumers: Transport and Logistics Step-by-step

As briefly discussed, there are important underlying factors contributing to costs and delays in each step of the logistics chain. Issues such a quality of existing infrastructure, transport services, customs efficiency, and harmonization and standardization of procedures can have a direct impact in the cost of moving goods inside the region. At the same time port performance, efficiency and connectivity help determine the costs of trading outside the region. This section briefly discusses main lessons about the region performance at each step of the logistics chain.

Step 1: From firms to distribution centers

Poor quality of second and rural roads is identified as a major challenge for agro-producers in all countries in the region, with a larger impact on small producers. The lack of good-quality paved roads linking farms with cities impedes intraregional commerce notwithstanding the relatively good condition of the major transit arteries. In fact, paved roads represent less than a third of regional road network. The poor road quality, in turn, causes direct losses from delays in shipments, breakage, losses in weight (cattle) and quality (perishable goods), of 8 to 12 percent of the sales value. Small producers are particularly affected by rural road quality. As illustrate in Figure 5, on average small cattle producers travel longer distance to reach distribution centers, spending almost 3 times more in transport expenses.

Figure 5: Large vs. Small: Logistics Expenses for Cattle Ranchers

Logistics Expenses from the Farm Gate to the Slaughterhouse Nicaraguan Beef Export Chain		
Large Producer		**Small Producer**
35 paved km	Distance to Slaughterhouse	144 km, most unpaved
$4/animal	Transport Expenses	$14/animal
Low	Probability of Injury	High
>2.5%	Loss of Carcass Weight in Transit	<5%
About 30 hours	Total Time from Departure to Slaughter	Up to 3.5 days
US$2.84	Farmer's Received Price per kg of Meat on the Canal	US$2.76
US$0.15	**Total Logistics Burden per kg**	**US$0.32**

Source: Fries (2012)

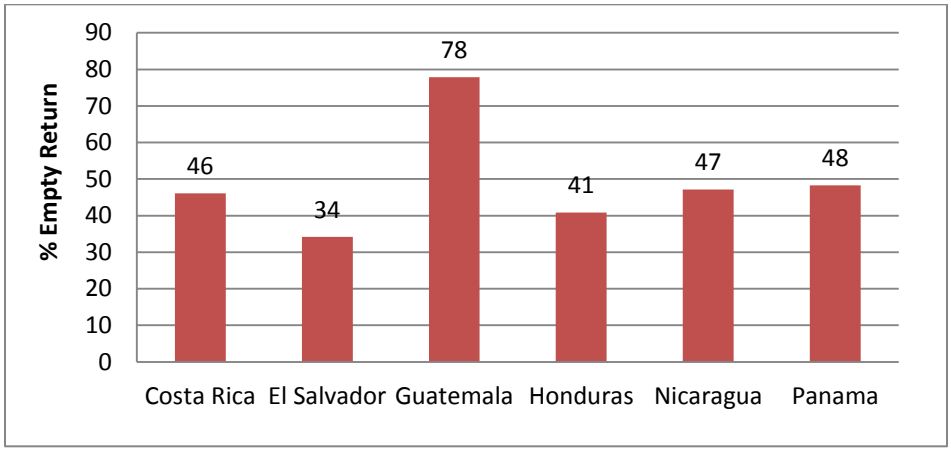
In this context, increasing producers' access to processing and distribution center can generate both economic and distributional gains. Farmers' access to processing centers and markets can be improved by building, improving, and maintaining rural roads in strategic areas, with attention to cost-effective and sustainable alternatives to asphalt. Another option involves shortening the distance between farms and refrigerated storage facilities, distribution or processing centers by facilitating and providing incentives for the construction of small storage centers in rural production zones.

Step 2: From distribution centers to regional destinations (markets or ports)

Transport services have a major impact on costs in this logistic segment. While the overall road infrastructure is modest compared to the developed countries, the main corridors are well designed and maintained. Transport services on the other hand, present important bottlenecks that drive cost up. On average, transport services costs in Central America are higher than in other LAC countries such as Chile and Brazil. High fuel costs, security costs, and low utilizations rates contribute to this result.

