Central America, China and the U.S.: What Prospects for Development?

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ABSTRACT. Central America remains among the poorest sub-regions of Latin America, and many Central American countries are among the most dependent upon primary-product exports. Unlike other commodity exporters in Latin America, however, Central American countries have not benefited from booming Chinese demand for primary products. We use a series of measures to assess Central American countries' trade structure, and find that they face increasing competition with Chinese products in third country markets (like Mexico) but also little complementarity with Chinese demand (unlike Argentina or Chile). Central American countries continue to be very dependent upon the US market for exports--and, to a lesser extent, for foreign direct investment and foreign aid inflows--though dependence upon the US has slipped even as most of the countries in the sub-region have entered into a preferential trade agreement with the US. The pattern of exports has shifted from agricultural to assembly plant manufactures in several countries, and Costa Rica now exports sophisticated manufactured products to the US and China alike. We explore the role that diplomatic relations may have played in Central America's tepid China trade: all Central American countries save Costa Rica (since 2007) recognize Taiwan and not the People's Republic of China. We end with some considerations of development strategies in the region.

Keywords: China, Taiwan, Central America, trade, development

What does the shifting relative importance of the United States and China mean for development prospects in the countries of Central America (which for the purposes of this paper include El Salvador, Costa Rica, Guatemala, Honduras, Nicaragua, and Panama)? Has rapid growth in China been a bane or boon for Central American countries? Have these countries been harder hit by the economic downturn in the United States than their neighbours in South America? What are the longer-term implications of Central American countries' economic relationships with China and the United States? This paper explores these questions by analyzing Central America's investment, aid and -- especially -- trade relations with the United States and China.

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We begin with a quantitative assessment of Central America's trade patterns with the United States and China (Section 1). Though the economic circumstances of the countries of the isthmus are marked by considerable heterogeneity, many of the countries of the region (Guatemala, Honduras, Panama) continue to be highly dependent on primary product exports, particularly coffee, bananas and sugar, with some mineral production. Unlike rapidly growing commodity exporters of South America, Central American countries export goods for which there is little demand in the Chinese market. As such, these countries remain tightly linked to the U.S. economy. In short, the beneficial impact of the so-called “China effect” on hard commodities has not reached Central America, whose exports are focused on soft commodities. A second group of Central American countries -- El Salvador, Nicaragua, and to a certain extent Guatemala, again -- have seen important increases in manufactured exports, particularly maquila (assembly plant) exports to the US. In Section 3 we analyze evidence that suggests these exports face increased competition from Chinese exports of similar goods, particularly in textiles. Costa Rica's recent rise in exports of microprocessors to China and the US alike represents an exceptional case of dynamism in the region's export history.

We then broaden our perspective beyond trade, to look at foreign direct investment flows and official development assistance flows from the United States and China to the countries of the region (section 3). We further discuss whether Central America's feeble Chinese trade has been depressed by the sub-region's role in the diplomatic rivalry between mainland China and Taiwan: all Central American countries (with the exception of Costa Rica, which broke from the pack in 2007) officially recognize and maintain diplomatic relations with only Taiwan.

We include comparative analysis of the sophistication and capability of Central American countries' export sectors, using new insights from the "product space" literature. This confirms
the picture drawn in Section 2: namely, highly concentrated export baskets with little diversification of export markets. Finally, the paper also explores the implications of rapid Chinese growth for development strategies and public policy in Central American countries.
1. Central America in the Global Economy

When it comes to their place in the world trading system, Central American countries exhibit a surprising heterogeneity that is a kind of microcosm of the heterogeneity of Latin America as a whole (fig. 1). El Salvador, Guatemala, Honduras and Nicaragua are poorer than the average Latin American country; meanwhile, Guatemala, Honduras, Nicaragua and Panama are more dependent upon commodity exports than the Latin American average. Lower per-capita income tends to be associated with lower levels of manufactures in a country’s export basket, but there are exceptions: El Salvador, though poorer than average, has a manufactured exports share higher than Mexico’s; Panama, while not a strong manufactured goods exporter, has higher per-capita income than the average Latin American country, like Chile. (Note that these trade data consider only trade in goods, not services.)

**Figure 1. Share of manufacturing exports and GDP per capita**

*Note: Average values, 2009-2011. Horizontal and vertical bars mark the average values for Latin America and the Caribbean.  
Source: World Development Indicators, World Bank.*
Figure 2. Average Rate of per Capita GDP growth in Latin America: 2003-2008 and 2009-2012 (e)

Source: Based on national accounts, 2012.

Economic growth rates in Central American countries during the pre-crisis period were respectable -- per capita GDP expanded by 4 percent or more per annum over a period of five years. But these rates were relatively unspectacular compared with the seven largest economies of Latin America, which experienced growth rates of GDP per capita above 6 percent (fig. 2). The post-crisis years have proven more difficult for several economies in Central America. Guatemala, Honduras and Nicaragua were the most adversely affected, with per-capita GDP growth rates below 2 percent. Among the LAC-7 countries, only Venezuela has experienced similarly depressed growth after 2009. Like the remainder of Latin America, and other developing economies, Central America's post-crisis growth rates have been lower than those observed during the pre-crisis years.
In contrast with the average Latin American economy, the share of exports of Central American countries is higher; this is not surprising, given that most of the Central American economies are smaller than average for the Latin American region (fig. 3). Since the beginning of the 2000s, total exports in Latin America have represented about 20-25 percent of total output. In the case of Costa Rica (47 percent), Honduras (60 percent) and Panama (79 percent), this share has been more important, illustrating one important difference with other economies in the region: small economies in Central America are more open and therefore more vulnerable to trade shocks. The export share of Latin American economies -- Central American countries among them -- has not grown much in the first decade of the new century. But the composition and destination of exports has changed substantially for some countries in the region.
Figure 4a. Main exported products as share of total exports in Central America 2000-2011


Figure 4b. Disaggregated information on Central American exports, 2011


Central American exports have grown little (as a share of GDP) over the last decade, but the composition of export baskets has changed somewhat (fig. 4a). For all six countries, the four main exports by country remained the same between 2000 and 2011. Coffee exports maintain a similar share of exports for coffee-exporting countries (Guatemala, Honduras, El Salvador). More interestingly, the share of manufactured goods has increased in Costa Rica and Nicaragua, while maquila (assembly-plant) exports in El Salvador have fallen. This composition illustrates the
heterogeneity of Central American countries vis-à-vis Chinese competition. Whereas Guatemala, Honduras and Panama can be certainly considered commodity exporters, the export profile of Costa Rica, El Salvador and Nicaragua is more diverse, including both commodities and manufactured goods. Product-level information regarding the leading exports confirms the importance of primary products even in the more manufacturing-oriented economies of the region (fig. 4b).

**Figure 5.**

![](chart.png)

*Note:* The Herfindahl-Hirschman index is estimated as the squared sum of market shares of exports of country $i$ to country $j$ on all 4-digit levels of goods, corrected by the number of exported goods. See the Annex for details. *Source:* Based on UN Comtrade.

It has been a commonplace of development policy advice for countries that primarily export commodities that they should diversify their export baskets to reduce exposure to global price swings.\(^2\) How dependent are countries in Central America on a single export, or a small number of exported goods? A more detailed estimation of export concentration provides the level of

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\(^2\) For Latin American countries, this advice dates back at least to the seminal report of the UN Economic Commission for Latin America entitled *The Economic Development of Latin America and its Principal Problems* (Lake Success, NY: United Nations, 1949), which went further and recommended import-substituting industrialization. Refer also to the discussion in Section 2 of this paper.
product concentration (or specialization) that characterizes Central American economies (fig. 5). In this regard, most countries in the region have maintained low levels of concentration: that is to say, a more diversified basket of commodities (as is the case for El Salvador, Guatemala and Honduras) compared with oil/mineral exporters (Venezuela, Chile). As we will see below, a low level of product concentration in exports is desirable, but not sufficient, for economic development.

