CHINA IN LATIN AMERICA: ENVIRONMENT AND DEVELOPMENT DIMENSIONS

Rebecca Ray[1]
Kevin P. Gallagher[2]

China's rise as an important market partner for Latin America and the Caribbean (LAC) brings to the forefront the importance of environmental and social safeguards in the region. China is now the most important export destination for South America, and the second destination of Latin America overall. But China's demand is heavily concentrated in just a few primary commodities: over two-thirds of LAC-China exports since 2009 were in just five categories: iron, oilseeds, copper (refined and unrefined), and crude petroleum. This concentration in commodities means that the LAC exports to China are much more environmentally intensive and prone to social conflicts than other LAC exports. On average, LAC exports to China generate about 15% more net greenhouse gas emissions, use about twice as much water, and support fewer jobs than other LAC exports, per million dollars of export revenue. In this context, it is extremely important for LAC governments and civil society groups to enforce and bolster their environmental and social safeguards. Fortunately, LAC has significant market power in the raw commodities it exports to China. So the region has room to prioritize the environmental and social protections around mining, or deforestation enforcement around soy production, without risk of losing China altogether in these items.

Keywords: China; Latin America; environment; social protection.

A CHINA NA AMÉRICA LATINA: DIMENSÕES AMBIENTAL E DE DESENVOLVIMENTO

A ascensão da China como um importante mercado parceiro para a América Latina e o Caribe (ALC) traz à tona a importância de salvaguardas ambientais e sociais na região. A China é hoje o destino mais importante das exportações da América do Sul, e o segundo da América Latina em geral. Contudo, a demanda chinesa está fortemente concentrada em poucos produtos primários: desde 2009, mais de dois terços das exportações ALC-China corresponderam a cinco categorias: ferro, sementes oleaginosas, cobre (refinado e não refinado) e petróleo bruto. Esta concentração em *commodities* significa que a pauta de exportações da ALC para a China é muito mais ambientalmente intensiva e propensa a conflitos sociais do que outras exportações da região. Em média, as exportações latinas para a China geram 15% a mais de emissões líquidas de gases de efeito estufa, cerca do dobro de água, e empregam menos pessoas comparativamente a outras exportações da região (em milhão de dólares em receitas de exportação). Neste contexto, é extremamente importante que governos da ALC e grupos da sociedade civil reforcem e façam cumprir salvaguardas ambientais e sociais. Felizmente, a ALC tem poder de mercado significativo nas *commodities* que exporta para a China. Assim, a região tem espaço para reforçar proteções ambientais e sociais no setor de mineração, ou contra o desmatamento, no caso da produção de soja, sem risco de minar a demanda China por estes itens.

Palavras-chave: China; América Latina; ambiente; proteção social.

1. Pre-doctoral fellow at Boston University's Global Economic Governance Initiative, where she coordinates the China's Global Reach Program. She is also a PhD student in development economics at the University of Massachusetts – Amherst. She holds an MA in international development from George Washington University in Washington, DC. Her fieldwork has included case studies in Ecuador, Nicaragua, and Canada.

2. Professor of global development policy at Boston University's Frank S. Pardee School of Global Studies. He co-directs the Global Economic Governance Initiative and the Global Development Policy Program. He has served as an advisor to the United States Environmental Protection Agency and the United Nations Conference on Trade and Development. He holds a PhD in international political economy from Tufts University.

CHINA EN LATINOAMÉRICA: DIMENSIONES DEL AMBIENTE Y DEL DESARROLLO

El ascenso de China como un mercado importante socio para América Latina y el Caribe (ALC) pone de manifiesto la importancia de las salvaguardias ambientales y sociales en la región. China es ahora el destino más importante de exportación para América del Sur y la segunda en América Latina en general. Sin embargo, la demanda china está muy concentrada en unos pocos productos primarios: desde el año 2009, más de dos tercios de las exportaciones de China y ALC fueron cinco categorías: hierro, semillas oleaginosas, cobre (refinado y sin refinar) y petróleo bruto. Esta concentración en materias primas significa que la agenda de las exportaciones de ALC hacia China es mucho más ambientalmente intensa y con tendencia a conflictos sociales que otras exportaciones de la región. En promedio, las exportaciones Latinas hacia China generan emisiones netas de 15% más de gases de efecto invernadero, sobre el agua dos veces, y emplean a menos personas en comparación con otras exportaciones de la región (en millones de dólares en ingresos de exportación). En este contexto, es muy importante que los gobiernos de ALC y los grupos de la sociedad civil fortalezcan y hagan cumplir las salvaguardas ambientales y sociales. Afortunadamente, ALC tiene un poder de mercado significativo en *commodities* que exporta a China. Por lo tanto, la región tiene margen para reforzar las salvaguardias ambientales y sociales en el sector de la minería, o estar en contra de la deforestación en el caso de la producción de soja, sin riesgo de socavar la demanda china por estos artículos.

Palabras clave: China; Latinoamérica; ambiente; protección social.

JEL: F18; N50; O13.

1 INTRODUCTION

In the 1990s China was barely a topic of economic conversation in Latin America but by the middle of the 2000s China became the number one trading partner with many of the region's largest economies. This new trend has sparked a significant policy discourse on the impact on the Latin American economies, on Latin American politics, and on the broader geopolitical implications especially those with the United States (Jenkins and Dussel-Peters, 2009; Gallagher and Porzecanski, 2010; Ahearn, 2011). On the economic front, in recent years much attention has focused on the fact that Chinese economic activity in the region tends to be concentrated in primary commodities sectors. Thus, subsequent analyses concerned the extent to which such concentration would be able to maintain long-run growth by threatening the economic diversification process. Relatively less attention has focused on the environmental and social implications of Chinese trade and investment in Latin American and the Caribbean (LAC).

This chapter aims to contribute to a new conversation on the environmental and social implications of Chinese trade and investment in LAC. To what extent is China a driver of environmental change in LAC? To what extent is Chinese economic activity contributing to employment growth in the region? How are these trends impacting local livelihoods, identities, and domestic politics? What might be the long-run implications for economic prosperity? This chapter provides an aggregate level analysis of the overall trends in LAC-China economic activity,

and provides analyses of the environmental and employment aspects of the relationship. China is a welcome new major economic partner for LAC, providing a new and strong market for LAC goods, especially when LAC's main markets had begun to wane. However, it is also clear that the nature of Chinese demand in LAC is in sectors that are of little value added, employment level, and that are endemically degrading to the environment. Moreover, natural resource based growth can accentuate long-standing tensions between rural and indigenous populations over livelihoods, land rights, and identity.

This chapter has six parts. Part two examines trends in LAC-China trade. Part three focuses on investment. Part four presents an aggregate-level analysis on the environmental aspects of China-LAC trade and investment. Part five conducts a similar analysis for employment growth. Part six summarizes the main findings and provides general lessons for future research and for policy-makers.

2 LAC EXPORTS TO CHINA IN CONTEXT

Latin America and the Caribbean (LAC) sent US$ 130.9 billion in exports to China in 2012 and have been growing significantly faster than LAC's exports to the world and than gross domestic product (GDP) in the 2000s. The vast majority of LAC exports to China are in primary commodities sectors. In turn, LAC has become a major destination for Chinese exports as well. Chinese exports are largely in industry and manufacturing, and are diversified across a variety of products.

Over half of LAC exports to China are in four major commodity groups. Table 1 shows that each of these four groups (refined copper, copper ores and concentrates, iron ore and concentrates, and soybeans and other oilseeds) saw substantial growth in 2012 between six and 37% by weight. Considered as a single group, they grew by 11.4%: nearly identical to their average annual growth rate over the five-year period of 2007-2012, of 11.7%. But the revenue from their sale grew by much less than the quantity exported, and actually declined for iron and copper ores and concentrates. Export revenue for all four groups combined was essentially flat, growing only 1.8%. This is a huge drop from the 18.9% average annual growth rate over the last five years. Behind the increase in export quantity and flat export revenue is a drop in the price of each kilogram exported. Three of the four groups saw a price decline, and together they fell by nearly 11%. In effect, LAC exporters were running in place in 2012: selling more goods but not seeing more revenue from the sales.[3]

3. Another possibility is worth mentioning: since each of these commodity groups contains several individual commodities, exports could also have shifted from more to less expensive items within each group.

