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Regional Integration Behind the Border – Applying a value chain approach

Grant Aldonas

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Abstract

This paper outlines a methodology for assessing the cost of internal and external obstacles affecting the performance of the value chains serving local producers in developing countries as a means of identifying high impact interventions that would contribute to the country’s successful integration into regional and global markets. The objective is to create a single measure of the effect of such barriers in order to illustrate the value of examining internal reforms (i.e., those steps essential to regional integration “behind the border”) as well as export barriers in developing a regional integration strategy that makes sense in the context of the accelerating integration of global markets.

The methodology employed uses tools applied by global firms in assessing their own operations and in making critical sourcing decisions. That methodology starts with a map of both physical and institutional geography – one that identifies the various steps in the value chain that affect costs. The value chain map allows the gathering of data either over time or across industries that would allow the application of basic econometric techniques to create a common measure of the various obstacles encountered in the value chain. The ability to create that common measure is key to using the methodology to set priorities by illuminating where policy interventions would have the greatest impact in improving the overall efficiency of the value chain.

Decisions on potential reforms can then be focused on actions with the greatest cost-effectiveness in terms of potential to spur trade and contribute to increased national income. For businesses looking for government action, the methodology likewise provides a readily understood tool to use in pushing for reforms—and quantifying the potential gains from policy action as part of a regional integration strategy that looks behind the border.

I. Introduction

Globalization has fundamentally altered the conduct of international trade, the organization of production, and the basis of international commercial competition. Trade, once characterized by arm’s length transactions between independent buyers and sellers in different countries, is now driven by and takes place within the companies operating on a global basis or within the broader reach of their supply chains. For individual firms, their
ability to add value as a part of such supply chains determines their success and their survival.

The accelerating integration of world markets allows global firms to organize production on a globally-efficient basis. Operating a global supply chain has now become a competitive necessity. These changes have altered the structure of global enterprises. Rather than operating as single vertically-integrated multi-national firms located in one country largely exporting goods produced almost entirely in its home market, global firms increasingly organize themselves on a horizontal basis, serving as the hub of a network of suppliers located in a number of different countries.

In effect, globalization has softened the boundaries of these enterprises. These enterprises operate more as an economic eco-system than as a simple linear sequence of steps in a production process. The interaction among the various stakeholders in this eco-system is thicker and more frequent than a linear representation of a conventional supply chain conveys.

As the hub of the network of suppliers, the global firm mobilizes the capital, talent and ideas needed to produce the goods or services for a global market. It also coordinates the interaction among the various suppliers in the product’s value chain needed to produce a final product for consumer sale – from research and development to design and manufacturing all the way through to distribution, retail sales and after-sales service. Only the few industries – and fewer every day – whose output is physically untradeable are exempt from these forces.

Organizing production on a global basis offers to such enterprises economies of scale and efficiencies that make them cost competitive in virtually any market. They are, as a result, driving the cost efficiencies that deliver the benefits of globalization to consumers’ doorsteps around the world. They also compel their competitors to go global in order to compete.

These global networks of suppliers have become the new basis for global competition among firms. Successful management of a global supply chain has become “a defining source of value generation” for the globally-engaged firm. By the same token, the lack thereof becomes a critical liability. In the process, these global supply chains increasingly dominate much of global trade. They have, in effect, become the market.

This dynamic has deep implications for both regional integration and development. It is difficult to point to a development success that has not relied heavily on its access to export markets as one of the principal ways of both raising incomes and driving change. Indeed, regional integration strategies adopted in both Latin America and Asia have largely been designed with that objective in mind.

To the extent that the dynamic unfolding in global markets redefines the terms of “market access,” regional integration strategies designed to help member countries reach global markets have to adjust as well. In this new environment, market access depends not
only on the ability to be productive and competitive in specific activities, but also on the
ability to link effectively with other suppliers in a global chain.

A sound regional integration strategy must facilitate that linkage – it must provide a
policy environment that encourages the economic eco-system essential to local firms’
participation in such global supply chains. This remarkable shift in the industrial organization
should lead us to ask whether the conventional perspective on regional integration and trade
policy fully captures the unfolding dynamic in global markets. The answer is that they do
not and that the unfolding changes in global markets will require a different approach to
regional integration that takes the new competitive dynamic into account.

From a development perspective, the rapid integration of markets globally and the
rising dominance of world trade by competing supply chains requires us to think of trade
and development as a single process that connects individuals to markets – at first locally
and regionally, but eventually on a global basis. Thinking in terms of development solely
within a developing country makes less sense in light of the globalization of the world
economy, particularly when a developing country’s economic competitiveness and standard
of living may be eroding by virtue of its lack of engagement in the broader world economy.

