



Distinctive Patterns & Prospects in China-Latin: America Trade, 1999-2005

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Authors:
*Alexander B.
Hammer and
James
A. Kilpatrick¹*

Abstract

This paper examines significant China-Latin America trade patterns that have emerged between 1999 and 2005, and assesses implications of these developments on these trading partners' future economic relationship. We show that China's iron, copper, and soybean imports from Latin America have become increasingly concentrated; that China and Latin America are rapidly becoming interconnected on telecommunications and computer manufacturing supply chains, with China supplying parts for assembly in Latin America; and that Chinese-made electronic and textile consumer goods have rapidly penetrated Latin American markets. The implications of our findings suggest that while there are many benefits of deeper economic integration to both sides, the vulnerabilities are likely to be predominantly borne by China's Latin American trading partners.

¹ Alexander B. Hammer (alexander.hammer@usitc.gov) is an International Trade Economist in the Office of Economics, and Dr. James Kilpatrick is an economist at the Central Intelligence Agency. The views presented in this article are solely those of the authors, and do not necessarily represent the position of the USITC, CIA, or the U.S. Government.

Introduction

China's merchandise trade balance with Latin America fell from a \$2.2 billion surplus in 1999 to a \$3.3 billion deficit in 2005. While the magnitude of bilateral trade remained small relative to China's global trade flows,² it has represented an increasingly important source of economic growth for many Latin American countries. Moreover, the progressive widening and restructuring composition of China's trade deficit with Latin America since 1999 are suggestive of important new trade phenomena that warrant deeper analysis.

Our objective is to understand emerging trade patterns between China and Latin America since the acceleration of their bilateral trade flows starting in 1999, and to identify possible implications of such developments on these trading partners' future economic relationship. Using highly disaggregated trade data from official Chinese and Latin American sources,³ we identify the following prominent trade patterns:

Key Trade Patterns

Commodity trade

China's imports from Latin America have become increasingly concentrated in a few commodities —iron, copper, and soybeans— which have helped fuel China's rapid industrialization and rising standards of living. Latin American firms have recently benefitted from quantity and price increases associated with growing demand from China as a dominant global purchaser. Moreover, increased trading among Chinese and Latin American state and para-statal enterprises, as well as volatility in global commodity markets, have added new dimensions to the evolving trade relationship.

² China's exports and imports to/from Latin America constituted a 3-4 percent share of its global trade flows between 1999 and 2005.

³ As reported through the World Trade Atlas at the 8-digit Harmonized System (HS) level of classification. Analysis was primarily conducted on Chinese official data, given the need for a consistent, highly detailed set of information.

Global supply chain integration

China and Latin America have become increasingly integrated on global supply chains, particularly in the manufacturing of electrical products, such as mobile phones and computers. China's fastest growing exports to the region are "parts for assembly" for Latin American factories. This trend is differentiated from China's well established supply chain relationships in East Asia, where China has typically remained at the final stage of the assembly process (Bergsten et al. 2006, 89).

Consumer goods

China's other dominant exports—cheap electronic and textile consumer goods—have also recently surged on Latin American markets, and have helped meet growing demand from an increasingly prosperous Latin American consumer base.

Implications

China and Latin America will likely become more economically integrated in years to come. First, the rapid acceleration of China-Latin America trade is broadly reflective of China's emergence as a dominant actor in global trade, and of Latin America's ability to adapt and take advantage of China's economic expansion. Second, China-Latin American trade is mostly complementary in nature, based on the two sides' contrasting resource endowments. While there are exceptions to this—most notably in Mexico and Panama where competition from China has challenged labor-intensive, export-oriented textile industries—basic Heckscher-Ohlin principles nevertheless generally prevail. Third, the volume of bilateral trade remains relatively small thus far, leaving considerable room for growth. Finally, both China and Latin America represent growing economies that are likely to exhibit sustained demand for the products that currently dominate bilateral trade.

Many actors stand to benefit from deeper bilateral economic integration, including sellers of Latin American raw materials, certain Latin American telecommunication and computer manufacturers, Latin American and Chinese consumers, and Chinese primary goods importers. Latin America's disproportionate increase in exports, however, suggests that its economies may be more susceptible to risks associated with deeper bilateral economic integration.

Paper Structure

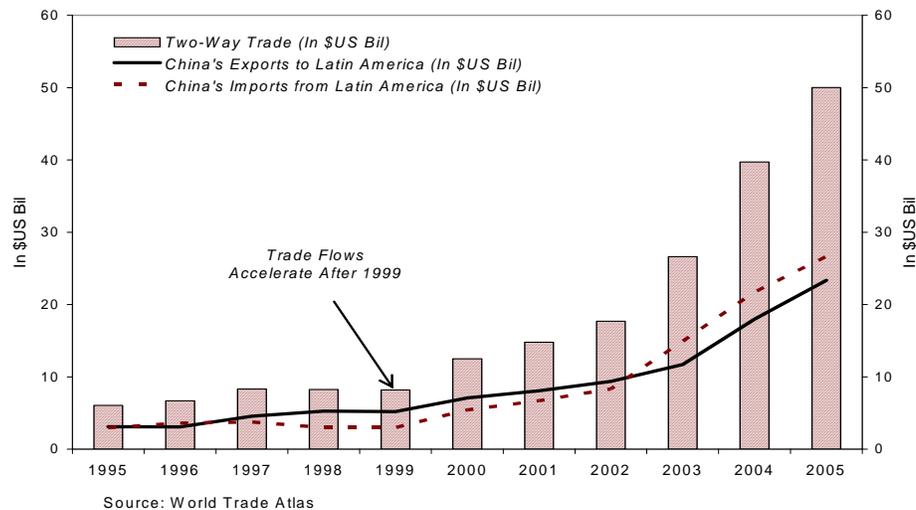
Part II exposes overarching patterns in China-Latin America bilateral trade. Part III then decomposes China's imports from Latin America according to country, commodity, and country-commodity sources. Using a similar methodology, Part IV subsequently describes unfolding patterns in China's exports to Latin America. The final section adds context to our findings by highlighting future benefits and vulnerabilities associated with China-Latin America economic integration.