Backhaul practices are pivotal in explaining differences in prices, as truck companies compensate for the expenses of the empty backhaul by charging higher prices in the first leg of the trip. Empty backhauls are particularly high in Guatemala, where 78 percent of truck trips are returning empty. Apart from market failures which contribute to empty backhauls, there are also government inefficiencies at play. While regional agreements grant traffic rights to truckers, permitting them to transport cargo within the region, there are some restrictions. For instance, the regional regulation includes a domestic cargo reservation, where local companies are granted an exclusive right to transport cargo with domestic origin and destination. In addition, foreign trucking firms are often not permitted to pick up cargo from foreign free trade zones. Finally, trucking firms claim to be discouraged from long waiting time at border crossings as a main reason for returning empty on cross border trips (returning empty would allow them to cross the border much faster). Thus it appears that empty backhaul is influenced by both market and government inefficiencies. Therefore, improving information sharing and coordination among transport firms and clients in other countries, as well as relaxing restrictions to cargo pick would help lower services prices.

Figure 6: Empty backhauls comprise a large share of return trips (Sep, 2011 to Mar, 2012)

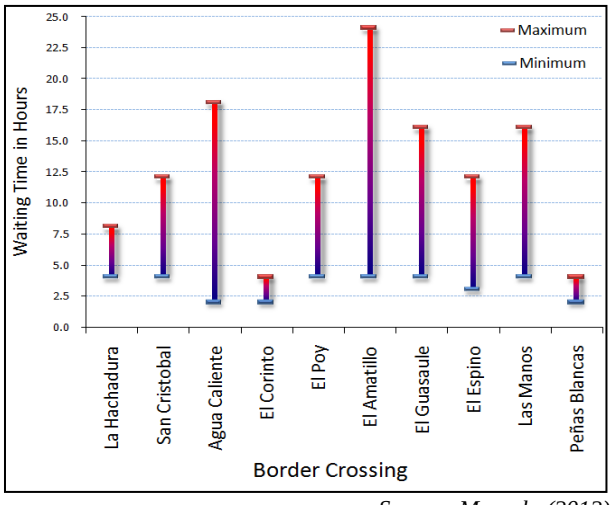


Source: Pachón, Araya, and Saslavsky. (2012)

Step 3: Borders, Customs and Export Procedures

Border crossing and related procedures are not only costly, but a source of uncertainty. Therefore, coordinated policy actions in this area can bring larger gains. Waiting times at border crossings vary widely within Central America, within each country, and even within bi-national borders. Trucks can wait up to 20 hours to cross the border, which is especially costly for those carrying perishable goods (Figure 8). Long and unpredictable waiting times at border crossings are mostly a result of the lack of coordination and inefficient processes and procedures of border agencies, as well as limited equipment and infrastructure. For instance, the lack of a single window and inconsistencies in hours of operations among border agencies and brokers often cause delays. Uncoordinated SPS procedures are often burdensome. For example, to trade fresh tomatoes, it takes at least 3 hours to go through customs, phytosanitary, and narcotics inspections on the Costa Rican side of the border. On the Nicaraguan side, waiting time can equal five hours to re-do the same inspections and procedures.

Figure 7: Border Crossings Times in Central America (February to March 2012)



Source: Marcelo (2012)

Central American integration efforts have helped alleviate border crossing barriers, but challenges remain. There has been progress in the process of Central America's regional trade integration, though this progress has been uneven. On the positive side of the ledger, products today flow freely among Central American countries for 95 percent of all tariff lines, a common customs regulatory framework has been adopted, and there is electronic exchange of customs information for trucks on transit. However, given the long history of regional integration since the 1960s, the achievements may seem less noteworthy. A conscious choice of allowing countries to move at different speeds was made in the 1990s (following the end of civil wars in many countries), which helps to explain the unevenness in the advances seen. While most tariff lines have been harmonized, the products that remain to be treated equally by all countries are all highly sensitive and progress is slow. Country-specific SPS requirements are not aligned and the customs regulatory frameworks of countries are still in place and sometimes clash with the regional framework. In addition, the institutional framework created in the 1990s has been relatively weak and unable to deliver on the many mandates to further trade (Mayora de Gavidia, 2011). Overall, Central America still faces a challenging agenda for integration.

