

LATIN AMERICA AND THE RISING SOUTH

CHANGING WORLD, CHANGING PRIORITIES



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Foreword

The dynamics of the world economy have changed radically and the once immutable assumptions of the global trade and financial order no longer hold fast. In the last two decades alone, wealth has shifted so profoundly that the simple, old North-South hierarchy—where the North were the rich few and the South were the many poor countries of the world—is no longer a given. In fact, in 1990, the majority of the world population, 62 percent, lived in poor countries. As of 2010, 72 percent of the world’s population lived in middle-income countries.

Such tremendous transformation is the inspiration for the World Bank’s latest regional flagship report for Latin America and the Caribbean, *Latin America and the Rising South: Changing World, Changing Priorities*. As an in-depth look at the region’s expanding global connections in trade and finance, and a sober assessment of its promise and challenges, the report is an important contribution in and of itself; at the same time, as a report that tracks global trends, it also provides an invaluable analysis that the World Bank is uniquely positioned to undertake.

While these global trends were the inspiration, the motivation behind this report is the urgent need to disentangle the complicated knot of Latin America’s growth problem. For more than 100 years, Latin America’s

average income per capita has remained barely 30 percent of that of the United States. In other words, the region has been unable to narrow a gaping income disparity with its northern neighbor.

This is not to say that Latin America has been unable to grow. In fact, during the commodity boom of the 2000s, average growth rates reached nearly 5 percent. Moreover, income growth of the poorest 40 percent was higher in Latin America and the Caribbean than in any other region of the world, relative to the total population, making growth also equitable.

Global economic activity, however, has slowed and medium-term growth prospects have diminished. Latin America is now in its fourth year of growth deceleration, and it is expected to grow below 1 percent in 2015. This poses brand new challenges, particularly as the conditions that led to the good years of the 2000s are not with us anymore.

Current global conditions pose similar challenges to all middle-income countries, not only those in Latin America. Indeed, disappointing growth in major emerging economies around the world raises important concerns, particularly considering that two thirds of the extreme poor in the world still live in middle-income countries. For the World Bank Group, a global institution committed to eradicate extreme poverty by

2030 and to boost prosperity for the bottom 40 percent of the population, these are crucial challenges.

The web of connections that have multiplied throughout the world from the North to the South, from the South to the North, and, perhaps more significantly, from the South to the South represents an important change over the past two decades. It is

therefore our hope that a profound look at the way Latin America—and the world—have been integrating will help shed a light on the way forward. In other words, our expectation is that a clearer understanding of how the South has been rising—and how it has not—will help those countries break out of their middle-income status and move closer to the group of rich nations.

Jorge Familiar
Vice President for Latin America and the Caribbean
The World Bank

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Abbreviations

BoP	balance of payments
CPIS	Coordinated Portfolio Investment Surveys
EAP	East Asia and Pacific
ECA	Europe and Central Asia
ER	exchange rate
ES	endogenous saving
FDI	foreign direct investment
FVA	foreign value added
GDP	gross domestic product
GVC	global value chain
G-7	Group of Seven
i.i.d.	independent and identically distributed
IFS	International Financial Statistics
IIT	intraindustry trade
IPR	intellectual property rights
IR	interest rate
ISIC	International Standard Industrial Classification
LAC	Latin America and the Caribbean
M&A	mergers and acquisitions
MENA	Middle East and North Africa
MNC	multinational corporation
OLS	ordinary least squares
PTA	preferential trade agreement
R&D	research and development
RCA	relative comparative advantage
RTA	regional trade agreement
SA	South Asia

S-GMM	system generalized method of moments
SITC	Standard International Trade Classification
SSA	Sub-Saharan Africa
SVAR	structural vector autoregression
TEU	20-foot equivalent unit
TTB	temporary trade barrier
UNCTAD	United Nations Conference on Trade and Development
VAR	vector autoregression
WTO	World Trade Organization

Overview

The world economy is not what it used to be 30 or even 15 years ago. The rise of the South—that is, the growing economic influence of emerging economies—has changed the global economic landscape.¹ The changes have been deep and most likely permanent. They reflect not only the growing economic heft of the South, given its substantially higher growth rates with respect to the North (that is, the advanced economies), but also structural changes. The South has become a driver of global economic trends by playing a role that is qualitatively different from that of the North. At the epicenter of these changes has been China.

This report focuses on the restructuring of the global economy and its implications for the development and policy priorities of Latin America and the Caribbean (LAC). It examines how the global economy has changed, especially with regard to the patterns of international trade and financial integration as well as the differential roles played by the large emerging economies and the traditional economic powers. Some of these themes were explored, in a preliminary fashion, in the September 2011 issue of the LAC Region's semiannual report series, "Latin America and the Caribbean's Long-Term Growth:

Made in China?" (De la Torre and others 2011). While China was the sole focus then, the analysis here is deeper and broader, not least because it covers the evolving role of emerging economies more generally.

This report argues that as the world economy has irreversibly changed, LAC has been adjusting to the associated global economic shocks, both commercial and financial. The adjustment process has been conditioned by LAC's trade and financial structures and reflected in the observed patterns of structural change. Key challenges have emerged for the region, particularly because the changes may not have improved the region's prospects for long-term economic growth. Simply put, economic policy priorities in the region have evolved in response to worldwide changes even as these changes have exacerbated some of the region's long-standing development challenges, such as those associated with its dependence on mineral and agricultural commodities and its comparatively low saving rates. The debate in the region over public policy priorities in the context of a new global landscape will thus likely intensify, with the growth agenda at its core.

The rest of this overview addresses the "what," the "how," and the "so what"

questions associated with the rise of the South and its implications for LAC. The overview is organized in three main sections. The first documents salient features of the new global economic order by focusing on the rising prominence of emerging economies. It characterizes the tectonic shifts in the global economy, including by looking at the data through the lens of network analysis. It then examines the fundamental change in the role of the South in the global economy and highlights key dimensions of heterogeneity within the South.

The second section provides an economic interpretation of how the changes at the heart of the global economy are conditioning growth and employment prospects in LAC. This narrative posits that, from the point of view of LAC, the rise of the South manifested itself as a set of economic shocks working through commercial and financial channels. The impacts of these shocks varied across the region, depending on countries' initial trade structures, resource endowments, degree of financial globalization, and saving patterns, among other factors.

The third section assesses broad policy areas that, given the rising South phenomenon, should find their way to the top of the region's growth-oriented reform agenda. Among these areas are the structure of trade

and foreign investment as potential drivers of growth and productivity; labor market frictions, which make economic adjustments sluggish and thus reduce the potential gains from globalization; and the region's notoriously low national saving rates, which may hamper long-term growth by undermining external competitiveness.

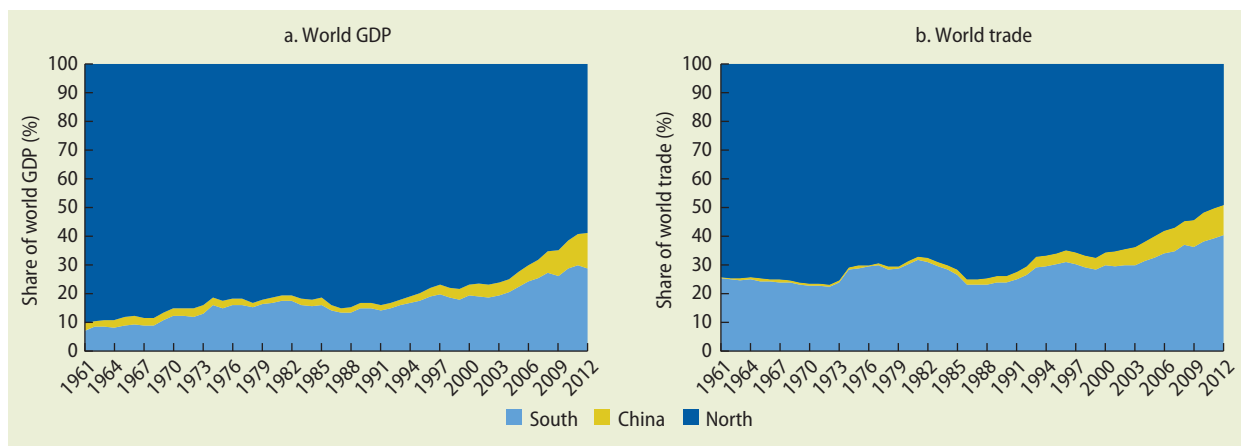
Changes at the center of the world economy

To fully understand the implications of the economic rise of the South, it is helpful to distinguish between the economic weight of emerging economies, the extent of trade and financial integration of these countries, and the different roles played by the North and South countries that are systemically important for the world economy.

Tectonic shifts in the global economic landscape

For most of the 20th century, global economic activity was concentrated in the developed North (composed of Canada, the United States, the Western Europe countries, and Japan, which joined the pack only after World War II). Since the dawn of the 21st century, the South (defined as all

FIGURE O.1 The rise of the South



Sources: Calculations based on data from World Development Indicators (WDI) and Direction of Trade Statistics (DOTS).

Note: The North includes the G-7 members and Western Europe countries. The South includes all other economies. G-7 = Group of Seven; GDP = gross domestic product.

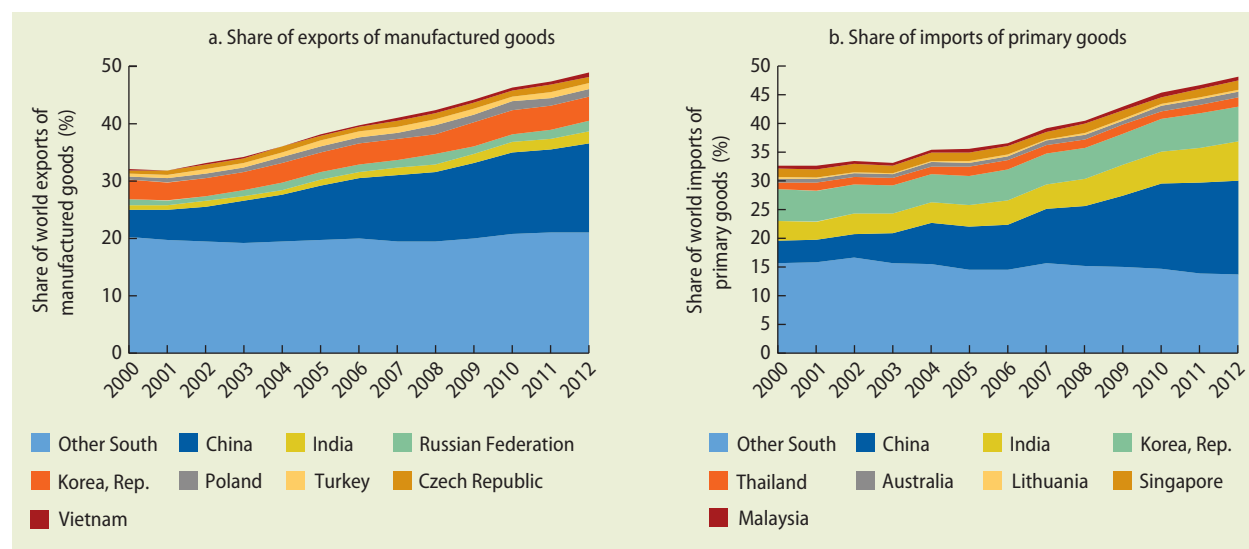
developing economies not in the North), led by China and other large emerging economies, has risen with surprising speed. In fact, several South countries have become major, systemically important players in the global economy. The gross domestic product (GDP) of the South, which represented about 20 percent of world GDP between the early 1970s and the late 1990s, doubled to about 40 percent by 2012, with China alone accounting for 12 percent of global GDP (figure O.1, panel a).

The rising share of the South in global GDP was accompanied by increasing influence in international trade and finance. Indeed, although the secular process of globalization of the South had long been advancing, the 2000s saw a notable intensification of this process. The South's participation in global trade rose from 24 percent in 1970 to 35 percent in 2000 and 51 percent in 2012 (figure O.1, panel b). This advance was associated with major transformations in the structure of world trade, as the weight of the South varied across sectors. Between 2000 and 2012, the South's share of global exports of manufactures increased from 32 percent to

48 percent (figure O.2, panel a), and its share of global imports of primary (agricultural and mineral) goods expanded from 32 percent to 47 percent (figure O.2, panel b). An acceleration of financial globalization accompanied the rise of the South in commercial flows. The South's share of global capital inflows (including foreign direct investment [FDI]) rose from about 18 percent in the 1970s to 25 percent in the 1990s and to more than 50 percent by 2012 (figure O.3).

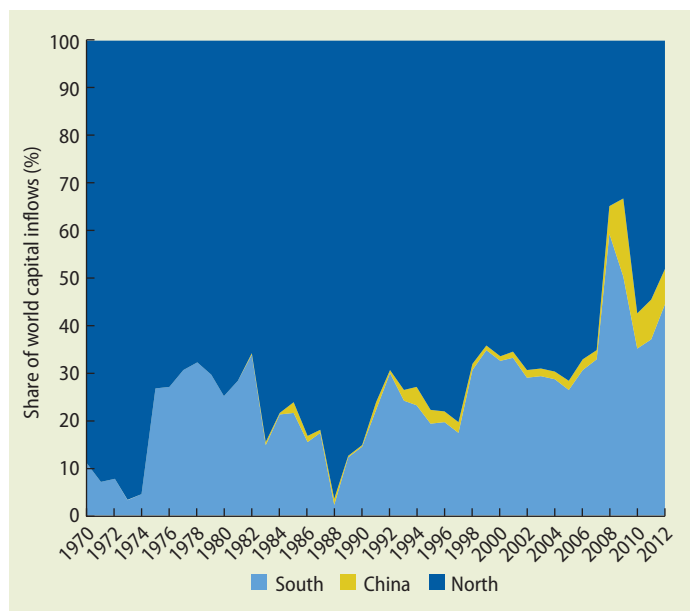
The increase in the economic weight of the South is likely here to stay: it is probably neither short lived nor reversible. Although long-term economic forecasts are notoriously uncertain, current projections suggest that the South will continue to gain importance in the world economy. According to the World Bank's 2013 *Global Development Horizons*, the share of the South in global GDP will reach 55 percent by 2025. A 2012 report by the U.S. National Intelligence Council projects this share to reach 70 percent by 2030. The Asian Development Bank forecasts that the share of exports from the South will rise to 64 percent of global exports by 2030 (Anderson and Strutt 2011). The 2013

FIGURE O.2 The South's share of global trade flows



Source: Calculations based on data from Comtrade database.

Note: The eight South countries that gained the most in market share between 2000 and 2012 are shown separately from the rest of South countries. The North includes the G-7 members and Western Europe countries. The South includes all other economies. G-7= Group of Seven.

FIGURE O.3 The South's share of global capital inflows

Source: Calculations based on data from Balance of Payments Statistics (BOPS).

Note: Gross capital inflows include portfolio, banking, and foreign direct investment flows. The North includes the G-7 members and Western Europe countries. The South includes all other economies. G-7= Group of Seven.

Global Development Horizons projects that by 2025 the South will account for 63 percent of world capital inflows and 80 percent of world capital outflows.

As the South gained weight in the global economy, the number of its bilateral economic connections proliferated. These ties increased in every direction, but new South-South connections rose more rapidly than North-South linkages in both trade and finance. In 1980, the number of active South-South trade connections was 40 percent of all possible connections (the number of connections that would exist if every South country were connected to every other South country). This figure rose to 46 percent in 1990 and 70 percent in 2012. Trade linkages between North and South countries expanded less rapidly (from 92 percent in 1980 to 96 percent in 1990 and 98 percent in 2012), at least in part because they had been almost fully exploited since the 1980s.² Similar trends are observed across different types of financial flows.³ To be sure, this process is far from mature, as a significant number of countries in the South

have yet to be linked to a wide set of other countries, especially in terms of financial connections. Indeed, only 18 percent of the potential South-South connections related to portfolio flows were active in 2011.⁴

The fundamental change in the global role of the South

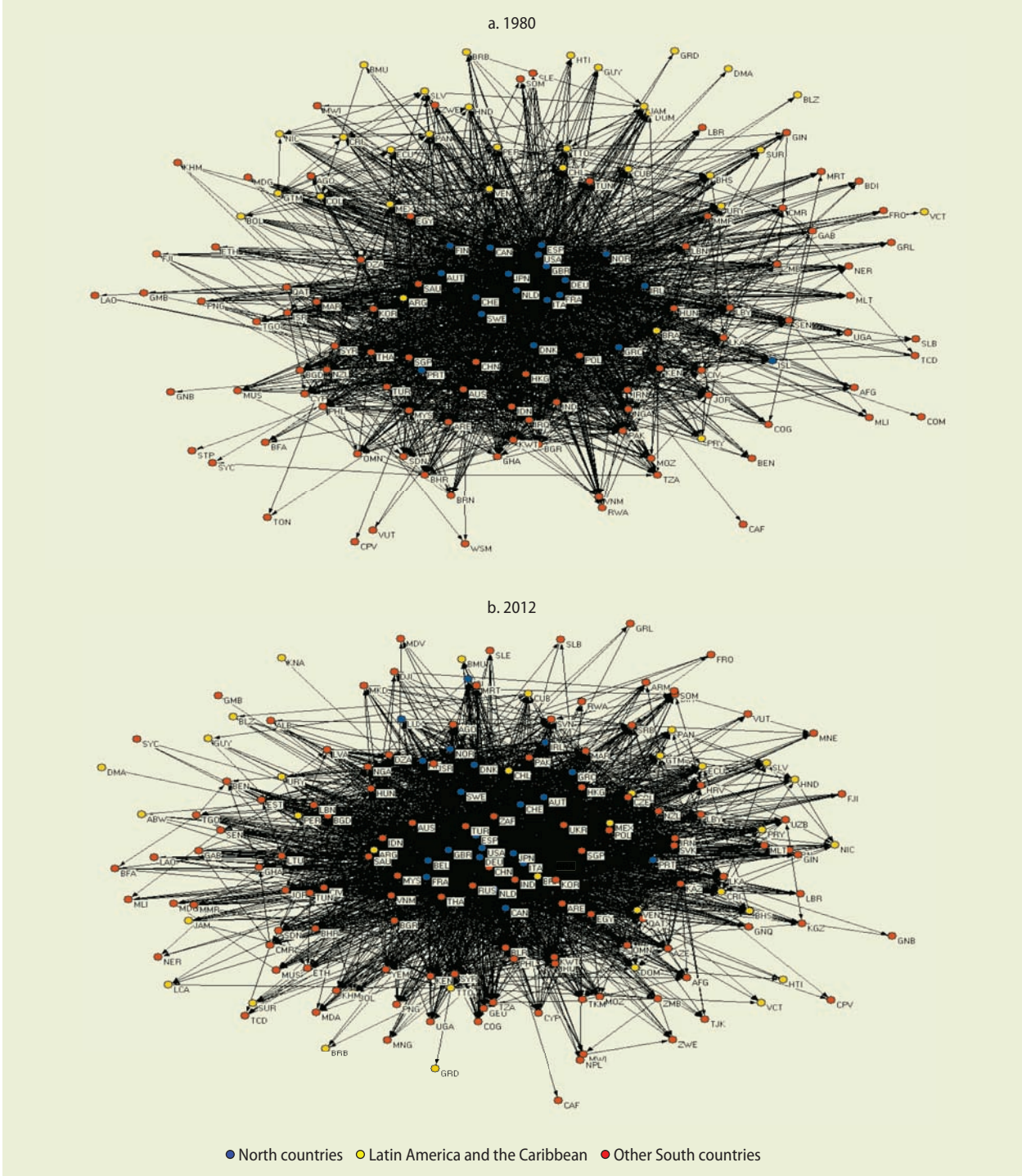
Changes in relative economic weight provide a bird's-eye view of the rise of the South. But, impressive as they are, they do not illustrate the full scale of the economic shifts in the global landscape. Further insights into the nature of the rise of the South emerge when trade and financial connections are viewed from a global network perspective. Four key stylized facts arise from this approach (for a more detailed analysis, see chapter 1 of this report).

First, *the North is no longer the center of the global trade network and the South is no longer its periphery*. Indeed, several economies from the South have become part of what can be empirically characterized as the “center” of global trade. This momentous change is highlighted in figure O.4, which shows the global trade network in 1980 and 2012. Each node in the graphs represents a country, and each link corresponds to exports from one country to another (indicated by the arrows). Connections that are trivial in magnitude are not graphed, but once graphed, each connection has the same weight. The greater the number of its connections to other countries, the more centrally located a country is.

The change has been remarkable. In 1980, only a few North countries—the United States, some Western Europe countries, and Japan—stood at the center of the global trade network. In contrast, by 2012, several South countries—including not only China but also Brazil, India, the Russian Federation, South Africa, and Turkey—had moved to the center.

Second, *at the center of the global trade network, the role played by countries from the South and countries from the North differs*. This stylized fact is illustrated in figure O.5, which shows the relative (rather than absolute) importance of each country

FIGURE 0.4 The global trade network



Source: Calculations based on data from DOTS.
Note: Networks are drawn using the Kamada-Kawai algorithm. Each node represents a country. Each link corresponds to a trade connection between a pair of countries. Arrows indicate the direction of these connections. The North includes the G-7 members and Western Europe countries. Other South includes all other economies except Latin America and Caribbean countries. Only trade flows (exports) greater than \$10 million in 1980 or greater than \$100 million in 2012 are shown. The figure thus ignores very small countries. It would show similar results if these connections were reported. G-7 = Group of Seven.

FIGURE O.5 Similarity and systemic importance in the global trade network



Source: Calculations based on data from DOTS.

Note: Each node represents a country. Each link corresponds to an active trade connection between a pair of countries. Arrows at the end of each link capture the direction of these connections. Trade connections are measured as exports as a share of total exports of the source country. Only shares greater than 1 percent are reported. The distance between countries reflects similarity in the structure of their trade connections: the closer countries are to one another, the more alike they are in terms of export shares. Countries capturing a larger share of other countries' exports and connected with a larger number of trading partners appear on the right-hand side of the figure (more systemically relevant countries in global trade). The smaller the distance between two countries along the vertical dimension, the more similar the structure of their trade connections across other members of the network.

in the global trade network. The vertical distance between countries in the figure reflects the degree of similarity in the structure of their trade connections, whereby more similar countries are grouped closer together.⁵ The farther to the right of the figure a country is located, the greater its importance to the global trade network.⁶

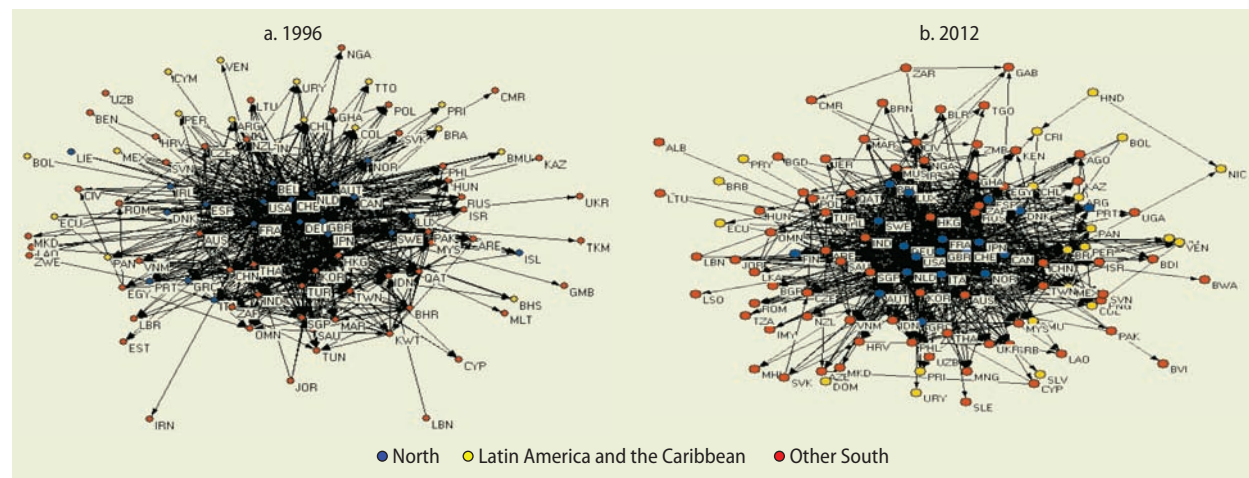
Panel a of figure O.5 shows that in 1980 only North countries were clustered toward the right of the graph, thus indicating that they were of greatest systemic importance to the global trade network. In addition, these countries were very close to one another along the vertical dimension, reflecting a high degree of similarity in the structure of their trade connections with other countries in the network.

The global trade network in 2012 shifted dramatically (figure O.5, panel b). Several countries from the South appeared on the right side of the figure, indicating their increased systemic relevance to world trade. However, they remained somewhat distant (along the vertical dimension) from the other (North) countries on the right side of the figure, reflecting differences in trade shares

across trading partners. The right side of the figure resembles a star, with small groups of central countries placed at a certain vertical distance from one another. The Russian Federation and Turkey, for example, are not located near any North core country from Europe, and Japan is not close to either China or the Republic of Korea. The implication is that systemically important South countries play a different role from the role played by North countries in the global trade network. These different roles seem to be inherently linked to fundamental differences in factor endowments, trade, production, and aggregate demand structures, as discussed below.

Third, *there is a notable asymmetry in the patterns of change in global trade and financial networks*. In the sphere of trade, the traditional overlap between the North and the “center” (and the South and the “periphery”) no longer holds. In contrast, in the sphere of finance, countries from the North still stand alone at the center, as illustrated in figure O.6 for syndicated bank loans. A similar picture emerges for portfolio investments, mergers and acquisitions (M&A), and greenfield investment flows. Whether this asymmetry

FIGURE O.6 The global financial network for syndicated bank loans



Source: Calculations based on data from SDC Platinum.

Note: Networks are drawn using the Kamada-Kawai algorithm. Each node represents a country. Each link corresponds to an active connection (a positive flow of investments) between a pair of countries. Arrows indicate the direction of these connections. The North includes the G-7 members and Western Europe countries. Other South includes all other economies except Latin America and Caribbean countries. G-7 = Group of Seven.

proves transitory is debatable, although most observers agree that it is unlikely to be dislodged soon, for several reasons. For starters, there is broad recognition that the U.S. dollar continues and will continue to have a stronghold as both the privileged currency for international contracts and the safe haven in times of global risk aversion. In addition, the scale and network effects associated with the dominance of the advanced financial centers (including New York, London, Frankfurt, Tokyo) will not be easy for the South to overcome. This trade-finance asymmetry in global networks stands in sharp contrast to broad historical developments since the Industrial Revolution and throughout most of the 20th century, when countries that became important trading powers also became important international financial centers.

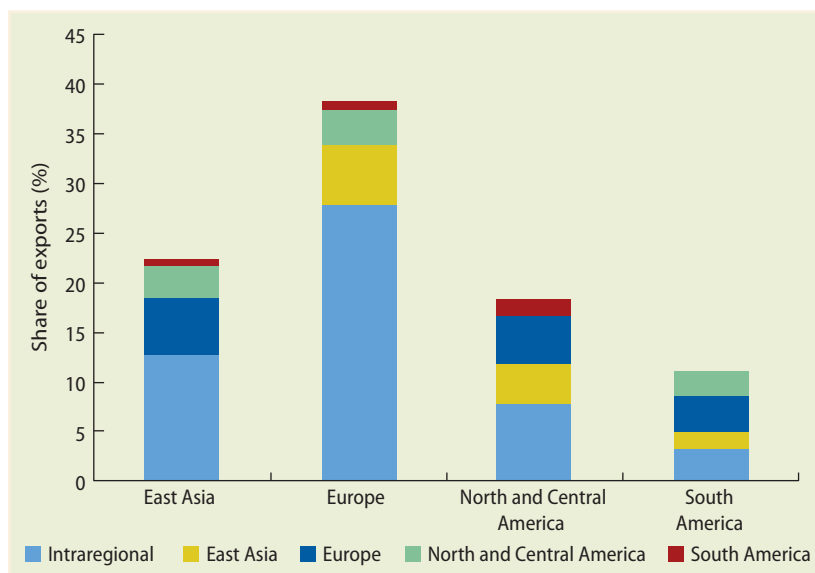
Fourth, despite an increase in the number of connections around the world, *there is a significant degree of regional (geographic) clustering within global trade and financial networks*. Underpinning these clustering patterns has arguably been the development of global value chains (GVCs)—the distribution

of production activities belonging to the same production processes across countries. As GVCs have gained prominence on the international trading scene, exports of final products have become increasingly composed of imports of intermediate inputs. To date, GVCs are mostly regional, not global. The foreign value added (FVA) content in exports typically originates in neighboring countries (figure O.7).⁷ For example, about 56 percent of the FVA in the exports of East Asian countries come from other East Asian economies, and more than 72 percent of the FVA in the exports of European countries come from other European economies. There is also clustering—albeit less intense—across countries within LAC subregions. For instance, imports from other South American countries represent about 30 percent of the FVA in the exports of South America.

The heterogeneity of the South

The rise of the South in global economic affairs conceals important differences across South countries. Four types of heterogeneity are noteworthy. The first is *differences in*

FIGURE O.7 Regional clustering in global value chains, 2011



Sources: Calculations based on data from Eora MRIO and WDI.

Note: Figure shows the geographical composition of sources of foreign value added used in a country's exports, scaled by the country's exports.

the changes in export and import shares of the South (recall figure O.2). The rise of the South implied a growing share of the South (as a whole) in global manufacturing exports. But only a subgroup of South countries carried the load in this regard, with China the leader by a wide margin. China's share in global manufacturing exports increased by more than 10 percentage points, from slightly less than 5 percent in 2000 to more than 15 percent in 2012. In contrast, the other top 20 South countries in terms of their increases in global shares—a group that includes Brazil and Chile—increased their share of global manufacturing exports as a group by only about 8 percentage points. The shares of world manufacturing exports of several large South countries (for example, Malaysia, Mexico, and the Philippines) actually declined.

The rise of the South also featured a substantial increase in its share of trade (exports and imports) of primary (mineral and agricultural) products. But cross-country differences within the South are stark. In particular, the set of South countries whose shares in commodity exports rose most significantly has little overlap with the set of South countries whose shares of commodity imports rose. In contrast, the set of South countries whose shares of manufacturing exports rose significantly (virtually all of which are outside LAC) has greater overlap with the set of South countries whose shares of commodity imports rose. Australia, Brazil, and the Russian Federation jointly accounted for the largest gains in the shares of global primary exports (their share rose from 13 percent in 2000 to 23 percent in 2012). Other top 20 commodity-exporting countries from the South include Azerbaijan, India, Kazakhstan, and several LAC countries (Bolivia, Chile, Colombia, Ecuador, Peru, and Uruguay). China stands out as a giant commodity importer: its share of global imports of agricultural and mineral commodities rose from less than 4 percent in 2000 to more than 15 percent in 2012. All other South countries with rising manufacturing export shares that also increased their shares of imports of commodities (such as

India, Korea, Poland, and Turkey) are outside LAC. As such, LAC gained global relevance as a major commodity exporting region even though it lost relevance as a manufacturing exporter.

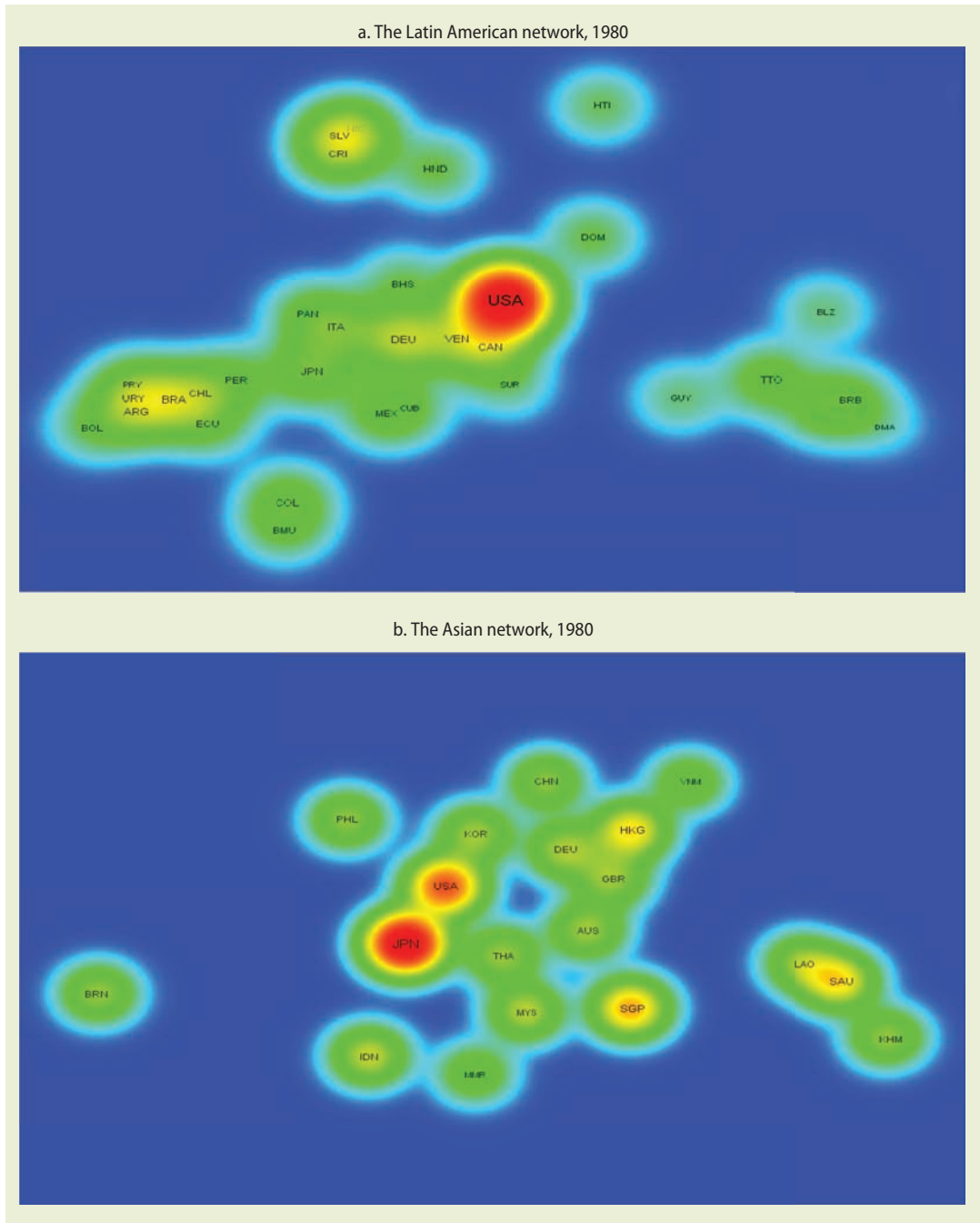
A second important dimension of heterogeneity within the South is *the contrast between LAC and the East Asian economies in terms of the density of their regional trade networks*. Figure O.8 highlights this feature by providing snapshots of the regional trade networks of these two regions in 1980 and 2012. Each regional trade network includes (as nodes) all countries of the region plus the five countries from the rest of the world that are the largest trading partners for each regional network.⁸

In 1980 the trade networks of LAC and East Asia were similar: they were thin, unbalanced, and centered on a few dominant North economies. Japan and the United States were the only two dense nodes in the 1980 snapshot of the East Asian network, and the United States was the sole dense node in the 1980 LAC network.