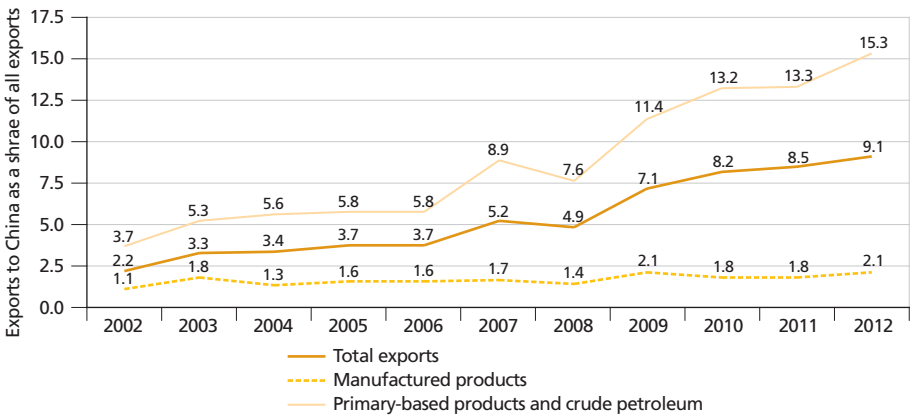
TABLE 1
LAC-China exports: annual growth in weight and value – top commodities
(In %)

	Growth in		
	Total weight (kg)	Total value	Price
	Annual growth (2012)		
Four major categories combined	*11.4*	*1.8*	*-10.7*
Copper (refined)	8.8	-2.0	-10.0
Copper (ores, concentrates)	36.9	23.5	-9.8
Iron (ores, concentrates)	11.9	-13.6	-22.8
Soybeans, other oilseeds	6.2	13.1	6.5
	Average annual growth (2007-2012)		
Four major categories combined	*11.7*	*18.9*	*6.4*
Copper (refined)	15.2	18.3	2.7
Copper (ores, concentrates)	10.3	12.7	2.2
Iron (ores, concentrates)	11.9	20.0	7.2
Soybeans, other oilseeds	10.5	21.5	10.0

Source: Undesa (2013).
Elaborated by the author.
Note: Price data are the change in weighted average price of LAC exports to China in a particular commodity category. They are not global commodity price changes.

China continues to grow in importance as an export market for LAC, even as LAC exports to China are slowing in absolute terms. Five years ago, China consumed about 5% of LAC exports, but by 2012 that figure nearly doubled to 9.1%. As figure 1 shows, that increase is due almost entirely to China's increased demand for raw materials from LAC. Since 2008, China has more than doubled its share of LAC exports of primary-based products, from 7.6% to 15.3%.[4]

FIGURE 1
Importance of China as an export destination for LAC exports, by category
(In %)



Source: Undesa (2013).
Elaborated by the author.
Note: Categories are defined using Sanjaya Lall's Technological Classification of Exports developed in Lall (2000).

4. Categories are defined using Sanjaya Lall's Technological Classification of Exports developed in Lall (2000). In addition to Lall's definition of primary-based products (processed and unprocessed mining and agricultural products) we have included crude petroleum oil.

China's increasing importance as an export market for primary-based products is particularly visible for the region's major exporters of metals: Brazil, Chile, and Peru. China imported about one-fourth of each of these countries' total primary-based exports in 2012, up from between 14% and 17% in 2008. Because the primary-based category represents over half of each of these countries' exports, China has become a particularly important overall export market for them.

TABLE 2
China's share of LAC primary-based and petroleum exports (2008-2012)
(In %)

	2008	2009	2010	2011	2012
			LAC region		
All exports	4.9	7.1	8.2	8.5	9.1
PRBP + crude oil	7.6	11.4	13.2	13.3	15.3
			Brazil		
All exports	14.4	16.5	18.2	18.0	14.4
PRBP + crude oil	14.2	20.3	22.9	25.2	25.0
			Chile		
All exports	13.5	24.2	24.8	23.3	23.6
PRBP + crude oil	15.1	26.9	27.3	25.9	26.3
			Peru		
All exports	12.1	15.5	15.7	15.5	17.3
PRBP + crude oil	17.0	24.1	22.5	22.1	24.9

Source: Undesa (2013).
Elaborated by the author.
Note: Categories are defined using Sanjaya Lall's Technological Classification of Exports developed in Lall (2000).

As noted above, a few commodities dominate LAC exports to China. In turn, a few countries dominate the export market to China for each of these commodities. Table 3 shows that since 2008, 70% of LAC exports to China have come from just six sectors in two or three countries each. This concentration in a few, mostly unrefined exports, exposes the region to global commodity price swings like the ones mentioned above.

TABLE 3
LAC exports to China by commodity (2008-2012)

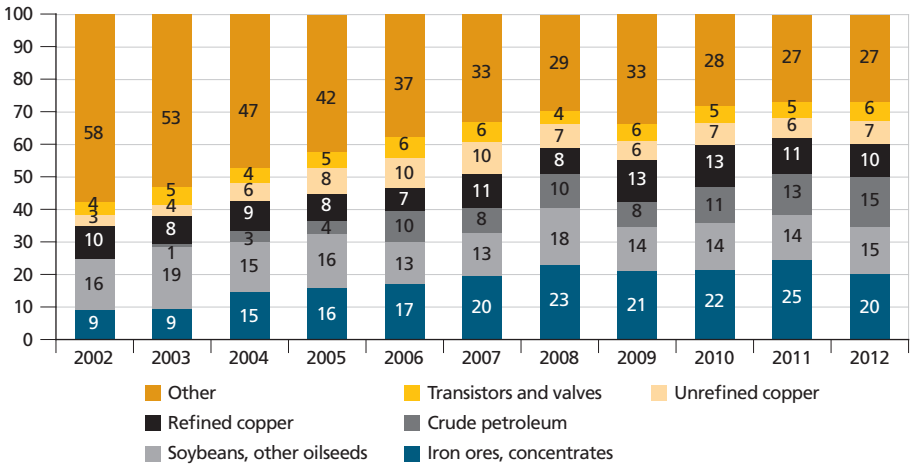
Sector	Share (%)	Country share of LAC-exports in sector
Iron ore, concentrates	22.1	Brazil (86%).
Soybeans, other oilseeds	14.7	Brazil (67%), Argentina (28%).
Crude petroleum	11.9	Venezuela (46%), Brazil (29%), Colombia (10%).
Refined copper	10.9	Chile (92%).
Copper ores, concentrates	6.9	Chile (51%), Peru (32%), Mexico (13%).
Transistors and valves	5.1	Costa Rica (82%), Mexico (17%).
Total	**71.6**	**-**

Source: Undesa (2013).
Elaborated by the author.

Over the last ten years, these six commodities have grown in importance among LAC-China exports. As figure 2 shows, they have expanded from less than

half of regional exports to China in 2002 to nearly three-fourths in 2012. They have made up over 70% of total exports to China for four of the past five years.

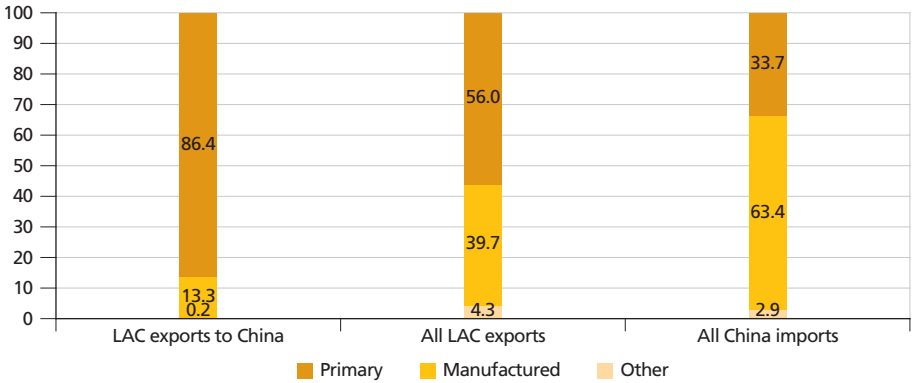
FIGURE 2
Distribution of LAC-China exports among major commodities (2002-2012)
(In %)



Source: Undesa (2013).
Elaborated by the author.