The increasing share of world trade dominated by global supply chains should also
lead us to consider how policymakers could best make use of the same tools used by
globally-engaged firms to think about their own operations. That is particularly important
with respect to their sourcing decisions and how they connect producers in developing
countries to global markets. The challenge that presents is how to use those tools in a way
that would inform the judgment of policy-makers in developing countries, as well as
international financial institutions like the Inter-American Development Bank (“IDB”), the
Asian Development Bank (“ADB”) and development assistance agencies, on the priorities
the country might wish to address as part of a regional integration strategy.

The following discussion outlines an analytical approach to address this challenge. It
reviews the tools used by global business in analyzing their own operations and how those
tools might be applied to the challenge of building a stronger regional platform from which
local producers can compete in global markets.

II. Analytical Approach

The analytical approach suggested here applies the tool most commonly used by
global businesses in making their own strategic decisions about sourcing – a value chain
map. Global businesses use such maps to identify each step in the process of producing and
marketing their goods and services on world markets in order to assess how to reduce costs
at every stage.

The same tool, however, can also be used to identify the internal and external barriers limiting the ability of a country or region’s producers to participate in such value
chains. Conventionally, trade policy and regional integration strategies have focused on
barriers to exports (i.e., those obstacles that hinder the export of goods and services to particular markets). By the same token, the conventional approach to removing those barriers involves trade negotiations, either within a multilateral forum such as the World Trade Organization or in regional or bilateral trade arrangements.

In today’s global markets, however, market access is defined less by conventional tariff and non-tariff measures. It will, instead, depend on the ability of local producers to meet the commercial standards of global buyers and integrate their business processes with those of the buyer and the other suppliers in the buyer’s value chain.

The first step in the analytical approach involves mapping the value chain to identify costs and weaknesses that undercut the competitiveness of local firms or inhibit their efficient integration into the web of suppliers and customers along the value chain. The reason for this step flows directly from the perspective of the globally-engaged firms that manage the value chain and make its sourcing decisions. Those firms have a compelling interest in managing the cost side of their businesses to remain competitive in world markets.

At each step in a value chain, a producer purchases inputs and then adds value. The producer’s value-added becomes part of the cost of the next stage of production. The eventual price to the consumer is the sum of the value added by everyone in the supply chain, including the requisite return on capital demanded by investors in each producer (i.e., profit) at each stage of production. Firms examine each stage in the production process to determine how they can lower costs and raise quality by working with existing suppliers or seeking alternative sources of supply.

Seen in that light, the focus of global firms on mapping the barriers that might impede connecting potential suppliers to their network of suppliers is critical due to the impact it has on costs at each stage of production and the delay and uncertainty such barriers can create for production throughout the entire value chain. In that sense, the value chain map not only holds the key to the globally-engaged firm’s profitability, but also defines the parameters that their suppliers must meet in order to participate as part of a network of suppliers.

In essence, the map helps explain why, even when informational barriers are overcome, trade opportunities are often unavailable to entrepreneurs that face hurdles in bringing their goods to market. These barriers are adding cost to the globally-engaged firm’s supply chain. To be competitive, and able to host the firms that successfully interact in one segment of the value chain, a country must have both productive conditions and available inputs that allow the activities within each stage of production to be done profitably, and a business climate that allows the links between successive stages to be efficient, cheap and safe.

Applied to the question of regional integration, the value chain map would perform a similar function. It would help identify the barriers, whether internal or external, that hinder the ability of regional producers to become a part of global value chains serving external
markets. Significantly, the barriers can lie within the links of the value chain, in which case the local firms must invest in process improvements that will allow them to integrate successfully into such value chains. Alternatively, the barriers can lie between successive links in the value chain, relating less to the competitiveness of the individual local enterprise and more to the internal weaknesses in the business climate or to costs and delays in the process by which companies interact with international suppliers, service providers and end-customers.

The second step in the analytical framework involves using the value chain map to collect information on barriers affecting each stage of production by product within a country and within a region. That data is essential to the application of an econometric framework (described below) that would provide a single, consistent measure of effect of the barriers, whether internal or external, on the ability of local producers to integrate into the global value chains that would take their goods and services to world markets.

The needed information would include, for example, information on changes in the nature of the value chain of production over time (e.g., information regarding improvements in the efficiency of a port over time or data reflecting a decline in the quality of roads over time and the impact that has on time to market). This can then be added to data on trade flows over time, with the model predicting trade flows in a given year and the ups and downs of the trade barriers over time being used in the econometric application to assess the impact of such changes. If improvements in roads, for example, tend to occur at the same time as strong exports (after taking into account the “normal” influences of exports), this would suggest that road improvements are an important positive influence on trade flows.