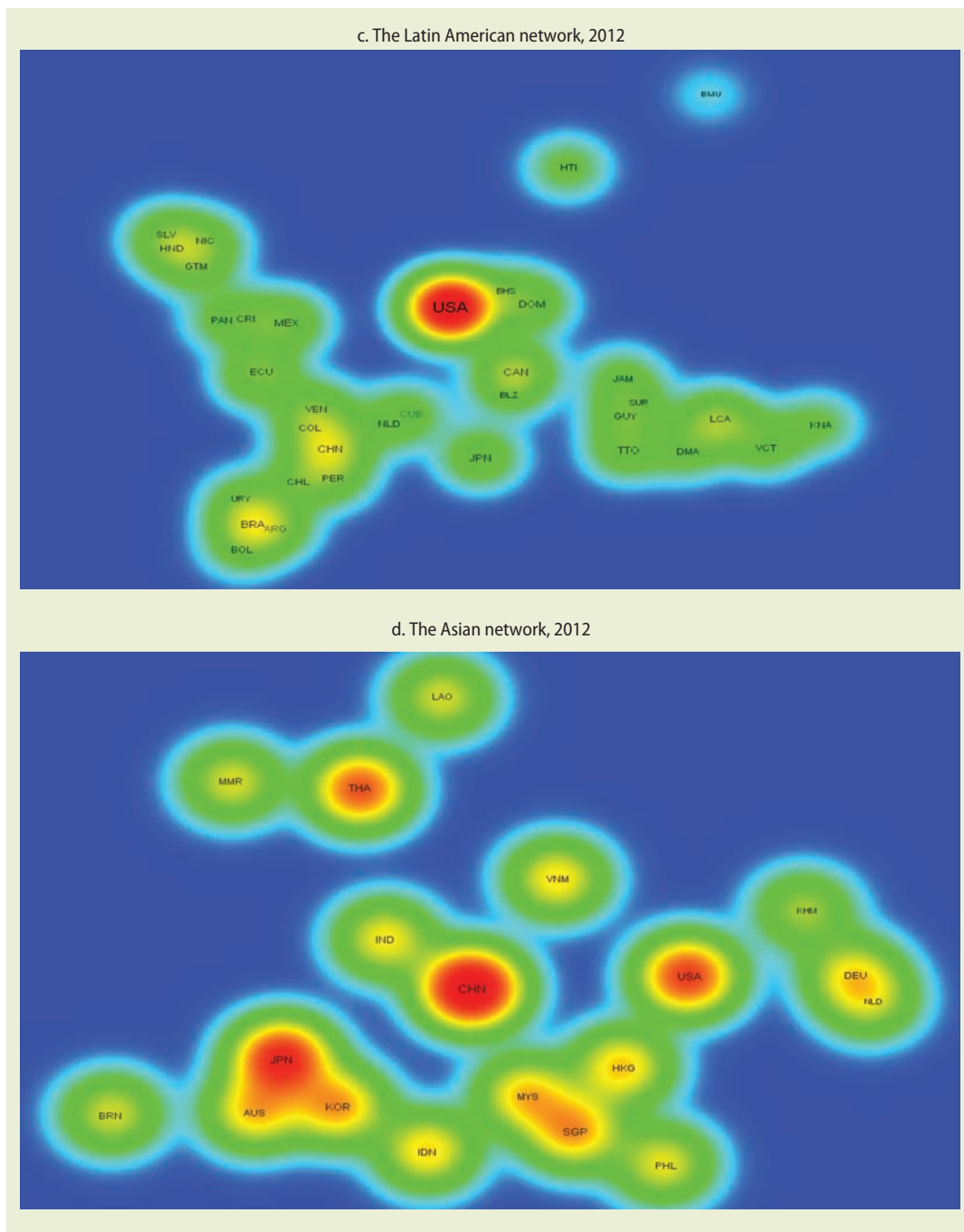
By 2012 the two regional networks had diverged. The East Asian network had become substantially denser and more balanced, with high-density connections distributed rather evenly across numerous countries (nodes), including not just Japan, the United States, and China but also Korea, Malaysia, Singapore, and Thailand. In contrast, the 2012 snapshot of the LAC trade network was almost as thin as it was in 1980, and it remained dominated by the United States, with Brazil a very distant second. A significant change between 1980 and 2012 was that China joined the LAC network, albeit at a comparatively low density.⁹

The large difference in regional network densities in 2012 reflects trade connections within East Asia that became multidirectional (that is, intense in the direction of virtually every country within the network). In contrast, connections within the LAC network have remained largely bi-directional, linking LAC countries mainly with the United States and secondarily with China (and, within the South America subregion,

FIGURE 0.8 Density maps of regional trade networks

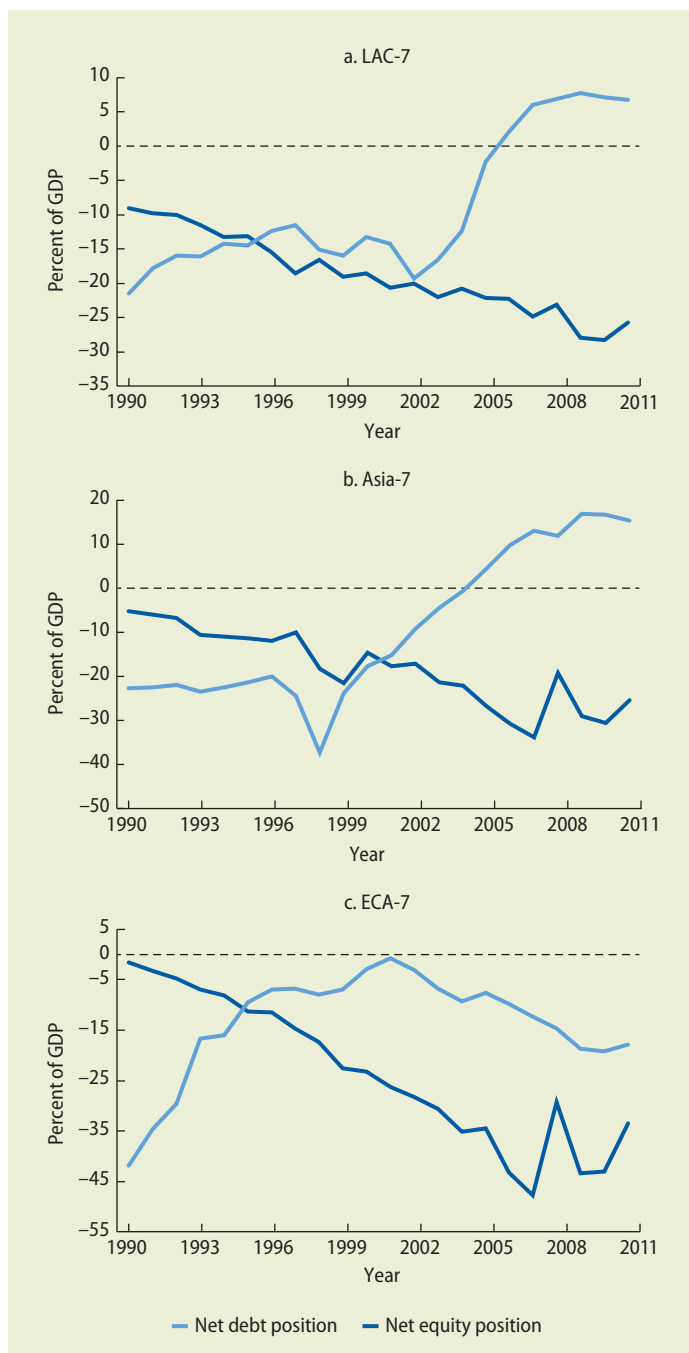


(continued)

FIGURE 0.8 Density maps of regional trade networks (continued)

Sources: De la Torre, Didier, and Pinat 2014 and DOTS.

Note: Figure shows the density maps of two regional trade networks based on bilateral exports, measured as a share of total exports of the sending country in 1980 and 2012. The density of a country in these maps depends on the number of neighboring countries and the economic distance between countries. The node density is translated into colors using a red-green-blue scheme in which red indicates the highest density and blue the lowest. Each country is represented by its three-letter acronym. See box 1.1 in chapter 1 of this report for technical details.

FIGURE O.9 Composition of foreign assets and liabilities in the South, by region

Source: Calculations based on updated and extended version of dataset constructed by Lane and Milesi-Ferretti 2007.

Note: Ratios are calculated at the country level and then averaged across countries (simple average) between 1990 and 2011. LAC-7: Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Uruguay. Asia-7: China, India, Indonesia, the Republic of Korea, Malaysia, Philippines, and Thailand. ECA-7: Croatia, the Czech Republic, Hungary, Lithuania, Poland, the Russian Federation, and Turkey. GDP = gross domestic product.

Brazil). The density of connectivity in the East Asian network also suggests strong feedback effects, whereby tighter trade connections within East Asian emerging economies boost trade with advanced countries in the North and vice versa. In contrast, LAC countries (with the possible exceptions of Mexico and Costa Rica) seem to significantly underexploit the potential for complementarities and mutually reinforcing effects between intraregional trade and global trade. These different patterns may be linked to the fact that East Asian countries participate much more actively in GVCs than LAC countries do.

A third salient dimension of heterogeneity concerns *the asymmetric shifts in the net debtor-creditor positions with respect to the rest of the world for different emerging regions in the South*. LAC and East Asia followed a similar pattern in this respect, in sharp contrast with countries from Eastern Europe and Central Asia (figure O.9). During the 2000s, there was a major shift from debt to equity in the external net liability positions of East Asia and LAC (in the context of the rise of the South). In contrast, Eastern Europe and Central Asia shifted its position toward debt liabilities.

Regarding debt contracts, East Asia and LAC went from being large net debtors with respect to the rest of the world in the 1990s to significant net creditors during the 2000s. This change reflected a strengthening of macrofinancial policy frameworks, which entailed a process of external debt reduction by governments coupled with self-insurance through accumulation of international reserves by central banks.¹⁰ It also reflected the continued presence of large current account surpluses, particularly among the high-saving East Asian economies.

Over the same period, both East Asia and LAC became more active users of foreign equity finance, which led to rising net debtor positions in risk-sharing equity contracts (particularly FDI) with respect to the rest of the world. The equity-laden position LAC and East Asia achieved in the 2000s arguably represents a more resilient form of integrating

into often volatile international financial markets than the debt-laden external net liability position of Eastern Europe and Central Asia.

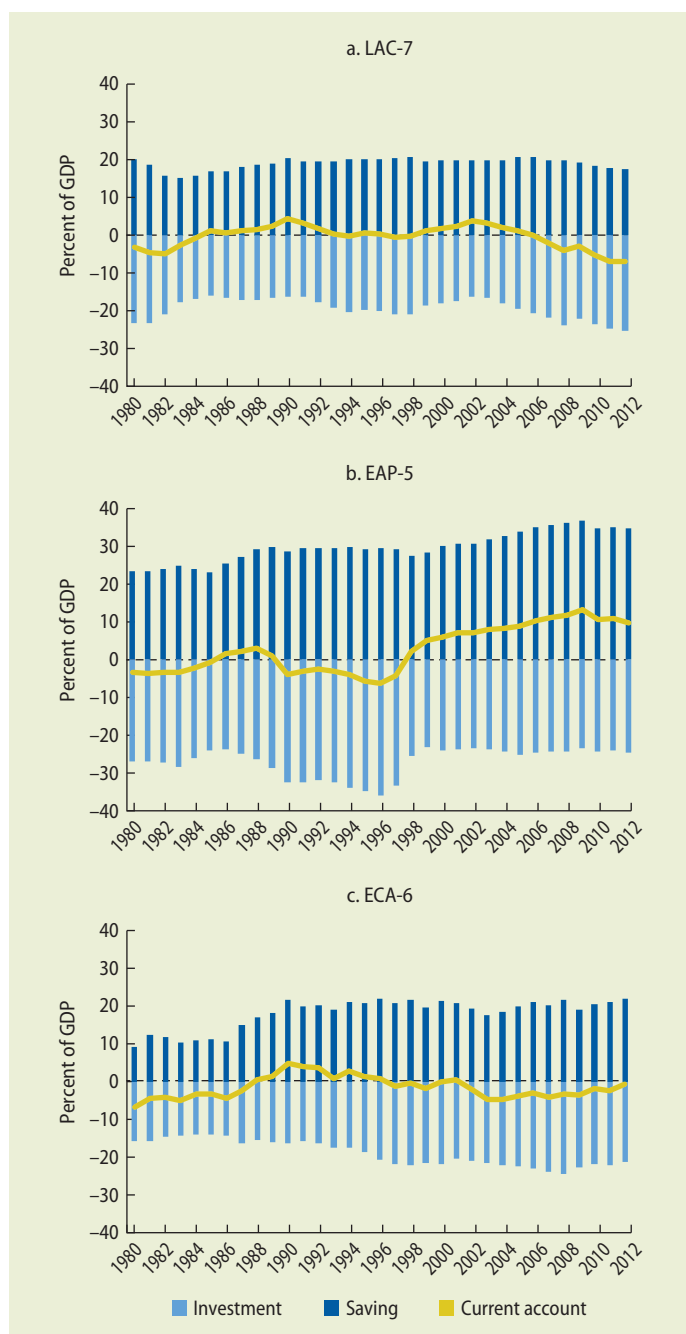
A fourth dimension of heterogeneity that is key to understanding the implications of the rise of the South is the differences in *the relative importance of domestic versus external demand in macroeconomic aggregates*. The contrast is sharpest between LAC and East Asia. While in LAC domestic demand largely drives the economy, in East Asia external demand is a dominant force. That LAC exhibits domestic demand-driven macroeconomic patterns implies an excess of aggregate demand over national income and, hence, typically low saving rates and a penchant for current account deficits (figure O.10). The external demand-driven patterns of East Asia imply an excess of national income over aggregate demand and, hence, typically high domestic saving rates and current account surpluses. The macroeconomic patterns of the emerging economies of Eastern Europe and Central Asia are more similar to LAC than to East Asia. As argued below, a macroeconomic pattern that relies on external demand, and therefore high national saving rates, may be more conducive to seizing the potential growth benefits associated with the rise of the South.

How the rise of the South conditioned development in Latin America and the Caribbean: An interpretation

The rise of the South has left a noticeable mark upon the world economy. The preceding discussion highlights the heterogeneity of structural economic characteristics within the South before and during its rise, especially since 2000. This section interprets these global and regional trends, based on the evidence presented in this report.

From the viewpoint of small open-economies, including LAC countries, the rise of the South can be understood as having set three types of global shocks in motion: a supply shock, a demand shock,

FIGURE O.10 Saving, investment, and the current account



Source: Calculations based on data from the IMF's International Financial Statistics (IFS).

Note: Simple regional averages are presented. LAC-7 includes Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Uruguay. EAP-5 includes Indonesia, the Republic of Korea, Malaysia, the Philippines, and Thailand. ECA-6 includes Croatia, the Czech Republic, Hungary, Lithuania, Poland, and Turkey. GDP = gross domestic product.

and a financial shock. Both the demand and supply shocks have been associated with the asymmetric rise of the South across industries and trade flows (exports versus imports). The financial shock has been related to the recycling of savings from the emerging South.

LAC countries responded differently to these shocks as a result of differences in initial conditions, including factor endowments, initial trade structures, and macroeconomic frameworks. As it is difficult to precisely identify the direction of causality, this narrative provides an interpretation of the facts and statistical findings rather than a model of how the world economy has been operating.

This section thus characterizes the rise of the South from the viewpoint of LAC as a combination of external shocks. Subsequently, it examines the heterogeneous responses to such shocks across countries in the region and discusses the potential implications for LAC's long-term growth and (to a lesser extent) employment.

The rise of the South as external shocks for Latin America and the Caribbean

A global *supply shock* was related to the huge expansion in South-originated production

of manufactures, led by but not limited to China. This shock presumably lowered the (quality-adjusted) prices of manufactured goods and thus dampened global inflationary pressures. The shock can be interpreted as emanating from an increase in the number of manufacturing workers engaged in international trade, whose labor services were previously not integrated into the global economy (arguably the case of China before it joined the World Trade Organization in 2001).

For LAC economies, this shock implied increased international competition for various manufacturing industries. It thus instigated structural changes across sectors as well as within LAC's manufacturing sector. The resulting decline in the relative prices of manufactured goods was also associated with improved terms of trade for economies that were net importers of manufactured goods.

A *demand shock* was associated with an increase in global demand for primary goods. It reflected the relatively high commodity intensity of imports of the larger rising South countries, particularly China. The result was a rise in commodity prices—an unusually vigorous upswing phase of a veritable commodity supercycle.¹¹ For commodity exporters, including in LAC, this shock was associated with terms of trade gains.

The effects of the global supply shock may have dominated the effects of the global demand shock to the extent that large current account surpluses were observed at the epicenter of the shock (China and other East Asian economies). Consequently, the combination of the global supply and demand shocks engendered a global *financial shock*. This shock was associated with the international recycling of net savings from the South, particularly from the Asian and Middle Eastern countries, and changes in relative prices in financial markets around the world, including exchange and interest rates. These South countries integrated into the global economy with persistent current account surpluses that were accumulated mainly in the form of international reserves, most of which were recycled through the North. The result was a “global savings glut” that eased

FIGURE O.11 Real U.S. interest rates



Sources: Calculations based on data from the Board of Governors of the U.S. Federal Reserve System and the Federal Reserve Bank of Cleveland databases.

Note: Series was constructed by deflating the (effective) monthly federal funds rate by the inflation rate for the previous 12 months.

financial constraints in countries with external and fiscal deficits, particularly the United States, and exerted significant downward pressure on world interest rates.¹² Accommodative monetary policy in the North contributed to the maintenance of unusually low global interest rates (figure O.11). With low interest rates in the North, a search for yield among investors triggered capital flows to the South, including LAC, where borrowing spreads fell to historically low levels and currencies experienced strong appreciation pressures.

Heterogeneity of impacts as a result of initial sectoral trade weights

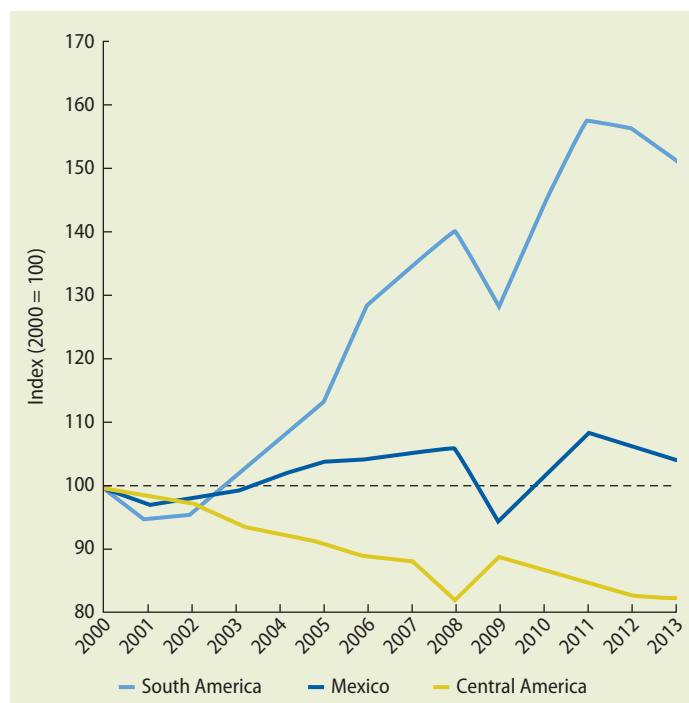
The combination of these supply and demand shocks affected the LAC countries' patterns of trade differently, depending on their natural endowments, geographical characteristics, economic size, and initial production and trade structures. The shocks were channeled through changes in the terms of trade starting in the early 2000s and reflected the extent to which initial trade structures were similar to those of China, at the epicenter of these shocks, and the United States.

Only a few countries in the region—chiefly Mexico and, to a lesser extent, countries in Central America—maintained an export structure similar to that of China. The trade structures of most countries in the region were quite different from that of China. For the economies of South America, where the dominant resources are land and mining endowments, the combination of external supply and demand shocks translated into unequivocal and significant improvements in their terms of trade (figure O.12). In contrast, Mexico's diversified economy—which combined an initially broad and relatively strong manufacturing base with substantial productive capacity in commodities (such as fossil fuels, coffee, and iron ore)—experienced stagnant terms of trade.¹³ In Mexico, the supply shock that kept manufacturing prices in check was compensated for by the demand shock that increased commodity prices. Central America and the Caribbean experienced

a deterioration of their terms of trade because of their export dependence on light manufactures and high level of imports of commodities. In addition, in some LAC economies, low domestic saving rates further reduced the competitiveness of the manufacturing sector, and in economies with large agricultural and mining sectors, wages were pushed up, as explained below.

Illustrative of the differences within LAC as a whole, figure O.13 shows the evolution of indexes of manufacturing export similarity for Brazil and Mexico. Brazil's highly diversified export structure (spanning from agricultural commodities to automobiles) has been more similar to that of the United States and the European Union than that of China. In contrast, Mexico's manufacturing export basket has been consistently more similar to

FIGURE O.12 Terms of trade within Latin America and the Caribbean



Sources: Calculations based on data from the Economic Commission for Latin America and the Caribbean (CEPAL).

Note: Simple average across countries within each LAC subregion are presented. South America includes Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, and República Bolivariana de Venezuela. Central America and Caribbean includes Costa Rica, the Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Nicaragua, and Panama.

China's. Approximately 60 percent of Mexico's exports of manufactures were similar to those of China, compared with only 30 percent in the case of Brazil.¹⁴ The global manufacturing supply shock dampened the potential growth of LAC's manufacturing exports in general, with the effect most acute in countries whose export structures were most similar to China's at the outset (in 2000). LAC countries that benefited the most from the Asia-led global commodity demand shock were countries that were rich in natural resources and had a commodity-oriented initial export structure that matched the structure of commodity (agricultural and mineral) imports of China.

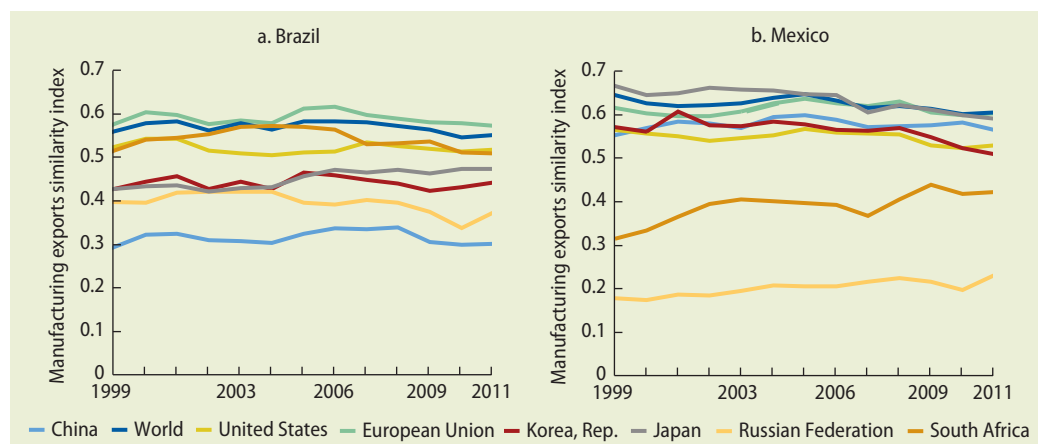
Empirical attempts to gauge the impact of the rise of the South on LAC exports are consistent with differences in the evolution of the terms of trade and the variance in the degree of similarity between the LAC region's initial trade structures and the trade structure of China. Figure O.14 illustrates these patterns by presenting indexes of the quantitative impact of the rise of China on the growth rate of manufacturing, mineral, and agricultural exports for a large sample of LAC countries between 2000 and 2011. The heterogeneity of the estimated impacts across countries in the region is pronounced. The negative impact on the exports of manufactures was stronger for

the Caribbean, Central America, and Mexico, where initial export structures were similar to China's (panel a). In contrast, the negative impact of the rise of China on manufacturing exports was significantly weaker for South American economies. The positive impact on their exports of agricultural and mineral commodities was substantial (panels b and c).¹⁵ In fact, South American countries represent all the observations in the three panels of figure O.14 that were above the LAC average.

Weak participation of Latin America and the Caribbean in global value chains

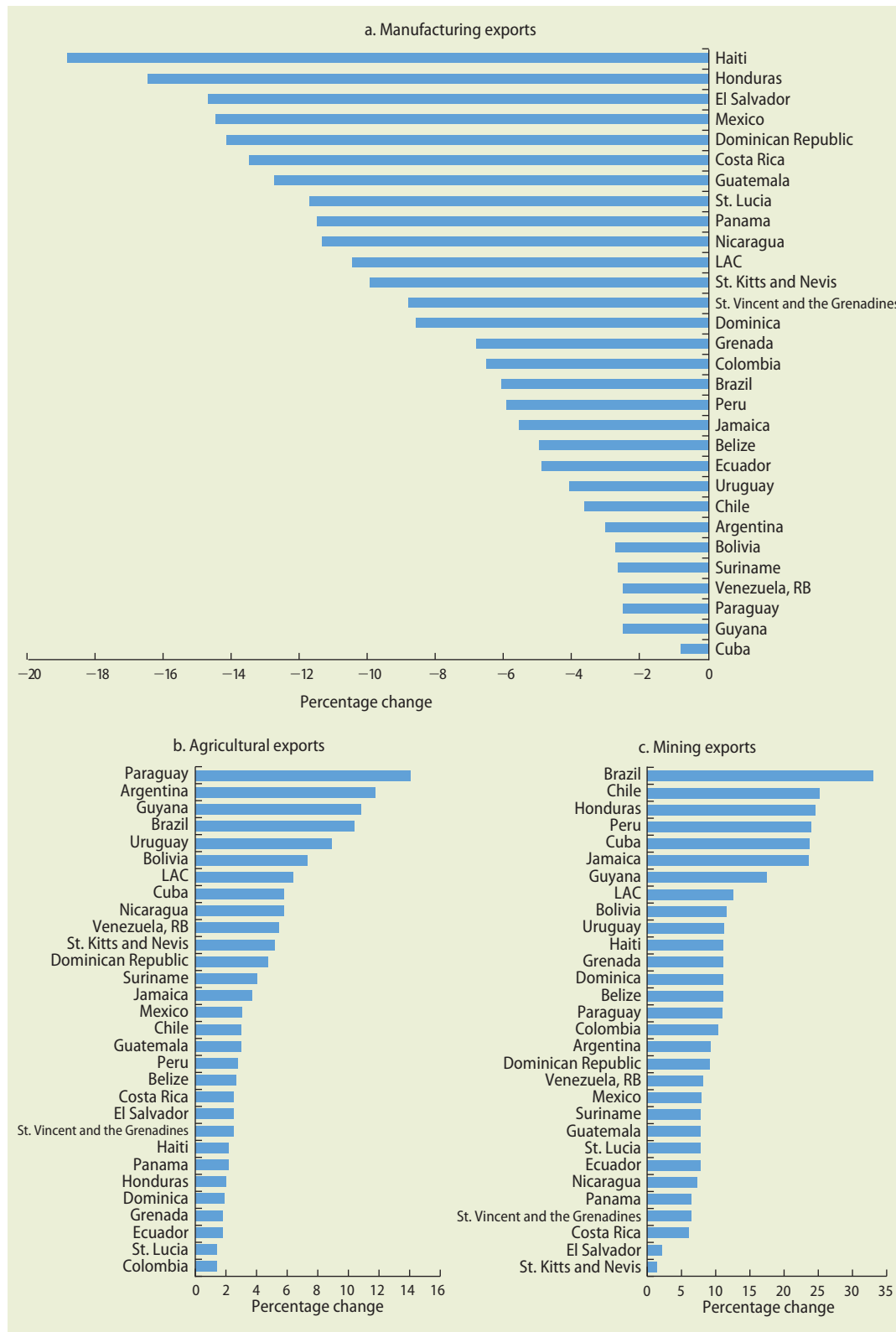
The sectoral composition of trade conditioned the within-LAC heterogeneity of export and import responses to the global supply and demand shocks. These shocks boosted LAC's share in world commodity exports while undercutting the region's share in global manufacturing exports. Financial flows to LAC countries seem to have reinforced these trends. Specifically, LAC's cross-border financial inflows from the South have been more biased toward the primary sector than flows from North countries. For example, during the 2000s, 92 percent of the total cross-border M&A investments from the South in LAC went to the primary sector, whereas only 48 percent of the same type of investments

FIGURE O.13 Export similarity indexes in manufacturing in Brazil and Mexico



Sources: Calculations based on data from World Integrated Trade Solution (WITS) and Comtrade; index proposed by Finger and Kreinin 1979.
Note: The higher the index, the greater the similarity between the manufacturing export baskets of two economies.

FIGURE O.14 Effects of the rise of China on gross exports from Latin America and the Caribbean, by sector, 2001–11 average



Source: Artuç, Lederman, and Rojas 2015, based on data from WITS and Comtrade.

Note: Sectoral classification of trade flows is based on the ISIC classification, Revision 3. Agriculture corresponds to ISIC codes 0111–0500, mining to ISIC codes 1010–1429, and manufacturing to ISIC codes 1511–3699. See box 3.1 in chapter 3 of this report for technical details. LAC = Latin America and the Caribbean.

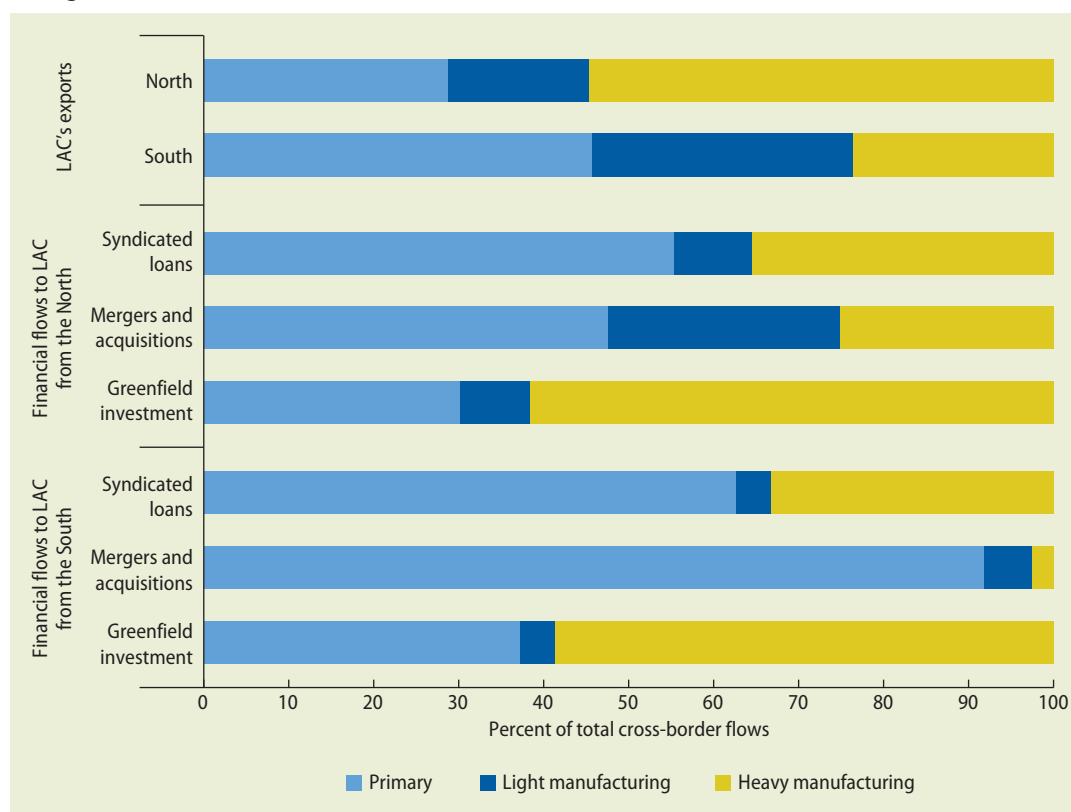
from the North in LAC went to the primary sector (figure O.15). Large, albeit less striking, differences are also observed in cross-border greenfield investments and syndicated loans.¹⁶

These trends suggest that the proliferation of LAC's ties with the South was driven to a larger extent by natural endowment-based comparative advantages than by integration into manufacturing GVCs. Two key questions may be raised in this regard. First, is LAC indeed characterized by weaker integration into GVCs than other South regions? Second, are some types of trade structures (such as structures associated with participation in GVCs) more conducive to growth than others? The rest of this section provides

evidence to support a nuanced yet positive answer to the first question.¹⁷ The second question is examined in a subsequent section.

New forms of cross-border trading emerged alongside the rise of the South. One manifestation of this phenomenon was the proliferation of GVCs. These chains entail the offshoring and international distribution of specialized activities that are part of an integrated production process. They typically involve a group of firms located in different countries that operate at different stages of the same production process in a coordinated fashion, all under the aegis of a lead firm, with the goal of enhancing the overall efficiency of the chain. The GVC-based globalization

FIGURE O.15 Sectoral composition of cross-border flows in Latin America and the Caribbean, 2003–2011 average



Source: Calculations based on data from Comtrade, SDC Platinum, and fDi Markets.

Note: The primary sector includes agriculture, hunting, forestry, and fishing; mining; and crude petroleum and natural gas. The light manufacturing sector includes food, beverages, and tobacco; textiles and apparel (including leather); and wood and paper-related products. The heavy manufacturing sector includes refined petroleum and related products, chemicals and plastics, nonmetallic minerals, metals, machinery and equipment, and transport equipment. The North includes the G-7 members and Western Europe countries. The South includes all other economies. Figure excludes offshore centers. G-7 = Group of Seven; LAC = Latin America and the Caribbean.

pattern is thus driven more by firms' global strategies than by traditional country-based comparative advantages. The resulting multicountry production process calls for a finer analysis of trade patterns that goes beyond the traditional focus on broad sectors and skill categories (see, for instance, Baldwin 2012).

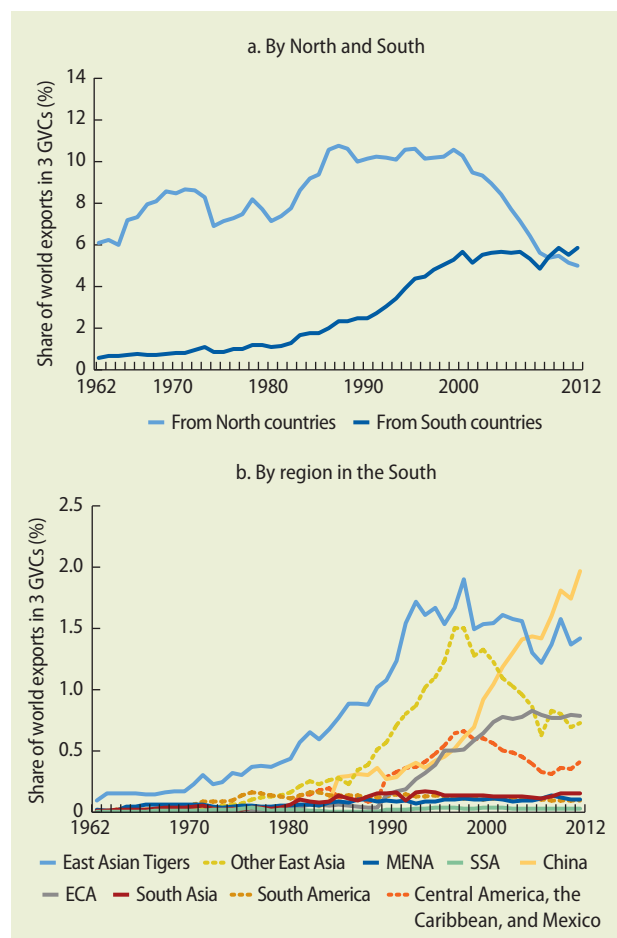
Measuring the intensity and quality of integration of a country into GVCs is a challenge. Given the paucity of suitable data, proxies must be used.¹⁸ One way to do so is to focus on exports of GVC-relevant intermediate goods, as these fragmented production processes require that parts and components cross borders before finished goods are shipped to final markets. Figure O.16 documents the rise of exports of intermediate goods that are relevant for GVCs in three industries: apparel and footwear, electronics, and automobiles and motorcycles.

The North started visibly losing its dominance in the exports of these intermediates (measured as share of total exports of GVCs in the three industries) in the late 1980s, when the South's activity appears to have taken off (figure O.16, panel a). This process accelerated in the 1990s; by 2009 the South's exports of intermediate goods for these GVCs had surpassed the exports of the North. The North's relative importance in GVC-relevant intermediate exports began to decline around 2000—yet another piece of evidence that a major global restructuring broadly coincided with China's accession to the World Trade Organization.

Participation in GVC-relevant exports of intermediate goods varied widely across countries and regions within the South (figure O.16, panel b). The first economies from the South that picked up sizable shares of global trade in intermediates were the East Asian Tigers (Hong Kong SAR, China; Korea; Singapore; and Taiwan, China), whose surge began in the 1970s. They were followed by other Asian countries (Indonesia, Malaysia, the Philippines, and Thailand), which picked up sharply in relative importance during the 1990s but then lost ground precipitously after 2000, when China rose to a dominant position.

Within LAC, Central America and Mexico gained relative importance during the early 1990s, probably as a result of the North American Free Trade Agreement (NAFTA). They peaked around 2000 and then lost ground, even as Eastern Europe rose, until about 2009. Since then, Central America and Mexico seem to have experienced a rebound. The contrast with South America is stark: it did not experience a relative surge in terms of

FIGURE O.16 Exports of intermediate goods as share of total exports in three global value chains



Sources: Calculations based on data from Comtrade; classification of intermediate goods into three major global value chains (apparel and footwear, electronics, and automobiles and motorcycles) is from Sturgeon and Memevodic 2010.

Note: The North includes the G-7 members and Western Europe countries. The South includes all other economies. East Asian Tigers include Hong Kong SAR, China; the Republic of Korea; and Singapore. Other East Asia includes Indonesia, Malaysia, the Philippines, and Thailand. All other regions follow the World Bank classification of countries. ECA = Europe and Central Asia; G-7 = Group of Seven; GVC = global value chain; MENA = Middle East and North Africa; SSA = Sub-Saharan Africa.

exports of GVC-relevant intermediates, and it never had as large a share as many other South regions. This evidence suggests that geography (that is, proximity to the United States and distance from East Asian countries) played a key role within LAC as a conditioning factor for the region's participation in GVCs.

Another way of gauging a country's integration into GVCs is to focus on GVC-related forward and backward linkages. From this perspective, even raw commodity exporters can participate in GVCs, albeit in the forward linkage space, by, for instance, exporting inputs (such as crude oil) for the manufacture of intermediate goods with greater degrees of processing or final goods (such as gasoline and other oil derivatives). Figure O.17 shows the differences between regions and subregions around the world in terms of their backward- and forward-linkage participation in GVCs.

Mexico and Central America relate to GVCs mainly as manufacturers of final goods, hence predominantly in the backward linkage part of GVCs. Moreover, they have integrated toward the final stages of GVCs with North countries, particularly the United States. South American countries, by contrast, being net commodity exporters, are inserted mainly in the forward-linkage segments of GVCs.

The East Asian countries show equal participation in the forward and backward segments of GVCs, implying that about half of their GVC-related trade is from imports of intermediate goods and half from exports of final goods. This benchmark of 50 percent may be relevant for growth, as it could be a sweet spot for the maximization of certain learning spillovers, as, for instance, producers of tradables can learn as much from their suppliers of imported goods as from the buyers of their exports.

Differential employment effects

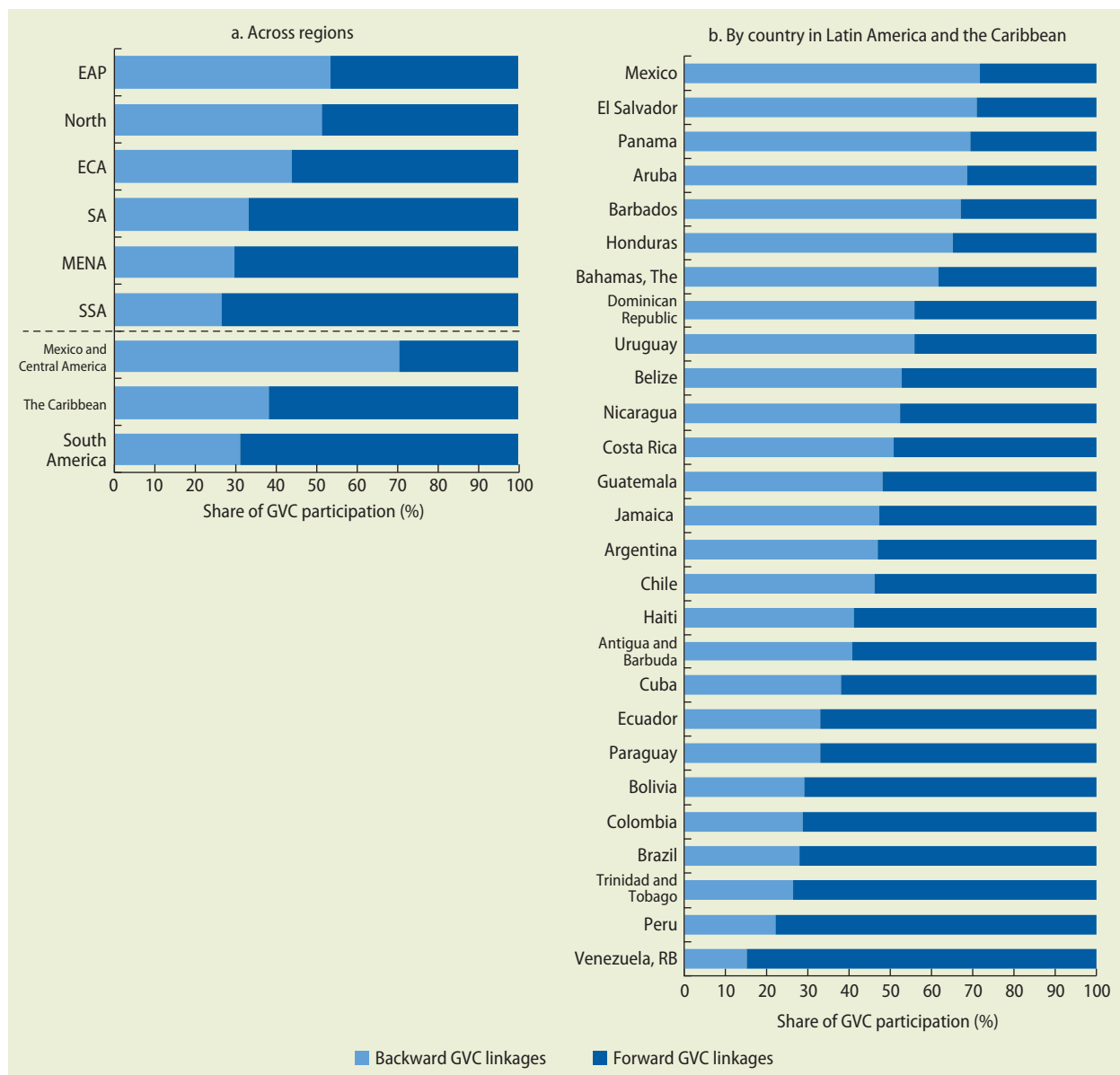
How did the economic shocks emanating from the restructuring of global trade affect employment in LAC, especially given the similarity in the trade structures of the region's

larger countries and China? The consequences were indeed asymmetric across LAC countries and tradable industries, as could be expected.