China-Latin American Bi-Directional Trade Flows

Trends

China's trade balance with Latin America fell from a \$2.2 billion surplus in 1999 to a \$3.3 billion deficit in 2005. As seen in figure 1, China's trade with Latin America accelerated after 1999, largely as a result of (1) China's increased market liberalization reforms in light of its impending 2001 accession to the WTO; (2) China's 1999-2003 construction boom, when consumption of

Figure 1 China's Trade with Latin America, 1995-2005



construction materials and imports of primary products surged;⁴ and (3) decreases in real raw material import prices China faced vis-à-vis Brazil—Latin America's largest economy—in the aftermath of Brazil's substantive 1999 and 2002 devaluations.⁵

China as a Rising Trade Partner

Since the beginning of the millennium, China has become a significant trading partner to all of Latin America's largest economies, joining the United States, Europe and other neighboring Latin American trading partners. While partially attributable to China's growing influence in global trade,⁶ China's rapid entry into the list of top Latin American trading partners constituted one of the few significant changes in Latin American trade patterns in recent history. Brazil and Mexico's top five trading partners, for example, remained relatively unchanged from 1995 to 2005, with the exception of China as a rising trade partner. While the United States has maintained its position as the most dominant trading partner in most of Latin America's countries, China's rapid growth has put it firmly into second or third place.

China's Major Latin American Trading Partners

Figure 2 highlights China's bilateral trade position vis-à-vis its largest Latin American trading partners in 1999 and 2005. China's growing trade deficit with Latin America has been primarily driven by its bilateral deficits vis-à-vis Brazil, Chile, and Argentina. In 2005, these deficits collectively amounted to \$10.4 billion. In 2005, China's growing trade deficit with Brazil, Chile, and Argentina was partially offset by its \$6.4 billion merchandise surplus with Mexico and Panama. Moreover, those Latin American countries that had a deficit vis-à-vis China in both years had greater deficits in 2005 compared to 1999, while those Latin American countries that had surpluses vis-à-vis China in both years had greater surpluses in 2005 relative to 1999.⁷

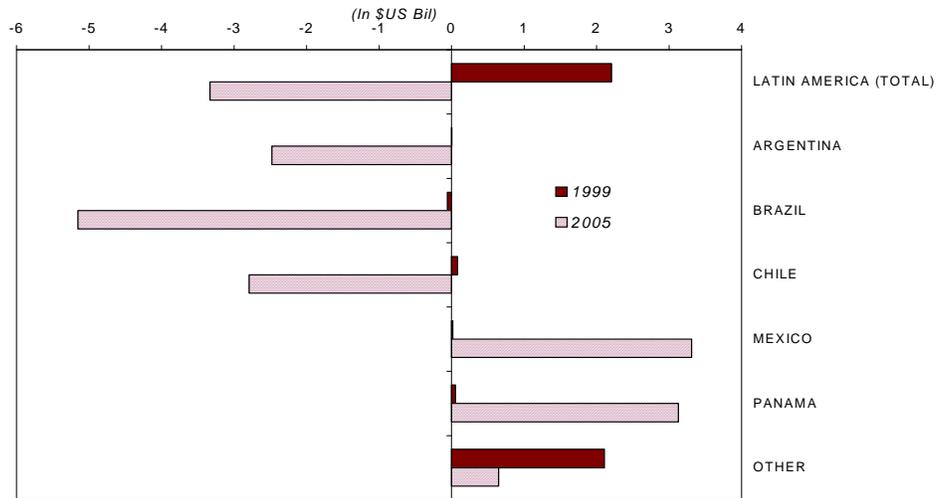
⁴ Based on construction starts, construction material consumption, and imported primary goods data collected from China's Bureau of Statistics.

⁵ Since China's exchange rate vis-à-vis the U.S. dollar was fixed during this period, changes in the yuan-real rate were reflective of changes in the dollar-real rate.

⁶ China has recently surpassed Japan as the world's third largest trading country.

⁷ The only exception to this was Chile. Surges in Chinese demand for Chilean copper after 1999 greatly contributed to China's growing bilateral trade deficit with Chile by 2005.

Figure 2 China's Bilateral Trade Positions In Latin America, 1999 and 2005



Source: World Trade Atlas

The Commodity Source of China's Trade Deficit with Latin America

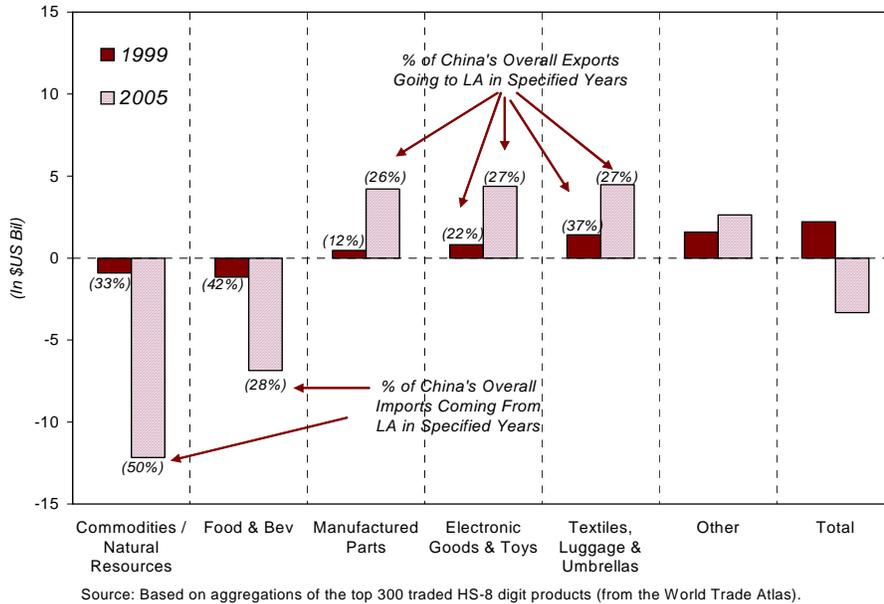
To identify what commodities have driven bilateral trade flows between China and Latin America, we decompose those flows into categories that broadly account for the most substantive portions of trade. The results can be seen in figure 3, which consolidates the top 300 Harmonized System's product categories (at the 8-digit level) traded between China and Latin America. As can be seen, China is not only trading manufactured parts, electronic goods, and textiles to Latin America in exchange for natural resources and food, but the magnitude of this trend has substantially grown since 1999, which help explains China's growing bilateral deficit with resource-rich Latin American countries.⁸

Asymmetric Influence

While China's trade with Latin America has accelerated in recent years, China's exports and imports to that region only represented 3 percent and 4 percent of its global exports and imports in 2005. Latin American countries, in contrast

⁸ For a similar approach, see Economic Commission for Latin America & Caribbean December 2005.