In reality, it will be difficult at the outset to obtain such data on changes in barriers over time for the simple reason that the data might not have been kept in previous years for the trade barriers of most interest. Having said that, one of the benefits of adopting the analytical framework is precisely to begin the process of collecting data on what really matters in terms of sourcing decisions – something that conventional trade statistics alone do not do.

Another example of the type of data needed involves information on the value chain of production across items within a country. This would require data for only a single time period, but it would be information across several or a range of products. The empirical model could then be applied to gauge the extent to which higher-than-expected trade flows were associated with products that had relatively low barriers within their value chains.

The third step in the analytical framework involves the application of econometric measures to the data collected on obstacles at various stages of the value chain. Gravity equations are valuable as they help quantify the effect of barriers imposed on exports by transit cost and distance, and in a way reduce those barriers to a single measure that allows policymakers to assess where they might get the greatest return on investment in lowering the barriers to trade, whether internal or external, that inhibit access to global markets. Reducing the barriers to a common measure would also help inform the IDB’s or ADB’s
judgment, and that of development assistance agencies, in their efforts to work with local officials on their regional integration and development strategy.

Previous work done for the World Bank by Djankov, Freund and Pham takes a significant step in that direction, by introducing the impact of time spent in shipping, as opposed to shipping costs alone, as an element to consider. What we propose here goes further, by not only looking into costs, delays and risks related to international shipping in and out of the country, but also to the domestic barriers to the efficient operation of value chains. These barriers may have different impacts across sectors, and hence cross-industry. The empirical model could, as result, gauge the extent to which higher-than-expected trade flows were associated with products that had relatively low barriers within their value chains.

What that requires, in the first instance, is an empirical model that explains trade flows. Significantly, the focus here is on the ability of enterprises in a country or region to integrate into the global value chains that make up the global market, as opposed to a simpler measure of export competitiveness that might be examined for purposes of trade negotiations. That means that the model should address both imports and exports in order to assess the obstacles in the flow of components and other inputs to local producers as well as the flow of their finished work to be integrated into the global buyer’s value chain.

The framework suggested here is based on the well-understood gravity model, in which the volume of trade flows of particular types of items depends on the economic size of the trade partners, their physical distance and other measures of transportation costs, and political economy factors such as the existence of a bilateral or multilateral trade agreement or a common border. This provides the baseline onto which to add information about the value chain of production and barriers at different stages of the production process.

Intuitively, the model is used to predict what trade between two nations in a particular product “should be.” Additional information is then added on the particular type and magnitude of barriers affecting a product in order to gauge the impact of barriers, whether internal, at the border, or external on both inbound and outbound trade flows (imports and exports).

The output of the model is thus an estimate of the incremental impact of particular types of barriers on trade, where the barriers to be examined will depend on the available data. Once the model has been estimated, simulations can be carried out that show the quantitative impact on trade of policy reforms that remove or lessen particular barriers.

The model to be estimated can be represented as follows, whereas an example of the equation involved is of exports of an item from country A to country B:

\[
\text{Exports}_{AB} = \text{GDP}_A + \text{Population}_A + \text{Distance}_{AB} + \text{Remoteness}_A + \text{landlock}_A + \text{Time}_A + \varepsilon_{AB}
\]
In this stylized model, the dependent (left hand side) variable is the quantity (volume) of exports of the particular item. This depends on the gross domestic product (GDP) and population of the exporting country, A, the distance from country A to country B, a measure of the remoteness of country A in terms of its being physically isolated from global centers of economic gravity, an indicator as to whether country A is landlocked, and a measure of the Time it takes to move a product from the factory to the main port for exports from country A. As expected, bigger and richer countries tend to export more, while distance and remoteness from other countries and groups of countries tends to reduce exports, as does being landlocked. The coefficient on the last variable, Time, then indicates the impact in reducing exports of an additional day of transit from factor to port—that is, the cost of delay.

The model can be estimated using a variety of appropriate data. For example, data on exports of a common item can be collected for many countries to many destinations, and this cross-country variation used to isolate the impact of an additional delay of time on trade in that product on average across countries. The precise econometric specification would then be adapted to take into account the cross-country nature of the data—for example, by adding country-specific “dummy” variables to control for factors idiosyncratic to each nation; this provides for an apples-to-apples comparison of the data across disparate nations (some of which, for example, might export a lot of a particular item while others might export very little). The estimated impact coefficient on the effect of time on exports can then be used in conjunction with the actual days of delay for each country to calculate the trade-reducing impact on a country-by-country basis.