**Figure 6. Main destination of Central American exports 2000-2010**

Diversification of export destinations in many South American countries -- particularly increased trade with China -- is credited with dampening the shock of the global financial crisis that erupted in late 2008. The severity of the shock in Mexico, meanwhile, is in part blamed on that country's ever-deeper trade integration with the US. Central American countries are in this regard closer to the Mexican end of the continuum. The dominant role of the US as the main importer of Central American goods (figs. 6 and 7) has not diminished during the last decade.\(^3\) Indeed, the US has become even more important as an export destination for Nicaragua and, to a lesser extent, Guatemala. Costa Rica, El Salvador and Panama, meanwhile, have increased export shares to other partners: neighbouring countries, Europe (Netherlands, Germany) and, marginally, China. (The abrupt jump in Salvadoran export share to the US in 2005 marks a return to more historically typical levels for the country, following a severe depression in its exports to the US\(^3\)Victor Bulmer Thomas provides a historical overview of the development of Central America's commodity-based export structure, and of the role of the U.S. as its principal export destination, in *The Political Economy of Central America Since 1920* (Cambridge, UK: Cambridge University Press, 1987).
from 2000 to 2004. The magnitude of the increase nevertheless suggests that there may have also been a change in reporting practices or some other statistical artifact -- which we were unable to identify -- in addition to increase exports to the US.) In contrast to this pattern, for most LAC-7 economies China has become a strategic destination of their exports (fig. 9).

All of the countries included in this paper save Panama (and also including the Dominican Republic) entered into a preferential trade agreement with the United States between July 2006 and January 2009: the Dominican Republic-Central America-United States Free Trade Agreement (CAFTA-DR). It has been argued that the fear of increasing Chinese competition in the US market was an important argument for Central American and Dominican administrations to join this agreement. In contrast to the much-commented explosion in US-Mexico trade following the adoption of the North American Free Trade Agreement in 1994, CAFTA-DR has witnessed an anemic trade response, in part because the agreement coincided with the US financial crisis (refer to fig. 7). In fact, while 73 percent of CAFTA-DR countries' exports flowed to the US in 2000, by 2010 that fraction had fallen to 43 percent. Only Costa Rica and Nicaragua enjoyed increases in their exports to the US: both countries' export values had tripled in nominal terms by 2010, relative to 2000-2008 levels. Nicaragua has moved into maquila-type manufactured exports already exported by El Salvador and Guatemala, as well as traditional agricultural products to the US. Costa Rica, meanwhile, now exports more sophisticated manufactured goods to the US, including integrated circuits and specialized aircraft motors. For the other CAFTA-DR countries in Central America, the composition of exports to the US has been much less dynamic.

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The low concentration of trade partners for Central American countries is also captured in the Herfindahl-Hirschmann index, computed by export destination (fig. 8). This indicator gives us an estimation of the number and distribution of exports among trade partners with each country. Mexico, for example, is highly concentrated in terms of destination, with more of its exports targeting the U.S. However, Honduras, Guatemala, Panama and Nicaragua exhibit much lower levels of dependence on a single trade partner, in a range similar to that of the average Latin America economy. In fact, export concentration (by destination) decreased between 2000 and 2010 for Latin America as a whole.
2. Central America's China Trade: A Descriptive Analysis

There is a view, perhaps oversimplified, of the implications of China's rapid growth and industrialization for Latin America and the Caribbean. In this view, the countries of the region fall into two categories. On the one hand, there are the commodity-exporting South American countries, whose export performance weathered the Great Recession beginning in 2008 thanks to vigorous Chinese demand for their exports (indeed, it was in large part due to this demand that Latin America enjoyed such spectacular growth and an economic bonanza during the pre-crisis years 2003-2008\(^6\)). On the other hand, there are countries with export baskets that closely resemble China's export profile, and this second group has increasingly suffered from fierce Chinese competition in third-country markets. This latter group, moreover, depends critically on the U.S. market for its exports, a market still beleaguered by the effects of the 2008 global financial crisis. This second group of countries has thus had to cope with a much higher level of competition from China, including the ability to attract foreign direct investment, and this has dampened their productive capacity in the medium term; in the long run, this trend implies their exclusion from global value chains and opportunities for productive upgrading. Whereas Brazil and Chile are good examples of this first group of countries, Mexico represents the serious challenges faced by the second (refer to fig. 1 above for evidence on manufactured exports). The dichotomy is further complicated: countries can fall into both categories. A number of South American countries, most notably Brazil, have benefitted from high commodity prices and seen an increasing loss of market share to China in third markets.

Others have interpreted these trade-offs differently. Despite the riches that have accrued for South American exporters of raw materials, this second viewpoint holds that these economies are foolhardily postponing a necessary diversification of their respective productive structures and their export baskets. Especially for exporters of manufactures located nearer to the United States, the collective pain of the recession and restructuring due to Chinese competition will turn out to have been a better long-term strategy.

Where do the Central American countries fit in with regard to this debate? The question is not frequently posed, but the answer could be important for policy makers in the countries of the isthmus. In particular, if breakneck Chinese growth and its associated demand for commodity exports can serve as a motor for economic growth elsewhere in the developing world, few parts of Latin America stand in greater need of such a motor than the largely poor Central American economies. At the same time, if a dependence upon primary-product exports slows long-term development achievements, then perhaps Central American policy makers should look askance at this putative opportunity.

In this section we situate Central American countries in the Latin American-Chinese trade dichotomies mentioned above: fast-growing exporters of primary products to China versus slow-growing manufactures, competing with China. Both economic scenarios exist in Central

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7 This is a view most consistent with a long series of publications by the U.N. Economic Commission for Latin America and the Caribbean, e.g. Cambio estructural para la igualdad: una visión integrada del desarrollo (Santiago: Comisión Económica para América Latina y el Caribe, 2012). Clearly it matters whether countries export largely unprocessed commodities (e.g. coffee), or whether they export primary products with much greater value added (e.g. wine and salmon in Chile, Café Britt in Costa Rica, etc.).

America, though the evidence for the sub-region paints a fairly heterogeneous portrait from one country to the next.

While the effect of China’s increasing demand for Latin American goods has not dramatically modified the contribution of exports to GDP in Central America, it is illustrative to compare the exports to China as a share of total exports across different countries (fig. 9). Chile, Peru and Brazil have tightened their trade bonds with China, with a much higher contribution of Chinese imports in their total exports. Currently, more than 50 percent of Chilean copper is destined to satisfy China’s demand for this metal for infrastructure development, construction, industrial equipment and transportation. In contrast, the export profile of Central America’s core economies shows that the share of exports to China is minuscule: only Costa Rica, and to some extent Panama, have increased their exports to China, with these shares hardly reaching 5 percent of total exports.

Source: UN Comtrade, 2012.
Figure 10. Evolution of Export competition with China for Central American countries, 2000-2009

Note: CS and CC coefficients calculated with exports of country i and exports of country j (China). The coefficient of specialization (CS) and coefficient of conformity (CC) are measures of the level of trade competition between two economies. The competition level is determined by the similarity of export baskets between these countries, with competition being high (tends to 1) when export structures are similar, and competition being low (tends to 0) when export structures are complementary. See Annex for more details.

Source: Based on WITS Database, 2012

A closer look at the trade competition patterns between Central America and China is provided by comparing their trade structures at a disaggregated level. That is, how similar are countries' export baskets to that of China? We begin by looking at widely-used coefficient of conformity (CC) and coefficient of specialization (CS) indices. These indicators suggest that average trade competition of Central American countries with China is relatively low: Costa Rica, El Salvador, Guatemala, Honduras and Panama all show more complementarities than competition with China’s exports basket (fig. 10). More recent indicators for trade competition from 2010 (fig. 11), illustrate this same result: in comparison with other emerging regions -- notably Central Europe and East Asia -- competition for Central American countries with China is low. Later in the paper, we consider an alternative index that addresses criticisms of the CC and CS indices.