This heavy emphasis on primary materials is not reflected in LAC exports overall. In fact, from 2008 to 2012 manufactured goods made up about 40% of LAC's exports to the world, as figure 3 shows. Nor is it reflected in China's overall imports, which are mostly manufactured. So the importance of primary materials in LAC exports to China is especially notable, because it is unique for both parties.

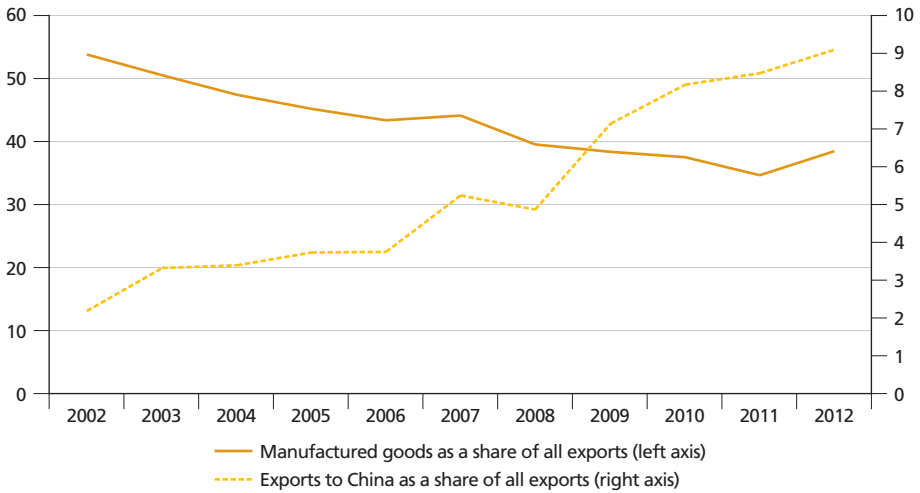
FIGURE 3
LAC exports of goods to China compared to all LAC exports of goods and all China imports of goods, by category (2008-2012)



Source: Undesa (2013).
Elaborated by the author.

In fact, as China has grown in importance as an LAC export market, manufactured goods have fallen in importance, as shown in figure 4. LAC exports have gone increasingly to China, from 3.3% of LAC exports in 2002 to 9.1% in 2012, and have simultaneously become more concentrated in primary goods. In 2002, manufactured goods made up a small majority of LAC exports; by 2011 they had fallen to about one-third, before rising slightly in 2012 to 38%.

FIGURE 4
Manufactured exports and exports to China as a share of total LAC exports
(In %)



Source: Undesa (2013).
Elaborated by the author.
Note: Manufactured exports are defined using Sanjaya Lall's Technological Classification of Exports developed in Lall (2000).

Significant attention has been paid to these latter trends. Since the 1930s LAC has tried various means to diversify its economies from primary commodities. By the turn of the century more than half of all LAC exports were in the manufacturing sector. By 2012 however the share of manufacturing exports to total exports dipped to less than 40% as China's share of all LAC exports increased. There is pressure on two levels. Chinese manufacturing producers are outcompeting LAC producers in LAC markets and in markets across the world (Gallagher and Porzecanski, 2010).

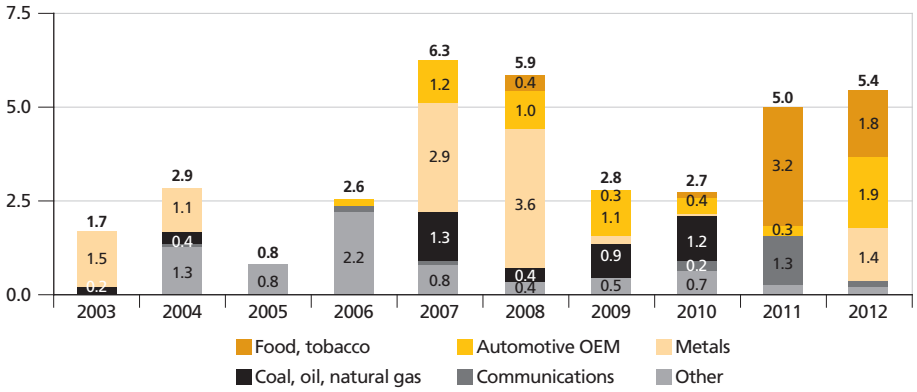
3 FOREIGN INVESTMENT: FIRMS AND FINANCE

LAC is also a growing recipient of investment and finance from China, and such investment tends to track similar sectors as LAC exports to China. While Chinese investment in the region is still relatively small, it appears to be growing fast. The LAC region received US$ 174.5 billion in foreign direct investment (FDI) flows in 2012; of that,

China accounted for US$ 9.2 billion, or 5.3% of the total.[5] FDI contains two major components: new "greenfield" projects and mergers and acquisitions (M&A) flows. Greenfield projects make up slightly less than half of total FDI flows, but are arguably more important, as they involve growing the region's capital stock. Both types of Chinese investment in LAC, discussed in detail below, show the same concentration among sectors and countries as LAC exports to China.

Greenfield FDI flows from China to LAC have grown recently, but remain relatively small and are very concentrated. They amounted to US$ 3.7 billion in 2012, or about 5.4% of all greenfield inflows (US$ 68.3 billion). As figure 5 shows, their distribution across sectors changed dramatically between 2010 and 2012. Between 2010 and 2011 agriculture went from a minor category to the most important FDI target, due to a US$ 2.5 billion project by the Chongqing Grain Group growing and processing soybeans in Bahia, Brazil and a separate agreement of over US$ 1 billion by Heilongjiang Beidahuang raising grain and oilseeds in Rio Negro, Argentina. In 2012 automotive replacement parts (OEM, for original equipment manufacturer) took the top place, spread across five smaller projects in Brazil and Paraguay. Nonetheless, agriculture continued to be an important sector in 2012, with another deal by the Chongqing Grain Group of over US$ 1 billion in Argentina. Of course, it is still too early to determine whether either of these changes will become a trend. But the suddenness with which Chinese food and tobacco investments overtook other sectors is certainly noteworthy and capable of changing the FDI landscape.[6]

FIGURE 5
Chinese greenfield FDI in LAC, by sector, as a share of total LAC greenfield inflows
(In %)



Source: FDIMarkets (2013).
Elaborated by the author.

5. These figures come from Eclac (2013a; 2013b).
6. For more on the developing importance of agricultural FDI from China to LAC, see Myers (2013).

This new Chinese investment in the food and tobacco sector has all gone to two countries: Argentina and Brazil. China has invested nearly the same amount of money in the sector in both Argentina and Brazil (49% and 51% of the total, respectively) since 2008, though this figure is a much larger portion of Argentina's total FDI. In fact, China has been responsible for over three-fourths of all agricultural greenfields inflows into Argentina since 2008, and in Brazil it has been responsible for slightly less than half.

Overall, Chinese greenfield FDI has become increasingly concentrated among the five major industries shown in figure 5 (food and tobacco; automotive OEM; metals; coal, oil and natural gas; and communications), regardless of shifts between them. These five sectors made up over 95% of all Chinese greenfield inflows in 2012, up from an average of 89% over the previous five years and 83% since 2003.[7] In contrast, global greenfield inflows to the LAC region has gotten slightly more diversified over the same period. The five major industries in figure 6 represented 65% of total FDI inflows in 2012, down from an average of 68% during the previous five years and 70% since 2003.