Figure 3 The Commodity Composition of China-Latin America Trade, 1999 and 2005



view China as an increasingly dominant trading partner. This imbalance in perspectives makes the economic impact of bilateral trade more significant to the individual Latin American economies, and less significant to China's economy.

Latin American's two largest economies, Mexico and Brazil, best exemplify this point. For Mexico, China is its second largest source of imports after the United States, having recently replaced its traditional partner Brazil. For Brazil, China is close to replacing Argentina and Germany as its second largest source of imports.⁹ Although Mexico and Brazil are China's largest export markets in Latin America, Mexico is only China's 23rd largest export destination, and Brazil is its 24th.

⁹ For the first 9 months of 2006, imports from China represented Brazil's 3rd largest country source (just behind Argentina).

China's Imports from Latin America

Context

Since 1999, China's import market has undergone a subtle, yet important transformation. While it was still predominantly dependant on imports from Asia (67 percent), Europe (11 percent) and the United States (7 percent) by 2005, the market has been increasingly influenced by robust growth from some of China's non-traditional trading partners. As seen in table 1, in decreasing order of magnitude, Asia, the Middle East, Latin America, and Africa have exhibited growth in their shares of China's import market since 1999, at the expense of both Europe and the United States. When crude oil is removed from these calculations —to remove the effect of global oil price increases — Asia and Latin America are shown to have contributed most positively to China's import market since 1999.

TABLE 1 Sources of Growth in China's Import Market, 1999 & 2005

| Region | Level (\$US Mil) | | Share of China's World Imports (%) | | Mkt-Share Change (%) |
|------------------------|------------------|------|------------------------------------|------|----------------------|
| | 1999 | 2005 | 1999 | 2005 | 1999-2005 |
| Asia | 102 | 442 | 62 | 67 | 5.1 |
| Middle East | 4 | 32 | 2 | 5 | 2.6 |
| <i>Excl. crude oil</i> | 1 | 9 | 1 | 1 | 0.6 |
| Latin America | 3 | 27 | 2 | 4 | 2.2 |
| <i>Excl. crude oil</i> | 3 | 25 | 2 | 4 | 2.1 |
| Africa | 2 | 21 | 1 | 3 | 1.8 |
| <i>Excl. crude oil</i> | 1 | 6 | 1 | 1 | 0.1 |
| Other | 9 | 16 | 5 | 2 | -3.0 |
| United States | 19 | 49 | 12 | 7 | -4.4 |
| Europe | 26 | 74 | 16 | 11 | -4.4 |
| World | 166 | 660 | 100 | 100 | 0.0 |

Source: World Trade Atlas.

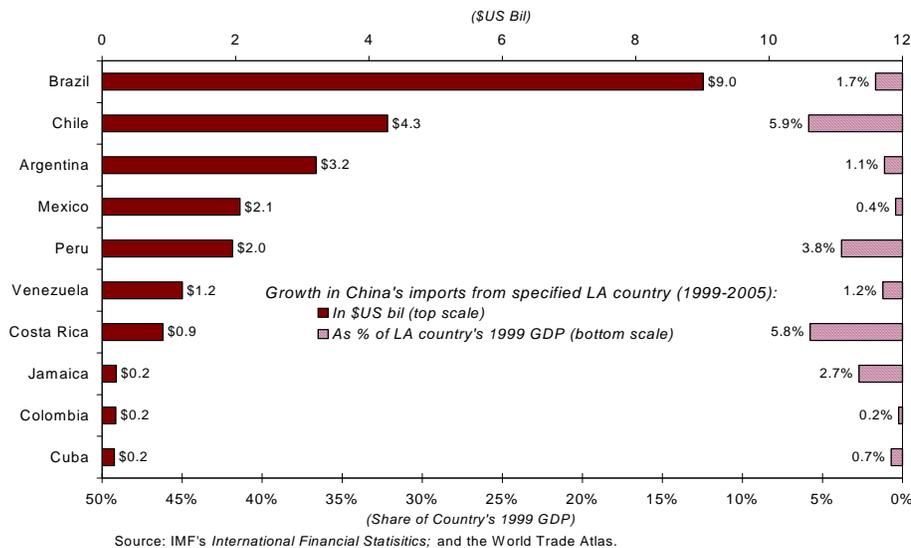
These developments illustrate two different phenomena. The first relates to Asia's large and growing dominance in China's import market, attributable mostly to other Asian firms sending intermediary parts for assembly into China for re-exportation. The second, which is central to our analysis, is the rapid growth of China's non-oil imports from Latin America, mostly in the form of raw materials being used to fuel China's dynamically growing economy.

By-Country Decomposition of China's Import Growth from Latin America, 1999-2005

China's imports from Latin America grew from \$3 billion in 1999 to \$27 billion in 2005, and represented 2 percent and 4 percent of China's import market in 1999 and 2005, respectively (see table 1). Imports from Latin America primarily derived from Brazil (38 percent of China's total Latin American imports), Chile (19 percent), and Argentina (14 percent) in 2005, and that composition has remained broadly unchanged since 1999.¹⁰ Figure 4 shows the largest sources of China's import growth from Latin America between 1999 and 2005, and provides context by showing these gains relative to the individual Latin American countries' 1999 GDP levels. As can be seen, increased Latin American trade with China between 1999 and 2005 was the greatest relative to Chile, Costa Rica, and Peru's respective 1999 GDP levels.

China's increasing demand for soybeans, iron ore, and copper from Latin America, is consistent with China's increasing global demand for these commodities. For example, China's demand for soybeans — a land-intensive agricultural commodity that is difficult to grow domestically— currently accounts for 40 percent of world soybean imports, and is primarily used to

Figure 4 China's Import Growth from Latin America, 1999 and 2005



¹⁰ With the exception of Argentina, whose share of China's imports from Latin America fell from 20 percent in 1999 to 14 percent in 2005.

satisfy increased Chinese demand for meat products¹¹. China is also the world's first (42 percent in 2004) and second largest (19 percent) importer of iron ore and copper, respectively. Iron ore is being sought in great quantities in China, to support steel production for the countries' booming construction sector, while copper is mainly used as an input in electrical products (e.g. wires, conductors in integrated circuits) and metal products (e.g. pipes, tubes, machine tools).