Alternately, data on exports and barriers facing a variety of products can be collected for a single country, whether in a single or small number of years, or if possible, over a period of time. Estimating on data for a single country then shows the impact of delays more narrowly-focused within that nation.

The key to estimate the model, regardless, is to have variation across at least one dimension—over time or across products. It could be quite difficult to gather the needed information on trade and transportation barriers over time, since detailed records might not, as yet, be available going backward in time. This suggests that a cross-product approach might be more fruitful, at least in the near term. Data would be needed on the steps and barriers involved in the value chain of production for a range of items; the impact of these barriers can then be assessed within a nation.

The methodology can be applied for both exports and imports and, of course, the exports from one nation are the imports to another. But, as highlighted above, understanding the competitive affects of the barriers to imports is just as important as barriers to exports in that import barriers can contribute significantly to the cost of local production.

The basic outline of this empirical methodology has been successfully used by the World Bank’s Doing Business project to estimate the impact on exports of additional days of delay in getting a good from the factory to its port of embarkation. Using data on trade
flows across 126 countries, the World Bank finds that each day on average that a product is delayed within a nation in its transit from factory to port reduces trade by one percent. This impact is statistically significant and quantitatively meaningful: each day of delay is as costly for trade as if the countries involved—the origin of the items and the destination—were an additional 70 km in distance. As expected, the impact of shipping delays is especially salient for time-sensitive products such as perishable agricultural items.

The results of the World Bank project suggest that developing nations could usefully focus on reducing barriers to trade that stand between products and markets—delays in getting goods to market matter for trade and thus for national income and well-being. This applies whether the barriers relate to exports or imports—delays matter whether they are between the importing vessels and consumer or between the domestic producer and potential export destinations in other nations.

Perhaps most significantly for purposes of the trade policy choices that countries in both Latin America and Asia are contemplating, the analysis outlined here will illustrate that the reduction in barriers behind the border are every bit as important, if not more important, as the elimination of conventional trade barriers (i.e., tariff and non-tariff measures in principal export markets) specific to the region’s exports.

### III. Case Study: Mapping the Peruvian Value Chain for Perishable Agricultural Products

In the work under way for the IDB, we constructed a value chain map based on existing literature regarding the perishable agricultural products industry and conducted interviews with a number of key participants in the Peruvian perishable products industry itself to detect the main links and the sources of the key inputs at each step of the process. We focused on perishable agricultural products for four reasons—

- Peru already has established a successful industry in the sector, particularly in the case of asparagus, which suggests that improving the efficiency of each step in the value chain could offer significant benefits, both to existing export crops like asparagus, but also to newer entrants such as avocados;

- By their nature, the products are sensitive to any delays introduced into their production, harvest, processing, shipping and distribution, which reduces the competitiveness of Peruvian agricultural products in global markets. Therefore, the innovative contribution of a value-chain approach – one that looks between production stages and to inter-related processes, rather than thinking of each firm as acting in isolation – is particularly relevant in this sector;

- Reducing barriers to production, distribution and sale of perishable products offers a way to generate significantly higher returns for producers who otherwise are limited in their potential scale to serving local markets; and
• Smaller scale producers, which make up a significant share of the producers Peru would most like to connect to wider markets, are likely to suffer most from the added cost that barriers to trade impose, whether internal or external, due to their lack of scale and the inability to pass those costs on to consumers in the highly competitive environments in which they operate.

The description and analysis of the value chain allows us to identify some areas in which domestic reform or the removal of external trade barriers could improve the prospects for Peruvian entrepreneurs to compete successfully in global markets. That includes those areas where assistance from the IDB or other institutions, such as the World Bank, in the context of the Aid for Trade initiative, might contribute to lowering the cost of accessing markets through targeted support for improving the physical and institutional infrastructure needed to connect existing Peruvian entrepreneurs to markets, improve the export performance and allow new and initially small entrants to establish the links already enjoyed by their predecessors.

We assessed the key strengths and weaknesses in the value chain serving Peru’s perishable agricultural products industry by identifying the barriers and costs that prevent higher competitiveness and the entrance of smaller producers, into the export value chain of perishables. We, preliminarily, approached that challenge from two different angles. One involved drawing on the databases of the barriers Peruvian producers confront in producing and bringing goods to the international market that have been developed by the World Bank in the context of its Doing Business series. The World Bank Doing Business reports document barriers entrepreneurs face in doing business in a variety of developing country markets, including Peru. The World Bank’s data set offers a useful reference point for a more in-depth analysis of the barriers in Peru specifically. To supplement the World Bank’s Doing Business data set, we also met with Peruvian producers, Peruvian officials, logistics companies, and potential buyers to gain a better sense of the steps involved in bringing Peruvian perishables to market. We also analyzed the dataset in the World Economic Forum’s World Competitiveness Report.