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Central America and China have complementary export baskets because several of the Central American countries are primarily commodity exporters, while China is a massive exporter of manufactures. Could Central American economies benefit from China’s rapidly increasing demand for goods? This requires an explicit analysis of the compatibility of Chinese imports and Central America’s main exports. The picture that emerges is not very encouraging.\(^{10}\) Honduras, Panama and Costa Rica export goods substantially different from those imported by China. There are few potential complementarities to be exploited for these countries by targeting Chinese markets (fig. 12).

Though Export Similarity Indices (ESI), such as the coefficients of Conformity and Specialization, are useful to compare export structures, they do not provide the complete story. Indeed, these indicators have to be corrected for the effect created by the scale differential

\(^{10}\) The estimation is a modified version of CS and CC coefficients, taking into account the imports of the Chinese economy, and comparing the similarity with Central American exports.
between the economies being compared. While all six countries considered in this study account together for a sub-regional GDP in 2013 of $313 billion, China’s output for the same year, $13.395 billion, is 42 times larger. ESI-type indices are intended to compare patterns of exports across product categories, and they should not be influenced by the relative size or scale of total exports.\textsuperscript{11} To partially remove the scale effect, we used the share of each product in total exports, rather than the value of exports (see Annex for more details). However, even with this correction, the problem of ESI-type indices can persist when comparing small economies with China: the share of exports of China in a product, even if small, could be large and therefore the competition effect is not properly captured. Moreover, with ESI indices we do not have a measurement of the increase in \textit{intensity} or the trend of competition with China.

To better correct for the scale effect, following the work of Rhys Jenkins (see footnote), and instead of comparing the proportion of total exports, we focus on the proportion of exports accounted for which China is globally competitive. The Index of Competitive Threat (ICT) for a given country is therefore a percentage of goods in the production and export of which China is globally competitive.\textsuperscript{12} To identify the goods where China is competitive, we estimate the sectors for which China’s exports have grown faster than world exports over the period 2000-2012.\textsuperscript{13}

\textsuperscript{11} This point is made by Rhys Jenkins, in “Measuring the Competitive Threat from China for Other Southern Exporters”, \textit{The World Economy} (2008), and “China’s Global Growth and Latin American Exports”, WIDER Research Paper 2008/104.

\textsuperscript{12} See Annex for the definition of the ICT.

\textsuperscript{13} This is the approach used by Albaladejo, M., and Lall, S. (2004), "China's Competitive Performance: A Threat to East Asian Manufactured Exports?,” World Development, Elsevier, vol. 32(9), pages 1441-1466, September.
Figure 12. Index of Competitive Threat for Latin American Countries

2000-2012

Note: The Index of Competitive Threat is estimated as the percentage of sectors (for all 4-digit sectors in STIC Revision 3 classification) where China exhibits growth in excess of global export growth over the period 2000-2012.

Source: Authors’ calculation based on Jenkins (2008), op. cit., and Comtrade data (2014).

The Indices of Competitive Threat for Central American countries, in contrast to the previous indicators, tell a more pessimistic story regarding Chinese competition, at least for some countries. These countries in fact face increasing competition when comparing the goods where China is more competitive. The strongest increase in competition takes place in Honduras, with a 47 percent increase in the ICT index. By 2008, four of the top five Latin American countries, in terms of the competitive threat from China in the US market between 2001 and 2006, were in Central America and the Caribbean (El Salvador, Guatemala, Honduras and Dominican Republic). Interestingly, having a high ICT in this period confirms that Central American countries were specialized in products in which China had a significant share of the US market in 2001. The
growth of the Central American textile and clothing industry during this period, in particular, explains this increasing competition.\textsuperscript{14}

As mentioned before, ESI-type indices focus on the similarity of export structures and can miss a fundamental element of the analysis. Even if China’s export share in a specific product is declining, and a Latin American country exports this product, it does not necessarily mean a decline in competition. As Chinese exports have grown rapidly over the last decade, the apparent loss of \textit{comparative} advantage can hide an increase in China’s \textit{competitive} advantage in the product.\textsuperscript{15}

While the role of China in the global demand for commodities has been studied in detail, less work has been devoted to understanding the impact of this demand on \textit{global commodity prices}. From the perspective of Central American countries, the straightforward channel through which China’s effect has been perceived in the region is the increasing demand for raw materials and eventually competition in third markets. This does not mean that Central America is not affected by other side effects of China’s growth. As a price-taker of imported commodities such as oil and metals, Central American countries have been indirectly affected by China’s considerable influence on commodity prices, which, even after the boom between 2001 and 2008, persists today.

\textsuperscript{14} Another caveat, related to data sources and comparability: not all Central American countries include Free Trade Zones in the exports data provided by Comtrade. In fact, El Salvador, Guatemala (since 2006) and Nicaragua use the General Trade System to account for their export/import data. In this case, export flows come from the free circulation area, premises for inward processing or industrial free zones, and premises for customs warehousing or commercial free zones. Costa Rica, Honduras and Panama, meanwhile, use the Special Trade System, in which the statistical territory comprises only the free circulation areas, and may not include exports from Free Trade Zones. These differences could be taken into account by re-estimating the Indices of Competitive Threat using mirror data on imports from all countries regarding the six Central American countries. We have not carried out this exercise, though it might not change the pattern identified in our paper, as a large share of exports in Free Trade Zones belong to manufacturing.

\textsuperscript{15} Jenkins, "China’s Global Growth and Latin American Exports," op. cit.
The effect of China on commodity prices is a reflection of its increasing demand for both non-renewable (oil, copper, iron ore, zinc) and agricultural commodities (coffee, soybean, sugar, meat products). While domestic suppliers, until the beginning of the century, provided some of these goods, the share of China’s consumption was relatively low and started to increase rapidly. There are, indeed, other factors associated with the evolution of commodity prices, and the peak levels registered over the last decade do not respond solely to the increasing demand of China or other economies. Supply-side effects, such as climatic factors, resource discoveries, depletion of reserves and the so-called "financialization" (and associated speculation) of commodity-related industries have also affected the growth of prices.

Jenkins estimates the China-effect on global commodity prices by estimating how large the demand for a certain commodity would be if China’s demand had grown at rates similar to those of the rest of the world. In other words, Jenkins compares China’s demand effect with a counterfactual in which all countries’ demand (including China) is the same. The effects on prices need to take into account the elasticity of supply of these industries, which, as illustrated in some cases (e.g. zinc), is relatively low. The results show that the Chinese effect was stronger in four metals (iron, copper, aluminum and zinc). These estimates show that the growth of Chinese demand is believed to have increased the price of these commodities by at least 40 percent. For other commodities, mostly agricultural, the effect of Chinese demand is considered to be below 10 percent of the price. Taking into account the main commodity exports of Central American economies (sugar in Guatemala, coffee in Honduras, Nicaragua and El Salvador), it is clear that the “China-effect” on commodity prices has been more beneficial to hard-commodity exporters than to agricultural exporters.

The distinction between the China effect for hard and soft commodities is reflected in export earnings for Latin American countries. The large effect on earnings is captured on metals, where China’s price-effect was more pronounced: crude oil, iron ore, copper, aluminum and zinc. Agricultural products like coffee, sugar and bananas, where Central American exports are concentrated, experienced a lesser effect from China’s demand (Table 1). The commodities they export, including coffee and bananas, have not significantly benefited from increasing demand or prices.