Table 2 identifies the major commodities (soybeans, iron ore, and copper) that led Chinese import growth from Latin America between 1999 and 2005. The table also shows that relative to 1999, China's 2005 imports of these commodities have become increasingly concentrated. To more accurately test China's deepening import concentration levels from Latin America, Herfindahl-Hirschman Index (HHI) was constructed using China's top 50 HS-8 digit imported commodities in 1999 and 2005.^{12, 13}

As can be seen in figure 5, not only are China's imports from Latin America becoming more concentrated, but China's global imports are following the same trend (albeit at a slower pace). While China's imports from Latin America are more concentrated than its world imports, the discrepancy has notably widened over the course of only six years.¹⁴ China's imports from Latin America have been less concentrated than China's imports from the Middle East and Africa (mostly world imports, the discrepancy between Latin America and the rest of the world has due to price and volume affects associated with China's crude oil imports). China's imports from Latin America have been more concentrated than its imports from the EU, OECD, U.S., East Asia, and, interestingly, the world's "least developed countries".

¹¹ Soybeans are crushed into soy meal, which is in turn used to feed the livestock used for human consumption.

¹²
$$HHI = \sum_{i=1}^{50} S_{ij}^2$$
 where:

s = Share of China's imports from Latin America;
i = China's top imported commodities (at the HS-8 level of classification); and
j = China's Latin American or world imports

¹³ Similar results were found using more aggregated HS commodity listings.

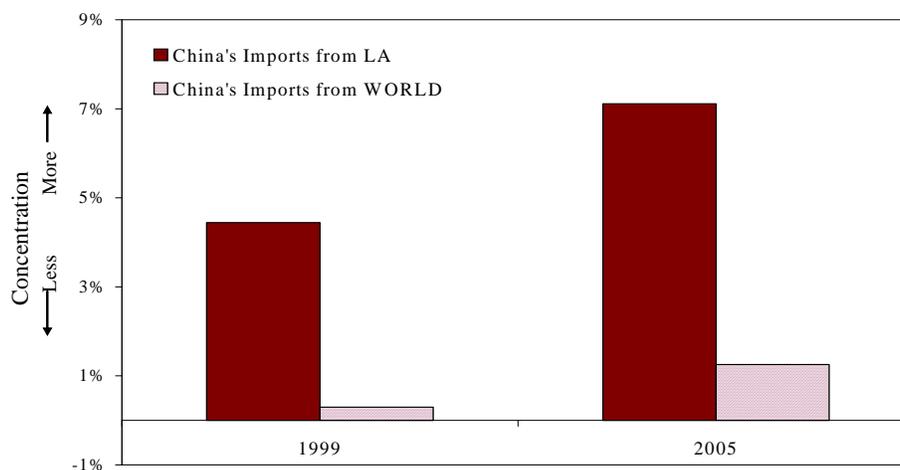
¹⁴ These conclusions are broadly consistent with similar HHI calculations done at more disaggregated levels of classification.

TABLE 2 China's Commodity Imports From Latin America, 1999 and 2005
(billions US dollars)

| | 1999 | 2005 | Difference | Difference as % of total export growth |
|---|--------------|---------------|---------------|--|
| Yellow soya beans | 308 | 4,612 | 4,304 | 18 |
| Non-agglomerated iron ores & concentrates | 262 | 3,748 | 3,485 | 15 |
| Copper ores & concentrates | 162 | 2,257 | 2,095 | 9 |
| Copper cathodes & sections of cathodes | 204 | 2,160 | 1,957 | 8 |
| Agglomerated iron ores & concentrates | 109 | 888 | 782 | 3 |
| Flours/fish meal, used in animal feeding | 215 | 929 | 722 | 3 |
| Crude soya-bean oil | 228 | 871 | 643 | 3 |
| Molybdenum ores & concentrates | 7 | 453 | 446 | 2 |
| Aluminum oxide, o/t artificial corundum | 8 | 307 | 317 | 1 |
| Semi bleached chemical wood pulp | 99 | 386 | 286 | 1 |
| Top 10 total | 1,602 | 16,611 | 15,037 | 63 |
| <i>In percent of total imports</i> | <i>54</i> | <i>62</i> | <i>...</i> | <i>...</i> |
| Other China imports from LA | 1,389 | 10,062 | 8,645 | ... |
| <i>In percent of total imports</i> | <i>46</i> | <i>38</i> | <i>...</i> | <i>...</i> |
| Total China Imports from LA | 2,991 | 26,673 | 23,682 | ... |

Source: World Trade Atlas.

Figure 5 Concentration of China's imports, 1999 and 2005



Source: World Trade Atlas; Calculations based on computed Herfindahl-Hirschman Index, Top 50 8-Digit commodities.

By-Country/By-Commodity Decomposition of China's Import Growth from Latin America, 1999-2005

The preceding sections identified Brazil, yellow soybeans, and iron ore as the principle sources of Latin America's robust export growth to China since 1999, though they have not necessarily implied that these developments were related. Table 3 below combines our findings to identify by-country, by-commodity drivers behind Latin America's exports to China. As can be seen, Brazilian iron ore and soybeans represented 20 percent of Latin America's overall export growth to China from 1999 to 2005. Meanwhile, yellow soybeans from Argentina, and copper from Chile also represented important growth drivers. All in all, the top 10 by-country, by 8-digit HS commodity exports represented a very large (55 percent) and growing share (by 10 percent since 1999) of Latin America's overall exports to China in the considered period. These findings further explain China's increasing import concentration levels from Latin America.

TABLE 3 China's Country and Commodity Imports from Latin America, 1999 and 2005 (million of US dollars)

| | 1999 | 2005 | Differ- ence | Difference as % of Total Export Growth |
|--|--------------|---------------|-----------------|--|
| Brazil: Non-agglom. iron ores & concentrates | 236 | 3,227 | 2,991 | 13 |
| Brazil: Yellow soya beans | 146 | 2,380 | 2,234 | 9 |
| Argentina: Yellow soya beans | 162 | 2,179 | 2,017 | 9 |
| Chile: Copper cathodes & sections | 204 | 2,013 | 1,809 | 8 |
| Chile: Copper ores & concentrates | 126 | 1,534 | 1,408 | 6 |
| Costa Rica: Other monolithic digital IC | 0 | 719 | 719 | 3 |
| Brazil: Agglom. iron ores & concentrates | 74 | 648 | 574 | 2 |
| Argentina: Crude soya-bean oil | 181 | 733 | 552 | 2 |
| Peru: Flours or meals of fish | 187 | 713 | 526 | 2 |
| Peru: Copper ores & concentrates | 37 | 534 | 497 | 2 |
| Top 10 Total | 1,352 | 14,680 | 13,328 | 56 |
| <i>In percent of total imports</i> | 45 | 55 | ... | ... |
| Other China Imports from LA | 1,639 | 11,993 | 10,354 | ... |
| <i>In percent of total imports</i> | 55 | 45 | ... | ... |
| Total China Imports from LA | 2,991 | 26,673 | 23,682 | ... |

Source: World Trade Atlas.