Like export revenue, greenfield flows from China to LAC are highly concentrated among countries as well as sectors. Table 5 shows the geographical distribution since 2008 for the five major industries of greenfield flows listed above: food and tobacco; automotive OEM; metals; coal, oil and natural gas; and communications. These five sectors have comprised over 90% of flows for the last five years, and are focused in a handful of countries each. Most of the information in table 4 will not be surprising to Latin America observers, but a few points merit highlighting. Among metals investment, the Chinese firm Bosai Minerals has invested US$ 1.3 billion in Guyana's aluminum industry since 2008 – about twice as much as Chinese inflows to Brazil's metals sectors (US$ 650 million from the Anshan Iron and Steel Group), even though the latter may be better known. Second, China's oil and natural gas investments in the LAC region are all under the auspices of the China National Petroleum Corporation (CNPC), but are differentiated by country: petroleum extraction in Venezuela and refining in Costa Rica, and natural, liquefied, and compressed gas manufacturing in Cuba. Finally, the automotive sector has a strong showing as Chery, Changan, and other Chinese companies have begun vying for the South American market.

7. These findings are largely in line with those by Dussel-Peters (2012), who finds that from 2000 to 2011, roughly two-thirds of Chinese OFDI (greenfields and M&A together) were in raw materials sectors.

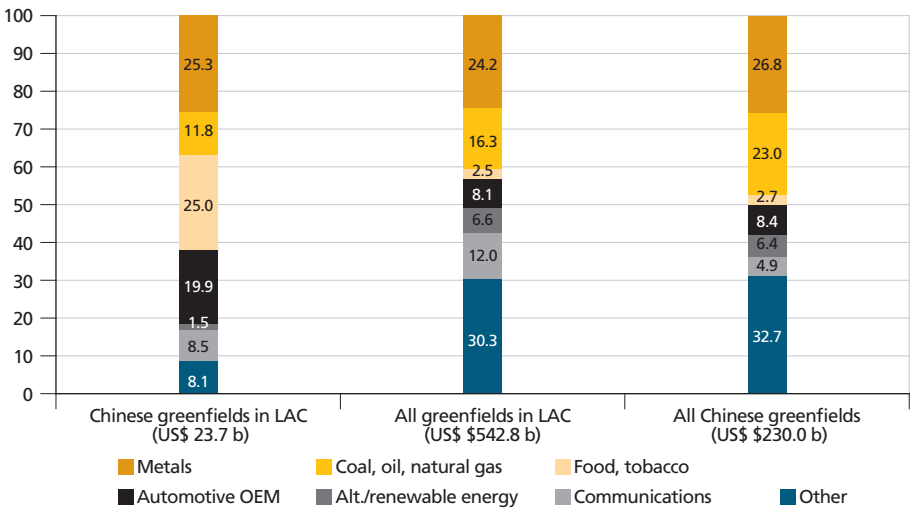
TABLE 4
Distribution of China-LAC greenfield FDI flows among industries (2008-2012)

Industry	China-LAC FDI (%)	Country share of industry FDI
Metals	25.3	Peru (65%), Guyana (22%), Brazil (11%).
Food & tobacco	25.0	Argentina (50%), Brazil (50%).
Automotive OEM	19.9	Brazil (56%), Mexico (18%), Argentina (14%).
Coal, oil, natural gas	11.8	Cuba (47%), Costa Rica (36%), Venezuela (17%).
Communications	8.5	Brazil (84%), Colombia (10%).
Total	**90.4**	**-**

Source: FDIMarkets (2013).
Elaborated by the author.

As with exports, the concentration of Chinese greenfield investment is unique to the China-LAC relationship. Overall greenfield inflows to LAC are much more diverse, as are overall greenfield *outflows* from China. Specifically, Chinese LAC investment is notable for its concentration in agriculture and automotive OEM. In other words, Chinese investors approach LAC not only as a potential provider of resources (as in agriculture) or as a potential market (as in the automotive sector), but as a more complex mix of the two.

FIGURE 6
Sector shares of Chinese greenfields in LAC, all greenfields in LAC, and all Chinese greenfields (2008-2012)
(In %)

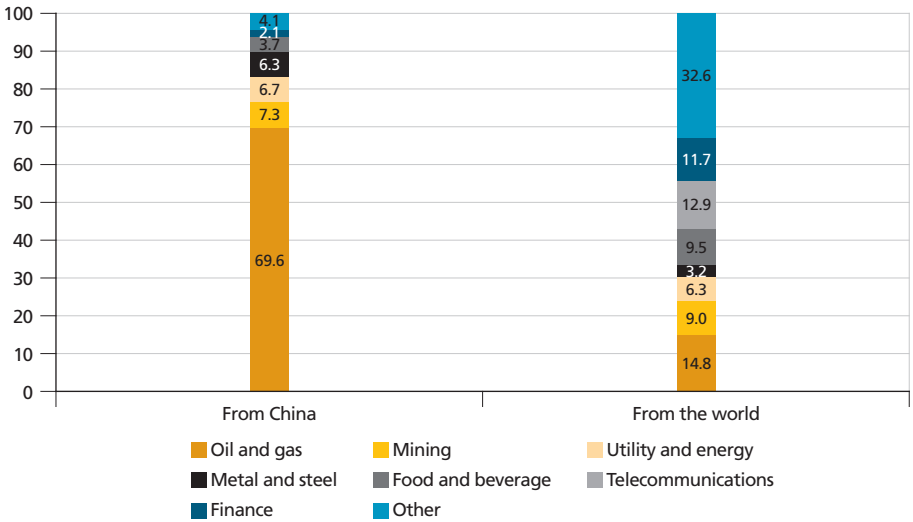


Source: FDIMarkets (2013).
Elaborated by the author.

The other major component of FDI, mergers and acquisitions, are notoriously difficult to measure in total scope (as many of the agreements occur in private, and payments can be made over several years) but it is still possible to look at the sector composition.

Mergers and acquisitions (M&A) inflows are distributed among the same major industries as greenfield FDI, but with an even greater concentration in the production of a few commodities. In this regard, Chinese M&A inflows are strikingly different from other M&A inflows to LAC, as figure 7 shows. While five sectors comprise over 95% of M&A inflows from China (and the overwhelming majority is concentrated in oil and gas), the same is not true of overall inbound M&A flows, in which the top seven industries make up only about two-thirds of the total.

FIGURE 7
Inflows from mergers and acquisitions, by industry (2008-2012)



Source: DeaLogic (2013).
Elaborated by the author.

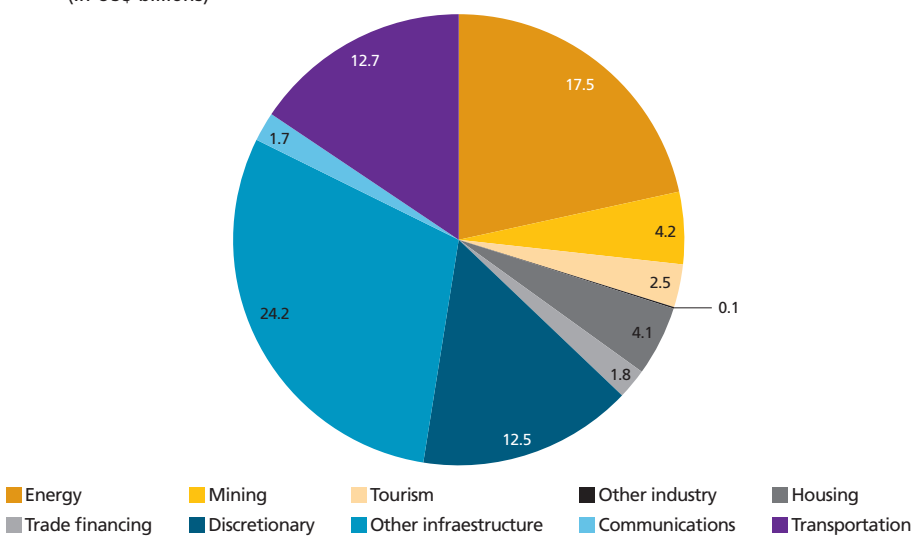
3.1 Financing

Another major aspect of China-LAC Economic Relations is that China continues to provide sovereign lending to Latin American governments. Boston University's Global Economic Governance Initiative and the Inter-American Dialogue (IAD) publish the annual China-Latin America Finance Database (IAD, 2013) that seeks to estimate annual inflows of Chinese sovereign lending to LAC governments on an annual basis. Largely provided by the China Development Bank (CDB) and the China Export-Import Bank (Ex-Im), estimates of 2012 lending

are US$ 6.8 billion in 2012, down from over twice that amount in 2011. It has fallen by over 80% since their peak in 2010, when it hit US$ 37 billion. However, CDB and Ex-Im loans to LAC governments tend to be lines of credit and thus a fall in new lines or loans may not necessarily represent a slowdown in new debt but rather that nations may need time to draw on existing lines of credit.