Table 1. Estimated Impact on Net Export Earnings for Central America

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<tr>
<th></th>
<th>Central America</th>
<th>South America</th>
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<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>-7.5</td>
<td>-13.3</td>
</tr>
<tr>
<td>El Salvador</td>
<td>-19</td>
<td>-37</td>
</tr>
<tr>
<td>Guatemala</td>
<td>0.1</td>
<td>3.4</td>
</tr>
<tr>
<td>Honduras</td>
<td>1.6</td>
<td>3.6</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>-7.5</td>
<td>-14.9</td>
</tr>
<tr>
<td>Panama</td>
<td>-7.6</td>
<td>-9.3</td>
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</tbody>
</table>

Central America | -4 | -6 | South America | 13.3 | 23.8 |

Source: Jenkins (2011), based on Comtrade.

Both the effect on commodity prices and export earnings derived from Chinese economic growth seem to have benefited other Latin American countries more than Central America. This is also reflected in two stories observed in the evolution of terms of trade, the ratio of a country's export prices to the prices of its imports (Figure 13). Whereas hard-commodity exporters like Venezuela, Chile and Peru have enjoyed advantageous terms of trade for most of the 2000s, the story for Central America is quite the opposite. The positive China effect on soft commodities, and therefore export prices, has not offset the costs these countries have to pay today by importing hard commodities (oil and gas in particular).
Figure 13. Evolution of Terms of Trade for Central American countries (2000=100)

Note: The vertical axis in each panel is an index equal to 100 in 2000.
Source: Authors' calculation, based on data from Comtrade.

An additional dimension, not considered up to this point, is the level of *intra-industry trade* in Central American economies. Intra-industry trade refers to the volume of exchange of products belonging to the same industry. The level or potential level of this kind of exchanges is not captured by the ESI or ICT indices analyzed above. The Vollrath index is a measure of comparative advantages taking into account intra-industry trade. It measures each country’s exports and imports relative to global exports and imports in each sector. Values above 1 indicate a comparative advantage for the country in that specific sector. Table 2 summarizes these results, highlighting in red the sectors when comparative advantage is higher, and recognizing that considerable information regarding comparative advantage at a more disaggregated level is hidden beneath these fairly aggregated numbers.
Table 2. Vollrath index of comparative advantage in selected Latin American countries
2000 – 2010

<table>
<thead>
<tr>
<th>Product code</th>
<th>Argentina</th>
<th>Brazil</th>
<th>Chile</th>
<th>Colombia</th>
<th>Mexico</th>
<th>Peru</th>
<th>Venezuela</th>
<th>Costa Rica</th>
<th>Guatemala</th>
<th>Nicaragua</th>
<th>Panama</th>
<th>El Salvador</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food and live animals</td>
<td>-2.85</td>
<td>1.74</td>
<td>2.45</td>
<td>-0.68</td>
<td>0.54</td>
<td>1.87</td>
<td>-1.66</td>
<td>-1.09</td>
<td>1.30</td>
<td>2.67</td>
<td>-6.98</td>
<td>7.74</td>
</tr>
<tr>
<td>Beverages and tobacco</td>
<td>0.30</td>
<td>1.87</td>
<td>3.25</td>
<td>0.38</td>
<td>0.79</td>
<td>-1.06</td>
<td>1.20</td>
<td>-0.19</td>
<td>0.26</td>
<td>-0.25</td>
<td>1.40</td>
<td>-0.70</td>
</tr>
<tr>
<td>Crude materials excluding food/Fuels</td>
<td>1.04</td>
<td>1.04</td>
<td>2.20</td>
<td>0.57</td>
<td>1.19</td>
<td>0.80</td>
<td>0.06</td>
<td>-1.42</td>
<td></td>
<td></td>
<td></td>
<td>-1.42</td>
</tr>
<tr>
<td>Mineral fuels/substances 1</td>
<td>1.77</td>
<td>2.08</td>
<td>2.28</td>
<td>0.52</td>
<td>0.91</td>
<td>-0.34</td>
<td>0.84</td>
<td>-0.99</td>
<td></td>
<td></td>
<td></td>
<td>-0.94</td>
</tr>
<tr>
<td>Animal/vegetable oils/waxes</td>
<td>3.41</td>
<td>0.78</td>
<td>2.64</td>
<td>1.19</td>
<td>2.01</td>
<td>0.41</td>
<td>0.80</td>
<td>-0.60</td>
<td></td>
<td></td>
<td></td>
<td>-0.31</td>
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<td>-0.84</td>
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<td>3.27</td>
<td>-1.74</td>
<td>0.87</td>
<td>3.92</td>
<td>-5.29</td>
<td>-0.76</td>
<td>1.39</td>
<td>-0.76</td>
<td>-2.60</td>
<td>-3.25</td>
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<td>1.80</td>
<td>0.12</td>
<td>0.98</td>
<td>0.14</td>
<td>-2.72</td>
<td>0.40</td>
<td>-0.96</td>
<td>0.20</td>
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<td>2.39</td>
<td>-3.90</td>
<td>-1.44</td>
<td>0.38</td>
<td>-4.61</td>
<td>4.29</td>
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<th>Colombia</th>
<th>Mexico</th>
<th>Peru</th>
<th>Venezuela</th>
<th>Costa Rica</th>
<th>Guatemala</th>
<th>Nicaragua</th>
<th>Panama</th>
<th>El Salvador</th>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food and live animals</td>
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<td>3.36</td>
<td>9.11</td>
<td>11.09</td>
<td>5.56</td>
<td>4.14</td>
<td>-5.42</td>
<td>5.11</td>
<td>2.68</td>
<td>4.53</td>
<td>6.77</td>
<td>-5.88</td>
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<tr>
<td>Beverages and tobacco</td>
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<td>1.02</td>
<td>1.04</td>
<td>-2.02</td>
<td>0.55</td>
<td>2.05</td>
<td>-2.53</td>
<td>-0.76</td>
<td>0.43</td>
<td>0.49</td>
<td>1.00</td>
<td>0.30</td>
</tr>
<tr>
<td>Crude materials excluding food/Fuels</td>
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<td>3.52</td>
<td>3.49</td>
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<td>0.39</td>
<td>3.59</td>
<td>-0.08</td>
<td>0.57</td>
<td>1.59</td>
<td>0.07</td>
<td>0.53</td>
<td>-0.65</td>
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<tr>
<td>Mineral fuels/substances 1</td>
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<td>0.70</td>
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<td>0.91</td>
<td>0.89</td>
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<td>0.17</td>
<td>0.44</td>
<td>-1.05</td>
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<tr>
<td>Animal/vegetable oils/waxes</td>
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<td>0.78</td>
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<td>2.23</td>
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<td>Chemicals/products</td>
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<td>Manufactured goods</td>
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<td>0.88</td>
<td>1.61</td>
<td>1.61</td>
<td>0.17</td>
<td>-0.37</td>
<td>-2.25</td>
<td>-1.10</td>
<td>0.14</td>
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<tr>
<td>Machinery/transport equipment</td>
<td>-0.82</td>
<td>-0.65</td>
<td>-2.78</td>
<td>-3.12</td>
<td>0.52</td>
<td>4.17</td>
<td>-4.08</td>
<td>-0.43</td>
<td>-2.98</td>
<td>4.11</td>
<td>-7.41</td>
<td>-2.45</td>
</tr>
<tr>
<td>Miscellaneous manufacturing</td>
<td>-1.68</td>
<td>-0.98</td>
<td>-1.99</td>
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<td>0.30</td>
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<td>1.67</td>
<td>-0.42</td>
<td>-1.97</td>
<td>3.34</td>
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<td>Other commodities</td>
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<td>1.44</td>
<td>-0.48</td>
<td>-3.32</td>
<td>-4.75</td>
<td>0.51</td>
<td>-0.76</td>
<td>-0.45</td>
</tr>
</tbody>
</table>

*Note:* Highlighted numbers indicated revealed comparative advantage for the indicated country in that product. See Annex for details.

*Source:* Authors’ calculation, based on Comtrade (2013).