Empirical Testing

Our empirical findings of the commodity/country source of China's imports from Latin America are supported by firm-level developments. Press reports confirm Brazil's rapidly growing iron ore exports to China, and point to the industry-wide ramifications of surging trade, investment, and intra-firm price negotiations between Latin American and Chinese firms. For example, Brazilian iron ore companies, such as para-state giant Companhia Vale do Rio Doce, and large Chinese steel companies such as BaoSteel (The New York Times 2004), Aluminum Corporation of China (Forbes 2004), and Shougang (Brazil Magazine 2004) have dramatically increased joint operations and trading. Media reports also identify growing export dependence problems faced by Argentinean and Brazilian soy farmers in the face of surging sales to China (AP-Food Technology Online 2006) as well as new joint-ventures being formed by Chile's Codelco (the world's largest copper producer) and China's Mimetals mining company to secure future copper supplies (Bloomberg 2005).

China's Exports to Latin America

Context

China's \$23.3 billion in exports to Latin America represented only 3.1 percent of its total exports in 2005 (see table 4). Since 1999, China's average annual rate of export growth to Latin America has been 29 percent. Although its share of China's export market increased, the growth was less than China's export growth to other trade partners, most notably to the EU. Table 4 also highlights the fact that, since 1999, China has diversified its exports markets. Specifically, its exports to the EU and some of its smaller trading partners (Middle East, Latin America, Africa, "other") are constituting a progressively larger share of China's overall exports since 1999, at the expense of China's two top trading groups (Asia and the United States).

TABLE 4 Sources of Growth in China's Export Market, 1999 and 2005

| | Level (\$US Bil) | | Share of China's World Exports (%) | | Market Share Changes (%) |
|---------------|------------------|------|------------------------------------|-------|--------------------------|
| | 1999 | 2005 | 1999 | 2005 | 1999-2005 |
| Other | 0 | 20 | 0.0 | 2.6 | 2.6 |
| Europe | 32 | 144 | 16.5 | 18.9 | 2.4 |
| Middle East | 5 | 26 | 2.7 | 3.5 | 0.8 |
| Latin America | 5 | 23 | 2.7 | 3.1 | 0.4 |
| Africa | 4 | 19 | 2.1 | 2.5 | 0.3 |
| United States | 42 | 163 | 21.5 | 21.4 | -0.2 |
| Asia | 103 | 367 | 52.9 | 48.1 | -4.8 |
| World | 195 | 762 | 100.0 | 100.0 | 0.0 |

Source: World Trade Atlas.

By-Country Decomposition of China's Export to Latin America, 1999-2005

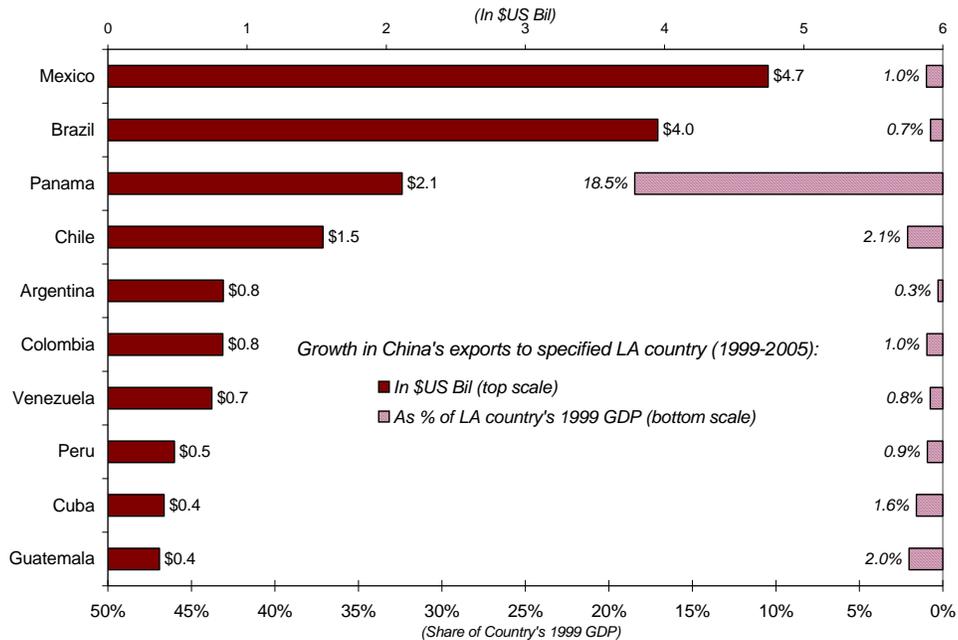
China's exports to Latin America grew from \$5 billion in 1999 to \$23 billion in 2005. Of these, Mexico, Brazil, Panama, and Chile, and Argentina constituted the 5 largest import markets for Chinese goods. Table 5 highlights the point that while the relative ranking of these countries as recipients of Chinese exports has not changed since 1999, the top 2's (Mexico and Brazil) share has increased, while the share in the remainder of countries in the top 5 (Panama, Chile, Argentina) has decreased. This trend suggests that Latin America's imports from China are becoming more concentrated.

TABLE 5 China's Exports to Latin America, 1999 & 2005

| | Level (\$US Bil) | | Share of China's LA Exports (%) | | Market Share Changes (%) |
|---------------|------------------|------|---------------------------------|-------|--------------------------|
| | 1999 | 2005 | 1999 | 2005 | 1999 - 2005 |
| Mexico | 0.8 | 5.5 | 15.2 | 23.7 | 8.5 |
| Brazil | 0.9 | 4.8 | 16.9 | 20.7 | 3.8 |
| Panama | 1.0 | 3.2 | 20.0 | 13.5 | -6.5 |
| Chile | 0.6 | 2.2 | 11.6 | 9.2 | -2.4 |
| Argentina | 0.5 | 1.3 | 9.5 | 5.7 | -3.9 |
| Other | 1.4 | 6.3 | 26.8 | 27.2 | 0.4 |
| Latin America | 5 | 23 | 100.0 | 100.0 | 0.0 |

Source: World Trade Atlas.