Despite recent improvements, customs performance still represents an obstacle to trade in some countries in the region, while lack of coordination and harmonization is a challenge for all. According to the World Bank Doing Business database, the total time used to prepared documents and meet customs requirements ranges from 5 days in Panama to almost 16 days in Honduras, which is high for international standards. The customs assessment trade toolkit (CATT) helps shed a light on different aspects of customs performance in the region (Fanta, 2013). While most customs in the region perform at around 50 percent of the best practices, challenges and strength vary from country to country. For example, Nicaragua customs scores relatively well with respect to its core customs strategy, but they underperform in trade facilitation. Costa Rica, on the other hand performs well with respect to transparency of procedures, but weakly with respect to its modernization strategy. El Salvador, the top performer in the region, is close to best practices in terms of process orientation, but still lags behind in facilitation. In addition to individual shortcomings, coordination and harmonization of customs and trade procedures is a challenge faced by all countries in the region. In particular, regional initiatives for trade integration could proactively address the use of SPS measures as non-tariff barriers to trade.

Box 1: Customs Assessment Trade Toolkit (CATT)

CATT is an integrated monitoring tool for measuring Customs performance over time. It assesses relative strengths and weaknesses of a Country's Customs administration compared to good practices, recommend reforms and re-assess performance. CATT considers 120 indicators (including, regulation and norms, financial, human resources, IT, planning) over seven dimensions:

1. **Process Orientation:** Measures quality of processes, regulations, procedures and documentation.
2. **Strategic Thinking:** Measures existence of innovation core strategies master plan, and a modernization program.
3. **Control:** Measures compliance with regulations and risk management.
4. **Efficiency:** Measures whether results are achieved with minimum cost, excise taxes effectively, process declarations and customs procedure quickly.
5. **Effectiveness:** Measures the quality of the organization.
6. **Facilitation:** Measures whether operations are easy and simple for customers and trade operators.

7. **Transparency:** Measures access to information held by customs.

In Central America, Costa Rica, Nicaragua, and El Salvador have undergone the assessment and are currently implementing recommendations. Guatemala and Honduras are expected to undergo the soon.

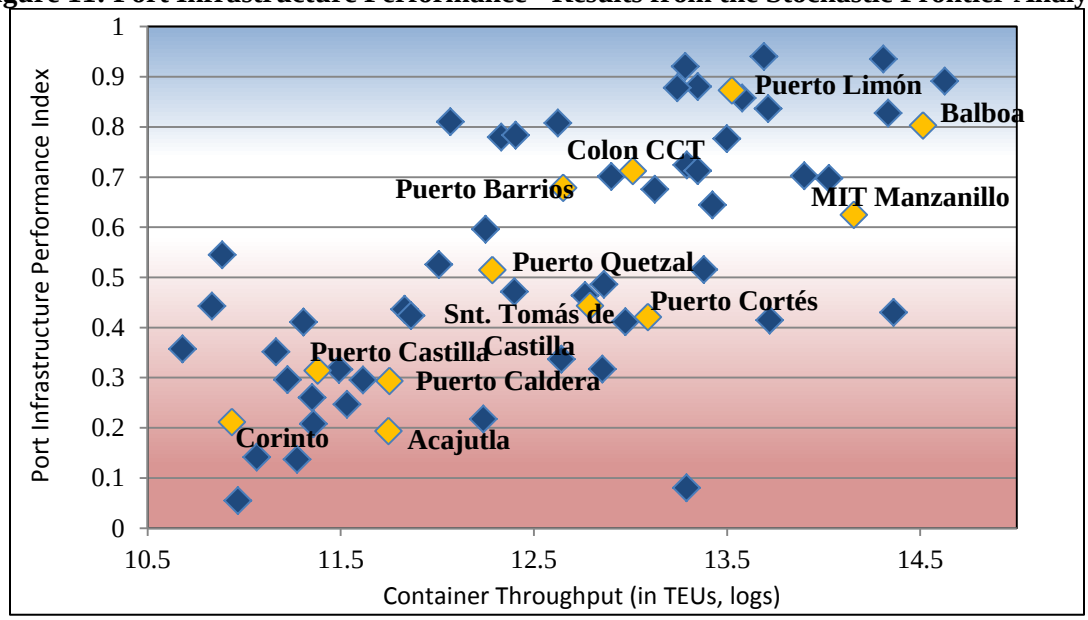
Step 4: From Central America to the World

Maritime transportation is the primary mean to export goods from Central America to the rest of the world and have direct implications for regional competitiveness. The Central American region has 12 relatively large container ports on the Atlantic and Pacific coasts. Out of these, four are in Panama, three in Guatemala, two in Costa Rica and only one in each of the remaining countries.[4] Due to the region's strategic location, with easy access to the main international maritime routes, and to the significant growth of containerization in recent years, an improvement in operational efficiency and infrastructure has become a priority in face of an increasingly higher demand for maritime shipping and thus port services.