Table 2 illustrates and confirms the specialization pattern that countries like Chile, Colombia, Peru and Venezuela have developed over the last decade. In the case of Central American countries, there is a high comparative advantage in food and animals products. Manufacturing does not exhibit high levels of comparative advantage computed in this way (see the low indexes for all Central American countries).
If Central American countries’ trade flows are tilted overwhelmingly away from China and in the
direction of the US, the source of other international resource flows, including foreign direct
investment and official development assistance, are even more skewed toward the US.

Though Chinese FDI flows to some parts of Latin America and the Caribbean now rival those of
the US, this is not the case in Central America. Enrique Dussel Peters reports that 78 percent of
the nearly $27 billion of realized Chinese FDI in Latin America and the Caribbean flowed to
Brazil and Argentina alone, and perhaps another 8 percent flowed to tax havens in the
Caribbean.¹⁷ News reports of planned Chinese-financed projects in Central America--most
notably a $40-billion trans-isthmus canal in Nicaragua--may portend a change.¹⁸ Information
from China's Ministry of Commerce (MOFCOM) and the Statistical Bulletin of China’s Outward
Investment report that Panama is an exception in the region in that it has significant levels of
Chinese investment, despite not having diplomatic relations with Beijing.

Outward-bound Chinese FDI raises a number of issues for Chinese firms. The China’s Going
Global Investment Index, proposed and calculated by the Economist Intelligence Unit, attempts to
capture the opportunities and risk of Chinese investments abroad in a variety of countries. In
addition to resource-related firms for investment, the index explores the importance of other
factors sought by Chinese firms, such as access to new markets, technology, intellectual property,
and brands. There are also risks involved for these firms going abroad: domestic political and

¹⁷ Enrique Dussel Peters, "Characteristics of Chinese Overseas Foreign Direct Investment (OFDI) in Latin
America (2000-2012)," also submitted for inclusion in this issue of Pacific Affairs Table 3.
¹⁸ R. Evan Ellis, "El canal de Nicaragua y la transformación de América Latina," InfoBAE, 26 June 2013:
http://opinion.infobae.com/evan-ellis/2013/06/26/el-canal-de-nicaragua-y-la-transformacion-de-america-latina/
regulatory risk, cultural proximity and operational risk among them. The index shows that, out of 67 countries, Chile (22\textsuperscript{nd}), Brazil (26\textsuperscript{th}), Mexico (30\textsuperscript{th}) and Costa Rica (32\textsuperscript{nd}) are the most attractive Latin American destinations for Chinese firms.

US FDI in Central America, though volatile from country to country and year to year, remains relatively important, as Table 3 demonstrates. In some years, US FDI has exceeded $1 billion in Costa Rica, El Salvador and Panama.
Table 3. US FDI and ODA flows in Central American Countries, 2002-2011

(a) US Foreign Direct Investment flows to Central America ($ million)

<table>
<thead>
<tr>
<th></th>
<th>Costa Rica</th>
<th>El Salvador</th>
<th>Guatemala</th>
<th>Honduras</th>
<th>Nicaragua</th>
<th>Panama</th>
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<td>2002</td>
<td>63</td>
<td>197</td>
<td>-50</td>
<td>22</td>
<td>93</td>
<td>530</td>
</tr>
<tr>
<td>2003</td>
<td>75</td>
<td>-17</td>
<td>10</td>
<td>83</td>
<td>23</td>
<td>353</td>
</tr>
<tr>
<td>2004</td>
<td>291</td>
<td>152</td>
<td>44</td>
<td>193</td>
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<td>-71</td>
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<td>2005</td>
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<td>81</td>
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<td>88</td>
<td>36</td>
<td>106</td>
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<tr>
<td>2006</td>
<td>1,412</td>
<td>-81</td>
<td>-5</td>
<td>36</td>
<td>..</td>
<td>214</td>
</tr>
<tr>
<td>2007</td>
<td>172</td>
<td>2,314</td>
<td>169</td>
<td>71</td>
<td>..</td>
<td>1,218</td>
</tr>
<tr>
<td>2008</td>
<td>574</td>
<td>1,834</td>
<td>659</td>
<td>173</td>
<td>46</td>
<td>845</td>
</tr>
<tr>
<td>2009</td>
<td>-181</td>
<td>135</td>
<td>86</td>
<td>3</td>
<td>29</td>
<td>778</td>
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<tr>
<td>2010</td>
<td>-124</td>
<td>170</td>
<td>101</td>
<td>156</td>
<td>-1</td>
<td>-814</td>
</tr>
<tr>
<td>2011</td>
<td>71</td>
<td>112</td>
<td>39</td>
<td>-78</td>
<td>53</td>
<td>-130</td>
</tr>
</tbody>
</table>

(b) US Official Development Assistance to Central America ($ million)

<table>
<thead>
<tr>
<th></th>
<th>Costa Rica</th>
<th>El Salvador</th>
<th>Guatemala</th>
<th>Honduras</th>
<th>Nicaragua</th>
<th>Panama</th>
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</thead>
<tbody>
<tr>
<td>2002</td>
<td>-24</td>
<td>62</td>
<td>65</td>
<td>97</td>
<td>67</td>
<td>6</td>
</tr>
<tr>
<td>2003</td>
<td>-21</td>
<td>73</td>
<td>68</td>
<td>70</td>
<td>70</td>
<td>10</td>
</tr>
<tr>
<td>2004</td>
<td>-15</td>
<td>115</td>
<td>54</td>
<td>112</td>
<td>70</td>
<td>9</td>
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<tr>
<td>2005</td>
<td>-12</td>
<td>47</td>
<td>38</td>
<td>88</td>
<td>103</td>
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<tr>
<td>2006</td>
<td>-10</td>
<td>25</td>
<td>67</td>
<td>84</td>
<td>68</td>
<td>19</td>
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<tr>
<td>2007</td>
<td>-3</td>
<td>39</td>
<td>46</td>
<td>71</td>
<td>77</td>
<td>7</td>
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<tr>
<td>2008</td>
<td>-3</td>
<td>42</td>
<td>70</td>
<td>96</td>
<td>104</td>
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<tr>
<td>2009</td>
<td>-1</td>
<td>82</td>
<td>84</td>
<td>129</td>
<td>89</td>
<td>17</td>
</tr>
<tr>
<td>2010</td>
<td>1</td>
<td>151</td>
<td>105</td>
<td>103</td>
<td>54</td>
<td>12</td>
</tr>
<tr>
<td>2011</td>
<td>10</td>
<td>165</td>
<td>102</td>
<td>48</td>
<td>60</td>
<td>15</td>
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</tbody>
</table>


Official development assistance (ODA) has dwindled in importance in Latin America and the Caribbean, although some Central American countries are still relatively important recipients of aid from some members of the Development Assistance Committee (DAC) of the Organisation for Economic Co-operation and Development (notably the US and Spain). Table 2 demonstrates that the primary recipient of US ODA switches from year to year among the poorest countries of
the region: El Salvador, Guatemala, Honduras and Nicaragua. Indeed, in some years, US ODA exceeds US FDI flows to some countries in the sub-region. As a share of the recipient country's gross national income (GNI), Nicaragua is the main aid recipient in Central America: in 2011, total aid from OECD members to the country reached 4.73 percent of GNI, much higher than the second main recipient, El Salvador, with 1.11 percent of GNI.19

Much less is known about the portfolio of Chinese development assistance. Barbara Stallings has extrapolated estimates of Chinese aid to Latin America and the Caribbean from a slim set of data sources; with the exception of Costa Rica, which received concessional official loans ranging from $180 million to nearly $1 billion for a variety of infrastructure-related projects following its diplomatic recognition of Beijing in 2007, she reports no Chinese aid to Central America.20