That work has allowed us to produce a rough map of the value chain connecting Peru’s producers to local, regional and global markets, both as producers and as consumers. The outbound map helps illuminate internal barriers to trade in Peru and external barriers Peruvian producers face, whether those imposed by the market (e.g., commercial standards) or by foreign governments (e.g., tariffs, quotas, phyto-sanitary standards, etc.). The inbound value chain map details the same process from the perspective of the individual Peruvian entrepreneur as a consumer acquiring inputs for the production of perishables in Peru. That map will help policymakers understand how their own tariff and non-tariff barriers to trade, as well as processes like customs clearance and physical barriers like poor roads or ports, may raise the cost and limit the ability of local entrepreneurs to connect to and compete in local, regional and global markets.
In one sense, this initial value chain map serves as a benchmark. Gathering information on and analyzing changes in the nature of the value chain over time would offer Peruvian policymakers and the IDB a means of measuring progress in connecting Peruvian producers to export markets, as well as a sense of the obstacles to regional integration. As noted above in outlining the analytical framework, information collected in succeeding years on the obstacles identified in the initial mapping exercise (e.g., changes in the efficiency of ports or the quality of roads over time). This can then be added to data on trade flows over time, with the model predicting trade flows in a given year and the ups and downs of the trade barriers over time being used in the econometric application to assess the impact of such changes.

Perhaps most significantly from the perspective of defining “regional integration beyond the border,” the process also allows illustrating barriers that happen within the country, either in the form of obstacles to competitive production, or to impediments to an efficient link between domestic firms that act as successive links of the chain. Policymakers can then identify missing pieces, in the form of absent public goods, externalities or shortfalls in the supply of specific services or inputs. Often, appropriate policy is directed at creating the incentives and conditions for those missing pieces to emerge.

In addition to examining the connections between the links in the value chain, we also attempted to offer some assessment of the strength of each link. We relied on the numbers used by the World Economic Forum in its annual competitiveness report, combined wherever possible with data from those companies we interviewed as part of the project. We supplemented that analysis with existing information on similar industries and an inventory of non-tariff measures in the region, including those affecting Peru’s producers of perishable agricultural projects.

The resulting picture helps clarify which actions by Peruvian policymakers and the IDB have the greatest potential to improve the prospects of Peruvian producers accessing global markets – whether those actions involve domestic reforms, infrastructural investment, satisfying global buyers’ commercial standards, or negotiation with foreign trading partners to lower export barriers.

To facilitate the exposition, we have broken down the value chain for export perishables in two segments: those that supply raw materials and services to agricultural producers and processors are the “upstream” half, and those that work and deliver the output to the international market make up the “downstream” half. We also focus on sanitary and phytosanitary requirements and transportation because they relate in very direct ways to the issue of what steps are involved in regional integration behind the border.

Upstream in Peru’s perishable agricultural products sector, producers buy directly machinery, equipment and agro-industrial tools, plus irrigation implements, fences, fuels and packaging materials, including bales, cardboard, labels, etc. Some of these inputs (especially chemicals, tools and equipment) are imported from abroad, from foreign firms that have local representation and permanent local stocks. Although each brand may have only one representative, importer or distributor, there are enough providers in the market of most of
these inputs and services that competition is intense across brands. The number of participants in each segment of the chain, as the figure illustrates, is quite high, except in the case of fuel, which is such a generic commodity that only four providers, plus the threat of additional competition, are enough to provide some market discipline. Other inputs, like cardboard, bands, towels, asparagus holders, and basic fertilizers are mostly provided by local producers, although this does not imply that markups are necessarily smaller.

In services, competition is a lot more intense. It is mostly local consultants, many of them on retainer by producer associations, chambers or even the government, who provide technical assistance for the growth and protection of crops, for example. Several certification bodies (for instance, INDECOPI) decide on technical norms; verification of origin is extended by SENASA (a government body); other public sector departments are in charge of lab tests, SPS, food safety, etc.

In the case of the upstream processes, the resulting value chain map looks like this:
In general, the value chain map helps provide an overview of the competitiveness of different stages. As the number of suppliers reflects, the supply of many of the major inputs and services is sufficient and competitive, and the levels of quality and times of delivery have improved significantly over the last few years (and vary across specific products, as we illustrate below).