In Argentina, Brazil, and Mexico, the share of manufacturing employment, especially formal employment, has declined since roughly 2000 (figure O.18). The fact that it was most apparent in Mexico—one of the countries in the region hardest hit by the rise of China in global markets of manufactured products—suggests that the employment impact of China was particularly intense where the trade effects were largest.

Evidence from the simulation models presented in this report indicates that the impact of China on labor market dynamics in Argentina, Brazil, and Mexico (through global markets of manufactured goods, agriculture, and mining) was substantial in the short run but, perhaps contrary to expectations, relatively weak in the longer run (for technical details, see chapter 3 of this report). Labor market frictions appear to have significantly increased the short-run pain of the adjustment for workers in the manufacturing industry. However, these effects were counterbalanced in Argentina and Brazil by the positive employment effects of rapidly rising agriculture and mining imports from China. Mexico fared a bit worse: the simulation estimates suggest that the negative effects on labor demand in manufacturing were too large to be compensated for by the relatively small positive effects on Mexico's labor demand in agriculture and mining. This China-led rise of the South can thus plausibly and at least partially explain why wages (adjusted for purchasing power parity) rose faster in Brazil than in Mexico since the early 2000s (figure O.19). The evidence on the seemingly small longer-run employment impacts should be interpreted cautiously, however. Evidence from other sources discussed in this report suggests that labor market frictions that inhibit labor migration within countries may result in significant long-term losses in areas that had high levels of manufacturing employment before the rise of China (see, for instance, Autor, Dorn, and Hanson 2013; Chiquiar 2014).

FIGURE 0.17 Backward and forward participation in global value chains, 2011



Sources: Calculations based on data from Eora-MRIO and WDI.

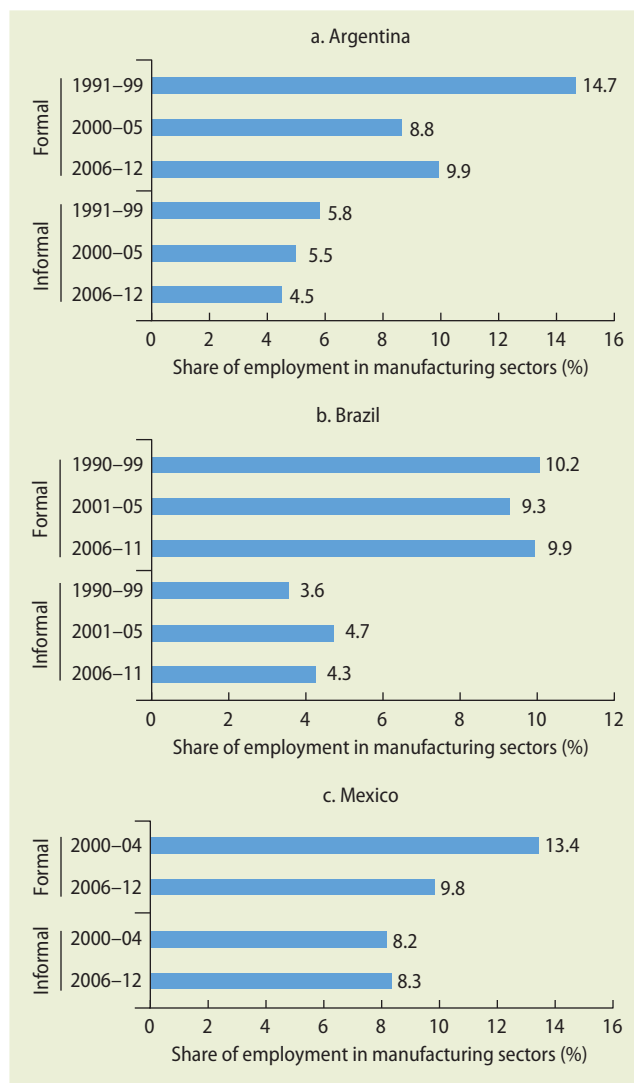
Note: Participation in global value chains (GVCs) is proxied by the share of a country's export that is part of a multistage trade process. This measure is constructed by adding the foreign value added used in a country's own exports (backward GVC linkages) to the value added supplied to other countries' exports (forward GVC linkages) and scaling the total by the country's total exports of goods and services. Panel a reports cross-country averages. The North includes the G-7 members and Western Europe countries. The South includes all other economies. All other regions follow World Bank classification of countries. EAP = East Asia and Pacific; ECA = Europe and Central Asia; G-7 = Group of Seven; GVC = global value chain; MENA = Middle East and North Africa; SA = South Asia; SSA = Sub-Saharan Africa.

Low saving rates in Latin America and the Caribbean

LAC's response to the global shocks was also conditioned by the net integration of countries

into the world economy. This seldom explored structural dimension of globalization is based on the composition of demand—that is, the relative importance of domestic versus external demand relative to the country's income.

FIGURE O.18 Employment shares in the formal and informal manufacturing sectors of Argentina, Brazil, and Mexico



Sources: Calculations based on data from Encuesta Permanente de Hogares-Continua (EPHC) surveys in Argentina, Pesquisa Nacional por Amostra de Domicílios (PNAD) surveys in Brazil, and Encuesta Nacional de Ingresos y Gastos de los Hogares (ENIGH) surveys in Mexico.

Note: Informal workers are defined as workers without social security benefits.

The patterns of net integration of LAC countries are undisputedly related to the region's historically low savings rates. Indeed, the difference between aggregate domestic demand and income is the external current account, which is also equal to the difference between domestic saving and investment. For its part,

national saving could be related to external competitiveness, balance of payments sustainability, investment, and growth, among other factors. This section documents key relevant facts regarding the patterns of saving, investment, and real exchange rates in LAC relative to other middle-income South regions. The effects of (low) saving on growth are discussed further below.

Figures 20 and 21, which come from an econometric model discussed in this report, show the comparative dynamics of saving, investment, the current account, and the real exchange rate resulting from global shocks for LAC and non-LAC emerging economies.¹⁹ As discussed earlier, the supply shock in the first decade of the 2000s seems to have dominated the demand shock. Hence, the focus is on the response to an increase in global supply and to a decline in world interest rates (equivalent to a shock from monetary easing).

Assuming no major institutional or structural change during the entire period, a positive supply shock (an increase in global supply) boosts LAC's investment, appreciates its real exchange rate, and widens its current account deficit more and more persistently than in other emerging economies (figure O.20). At the same time, such a shock depresses LAC's saving rates for a prolonged period (in contrast with other emerging economies).

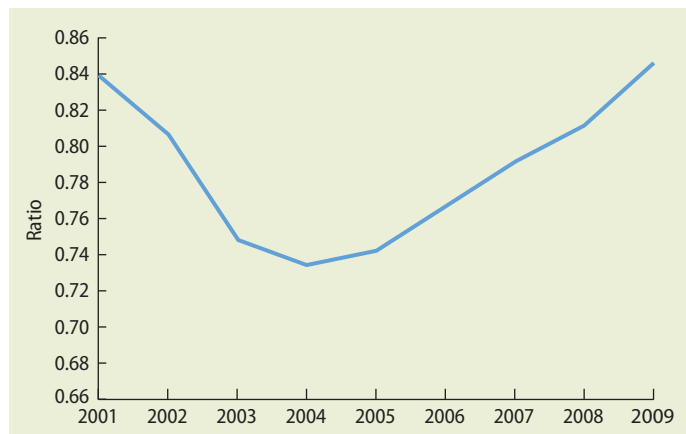
Consistent with the earlier discussion, a favorable global monetary shock that took place over the same period accentuated the macroeconomic effects of the global supply shock in LAC. In fact, the econometric exercise finds that a decline in the U.S. interest rate led to a rise in LAC's investment rate, an appreciation of its exchange rate, and a fall in its saving rate (figure O.21). These effects were also more durable than in other emerging economies.

The patterns of low saving rates and appreciating real exchange rates that prevailed in many LAC countries over the past decade can thus be at least partially explained as region-specific responses to global shocks emanating from the rising South. The differences in macroeconomic responses to the global shocks between LAC and other

emerging South regions seem to have diminished during the past decade, however, at least in part thanks to improvements in macroeconomic policy management. In particular, evidence from the econometric exercise suggests that the adoption of inflation-targeting-cum-exchange-rate-flexibility and improved fiscal rules in several LAC countries appears to have led to significantly smoother responses of output, consumption (hence saving), and investment to global shocks. This smoothing was counterbalanced, at least in inflation-targeting countries, by larger responses in the real exchange rate.

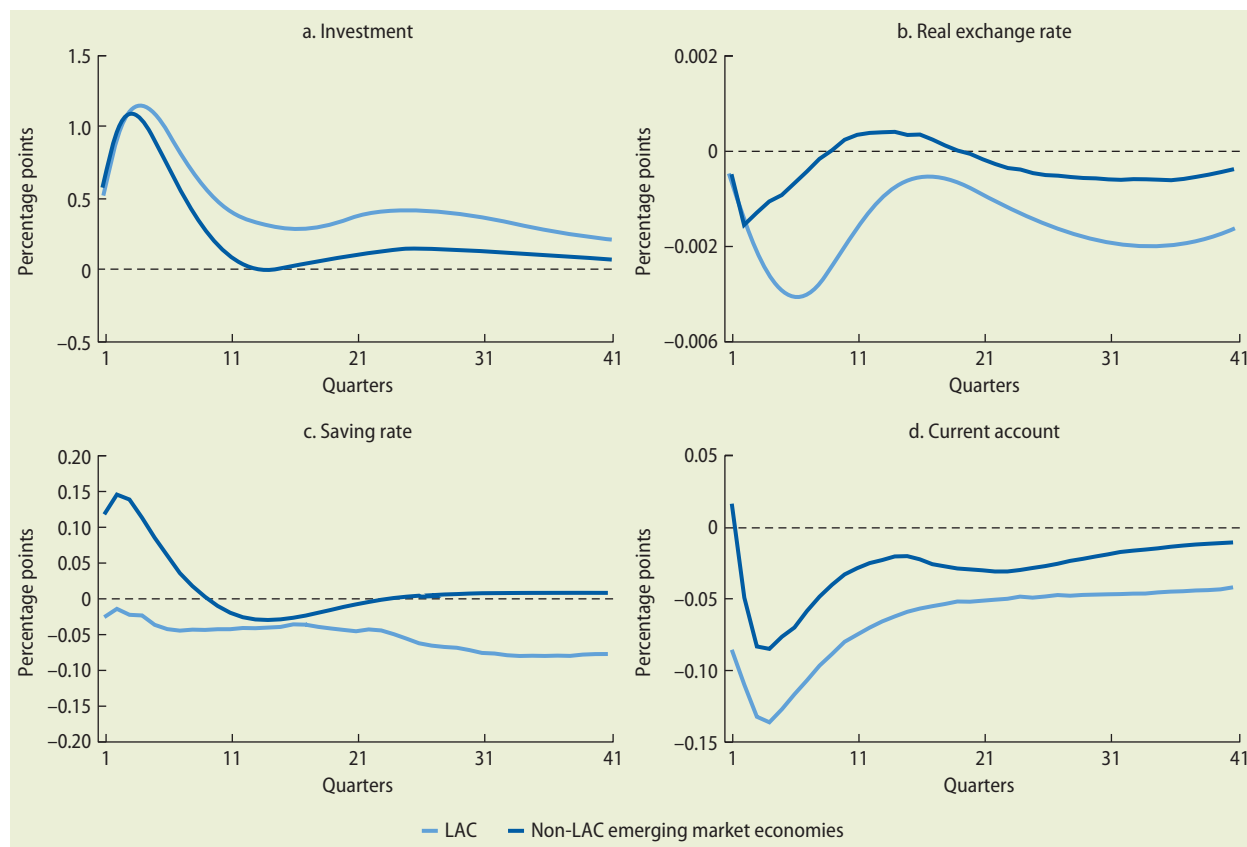
LAC's patterns of macroeconomic responses to the global shocks, and the change in such patterns over the past decade, are arguably influenced by LAC's reliance on

FIGURE O.19 Evolution of wages in Brazil relative to wages in Mexico



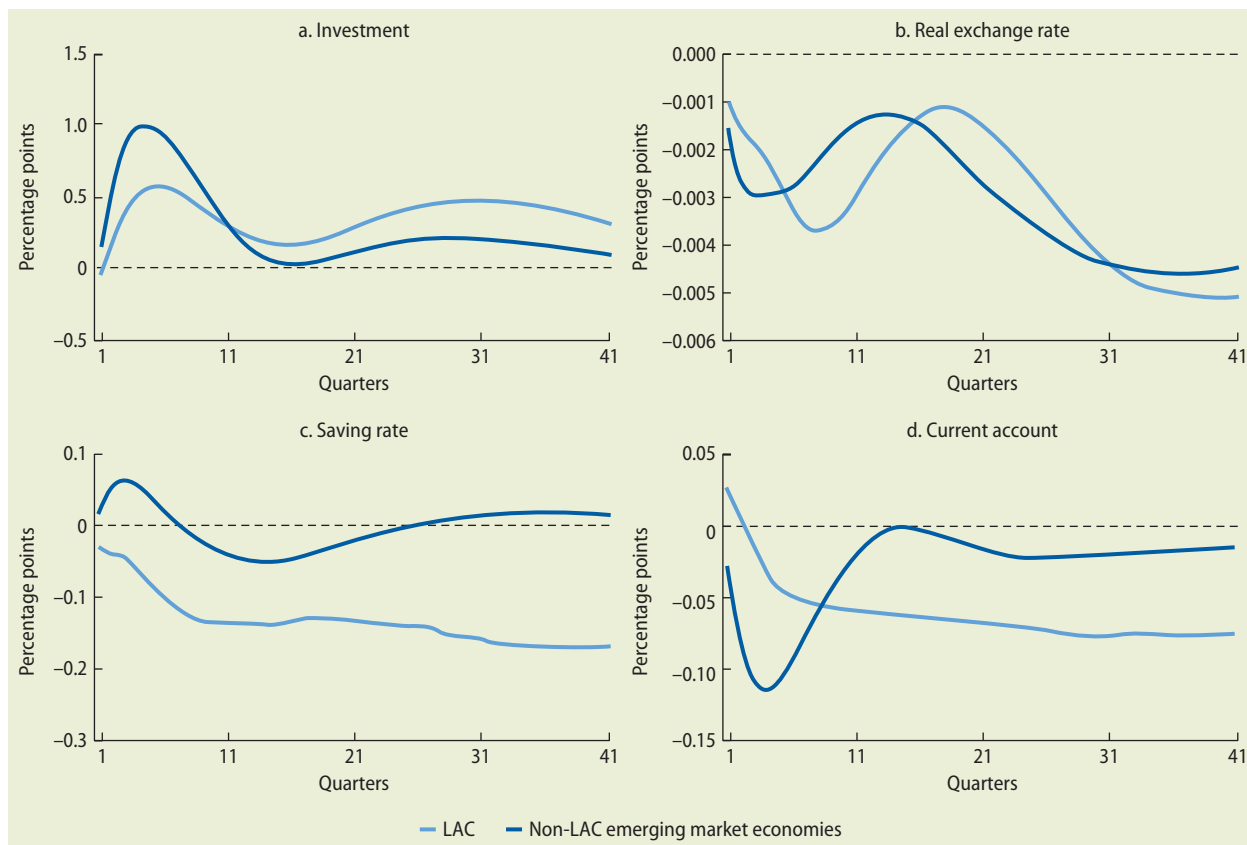
Source: National average wages in local currency are from the International Labour Office. They were converted to international purchasing power parity constant 2005 U.S. dollars using the conversion factor from World Development Indicators (WDI).

FIGURE O.20 Responses to a positive global supply shock in Latin America and the Caribbean and other emerging market regions



Source: Hevia and Servén 2014.

Note: Lines represent the accepted median model deviation from the trend from a global demand shock, in terms of the sign restrictions defined in Hevia and Servén (2014). See table SA.4 in chapter 5 of this report for technical details on the sign restrictions. Non-LAC emerging market economies include Hungary, India, Indonesia, the Republic of Korea, the Philippines, Poland, the Russian Federation, South Africa, Thailand, and Turkey. LAC = Latin America and the Caribbean.

FIGURE O.21 Responses to a global monetary easing in Latin America and the Caribbean and other emerging market regions

Source: Hevia and Servén 2014.

Note: Solid lines represent accepted model median deviation from the trend from a global demand shock, in terms of the sign restrictions defined in Hevia and Servén (2014). See table 5A.4 in chapter 5 of this report for technical details on the sign restrictions. Non-LAC emerging market economies include Hungary, India, Indonesia, the Republic of Korea, the Philippines, Poland, the Russian Federation, South Africa, Thailand, and Turkey. LAC = Latin America and the Caribbean.

domestic demand (associated with low saving rates and a penchant for current account deficits). Some evidence to back this statement was provided earlier, in connection with figure O.10, which shows that current account deficits tend to emerge systematically in LAC, even during the recent times of favorable terms of trade.

Low saving rates arguably condition macroeconomic outcomes and responses to external shocks through one of two channels. The first is a real exchange rate (ER) channel—a competitiveness-reducing effect caused by appreciating real exchange rates that can hinder growth.²⁰ The second is an interest rate (IR) channel, associated with a balance

of payment vulnerability effect, which can also hinder growth.²¹ Where the ER channel dominates, one would expect to observe a pattern in which countries that save less grow less and have appreciated real exchange rates. Where the IR channel dominates, one would also expect to see that countries that save less grow less. Yet, real exchange rates would be undervalued in this case, reflecting low sovereign ratings and vulnerable balance of payments trajectories.

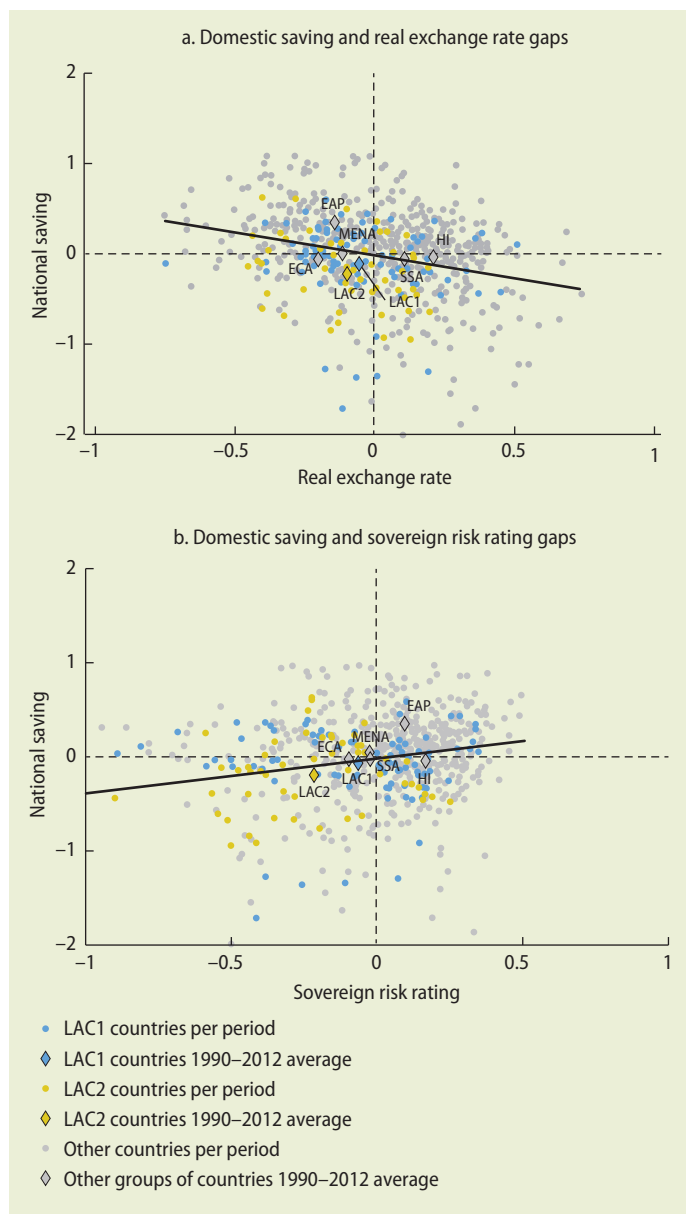
The patterns observed in figure O.22 are consistent with these expectations. The variables of interest in the scatter plots reflect medium-term equilibrium relations that are presented in the form of deviations from the

benchmark.²² The size of the deviations can be attributed largely to differences in policies and policy-driven institutions.²³

Panel a of figure O.22 shows that an ER pattern is consistent with the entire analyzed sample: on average countries that save more have more competitive real exchange rates, relative to benchmark. However, LAC countries (divided into two groups, higher-income countries [LAC1] and lower-income countries [LAC2]) tend to be located in the lower-left quadrant, where exchange rates are undervalued. In contrast, East Asia and Pacific countries tend to occupy the upper-left quadrant, where oversaving is associated with undervaluation. These patterns suggest that low saving rates have historically influenced macroeconomic outcomes in LAC mainly through the IR channel—that is, through adverse balance of payments vulnerability effects reflected in low country ratings. This finding is consistent with the scatter diagram in panel b of figure O.22, which shows that worldwide data also support an IR pattern (countries that save less tend to have lower sovereign risk ratings). LAC is located closer to the fitted line, although it still appears as an undersaving and underrated region.

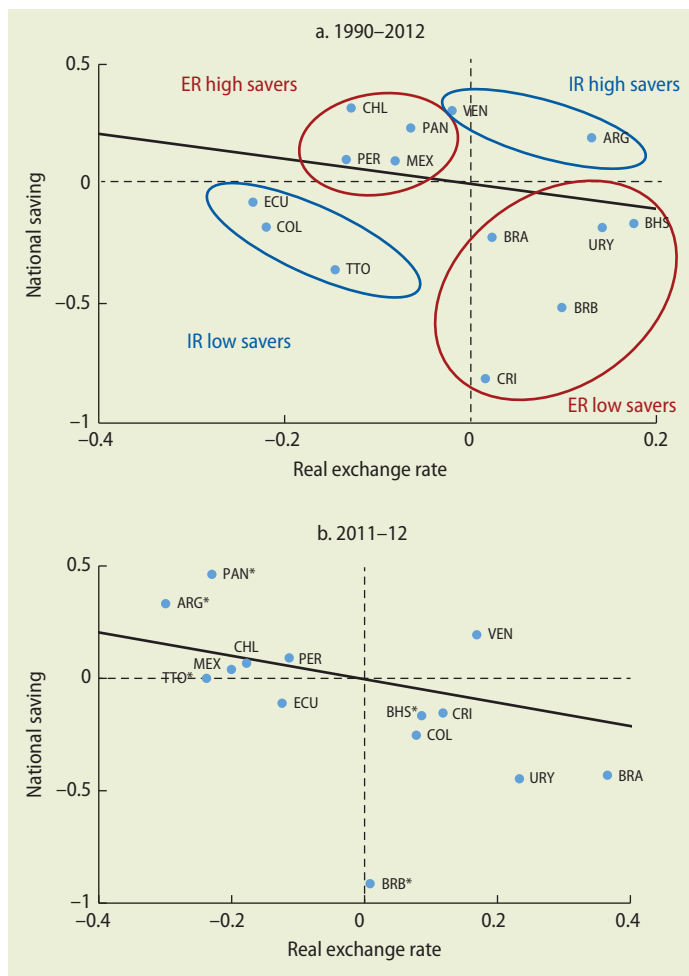
Two key caveats have to be made in this regard. First, there has been considerable heterogeneity within LAC, as shown in panel a of figure O.23. Between 1990 and 2012, the region started to break free from the spell of low sovereign ratings (figure O.24) and hence started to transition from an IR to an ER pattern. Chile, Mexico, Panama, and Peru appear as oversavers with undervalued real exchange rates (all relative to benchmark), whereas the Bahamas, Barbados, Brazil, Costa Rica, and Uruguay appear as undersavers with overvalued exchange rates. These country cases thus conform to the ER pattern. In contrast, Colombia, Ecuador, and Trinidad and Tobago sit in the lower-left quadrant, with low domestic saving and undervalued exchange rates. These patterns suggest that these latter countries have remained more persistently under the grip of the IR channel. Perhaps surprisingly,

FIGURE O.22 Domestic saving, real exchange rates, and sovereign risk ratings, 1990–2012 average



Sources: Calculations based on data from United Nations (UNSTAT), WDI, and Institutional Investor database.

Note: The linear fit was calculated for the period version of the complete country sample for 1990–2012. LAC1 countries are countries in Latin America and the Caribbean (LAC) with annual per capita GDP of more than \$5,000; LAC2 countries are those with annual per capita GDP of \$5,000 or less; see table OA.1 for list of countries in all groups). GDP = gross domestic product; EAP = East Asia and Pacific; ECA = Europe and Central Asia; HI = high income; MENA = Middle East and North Africa; SSA = Sub-Saharan Africa. See annex 5A in the main report for details on how the benchmarks are calculated.

FIGURE O.23 Saving and real exchange rate gaps for higher-income countries in Latin America and the Caribbean

Sources: Calculations based on data from UNSTAT and WDI.

Note: The linear fit (shown in both panels) was calculated for the complete country sample for 1990–2012. Higher-income countries in Latin America and the Caribbean are countries with annual per capita GDP of more than \$5,000 (see annex table OA.1 for list of countries). See annex 5A in chapter 5 of this report for technical details on the calculation of the benchmarks. Three-letter country groupings correspond to ISO 3166 standard. * = due to missing data for the 2011–12 period, the latest available period was used. IR=countries affected by the interest rate channel. ER= countries affected by the real exchange rate channel. GDP = gross domestic product.

Argentina and República Bolivariana de Venezuela appear as high savers with overvalued currencies. As these countries have had sovereign ratings well below the average of the LAC1 group, a plausible explanation for their location in the figure is the repeated occurrence of exchange controls and episodes of massive capital flight, during which excess saving and current account surpluses

were generated to effect the transfer of capital abroad.²⁴

Second, consistent with the suggestion stemming from the dynamic analysis referred to earlier, the benchmarking exercise identifies an accelerated migration of LAC1 countries toward the ER pattern during the first decade of the 2000s, as real exchange rates appreciated substantially and sovereign risk ratings rose steeply. Country ratings actually converged in this period to those of the middle-income countries of Southeast Asia (figure O.24), with several countries in LAC joining the investment-grade asset class.²⁵ This migration reflected improvements in macrofinancial policy frameworks and, at least in South America, the powerful forces of the global shocks associated with the rise of the South. In fact, as shown in panel b of figure O.23, many LAC1 countries moved significantly closer to the ER pattern that is observed for the entire sample (the fitted line) during the 2011–12 period. Particularly strong real appreciations took place in Brazil, Colombia, Costa Rica, and Uruguay.

Implications for growth: Trade structure, foreign direct investment, and the composition of aggregate demand

Do the LAC-specific trade and aggregate demand structures really matter for growth? This section summarizes the main findings of a battery of econometric tests conducted to shed light on this question, with special attention on the relevance for growth of trade structure, FDI, and domestic saving. The key message is that economic structures matter for growth. A reassessment of the region's growth- and productivity-oriented reform agenda from the angle of structure would therefore be useful.

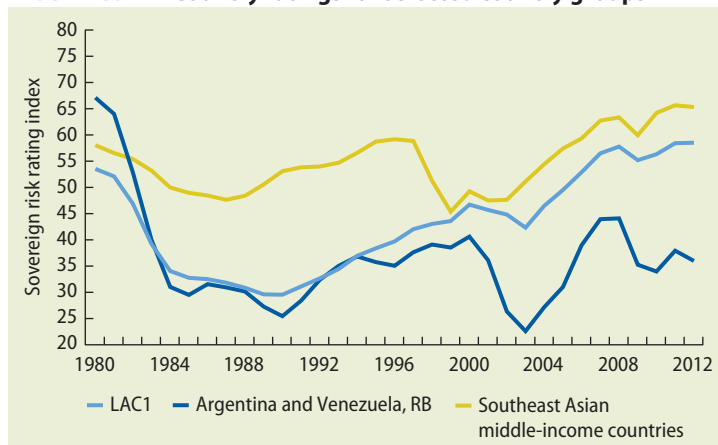
The role of trade structure. The literature supports the notion that trade openness can raise growth rates, at least temporarily, during the transition to a higher steady-state path of GDP per capita.²⁶ There is much debate, however, regarding the channels through which this transition may operate.

The traditional answer, dating back to the neoclassical theories of trade, has been that trade lifts growth (at least transitionally) through the efficiency gains of specialization based on comparative advantage. This channel hinges on differences in either factor endowments (labor, capital, land, natural resources) or average productivities across countries.²⁷

More recently, the focus has been on a different (and arguably complementary) mechanism, whereby trade boosts growth by serving as a conduit for learning spillovers and technology diffusion (see Keller 2004 for an early review of the literature). One implication is that when it comes to its impact on growth, not all trade is created equal. The question is less about whether and how much an economy trades but rather how much it learns from its international trade. This realization naturally shifts the debate toward questions such as how and with which partners a country trades. Empirically, these questions point to measurable dimensions that can be used as proxies for learning-intensive trade.²⁸ As such, this report adds to the growing evidence that suggests that certain features of a nation's trade structure matter for economic development and growth. Some of these features include the degree of intraindustry trade, participation in GVCs, the composition of trading partners, and the degree of export concentration. These features shed light on the extent to which technology diffusion and the learning intensity of trade can positively affect growth and other economic outcomes, such as macroeconomic volatility (see, for instance, Lederman and Maloney 2007; Alvarez, Buera, and Lucas 2013; and Pinat 2015).

This report analyzed the relationship between several characteristics of trade structure and growth, given that there is no overarching consensus in the literature as to which ones are most influential. Two particularly interesting characteristics—intraindustry trade and participation in GVCs—are likely to be related to international technology and knowledge flows because they tightly link trade to domestic factor and input markets, logistics, and production processes. One

FIGURE O.24 Country ratings for selected country groups



Source: Calculations based on data from Institutional Investor database.

Note: Middle-income countries in Southeast Asia include Indonesia, the Republic of Korea, Malaysia, the Philippines, and Thailand. LAC1 countries are countries in Latin America and the Caribbean (LAC) with annual per capita GDP of more than \$5,000 (see annex table OA.1 for a list of countries). GDP = gross domestic product.

can thus surmise that to the extent that trade flows embody technology and knowledge, producers can benefit more from exports and imports that are part of the same industry or a GVC than they can from exports and imports that correspond to unrelated or disconnected activities. The composition of trading partners may also play an important role in how much countries learn and how quickly they adopt new technologies.

The econometric evidence in this report suggests that trade linkages with the North could indeed yield higher growth payoffs than trade with the South. The results, based on data for 1960–2010, indicate that a 1 percentage point increase in the degree of trade openness with North countries is associated with a 1.6 percent increase in GDP per capita per year over a five-year period, followed by potentially longer-lasting effects. In contrast, the estimated effect of trade with the South is much lower: a 1 percentage point increase in the degree of trade openness with South countries is associated with an increase in GDP per capita of only about 0.3 percent.

The difference in the estimated effects when trading with the North versus the South seems to be associated with differences in the

structure of trade along several dimensions, arguably including the extent and manner in which countries participate in GVCs (see chapter 2 of this report and Didier and Pinat 2015 for technical details and a deeper analysis of the structure of trade linkages and economic growth). Controlling for the overall volume of trade flows, increases in participation in GVCs, especially the middle segments of these chains, yield additional gains in GDP per capita. An increase in the share of total trade that comes from intraindustry trade has a positive and statistically significant association with income growth. Trading with countries at the center of the global trade network is associated with higher growth, arguably because these types of connections expose the country to the frontier of ideas and technologies. The econometric results also suggest that countries benefit more from international trade connections when they have a more educated labor force, which points to the importance of human capital formation for the absorption of foreign technology and knowledge.

Intraindustry trade and insertion into the core of GVCs thus appear to be more conducive to higher long-term growth rates. Except possibly in Mexico, Costa Rica, and Uruguay, the rise of the South has not systematically yielded these types of growth-inducing changes in trade structures in LAC.

The role of foreign direct investment. The increase in financial flows across countries, especially FDI, could be driven by companies seeking to capitalize on efficiency improvements made possible through the fragmentation of production stages across countries. Therefore, the rising participation of the South in global financial flows could be a potential driver of economic growth. Such flows may not only ease financing constraints in recipient economies but also be a conduit for technology diffusion and learning spillovers. Indeed, policymakers from the South, including LAC, see the attraction of FDI and multinational corporations as a policy priority.

The empirical findings presented in this report indicate that although North-North

M&A flows are positively (and significantly) associated with the recipient country's labor productivity within manufacturing industries, North-South, South-North, and South-South flows are not (for technical details, see chapter 4 of this report and Didier, Nguyen, and Pienknagura 2015). These findings suggest that LAC and other South economies have yet to benefit in terms of labor productivity increases within manufacturing industries from their flourishing connections with the rest of the South or the North.

Other evidence, however, suggests that LAC has benefited from the presence of multinational corporations through different channels, including by accelerating the exit of low-productivity domestic firms and enhancing the productivity of domestic firms across all industries (see, for instance, Lederman and others 2014).

The new evidence on FDI presented in this report suggests that aggregate industry-specific labor productivities in the South so far appear to be unaffected by foreign firms' mergers with or acquisitions of domestic firms. Future research could attempt to ascertain the features in North economies that allow them to benefit from M&A flows within industries, with an eye toward understanding whether these positive effects depend on public policies (as impediments to or propagators of learning spillovers), the quality of institutions, the quality of human capital, or other factors. The section on policy priorities below addresses these issues.

The role of the composition of aggregate demand. Do low national saving rates—a trademark of LAC economies—hamper growth? Mainstream open-economy growth models typically assume that foreign and domestic saving are perfect substitutes. Implicit in these models is the notion that what really matters for growth are investment (and profit) prospects, but not how investment is financed. This view is consistent with the assumption that factors of production (particularly capital) respond to small differences in relative returns by flowing into their most productive uses,

both across countries and industries or firms within countries. The implication is that domestic saving, and more broadly the composition of aggregate demand, is not a determinant of the equilibrium real exchange rate. Rather, the latter would be determined only by productivity differentials across tradable and nontradable industries driven by supply-side characteristics, such as the capital intensity of production. Consequently, saving and the real exchange rate would not affect growth, as small increases in returns to capital would immediately attract capital to the countries, industries, or firms that temporarily offer higher returns. The real exchange rate would adjust back to its equilibrium level accordingly.

This view clashes with certain well-established stylized facts. For example, countries that rely on foreign saving grow less (see, for instance, Prasad, Rajan, and Subramanian 2007); countries whose productivity falls behind are countries that “tax” saving (see, for instance, Gourinchas and Jeanne 2012); and there is considerable misallocation of factors of production, which shows up in large and persistent dispersion of productivities across firms, sectors, and countries.

This report provides evidence in support of the alternative hypothesis that national saving matters for growth, implying that domestic and foreign saving are imperfect substitutes. Econometric evidence suggests that national saving rates have an impact on growth (for technical details, see chapter 5 of this report and De la Torre and Ize 2015). It shows that, on average, a 10 percentage point increase in the saving rate (which would bring the average LAC saving rate to the level in Southeast Asia) would increase GDP per capita by 1–2 percentage points a year for at least three years, followed by potentially long-lasting effects of similar magnitudes thereafter. The evidence is preliminary and thus should be interpreted with caution. However, it does strengthen the argument that saving matters for long-term growth.

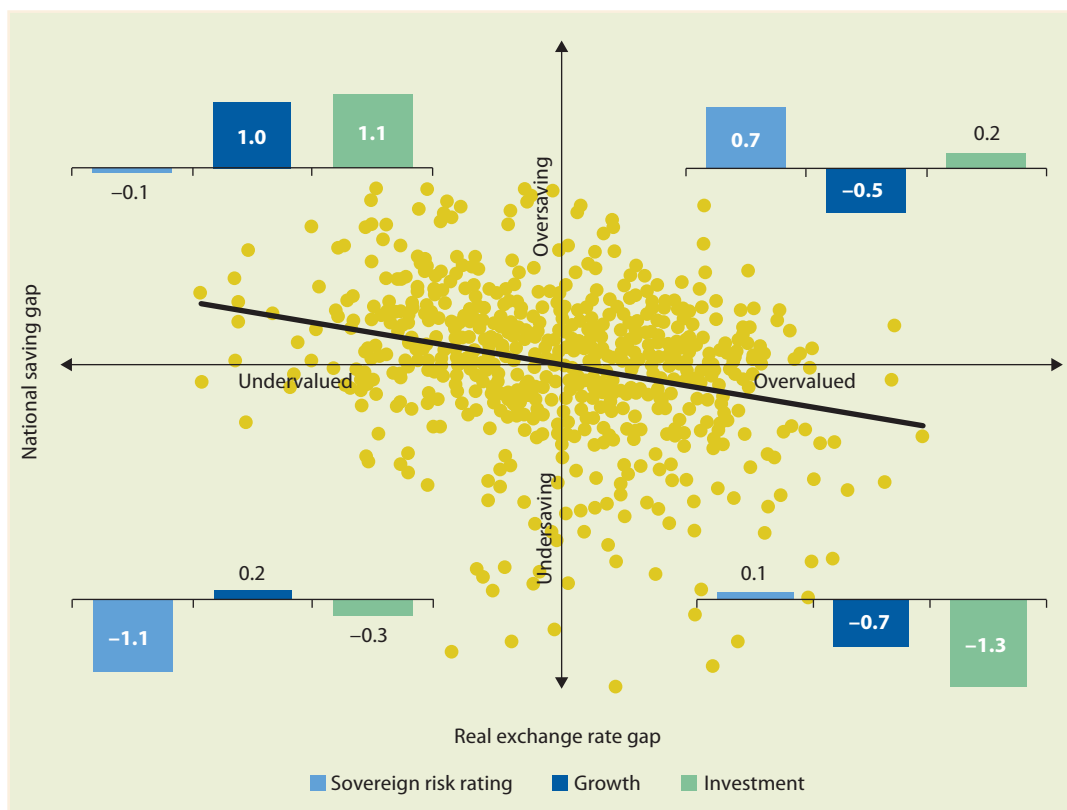
The findings also suggest that the saving-to-growth link is stronger for middle-income countries. This result should not be

surprising, given that factor mobility is lower (and factor misallocation higher) in emerging than advanced economies. Foreign and domestic saving are thus less perfect substitutes, as far as growth is concerned, in these emerging economies. The result also suggests that saving rates can in some sense compensate for market imperfections and policy obstacles that get in the way of efficient resource allocation. As the allocative function of markets improves, saving should be less of a constraint on growth.