4 The China Factor in Diplomatic and Economic-Development Strategies in Central America

Central America's China trade is potentially complicated by the diplomatic rivalry between China and Taiwan. Only 22 countries now maintain diplomatic relations with Taiwan, and fully twelve of those are countries in Latin America and the Caribbean. More to the point, all of these save Paraguay are small to very small economies in Central America and the Caribbean.21 Of the six countries covered in this paper, only Costa Rica has established relations with Beijing, and broken relations with Taipei, and only since June 2007 (a free trade agreement with China

19 OECD.stat.
20 Barbara Stallings, "Chinese Foreign Aid to Latin America: Trying to Win Friends and Influence People," also submitted for inclusion in this issue of Pacific Affairs.
21 Taiwan's diplomatic relationship with Central American countries is sketched by Francisco Javier Haro Navejas, "China's Relations with Central America and the Caribbean States: Reshaping the Region," in Adrian H. Hearn and José Luis León-Manriquez, eds., China Engages Latin America; Gabriel Aguilera Peralta, "Central America Between Two Dragons: Relations with the Two Chinas," in Alex E. Fernández Gilberto and Barbara Hogenboom, eds., Latin America Facing China; and Mario Esteban Rodríguez, "Batalla diplomática entre China y Taiwán: las paradojas de Costa Rica y Nicaragua," paper presented at the conference China, América latina y el Caribe: condiciones y retos en el siglo XXI, Facultad de Economía, UNAM, Mexico, May 2012.
followed in April 2010).

For decades, the smaller economies of the region may have judged their bet on Taiwan a good one, as Taipei rewarded their diplomatic loyalty with development assistance (including foreign aid and technical assistance) and other economic links: that is, they benefited from Taiwan's so-called "checkbook diplomacy." But with the election of the Kuomintang administration to the national government in 2008, checkbook diplomacy more or less came to an end.22 Overtures to Beijing from countries in Taipei's camp have been reportedly rebuffed for now. The country most frequently mentioned as next in line for normalization of relations with Beijing is Panama: certainly Chinese firms are interested in improvements to Panama's canal, just as Panama recognizes the looming importance of Chinese demand for much of the goods that transit through the canal. But despite sporadic high-level contacts over several years—including a Spring 2004 visit by the Chinese Vice-Minister for Foreign Affairs to China--Panama and China have not advanced to formal diplomatic relations.

22 Lee Ming argues that those countries that continue to recognize Taipei are important to the latter because they represent scarce diplomatic support, but they are not important to Beijing because they have few important natural resources. "Cross Taiwan Straits Relations and Ma Ying-Jeou's Policy of Diplomatic Truce," in Cross-Taiwan Straits Relations Since 1979: Policy Adjustment and Institutional Change Across The Straits, edited by Kevin G. Cai, Series on Contemporary China, vol 28. (Singapore: World Scientific Publishing, 2011), pp. 200-1.
Table 4: Central American Trade with China and Taiwan, 2001-2012

(a) Central American Exports to China ($ millions)

<table>
<thead>
<tr>
<th>Year</th>
<th>Costa Rica</th>
<th>El Salvador</th>
<th>Guatemala</th>
<th>Honduras</th>
<th>Nicaragua</th>
<th>Panama</th>
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<td>19.4</td>
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<td>36.7</td>
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<td>34.7</td>
<td>n.a</td>
<td>10.6</td>
<td>n.a</td>
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(b) Central American Exports to Taiwan ($ millions)

<table>
<thead>
<tr>
<th>Year</th>
<th>Costa Rica</th>
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<th>Guatemala</th>
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<th>Nicaragua</th>
<th>Panama</th>
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<td>16.4</td>
<td>7.5</td>
<td>26.8</td>
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<tr>
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<td>158.5</td>
<td>362.3</td>
<td>185.7</td>
<td>221.7</td>
<td>311.4</td>
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<td>111.3</td>
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<tr>
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<td>75.6</td>
<td>28.2</td>
<td>43.6</td>
<td>49.3</td>
</tr>
<tr>
<td>2011</td>
<td>295.9</td>
<td>64.3</td>
<td>75.8</td>
<td>35.5</td>
<td>57.0</td>
<td>46.6</td>
</tr>
<tr>
<td>2012</td>
<td>395.2</td>
<td>15.8</td>
<td>73.4</td>
<td>38.9</td>
<td>57.6</td>
<td>40.0</td>
</tr>
</tbody>
</table>

Source: WITS Comtrade (for China Statistics) and Taiwan Bureau of Foreign Trade (for Taiwan statistics), 2013.

In light of the economic analysis of the structure of Central America's foreign trade presented here, it is difficult to see how normalized relations between Beijing and the Central American republics would have fundamentally changed the stakes for Chinese-Central American trade. That is, the principal Central American soft commodity exports have not experienced the same kind of price growth that hard commodities needed for Chinese industrialization have enjoyed. At the same time, more non-traditional exports from the region to China may not be impeded by the
diplomatic impasse. To the extent that ever more Central American exports come from affiliates of transnational corporations, particularly from the US, those TNC global value chains and clients have a lot to do with export destinations. That is particularly clear in the case of Costa Rica, where exports to Asia, notably including China and Taiwan, are closely linked to exports of microchips by Intel's plant in the country (established in 1997).

Nevertheless, diplomatic relations matter: Table 4 reveals that exports to both Taiwan and China are generally small in volume, though volatile from one year to the next, and that exports to Taiwan exceed those to China for most countries in most years. In 2012, Salvadoran and Nicaraguan exports to Taiwan were around five times as large as those to China. Perhaps most surprising, Costa Rica--the only country in the isthmus with a preferential trade agreement with China--continues to export more to Taiwan than to China.23

Would formal relations, and perhaps free trade agreements, have increased flows all that much? Given the poor complementarity between Central American supply and Chinese demand, and the small scale of Central American markets for Chinese sellers, it is not likely that diplomatic constraints were particularly binding on trade flows.

The relationship between free trade agreements (FTAs) and bilateral trade and investment flows, moreover, is not straightforward. Wise's analysis of the FTAs signed with China by Chile (2006) and Peru (2009) suggests that Chilean and Peruvian policy makers were not solely motivated by a desire to lower trade barriers.24 In exchange for securing the outflow of minerals exports sought by China, negotiators in Chile and Peru were able to protect some domestic sectors from competition with Chinese manufactured goods. Wise surmises that Chinese negotiators judged

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23 The figures in Table 4 may not be strictly comparable. The Chinese data come from the WITS/UN Comtrade data base, the data source for most international trade research; Taiwanese data in the Comtrade data base are spotty, so we have reported figures from Taiwan's Bureau of Trade.

24 Carol Wise, "Tratados de libre comercio al estilo chino: los TLC Chile-China y Perú-China," Apuntes: Revista de Ciencias Sociales 71 (2012); see also Wise's paper in this issue.
this a reasonable trade-off because of the relatively small size of the Latin American markets in question, and in light of the critical need of Chinese industry for the copper and iron exported by these countries. While the first consideration (small domestic market size) implies the possibility of some policy space for Central American trade negotiators, the second (vast supplies of critical mineral wealth) does not: Central American countries are not selling the primary products demanded by China.

The prospects for Central American bilateral FTAs with China are stalled diplomatically and hold little promise for high-value-added exports even if they were to be adopted. But early indicators of the sole FTA between China and a Central American country might nevertheless be cause for guarded optimism. Costa Rica joined Chile and Peru in the select group of Latin American countries having signed FTAs with China in 2011. Nevertheless, it is not clear that Costa Rica's dynamic trade with the People's Republic is a consequence of the FTA: Costa Rica's exports to China have arguably more to do with Intel's exports of microprocessors to China. Indeed, microprocessors constituted 20.6 percent of Costa Rican exports in 2013, making them the country's number one export overall. In 2012, Costa Rica's principal exports to China were processors and controllers (78 percent of total exports to China), followed by light sockets, plugs and power outlets (4.3 percent of total exports). The leading primary product exported to China, concentrated orange pulp, made up only 3.7 percent of the total. At this point, Costa Rica's export bundle in China is higher in technology, value added and manufactures than is Brazil's. It is early to draw definitive conclusions, but one wonders whether the China-Costa Rica FTA has given Costa Rica a "leg up" in participating in Chinese value chains.