There were, however, three exceptions to this rule that are worth highlighting here, particularly as they relate to regional integration behind the border. The first involves quality control, including toxicological analysis, which is critical to exports destined for developed markets, especially Europe. In Peru, there are no labs that can do the required analyses, resulting in delays of 10-15 days, and additional costs, incurred by the need to take these samples to labs in Chile. In one sense, regional integration, as well as Peru’s export competitiveness, would be encouraged if there were a single regional set of requirements and the Chilean labs established operations in Peru and elsewhere throughout the relevant region.

The second exception involves SENASA (National Agricultural Sanitary Service) – the part of the Ministry of Agriculture that is in charge of, among other things, issuing sanitary certificates and collaborating with, among others, INDECOPI, in setting technical norms for the production of fruits and vegetables. According to the interviewed parties in the private sector, these institutions do an acceptable job, but the lack of growth in SENASA’s budget or staff and the lack of investment in new technologies represents a potential serious choke point given that the quantity of exports has trebled. This means that the processing of certificates, which are required by importers and which used to be very quick and adequate, has increasingly become delayed and prone to errors that result in delays.

This second exception highlights a different sort of challenge for regional integration behind the border – one that has limited the utility of a number of free trade arrangements to date. That is the investment in institutions required to implement such an arrangement and ensure that regional progress is not slowed by the weakest link in the institutional chain.

The third exception involves mark-ups in the sale of some inputs and services, which can be quite high, especially in chemical products like fertilizers and pesticides. This leads many large producers to become direct importers, mostly from China, and producers associations to act as direct buyers as one of the services they deliver. These arrangements are inefficient (usually there is a delay, little local stocks, lack of services and technical support connected to the imported product, a deviation of the attention and resources of the local organizer, etc.); they only exist due to the very high prices that create a need to circumvent the local representative of the foreign brand.

Peru has developed innovative arrangements among its producers as a means of reducing the inefficiencies inherent in the current arrangement. Those innovations raise a third potentially interesting area for exploration in terms of regional integration behind the
border – that of developing and extending innovations like Peru’s to producers throughout a particular region as a means of improving the region’s competitiveness, increasing the value of the clusters of high quality production within the region, and taking advantage of the network externalities that would flow from such market dynamics.

Regarding shipping and port costs, Peru is quite competitive, whether compared with its immediate neighbors or with other developing regions in the world. There is, on the other hand, some room for improvement. It takes less time and less paperwork (although more money) to process imports and exports than for the average Latin American competitor, and although the cost per container, at $875, is 28.8% lower than the regional average, and 18.1% cheaper than the OECD average, we should remember that among Peruvian exports, bulky items with large volume-to-value ratios are more prominent than in other countries, and, therefore, shipping costs are still high. Furthermore, Chile, a fairly relevant competitor in fresh produce, still beats Peru in all these counts.

Of course, origin certification and the meeting of high sanitary standards and strict technical norms are very important for Peru, and explain a significant portion of the higher cost and delay than in some other countries. It would hardly be beneficial for the perishable exports sector to waive those requirements for the sake of expediency, losing marketability, value and product differentiation. At the same time, seen from the perspective of regional integration behind the border, the adoption of a single regional set of rules that squared with those used by global buyers and the region’s principal export markets would yield efficiencies that would benefit Peru’s producers as well as producers in the rest of the region.

Given Peru’s relative strength in terms of meeting the necessary sanitary and phytosanitary standards, however, an effort aimed at reducing the time and cost of port and terminal processing and document preparation seems like a more urgent investment.

### Cost and delay for processing foreign trade at border

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<th>Number of documents for export</th>
<th>Days to clear exports</th>
<th>Cost for exports per container</th>
<th>Number of documents for import</th>
<th>Days to clear imports</th>
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<td>8.3</td>
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<td>21</td>
<td>745.0</td>
<td>7</td>
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<td>9</td>
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Source: Doing Business 2009, World Bank
Recent work estimates that one day of extra delay in the export process implies roughly one percent less export volume, and that this effect is even larger for time-sensitive products, with a limited storage life. In economic terms, the extra three days of waiting for export processing put Peru to the south of Chile: farther from the European and North American markets where their competing produce is directed.

Problems at the border are, of course, only one aspect of the country’s competitiveness and business climate. Internal barriers affect the profitability and volume of exports as well. Those include a broad range of areas, including the general business climate relative to a country’s competitors; the quality of institutions and infrastructure; macroeconomic stability; basic education; the efficiency of the goods and labor markets; and the ability of local firms to innovate and adopt new technologies and business process; the degree of concentration of market power, especially in the process of distributing imported goods.