Finally, important asymmetries seem to characterize the effects of saving on growth. In particular, a higher domestic saving rate has a greater positive impact on growth when countries experience current account deficits. This finding should not be surprising, as it stands to reason that the benefits of a saving effort that help to avoid unviable balance of payments trajectories outweigh the benefits of a saving effort that increase an already strong current account surplus.

When the data are explored in ways that identify the underlying mechanisms, the relevance of both the external competitiveness (ER channel) and the balance of payment vulnerability (IR channel) effects of saving is borne out. Figure O.25, which uses the entire sample, shows deviations from benchmark in the domestic saving–real exchange rate space. For all observations in each quadrant (that is, for all the dots plotted in figure O.22, panel a), figure O.25 shows the average of the corresponding deviations from benchmark for other key variables (namely, sovereign ratings, growth rates, and investment rates).

Four key messages emerge from figure O.25. First, countries with undervalued real exchange rates grow faster than countries with overvalued currencies. This finding is a restatement of the well-known finding of Rodrik (2008). Second, the ER pattern strongly emerges from the world data: countries that oversave typically have undervalued real exchange rates and grow faster than other countries, whereas countries that undersave typically have overvalued currencies and grow more slowly. Third, the IR pattern also emerges from the data: countries

FIGURE 0.25 Sovereign risk rating, growth, and investment gaps, 1990–2012

Sources: Calculations based on data from UNSTAT and WDI.

Note: Each bar in the figure represents the simple average of sovereign risk rating, growth, or investment gaps for the observations located in each quadrant of the scatter plot. The scatter plot is a reproduction of figure 0.22, panel a. Each point represents a country for a given time period. See chapter 5 for additional details.

that undersave and face balance of payments viability problems (that is, countries in which sovereign risk ratings are well below benchmark) also have undervalued real exchange rates. Fourth, saving affects future growth through investment: countries that oversave relative to benchmark typically outperform their peers in terms of investment rates, especially where the real exchange rate is undervalued.

During the past decade or so, LAC was caught up in the forces of real and monetary global shocks precisely at a time when significant improvements in macrofinancial policy frameworks were materializing. The confluence of these external and internal factors promoted rapid improvement in country

ratings for much of LAC, even as the region boosted growth and reduced systemic vulnerabilities. However, LAC adapted and responded to these shocks with its traditional domestic demand-reliant (low saving) macroeconomic structure, which led to strong real appreciations, especially in countries that save less.²⁹ The force of the external tailwinds was such that they more than offset (and actually concealed) the adverse growth effects of low saving. Now that the tailwinds of commodity prices no longer blow, one can hypothesize that, given the vastly improved country ratings, low saving rates in LAC may hinder growth less through balance of payments vulnerability effects and more through external competitiveness effects.

Changing world, new priorities

The rise of the South has affected at least three major policy areas, all of which have implications for employment and growth. In some respects, the global shocks may have temporarily dimmed the urgency of such old policy challenges as commodity dependence, labor market frictions, and low saving rates. However, as the pull of the rise of the South tapers off and the tailwinds recede, the policy agenda should turn even more forcefully toward the issues highlighted below.

Reducing labor market frictions

Labor market frictions made the process of adjustment to the global supply and demand shocks unnecessarily costly, especially for the net commodity importing countries in LAC. They explain why China was once the scapegoat of choice for LAC policymakers.³⁰

Especially since 2001, when China accelerated its pace of growth in global trade, workers in LAC could have benefited from the declining prices of manufactures and the employment opportunities in agriculture, mining, and nontraded domestic industries if they had been able to switch jobs easily. However, the evidence in this report, as well as the public's tendency to worry about competition from China, suggests that labor market frictions prevent workers from easily transitioning to industries where they could be most productive. The evidence indicates that workers behave as if they have "sticky feet," the title of a recent World Bank report on trade and jobs (Hollweg and others 2014). As Chinese competition in manufactured goods markets became tough, manufacturing industries had to adjust, partly by shedding workers and partly by retooling to regain competitiveness. Workers stuck in "senescent" (declining) manufacturing industries bore a heavy price, in the form of unemployment or informality. They would have been better off had they been able to adapt their skills and more easily move within countries to take advantage of better employment opportunities.

The root causes of such labor market frictions remain unclear. The policy agenda is therefore far from obvious. Regulatory rigidities, which are often bypassed by voluntary shifts to informality, are unlikely the only source of friction (although they are undoubtedly important). Other sources could include skills mismatches (including mismatches arising from information asymmetries or limited skill portability) and transport costs within countries.

The role of skills mismatches is evidenced by the well-known finding that the estimated costs of moving to a new job varies significantly across industries, which implies that skills are to a large extent industry or firm specific. LAC's experience over the past decade, as well as the powerful forces of technical change, calls for a policy agenda aimed at facilitating and enhancing skills development, skills matching, and the formation of more flexible human capital, so that workers can more easily adjust to production innovations and shifting market realities by changing jobs and careers over their working lives at lower personal (and social) costs. This policy agenda naturally puts a premium on suitable reforms to educational systems, labor market rules and contracts, social protection benefits (to make them more portable and compatible with labor mobility), and training and retraining programs.

The potential role of transport costs (and hence transport-related policies) in interindustry labor mobility has received little attention to date. The costs of moving labor across industries may reflect the concentration of industries across territories. In Brazil, for example, most manufacturing is concentrated around São Paulo and the southeastern coast, whereas agriculture is located in the interior of the country. The costs of moving workers and their families across vast geographical regions may help explain the sluggishness of labor market adjustments within countries. In fact, a growing body of academic literature argues that transport costs may play an inhibiting role in the integration of domestic labor markets.

There is, however, persistent, albeit relatively low-level, rural-to-urban migration within LAC countries, including Brazil and Mexico. It is thus also plausible that the choice of migration by workers across vast distances is driven not just by transport costs but also by workers' specific circumstances and preferences, some of which may be unrelated to market signals. For instance, being close to family may be an overriding consideration for workers unless they face extreme circumstances (shocks) or belong to communities with a historical inclination for migrating to specific destinations.

The objective here is not to prescribe specific policies but rather to argue that policy makers need to rethink broad priorities. Infrastructure is one area that may be prime for reconsideration, not just because of its relationship with competitiveness (through its impact on firms' cost structures) but also because poor infrastructure may make domestic labor markets less nimble and thus less able to absorb permanent shocks.

Fostering trade, foreign investment, and knowledge spillovers

For some LAC countries, the rise of the South brought some benefits, such as lower borrowing costs and better terms of trade for net exporters of agriculture and mining products. However, the structure of trade between LAC and the South seems to be less growth inducing than its trade with the North. Likewise, FDI into LAC (in the form of M&A) that originates in other South countries does not seem to be raising labor productivity within industries in the region. Labor productivity appears to more clearly benefit from North-North M&A activity. Both sets of results suggest that some rethinking is called for in the area of structural change and the scope for learning and technology diffusion through ties with global partners.

There have been two extreme paradigms about policy challenges in this area. One is the laissez-faire view, which posits that learning from foreign knowledge will take place as long as domestic markets function well

and are undistorted. From this viewpoint, removing policy distortions that get in the way of market-driven resource allocation and reducing the costs of doing business will naturally attract corporations from around the world. Trade structures would then specialize and respond endogenously to comparative advantages and a business-friendly environment. Whether the efficient outcome is a knowledge-intensive type of export growth will depend on factor endowments and relative returns, but the outcome would move the economy to its production possibilities frontier. This paradigm emphasizes public policy failures that hinder market forces rather than market failures. It thus puts a premium on reforms that seek to maximize the operation of the Invisible Hand.

The alternative view is that by itself, the market may not automatically bring knowledge from abroad and will thus underexploit opportunities for boosting technology-driven endogenous growth dynamics. From this perspective, some form of industrial policy will be required to induce market players to internalize the positive externalities associated with the exploitation of knowledge spillovers. A 2014 report by the Inter-American Development Bank, *Rethinking Productive Development*, provides a set of organizing principles to discipline thinking about choosing industrial policy interventions to target specific types of market failures.

Looking through the prism of the rising South phenomenon, this debate boils down to a balancing act. On the one hand are the potential benefits of improvements in the market-enabling environment that reduce trade costs for domestic agents, who in turn are guided by competition and relative price signals in enhancing their trade and financial linkages with both the South and North. On the other hand are the coordinating roles of the state, including through the provision of specific tax or subsidy incentives, or targeted loans and loan guarantees, for firms and workers to move into preselected activities that have a good chance of becoming part of GVCs or fostering intraindustry trade patterns.

A safe approach is one that strikes a sensible balance between the laissez-faire and industrial policy approaches. First and foremost, policy should do no harm: policy-induced distortions that get in the way of efficient resource allocation and unnecessarily raise the costs of international transactions should be reduced. The report highlights one such distortion: the region's increasing reliance on temporary trade barriers (such as antidumping, countervailing, and safeguard import duties), which appear to be overused, especially against China and other South economies. Many other actions can be considered in this regard, including eliminating or redesigning government programs that unintentionally subsidize informality or unduly encourage firms to remain small.

Second, there is plenty of room for positive policy actions aimed at improving the market-enabling environment—by, for instance, raising information transparency and disclosure standards and strengthening contract rights. In general, horizontal policies of this nature can only help, although they may not necessarily remove the most binding constraints to the development of growth-friendly globalization patterns. Policies aimed at improving the functioning of labor markets while maintaining adequate labor protections are worthy of special attention in this regard.

Third, it is time to get serious about assessing deficits in the formation of human and physical capital (particularly transport, energy, and telecommunications infrastructure), which may be constraining the ability of individuals and firms to engage in cross-border transactions efficiently. On the human capital side, educational systems need upgrading, particularly in ways that allow them to foster the type of skills modern economies demand. Workers need to be trained and retrained, on and off the job, throughout their working lives. On the infrastructure side, closing gaps is essential to reducing international trade costs, a key determinant of the emergence of, and incorporation into, GVCs and other types of international commercial relations.

Fourth, both vertical and horizontal industrial policies need to be put on the table, particularly for countries that have advanced on the laissez-faire front, so that old policy distortions do not get in the way of the potential success of new industrial policies. Countries throughout LAC already have some industrial policies in place, such as investment and trade promotion that targets certain types of firms and industries over others. An extension of this debate could encompass policy-based incentives, including tax and expenditure policies, with an eye on helping markets internalize large positive externalities associated with research and development (R&D) and technology adoption and adaptation. Given that industrial policies can have significant downsides, it is important that they be designed and implemented in ways that generate information and learning (so that impacts can be assessed and mistakes corrected promptly along the way) and complement and crowd in market forces (in order to widen the scope for efficiency gains).

Raising national saving rates

A reform agenda in LAC focused exclusively on the sorely needed enabling environment and supply-side reforms may not be sufficient to avoid the downsides of globalization while fully reaping its upsides. A demand-side component focused on raising national saving rates, intended to prevent persistent currency overvaluations and balance of payments vulnerabilities, is also a crucial element of the growth-oriented reform agenda. This demand-side component is particularly important for LAC countries that exhibit chronic low saving rates. It is also key in the context of market imperfections that limit the scope of factors to quickly and smoothly move to their more productive uses.

Keeping these considerations on the policy radar screen may not be easy, given that the region's historical low-saving/low-growth syndrome may be shifting in the context of the rising South and the region's more resilient macrofinancial policy frameworks. The greatly improved sovereign risk

ratings that now characterize much of LAC may facilitate external borrowing, which (in the best of cases) can conceal the adverse growth consequences of uncompetitive real exchange rates or (in the worst of cases) rekindle LAC's traditional tendency to suffer from balance of payments sustainability problems.

Although economists often resist treating saving as a policy variable, a saving-boosting reform agenda is within reach, although it will require patience and persistence and is likely to be fraught with tensions. There are at least four entry points for a comprehensive policy approach.

First, raising public sector saving can raise national saving, because it is unlikely that the private sector will completely offset such efforts by reducing its saving. Raising public saving through fiscal tightening (by raising revenues, reducing expenditures, or both) would not be easy in the current global economic environment. Fiscal reforms that boost public saving, and hence tilt public outlays in favor of investment, would have to confront the difficult and sensitive question of who would consume less today. Tensions would thus arise over the distribution of taxes and expenditures across space, households, and firms as well as between current and future generations. Deft political leadership would be needed to increase frugality and foster asset building (which implies a sacrifice of some consumption today) in a way that protects the basic consumption needs of the poor.

Second, there may be openings for implementing saving-enhancing policies in the financial sector. Since the late 1990s, financial development in LAC has been strongly biased in favor of consumer finance when contrasted with other regions, as De la Torre, Ize, and Schmukler (2011) show. Reforms of financial regulations could help promote saving, investment, and production rather than consumption. Financial inclusion could be expanded on the deposit-taking and payment side rather than the lending side. Macroprudential regulatory policy aimed at preventing credit-fueled consumption booms is also called for.

Third, careful social safety net reforms can strengthen domestic saving. The region made progress in the past decade in mainstreaming and targeting social assistance to the poorer and most vulnerable segments of the population, including through highly successful conditional cash transfer programs. Several LAC countries complemented these efforts with improvements in noncontributory social benefits, especially through minimum pension pillars (so-called social pensions) and the provision of health services at very low or no cost to poor households and informal workers. Given the social benefits of higher saving rates, however, as the region considers second-generation reforms to the health, pensions, and unemployment safety nets, it should ensure that such reforms should not only improve fairness and financial sustainability but also promote self-reliance (instead of excessive reliance on the state), especially among the elites and upper social echelons.

Fourth, in designing short-run macroeconomic interventions, policy makers should take more explicit account of the growth-boosting saving agenda. Doing so militates in favor of shifting toward a tighter fiscal, looser monetary macroeconomic policy mix—something that is politically difficult to achieve, especially in the current environment of weak world demand, which puts a premium on spending rather than saving. The current international financial environment, characterized as it is by low interest rates and abundant liquidity, could encourage policy makers to borrow imprudently and hence risk fiscal and balance of payments sustainability problems in the future. To reconcile short-run aggregate demand management with longer-run growth objectives, it is crucial that LAC maintain robust saving rates.

The rise of the South has deeply changed the global economy, and irreversibly so. Policies and reform agendas have to adapt to this momentous change. The challenge is great, but it provides LAC's political leadership with an opportunity to shine. It is time for cold-headed rethinking of policy priorities that can unleash growth potential of an immensely diverse and in many ways rich region.

Structure of the report

The five chapters that make up the rest of this report provide a more detailed analysis of the rise of the South and the nature of LAC's evolving external connections. They draw implications from these changes for the region's economic development.

Chapter 1 sets the stage for the rest of the report by characterizing the rise of the South and outlining a set of relevant trends that are shaping LAC's economic prospects.

Chapter 2 explores the notion that the structure of trade matters for economic development. It analyzes the extent to which the trade connections of countries in LAC—particularly with other South countries—can lead to a virtuous cycle of thriving trade and economic growth. It focuses on the potential for technology diffusion and learning spillovers from the region's international trade linkages.

Chapter 3 assesses whether and how the ongoing restructuring of the global economy,

especially the changes brought about the emergence of China, has affected labor markets in the region. It provides a discussion of how social protection policies can help reduce labor market adjustment costs when economies face long-lasting structural changes emanating from the reconfiguration of the global economy.

Chapter 4 provides a detailed analysis of the degree of financial connectivity of LAC countries with the North and the South. It investigates the extent to which LAC's financial integration is related to its trade integration and the degree to which financial flows are associated with increases in labor productivity.

Chapter 5 studies the evolving connectivity between LAC and the rising South based on the relative importance of domestic versus external demand. It evaluates whether the low domestic saving rates in the region impaired its growth potential in the past and may continue to do so in the future given changes in the world economy.

Annex OA

TABLE OA.1 Country group composition

Region	Countries
Higher-income countries in Latin America and the Caribbean (LAC1)	Argentina, the Bahamas, Barbados, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Panama, Peru, Trinidad, Uruguay, Venezuela, RB.
Lower-income countries in Latin America and the Caribbean (LAC2)	Belize, Bolivia, the Dominican Republic, El Salvador, Guatemala, Guyana, Honduras, Nicaragua, Paraguay
East Asia and Pacific (EAP)	Bangladesh; Bhutan; Cambodia; China; Fiji; Hong Kong SAR; China; India; Indonesia; the Republic of Korea; Malaysia; Pakistan; Papua New Guinea; the Philippines; Sri Lanka; Thailand; Tonga; Vietnam
Europe and Central Asia (ECA)	Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, Georgia, Greece, Hungary, Kazakhstan, the Kyrgyz Republic, Latvia, Lithuania, the former Yugoslav Republic of Macedonia, Moldova, Mongolia, Romania, Slovenia, Tajikistan, Turkmenistan, Ukraine
High income	Australia, Belgium, Canada, Cyprus, Denmark, Finland, France, Germany, Iceland, Ireland, Israel, Italy, Japan, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, the United States
Middle East and North Africa (MENA)	Algeria, the Islamic Republic of Iran, Jordan, Lebanon, Morocco, Syria, Tunisia, Turkey
Sub-Saharan Africa (SSA)	Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Chad, Côte d'Ivoire, Equatorial Guinea, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Rwanda, Senegal, South Africa, Sudan, Swaziland, Togo, Uganda, Zambia

Note: The dividing line between LAC1 and LAC2 countries is per capita income of \$5,000 a year.

Notes

1. In this report, the North includes the Group of Seven (G-7) members (Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States) plus the following Western Europe countries: Andorra, Austria, Belgium, Denmark, Finland, Greece, Iceland, Ireland, Liechtenstein, Luxembourg, Monaco, Netherlands, Norway, Portugal, San Marino, Spain, Sweden, and Switzerland. The South includes all other economies, including all countries in Latin America and the Caribbean (LAC).
2. As a share of the total number of possible connections, the number of LAC trade connections with North countries remained almost stable, at about 98 percent, between 1990 and 2012, whereas the number of LAC-South connections increased from about 40 percent in 1990 to 62 percent in 2012.
3. LAC's financial connections with other South countries also grew faster than its connections with North countries, especially during the second half of the 2000s. For a deeper analysis of the degree of financial connectivity of LAC countries with the North and the South, see Didier, Moretti, and Schmukler (2015) and chapter 4 of this report.
4. The share of active financial connections within the South in 2011 was even smaller for mergers and acquisitions (1.4 percent), syndicated loans (2.0 percent), and greenfield investments (3.6 percent).
5. This similarity in export shares captures two distinct dimensions: the relative importance a given country has in other countries' exports and the relative importance that other countries have in a given country's exports.
6. The importance of a country to the global trade network rises with its share in other countries' exports and the number of its bilateral trade connections.
7. The measure of FVA of exports captures only backward linkages (the imports a country uses in producing its exports). It does not capture forward linkages (the exports of a country that are used by other countries as inputs to produce their exports). The patterns of regional clustering in forward linkages are qualitatively similar to the ones reported here. Chapter 2 of this report provides a detailed analysis of GVCs.
8. The algorithm underlying figure O.8 is similar to that of figure O.5, in that it takes into account the relative (rather than the absolute) importance of each country in its regional trade network. The distance between countries reflects the degree of similarity in the structure of their trade connections ("similarity" is measured in terms of the relative importance that a country has in other countries' exports and the relative importance that countries have in a given country's exports). Countries with similar trade structures are clustered together in figure O.8. Unlike figure O.5, however, figure O.8 depicts the density of connections, hence the systemic importance of countries in their respective regional network, in terms of colors. The systemic importance of countries increases as colors shift from green to yellow to red. Distance between countries is defined by the sum in absolute value of the differences in trade shares between countries for a given destination. The density captures the average distance per number of connections; the smaller the distance, the higher the density (see De la Torre, Didier, and Pinat 2014 and Van Eck and Waltman 2010 for more technical details).
9. The contrast between the two regional networks in 2012 is captured by measures of average node density, defined as the average across nodes of the number of links over the total number of possible connections. The average node density in 2012 was 0.99 for East Asia and just 0.89 for LAC. The dispersion of node centrality (the standard deviation of the node density) was 0.09 for the East Asia network and 0.31 for the LAC network.
10. Various issues of the semiannual report series produced by the World Bank's Chief Economist Office for LAC (<http://go.worldbank.org/WTVI133GT0>) examine the improvement in LAC's macrofinancial policy management, beginning with the April 2008 issue, entitled "Latin America's New Immune System: How Is It Coping with the Changing External Environment?"
11. In contrast with other commodity cycles experienced by LAC in the post-World War II era, the rise of the South was associated with the simultaneous surge in the international prices of virtually all commodities exported by LAC economies for an extended period of time. In this sense, it was a supercycle (see Sinnott, Nash, and De la Torre 2010).
12. Bernanke (2005) argues that a confluence of factors led to the emergence of a global saving glut, including policy interventions to boost

- exports in Asia, higher oil prices in the Middle East, and a dearth of investment opportunities and an aging population in advanced industrial countries. Mendoza, Quadrini, and Rios-Rull (2007) attribute high saving in emerging market countries to relatively low levels of financial development, which generate greater precautionary saving. Caballero, Farhi, and Gourinchas (2008) instead emphasize the lack of investment opportunities in these countries and the associated shortage of financial assets as the main source of the global saving glut. Similarly, the IMF (2005) stresses low investment rates following the Asian crisis rather than an increase in saving rates.
13. In fact, between 2000 and 2011 Mexico was a net exporter of mining products every year, a net exporter of agricultural commodities in some years, and a net importer of manufactured products every year. Its gross exports of manufactured goods faced stiff competition from China, however, as discussed later in the overview.
 14. Exports are disaggregated at the four-digit level of the International Standard Industrial Classification (ISIC).
 15. Brazil, Chile, and Peru were among the countries that benefited most from China's rising imports of mineral commodities. Some Central American and Caribbean economies also seem to have received a boost in their mineral exports (such as zinc from Honduras and aluminum and bauxite from Jamaica), confirming that natural resource endowments were important determinants of the impact of the rise of China.
 16. There are, however, significant differences within countries in LAC. Chapter 4 of this report explores the link between trade and financial flows.
 17. The empirical literature on the extent of integration of LAC countries into GVCs is sparse, but it has been expanding. Useful references are UNCTAD's 2013 report *Global Value Chains: Investment and Trade for Development* and the Inter-American Development Bank's report *Synchronized Factories* (Blyde 2014). Chapter 2 of this report expands on this literature by providing more detailed evidence on LAC's participation in GVCs, including its integration into GVCs with North and South countries. The general message of this literature is consistent with the message of this report—namely, that LAC's participation in GVCs is lower than that of other South regions, even though there has been an increase in its participation since the 1990s. There is, however, considerable heterogeneity across LAC countries.
 18. FDI data, for instance, do not typically differentiate between affiliates that provide inputs to parent companies and affiliates that produce the same good or service as its parent.
 19. Non-LAC emerging market economies include Hungary, India, Indonesia, Korea, the Philippines, Poland, the Russian Federation, South Africa, Thailand, and Turkey. The econometric exercise entailed the estimation of structural vector auto-regressive models (SVARs) (see Hevia and Servén 2014 and chapter 5 of this report for technical details).
 20. Low domestic saving implies an excess of domestic expenditure over income. For small open economies, which cannot influence international prices, the excess expenditures that flow out of the country are satisfied by higher imports at unchanged international prices. The excess of expenditure that falls on the nontradable sector of the economy raises domestic prices, particularly if the economy is near full employment. The rise in the prices of nontradables relative to tradables is a real exchange rate appreciation. It can become durable to the extent that factors (especially capital) are sticky and reallocate sluggishly to more productive uses across sectors and borders, a fact that is borne out by the observed large and persistent differentials in factor productivities across firms, sectors, and countries (see Hsieh and Klenow 2010; Svyrson 2011; and Artuç, Lederman, and Rojas 2015, among others).
 21. Low saving leads to a systematic tendency toward current account deficits, which imply a buildup of external liabilities over time. Such a buildup can make the balance of payments more vulnerable to shocks and raise the risk of default, which would be reflected in a bias toward higher risk premiums.
 22. Each point in the scatter plot represents a country for a given time period. As the aim of this figure is to capture medium-term equilibrium relationships, each period is a three-year average.
 23. The benchmark is calculated based on regression analysis for the entire sample. It indicates where a country is expected to be, controlling

for its stage of development (as proxied by per capita income); structural features that are largely beyond the control of policy (for example, demographic structure, natural resource endowment, economic size); and the average policies of its peers (see De la Torre and Ize 2015 for technical details).

24. Associated with capital flight episodes were multiple exchange rate regimes, which tend to show up in the data as overvaluations, given that the official exchange rate is typically used to measure the purchasing power parity index.
25. Chile, Colombia, Mexico, Peru, Trinidad and Tobago, and Uruguay were in the elite group of “investment-grade” countries.
26. See Frankel and Romer (1999) and Alcalá and Ciccone (2004), among many others. Singh (2010) reviews this literature.
27. Endowments determine the structure of production, employment, and trade in neoclassical models of trade and development in the tradition of Heckscher-Ohlin. Relative national average productivities matter in Ricardian models.
28. Some studies, notably Hausmann, Hwang, and Rodrik (2007), put the emphasis on what a country trades as a means of identifying the productivity embedded in the traded good. However, the empirical approach in such studies suffers from important limitations, as Lederman and Maloney (2012) note.
29. Both high and low savers in the LAC1 group of countries had substantially undervalued currencies in the 1980s and 1990s, and both groups experienced a substantial appreciation during the 2000s. However, the real appreciation was much more pronounced (and investment and growth lower) among low savers, which became significantly overvalued relative to benchmark by the end of the period. In contrast, the high savers were able to retain somewhat undervalued currencies by the end of the period.
30. As an example, at a summit meeting of the Asia-Pacific Economic Cooperation in 2002, President Vicente Fox remarked, “It is not clear whether or not China is actually competitive. Perhaps it is, but perhaps its current success is based on the fact that they do not respect a series of rules that other countries, such as Mexico, do respect” (cited in Lederman, Olarreaga, and Perry 2009, 4).

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Three Global Trends That Shaped Latin American and Caribbean Development at the Dawn of the Twenty-First Century

1

The world economy is not what it used to be 30 or even 15 years ago. For most of the twentieth century, the developed North dominated the global economy.¹ This dominance led to the emergence of various strands of “dependency” theory, which found green pastures in Latin American development thinking.² The essence of Latin American structuralism was pessimism: the dominance of the North, acting as “center” to a “periphery” of developing South countries, would be ever rising, at least in part because of the secular trends in the prices of exports from the South relative to exports from the North.

The world economy has evolved in the past several decades, rendering this central tenet of Latin American dependency theory obsolete. Several South economies are now part of what can be empirically characterized as the “center” of global commercial relations. This chapter documents this empirical regularity through network analyses based on bilateral trade and financial data that show how countries are part of global networks. Being at the center of a global network entails having numerous and quantitatively important bilateral connections. It is in this (narrow) technical sense

that the South has arrived at the center of the global economy with surprising speed, especially since the dawn of the 21st century. This reconfiguration of the global landscape suggests the need to go beyond the static North-South paradigm toward a dynamic center-periphery one.

This report argues that the economic shocks emanating from the rise of South countries as central players in global economic relations have brought significant changes to economies in Latin America and the Caribbean (LAC), with notable differences within the region depending on the economic structures that each country inherited from the twentieth century. LAC is an increasingly globalized region, and its economic future depends a great deal on the extent and quality of its external connections. It is likely that not only the incidence of international trade and financial connections but also the nature of these international linkages matter for its future economic growth and for the generation of good-quality jobs. This report therefore places significant emphasis on the consequences of the changing nature of LAC’s external connections, analyzing particularly their trade, financial, macroeconomic, and labor market aspects.

As a starting point for this analysis, this chapter outlines three sets of facts related to the rise of the South that are shaping LAC's economic prospects:

1. The weight of the South in the global economy has risen, particularly after 2000, but its rise has not been even across sectors or types of flows.
2. Several South countries are now at the center of the global trade network, but none is at the center of global financial networks.
3. The structure of bilateral trade and financial connections of the South has been generally different from that of the North, with geography and endowments arguably shaping their evolving structure.

Set of Facts 1: The weight of the South in the global economy has risen, particularly after 2000, but its rise has not been even across sectors or types of flows.

The South has been growing faster than the North. The gross domestic product (GDP) in current dollars of the South remained at about 20 percent of world GDP between the 1970s and 1990s (figure 1.1, panel a). By the late 2000s, this share had doubled to 40 percent.

Moreover, the globalization of the South, which picked up in the late 1980s and continued apace during the 1990s, accelerated and intensified substantially in the 2000s. The South accounted for 51 percent of global trade flows in 2012, up from just 24 percent in 1970 and 35 percent in 2000 (see figure 1.1, panel b). The South received less than 20 percent of global capital inflows in the 1970s and about 26 percent in the 1990s, whereas by the end of the 2000s it received almost 55 percent (see figure 1.1, panel c). South countries also became more representative as sources of capital flows, sending about 55 percent of global capital outflows between 2008 and 2012, up from 14 percent in 1990.

As of the writing of this report, the world seems to be entering a phase that many observers have called “the new normal,” characterized by a slower global growth. The second half of the 2010s is thus poised to have different dynamics from the first decade of the 2000s.

Despite the swiftness of these changes, projections suggest that these patterns are not temporary and that the South will continue to gain space in the years to come.³ This outlook partly reflects the broad reach of the rise of the South, a phenomenon that goes well beyond the emergence of China as a giant in the global economy. Indeed, these trends are not driven by a small set of South countries; they are observed across a vast number of countries. During the 2000s, 69 of 164 South countries in the sample grew faster than the average South country, 130 more rapidly than the fastest-growing North country (Luxembourg), and 154 more rapidly than the average North country.

Although China is not the only South economy behind these trends, it has played a particularly important role. In the span of less than 30 years, it transformed itself from a rural, inward-looking, slow-growing economy to a fast-growing and increasingly urban and industrial one. Between 1978, when economic liberalization began, and 2012, China's economy expanded more than 20-fold in real terms. In 1978 China's nominal GDP represented about 1.7 percent of world GDP; by 2012 China had become the world's second-largest economy in terms of nominal GDP, representing about 51 percent of the United States' GDP and 11.3 percent of global GDP in current dollars. China also gained prominence in global trade, becoming the world's largest exporter in absolute terms and one of the world's largest importers. Its rise in global finance was more modest but also significant: China represented about 8 percent of global capital inflows (9 percent of global capital outflows) in 2012, up from 1 percent (1 percent) in 2000.

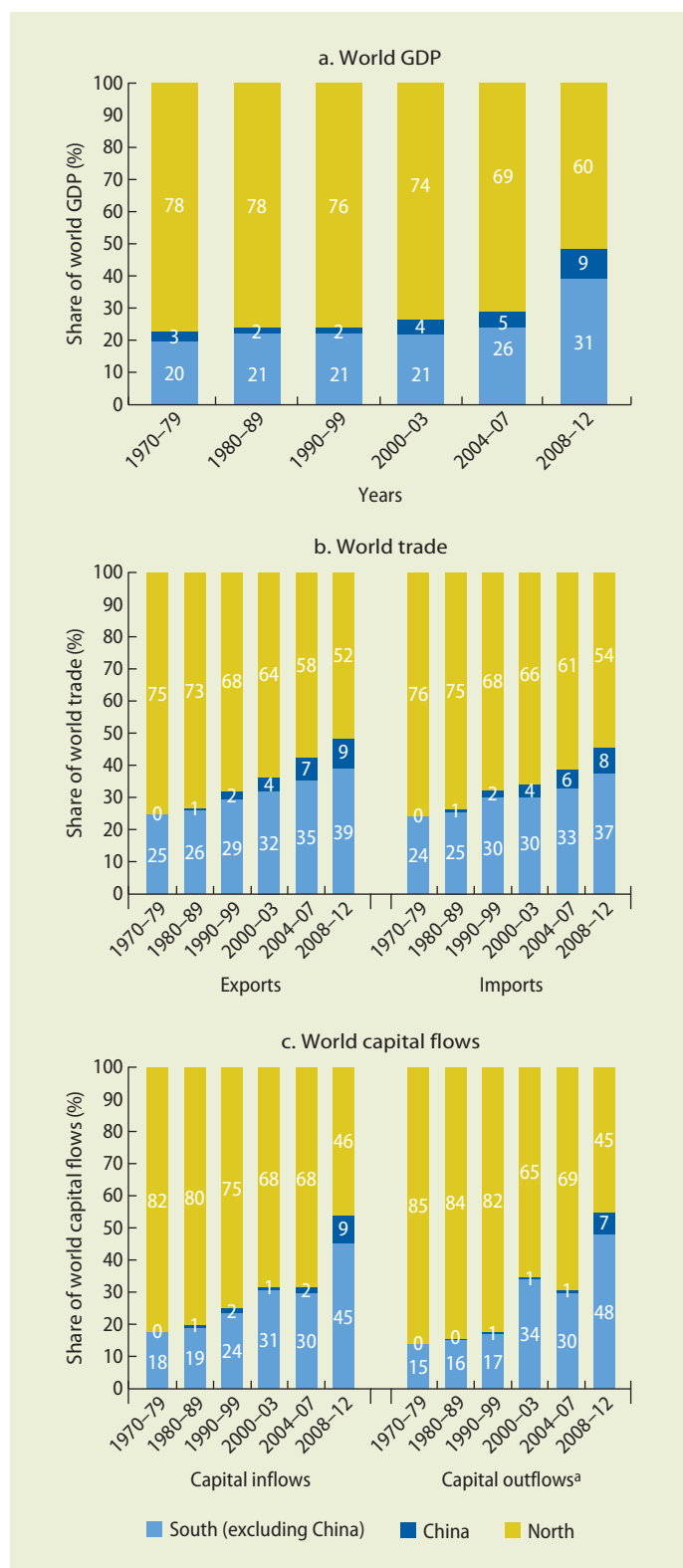
The rise of the South has changed the composition of global trade flows across sectors and between exports and imports within sectors.

The rise of the South in the global economy reflects not only higher growth rates in the South than in the North but also differences in structural features. The patterns of globalization of the North and the emerging South differ in important ways. In particular, there is significant heterogeneity in the sectoral composition of trade flows of the North when contrasted with the South as well as in the sectoral composition of trade flows across South countries. The export baskets of South countries typically include a larger share of primary goods than those of North countries (figure 1.2, panel a). Between 2000 and 2012, for example, the share of primary goods in total goods exports was 57 percent in Sub-Saharan Africa (SSA), 29 percent in LAC, and just 8 percent in the North.

There are also differences in the sectoral composition of imports of North and South countries (see figure 1.2, panel b). The share of primary goods in imports averaged about 10 percent in the South and 14 percent in the North between 2000 and 2012. China in particular and East and South Asian economies more broadly seem to be exceptions among South economies: the composition of their trade baskets is on average more similar to that of North countries than to other South countries.

In light of these differences, changes in the weight of the South in global trade, especially during the 2000s, differed across sectors and between exports and imports within a given sector. The weight of the North in global trade declined substantially during the 2000s in both the primary (agriculture and mining) and manufacturing sectors, though rankings across sectors were

FIGURE 1.1 Rise of the South: Share of world GDP, trade, and capital flows



Sources: Calculations based on data from World Development Indicators (WDI), Direction of Trade Statistics (DOTS), and Balance of Payments Statistics (BOPS).

Note: The North includes the G-7 members and Western Europe countries. The South includes all other economies. G-7 = Group of Seven; GDP = gross domestic product.

a. Capital outflows exclude international reserves.

broadly maintained (see figure 1.2, panels c and d). The flipside of this trend is an increase in the shares of the South: between 2000 and 2012, its share of global manufactures exports increased from 30 percent to 46 percent and its share of global commodities exports rose from 62 percent to 68 percent.

There is also significant heterogeneity within the South across both countries and sectors.⁴ China is by a wide margin the most important country behind the expansion of the South in global exports of manufacturing: its share increased more than 10 percentage points, from slightly less than 5 percent in 2000 to about 16 percent in 2012 (see figure 1.2, panel c). Together the other top 20 South countries increased their share in global manufacturing exports by no more than 9 percentage points.⁵ At the same time, the share of world manufacturing exports of some South countries (for example, Malaysia, Mexico, and Philippines) declined.

The rise of the South in global primary exports features a different set of countries, with Australia, Brazil, and the Russian Federation registering the largest gains in global shares. Among the top 20 South countries are India, Nigeria, South Africa, and some LAC countries (Bolivia, Chile, Colombia, Ecuador, and Peru). China experienced the largest increase in weight on the receiving end: its share of global imports of (agricultural and mining) primary products rose from about 3 percent in 2000 to 14 percent in 2012 (see figure 1.2, panel d). Several South countries with increases in manufacturing exports, such as India, Poland, the Republic of Korea, and Turkey, also increased their imports of commodities.