How should Central American trade policy makers respond to China’s consolidation as a global driver of growth? Can trade with China be marshaled in support of productive transformation --

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26 Figures from the Costa Rican Foreign Trade Promotion Agency (PROCOMER), courtesy of the Costa Rican embassy in Washington DC.
the capacity of an economy to engage in structural change and higher productivity activities? Few Latin American economies have achieved this. Productivity levels in the region have remained stagnant for years and to a great extent this explains the low income of the region relative to the industrialized economies.  

Recent research has explored the relationship between export structure and productive transformation. The "product space" literature focuses on the "aggregate value" of exports as a way of categorizing relationships between export industries, in order to evaluate the export profile of a specific country over time. These researchers find that two dimensions in particular provide an informative perspective on the country’s positioning of itself in world trade. The degree of sophistication of a country’s export basket (EXPY in fig. 14) indicates the complexity of the goods the country exports. The second, capability, measures the variability of goods produced by a country, taking into account how frequently these goods are produced in other countries. In other words, the capability measure combines a measure of product diversification (how many goods are exported) with a measure of uniqueness (how different is the country’s export basket from the rest of the world). Both measures have been demonstrated to be statistically accurate predictors of GDP growth in this empirical literature.

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29 For details in the estimation of the indexes, see Hausmann et al., "What You Export Matters", Jankowska et al., "The Product Space and the Middle-Income Trap," and the annex of this paper.

Figure 14. Export sophistication and capacity, various countries, 1965-2009

Note: Definitions of the variables provided in the text. See the Annex for more details.

Figure 14 depicts the relationship between EXPY (sophistication of exports) and the capabilities index (capacity to produce new products) for a number of selected economies between 1965 and 2009. The U.S. has particularly high values of both variables over many years; South Korea and Singapore have high values of both in recent years, after substantial increases in both dimensions over time.

The results for Central American countries are striking. Most countries of the region are concentrated in low-sophistication goods. However, the trajectories over time differ from country
to country, reflecting the heterogeneity within Central American trade often noted in this paper. In Costa Rica, and to some extent Guatemala, the level of sophistication of exports has increased between 1965 and 2009, with a concurrent fall in the capability index. Panama, on the other hand, experienced an increase in the sophistication of exports up to 2000, which decreased thereafter, together with its capability index (indeed, Panama in 1965 had higher values of both dimensions than any other Central American county-year observation in fig. 14). In the case of Nicaragua the increase in sophistication has not been accompanied by higher capabilities. The picture emerging from the product space methodology is that Central American countries have marginally increased the sophistication levels of their exports, but their capabilities remain low. This suggests that their capacity for upgrading towards high value-added goods is still constrained, even if the basket of goods they export is more diversified (fig. 5).

In the area of international trade, Central American countries face many of the same challenges today that they did before China's rise in the early 1990s. Some of these problems are more acute today perhaps than in the past due to China's emergence. These challenges include: i) high levels of specialization and for some countries, increased competition; ii) the low value-added and unsophisticated nature of their exports; and, iii) the ever slimmer prospects for product upgrading.

Policy makers have focused on horizontal policies, such as infrastructure and innovation, to tackle some of the challenges posed by the China effect. Better infrastructure, in particular, could contribute to the strengthening of Latin American countries' competitive trade position. Investment in infrastructure in most countries remains low, which undermines competitiveness. Policy makers have focused on horizontal policies, such as infrastructure and innovation, to tackle some of the challenges posed by the China effect. Better infrastructure, in particular, could contribute to the strengthening of Latin American countries' competitive trade position. Investment in infrastructure in most countries remains low, which undermines competitiveness.
reports that it takes longer or costs more (or both) to ship a container from some Latin American port to the U.S. than it does from China, because of poor quality infrastructure. The Logistics Performance Index (LPI) provides a snapshot of weak and strong points for countries in trade logistics, based on a survey of operators (global freight forwarders and express carriers). Most Central American countries score poorly in terms of competitiveness/logistics, and lag behind Southeast Asian economies like Vietnam, Thailand or Malaysia (fig. 15).

**Figure 15. Logistics Performance Index, 2012**

![Logistics Performance Index](image)


Despite the heterogeneity of countries' trade characteristics, the comparative analysis of export sophistication and capacity reveals a group of countries with low levels of both overall, tied to rather poor performance on the infrastructure and logistics side. This confirms the descriptive statistics introduced in Section 2, which depicted -- in spite of some changes in the composition of some countries' export baskets -- relatively high and unchanging concentration of export markets (i.e. the US) and of exported products. This somewhat disappointing performance in export sophistication and capacity, moreover, does not bode well in an environment of growing competition with Chinese goods in third markets, as analyzed in Section 3.
Conclusion

In the current debate surrounding China's impact on Latin American development, Central America seems doubly cursed: largely trapped in a trade structure of primary product export dominance, with relatively low value added; but at the same time not profiting from vigorous Chinese demand for its exports--unlike the South American countries--and perhaps suffering from Chinese competition, like Mexico. Our systematic assessment of Central America's trade, in the larger context of changing Latin American patterns of trade, uncovers a truth that is somewhat more nuanced than that pessimistic interpretation, but largely confirms that there is little in China's rise likely to benefit Central American countries at present.

Among the nuances in the story is the heterogeneity of Central American countries. In fact, the larger Latin American dichotomy of booming economies selling primary products to China on the one hand, and struggling manufactures exporters competing with China on the other, is partially reproduced in miniature among the countries of the isthmus. Only partially, though. There is a group of primary product exporters: coffee, sugar and bananas all dominate the goods exported by Guatemala, Honduras, Panama. Unlike the case of many of their South American counterparts, however, these exports are not in demand in China on a par with certain minerals or extensively farmed crops. Whether changing consumption patterns in the Chinese middle class, for

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example, will drive up demand for these Central American commodity exports in the medium to longer term remains to be seen.

There is also a group of mixed manufactures exporters: Costa Rica, El Salvador, Nicaragua. All of these countries also export primary products but have substantial industrial exports as well. Compared with Mexico, however (the textbook case of a country that suffers from competition with Chinese trade), the figures reported in this paper suggest that competition with China is not particularly acute (except for Guatemala and El Salvador).

China's booming growth certainly presents opportunities for some Central American businesses and some Central American investment projects, and there will be even more such opportunities in the future. But in the aggregate, Central America has largely remained on the sidelines of the explosion of China-Latin American trade and investment and it is quite likely to remain relegated to the sidelines. Changes in cross-strait tensions between Taipei and Beijing could, if anything, be bad news for Central American countries as Taipei's willingness to underwrite development projects is likely to flag even as Beijing is cool to diplomatic advances from Central America.

There remains, perhaps, one sphere of economic influence which is more diffuse and more difficult to detect, but this could have an impact on Central America's prospects. We refer to the increasing success of the Chinese development model in the marketplace of ideas, even supplanting the long-standing supremacy of the liberal "Washington Consensus" with a "Beijing

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33 Competition with China may be more pronounced than the statistics suggest: it could be that commodity prices, unusually high at present, obscure the degree of competition in other sectors such as textiles, in the computation of the various indices considered in Section 2.
More than a few policy makers and opinion leaders in Latin America have been emboldened by China's success to promote new development strategies in their own countries. While these challenges to the Washington Consensus orthodoxy resemble Chinese economic policy making imperfectly at best, they nevertheless represent a new willingness to innovate or at least dust off discarded policy prescriptions from the past. Among the measures under discussion are a more activist industrial policy and more generous social transfers. If these debates encourage Central American policy makers to consider productive and efficient alternatives to the low-value-added export-drive development model, that would be a beneficial--though quite indirect--consequence of China's rise.