Figure 6 China's export growth to Latin America, 1999 and 2005



Source: IMF's *International Financial Statistics*; and the World Trade Atlas.

Figure 6 decomposed China's 1999-2005 export increases to Latin America according to major country recipient, while simultaneously expressing those values in terms of 1999 individual country GDP levels. Notable observations include the fact that (1) Mexico and Brazil are, as previously identified, the most important drivers of China's exports growth into Latin America; (2) Panama's import growth from China alone constituted a very high (19 percent) share of Panama's 1999 GDP;¹⁵ and (3) among the Latin American countries that do not re-export a majority of their exports in the Americas and/or Europe (all Latin American countries except Panama), Chinese imports had the biggest impact on the Chilean economy.

¹⁵ This supports anecdotal evidence that Panama is re-exporting many of its imports from China (given its location and transshipment trade practices).

By-Commodity Decomposition of China's Import Growth from Latin America, 1999-2005

By decomposing China's exports to Latin America by commodity composition in 1999 and 2005, two major themes emerge. First, the high values of textile and footwear related Chinese exports that were prevalent in Latin American markets in 1999 have been gradually replaced by Chinese electrical and non-electrical machinery exports, following China's global export trends. Second, China's exports to Latin America have been more concentrated than China's exports to world market, though this disparity has decreased (possibly suggesting convergence with what China maintains a competitive advantage in producing and selling).

Table 6 shows that, when considering the top 10 2-digit HS categories alone, textiles and footwear related products lost approximately 15 percentage points of their share of China's total exports to Latin America between 1999 (29 percent) and 2005 (13 percent). At the same time, China's electrical and non-electrical machinery exports to Latin America increased 11 percentage points between 1999 (22 percent) and 2005 (34 percent). This is consistent with China's broader trend of exporting more technically sophisticated machinery to world markets.

TABLE 6 China's Commodity Exports to Latin America, 1999 and 2005

| | 1999 | | 2005 | |
|---------------------------|--------------|------------|---------------|------------|
| | \$US | Share | \$US | Share |
| Total | 5,199 | 100 | 23,342 | 100 |
| Electrical machinery | 696 | 13 | 4,722 | 20 |
| Woven apparel | 583 | 11 | 3,114 | 13 |
| Machinery | 462 | 9 | 1,336 | 6 |
| Knit apparel | 336 | 6 | 1,085 | 5 |
| Footwear | 277 | 5 | 956 | 4 |
| Cotton + yarn, fabric | 172 | 3 | 915 | 4 |
| Toys and sports equip. | 169 | 3 | 868 | 4 |
| Vehicles, not railway | 154 | 3 | 828 | 4 |
| Organic chemicals | 151 | 3 | 619 | 3 |
| Leather art, saddle, bags | 128 | 2 | 545 | 2 |
| <i>Other</i> | 2,071 | 40 | 8,354 | 36 |
| Subtotal: | 1,496 | 29 | 3,120 | 13 |
| Textile + Footwear | | | | |
| Subtotal: Machinery | 1,158 | 22 | 7,836 | 34 |
| Top 10 HS2 | 3,128 | 60 | 14,988 | 64 |

Source: World Trade Atlas.

To understand what has been at the root of China's export growth to Latin America, we narrow our attention to the more detailed set of 8-digit commodity data, and assess where the changes in value between 1999 and 2005 have been the greatest. As can be seen in table 7, China's increased electrical and non-electrical machinery exports to Latin America have been essentially driven by a combination of manufacturing (e.g. mobile telephone and computer parts), and consumer goods (e.g. DVDs), which collectively constituted 8 percent of the overall growth in exports in the considered period.

As was done for China's imports from Latin America, a Herfindahl-Hirschman Index was constructed to test whether China's exports to Latin America are becoming more or less concentrated, using the top 50 traded HS-8 digit commodities. As can be seen in Figure 7, China's exports to Latin America are more concentrated than China's world exports in both considered years.

However, China's exports to Latin America have become less concentrated in 2005 relative to 1999,¹⁶ possibly reflecting convergence toward the production and selling of products in which China maintains a competitive advantage. Specifically, China's exports to world markets and Latin America are likely becoming increasingly similar and specialized in electrical and non-electrical machinery.

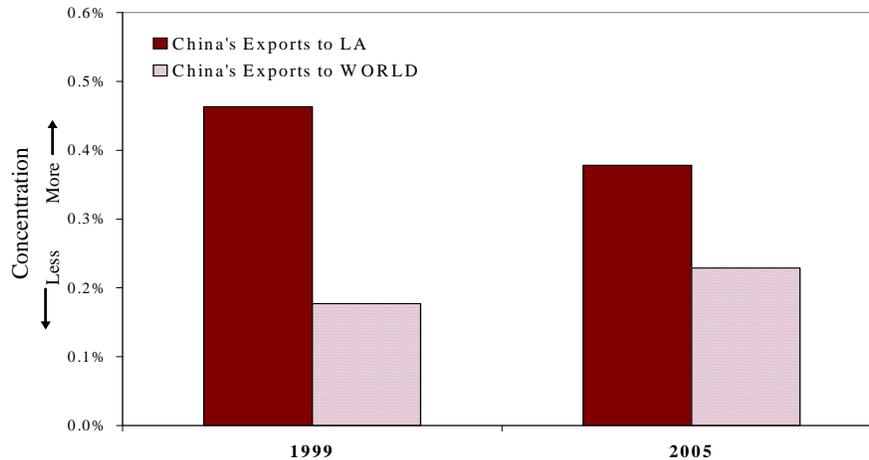
TABLE 7 China's Commodity Exports to Latin America, 1999 and 2005
(millions of US dollars)

| | 1999 | 2005 | Differ- ence | Difference as % of total export growth |
|---|--------------|---------------|-----------------|--|
| Parts for portable radio telephone | 9 | 616 | 607 | 3 |
| Digital Video Disc player | 0 | 507 | 507 | 3 |
| Parts/accessories for computers | 72 | 435 | 363 | 2 |
| Fuel oils (No. 5~7) | 0 | 348 | 348 | 2 |
| Female' cotton trousers and | 54 | 358 | 304 | 2 |
| Radio telephone handsets | 0 | 277 | 277 | 2 |
| Coke & semi-coke | 41 | 311 | 270 | 1 |
| Dyed woven fabrics of synth filament | 4 | 265 | 261 | 1 |
| Color film | 0 | 220 | 220 | 1 |
| Motorcycles, rec. inter piston engines | 0 | 213 | 213 | 1 |
| Top 10 Total | 180 | 3,550 | 3,770 | 19 |
| <i>In percent of total China exports to</i> | <i>3</i> | <i>15</i> | <i>...</i> | <i>...</i> |
| Other China Exports to LA | 5,019 | 19,792 | 14,772 | ... |
| <i>In percent of total China exports to</i> | <i>97</i> | <i>85</i> | <i>...</i> | <i>...</i> |
| Total China Exports to LA | 5,199 | 23,342 | 18,142 | ... |

Source: World Trade Atlas.