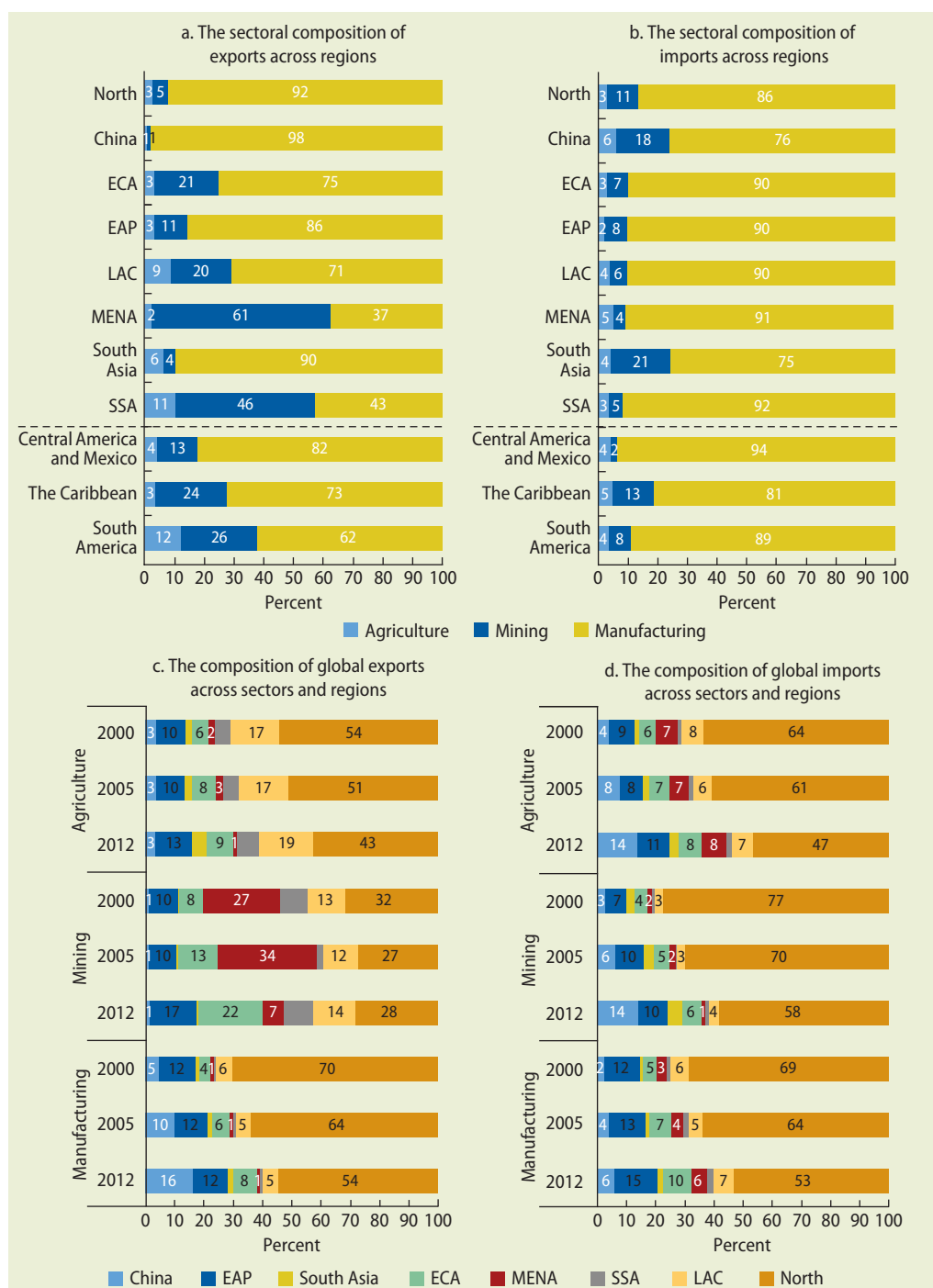
The rise of the South has also led to a significant recomposition of global financial flows across sectors and types of flows.

The sectoral composition of global gross financial flows (capital account–related flows by foreign and domestic agents) for the South and the North differ (figure 1.3). South

countries generally receive a larger share of financial flows in the primary sector than North countries, though there is significant variation in the magnitude of these differences across countries. For example, between 2003 and 2012, on average countries in Europe and Central Asia (ECA), LAC, and SSA received at least 50 percent of syndicated loans and merger and acquisition (M&A) inflows in the primary sector. The share in North countries was about 20 percent. Foreign investments by South countries are also tilted toward the primary sector on average. For example, between 2003 and 2012, the share of greenfield investments abroad that went to the primary sector was much larger in LAC (44 percent) than in the North (19 percent).

As the weight of South countries in global financial flows changed, so did the sectoral composition of global financial flows, especially during the 2000s. The share of global inflows in the primary sector increased for syndicated loans (from 25 percent to 35 percent of global flows) and for M&A (from 26 percent to 33 percent), whereas it fell slightly for global greenfield flows (from 22 percent to 19 percent) between 2003–07 and 2008–12. There was also a recomposition of senders and receivers of global flows across sectors (figure 1.4). The weight of North countries as senders and receivers of financial flows generally declined during this period, especially in the primary sector, where the share of North countries in global M&A fell 23 percentage points as senders and 21 percentage points as receivers. Conversely, the weight of the South in global capital flows increased, though different regions of the South gained space in different sectors and in different types of flows. For example, countries in East Asia and Pacific (EAP) typically increased their share as receivers of global syndicated loan flows in the primary sector, whereas countries in ECA and the Middle East and North Africa (MENA) lost global participation. LAC and EAP countries almost tripled their global share as receivers of M&A flows in the primary sector, whereas China and EAP countries became large senders of these flows.

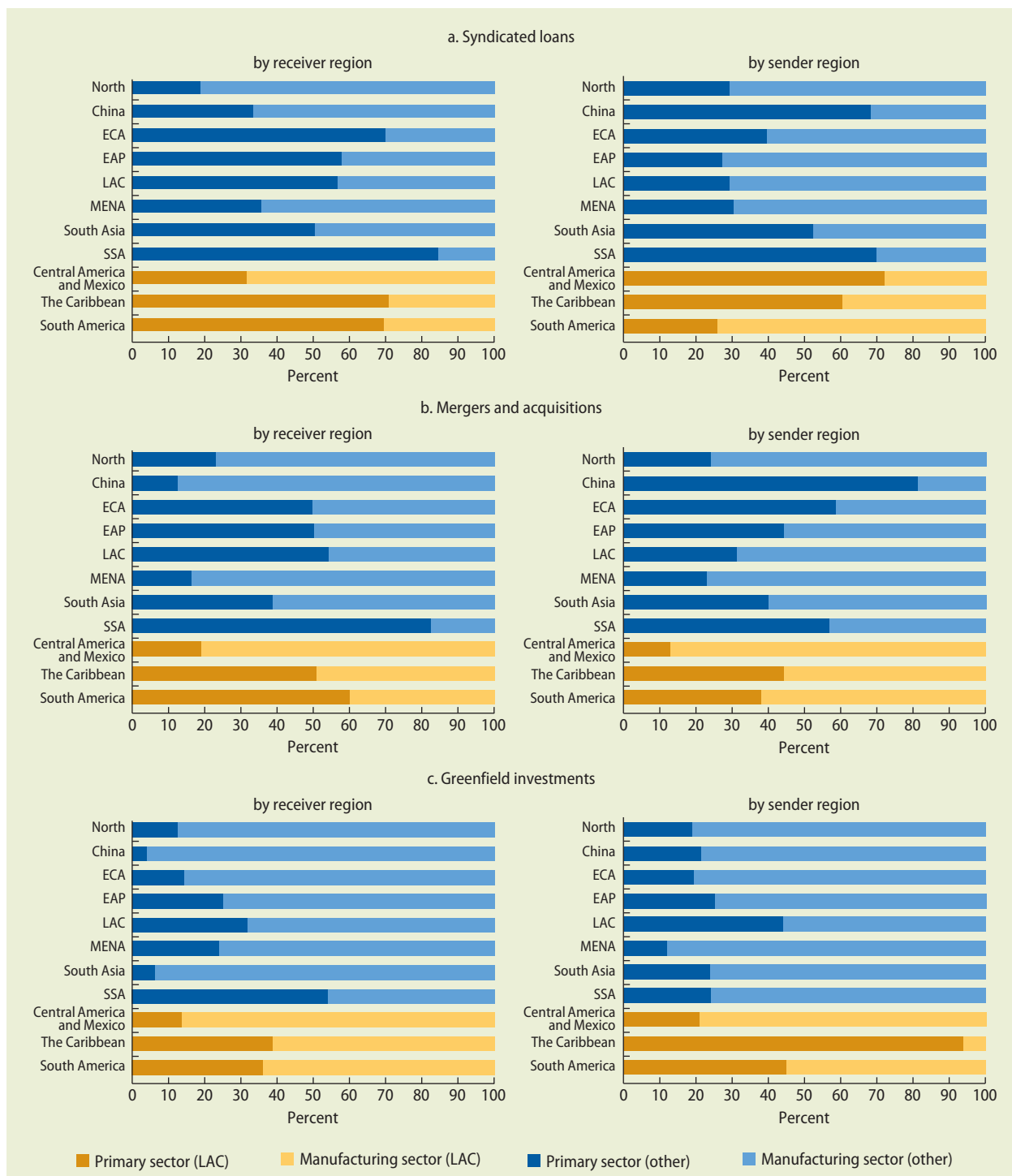
FIGURE 1.2 Sectoral composition of trade flows



Source: Calculations based on data from Comtrade.

Note: Panels a and b show the average sectoral composition of exports and imports between 2000 and 2012 across regions. The sectoral classification of trade flows is based on the International Standard Industrial Classification (ISIC) grouping, Revision 3. Agriculture corresponds to ISIC codes 0111–0500, mining to ISIC codes 1010–1429, and manufacturing to ISIC codes 1511–3699. The North includes the Group of 7 (G-7) members and Western Europe countries. EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MENA = Middle East and North Africa; SSA = Sub-Saharan Africa.

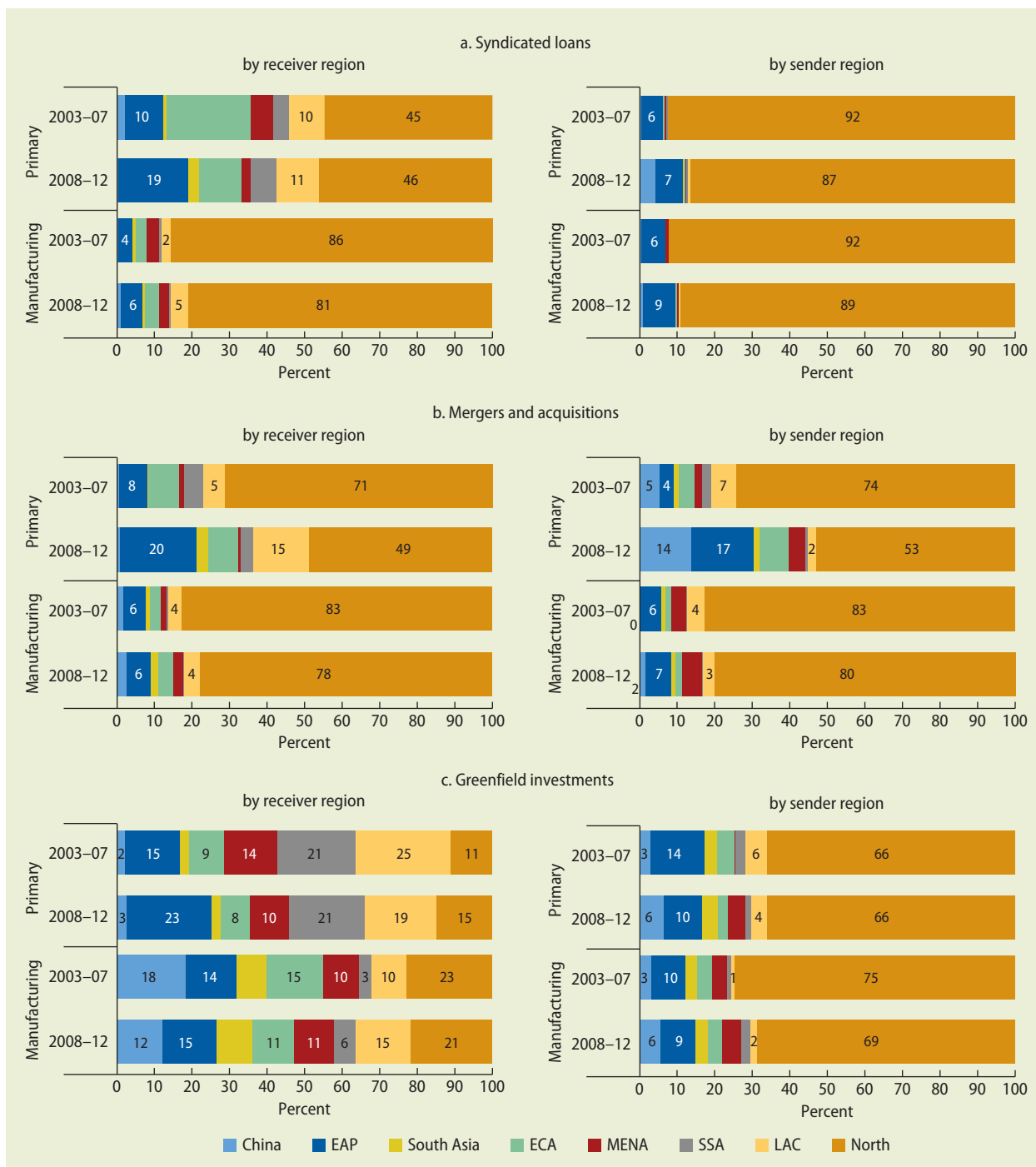
FIGURE 1.3 Sectoral composition of financial flows across regions



Sources: Data on syndicated loans and mergers and acquisitions are from SDC Platinum. Data on greenfield investments are from fDi Markets.

Note: The sectoral classification of financial flows is based on the International Standard Industrial Classification (ISIC), Revision 3. The primary sector corresponds to ISIC codes 0111–0500 and 1010–1429. The manufacturing sector corresponds to ISIC codes 1511–3699. The North includes the G-7 members and Western Europe countries. The South includes all other economies. EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MENA = Middle East and North Africa; SSA = Sub-Saharan Africa.

FIGURE 1.4 Composition of global financial flows across sectors



Sources: Data on syndicated loans and mergers and acquisitions are from SDC Platinum. Data on greenfield investments are from fDi Markets.
 Note: The sectoral classification of financial flows is based on the International Standard Industrial Classification (ISIC), Revision 3. The primary sector corresponds to ISIC codes 0111–0500 and 1010–1429. The manufacturing sector corresponds to ISIC codes 1511–3699. The North includes the G-7 members and Western Europe countries. The South includes all other economies. EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MENA = Middle East and North Africa; SSA = Sub-Saharan Africa.

The composition of global net financial flows also experienced important changes. In particular, there was a recomposition of net equity and net debt flows within countries in both the North and South. Since the late 1990s, partly in response to the painful lessons learned from the recurrent crises suffered during the late twentieth century, many countries in the South, especially in Asia and Latin America, have steadily changed the structure of their external assets and liability positions. Many countries in the South, especially in EAP and LAC, have switched their

external net liability positions from debt to equity (figure 1.5). Countries from the South that had been large net debtors became net creditors with respect to the rest of the world in debt contracts. This change reflected in large part the significant accumulation of international reserves that followed the crises of the late 1990s. At the same time, countries from the South became more active users of foreign equity finance, which led to a rising net debtor position in risk-sharing equity contracts (particularly foreign direct investment [FDI]) with respect to the rest of the

FIGURE 1.5 Composition of foreign assets and liabilities in the South, by region



Source: Updated and extended version of dataset constructed by Lane and Milesi-Ferretti (2007).

Note: Ratios are calculated at the country level and then averaged across countries (simple average) between 1990 and 2011. LAC-7: Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Uruguay. Asia-7: China, India, Indonesia, the Republic of Korea, Malaysia, Philippines, and Thailand. ECA-7: Croatia, the Czech Republic, Hungary, Lithuania, Poland, the Russian Federation, and Turkey. SSA-7: Angola, Ghana, Kenya, Nigeria, South Africa, Sudan, and Zambia. GDP = gross domestic product.

world. In contrast, countries from the North became net creditors in equity contracts and net debtors in debt contracts. These patterns reflect to some extent the dynamics of the recomposition of net savers and net borrowers in the global economy.

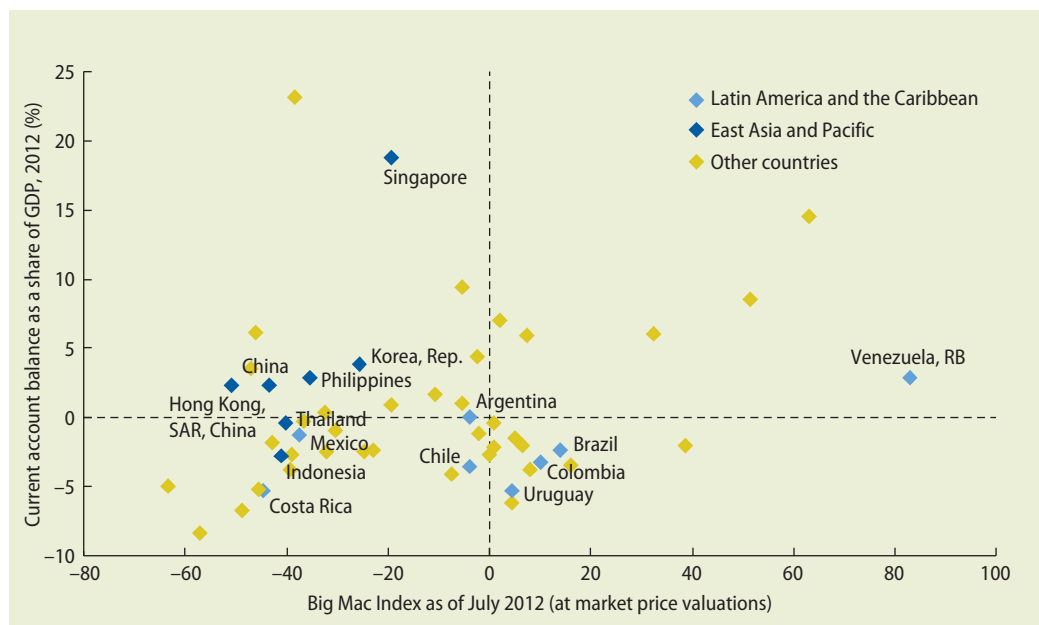
The net integration of countries into the global economy reflects uneven growth rates of imports and exports, capital inflows and outflows, or both.

Another dimension of globalization is the net integration of countries into the global economy, based on the relative importance of countries' domestic and external demands. To the extent that external demand reflects the excess of national income over absorption (comprising both consumption and investment spending), countries with external demand-driven integration patterns typically run systematic current account surpluses or systematic excesses of domestic saving over investment (reflecting on the one hand the difference between exports and imports and on the other hand the difference in capital inflows and outflows). In contrast, countries with a connection to the rest of the world based on domestic demand generally have systematic excesses of domestic investment over domestic saving and therefore typically run current account deficits. The pattern of globalization can thus differ across countries as a result of uneven growth rates of imports versus exports or of capital inflows and outflows. These persistent current account deficits are usually accompanied by consistently overvalued currencies.⁶

This seldom explored aspect of globalization is particularly important for many LAC countries, as it reflects a dependence on external saving and a reliance on domestic demand that sets them apart from many other South economies, especially in East Asia. In several LAC countries, notably Mexico and most South American countries, aggregate demand has been clearly tilted in favor of domestic rather than external

demand, and current account deficits have been persistent. For all of the debate about the commodity boom in the 2000s, current account surpluses among LAC's commodity exporters were in most cases short-lived: the surpluses were virtually gone by mid-2008 and only temporarily recovered in 2009, as an undesired consequence of the global trade collapse. Indeed, by 2012 current account deficits were the norm in these countries, with only República Bolivariana de Venezuela displaying a current account surplus (figure 1.6). In contrast, East Asian countries consistently generated relatively large current account surpluses during most of the past two decades. Moreover, LAC economies typically integrated with relatively appreciated real exchange rates compared with East Asian countries. The *Economist's* Big Mac Index provides some evidence that currencies in East Asia have been relatively undervalued, whereas currencies in LAC have been relatively overvalued.

The rise of China and other South players (especially in Asia and among oil-exporting countries) with persistent current account surpluses and large accumulation of international reserves has led to a heated debate over their contribution to the "global imbalances" in trade and finance and the "global saving glut," which has accumulated largely in U.S. Treasury bonds. A prominent view is that an excess of saving over investment in these South economies, invested in U.S. dollar assets, eased financial conditions in deficit countries, particularly the United States, and exerted significant downward pressure on world interest rates.⁷ With low interest rates in North economies, a search for yield among investors triggered capital flows to LAC and other South countries, where borrowing spreads fell to historically low levels and currencies appreciated significantly. Indeed, for most of the 2000s, the strong tailwinds coming from commodity prices, along with large volumes of capital inflows, reinforced the broad appreciation pressures in LAC.

FIGURE 1.6 Patterns of net integration into the global economy

Sources: Calculations based on data from WDI and Economist Intelligence Unit.

Set of Facts 2: The rise of the South has had asymmetric effects on global trade and financial networks.

Several South economies have joined the North at the center of the global trade network.

This momentous change stands out clearly in panel a of figure 1.7, which shows the global trade network in 1980 and 2012. Each node represents a country, and each link corresponds to an active bilateral connection that exceeds a minimum threshold (in panel a, exports from one country to another, as indicated by the arrows). Connections that are trivial in magnitude are not graphed, but once graphed each connection has the same weight.⁸ Countries with a larger number of connections are more centrally located in the figure.

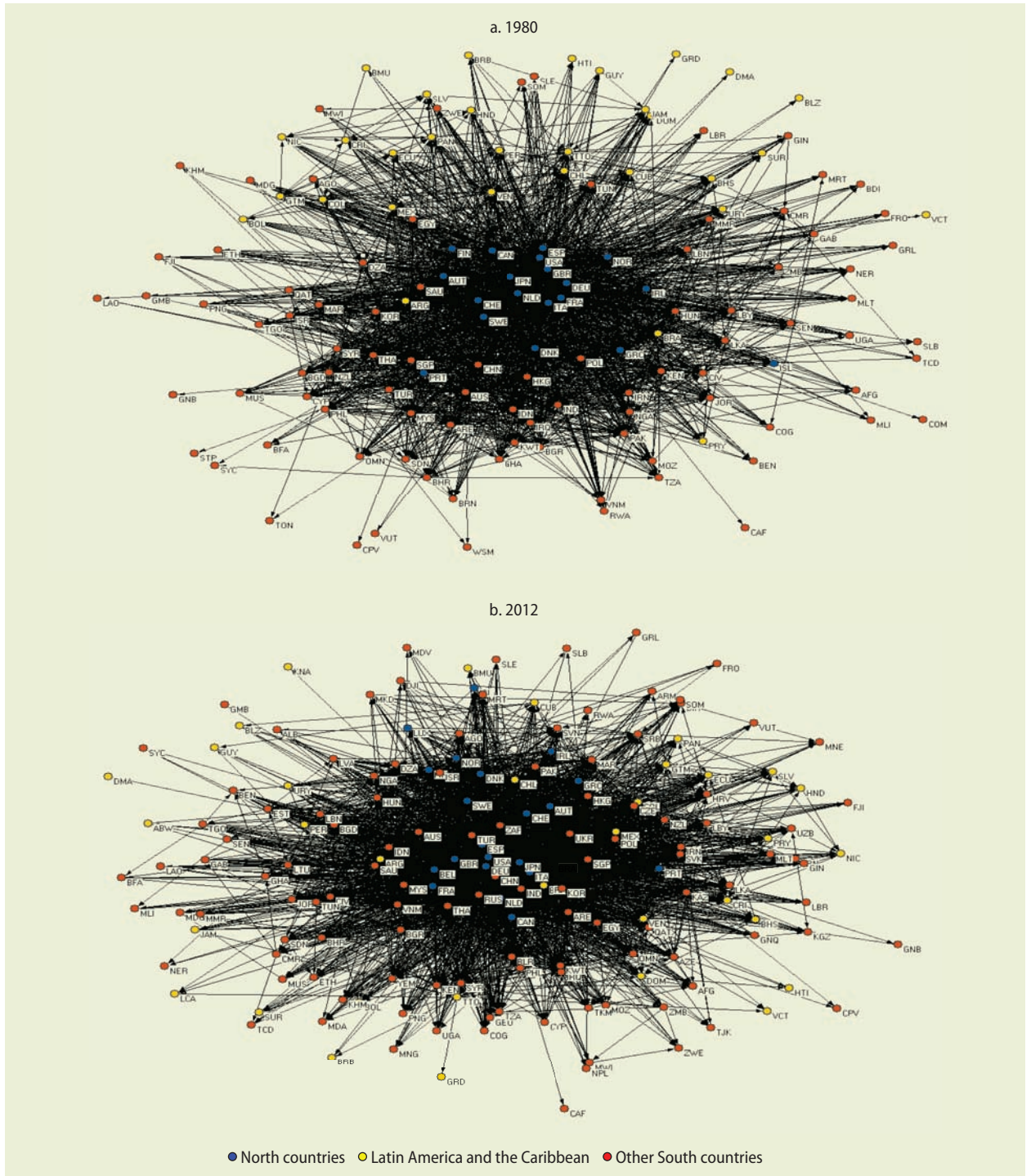
In 1980 a set of North countries stood at what can be empirically characterized as the center of the global trade network; the United States, Germany (and a few other Western

European countries), and Japan were at the core of the network. By 2012 several countries from the South, including not only China but also Brazil, India, the Russian Federation, South Africa, Turkey, and others, had moved to the center. As a result of these changes, the South is no longer a synonym for *periphery* (and the North no longer a synonym for *center*) in global trade.

The roles of North and South countries at the center of the global trade network have differed.

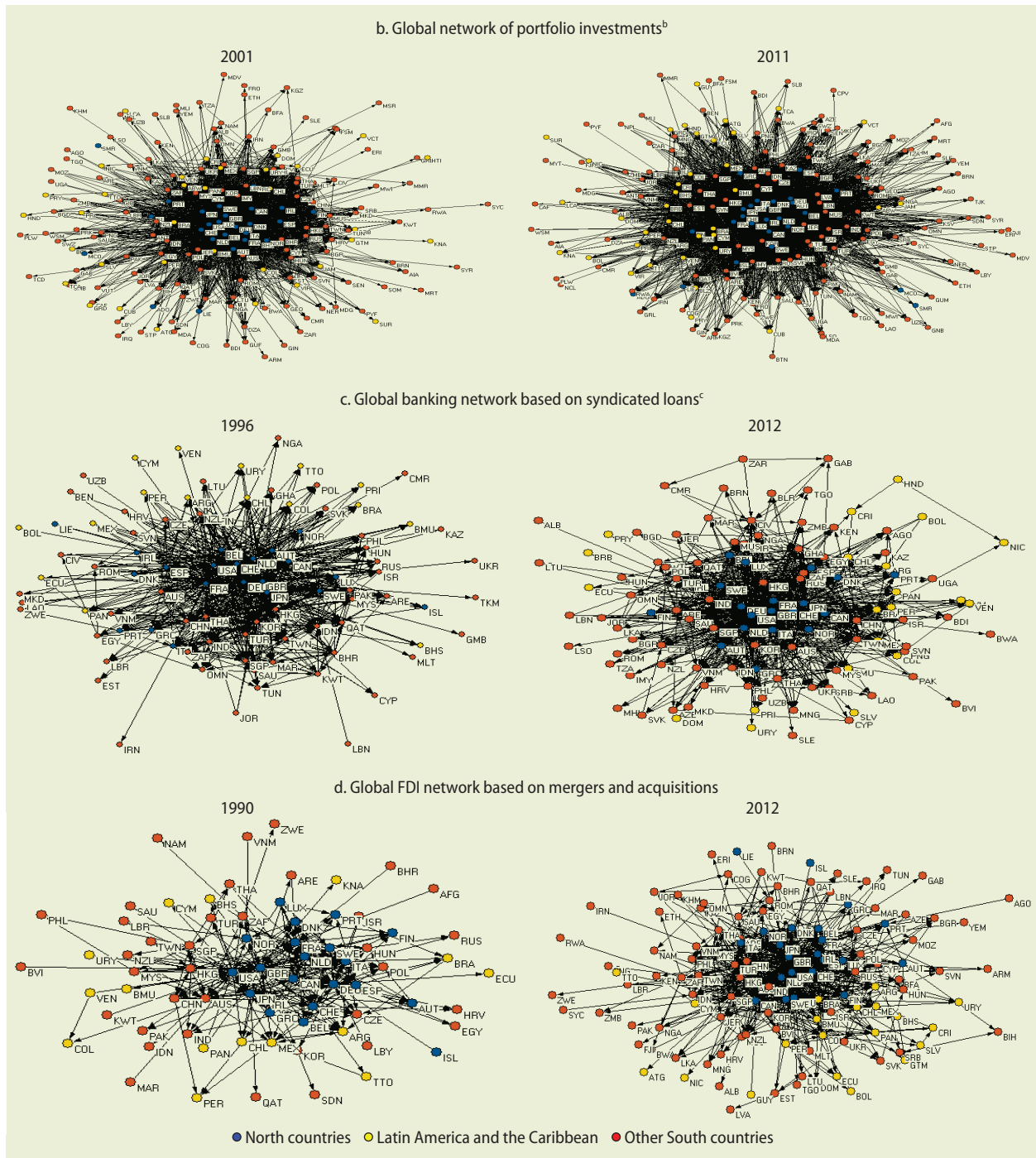
Figure 1.8 illustrates the differing roles of North and South countries. It takes into account the relative (rather than absolute) importance of each country in the global trade network. The distance between countries reflects similarity in the structure of their trade connections—the closer countries are to one another, the more alike they are in terms of export shares. This similarity in export shares captures two distinct dimensions: the relative importance a given country

FIGURE 1.7 Global trade and financial networks

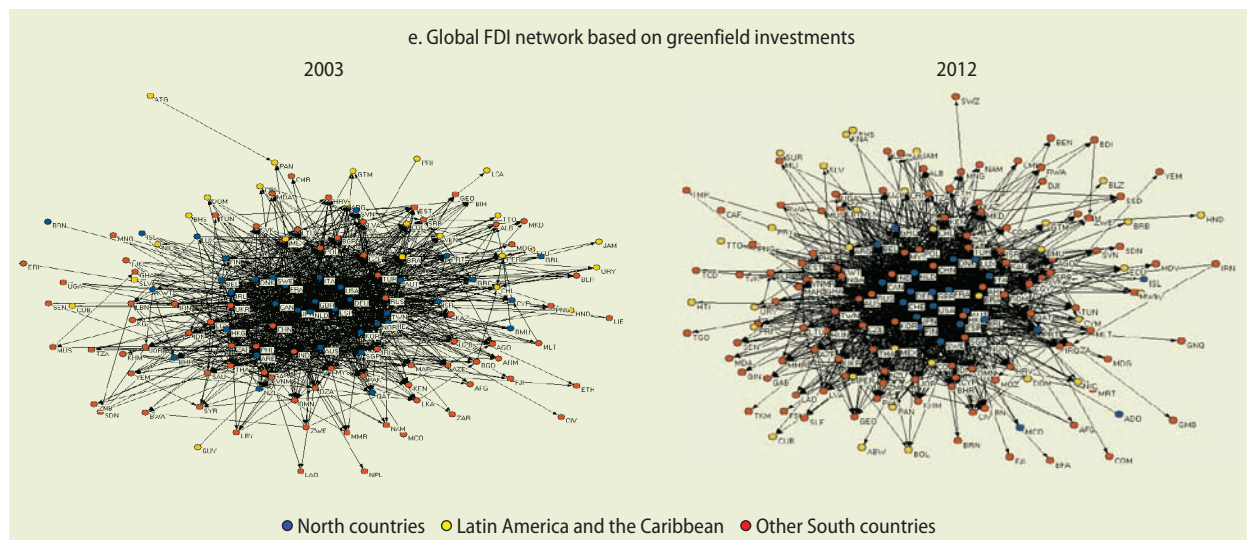


(continued)

FIGURE 1.7 Global trade and financial networks (continued)



(continued)

FIGURE 1.7 Global trade and financial networks (continued)

Sources: Calculations based on data on trade are from Direction of Trade Statistics (DOTS), on portfolio investments from Coordinated Portfolio Investment Survey (CPIS), on syndicated loans and mergers and acquisitions from SDC Platinum, and on greenfield investments from fDi Markets.

Note: Networks are drawn using the Kamada-Kawai algorithm. Each node represents a country. Each link corresponds to an active connection (a positive flow or stock of investments) between a pair of countries. Arrows indicate the direction of these connections. For each dataset, the left-hand column shows the networks in the first year of the sample and the right-hand column shows the networks in the last year of the sample. The North includes the G-7 members and Western Europe countries. Other South includes all other economies except Latin America and Caribbean countries. All new syndicated loans on a given year are reported. FDI = foreign direct investment; G-7 = Group of Seven.

a. Only trade flows (exports) greater than \$10 million in 1980 or greater than \$100 million in 2012 are reported.

b. Only positive holdings of foreign portfolio assets (equity and bonds) are reported.

c. All new syndicated loans on a given year are reported.

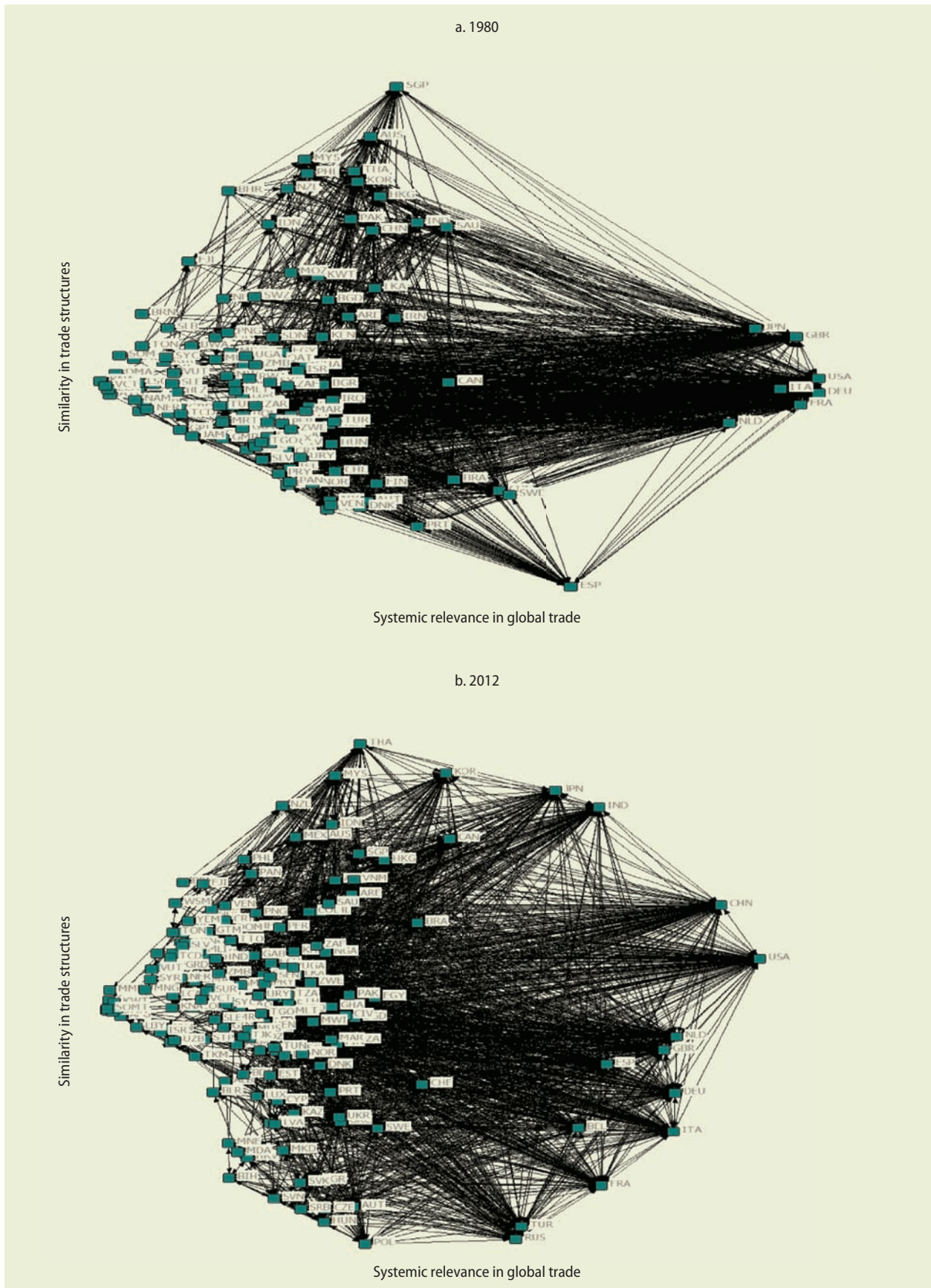
has in other countries' exports and the relative importance that other countries have in a given country's exports. Countries that capture a larger share of other countries' exports and that are connected with a larger number of trading partners (that is, countries that are more important in the global network) appear to the right in figure 1.8. Along the vertical dimension, the smaller the distance between two countries, the more similar the structure of trade connections across members of the network.

During the 1980s and 1990s, only North countries were clustered toward the right of the graph, indicating that only they were systemically important to the global trade network. For example, for 1980 the United States, Germany, and Japan appear at the far right side of panel a in figure 1.8. In addition,

the countries on the right are very close to one another on the vertical dimension, reflecting a high degree of similarity in the structure of their trade connections with other countries in the network. The global trade network in 1980 thus tended to display a sort of "single polarity," with some North countries acting as a single pole (that is, playing the same role) for world trade.

The global trade network in 2012 reveals a tectonic shift: several countries from the South appear on the right side of panel b of figure 1.8, indicating their increased relevance to world trade. However, they remain somewhat distant (along the vertical dimension) from the other (North) countries on the right side of the figure. This side of the figure resembles a star, with small groups of central countries placed at a certain distance from

FIGURE 1.8 Similarity in global trade networks



Source: Calculations based on data from Direction of Trade Statistics (DOTS).

Note: Each node represents a country. Each link corresponds to an active trade connection between a pair of countries. Arrows at the end of each link capture the direction of these connections. Trade connections are measured as exports as a share of total exports of the source country. Only shares greater than 1 percent are reported. The distance between countries reflects similarity in the structure of their trade connections: the closer countries are to one another, the more alike they are in terms of export shares. Countries capturing a larger share of other countries' exports and connected with a larger number of trading partners appear on the right-hand side of the figure (more systemically relevant countries in global trade). The smaller the distance between two countries along the vertical dimension, the more similar the structure of their trade connections across other members of the network.