In the meantime, though, the critical tasks for Central American development strategies are not fundamentally changed by the China factor. In terms of trade, lowering the cost of trade via infrastructure investments could stimulate existing trade relationships. More generally, the overarching economic policy priorities of all Latin American countries in the next decade are most certainly those of Central America as well: reducing economic inequality and its associated disastrous consequences and raising productivity.

34 John Williamson, who coined the term "Washington Consensus," considers the new policy prescriptions in "Is the Beijing Consensus Now Dominant?" Asia Policy 13 (2012).
Annex

A series of technical measures and concepts used in this paper are defined here for convenience.

**Coefficients of Specialization and Conformity**

Comparing trade structures is common means of studying the impact of trade on a specific economy. Coefficients of Specialization (CS) and Conformity (CC) have been developed to make such comparison, though their use has sometimes met with criticism in the trade literature. It has been noted that these indicators do not always account for the relative importance of each good in world markets and that the approach pays no attention to the size of the economies in question. Moreover, intra-industry trade in intermediate goods is not captured by a study of trade structures. To respond to these weaknesses, several alternatives have been envisaged, including a General Equilibrium framework assessing the trade impact and the use of a Revealed Comparative Advantage index accounting for differences in market size. It should be added that most of these approaches have reached similar conclusions.

This paper uses two different approaches for comparing trade structures. First, both CS and CC coefficients are calculated. Two modified indicators, using both exports and imports, are also proposed (namely CSm and CCm). Second, an indicator of relative comparative advantage (RCA) is constructed to verify the robustness of results.
The coefficients of Specialization (CS) and Conformity (CC) are traditionally calculated as follows:

\[ CS = 1 - \frac{1}{2} \sum \frac{a^n_i - a^n_j}{|a^n_i - a^n_j|} \]
\[ CC = \frac{\sum a^n_i a^n_j}{\sqrt{\sum (a^n_i)^2 \sum (a^n_j)^2}} \]

where \( a^n_i \) and \( a^n_j \) represents the share of good “n” in total exports of country \( i \) and \( j \) in period \( t \).

In the examples provided in this paper, China is measured against a sample of Latin American and other emerging economies. If two countries \((i,j)\) have exactly the same exporting structure, then both indexes are equal to 1 and potential trade competition is high. In the opposite case, if there is no coincidence, both indexes equal 0. To ensure consistent results, two separate indexes are employed. Coefficients are calculated yearly for the period 2000-2005. The data source is Comtrade (UNCTAD, World Integrated Trade System) and the three-digit Standard International Trade Classification (Revision 3) has been used.

**Relative Comparative Advantage Index**

The Vollrath Relative Comparative Advantage (RCA) Index\(^{37}\) is calculated as follows:

\[ RCA_{i,j}^c = \ln(RXA_{i,j}^c) - \ln(RMA_{i,j}^c) \]

where

\[ RXA_{i,j}^c = \frac{(X_{i,j}^c)/(X^{c,-}_{i,j})}{(X^{c,+}_{i,j})/(X_{i,j}^{c,-})} \]
\[ RMA_{i,j}^c = \frac{(M_{i,j}^c)/(M^{c,-}_{i,j})}{(M^{c,+}_{i,j})/(M_{i,j}^{c,-})} \]

The term $X_{c,t}^s$ represents the exports of country $c$ in sector $s$ at time $t$, $X_{c,t}^{s,s}$ represents the exports of country $c$ in all sectors except $s$, at time $t$, and successively. The Vollrath RCA index addresses some of the flaws found in other indexes (e.g. the Balassa index of revealed comparative advantage), especially because it takes into account both supply and demand sides on each sector. A positive value of Vollrath’s index reveals a comparative advantage whereas negative values indicate a comparative disadvantage.

**Herfindahl-Hirschmann Index**

The Herfindahl-Hirschmann index is calculated as follows:\(^{38}\)

$$HH = \left( \frac{\sum_{j=1}^{n} p_j^2 - \frac{1}{n}}{1 - \frac{1}{n}} \right)$$

where $p_j = \frac{x_{ij}}{X_i}$ represents the market share of country $j$ on the exports of country $i$ in its total exports ($X_i$). The squared-sum of all shares in also known as the Herfindahl-Hirschmann Index. Given that shares are weighted by the number of observations, the Herfindahl-Hirschmann index is adopted, allowing to compare different sets of goods and destinations.

**Index of Comparative Threat**

Following Jenkins (2008), the index of competitive threat (ICT) is defined as the share of exports in a country's export basket in which China is globally competitive. To define which are the products in which China is competitive, we consider those products where China’s exports (to the world) have grown faster than the countries exports (to the world). This differs slightly with

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\(^{38}\) We follow Mikio Kuwayama and José Durán, "La calidad de la inserción internacional de América Latina y el Caribe en el comercio mundial," *CEPAL Serie Comercio Internacional*, No. 26 (Santiago: Comisión Económica para América Latina y el Caribe, May 2003).
Jenkins’ definition of Dynamic Index of Competitive Threat (DICT), to the extent that it does not compare China to world exports, but to the country’s exports. In this way, the indicator highlights those products where China has surpassed, in growth rate, the country’s exports.

**PRODY and EXPY indexes**

The PRODY and EXPY, two key concepts in the product space literature, are two basic measures of sophistication for a product or for a set of products. For the PRODY, the index is composed of a weighted average of the per capita GDP of the countries that export it, weighted by the RCA (relative comparative advantage) of that country and product. In other words, the PRODY represents “the income level associated with that product”. A high PRODY corresponds to goods that are exported by high-income countries. The indicator is calculated as:

$$Prody_i = \sum_c [RCA_{ci} \cdot GDP_c]$$

with $x_{ci}$ being the total exports $i$ in country $c$, and $X_c$ the total value of exports for country $c$.

The EXPY is an estimate of the degree of sophistication of a country’s export basket. The definition of EXPY corresponds to a weighted average of the PRODY of the goods exported by a country, weighting by the relative export shares$^{39}$.

$$Expy_c = \sum_i \left[ \frac{x_{ci}}{X_c} \right] Prody_i$$

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$^{39}$ The definition is derived from that used by Hausmann et al., "What You Export Matters".
Both the PRODY and EXPY are used in the product space literature to determine which products (and which countries’ export basket) contains a higher degree of sophistication.

Capabilities

In the product space literature, the notion of capability is derived from two main concepts: the diversity of goods of a country’s export basket and the ubiquity of the goods it produces. The first concept is related to the diversification of exports of the country, already discussed above. The more products a given country exports, the more abundant capabilities are in that country. The second concept measures the “rareness” of the goods that the country is exporting in comparison to world exports. The less ubiquitous a good is, the more capabilities the country has for producing this good. Products that are exported by relatively few countries, i.e. are not very ubiquitous, seem to require many or very particular capabilities.

Using the “method of reflections”, these two sources of information are combined using a bipartite network representation of countries and products, in which countries and products are connected if a country has an RCA greater than one in that product category.

\[
K_{c,0} = \sum_p M_{cp}
\]

\[
K_{p,0} = \sum_c M_{cp}
\]

\[
K_{c,N} = \frac{1}{K_{c,0}} \sum_p M_{cp} K_{p,N-1}
\]

See also A. C. Hidalgo and R. Hausmann, "The building blocks of economic complexity", and Jankowska et al., "The Product Space and the Middle-Income Trap".

A. C. Hidalgo and R. Hausmann, "The building blocks of economic complexity".
\[ K_{p,N} = \frac{1}{K_{p,0}} \sum_{c} M_{cp}K_{c,N-1} \]

The iteration of the above equations provides information about product sophistication and country capabilities. The values are normalized afterwards (a zero capability value indicates that the country has the same capabilities as the world average).