Because of the importance of multi-year lines of credit, it is more useful to look at the sector concentrations of earmarked lending over the entire five-year period rather than year-to-year changes. Figure 8 shows that infrastructure (shown in shades of tan) has accounted for nearly half of Chinese lending to the LAC region since 2008: US$ 38.6 billion. Energy and mining-related lending may have received more attention, but it represents a much smaller amount: just over a quarter of the total. Finally, discretionary finance has grown in importance, as will be discussed in more detail below.

FIGURE 8
Chinese lending to LAC, by target sector (2008-2012)
(In US$ billions)



Source: IAD (2013).
Elaborated by the author.

A few countries, and a few sectors, dominate the picture. Most importantly, Venezuelan infrastructure loans amounted to US$ 24 billion: nearly two-thirds of the all infrastructure financing from China to LAC. Argentina also saw important infrastructure funding, with four loans totaling US$ 11.8 billion for train systems, including high-speed rail and the Buenos Aires subway system. Among energy loans, Brazil borrowed much more than any other LAC country: two loans totaling

US$ 10.4 billion, both for pre-salt oil projects. Ecuador is next in the energy sector, borrowing US$ 5.1 billion, split nearly evenly between oil and hydropower projects.[8]

As mentioned above, the most recent agreements have shown a trend toward discretionary loans borrowers can use as they see fit, rather than earmarking the money specifically for infrastructure or industrial development. Of US$ 6.8 billion lent in 2012, US$ 6.0 billion was discretionary. In contrast, China has not made any loans specifically for mining since 2010.

However, Chinese loans are increasingly concentrated among borrowers. The only countries to take out more than US$ 1 billion in new Chinese loans in 2012 were Venezuela and Ecuador. They were also the most heavily represented among 2011 borrowers. This concentration is to be expected, given that these countries enjoy lower interest rates and more favorable terms in borrowing from China than from global bond markets.[9] China is increasingly providing Ecuador with public finance for its annual budget. Interestingly, citing this finance, Moody's has upgraded Ecuador's bond ratings two times and Ecuador may re-enter global capital markets in 2014. Another characteristic of Chinese finance is fairly unique: more than half of Chinese financing to LAC is to be repaid in oil, even if the funds themselves are not earmarked for that sector's development. However, in 2012 there does not appear to be any commodity-backed financing.

4 THE ENVIRONMENTAL DIMENSION OF CHINA AND LAC

Economic activity between LAC and China is more environmentally intensive than domestic economic activity in LAC and with LAC's trade with the rest of the world. Given that trade and investment with China have been among the fastest growing areas of economic activity in recent years, the environmental dimension of the LAC-China relationship deserves more attention.

Comprehensive and comparable environmental indicators are notoriously scarce in LAC and across emerging market and developing countries in general. However, since the 1990s, those nations that are signatories of the United Nations Framework Convention on Climate Change (UNFCCC) submit regular emissions inventories to enhance the global monitoring of climate change.

The UNFCCC governs and monitors carbon dioxide, methane, nitrous oxide, hydro fluorocarbons, perfluorocarbons, and other cases known to cause global climate change. While global climate change is certainly not the only or even the first

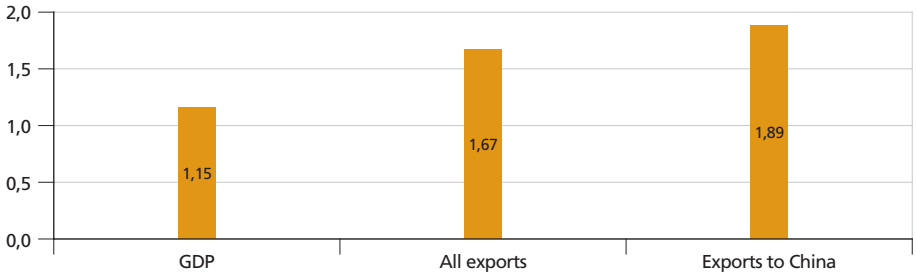
8. It bears noting that Ecuador and Venezuela both took out loans in which part was earmarked for oil and the remainder was discretionary. Only the earmarked portion is listed as energy-related here. As a result, these category distributions differ from those in IAD (2013).

9. For more on China's interest rate advantage for countries with less access to private bond markets, see Gallagher, Irwin and Koleski (2012).

priority environmental concern in LAC, indicators measuring greenhouse gas (GHG) emissions are useful for broader environmental analysis. First, the Inter-governmental Panel on Climate Change has introduced a methodology to convert the emissions of all GHG into one indicator, referred to as GHG emissions or their "carbon equivalent" (IPCC, 2006). Moreover, these gases are together emitted from a variety of types of economic activity such as energy use (carbon dioxide), industrial processes (carbon dioxide, nitrous oxides etc.), farming and forestry (carbon dioxide, methane, nitrous oxides). Therefore, GHG emissions data picks up the environmental impacts of energy, extraction, agriculture and forestry activities that not only cause climate change but also have many more localized environmental impacts such as toxic air and water pollution, land degradation, and so forth.

Extrapolating from the United Nations Environment Program (Unep), GHG emissions per dollar of GDP in LAC were 1.15 kg per dollar in 2005. This stands in contrast to OECD nations, where the GHG gas intensity for that year was 0.48 kg per dollar (Unep, 2010). Peters *et al.* (2011) undertook the laborious task of calibrating IPCC emissions intensities with world export data. According to Peters *et al.* (2011), data, the GHG emissions intensity of LAC exports is approximately 1.67 kg/dollar for LAC. For this chapter we calculated the GHG emissions intensity of LAC exports to China (see appendix for methodology), which is 1.89 kg/dollar. These data are exhibited in figure 9, and show that the GHG intensity of LAC exports to China are larger than the GHG intensity of the LAC economy as a whole and LAC exports as a whole and to the rest of the world.

FIGURE 9
LAC exports to China more GHG intensive
(In kg CO_2 equivalent per US$)



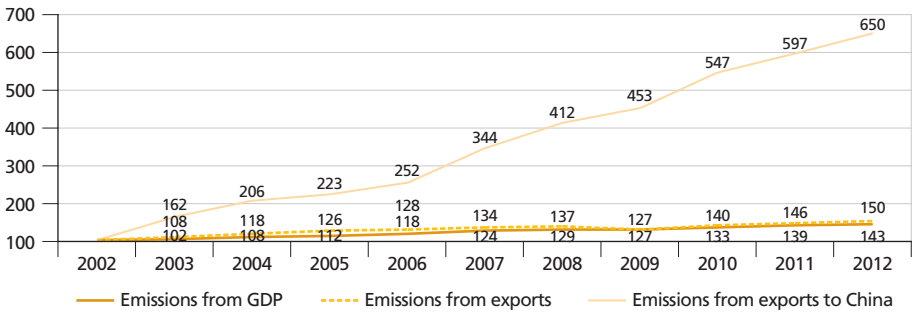
Source: Peters *et al*. (2011) and Undesa (2013).
Elaborated by the author.
Note: Data for GDP are for 2005, and those for exports are from 2004.

We estimate that in 2004, the LAC region emitted a total of 3,617 million metric tons of CO_2 equivalent, with 780 MMT of that amount emitted in

the production of exports, and 40 MMT from producing exports specifically for China. In other words, exports to China were responsible for 4.0% of LAC's export-related GHG emissions. This may seem like a modest portion, but it is disproportionately high relative to China's share of LAC exports (3.5%). Given that LAC exports are growing faster than GDP and that LAC exports are growing much faster than LAC exports as a whole, China is clearly demanding a more environmentally degrading basket of LAC exports than is the rest of the world. If such trends continue, Chinese demand will certainly be a driver of environmental degradation into the future.