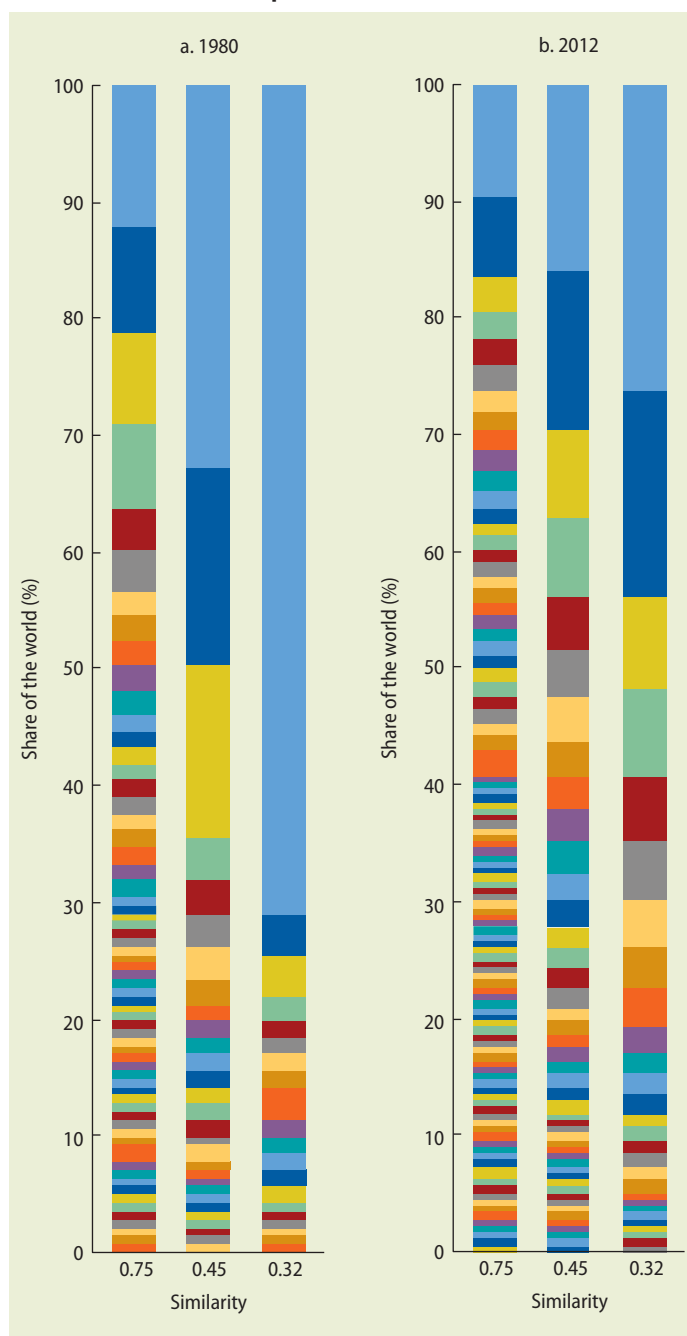
one another. Russia and Turkey, for example, are not located near any North core country from Europe, and Japan is not close to either China or Korea. Among the systemically important countries, South countries thus play a different role from North countries in international trade. It is in this empirically well-defined sense that the global trading landscape has become more heterogeneous and “multipolar.”

This rising heterogeneity at the center of global trade is also apparent when countries are grouped according to the structural equivalence of their trade connections (see, for example, Burt 1976). Two countries play the same role in the network (that is, have exact structural equivalence) when they have the same connections to all other countries. In figure 1.9, countries are grouped by different threshold levels of similarity in their trade structure (based on the value of trade flows between countries and the composition of trading partners). In 1980 there were basically three dominant groups of countries. In 2012, for the same threshold level of similarity in trade structures, there were many more than three groups, and fewer countries belonged to each of the top three groups. These patterns suggest that as the South gained space in global trade, the diversity of trade structures increased around the world. Intrinsically related to this diversity are arguably differences in the sectoral composition of the trade flows of South and North countries, as discussed in Set of Facts 1.

Unlike global trade, global finance has not been fundamentally restructured: the North still stands alone at the center of the global financial networks.

A key feature of the new dynamics of the global economy has been the asymmetry in the pattern of change in global trade and financial networks.⁹ In the sphere of trade, the traditional correspondence between the North and the center (and the South and the periphery) has been reconfigured. In contrast, in the sphere of finance, North countries still stand alone at the center of the

FIGURE 1.9 Structural equivalence of trade connections



Source: Calculations based on data from Direction of Trade Statistics (DOTS).
 Note: Countries are grouped according to different threshold levels of similarity in their trade structure (based on the volume of trade flows between countries and the composition of partners). Within each bar, the share of countries that belong to the same structurally equivalent group are shown in different colors. Each bar shows these grouping of countries at different threshold levels, reported in the x-axis. The structural equivalence of trade connections is based on the similarity of the correlation matrix of trade flows.

global financial networks, though the South has increased its connectivity within these networks (see figure 1.7, panels b, c, d, and e for portfolio investments, syndicated loans, M&A, and greenfield investment flows). Whether this asymmetry proves transitory is a matter of hot debate. Not only is there broad recognition of the U.S. dollar as an international currency, but the scale and network effects associated with financial centers will not be easy for the South to overcome. Moreover, the trade-finance asymmetry stands in sharp contrast with broad historical developments since the Industrial Revolution and throughout most of the twentieth century, when countries that became important economic powers also became international financial centers. London, New York, and Tokyo, for example, became financial centers as their nations strengthened their roles as gravity poles for regional and even global economic activity.

The growth of the South has been widespread, with new South-South as well as South-North and North-South connections developing.

As the South gained prominence in the global economy, the number of its bilateral international connections proliferated. New connections were established not only between the South and the North but also within the South (figure 1.10). In 1990 only 46 percent of the total number of possible South-South trade connections were active; by 2012 this proportion had risen to 70 percent.¹⁰ Similar trends are observed across types of financial flows. In 2001 South countries had portfolio investments in 10 percent of the countries of the South; by 2011 this share had more than doubled, to 21 percent. The increase in this extensive margin for FDI flows within the South was also considerable, albeit from much lower starting points. The share of the total number of South-South connections for M&A that were active rose from 0.1 percent in 1990 to 1.3 percent in 2011, and the share of active greenfield investments rose from 2.2 percent in 2003 to 3.4 percent in 2011.

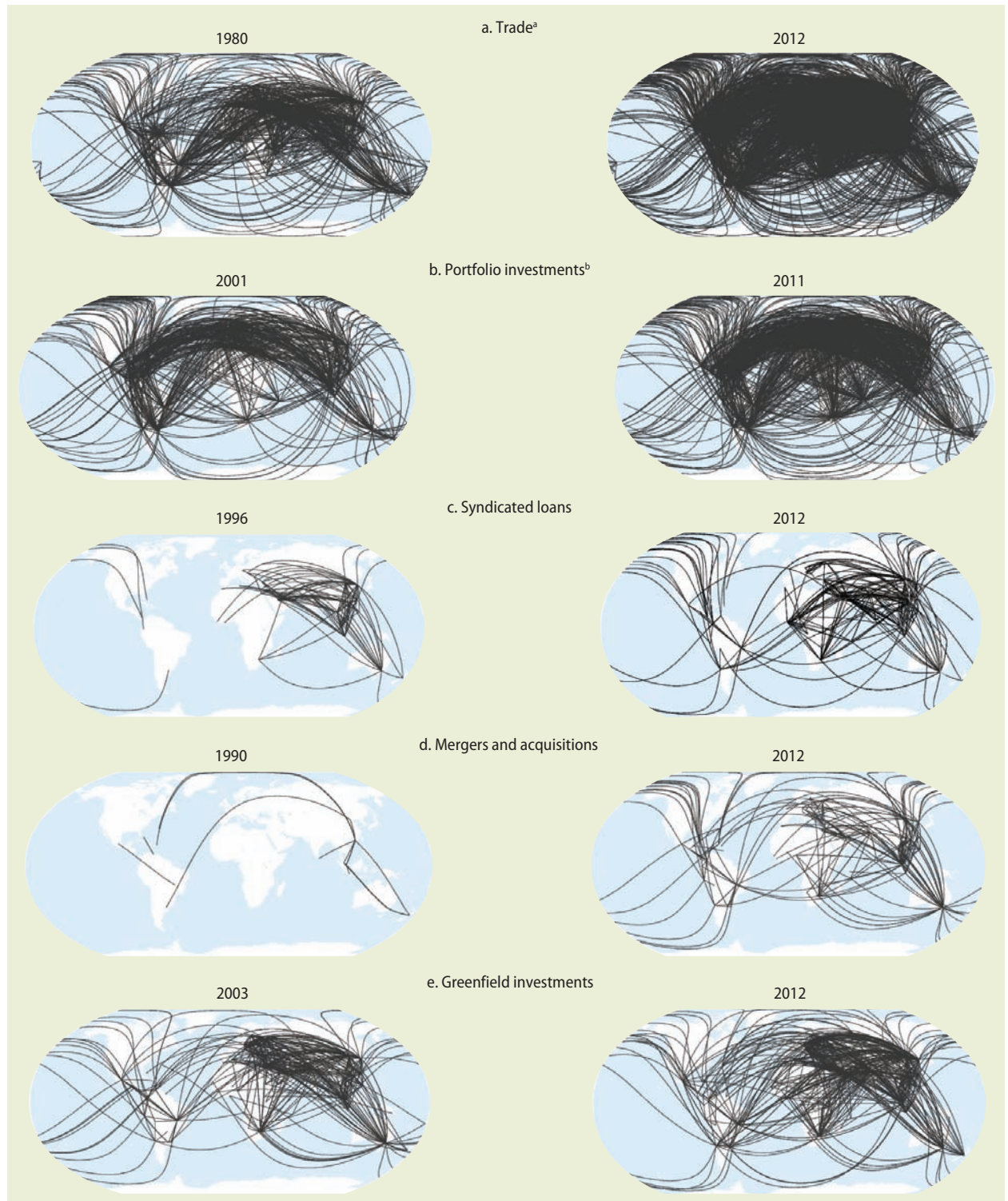
For all types of financial flows, the number of active South-South connections as a share of all active connections in the world increased more than the number of North-North, North-South, and South-North connections. The growing number of connections among the relatively small countries of the South is a significant driver of these patterns. Although larger South countries (such as Brazil, China, India, and Russia) increased the number of their connections with other countries in the South—and in terms of volume these connections typically dominate—they accounted for a relatively small fraction of the total number of South-South connections. The breadth of the reach of the rise of the South phenomenon is thus key to these patterns of financial flows. To be sure, many countries in the South have yet to be connected with a wide set of countries in the world, especially in terms of financial connections with other countries in the South, suggesting that there is still significant scope for the continued expansion of the South in cross-border flows.

LAC is increasingly connected with other South countries in both trade and finance.

Countries in LAC broadened and deepened their connections with other South countries, though the value of such connections is still relatively small, especially in finance, when contrasted to LAC-North connections (figure 1.11). For instance, the share of the South in total trade flows to and from LAC countries increased about 70 percent (from 26 percent to 45 percent), during the 2000s. The expansion of syndicated loans and M&A between LAC and other South countries was also striking, albeit from lower bases, with syndicated loans rising almost 180 percent (from about 4 percent to 12 percent of total flows) and M&A increasing more than 140 percent (from about 15 percent to 37 percent of total flows).

LAC countries also became increasingly integrated with a wider set of other South countries; intraregional integration has deepened, and linkages with other South countries have expanded. These patterns have

FIGURE 1.10 Extensive margin of South-South connections



Sources: Calculations based on data on trade are from Direction of Trade Statistics (DOTS), on portfolio investments are from Coordinated Portfolio Investment Survey (CPI), on syndicated loans and mergers and acquisitions are from SDC Platinum, and on greenfield investments are from fDi Markets.

Note: Each line represents a positive flow or stock of investments between two South countries. For each dataset, the left-hand column shows the network in the first year of the sample and the right-hand column shows the network in the last year of the sample. South countries comprise all countries that do not belong to the G-7 or are not located in Western Europe. G-7 = Group of Seven.

a. Only connections worth more than \$10 million are included.

b. Only positive holdings of foreign portfolio assets (equity and bonds) are reported.

been widespread across flow types (trade, portfolio investments, loans, and FDI). China in particular has emerged as an important partner for some LAC countries, especially South American countries on the trade front. In 1990 virtually no trade existed between LAC and China. By the late 2000s, LAC-China trade represented 12 percent of total trade flows to and from LAC countries. On the financial front, China's role has been more limited, though its importance has been rising, especially for FDI.

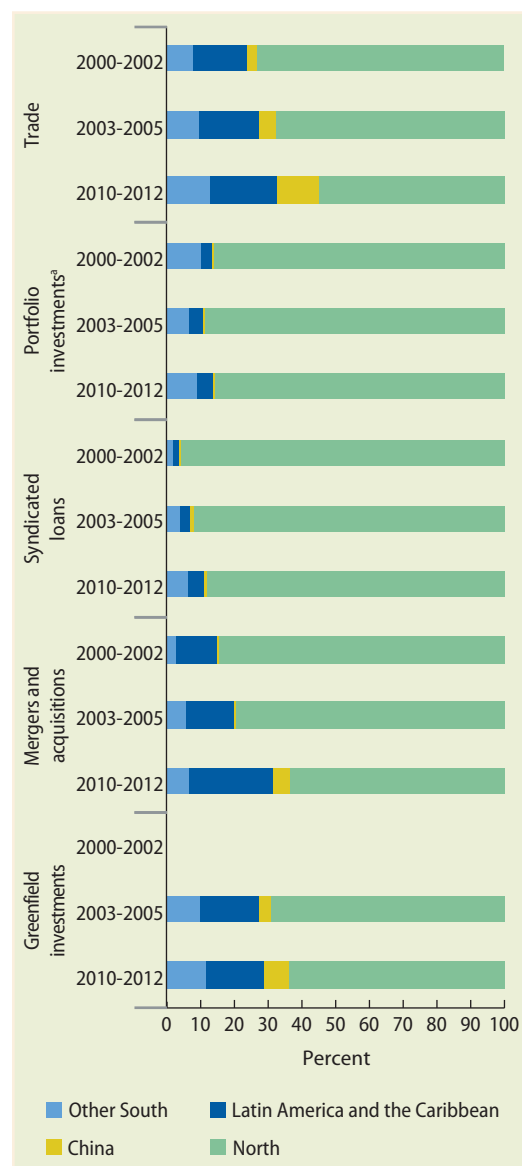
Set of Facts 3: The structure of bilateral trade and financial connections of the South has been generally different from that of the North, with geography and endowments arguably shaping their evolving structure.

Despite the increased diversification of connections around the world, there is significant regional clustering in both trade and financial relations.

The South has broadened and deepened its connections not only with North countries but also with other South countries. However, the strongest trade ties for countries in both the North and the South are with neighboring countries, suggesting that geographical proximity has played an important role in the evolution of these connections. Most Central American and Caribbean countries, for example, belong to a single cluster with North American countries, centered on the United States (figure 1.12). South American countries form a smaller cluster, centered on Brazil, made up mostly of countries in Mercosur. Other large clusters include one consisting of European countries, centered on Germany, and another comprising Asian economies, including Japan and most East Asian economies, centered on China.

Similar patterns are observed in global finance. South countries generally send the

FIGURE 1.11 Regional composition of cross-border connections of countries in Latin America and the Caribbean



Sources: Calculations based on data on trade are from Direction of Trade Statistics (DOTS), on portfolio investments are from Coordinated Portfolio Investment Survey (CPIS), on syndicated loans and mergers and acquisitions are from SDC Platinum, and on greenfield investments are from fDi Markets.

Note: The figure considers both inflows and outflows. The North includes the G-7 members and Western Europe countries. Other South includes all other countries except China and countries in LAC. G-7 = Group of Seven. a. The composition of portfolio investments is based on the holdings of cross-border portfolio (equity and bonds) assets. Because of data limitations, these data cover only the following periods: 2001–02, 2003–05, and 2010–11.

majority of their financial investments to the North, but neighboring South countries come in second as a share of these investments. Countries in LAC typically invest in other LAC countries, Asian countries invest largely in other Asian countries, Eastern European countries invest mostly in other Eastern European countries, and so on (figure 1.13). These patterns hold for portfolio investments and syndicated loans as well as FDI (both M&A and greenfield investment). The largest non-North recipients of investments from LAC countries during the 2000s, for example, were other LAC countries, which accounted for 7 percent of total portfolio investments, 24 percent of new syndicated loans, 34 percent of M&A flows, and 61 percent of new greenfield investments.

The development of global value chains has arguably played an important role in the regional clustering in trade and financial connections.

Underpinning to some extent these clustering patterns has been the development of global value chains (GVCs)—the dispersion of production stages and processes across countries.^{11, 12} GVCs are more regional than global.¹³ In Central America, for example, the dairy sector has crossed borders, and a GVC encompassing producers in El Salvador and Nicaragua has developed. Local companies in El Salvador have forged local partnerships with small industries in Nicaragua to produce their national cheese (“el quesillo”), which is then sold in the United States (see Martínez-Piva and Zúñiga-Arias 2012). In Sub-Saharan Africa, the recent entry of South African clothing manufacturers into neighboring countries (such as Lesotho and Swaziland) has led to the rise of regional value chains driven by South African retailers (see Morris, Staritz, and Barnes 2011). More broadly, Baldwin and Lopez-Gonzalez (2013) highlight the importance of three large production clusters around the world:

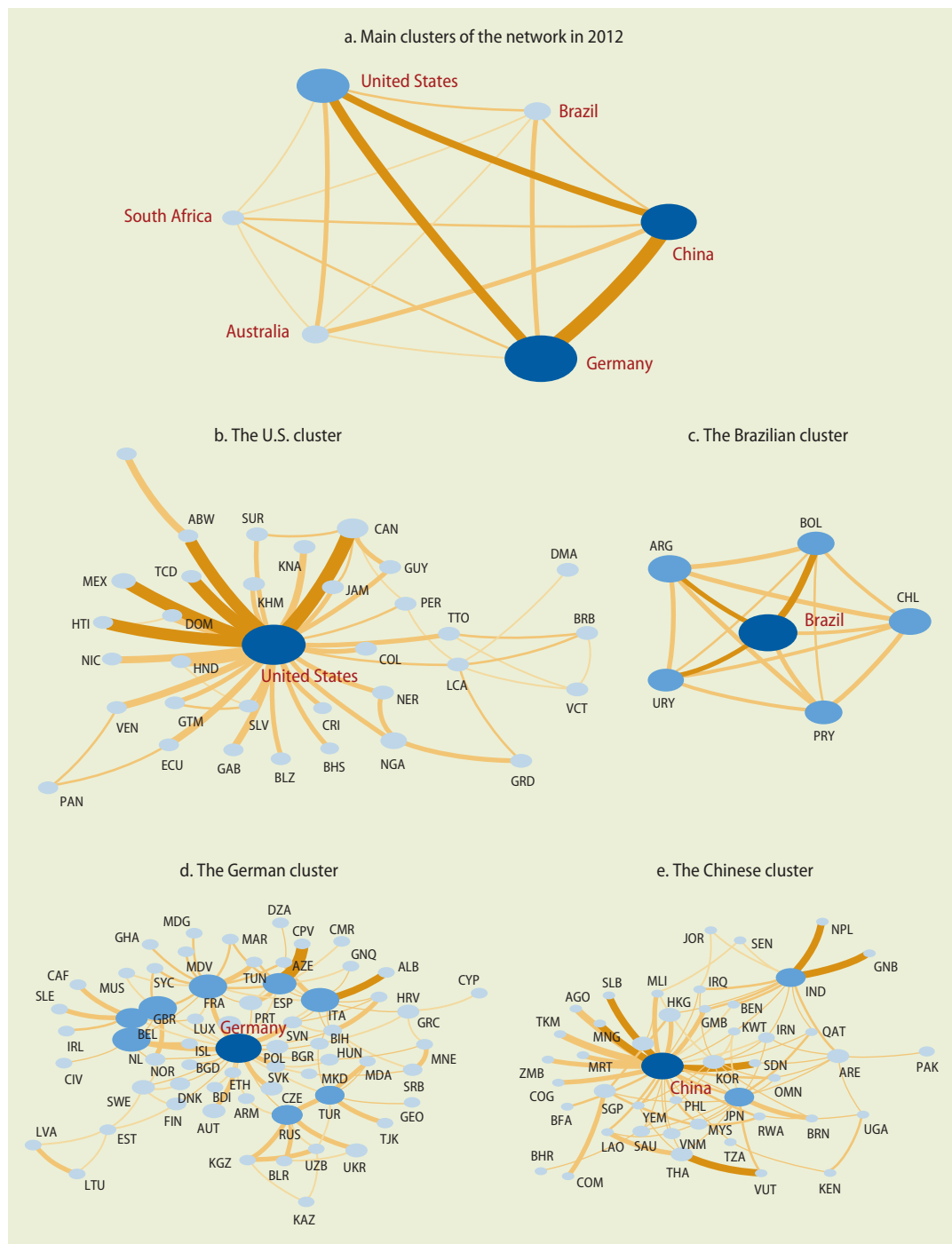
factory North America, factory Europe, and factory Asia.

As GVCs have gained prominence, exports of final products have become increasingly composed of imports of intermediate inputs: more intermediate goods are traded across borders, and more parts and components are imported for use in exports. Data on the sources of foreign value added (FVA) in exports point to the regional nature of GVCs, showing that the FVA content in exports typically originates in neighboring countries (figure 1.14, panel a).¹⁴ For example, almost 40 percent of the FVA in the exports of EAP economies comes from other economies in EAP, and more than 75 percent of the FVA in the exports of ECA countries comes from other ECA and Western Europe countries.

The degree of regional clustering in the sources of FVA in exports is much less pronounced in LAC than in other South regions, though there is some clustering within LAC subregions (see figure 1.14, panel b). Imports from other South American countries represent about 35 percent of the FVA in exports of South America on average, with the rest of LAC adding only another 3 percent of imported FVA. Similar patterns are observed for Central America and Mexico.

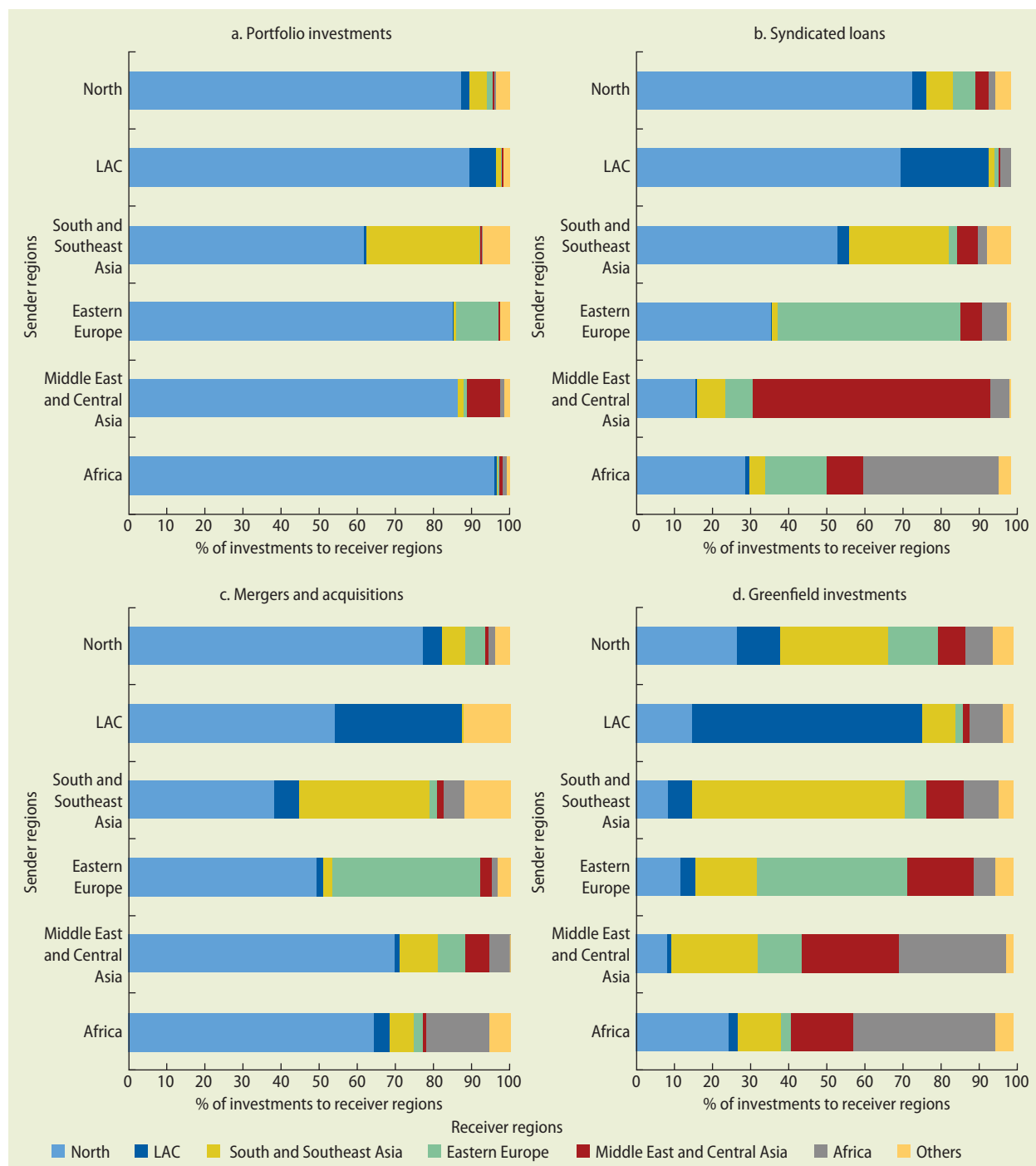
There is, however, a striking contrast in the relative importance of other regions in the FVA of exports across LAC countries. For Mexico, Central America, and the Caribbean, the United States and Canada are prominent sources of imported inputs used in their exports. GVCs in South America (as proxied by the FVA in exports) seem much less tied to North America than GVCs in Mexico, Central America, and the Caribbean. In fact, the three major centers of global production (North America, Western Europe, and East Asia) provide a more balanced contribution to the exports of South America. For example, in 2011 the United States and Canada provided about 40 percent of the FVA in the exports of Mexico, Central America, and the Caribbean but only 19 percent of the FVA in

FIGURE 1.12 Clusters in the global trade network



Source: Calculations based on data from Direction of Trade Statistics (DOTS).
 Note: This figure shows the results of clustering analysis on the global trade network in 2012. Panel a shows the most central countries for each of the main clusters (in the other panels) of the global trade network. Panels b through e show the composition of countries that belong to each of these individual clusters. Each node represents a country. Each link corresponds to an active trade connection between a pair of countries. The thickness of the link indicates the strength of these connections. For clarity purpose, panels only display the top 10 percent of links in the German cluster, and the top 5 percent of links in the U.S. and Chinese clusters, and all the links are displayed for the Brazilian cluster.

FIGURE 1.13 Regional composition of cross-border investments



Sources: Calculations based on data on trade are from Direction of Trade Statistics (DOTS), on portfolio investments are from Coordinated Portfolio Investment Survey (CPIS), on syndicated loans and mergers and acquisitions are from SDC Platinum, and on greenfield investments are from fDi Markets.
 Note: Each bar in each graph corresponds to the sender region and each group of countries within a given bar corresponds to the receiving region. Offshore centers are excluded. The North includes the G-7 members and Western Europe countries. G-7 = Group of Seven; LAC = Latin America and the Caribbean.

the exports of South American countries. For South American countries, about 16 percent of FVA originated in Asia, and 28 percent originated in Western Europe.

Despite the increase in the importance of the South in GVCs over the past decade, North countries still remain a significant source of imported inputs used in the exports of LAC countries.¹⁵ Also notable is the limited participation of LAC countries as sources of FVA for the exports of other countries, especially South countries.¹⁶ South American countries are more present in this regard than other LAC countries, albeit mostly because of their commodities exports.

Overall, although some regional clustering is observed within LAC, the patterns of trade integration in the region are different from those observed in other South economies, East Asia in particular. Box 1.1 examines some of these differences.

Endowments have also played a role in the structure of trade and financial linkages.

There is significant heterogeneity in the sectoral composition of global trade and financial flows not only of the North when contrasted with the South but also within the South (as discussed in Set of Facts 1). There is also heterogeneity in the sectoral composition of bilateral connections: South-South connections are different from North-South connections, which in turn are different from North-North connections.

One characteristic that reflects the differences in bilateral trade connections is the degree of intraindustry trade (IIT). The degree of IIT, measured by the Grubel-Lloyd index, ranges from 0 (pure interindustry trade) to 1 (pure IIT trade). The degree of IIT varies across South and North countries as well as within the South. North-North connections are typically characterized by a higher degree of IIT than South-North and South-South connections (figure 1.15, panel a).

The sectoral compositions of bilateral financial connections of the North and the

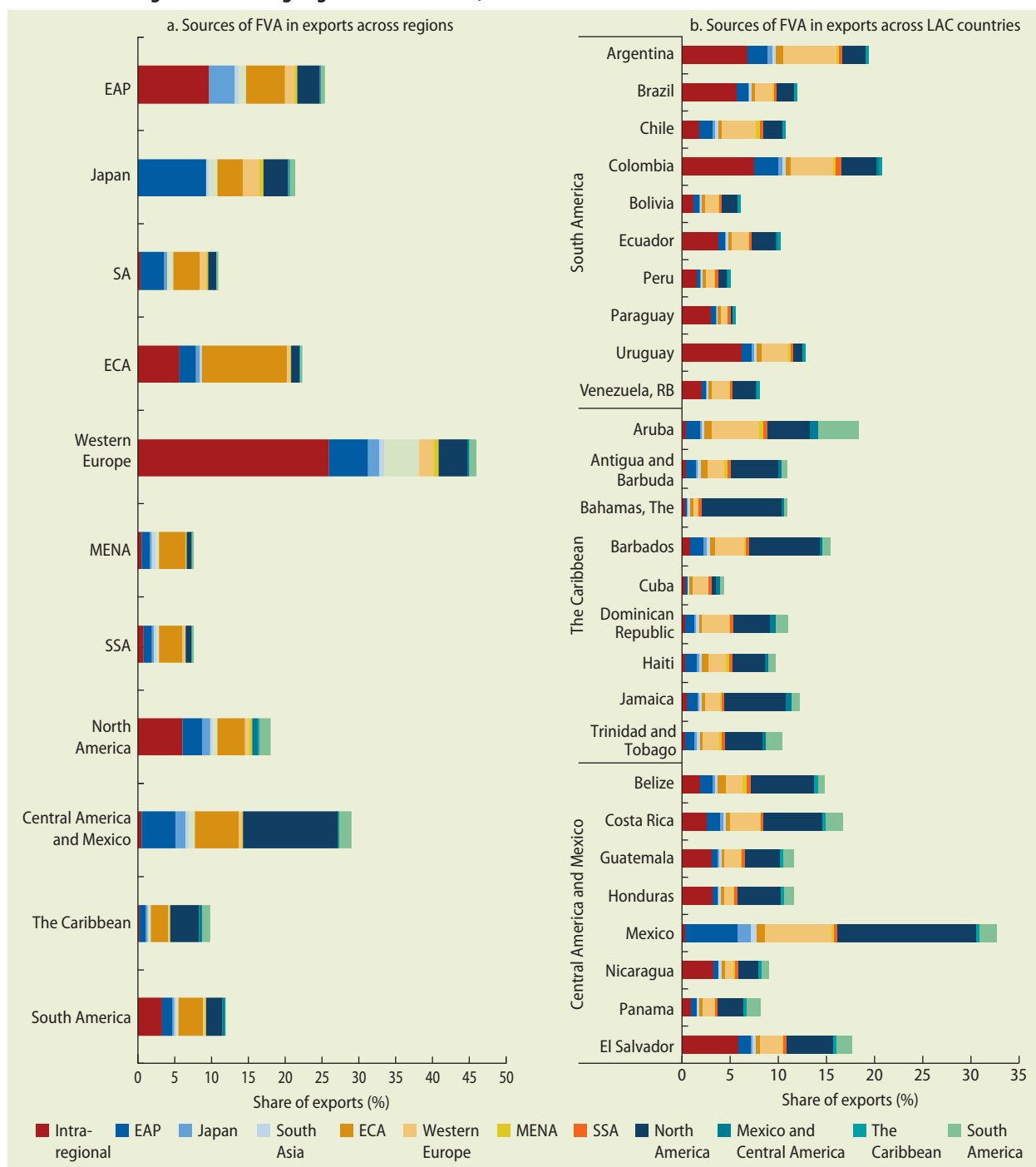
South are also strikingly different. The share of financial inflows in the primary sector is larger in the South than in the North, independent of whether the flows are from South or North countries (see figure 1.15, panel b). For example, the primary sector's share of syndicated loans averaged 45 percent of South-South flows and just 19 percent of North-North flows between 2003 and 2012. South-South M&A flows are also tilted toward the primary sector when contrasted with North-North flows. Flows to the primary sector, for example, accounted for 54 percent of South-South flows but just 20 percent of North-North flows. Similar patterns are also observed for greenfield investments. Relative to North-North financial flows, North-South and South-South flows include a larger share of investments in the primary sector.

The overall patterns of bilateral connections of the South and the North suggest that the South's trade and financial linkages are to some extent rooted in the forces of comparative advantage associated with relative endowments. The evidence presented above on the dynamics of trade connections suggests triangular trading relationships between some South and North economies. An example of this triangularity is the trade connections between China and South America, whereby China imports commodities from LAC (especially South America) and exports manufacturing goods to LAC and the rest of the world, including the North. In contrast, the North's trade linkages, especially linkages with other North economies, embed components of product differentiation and economies of scale.¹⁷

The sectoral composition of LAC's trade and financial connections with other South countries is different from the composition of its ties with North countries.

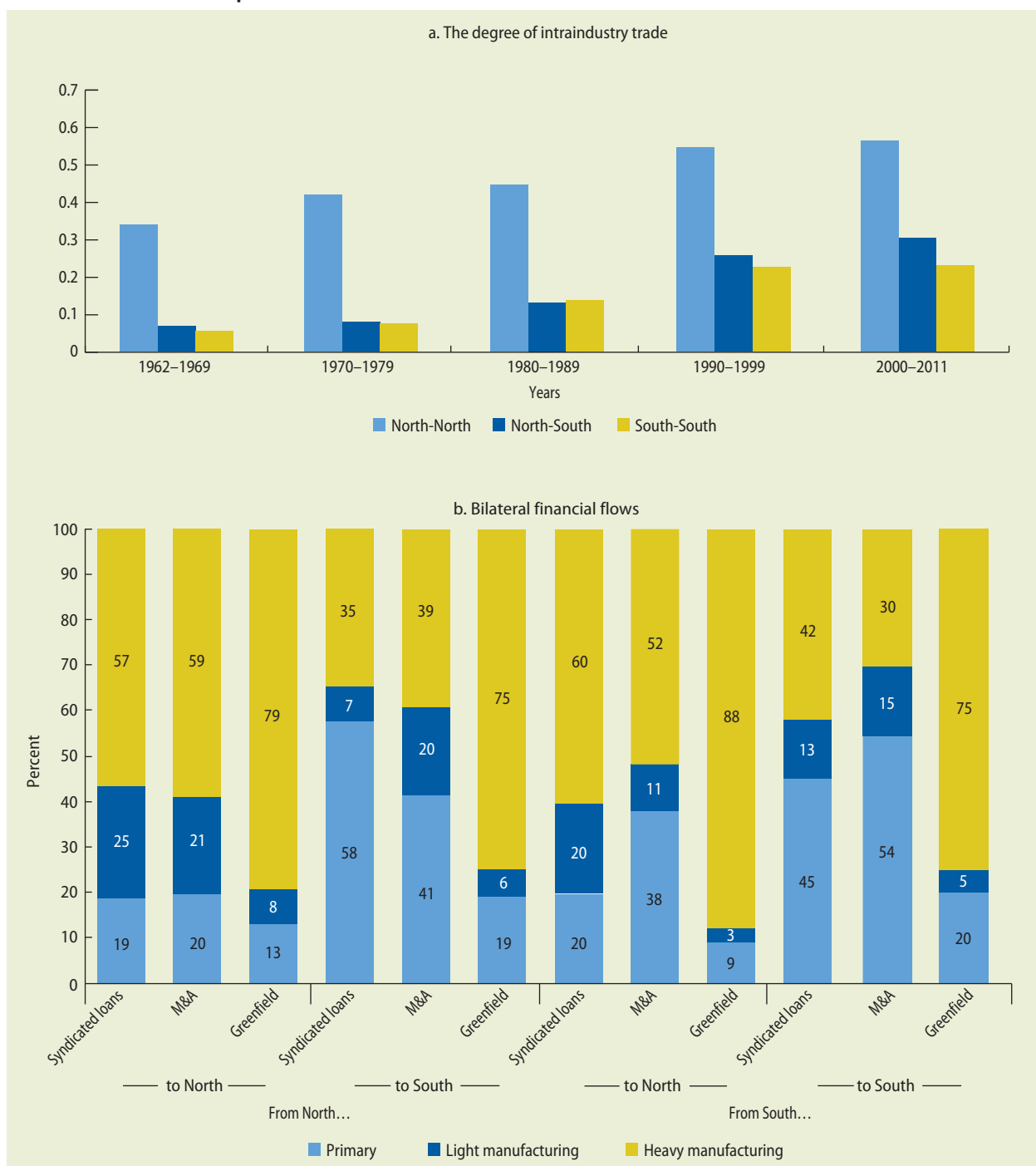
Trade and financial flows to LAC countries from the South include a larger share of flows in the primary sector than do flows from the

FIGURE 1.14 Regional clustering in global value chains, 2011



Sources: Calculations based on data from Eora MRIO and World Development Indicators.
 Note: Figure shows the regional composition of sources of foreign value added used in a country's exports, scaled by the country's exports. In panel b, the intraregional category captures the share of foreign value added sourced from the LAC subregion to which each country belongs. North America excludes Mexico. EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MENA = Middle East and North Africa; SA = South Asia; SSA = Sub-Saharan Africa; FVA = foreign value added.

FIGURE 1.15 Sectoral composition of bilateral cross-border flows



Sources: Data on intraindustry trade are from Comtrade, on syndicated loans and mergers and acquisitions are from SDC Platinum, and on greenfield investments are from fDi Markets.

Note: Panel a shows trade-weighted averages of country pairs. Panel b presents the sectoral composition of bilateral financial flows (namely syndicated loans, M&A, and greenfield) over 2003–2012. The primary sector corresponds to SIC codes 0–1500, light manufacturing to SIC codes 2000–2800 and 3100–3200, and heavy manufacturing to SIC codes 2800–3100 and 3200–3800. The North includes the G-7 members and Western Europe countries. The South includes all other economies. G-7 = Group of Seven; M&A = mergers and acquisitions.