Even the bureaucratic barriers to starting a company can have an impact, as well as opening up additional opportunities for corruption. Anecdotal evidence from Peru reinforces that point. It suggests that it is actually impossible for a small business to do certain things consistently within the law, a finding that is consistent with the work begun in Peru by Hernando de Soto roughly two decades ago.

While such items are commonly thought of as issues of internal reform, they would benefit from the adoption of a coherent strategy for regional integration behind the border. Peru’s process involves many more steps than those of many of its neighbors that would be likely partners in a regional arrangement. Adopting a regional integration strategy that looked behind the border would create the opportunity for Peru to remove those steps and improve its competitiveness along with that of the region without losing much if anything from the perspective of the prudent policies such measures may have originally been designed to serve.

What this points toward is the value of a regional integration strategy that does, in fact, address the obstacles to value chain participation behind the border. Properly understood, the implications of Peru’s institutional weaknesses relative to its competitors imply that Peru must compete in the global markets on the basis of cost, rather than product differentiation, specialization or productivity, all of which would pay greater dividends in terms of economic growth and development. This largely explains why most exports are still unprocessed traditional products.

Many of the findings with respect to the downstream value chain in Peru’s perishable agriculture production mirror those affecting the upstream value chain. For that reason, we focus here on a different use of the methodology suggested – one that is designed to illuminate the tradeoffs implicit in the policy and funding choices any country or group of countries make as part of a regional integration strategy that reaches behind the border.

The following figure illustrates the other half of the general value chain for perishable exports. Downstream from farmers, we also find several segments of the value
chain that involve sufficient providers to guarantee competition, world-comparable prices and quality, allowing output to reach the foreign final consumer in an effective and competitive way. Over 300 companies are direct exporters, in addition to a number of producers and processors themselves. There are also 122 logistics operators that serve the perishables sector in the process of getting their output to foreign markets.

Some of the processors or the packaging plants of agricultural output in the chain are either owned by the larger individual agricultural producers, or by associations, groups or cooperatives; only a handful of processing plants are stand-alone businesses. This means that this link in the chain is usually very fluid.

In some cases, the availability of a cold chain is key to add value to the resulting output. Several different companies would participate in the different aspects of the logistics for a single exporter. Some of these are cargo or shipment consolidators, either acting as intermediaries to provide smaller quantities and larger variety to foreign buyers, or as shipping agents putting together the cargo of different producers to share a single container.

The importance of the cold chain helps illustrate the tradeoff alluded to above. One of the key challenges in this value chain is the perishability of the products. Any delay raises
That affects the relevant choices for warehousing and transport of the goods and, more importantly for purposes of public policy and any eventual regional integration strategy, a potential implicit choice between two different export sectors.

With respect to asparagus, for example, the distributor in the importing country should receive the cargo within 4-5 days of the crop collection, to take full value of market opportunities. Shipping by sea, which is more common for Peru’s fruits, would be cheaper than shipping by air, but sea transport takes between 13-16 days, which sharply reduces the option value of the crop significantly. Even under optimal conditions, asparagus can hardly last beyond 21 days and even small oscillations in temperature and humidity can prove costly.

What this helps illuminate is the potential tradeoffs for Peruvian policymakers. Peru faces challenges in terms of transportation linkages affecting both air and seaborne cargo. With government budgets limited, it may be forced to make choices regarding where its transportation budget is spent. Improvements in air transport would redound to the benefit of asparagus producers – one of Peru’s success stories in terms of integrating its production into global markets. Improvements in sea transport would, instead, contribute to fruit exports – an area in which Peru has considerable room for diversification of its exports. In that sense, the choice of how Peru spends its transportation budget implicitly involves a choice between a development and integration strategy based on intensive exploitation of the existing advantage it holds in asparagus production or a strategy of export diversification, which is likely to draw many more producers into contact with global markets.

Seen in that light, the example of Peru’s asparagus and fruit industries also helps highlight the need for reaching beyond the mapping of obstacles in the value chain toward econometric modeling of the impact of those barriers. Peruvian policymakers would be in a far better position to assess the costs and benefits of either approach to transportation noted above if they had a common means of measuring the current costs of doing business as usual, as well as the value of specific improvements in the infrastructure.

**IV. Conclusion**

The analysis above remains a work in progress. The next step should involve a review of the preliminary results with Peruvian officials and local entrepreneurs to ensure that the results conform to and benefit from their intimate knowledge of both the local market and the administrative side of the equation. This step in the process would be used both as a means of ensuring accuracy and as a device for gathering additional information at a more refined level.