Peters has estimated GHG emissions intensities for two years in our sample: 2004 and 2007. Applying the average intensity of all exports in those years to the levels of exports from 2002 to 2012, we estimate the growth in total emissions over that time period. Figure 10 shows the results: emissions from exports to China rose more than six-fold, while those from other exports and from overall economic activity both rose by about 50%. Of course, total exports to China grew tremendously in value during this time, but by much less. The real value of LAC-China exports grew by 398% from 2002 to 2012, while emissions from those exports grew at a rate roughly 60% higher.

FIGURE 10
Total GHG emissions (in CO2 equivalent) from various sources in LAC (2002-2012): indexed (2002 = 100)



Source: Ray *et al.* (2016).
Elaborated by the author.

After calculating the GHG intensity of LAC exports to the world, to China, and to the rest of the world, table 5 shows the share of the most GHG intensive economic activities in LAC for 2002 and 2012. The average GHG intensity in 2004 and 2007 is listed next to each sector. Since the average GHG intensity of all exports (shown in figure 7, above) was 1.67 kilogram of CO_2 equivalent per US$ 1, sectors with intensity levels above 1.67 exert upward pressure on the overall GHG intensity of exports. Those sectors are included in the last line of table 5.

TABLE 5
Distribution of LAC exports among Major Commodity Groups (with average CO_2/US$ intensities) by export market and year
(In %)

Sector (CO_2/US$)	All exports		Exports to China		Exports to RoW	
	2002	2012	2002	2012	2002	2012
Ranching (10.3)	1.8	4.1	4.4	5.3	1.8	4.0
Fossil fuel refining/distribution (3.6)	4.7	4.0	0.4	2.9	4.8	4.1
Farming, forestry, fishing (2.0)	14.9	22.3	33.9	27.4	14.5	21.9
Metal/mineral mining (1.9)	11.0	14.2	30.5	35.7	10.6	12.5
Fossil fuel extraction (1.5)	14.2	14.6	0.1	14.4	14.5	14.6
Manufacturing (0.8)	52.1	39.3	30.3	14.0	52.5	41.3
Not specified	1.2	1.5	0.5	0.3	1.3	1.6
Most GHG – intensive	*32.5*	*44.6*	*69.1*	*71.3*	*31.7*	*42.5*

Source: Ray *et al.* (2016).
Elaborated by the author.
Note: Fossil fuel extraction includes coal, oil, and natural gas; fossil fuel refining/distribution includes refined and manufactured petroleum, natural gas, and coal products; ranching includes meat, livestock, dairy products, and wool.

Five sectors have GHG emissions intensities above the emissions intensity of the LAC economies as a whole. Ranching is the most GHG gas intensive because of both the de-forestation and methane emissions, as is agriculture. Fossil Fuel refining is also significantly GHG intensive, at 3.6 kg/dollar, mining is fairly GHG intensive at 1.9 kg/dollar. Fossil fuel extraction is not as GHG intensive in LAC because it may not always include large amounts of deforestation and the energy intensity of extraction is not relatively large. Manufacturing is the least GHG intensive in LAC because LAC does not produce relatively large amounts of heavy goods, but rather lighter manufacturing.

Table 5 shows that in both 2002 and 2012 the share of Chinese exports in GHG intensive sectors has been significantly larger than the share of exports to the rest of the world. In 2012, just over 71% of LAC exports to China were in the more GHG intensive sectors, whereas just 42.5% of exports to the rest of the world were concentrated in the most GHG intensive sectors. This is largely driven by the fact that LAC's biggest exports to the rest of the world are largely in crude petroleum (fossil fuel extraction) and in manufacturing. Table 6 shows that crude petroleum's GHG intensity is 1.5 kg/dollar and LAC's biggest manufacturing export sectors are all less than 1 kg/dollar.

Ranching (including production meat, dairy, livestock, and wool) is by far the highest GHG-intensity export sector. While it represents a small minority of total exports, demand from China was extremely important in its growth from 2002 to 2012, and concentrated in just a few exporting countries. Ranching grew from 1.8% to 4.0% of the LAC export basket from 2002 to 2012, and China accounted for 87.6% of the increase. In fact, over half of the total increase in ranching exports from LAC (53.4%) can be traced to Brazilian exports to China. Exports from Argentina and Uruguay to China each contributed an additional 8% of the total growth of this sector among all LAC exports.

China also accounted for the overwhelming majority (85.2%) of the increase in farming exports, which grew from 14.9% to 22.3% of all LAC exports between 2002 and 2012. As with ranching, Brazilian exports to China were the driving factor, accounting for 41.6% of the total increase in LAC farming exports. Argentine exports to China were also very important in this sector, contributing an additional 13.6% of its total growth.

The sector that is most clearly over-represented among LAC-China exports is mining. While it accounted for just 11% of all LAC exports in 2002, it accounted for nearly one-third of LAC exports to China. By 2012, mining had risen to 14% of all LAC exports, but 35.7% of exports to China. In fact, China accounted for over half (56.7%) of the increase in LAC mining exports from 2002 to 2012. This jump in Chinese demand for LAC mining exports was somewhat more diverse among exporting countries than ranching and farming, but Chile, Peru, and Mexico were all important in driving this overall increase. Chile (which supplies over 90% of LAC copper exports to China) saw its mining exports to China more than quadruple in real terms, accounting for 29.6% of the increase in overall LAC mining exports. Peru and Mexico (which supply China with less-refined copper ores and concentrates) also saw large jumps in mining exports to China, accounting together for about one-third of the entire growth in LAC mining exports over the decade. Finally, Brazil (which sells China nearly 90% of its imports of LAC iron ore and concentrates) saw its mining exports to China more than triple, accounting for an additional 14% of the region's mining export growth.

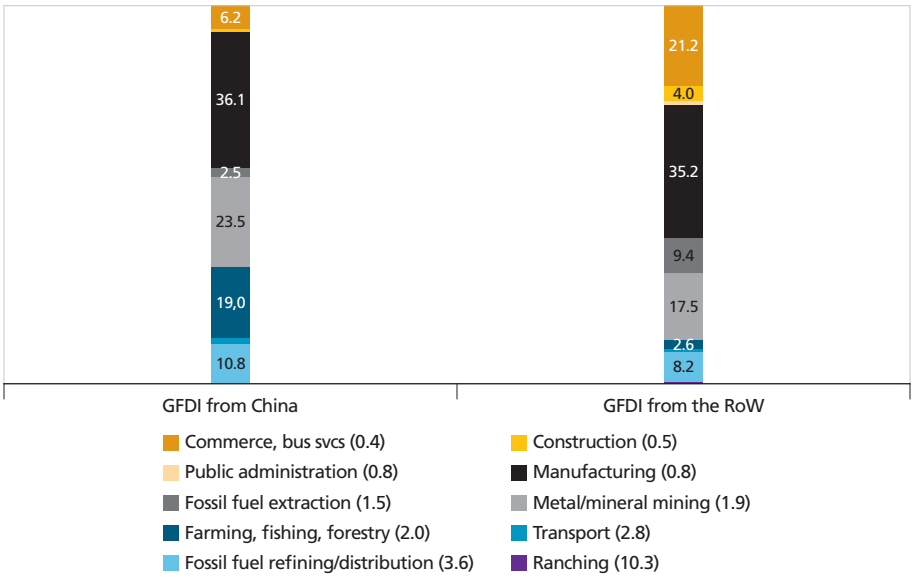
TABLE 6
GHG intensity of top LAC exports to world and China

	2002			2012		
	Share of exports (%)	Industry	Average GHG (kg/US$)	Share of exports (%)	Industry	Average GHG (kg/US$)
			Exports to China			
1	17.9	Oilseeds	1.3	23.9	Non-ferrous metals	1.4
2	15.4	Non-ferrous metals	1.4	18.6	Ferrous metals	2.6
3	13.9	Ferrous metals	2.6	18.5	Crude petroleum	1.5
4	7.0	Electronic equipment	0.6	14.6	Oilseeds	1.3
5	5.7	Miscellaneous food products	1.4	3.2	Petroleum, coal products	3.6
Sum:	*59.8*			*78.7*		
			All exports			
1	13.9	Crude petroleum	1.5	20.6	Crude petroleum	1.5
2	12.2	Electronic equipment	0.6	10.8	Non-ferrous metals	1.4
3	11.1	Machinery, equipment	0.7	8.3	Motor vehicles, parts	0.6
4	9.5	Motor vehicles, parts	0.6	8.1	Machinery, equipment	0.7
5	6.1	Chemicals, plastics, rubber	1.6	7.4	Electronic equipment	0.6
Sum:	*52.8*			*55.1*		

Source: Ray *et al.* (2016).
Elaborated by the author.