North (figure 1.16, panels a and b). Particularly striking is the large share of M&A investments from the South to LAC in the primary sector (92 percent during the 2000s). In contrast, only 48 percent of M&A investments from the North were in the primary sector. Large but less marked differences are also observed in greenfield investments and syndicated loans. Regarding trade flows, the share of natural resources in LAC imports from the South was 10 percent between 2003

and 2012, twice the average 5 percent of imports from the North.

Trade and financial flows from LAC countries to the South are also tilted toward the primary sector when compared with flows to the North (see figure 1.16, panels a and c). The share of natural resources in exports from LAC to the South during 2003–12 was about 60 percent larger than the share of exports to the North (46 percent versus 29 percent on average).

BOX 1.1 Differences in international trade integration: The case of Latin America and the Caribbean and East Asia

The analysis of the evolution of the connections within East Asia and LAC trade networks shows considerable differences between the two regions. The density maps of the trade connections within each region are particularly telling (figure B1.1.1).^a

One contrast in the nature of the trade connections of LAC and East Asian economies is the evolution of the relative importance of different countries within the networks. In 1980 trade networks in both regions centered on countries of the North, especially the United States for LAC and Japan for Asia. By 2012 many countries from both the North and the South were central players in the East Asian network, appearing as very dense nodes in the map. These countries included not only China and Japan but also Republic of Korea, Malaysia, Singapore, and Thailand. In contrast, in the LAC network no node was as dense as the United States. Brazil was the closest node in density, but it was far less dense than the United States. China entered as a new player in the LAC network in 2012, though its density was low. Differences in the dispersion of the centrality measure associated with each node within the two networks support these patterns. For example, in 2012 the dispersion of the node centrality was significantly lower in the East Asian network (0.09) than in the LAC network (0.31), indicating that there is less variation in the density of nodes in the former than the latter.

Another contrast is the degree of connectivity of countries within the networks, a feature that has

persisted over time. The trade connections within the East Asian clustering form a much denser network than those within the LAC cluster. In 2012 almost all countries were fully connected with all other countries within the East Asian network (as indicated by a network density measure of 0.99 for this cluster). Countries in the LAC network were not as fully integrated with one another (the network density measure for this cluster was 0.89).

Figure B1.1.1 also suggests that trade connections within the East Asian network are multidirectional and intense in every direction, whereas those within the LAC network tend to be mainly bidirectional, especially with the United States. For instance, triads of trade connections are typically observed at a higher frequency in the East Asian network than in the LAC network. In 2012 the number of triads as a share of the maximum number of triads within a network was 0.99 in the East Asian network and 0.92 in the LAC network. This type of connectivity observed in the East Asian network suggests strong feedback effects, whereby the tight trade connections within the region boost trading with the rest of the world and vice versa. In contrast, LAC countries do not seem to leverage intraregional trade to enhance their overall level of connectivity within the global trade network. These patterns may be linked, at least in part, to the more active participation of East Asian countries in GVCs relative to LAC countries.

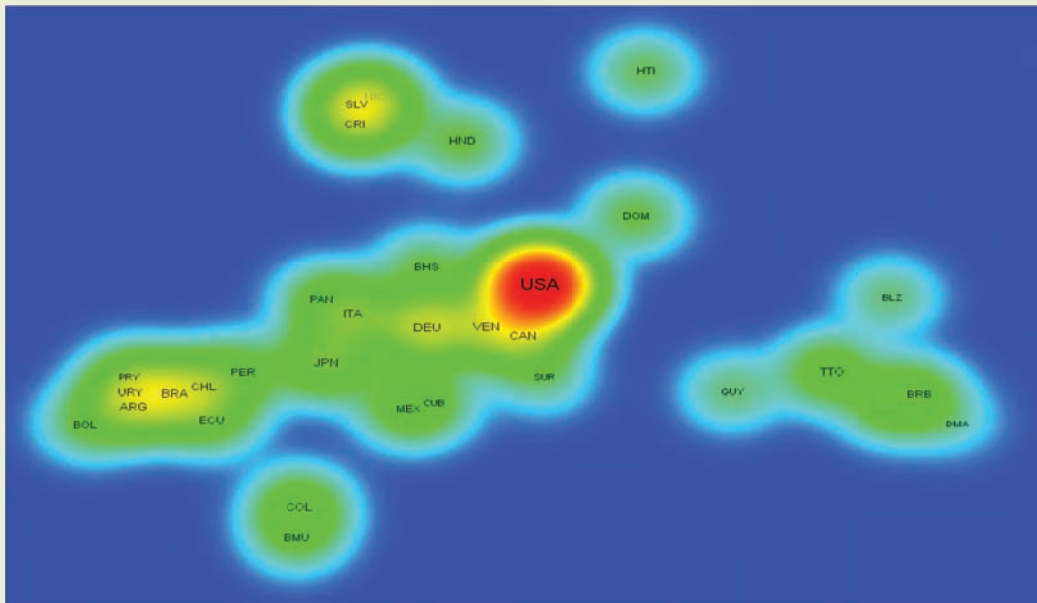
a. The density of a node depends on the number of neighboring countries and the economic distance between countries. The sample of countries included affects the maps, making it hard to directly compare node density across panels. Still, some features are comparable across maps. The set of countries in each of the two trade clusters analyzed includes all South countries within each region. This set of countries was expanded to include the five largest trading partners (measured by the total volume of trade flows) for countries in the region located outside the region.

(continued)

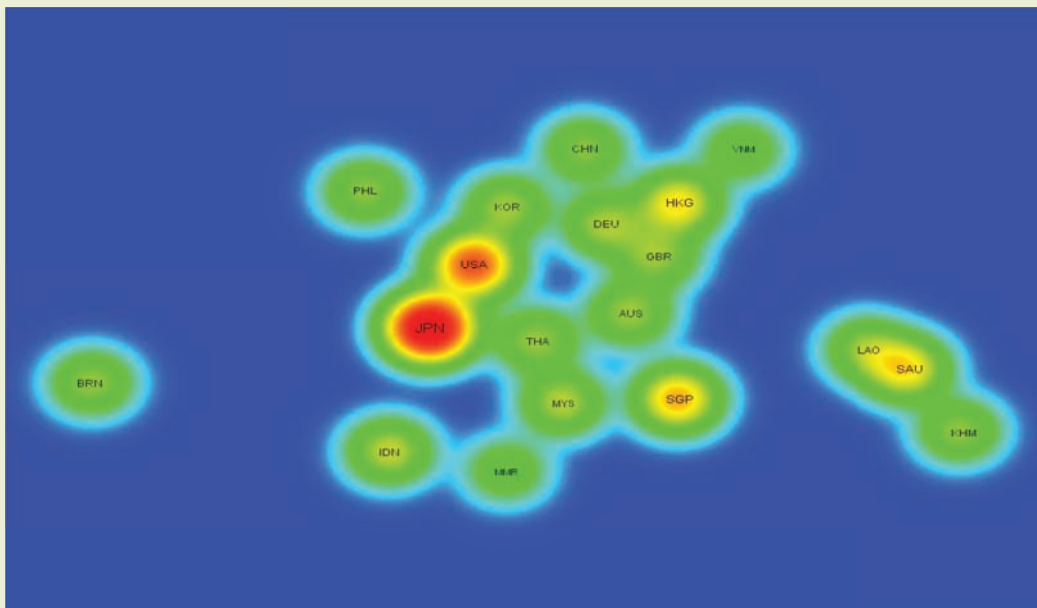
BOX 1.1 Differences in international trade integration: The case of Latin America and the Caribbean and East Asia *(continued)*

FIGURE B1.1.1 Density maps of trade networks

a. The Latin American network, 1980



b. The Asian network, 1980



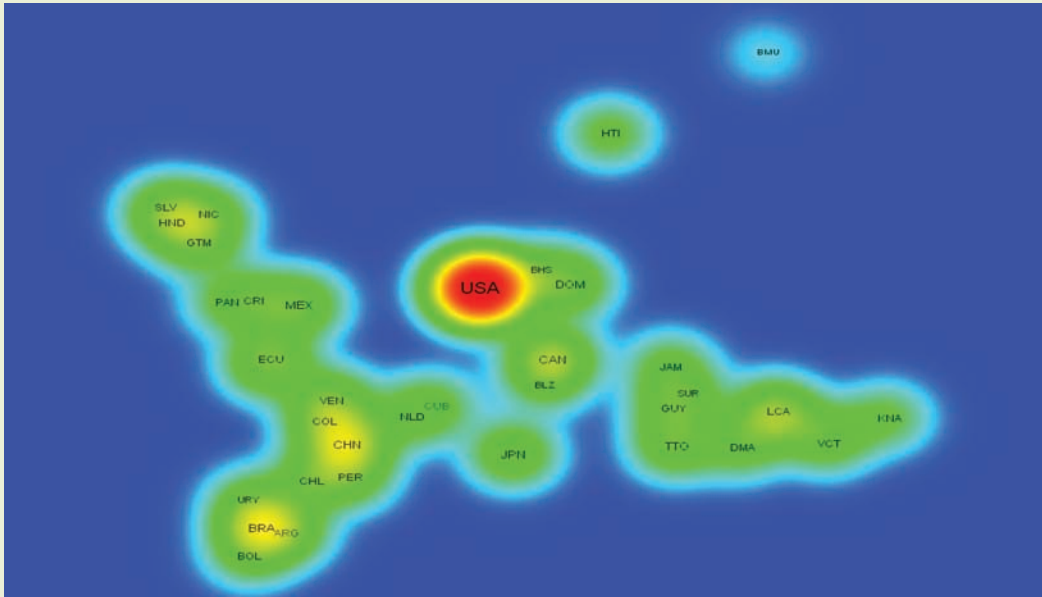
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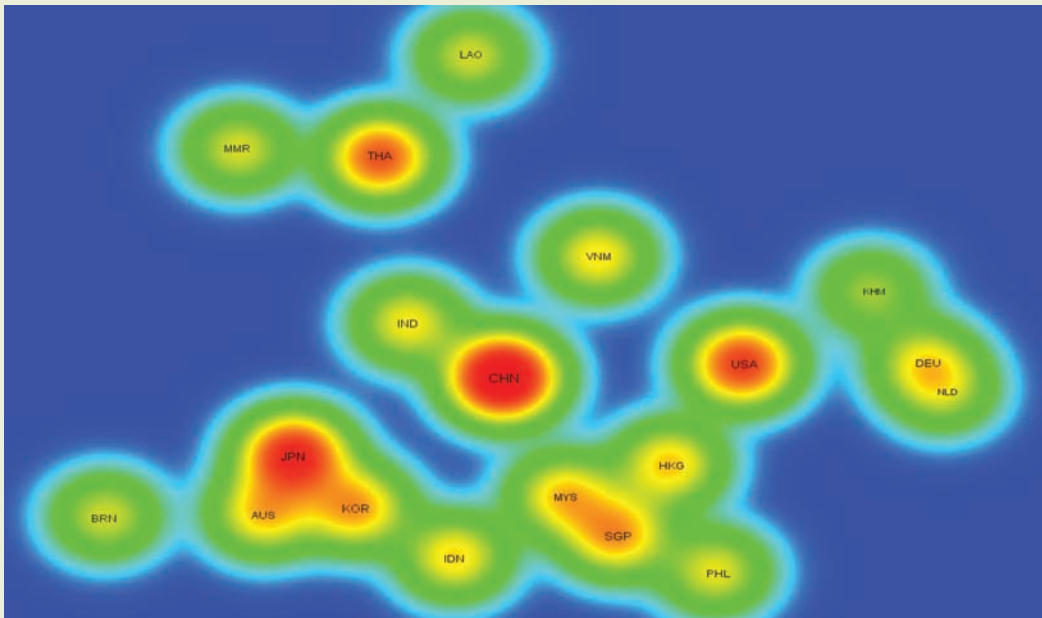
BOX 1.1 Differences in international trade integration: The case of Latin America and the Caribbean and East Asia *(continued)*

FIGURE B1.1.1 Density maps of trade networks *(continued)*

c. The Latin American network, 2012



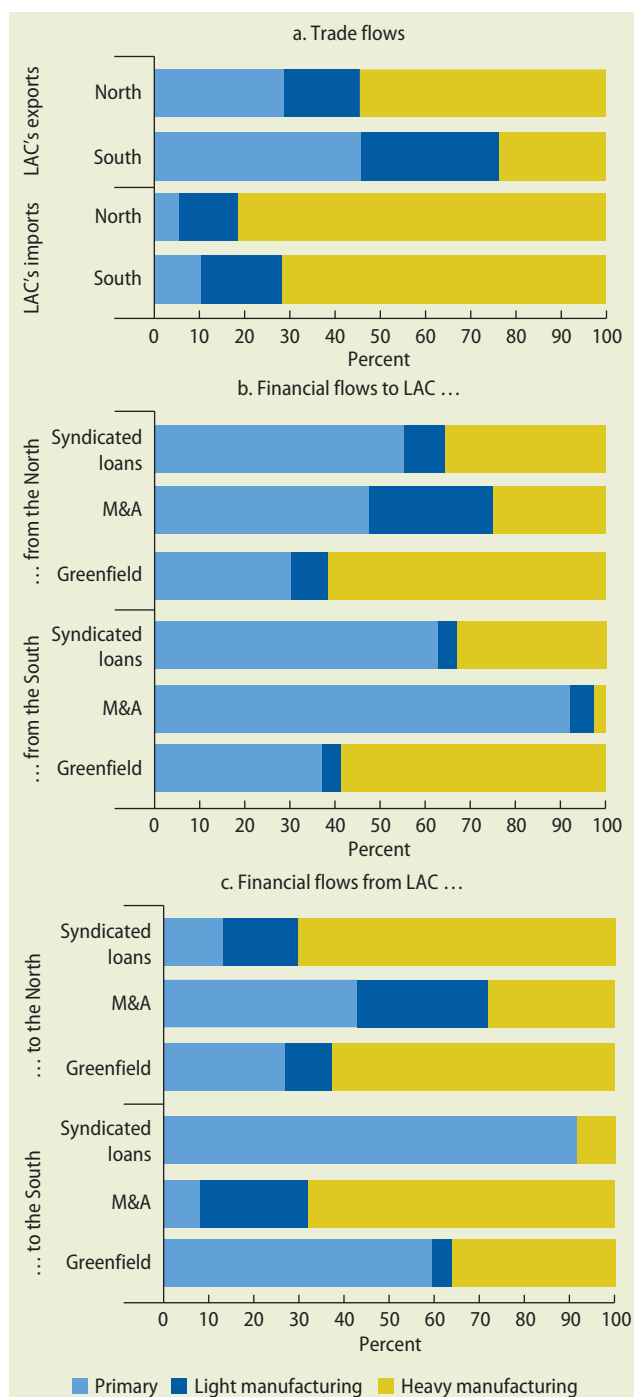
d. The Asian network, 2012



Source: De la Torre, Didier, and Pinat 2014.

Note: Density is based on the number of neighboring countries and the economic distance between countries. See box 1.1 for details on the mapping methodology. The node density is translated into colors using a red-green-blue scheme—from the highest density (red) to the lowest (blue).

FIGURE 1.16 Sectoral composition of cross-border flows for Latin America and the Caribbean



Sources: Data on trade flows are from Comtrade, on syndicated loans and mergers and acquisitions are from SDC Platinum, and on greenfield investments are from fDi Markets.

Note: Averages for the 2003–2012 period are reported. The primary sector corresponds to SIC codes 0–1500, light manufacturing to SIC codes 2000–2800 and 3100–3200, and heavy manufacturing to SIC codes 2800–3100 and 3200–3800. The North includes the G-7 members and Western Europe countries. The South includes all other economies. G-7 = Group of Seven; LAC = Latin America and the Caribbean; M&A = mergers and acquisitions.

Financial flows in the primary sector are also generally larger when destined to South countries. For example, greenfield investments in the primary sector represented 60 percent of all LAC greenfield investments in the South but only 27 percent of investments in the North. The differences in the composition of syndicated loans from LAC countries to the rest of the world were also large: between 2003 and 2012, 13 percent of flows to the North were in the primary sector versus 92 percent of flows to the South. Outflows associated with M&A were the only exception to this pattern: the share of flows from LAC to the North in the primary sector was larger than the share of flows to the South.

Overall, LAC's cross-border flows to and from the South are tilted toward the primary sector when contrasted with flows to and from the North. There are, however, significant differences within countries in LAC, which are explored in chapters 2 and 4. These patterns of integration in the world economy suggest that as connections with South countries deepened during the 2000s, both trade and financial flows became, to some extent, more rooted in comparative advantage forces and endowments.

Notes

1. In this report, the North includes the Group of Seven (G-7) members (Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States) plus the following Western Europe countries: Andorra, Austria, Belgium, Denmark, Finland, Greece, Iceland, Ireland, Liechtenstein, Luxembourg, Monaco, Netherlands, Norway, Portugal, San Marino, Spain, Sweden, and Switzerland. The South includes all other economies, including all countries in Latin America and the Caribbean (LAC).
2. The Latin American school of dependency theory was born in 1949 with the publication of two articles, one by the German development economist Hans Singer and the other by the Argentine economist and former director of the United Nations Economic Commission for Latin America and the Caribbean Raúl Prebisch. The Prebisch-Singer hypothesis

- postulated that the developing countries of LAC would experience immiserizing growth because of a secular deterioration in their terms of trade as manufactured goods (exported by the North) gained in value relative to agricultural and mining commodities (exported by many LAC economies, including Prebisch's homeland, Argentina). Events did not confirm these predictions during the early 21st century, a period characterized by improving terms of trade for many countries in LAC and the relative decline of the North. See Love (1980) on the role of Prebisch in shaping Latin American structuralism and Love (2005) for a review of economic structuralism in Latin America.
3. The World Bank's 2012 Global Development Horizon (GDH) forecasts that the share of the South in global GDP will reach 55 percent in 2025. A 2013 report by the National Intelligence Council projects that this share will reach 70 percent in 2030. The Asian Development Bank forecasts that the share of South exports will rise to 64 percent of global exports by 2030, while the share South imports will remain at about 46 percent. Regarding financial flows, the 2013 GDH projects that the share of the South in world capital will rise to 63 percent of inflows and 80 percent of outflows in 2025.
 4. There is great heterogeneity in trade structures across LAC economies in particular and within the South more broadly. This cross-country heterogeneity plays a particularly important role in the analyses presented in chapter 3 of the labor market implications of the rise of the South in global markets.
 5. These top 20 South countries include Brazil, Chile, the Czech Republic, Hungary, India, Korea, Poland, the Slovak Republic, Thailand, Turkey, and Vietnam.
 6. The causal link going from the current account to the equilibrium real exchange rate has been amply studied in the open economy macroeconomic literature with two-sector (tradables and nontradables) models. Excess demand for saving over investment raises the demand for both tradables and nontradables. For a small price-taking economy, the excess demand for tradables is resolved solely through quantities (a widening of the current account deficit) at given world prices, but the excess demand for nontradables raises their price relative to the price of tradables, appreciating the real exchange rate. See, for example, Dornbusch (1980).
 7. Bernanke (2005) argues that a confluence of factors led to the emergence of a global saving glut, including policy interventions to boost exports in Asia, higher oil prices in the Middle East, and a dearth of investment opportunities and an aging population in advanced industrial countries. Mendoza, Quadrini, and Rios-Rull (2009) attribute high saving in emerging market countries to relatively low levels of financial development, which generate greater precautionary saving. Caballero, Farhi, and Gourinchas (2008) emphasize instead the lack of investment opportunities in these countries and the associated shortage of financial assets as the main source of the global saving glut. The International Monetary Fund (IMF) (2005) also stresses low investment rates following the Asian crisis rather than an increase in saving.
 8. For ease of exposition, the figures show only the connections above a certain valued threshold. Hence, the graphical representation of small countries in particular is not entirely accurate, as connections smaller than the adopted thresholds are not shown. The results are qualitatively similar if these connections are reported.
 9. The analyses of global networks based on bilateral connections use data on trade, portfolio investments, FDI, and (syndicated) bank loans. The trade data are from the IMF's Direction of Trade Statistics (DOTS), covering the period 1980–2012. The portfolio investments data are from the IMF's Coordinated Portfolio Investment Surveys (CPIS), which provide data on the stock of portfolio assets between 2001 and 2011. For FDI, firm-level transaction data on M&A from Thomson Reuters' SDC Platinum cover the period 1991–2012, and (announced) firm-level greenfield investments from the *Financial Times*' FDi Markets cover the period 2003–12. For syndicated loans, the Thomson Reuters' SDC Platinum transaction-level data on syndicated loans is used for the period 1996–2012, covering more than 150 source and recipient countries. All firm-level transaction data are aggregated at the bilateral country level. Chapter 4 provides additional details on these data.
 10. The total number of possible South-South connections is defined as the number of active connections that would exist if each country of the South country were connected to every other country of the South country in the world.

11. The rise of a diverse set of South economies with relatively large pools of relatively low-wage workers, abundant raw materials, sizable domestic markets, and/or highly capable export-oriented manufacturers is tightly connected to changes in the dynamics of production and demand in the global economy. The development of GVCs is thus arguably linked to the rise of the South. Nonetheless, the specific roles South countries play in individual GVCs vary according to their degree of openness to trade and foreign investment, infrastructure and logistics capabilities, and other strategic considerations. Chapter 2 analyses the development of GVCs. See also Gereffi and Luo (2014) and OECD (2013).
12. GVCs have expanded to a wide range of industries—from manufacturing to services—covering not only final goods but also components, subassemblies, research and development (R&D), and innovation. See, for example, Gereffi (2014), Baldwin and Venables (2013), and UNCTAD (2011).
13. Sturgeon and Van Biesebroeck (2010) argue that on the production side of the automobile industry, the dominant trend has been of regional integration, a pattern that has been intensifying since the mid-1980s. In North America, South America, Europe, Southern Africa, and Asia, the production of parts tends to take place regionally to feed final assembly plants that produce largely for regional markets. See also Johnson and Noguera (2012b).
14. The analysis of the foreign content of exports captures mostly “backward supply chains.” It does not capture “forward supply chains” in which countries export parts that are integrated into other countries exports of final goods. The analysis of these forward linkages reveals that these patterns of regional clustering are also present if one considers the destination of value added supplied to other countries’ exports (these unreported results are available upon request). See chapter 2 for a more detailed analysis of GVCs.
15. Chapter 2 provides a more detailed analysis of the nature of LAC’s integration into GVCs with North and South countries.
16. For a detailed analysis of the role of individual countries in GVCs around the world, see Baldwin and Lopez-Gonzalez (2013). For empirical analyses of the value added content of trade, see Hummels, Ishii, and Yi (2001); Koopman, Wang, and Wei (2008); Trefler

and Zhu (2010); and Johnson and Noguera (2012a), among others.

17. See Hanson (2012) for a discussion of the empirical determinants of export specialization and why South-South trade looks so different from North-North trade.

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The Structure of Trade Linkages and Economic Growth

2

This chapter examines the extent to which the trade connections of countries in Latin America and the Caribbean (LAC)—particularly connections with other South countries—can lead to a virtuous cycle of thriving trade and economic growth. It briefly overviews the literature that shows that the nature of trade connections may play an important role in the trade-growth nexus, especially through technological diffusion and learning spillovers. This finding is particularly important for countries in the region as the connections LAC has forged with other South countries over the past decade are different from its connections with North countries. The chapter presents new evidence on the importance of the nature of LAC’s trade connections for economic growth. Although the implications vary widely across countries, the analysis indicates that the structure and quality of trade baskets merits attention. The extent to and manner in which countries participate in global value chains (GVCs) also affect the dynamics of trade and growth. In this regard, LAC countries seem to lag other South economies, especially East Asia. The composition of trading partners, especially connections with countries that are central to the global trade network, also appears to matter for growth. The evidence presented suggests that growth effects associated with trade openness are related to strong ties with countries that are more exposed to the frontiers of ideas and technologies. Other factors that may be reducing the growth potential of LAC’s trade connections include the quality of the region’s transport networks and its trade agreements.

Latin America and the Caribbean (LAC) is an increasingly globalized region. Its economic future depends a great deal on the quality of its external connections.

LAC countries have broadened and deepened their trade connections with other South countries (see Set of Facts 2 in chapter 1). The nature of LAC’s connections with other South countries differ from its connections

with North countries in many ways, from the sectoral composition of its export baskets (see Set of Facts 3 in chapter 1) to the degree of intraindustry trade (IIT) and the intensity of factors embedded in exports. LAC countries also differ from other South countries in their trade integration patterns. The region has its own peculiarities, which are highlighted throughout this chapter.

More broadly, the chapter explores the implications for LAC's economic development of the rise of the South and the changing nature of its cross-border linkages. The key question it addresses is whether such changes are evolving toward higher-quality connections. Do the linkages arising go beyond the generation of static efficiency gains (such as gains associated with comparative advantages)? Are they more likely to deliver dynamic gains, particularly through learning spillovers and technology diffusion, thereby further boosting the long-run growth of per capita income?

This chapter reports some new empirical regularities that suggest that the structure of trade connections affects the trade-growth nexus. This evidence indicates that on average, after controlling for the overall volume of trade flows, the degree of IIT and the factor intensity embedded in traded goods affect the dynamics of trade and growth linkages. There is wide variation in how these factors operate in individual countries in LAC. Many of their effects on economic growth are nonlinear and depend on countries' level of trade openness and labor force education. Nonetheless, a conclusion that emerges consistently from the empirical analysis is that the structure and quality of trade connections merit attention. The key issue for LAC is thus to understand how countries can develop trade linkages in ways that more effectively foster learning spillovers and technology diffusion in particular and economic development more broadly.

The extent of and manner in which countries participate in global value chains (GVCs) also affect trade and growth linkages. The development of GVCs—that is, the dispersion of production stages and processes across countries—has been an important pillar of the global economy since the late 1980s. Production in these chains comprises economic activities of all levels, from small-scale, household-based work to high-skilled, technology-intensive, and knowledge-intensive work. An important issue is thus the extent to which participation

in these GVCs facilitates economic upgrading—for instance, the movement of firms or more generally countries toward activities that require more skilled work or processes that make use of more advanced technologies. The novel evidence presented in this chapter suggests that participation in GVCs does not automatically translate into additional gains from trade beyond the gains associated with increased export volumes: location within GVCs matters in this regard. Being part of GVCs, especially in its middle segments, is associated with higher per capita income growth rates. The composition of trading partners in these production chains also seems to play an important role.

LAC seems to have just boarded this new train on the global economic landscape, at least compared with some economies in other regions, including East Asia. Countries in South America and the Caribbean typically have a greater forward participation in GVCs; that is, they tend to join GVCs at their initial stages, by supplying inputs to other countries. In contrast, Mexico and Central American economies have more backward participation rates, as they tend to be at the end of GVCs: the share of foreign inputs used in their exports is much higher than the share of their exports used in other countries' exports. This pattern partly reflects the exports of their goods to the United States for final consumption rather than further transformation. Countries in the region do not seem to be as well integrated into GVCs as other South economies, although there has been an increase in their participation since the 1990s.

This chapter also provides some evidence that the role of trading partners in the global trade network matters. For sufficiently integrated countries, an increase in trade linkages with countries at the center of the global trade network is typically accompanied by strong growth effects. In addition, there seems to be some form of complementarity between trade openness and the share of trade with these countries. The results also indicate that countries need educated enough labor forces to be able to benefit most from

trading with central countries, suggesting that human capital development is important for the absorption of foreign technology and knowledge. These findings are consistent with the idea that the growth effects associated with trade openness are not related simply to the development of strong trade ties with a single country, but instead to the establishment of strong ties with countries that are more exposed to the frontiers of ideas and technologies.

The chapter identifies a set of frictions that are particularly important for LAC countries and that could act as trade barriers, thereby affecting the dynamics between trade integration and economic growth. The quality of transport networks is arguably one such barrier. On average, LAC seems to underperform not only North countries but also some other South countries on a range of indicators capturing accessibility to and the quality of transport networks. There is also some evidence suggesting that the region is not spending sufficiently or effectively on infrastructure.

The quality of trade policies can also hamper economic ties. Evaluation of a wide range of trade agreements suggests that progress has been made in reducing overall trade and regulatory barriers between LAC and other South countries. Coverage of goods and services is generally good, although more needs to be done to reduce residual barriers and intensify integration with South countries. Much less progress has been made on more difficult regulatory issues, such as investment, intellectual property rights, and competition.

Overall, the empirical evidence is mixed: it is not clear that LAC trade connections are evolving toward higher quality, which could boost the long-run growth of per capita income. Increased trade linkages with South countries have been a mixed bag for countries in LAC. Although the structure and quality of trade connections improved in many aspects, there is great variation within the region. For example, in some South American countries, such as Colombia and Peru, the new connections with South countries

led to an increase in the level of IIT, and the share of skilled labor-intensive goods in the trade basket rose. Yet, these countries have the lowest participation rates in GVCs among LAC countries, and most of their GVC linkages are forward linkages, suggesting insertion in the initial stages of GVCs (supplying other countries with inputs). In contrast, Mexico is one of the most integrated countries in the region, but it has developed production chains mainly with North countries (the United States in particular); its placement is at the end of these chains, as indicated by its strong backward participation rate. Mexico has increased its trade connections with South countries, but these connections are characterized by a lower degree of IIT and a smaller share of skill-intensive goods than its connections with North countries.

Several factors affect the opportunities and challenges associated with trade relations. One is the ability of policy makers to craft effective policies. This ability depends in part on their sector-specific knowledge, which affects how well they understand the potential constraints firms face. Another is the presence of market failures—from the provision of infrastructure to the accumulation of human capital, the creation and management of ideas, and the resolution of coordination failures within existing industries—suggesting an important role for policies. The evidence in this chapter is also suggestive of positive externalities from the way countries integrate into the global economy. All of these factors suggest that the active engagement of policymakers may be called for.

Trade and economic growth

Trade integration has advantages and disadvantages. Whether the net effects are positive or negative depends on many factors, such as initial conditions, structural features (including geography and natural endowments), and policy frameworks, as well as the interactions and interdependencies among these factors and the evolving nature of globalization.

The key is to distinguish the more beneficial forms of integration and identify the conditions under which the upsides of globalization can be seized and maximized and the downsides minimized or avoided.

Laying out the basic theoretical arguments on the channels through which trade integration may affect economic growth can help in organizing and interpreting the evidence presented in this chapter.¹ Trade integration affects economic growth through four channels: larger markets, competition, technology diffusion and learning spillovers, and volatility. Accessibility to larger markets can enable classical efficiency gains from trade through specialization (which can involve some reallocation of production as well as labor) in line with comparative advantages and relative endowments. It can also facilitate the development of scale economies and Marshallian-type positive externalities that may be unavailable within small local markets. In addition, international trade can facilitate access for both producers and consumers to goods that are cheaper, of higher quality, and of greater variety.² For producers trade provides access to better-functioning input markets. These effects imply that as countries integrate into global markets, they can trade larger quantities of each good (the intensive margin), a wider set of goods (the extensive margin), and/or higher-quality goods.³

Access to larger markets may also be associated with increased competition. Industrial organization models predict a negative effect of increasing competition on innovation and growth to the extent that it reduces the monopoly rents that reward successful innovators. Because reaping adequate returns for one's innovation requires some form of temporary monopoly power, weak competition can entice producers to innovate (Schumpeter 1942). Tougher competition can also be associated with positive growth effects. For instance, greater trade integration can deepen and widen the monopoly-busting, efficiency-enhancing effects of competition. Increased competition from abroad can also enhance resource allocation by improving

the signal to noise ratio in relative prices and increasing the incentives for firms to continuously optimize production, management, and marketing practices, in order to avoid falling behind their competitors, remain profitable, and keep or expand market share. Competition can also stimulate quality upgrading.⁴ In addition, contestability stemming from foreign competitors may spur innovation by local firms, especially if these firms are not too far from the technological frontier.⁵ Changes in competitive forces associated with increased trade integration can also alter product markups and markup distortions, with consequent growth effects. For example, increased competition can lead to losses in market power for individual firms, thereby leading to reductions in markups and markup dispersion. This effect in turn could lead to a decline in productivity losses as a result of misallocation.⁶ A key question is, then, whether the benefits of tougher competition from abroad can be achieved while mitigating its negative effects (see Aghion and Griffith 2008).

Integration into global markets can greatly accelerate technological progress, a key driver of long-run growth. Technology diffusion and learning spillovers in particular can foster technological progress. These effects can take place through imports, especially of intermediate goods, which can embed technologies that may be unavailable in the importing countries. Use of these goods can reduce the costs of product development and lead to the production of new products.⁷

Knowledge spillovers are also possible. For instance, when imports of advanced equipment are put to use in production processes, the importer can benefit from various forms of support, training, and advice provided by the supplier. Learning can also occur through exporting, not least through the upgrading needed to meet international product quality standards and certification requirements. Exporters may gain access to new technology, and they can learn a great deal from feedback from global buyers, including on how to innovate and improve production

processes and managerial practices to better satisfy demand niches, consistently attain high quality, and more ably adapt to changing circumstances.⁸ Of course, in practice the extent of technology diffusion and learning spillovers varies greatly, depending on the nature of a country's trade linkages, as discussed below.

Greater integration into global markets implies more exposure to external shocks (especially price shocks, such as terms of trade shocks), which in turn can increase macroeconomic uncertainty and volatility. Conventional wisdom indicates that there is a negative relationship between volatility and growth (for theoretical analyses, see Caballero and Hammour 1994 and Aghion and Saint-Paul 1998. For some empirical evidence, see Ramey and Ramey 1995 and Servén 2003). Even if macroeconomic volatility does not directly affect economic growth, it entails direct welfare costs, which can be particularly large in South economies (see, for example, Loayza and others 2007 and references therein). At the other extreme, participation in global markets through trade can help dampen volatility generated by domestic shocks. For instance, greater trade integration can attenuate shocks in domestic markets for agricultural products, such as shocks associated with local climate conditions. The impact of increased trade integration on output volatility depends on various factors, related but not restricted to the composition of these flows, patterns of specialization, the degree of concentration, the degree of financial development, and the sources of shocks.⁹

Whether and how trade leads to growth is thus an empirical issue. A large body of literature discusses the empirical evidence on the role of trade in fostering economic development and growth. In a seminal article, based on 1985 data, Frankel and Romer (1999) show that cross-border trade, instrumented with countries' geographic characteristics, has a quantitatively large and robust positive effect on income. Many researchers have questioned these findings. For example, Rodríguez and Rodrik (2001) argue that the

geography-based instrument used is likely to be correlated with other geographic variables that affect income through nontrade channels. Acemoglu, Johnson, and Robinson (2001) note that these geographic instruments are closely correlated with countries' experiences during colonial times, which in turn help explain international differences in governance and institutions. Although the debate persists, many papers, including the most recent ones, find a causal effect from trade to income levels and growth.¹⁰

The rest of this chapter sheds light on this debate by going deeper into the global trends highlighted in chapter 1. In particular, it explores the implications for the economic development of LAC that the changing nature of its cross-border linkages entails. The key question is whether such changes are evolving in a direction of higher-quality connections—that is, do the linkages arising go beyond the generation of static efficiency gains (such as those associated with comparative advantages)? Are they more likely to deliver dynamic gains, particularly through learning spillovers and technology diffusion, thereby providing a further boost to the long-run growth of per capita income? A benchmark regression specification allow us to revisit the literature on trade and growth. Per Didier and Pinat (2015), a country's growth rate is assumed to be a linear function of the degree of its trade openness (captured by the value of its trade flows) and the level of its human capital. This benchmark specification controls for conditional convergence effects—that is, more developed countries typically grow less than less developed ones. Also included in the estimations is a set of control variables that capture not only their potential effect on growth rates but also whether they can affect the relation between trade openness and growth. In particular, the control variables considered are proxies for the development of public infrastructure and for relative price stability and exchange rate fluctuations. Box 2.1 provides additional details on the methodology employed and the sample analyzed here.

BOX 2.1 Methodology of trade and growth regression estimations

Drawing on Didier and Pinat (2015), the main question this chapter addresses is whether and how the structural features of countries' trade connections affect economic growth. The chapter explores the role of the nature of trade in different goods and with different partners. Equation B2.1.1 is the benchmark regression specification:

$$y_{c,t} - y_{c,t-1} = \beta_0 y_{c,t-1} + \beta_1 CV_{c,t} + \beta_2 TO_{c,t} + \beta_3 HK_{c,t} + \mu_t + \eta_c + \epsilon_{c,t} \quad (\text{B2.1.1})$$

where $y_{c,t}$ is gross domestic product per capita for country c at time t ; $TO_{c,t}$ is trade openness; $HK_{c,t}$ is human capital; $CV_{c,t}$ are control variables; μ_t are (unobserved) time-specific effects; η_c are (unobserved) country-specific effects; and $\epsilon_{c,t}$ is the error term.

All of the regressions presented in this chapter expand on this benchmark specification by including a set of proxies for the features of trade characteristics in order to infer whether they are associated with additional growth effects. Equation B2.1.2 is the expanded regression specification:

$$y_{c,t} - y_{c,t-1} = \beta_0 y_{c,t-1} + \beta_1 CV_{c,t} + \beta_2 TO_{c,t} + \beta_3 HK_{c,t} + \beta_4 TC_{c,t} + \mu_t + \eta_c + \epsilon_{c,t} \quad (\text{B2.1.2})$$

where $TC_{c,t}$ represent proxies for the features of trade connections (in terms of both partners and products).

To capture potential nonlinearities in the effects of trade openness on growth, this specification is further expanded by adding terms capturing the interaction between trade openness and, in turn, the different proxies for the nature of trade relations. Equation B2.1.3a displays this extended regression specification:

$$y_{c,t} - y_{c,t-1} = \beta_0 y_{c,t-1} + \beta_1 CV_{c,t} + \beta_2 TO_{c,t} + \beta_3 HK_{c,t} + \beta_4 TC_{c,t} + \beta_5 TO_{c,t} TC_{c,t} + \beta_6 (TO_{c,t} TC_{c,t})^2 + \mu_t + \eta_c + \epsilon_{c,t} \quad (\text{B2.1.3a})$$

where $TO_{c,t} TC_{c,t}$ represents the interactions between trade openness and the nature of trade connections (in terms of both partners and products) at country c time t .