¹⁶ These conclusions are broadly consistent with similar HHI calculations done at more disaggregated levels of classification.

Figure 7 Concentration of China's exports, 1999 and 2005



Source: World Trade Atlas; Calculations based on computed Herfindahl-Hirschman Index, Top 50 8-Digit commodities.

By-Country/By-Commodity Decomposition of China's Import Growth from Latin America, 1999-2005

The preceding sections identified Mexico and Brazil, and electrical and non-electrical machinery to be the principle sources of China's robust export growth to Latin America since 1999. This did not necessarily suggest, however, that the two were related. The results of a by-country, by-commodity decomposition of China's export growth are presented in table 8. As can be seen, the largest sources of growth were China's exports of cell phone parts to Brazil and Mexico, which collectively accounted for 3 percent of China's overall export growth to Latin America over the considered period. Other important driving factors have been computer parts to Mexico and Brazil (2 percent of total Chinese export growth to Latin America from 1999 to 2005). The textile and footwear products exported by China to Panama, which collectively accounted for a little over 2 percent of China's overall exports to Latin America, are more difficult to analyze given their likely subsequent re-exportation to different destinations in the Americas.

One of our major findings is that China's exports of cell phone, computer parts, and DVD players, to Mexico and Brazil are among the largest sources of China's export growth to Latin America. To underscore this finding, we note that the share of China's total cell phone parts, computer components, and DVD player exports going to Mexico and Brazil (relative to China's worldwide exports of those products) is greater than China's share of Brazilian and Mexican exports (relative to China's world exports) for both considered years.

TABLE 8 China's Country & Commodity Exports From Latin America, 1999 and 2005 (million of dollars)

| | 1999 | 2005 | Difference | Difference as % of total export growth |
|---|--------------|---------------|---------------|--|
| Brazil: Parts for portable radio telephone sets | 9 | 380 | 371 | 2 |
| Mexico: Parts/accessories for computers | 0 | 248 | 248 | 1 |
| Brazil: Coke & semi-coke | 25 | 268 | 243 | 1 |
| Mexico: Parts for portable radio telephone sets | 0 | 236 | 236 | 1 |
| Panama: Female cotton trousers and breeches | 0 | 214 | 214 | 1 |
| Panama: Rubber/plastic footwear (not cover ankle) | 0 | 140 | 140 | 1 |
| Brazil: Parts/accessories for computers | 0 | 118 | 118 | 1 |
| Brazil: Dyed woven fabrics of synthetic filament yarn | 0 | 100 | 100 | 1 |
| Panama: Cotton T-shirts, knitted/crocheted | 0 | 88 | 88 | 0 |
| Mexico: Female cotton trousers/breeches | 0 | 83 | 83 | 0 |
| Top 10 total | 34 | 1,876 | 1,842 | 10 |
| <i>In percent of total LA imports</i> | <i>1</i> | <i>8</i> | <i>...</i> | <i>...</i> |
| Other China Imports from LA | 5,166 | 21,466 | 16,301 | ... |
| <i>In percent of total LA imports</i> | <i>99</i> | <i>92</i> | <i>...</i> | <i>...</i> |
| Total China exports to LA | 5,199 | 23,342 | 18,142 | ... |

Source: World Trade Atlas.

Empirical Testing

The identified empirical findings related to the commodity/country source of China's exports to Latin America are supported by firm-level developments. For example, data showing China's large and rapidly growing volume of cell phone component exports to Mexico and Brazil has been supported by press reports claiming that Chinese cell phone manufactures, such as Huawei and ZTE, have been selling low-cost equipment to many of Brazil's and Mexico's telecommunication firms for local production. These exports include both low and high-technology (e.g. digital loop carriers,¹⁷ mobile telecommunication systems,¹⁸ and personal handphone systems¹⁹) component sales to such companies as Brazil's Tele Norte Leste Participacoes SA (TNE) and Mexico's

¹⁷ Digital loop technology allows users to simultaneously use voice, data, and video options on mobile devices.

¹⁸ Used to incorporate broadband services to mobile phones.

¹⁹ A technology that offers network access in densely populated cities.

Telmex (Cowley 2005).²⁰ Moreover, China's ZTE has reportedly made plans to establish local Mexican manufacturing plants for re-exportation into U.S. and Canadian markets, where Mexico has a free trade agreement (El Financiero 2004).

The described surges in China's computer component exports to Latin America have also gained widespread attention. Some press reports have confirmed China's recent export surges of these products to Brazil, such as through Lenovo's new alliance with Brazil's Solectreon to manufacture Thinkpads for the South American market (Volor Economico 2006). Most attention, however, has been focused on China's computer component exports to Guadalajara—Mexico's largest computer production cluster. This region produces nearly two-thirds of Mexico's computers, employs tens of thousands of local workers, and has greatly benefitted from FDI flows from the U.S., particularly those following NAFTA's establishment (Dedrick and Kraemer 1998, 2001). Most importantly, Guadalajara has been increasingly used as a final assembly and re-export platform from which computers are distributed throughout North America. While the very big multinationals have been relying on this re-export platform for several years, companies such as Lenovo (which recently bought IBM's line of personal computers) and LG have become increasingly aware of the advantages of manufacturing in Mexico. Despite higher wages in Mexico relative to China, Guadalajara's relative proximity to the U.S., Canadian, and Mexican end-markets, has been an important reason why Chinese and other multinational companies have increased their manufacturing in this region. Shortening supply chains is often considered important in a high-technology computer industry, where time-sensitivity, rapid depreciation costs, and built-to-order trends increasingly drive sales (Dedrick and Kraemer 2001).