Chinese FDI also tends to concentrate in more GHG intensive sectors. As indicated earlier, data on Chinese FDI to LAC is relatively scarce and difficult to obtain on an annual level. Figure 11 below shows the sector breakdown for inbound greenfield FDI flows from 2003 to 2012. It includes four service sectors that are relevant to investment but not commodity exports: commerce and business services, construction, public administration, and transportation. Greenfield flows from China are clearly more heavily concentrated among high GHG-intensity sectors, especially agriculture.

FIGURE 11
Inbound greenfield FDI: distribution among major sectors (with average CO2/US$ intensities), by source country (2003-2012)
(In %)



Source: Ray *et al.* (2016).
Elaborated by the author.
Note: Fossil fuel extraction includes coal, oil, and natural gas; fossil fuel refining/distribution includes refined and manufactured petroleum, natural gas, and coal products; ranching includes meat, livestock, dairy products, and wool; public administration includes health, education, defense, water, and sanitation.

5 CHINA AND LATIN AMERICAN EMPLOYMENT PROSPECTS

This chapter has documented the rise in China-LAC economic activity, and has provided an aggregate analysis of the environmental impacts of China-LAC economic activity relative to LAC's engagement with the rest of the world. Analogous to the environmental analysis, how labor intensive are LAC exports relative to the labor

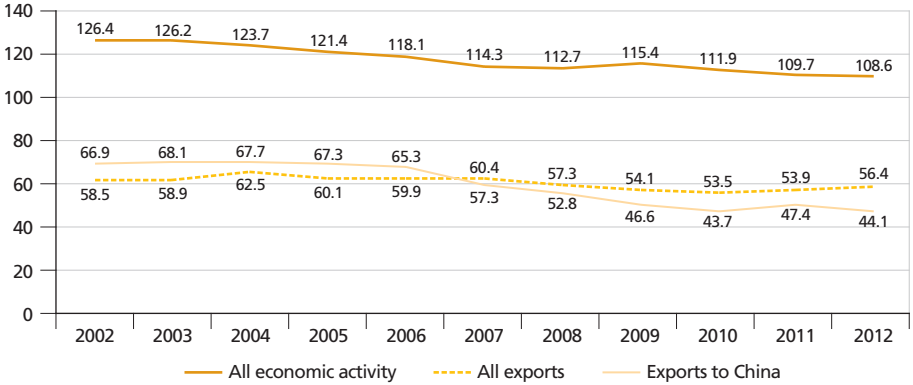
intensity of the LAC economies and their export basked? In addition, how much of the total change in jobs in LAC can be attributed to China?

We find that LAC's exports to China is significantly less labor intensive than than economic activity as a whole in LAC and has recently become less labor intensive than the general LAC export basket. We estimate that roughly 6.75 new jobs were supported in the LAC export sector between 2002 and 2012. China accounted for 12% of those jobs, almost totally in the agriculture and mining sectors.

From household survey data on employment and from sectorial national accounts, we estimate the average number of jobs supported by each country's agriculture, extraction, manufacturing, and other sectors, shown in figure 12, below. It is important to note that national accounts are an inadequate source on employment in agriculture, however, LAC export agriculture is strongly concentrated among a few products, including oilseeds and beef, which are much smaller shares of agriculture for the domestic market. To overcome this obstacle, we applied data on the labor intensity of each crop separately. This level of precise employment data was available only for Argentina, the largest source of agricultural exports from the LAC region. By applying Argentina's crop-specific labor intensity values to the appropriate exports from each country, we can reflect the differences in each country's agricultural export basket.

The environmental section of this chapter compared the average emissions intensity of all economic activity, all exports, and exports to China for 2005. This exercise merits repeating for labor, but in more detail in order to highlight changes during the decade. Figure 12 traces these values for every year from 2002 to 2012. LAC exports supported far fewer jobs per US$ 1 million of output than overall economic activity. Interestingly, exports to China began the period at a higher level of labor intensity than exports in general, but ended the period well below other exports. While exports in general supported between 56 and 61 jobs per US$ 1 million of output, exports to China lost over one fourth of their labor intensity, from supporting 66.9 to only 44.1 jobs per US$ 1 million of output. This result is not surprising given the shift in the LAC-China export basket toward a greater emphasis on extraction, which supports very few jobs. If China's importance as an LAC export market continues to grow, it will continue to exert downward pressure on the number of jobs supported by each US$ 1 million of exports. This decline in labor intensity creates a "running in place" effect, in which LAC must sell more exports in order to support the same number of jobs.

FIGURE 12
Labor intensity of GDP, exports, and exports to China (2002-2012)
(In jobs per US$ 1 million real – 2002 US$)



Source: Ray *et al.* (2016).
Elaborated by the author.

Of course, the amount of exports to China rose precipitously during this time, offsetting the fall in labor intensity. Figure 12 shows that total jobs supported by exports to China rose significantly from 2002 to 2012. As large as these gains may seem, however, it is important to note that they are dwarfed by the increase in their value. LAC-China exports nearly quadrupled in real terms from 2002 to 2012, rising by 398%. The number of jobs created by these exports, however, rose by 263%.

As the table below shows, extraction is by far the least labor-intensive of the three major economic sectors. Manufacturing is the highest on a regional level and in most countries, although in Mexico agricultural exports actually support more jobs per US$ 1 million.

TABLE 6
Average labor intensity of Latin American exports by country and sector
(In jobs per US$ 1 million real – 2002 US$)

	Jobs supported by each real (2002) US$ 1 million in exports		
	Agriculture	Extraction	Manufacturing
Argentina	30.3	9.8	66.8
Bolivia	153.2	89.2	366.5
Brazil	76.1	0.0	146.6
Chile	57.5	30.0	59.7
Colombia	48.6	33.9	142.4
Ecuador	48.8	21.8	110.9
Mexico	70.6	1.5	54.2
Peru	80.3	36.7	113.7
Latin America	**60.1**	**11.6**	**71.8**

Source: Ray *et al.* (2016).
Elaborated by the author.

From table 6, we see that Latin American exports to China have become increasingly concentrated in extraction, and much less concentrated in manufacturing, over the past decade. This trend explains the steep drop in labor intensity of Latin American exports to China shown in figure 12.

As table 7 shows, exports to China accounted for about 12% of all new export-related jobs in LAC between 2002 and 2012. These new jobs were also distributed differently from jobs associated with other exports. Among all exports, manufacturing created over five times as many jobs as agriculture, although exports to China created about the same number of jobs in each sector.

TABLE 7
New jobs arising from LAC exports, by sector and export market (2002-2012)

	World	China	Rest of world
	Millions of jobs		
Agriculture	0.96	0.33	0.64
Mining, extraction	0.63	0.19	0.44
Manufacturing	5.18	0.29	4.88
Other	-0.02	0.00	-0.02
Total	**6.75**	**0.81**	**5.95**
	New export-related jobs (%)		
Agriculture	14.3	4.8	9.5
Mining, extraction	9.3	2.7	6.6
Manufacturing	76.7	4.4	72.3
Other	-0.3	0.0	-0.3
Total	**100.0**	**11.9**	**88.1**

Source: Ray *et al.* (2016).
Elaborated by the author.