The successful conclusion of that step in the process would then lead to the data collection needed to do the econometric modeling and the use of the model outlined above to measure the individual obstacles in the value chain by a single comparable measure such as cost or time to market. Applying the econometric model would offer policymakers a
means of measuring the expected return on investment from any policy intervention they might choose.

Beyond the application of the methodology outlined above, there are a number of other analytical steps that might contribute to a more coherent regional integration strategy that reached behind the border and resulted in deeper economic integration as well as improvements in export competitiveness on global markets. One would involve benchmarking Peruvian perishables, for example, against other Peruvian export successes. Mapping the supply chain of existing successful enterprises would allow Peruvian policymakers and the IDB to evaluate progress in perishable agricultural products against those benchmarks. It might also help illuminate how existing successful enterprises overcame the barriers to trade found elsewhere in the Peruvian economy in order to connect themselves to local, regional and global markets.

This analytical step could also take the form of benchmarking Peru’s perishables sector against producers in other countries (Costa Rica, Brazil and Chile come to mind). Analyzing the value chains in perishable agricultural products in other countries might offer instructive examples of how other countries succeeded in building profitable and sustainable export sectors in perishables that include a greater share of small and medium-sized exporters.

Significantly, value chains such as that serving the perishable agriculture sector in Peru do not exist in isolation. The value chain here is, in turn, served by other value chains. To the extent warranted by the basic supply chain analysis (i.e., the extent to which either sector represents one of the high value barriers to be addressed), it would also make sense to apply the supply chain analysis to particular sectors that are known facilitators of both exchange and broader development goals.

What such an analysis would illuminate would be the inefficiencies (and therefore higher costs) involved in delivering services, such as finance and telecommunications, that are absolutely essential to enable Peruvian producers or perishables and other products to access export markets. Those sectors have their own supply chains and it may prove helpful to apply a similar analysis to the delivery of those key services as well as the supply chains of product and services markets.

The final step in completing the analysis would involve using the value chain analysis in developing both a country’s or a region’s trade negotiating strategy and its regional integration strategy. The supply chain analysis outlined above offers a means of identifying those foreign trade barriers the removal of which in future negotiations would generate the greatest return for a country’s or region’s exports.

At the same time, the value chain analysis could serve the purpose of assessing where changes behind the border would contribute to the ability of its producers to integrate successfully on a regional basis, as well as integrating into global markets. As the discussion above reflects, many of the challenges that Peruvian producers of perishable agricultural products face are the delays engendered by domestic institutions and problems with physical
infrastructure, which raise both costs and uncertainty – the two factors that are of the highest concern to potential global buyers of Peru’s products.

1 The following paper is substantially drawn from one authored by Grant Aldonas, Alberto Trejos, and Philip Schwagel for the Inter-American Development Bank. The responsibility of any errors or omissions in adapting that approach to the challenge of developing a regional integration strategy that reaches beyond the border is the author’s own.


3 Rise of Value Chain at 13.

4 Dymond and Hart capture this point well in highlighting the cost of internal barriers to trade in Canada inhibiting stronger economic performance because they “impede[] Canada’s participation in global value chains, and lock[] Canadians into the limited opportunities of the small domestic market”). Rise of Value Chains at 22.

The World Bank’s data set does have some limitations for our purposes. It focuses primarily on tasks such as starting a business or paying taxes, rather than focusing exclusively on the barriers to trade that a Peruvian entrepreneur would actually face in connecting to markets. In addition, where the World Bank’s data does address processes directly affecting the ability of Peru’s farmers to gain access to markets, it focuses on barriers they face in connecting to markets as a producer, while ignoring the barriers that would inhibit connecting to markets as a consumer in ways that would lower production costs and improve competitiveness.

6 The value chain analysis, in fact, helps underscore that, in today’s global marketplace, commercial standards may play a far more important role than do individual national trade barriers in defining whether or not goods or services will enter the global stream of commerce.

7 S. Djankov, C. Freund and C. Pham, Trading in Time, World Bank Policy Research Working Paper No. 3909 (2006). Djankov, Freund and Pham (2006) run a regression of a geography model in which, in addition to distance and shipping costs, delays in the process of exports and imports are counted as an independent variable. They find statistically significant and actually quite large coefficients for the explanatory power of time into the volume of exports. The effects are larger when only perishable products are considered.


9 According to the World Bank’s Doing Business Report, it takes 65 days, 10 separate legal/documentary procedures, and nearly three months of the average income, to open a new firm. Readers may remember that The Other Path, Hernando de Soto’s seminal work on understanding the cost of bureaucratic burdens and forced informality on the productivity and success possibilities of the poor, was based on documenting the massive cost of operating a business within the law in his native Peru.