Many of the region's container ports must improve operational efficiency in order to attract larger cargo volumes, while others need to expand their infrastructure stock. Figure 11 identifies, in the blue zone, the ports that will soon reach (or have already reached) their physical capacity, and therefore require an infrastructure expansion. In turn, the ports in the red zone are likely to be underutilizing their stock of assets, and therefore would need to improve their operational efficiency in order to increase throughput. Of the region's main container ports, Puerto Limón-Moin in Costa Rica urgently requires an expansion of its physical capacity, a need that is being addressed by the new container terminal currently under construction. On the other hand, many principal ports, including Puerto Corinto-NIC, Puerto Acajutla-SLV and Puerto Cortés-HON are underutilizing their present infrastructure endowment and there is room to scale up operations. Improving port performance and border efficiency can help directing cargo to underutilized ports.

[4] Considers ports with an annual throughput over 50,000 TEUS. Those ports are, from the largest to the smallest in 2010, PPC Balboa (PAN), MIT Manzanillo (PAN), Limón (CRI), PPC Cristóbal (PAN), Cortés (HND), Colón CCT (PAN), Santo Tomás de Castilla (GUA), Barrios (Guatemala), Quetzal (GUA), Caldera (CRI), Acajutla (SLV), Corinto (NIC).

Figure 11: Port Infrastructure Performance - Results from the Stochastic Frontier Analysis



Source: Schwartz (2012)

The absence or scarcity of container cranes and other equipment further hinders port performance. Results show that the gains in productivity from the use of ship-to-shore container cranes are the largest. Excluding Panama, there are only four container cranes in the other five countries combined, thus creating a big dependence on the less efficient ships' gear. Corinto, Acajutla and Limón are known for having limited cranes available, leading to a slower container movement and thus contributing to higher ship delays. The latter two have estimated ship delay times of 5 and 18 hours, respectively, much higher than the region's average. Poor technical capacity of port operators has been also associated with inefficiencies. Delays leading to missed boats are passed on by the shipping companies to the exporters in late charges that have been estimated at around $125 to $150 per day. Port management models throughout the region should be revisited and modernized, encouraging private sector investment and operations. This will help with optimal investments in the improvement of operational efficiency, expansion of equipment and infrastructure stock.

Concluding Remarks

While logistic bottlenecks impact costs in all segments, border crossing procedures and road quality seem to have the largest impacts on competitiveness in Central America, particularly among small producers. With respect to border crossings, direct costs associated with border procedures can add up to 12 percent of the final price of a product. Import/export processes at the border can delay by days the movement of traded goods, with implication for product quality and value, trucking service costs, and ports utilization capacities. Border crossing costs are driven by country specific factors, such as customs efficiency and capacity, and border infrastructure, as well as regional challenges, such as lack of information, coordination, and harmonization in rules, control mechanisms, sanitary procedures, and border schedules. With respect to road quality, secondary roads linking farmers to the cities is the key driver of transportation costs, particularly for small producers and exporters – who may be barred from the

opportunities of trade integration if this problem is left unaddressed. Finally, Central America has high trucking services costs, in part due to very high rates of empty backhaul. Aligning transport services regulation across the region and improving information system could lower land transportation costs for all.

Coordinated efforts to address logistics bottlenecks are likely to yield high economic and social returns in Central America. Most of the measures required are unlikely to require significant fiscal costs, particularly those that would simplify and facilitate border crossings. However, they require a willingness to join forces across countries to address the key issues in a concentrated fashion. A collaborative effort between the private and public sectors would be needed to ensure changes address the day-to-day barriers faced on the ground.

This note is based on a body of analytical work on Trade and Logistic in Central America developed by the World Bank, which includes the following reports available at www.worldbank.org/centralamerica and at www.bancomundial.org/centroamerica:

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