The bottom half of table 7 shows the percentage of new export-related jobs in LAC during the period under examination. The largest area of job growth was in manufacturing, even though manufacturing is a declining share of LAC exports. The areas of relatively weaker job growth were in mining, extraction and agriculture. This is concerning given the enormous rise in the value of exports in those sectors relative to the rest of LAC's export basked and given that such sectors are what drives LAC-China trade.

Figure 9, which shows the distribution of inbound greenfield FDI flows by sector according to source, shows a somewhat different story. FDI flows occur in fewer, larger, increments than trade flows, so the data do not support analysis of annual trends. However, over the entire decade, it is clear that Chinese greenfield FDI inflows to Latin America actually emphasize manufacturing *more* than FDI inflows from

other countries, as Chinese companies have established facilities aimed at domestic sales rather than exports. So FDI flows do not show the same stark difference between low-labor-intensity Chinese flows and higher-labor-intensity flows from elsewhere. However, it is important to note that Chin accounts for only about 5% of all greenfield FDI inflows to Latin America, whereas Chinese trade flows account for nearly twice that share of all inflows from exports. So the optimistic results from FDI flows are still far outweighed by the more pessimistic results from trade.

6 SUMMARY AND CONCLUSIONS

This chapter has shown that economic engagement with China is increasingly important for LAC. LAC exports to China are surging relative to exports to the rest of the world. Chinese finance in Latin America is also on the rise, but still relatively small. In the cases of both exports and finance, Chinese economic activity tends to concentrated in the mining, extraction, and agricultural sectors. Economic activity in such sectors is endemically degrading to the environment in a number of ways. Indeed, using GHG emissions as a proxy for such degradation we find that LAC exports to China are more GHG intensive than exports to the rest of the world. FDI from China into LAC is also more concentrated in GHG intensive sectors. We also find that Chinese trade and investment is less job creating than general economic activity in LAC and also less than LAC's total export basket. Coupled with earlier evidence on the general decline in industry in Latin America, if not managed properly Chinese economic engagement in LAC can create incentives toward de-industrialization, environmental degradation, and a lack of job growth.

To ensure the long-run sustainability of trade-led growth, Latin America will need to orient some of the newfound economic benefits from the China-Latin America economic relationship toward environmental protection. While China may be a driver of environmental change and a lack of robust employment growth in LAC, China cannot be blamed for the (mis)management of resources and environmental policy in LAC. Erten and Ocampo (2013) have shown that commodities go through price "super cycles" of surges in demand that are coupled with rising prices – yet the long run price level is in overall decline. Over centuries each of these surges have been a function of a related booms in economic activity that leads to increased demand for primary commodities – industrial revolution, world wars all the way up to now with the rise of China. What needs to be done if for LAC to capture the benefits of these booms and use them to mitigate some of the costs of these booms themselves. That would mean channeling some of the benefits into resource conservation, economic stabilization, employment-led economic diversification, and environmental protection. That said, it will also be important for China to upgrade its environmental standards for its overseas operations in order to maintain global market share and maintain good relations with host nations.

REFERENCES

AHEARN, Raymond. **Rising economic powers and the global economy**: trends and issues for congress. Washington: CRS, 2011. Available at: <https://goo.gl/pzrtYQ>.

DEALOGIC. **DeaLogic Platform**. London: DeaLogic, 2013. Available at: <http://goo.gl/u3A8SZ>.

DUSSEL-PETERS, Enrique. **Chinese FDI in Latin America**: does ownership matter? Boston: BU Working Group on Development and the Environment in the Americas, 2012. (Discussion Paper, n. 33). Available at: <http://goo.gl/iOO3Gn>.

ECLAC – UNITED NATIONS ECONOMIC COMMISSION FOR LATIN AMERICA AND THE CARIBBEAN. **Chinese foreign direct investment in Latin America**. Presented at the World Economic Forum Global Agenda. Abu Dhabi: Eclac, Nov. 2013a. Available at: <http://goo.gl/6EX7cG>.

_____. **Foreign direct investment in Latin America and the Caribbean, 2012**. Santiago: Eclac, 2013b. Available at: <http://goo.gl/jXhkBo>.

ERTEN, Bilge; OCAMPO, José Antonio. Super cycles of commodity prices since the mid-nineteenth century. **World Development**, v. 44, p. 14-30, 2013.

FDIMARKETS. **Financial Times**. London: FDIMarkets, 2013. Available at: <http://goo.gl/Qh6gIp>.

GALLAGHER, Kevin; IRWIN, Amos; KOLESKI, Katherine. **The new banks in town**: Chinese finance in Latin America. Washington: Inter-American Dialogue, 2012. Available at: <http://goo.gl/eOvJKE>.

GALLAGHER, Kevin; PORZECANSKI, Roberto. **The dragon in the room**: China and the future of Latin American industrialization. Stanford: Stanford University Press, 2010.

HEARN, Adrian. **China engages Latin America**. Boulder: Lynne Reinner Publishers, 2011.

IAD – INTER-AMERICAN DIALOGUE. **China-Latin America Finance Database**. Washington: IAD; Boston University's Global Economic Governance Initiative, 2013. Available at: <http://goo.gl/99U5j8>.

IPCC – INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE. **2006 IPCC Guidelines for National Greenhouse Gas Inventories**. Kanagawa: IPCC, 2006. Available at: <http://goo.gl/TdhOSu>.

JENKINS, Rhys; DUSSEL-PETERS, Enrique. **China and Latin America**: economic relations in the twenty-first century. Bonn: Deutsches Institut für Entwicklungspolitik, 2009. Available at: <http://goo.gl/MwQg1i>.

LALL, Sanjaya. The technological structure and performance of developing country manufactured exports, 1985-1998. **Oxford Development Studies**, v. 28, n. 3, p. 337-369, 2000.

MYERS, Margaret. **China's agricultural investment in Latin America**. Washington: Inter-American Dialogue, 2013. In press. Available at: <http://goo.gl/0nLWlD>.

PETERS, Glen *et al*. Growth in emission transfers via international trade from 1990 to 2008. **Proceedings of the National Academy of Sciences**, v. 108, n. 21, p. 8903-8908, 2011. Available at: <http://goo.gl/aKPzHl>.

RAY, Rebecca *et al*. **China in Latin America**: seeking a path toward sustainable development. London: Anthem Press, 2016.

SANBORN, Cynthia; TORRES, Victor. **La economia China y las industrias extractivas**: desafios para el Peru. Peru: Universidad de Pacifica, 2009.

UNDESA – UNITED NATIONS DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS. **UN Comtrade Database.** New York: Undesa, 2013. Available at: <http://goo.gl/3X55qy>.

UNEP – UNITED NATIONS ENVIRONMENT PROGRAM. **Vital climate change graphics for Latin America and the Caribbean**. Geneva: Unep, 2010.

COMPLEMENTARY BIBLIOGRAPHY

GLOBAL Forecasting Service. **The Economist**, [s.d.]. Available at: <http://goo.gl/WlpN9d>.

HSBC GLOBAL CONNECTIONS. **Brazil Trade Forecast Report**. [s.l.]: HSBC Global Connections, Oct. 2013. Available at: <https://goo.gl/3vKpx0>.

IMF – INTERNATIONAL MONETARY FUND. **IMF primary commodity prices**. [s.l.]: [s.d.]. Available at: < https://goo.gl/TvJo0e>.

_____. **World Economic Outlook**: transitions and tensions. Washington: IMF, Oct. 2013. Available at: <http://goo.gl/dtbhkw>.

KEENE, Tom Citigroup analyst Edward Morse on commodity prices. **Bloomberg Business**, Nov. 14, 2013. Available at: <http://goo.gl/yXi08T>.

WORLD BANK. **Commodity Markets Outlook**. Washington: World Bank, 2013. Available at: <http://goo.gl/MesfoA>.

_____. **World Bank Commodities Price Data (The Pink Sheet)**. Washington: World Bank, 2014. Available at: <http://goo.gl/OvvzBi>.

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