Anecdotal evidence also supports the observation that China's DVD player exports to Mexico and Brazil are surging. For example, China's TLC, which is one of the world's biggest manufacturers of electronic goods, recently established a very large and growing alliance with local distributors in Brazil, to both service the domestic market and re-export DVDs to the rest of South America. China's surge in DVD player exports to Latin America is not as striking as its surging exports of intermediary parts for cell phone and computer production, since China already produces a disproportionately large share of the world's DVD players (90 percent by 2004), and since Mexico and Brazil possess one of the wealthiest consumer bases in Latin America (Gazeta Mercantil 2005 and SinoCast China IT Watch 2006).

²⁰ Chinese firms' operational expertise in servicing complex telecommunication infrastructure market is well suited for the Latin American market.

Implications of Economic Integration

This section highlights the implications of sustained economic integration between China and Latin America. It suggests that while there are many benefits of deeper economic integration to both sides, the vulnerabilities may be predominantly borne by the Latin American economies.

Bilateral Gains in China-LA Trade

The gains from deeper economic integration between China and Latin America are predominantly based on complementary resource endowments, as well as on economic growth and rising income levels on both sides of the Pacific. China's imports from Latin America can be seen as necessary in meeting its demand for goods produced from relatively abundant land and natural resources, while Latin America's imports can be viewed as meeting its demand for labor-intensive consumer and manufacturing products. China's economic growth seems likely to continue unabated through the medium-term, and it will continue to depend on minerals and food to sustain its industrialization and rising standards of living (in a similar way to what was shown in Figure 3).

Beneficiaries of Deeper Economic Integration

China's Exporters: By increasing manufacturing component exports, Chinese exporters diversify their sales away from final goods, while gaining access to Latin American markets that might otherwise be difficult to penetrate. China's increasing dominance in Latin American consumer products markets (e.g. electronics and clothing) also enable Chinese firms to extend their existing export markets to that region.

China's Importers: Chinese importers have recently diversified their sources of raw material imports, increasing their presence on world commodity markets. Large state-owned Chinese firms are consolidating vertically integrated supply chains to acquire critical raw materials such as iron and copper in exchange for long-term contracts and investments in Latin American mines, roads, ports, and other production and transport facilities. Moreover, many of these contracts have been signed with Latin American parastatal firms.

Latin American Exporters: Chinese demand for raw materials has helped resource rich Latin American exporters dramatically expand their sales. Given China's dominant position in global commodity markets, its increased demand affects both the volume and price of its needed commodities, which in turn greatly benefits countries such as Argentina, Brazil, and Chile. Specifically, the boom in Latin American exports has stimulated economic growth and employment in resource-rich countries, and enabled Latin American countries to diversify their export markets by adding China to their traditional United

States and European trading partners. Moreover, Latin American exporters in Mexico and Brazil are also benefiting from using cheaper Chinese inputs as components to their exports of electrical machinery products (e.g. mobile phones and computers).

Latin American Importers: Latin American importers and retailers of Chinese made consumer goods have also increased their sales, and Latin consumer welfare has likely benefitted from improved access to a broad range of inexpensive consumer goods. Booming imports of Chinese parts for final assembly present Latin American economies with new opportunities for specialization in production as part of multinationals' global supply chains for technologically sophisticated products. Although some countries, such as Mexico, are reported to have lost manufacturing plants and jobs to Chinese firms, some Latin American firms are benefiting from their ability to take advantage of this new supply chain and China's increasing dominance in sales to worldwide consumer markets.

Asymmetric Vulnerabilities in China-LA Trade

Economic integration between China and Latin America will likely deepen in the near to medium-term, given many of the associated benefits discussed above. Although both sides continue to be exposed to risks, our data suggests that the likelihood and potential impact of those risks are asymmetric. Specifically, China maybe less susceptible to problems associated with bilateral trade flows given its disproportionately smaller trade dependence on Latin America. The risk exposures are as follows—

China's Exporters: Possible threats faced by China's exporters could include a widespread recession in Latin America or protectionism that created effective barriers to Chinese sales. Both should reduce demand for Chinese consumer goods and manufacturing components. Since the volume of this trade relative to China's overall exports is small, any such drop in demand would likely have a minimal impact on China's overall economy.

China's Importers: China's importers could be vulnerable to supply-chain interruptions and spikes in commodity prices. However, it is not clear how much higher prices would slow China's economic growth, which has weathered recent surges in commodity prices without any significant slowdown. In particular, construction, which has driven much of China's demand for iron and copper, has continued to grow relatively unabated despite rising iron and copper prices. Moreover, China maintains diversified sources for its primary products (though less so than the past). Finally, China's well financed importers—many of which are large state enterprises whose high volume purchases give them considerable negotiating power in international

commodity markets—maintain fallback options to purchase commodities from world markets if Latin American supplies were disrupted.

Latin American Exporters: Latin American exporters, in contrast, are aware of the history of boom and bust in their primary product export markets. The Chinese government's ability to stockpile, coordinate cross-company import strategies, and attempt to drive down prices could exacerbate Latin American exporter vulnerabilities. Chinese investment in ports and other transportation facilities might also be cut back, since much current and planned investment is aimed at improving efficiency in ports, transportation, and other facilities for extraction of primary commodities. With China's imports heavily concentrated in a few primary products, any slackening in the pace of industrialization and construction could sharply reduce both the volume and price of Latin American exports.

Latin American Importers: Latin American importers appear potentially vulnerable to supply-chain problems. Multinational corporations might decide to relocate final assembly of cell phones to new locations to gain better lower labor costs, for example, or Chinese companies might stop supplying parts for assembly. Although these appear unlikely, given China's export diversification strategies and desire to enhance exports to the Western Hemisphere, it could impact manufacturing in the telecommunication sector of Latin America.

Conclusion

We have identified three major China-Latin America trade patterns emerging since the escalation of bilateral trade activities in 1999, and addressed potentially important implications of these developments on these trading partners' future economic relationship. Specifically, we show that (1) China's iron, copper, and soybean imports from Latin America have become increasingly concentrated; (2) China and Latin America have become more interconnected on telecommunications and computer manufacturing supply chains; and (3) that Chinese-made cheap electronic and textile products have increasingly penetrated the Latin American consumer market. We also address potential implications of deeper economic integration between the two trading partners. Latin America's disproportionate export dependence on China suggests that the risks associated with deeper integration may be predominantly borne by China's Latin American trading partners.

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