Potential nonlinearities between the proxy for human capital and the features of trade connections is also considered. The idea is that the effects of human capital on growth could vary with the nature of trade relations. For example, to the extent that certain features of trade connections are associated with greater technology diffusion and learning spillover, their effects on growth depend on the development of human capital. Equation B2.1.3b provides this alternative specification:

$$y_{c,t} - y_{c,t-1} = \beta_0 y_{c,t-1} + \beta_1 CV_{c,t} + \beta_2 TO_{c,t} + \beta_3 HK_{c,t} + \beta_4 TC_{c,t} + \beta_5 HK_{c,t} TC_{c,t} + \beta_6 (HK_{c,t} TC_{c,t})^2 + \mu_t + \eta_c + \epsilon_{c,t} \quad (\text{B2.1.3b})$$

where $HK_{c,t} TC_{c,t}$ represents the interaction between the level of human capital and the nature of trade connections (in terms of both partners and products) at country c time t .

Equations B2.1.3a and B2.1.3b are used to estimate the total growth effects of changes in the structural features of trade relations that are shown in the figures throughout this chapter. This methodology does not identify the mechanisms through which trade structure affects growth, but it provides suggestive empirical evidence on the extent to which externalities such as those associated with technology diffusion and learning spillovers matter.

These trade-growth regressions pose several challenges for estimation. A number of empirical papers in the growth literature adopt the system generalized method of moments (S-GMM) procedure developed in Arellano and Bover (1995) and Blundell and Bond (1998) to overcome the endogeneity issue. Dollar and Kraay (2004); Loayza and Fajnzylber (2005); and Chang, Kaltani, and Loayza (2009), for example, use this methodology to estimate trade-growth regressions. Beck and Levine (2004); Beck, Levine, and Loayza (2000); and Rajan and Subramanian (2008) use it in the finance-growth literature.

The S-GMM procedure estimates a system of equations that combines the regression specification

(continued)

BOX 2.1 Methodology of trade and growth regression estimations (continued)

in levels, as described above, and the same specification in differences. This method deals with both the unobserved country-specific effects in this dynamic setup and the potential biases arising from the endogeneity of explanatory variables. Differencing the regressions controls for the unobserved country-specific effects, but it creates the additional problem that the error term of the differentiated equation is correlated with the lagged dependent variable. Taking advantage of the panel structure of the dataset, the S-GMM procedure uses so-called internal instruments to address this issue as well as the potential endogeneity of the explanatory variables. More specifically, for the equation in levels, the instruments are given by the lagged differences of the explanatory variables, whereas for the equation in differences, the instruments are lagged observations of both the explanatory and the dependent variables.

The set of instruments grows with the number of explanatory variables and time periods. As the time dimension of the sample size is limited, only a restricted set of moment conditions is used in order to avoid overfitting bias. More specifically, only the first appropriate lag of each time-varying explanatory variable is used as an internal instrument. For the variables measured as period averages, the instruments correspond to their average in period $t - 2$; for the variables measured as initial values within a given period, the instruments correspond to their observation at the start of period $t - 1$. As a consequence, in the estimations of equations B2.1.2 and B2.1.3a and b, the proxies for the nature of trade connections are interacted one at a time in order to simplify the interpretation of the results and to avoid overextending the number of required instruments (and hence the number of estimated parameters). Even with this restricted set of instruments, there are specifications in which the actual number of instruments is close to or even larger than the number of countries in the sample. In these cases, a restricted sample of control variables is used to reduce the number of explanatory variables.

The S-GMM procedure relies on four key assumptions: (a) the error terms are not serially correlated, (b) shocks to growth are not predictable based on past values of the explanatory variables, (c) the explanatory variables are uncorrelated with future realizations of the error term, and (d) the correlation between the explanatory variables and the country-specific effects is constant over time. Notwithstanding these assumptions, the method allows current and future values of the explanatory variables to be affected by growth shocks—it is exactly this type of endogeneity that the method is designed to handle. In addition, the consistency of the S-GMM estimates of the parameters of interest and their asymptotic variance-covariance matrix depend on whether lagged values of the explanatory variables are valid instruments in the growth regression.

Three specification tests are used to evaluate these potential issues: (a) the “full Hansen” test of overidentifying restrictions on the full set of instruments (which tests the validity of the instruments by analyzing the sample analog of the moment conditions used in the estimation process), (b) the “incremental Hansen” test of overidentifying restriction on the additional instruments that are introduced in the levels equations (which tests the stationarity assumption on which these instruments are based), and (c) a second-order serial correlation test (which tests whether the error term is serially correlated). The results of the Hansen and serial correlation tests (not reported) indicate that the null hypothesis of correct model specification cannot be rejected, lending support to the estimation results shown in this chapter.

This two-step S-GMM procedure is adopted throughout this chapter to estimate the trade-growth relations for an unbalanced panel dataset covering 118 countries, including 24 in LAC. For each country, the dataset comprised at most 10 observations of nonoverlapping five-year panels spanning 1960–2010. Annex table 2A.1 provides details on data used for each variable included in these estimations. (All the estimated regressions use variables represented in logs.)

This benchmark regression specification, shown in the first column of table 2.1, yields estimates comparable to the estimates in the empirical literature relying on the cross-country variation of within-country changes. Trade openness is positive and statistically significant, indicating its positive impact on average economic growth. Initial

gross domestic product (GDP) per capita has a negative and statistically significant coefficient, which is typically interpreted as evidence in favor of conditional convergence. The coefficient associated with the degree of human capital development is not statistically significant in this specification, though it is typically positive and

significant in other specifications.¹¹ The estimated coefficients on the control variables are also statistically significant and with the expected sign: public infrastructure is positively associated with per capita

income growth, and the terms of trade are negatively associated with growth, a result that captures the adverse effects of relative price and exchange rate instability on growth outcomes.

TABLE 2.1 Regression results on the effect of the nature of traded goods on economic growth

	Dependent variable: Growth rate of real GDP per capita				
	(1)	(2)	(3)	(4)	(5)
Initial GDP per capita	-2.318*** [0.174]	-2.888*** [0.062]	-2.620*** [0.139]	-0.422*** [0.081]	0.068 [0.074]
Labor force education	-0.035 [0.204]	0.240** [0.106]	0.077 [0.128]	0.898*** [0.048]	1.014*** [0.158]
Terms of trade	-0.941*** [0.164]	-1.404*** [0.071]	-0.937*** [0.154]		
Public infrastructure	2.036*** [0.151]	2.160*** [0.044]	1.701*** [0.097]		
Trade openness	1.571*** [0.234]		1.390*** [0.129]	0.515*** [0.133]	1.133*** [0.119]
Trade linkages with North countries		1.670*** [0.073]			
Trade linkages with South countries		0.228*** [0.079]			
Intraindustry trade (IIT)			7.841*** [0.707]		
<i>Share of trade in:</i>					
Primary products				5.572*** [0.784]	
Unskilled labor-intensive goods				12.756*** [0.807]	
High-tech-intensive goods				11.726*** [0.626]	
Skilled labor-intensive goods				26.141*** [1.076]	
<i>Participation in GVCs:</i>					
Participation in middle stages					1.301** [0.585]
Participation in initial stages					-5.440*** [0.514]
Number of observations	846	800	806	806	806
Number of countries	117	114	117	117	117

Source: Didier and Pinat 2015.

Note: This table reports the regressions of real GDP per capita growth on a number of indicators capturing the nature of products traded. See text and annex table 2A.1 for details on indicators used. In column (2), the Wald test on the difference of coefficients of the trade linkages with North and South countries is statistically significant. Robust standard errors are shown in brackets. All regressions include time dummies.

Significance level: * = 10 percent, ** = 5 percent, *** = 1 percent.

Not all trade connections are the same: trading with North countries seems to be associated with larger effects than trading with South countries (column 2 of table 2.1). LAC countries have broadened and deepened their connections with other South countries (as documented in Set of Facts 2 in chapter 1). The share of the South in total trade flows to and from LAC countries increased about 70 percent, from 26 to 45 percent, during the 2000s. These regressions seem to imply that these tighter connections to South countries may have negatively affected the trade-growth dynamics in LAC. Therefore, key questions are the extent to which the structural features of trade connections affect the trade-income nexus and whether there is a role for policy actions.

Differences in the nature of trade connections may play a key role in explaining the trade and growth dynamics; they may be one of the reasons why the debate on whether trade causes growth remains unsettled. The estimations presented above, like most of the regressions in the literature, capture whether the total value of trade flows matters for growth or if the imposed linear relation between trade and growth simply reflects an average effect.

The hypothesis of this chapter is that some features of cross-border trade linkages are more likely to foster the growth-enhancing effects of trade than others. To explore the issue, the analysis expands the benchmark regression specification to include a set of proxies for the features of trade characteristics in order to infer whether they are associated with additional growth effects and therefore alter the average effect estimated in the benchmark specification. The chapter explores two broad aspects of the structural features of trade connections—the nature of the products traded and the composition of trading partners.

The nature of traded goods

The sectoral composition of LAC's connections with other South countries is different from the composition of its connections with North countries (as highlighted in Set of

Facts 3 in chapter 1). The patterns of connections between LAC and other South countries suggest that trade flows during the 2000s were rooted in comparative advantage forces and endowments, especially when contrasted with the nature of its connections with North countries. For example, during 2003–11, the average share of natural resources in exports from LAC to the South (29 percent) was almost 50 percent larger than the share to the North (46 percent).

One strand of the literature has studied whether certain types of traded goods have greater growth-enhancing effects than others. For LAC the issue is whether greater reliance on traded primary goods has the same growth potential as greater reliance on trading other goods. The “natural resource curse” claim put forward by Sachs and Warner (1995, 1997) would suggest a negative answer to this question, based on empirical evidence that, on average, commodity-reliant countries grow more slowly than other countries.¹²

The debate over this issue has been heated. At its core is the idea that price mechanisms do not fully capture the benefits of trading a good when its production involves (Marshallian) externalities and rents. Externalities offer perhaps the strongest argument for the assertions that some goods are superior to others.¹³ These externalities can be either local (for example, if productivity increases with the overall size of the industry) or inter-industry (if production in one industry leads to spillovers in other industries). Hence market forces may not provide an economy with the appropriate set of incentives for the optimal allocation of resources.

Important for the discussion of trade-growth dynamics are the externalities intrinsically related to the technology diffusion and learning spillovers channel discussed above. The potential and intensity of these spillover effects may vary with the type of industry involved in international trade. In particular, some industries may offer greater potential for the upgrading of production to more differentiated, higher-quality, higher-value products or for the development of linkages within and across industries. It has long been recognized that industries with forward

and backward linkages tend to be good for growth. For example, Hausmann, Hwang, and Rodrik (2007); Hidalgo and others (2007); Hidalgo and Hausmann (2009); and Hausman and Hidalgo (2011) argue that countries specializing in products that can serve as “launching pads” for other products (or even industries) are likely to have better growth prospects. They liken the “product space” to a forest in which the distance between products depends on the similarity of their production capabilities. A short distance indicates that it is easier for firms to learn how to enter into proximate business activities and for technology to diffuse more rapidly to nearby products. The authors provide evidence that economies located in the denser parts of the forest are thus more likely to experience greater technology diffusion and learning spillovers—and consequently economic growth.¹⁴ Being located in a high-density segment of the product space could also result in greater export diversification, which in turn could reduce macroeconomic volatility.

Other researchers, such as Lederman and Maloney (2012), focus on how goods are produced rather than on what goods are produced. They argue that the literature offers little reliable evidence on the superiority of one type of good over another and hence gives little support to the selection of products or industries for special treatment. They note that the empirical evidence reveals an extraordinary heterogeneity of country experiences within product categories.¹⁵ Underlying the evidence is the notion that the same production process for a given traded good in two different firm and country setups may entail very different degrees of technology diffusion and learning spillovers. These differences may arise from identically classified goods being produced at very different levels of productivity, quality, and technological sophistication, as well as from the nature of trading relations, including the fact that in an evolving global production system, countries increasingly trade in tasks rather than in goods. The rest of this section, which draws on Didier and Pinat (2015), discusses the role of these two aspects for countries’ growth prospects.

Growth and the composition of traded goods

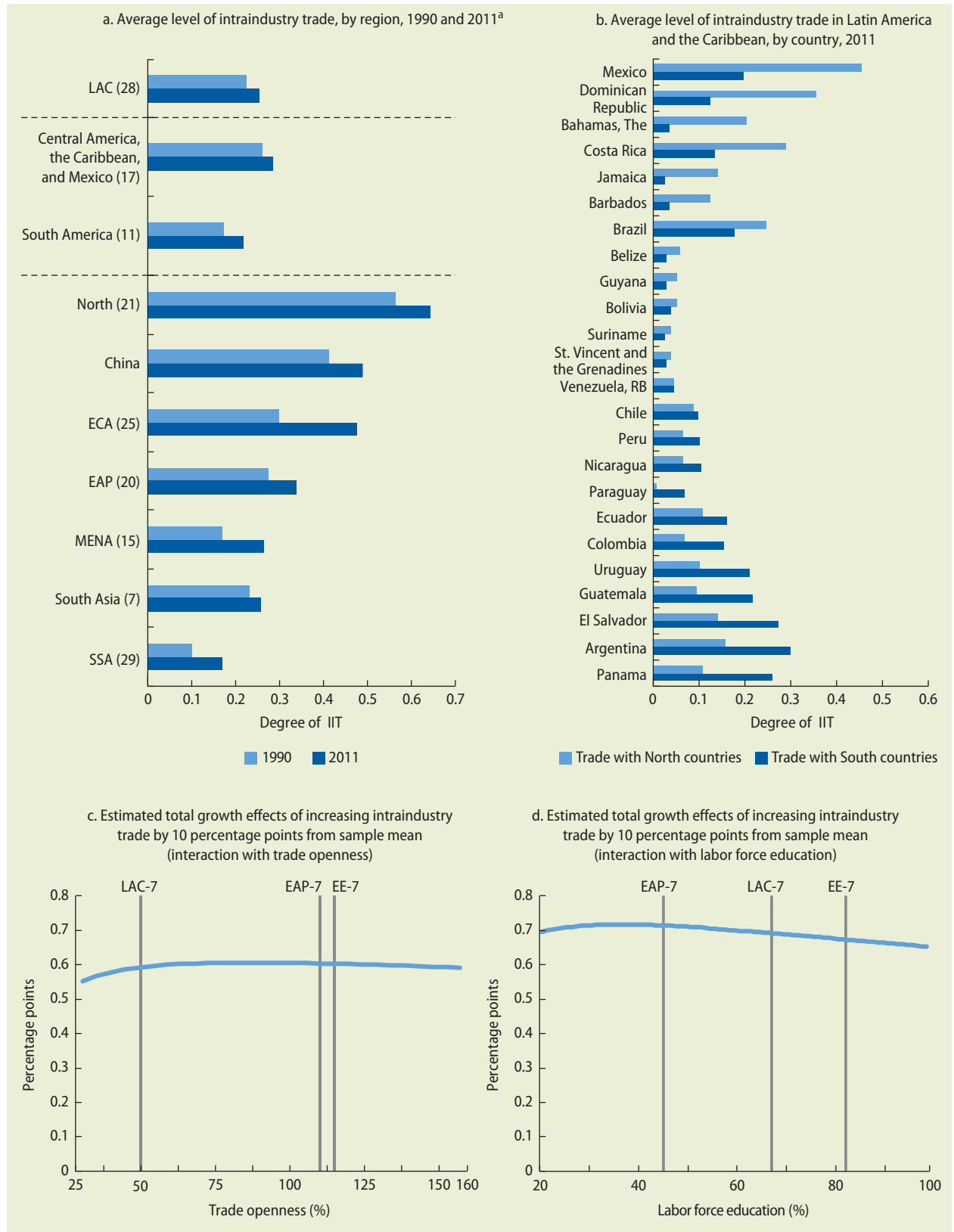
The first relevant trade characteristic is the degree of IIT, which ranges from 0 (pure interindustry trade) to 1 (pure intraindustry trade).¹⁶ LAC countries typically have lower levels of IIT than other emerging regions (figure 2.1, panel a). Although the share of IIT rose in most LAC countries between 1990 and 2011, the gap with other regions did not decline, except in Mexico. In 2011 the degree of IIT in LAC was about 0.25—far lower than the figures for the East Asian Tigers (Hong Kong SAR, China; Singapore; and Republic of Korea) (0.49), China (0.47), and Europe and Central Asia (ECA) (0.45). Within LAC, Caribbean and Central American countries show a higher average degree of IIT than South American countries.

The degree of IIT for LAC countries varies across trading partners (see figure 2.1, panel b). On average, it is slightly higher when LAC countries trade with North partners, though there is significant heterogeneity across countries. In Brazil, Costa Rica, and Mexico, for example, the level of IIT is much higher in their trade linkages with North countries, whereas in Argentina, Colombia, and Guatemala, trade with South countries has substantially higher levels of IIT.

A variety of arguments has been put forward suggesting that the degree of IIT is linked to differentiated growth outcomes and that differences in IIT with respect to North and South countries may have played a role in the dynamics of trade and growth in LAC. A high level of IIT within broadly defined industries indicates that the adoption, adaptation, and mastery of foreign technologies available through imported goods may be easier to the extent that they are directly applicable to a countries’ export basket. High IIT thus increases the probability that knowledge and technology gained from imports can be applied to exports.

Alvarez, Buera, and Lucas (2013) adopt a similar concept. They argue that improvements in technology can arise from interactions among firms that are brought together

FIGURE 2.1 Intraindustry trade



Sources: Calculations based on Comtrade data (panels a and b) and Didier and Pinat (2015) (panels c and d).

Note: Intraindustry trade (IIT) is measured by the Grubel-Lloyd index. See annex table 2A.1 for details on how this indicator was constructed. See Didier and Pinat (2015) for details on how the total growth effects were calculated. The North includes the Group of Seven (G-7) members and other Western Europe countries; the South includes all other economies. EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MENA = Middle East and North Africa; SSA = Sub-Saharan Africa. LAC-7: Argentina, Brazil, Chile, Colombia, Mexico, Peru, and República Bolivariana de Venezuela. EAP-7: Cambodia, China, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. EE-7: Bulgaria, the Czech Republic, Hungary, Lithuania, Poland, the Russian Federation, and Turkey. Other regions follow World Bank classifications.

a. Numbers in parentheses are number of countries in each region.

by the prospects of gains from trade and that get new ideas by adapting better technologies used in the production of other goods. In fact, other researchers highlight that the extent of IIT may be a direct proxy for technological diffusion and knowledge spillovers.¹⁷ The economies of scale associated with larger markets and the product differentiation that is possible with a higher level of IIT are thought to lead to more rapid productivity gains and hence faster growth.

The estimations reported in column 3 of table 2.1 show that for a given level of trade openness and human capital development, an increase in the level of IIT is associated with a positive and statistically significant impact on growth.¹⁸ The effect is sizable: a 10 percentage point increase in IIT from its sample mean is associated with an increase of about 0.6 percentage points in growth. Although an increase in IIT always has positive and large effects on growth in income per capita, the magnitude of this effect is nonlinear; the growth effects associated with greater IIT are smaller for very low (or very high) levels of trade openness and human capital development.

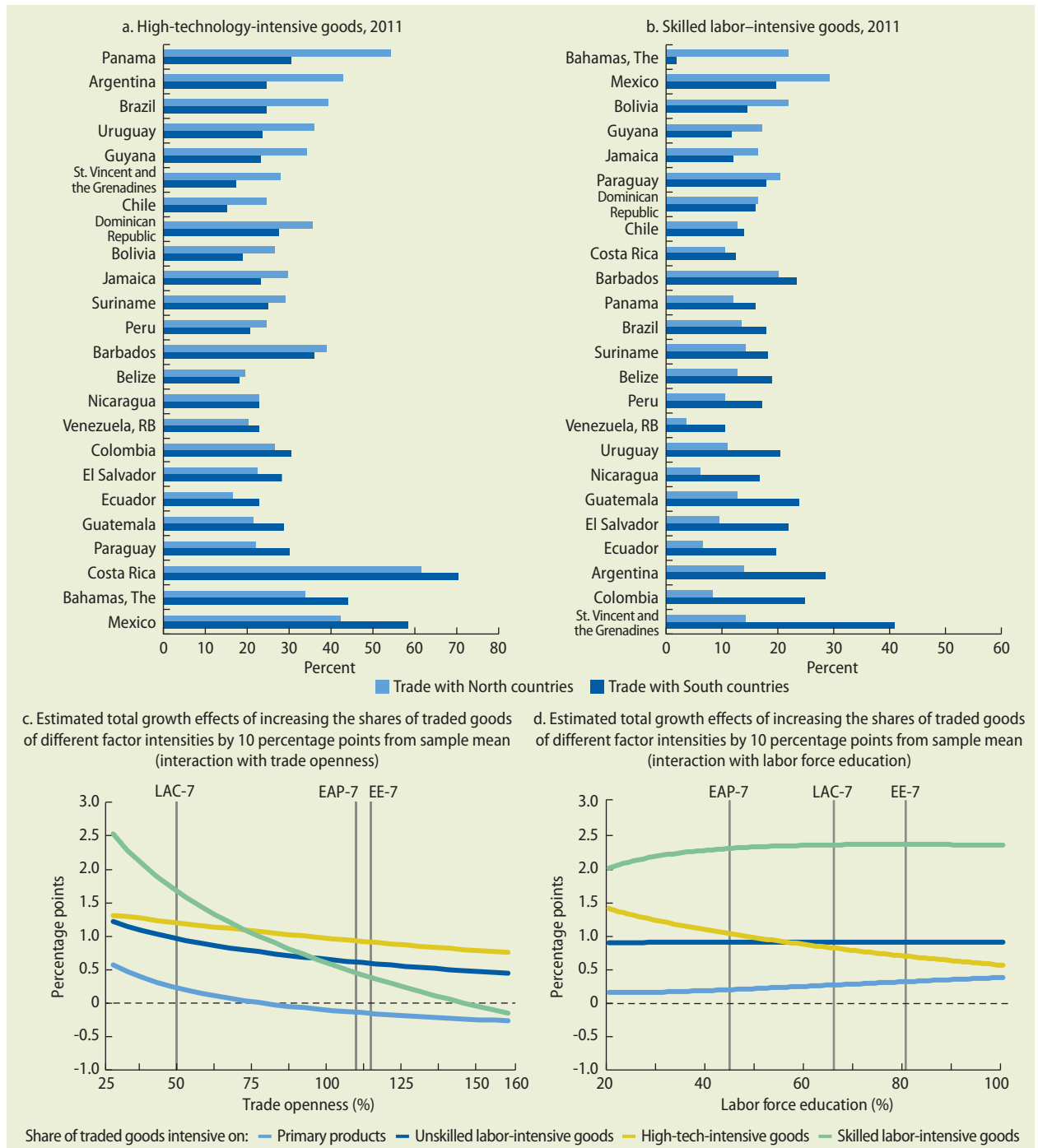
Figure 2.1 shows the total growth effects of a 10 percentage point increase in IIT from its sample mean as a function of trade openness (panel c) and labor force education (panel d). These effects are obtained in unreported estimations, presented in Didier and Pinat (2015), with interacted coefficients between trade openness and IIT and between the level of human capital development and IIT.¹⁹ In countries in which exports plus imports represent 50 percent or more of GDP, the growth effect is about 0.6 percentage points. For countries with secondary or tertiary enrollment rates of more than 20 percent, the growth effects can be as large as 0.7 percentage points. The effects of an increase in IIT can be sizable in LAC, where levels of IIT are typically relatively low, though they vary significantly across countries in the region. The effects could be particularly large for South American countries, which generally register the lowest levels of IIT in the

region, ranging from 0.9 to 1.1 percentage points; for Central America, the Caribbean, and Mexico, the increase in growth would average about 0.3 percentage points.

Another relevant characteristic related to the way goods are produced is factor intensity, such as the degree of technology and skilled and unskilled human capital embedded in traded goods. On average, the share of high-technology-intensive goods is larger in LAC countries' trade baskets with North countries than with South countries. This pattern is particularly evident in Argentina, Brazil, and Chile (figure 2.2, panel a). There are also differences in the patterns of trade of skilled labor-intensive goods. On average in LAC, the share of skilled labor-intensive goods is larger in trade with South countries than with North countries, especially in South America (see, for instance, Argentina and Colombia in figure 2.2, panel b). There is nonetheless great heterogeneity in the region. Mexico in particular stands as a notable exception to these patterns.

These differences may affect the likelihood that trade connections deliver dynamic gains, particularly through learning spillovers and technology diffusion, thereby changing the potential for the long-run growth of per capita income. More specifically, goods that require a larger share of skilled labor or high technology in their production processes may provide greater potential for upgrading and improvements. Moreover, their production may involve positive human capital externalities. Increasing the production of certain goods (such as goods intensive in high technology and skilled labor) may provide greater incentives for accumulating high-level human capital and thus be associated with greater growth effects. Exporting these goods may provide even greater incentives. For emerging economies, selling goods to consumers with higher incomes than domestic consumers—and thus potentially higher valuation of quality—may require quality upgrading, marketing, and other types of knowledge that skilled workers provide. Indeed, the empirical evidence indicates that exporting

FIGURE 2.2 Shares of traded goods of different factor intensities



Sources: Calculations based on Comtrade data (panels a and b) and Didier and Pinat (2015) (panels c and d); classifications of the goods intensity are from Hinloopen and van Marrewijk (2001) and Didier and Pinat (2015).
 Note: Figures report trade-weighted averages. See annex table 2A.1 for details on how this indicator was constructed. See Didier and Pinat (2015) for details on how the total growth effects were calculated. The North includes the G-7 members and other Western Europe countries; the South includes all other economies. LAC-7: Argentina, Brazil, Chile, Colombia, Mexico, Peru, and República Bolivariana de Venezuela. EAP-7: Cambodia, China, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. EE-7: Bulgaria, the Czech Republic, Hungary, Lithuania, Poland, the Russian Federation, and Turkey.

firms tend to hire more skilled labor and pay higher wages than firms that sell only to domestic consumers (Brambilla, Lederman, and Porto 2012).

The estimation in column 4 of table 2.1 indicates that the factor intensity embedded in traded goods affects the nature of trade-growth linkages. The coefficient on trade openness is positive and statistically significant, as are all the coefficients associated with the variables capturing the relative factor intensity of the traded basket. These results indicate additional growth effects relative to the omitted baseline category of the share of traded goods intensive in natural resources, although the magnitude of the growth effects varies. A larger share of skilled labor-intensive goods is typically associated with the largest growth effects. There are significant changes in the relative ranking of goods at different levels of trade openness and labor force education, suggesting that not all goods bring the same growth benefits to all economies.

Figure 2.2 shows the total growth effects for different categories of products of a 10 percentage-point increase in the shares of traded goods (from their sample means, accompanied by a decline of the same magnitude in the share of traded goods in natural resources). It shows how these effects vary with the level of trade openness (panel c) and human capital development (panel d) (these effects are in addition to the direct effects of trade openness and education on growth). An increase in the share of traded goods that are intensive in skilled labor yields the largest effects on economic growth for almost all levels of trade openness and labor force education. The second-largest growth effect is associated with an increase in the share of high-tech-intensive goods, especially as trade integration increases. In fact, for economies with trade openness of 75 percent or higher, the effects are even larger than the effects associated with skilled labor-intensive goods.

These changes in the relative ranking of different types of goods at different levels of trade openness and human capital development suggest that externalities may play

some role in the trade-growth dynamics and that not all goods are expected to bring the same benefits to all economies. This finding is particularly relevant for LAC, where there is great heterogeneity in the composition of the export basket across countries. On average, South American countries export a larger share of primary goods, and the countries of Central America and the Caribbean export more unskilled labor-intensive goods. In South America an increase of 10 percentage points in the share of skilled labor-intensive goods (and a similar decline in the share of natural resource-intensive goods) would be accompanied by an increase in income growth of about 0.9 percentage points on average. For Mexico, Central America, and the Caribbean countries, the effects may be even larger, about 1.1 percentage points. Increasing the share of high-tech-intensive goods would also be associated with different growth effects in different LAC countries, with South American countries benefitting most (enjoying increased growth of about 0.9 percentage points). The magnitude of these effects can be traced back to the relatively small shares of these goods in these countries' trade baskets, especially with South countries.

The literature provides inconclusive evidence on the superiority of one type of good over another and hence on the selection of products or industries for special treatment. What emerges consistently in empirical analyses is that the structure and quality of trade baskets merits special attention. The evidence in this section is also suggestive of positive externalities, such as those associated with technology diffusion and knowledge spillovers associated with the structure of trade relations. The key issue for LAC is thus to understand how countries can develop trade linkages in ways that more effectively foster learning spillovers and technology diffusion in particular and economic development more broadly. Because economically large growth effects appear to occur only when changes in the structure of trade dynamics are substantial, the development of a long-term policy agenda on trade and growth issues is critical.

Growth and insertion into global value chains

A complementary way of examining the scope for international trade-related growth effects, especially effects associated with technology diffusion and learning spillovers, is to focus on GVCs. The development of GVCs, which is characterized by the dispersion of production stages and processes across countries, is an important aspect of the changing patterns of economic globalization, what Baldwin (2006, 2012b) calls globalization's second unbundling. The technological revolution, especially in information technology, communications, and inventory management, facilitated development of these production chains. Moreover, large wage differentials across countries and declining trade costs made the geographical fragmentation of production profitable.²⁰ A large body of literature documents the importance of foreign direct investment (FDI) flows in forging these global production chains.²¹

The fragmentation of the production process means that individual countries no longer need to develop the full range of capabilities required to create a product or provide a service.²² They can contribute particular components of the final good, becoming specialized in “tasks” that contribute to the overall production process. As GVCs have gained in prominence, “trade in tasks,” where value is added along the production chain, has led to a significant increase in the value of global trade of intermediary goods (WTO and IDE-JETRO 2011). Indeed, as Grossman and Rossi-Hansberg (2008) note “It’s not wine for cloth anymore.” Individual products are no longer produced entirely in a single country; production chains are now spread out across many countries.

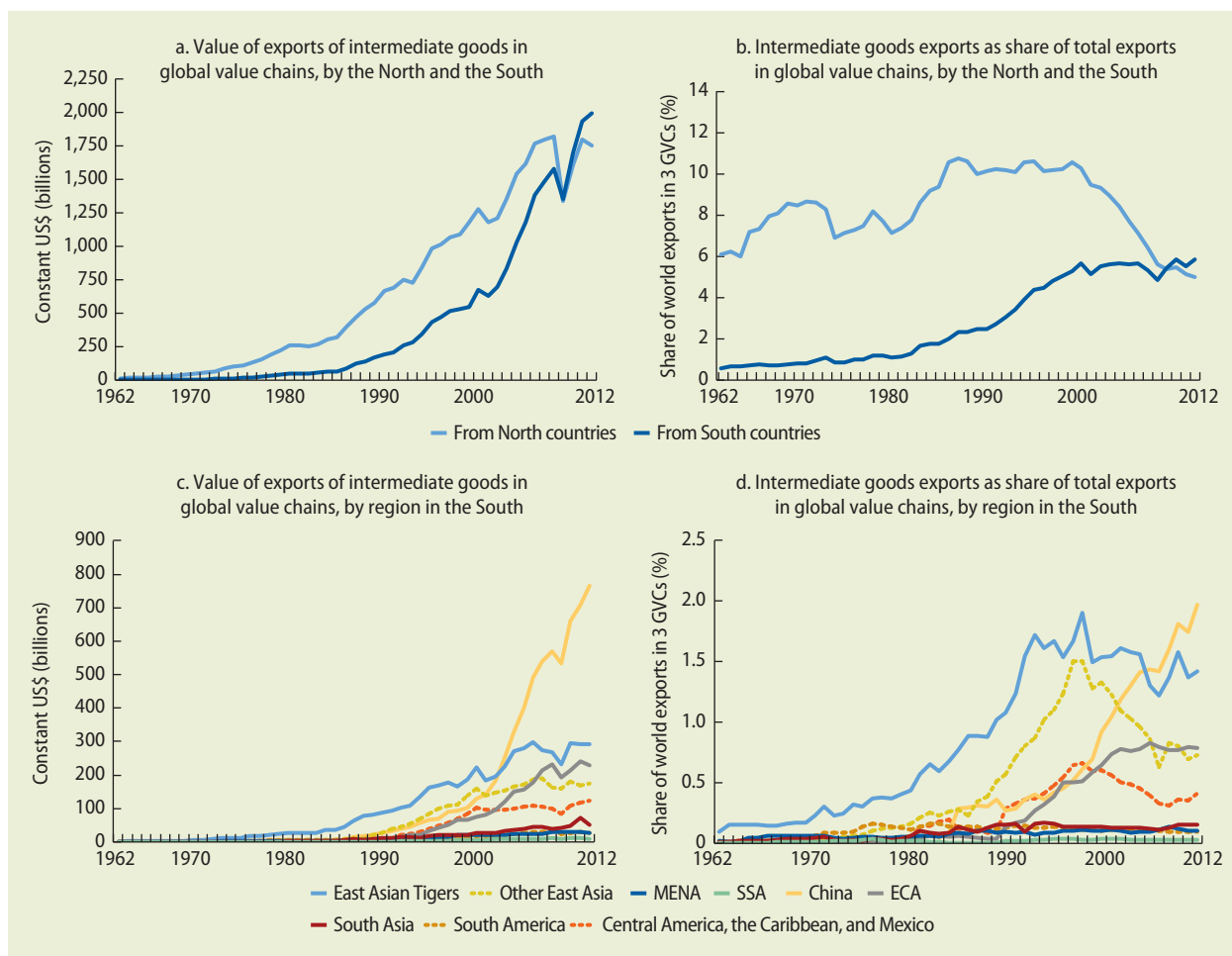
The development and establishment of GVCs as a pillar of the global economy and the consequent increase in trade in tasks that has been taking place since the 1980s are tightly linked to the rise of a diverse set of South countries.²³ Box 2.2 discusses the drivers of this dispersion of production stages (or tasks) away from the North toward the

South. Trade in intermediate goods is indicative of GVCs, as fragmented production processes require that parts and components cross borders, sometimes more than once, before finished goods are shipped to final markets. South countries have indeed shown a remarkable expansion in their exports of intermediate goods, especially when contrasted with the North.²⁴ The value of exports of intermediate goods from South countries now exceeds the value of intermediate goods exports from North countries (figure 2.3, panel a). Moreover, as a share of world exports, exports of intermediate goods have gradually expanded for South countries since the mid-1980s (see figure 2.3, panel b). This growth in intermediate goods trade as a share of world trade is noteworthy, especially as total world exports can increase for reasons other than increases in intermediate goods trade.²⁵

There is, however, great heterogeneity in the South’s participation in GVCs. While the value of intermediate goods trade expanded across all South regions, different trends emerge if the ratios of intermediate goods exports to total world exports are analyzed (see figure 2.3, panels c and d). Perhaps not surprisingly, China has displayed the most impressive growth in intermediate goods exports, both in dollar values and relative to world trade. Other East Asian economies, especially the East Asian Tigers, also expanded their exports of intermediate goods throughout most of the 1980s and 1990s. More recently, countries in ECA expanded their intermediate goods exports as a share of world exports. Within LAC, on average, Mexico and countries in Central America and the Caribbean export more intermediate goods than South American countries. Although the value of these exports in Central America, the Caribbean, and Mexico generally increased between 1990 and 2012, it remains small relative to East Asia and Eastern Europe.

The change in the production processes of apparel and footwear, automotive goods, and electronics is particularly striking (see Gereffi 2014 and references therein). In 1962 the

FIGURE 2.3 Growth of global value chains



Sources: Calculations based on data from Comtrade; classification of intermediate goods into three major global value chains (namely apparel and footwear, electronics, and automobiles and motorcycles) is from Sturgeon and Memevodic (2010).

Note: The North includes the G-7 members and other Western Europe countries; the South includes all other economies. ECA = Europe and Central Asia; MENA = Middle East and North Africa; SSA = Sub-Saharan Africa. East Asian Tigers: Hong Kong SAR, China; Singapore; and Republic of Korea. East Asia: Indonesia, Malaysia, Philippines, and Thailand. All other regions follow World Bank classifications.

North accounted for more than 80 percent of world exports of apparel and footwear and more than 90 percent of exports of electronics and automobiles (figure 2.4). Since then the North has steadily lost ground to South countries, accounting for only about half of exports in each market by 2012. Leading the expansion by South economies, China accounted for 16 percent of world exports of apparel and footwear and 24 percent of world exports of electronics in 2012. China did not entirely drive the shift in production from the North to the South, however; other South countries have been an integral part

of this process. In the automobile industry, for example, Brazil, India, Mexico, and the Republic of Korea are important exporters, having relied to varying degrees on FDI from lead firms in the North to jump-start their industries.²⁶ The East Asian economies are leading exporters of electronics. India, Indonesia, Pakistan, Turkey, and Vietnam occupy prominent positions in apparel and footwear.

The value added to goods at different stages of production has not shifted proportionally with the fragmentation of production across locations. Value added along the production chain has actually shifted away

BOX 2.2 What has driven the dispersion of production tasks away from the North toward the South?

Starting in the 1960s—and especially since the early 1990s—the combination of large actual and potential domestic market growth with a large surplus of low-cost, adequately skilled labor; capable manufacturers; and abundant raw materials in the largest countries in the South (such as Brazil, China, India, the Republic of Korea, Mexico, Turkey, and Vietnam) has led to waves of investment from the North.^a This investment has financed both flourishing domestic markets in the South and exports back to the North.^b Key for this renewed wave of investments was the decline in trade and investment barriers in the South. Many South countries underwent deep processes of trade and financial liberalization, with many countries unilaterally liberalizing tariffs (see, for example, Johnson and Noguera 2012 and Lopez-Gonzalez and Holmes 2011).

Perhaps surprisingly, the 2008 global crisis exacerbated these trends (Cattaneo, Gereffi, and Staritz 2010). The rapid growth of productive capabilities in China, India, and other large South economies led to a significant shift in global demand, from goods (both finished goods and intermediates) produced in the North to goods produced in the South. As demand in the North stagnated, the large South economies turned inward, redirecting production to their domestic markets and regional neighbors (Kaplinsky and Farooki 2010). Thanks to their large domestic markets, many South countries also became attractive for exporters in the North.

Another important factor behind the steady shift of production away from the North to the South has been the internationalization of firms from the South, which have sought global expansion through mergers and acquisitions of established global brands. The Chinese company Lenovo, for example, acquired IBM's personal computer division, in a deal that bought the company not only the brand but also a new

headquarters in the United States with a large R&D center in North Carolina; an advanced notebook computer development facility in Japan; three final assembly plants in China and one in India; regional distribution facilities in the Netherlands, Dubai, Florida, Australia, and India; and a large corporate planning, finance, and business process development group in Singapore. Similarly, India's Tata Motors acquired Jaguar and Land Rover in a deal that included production, design, and engineering facilities.

A few Latin American and Caribbean firms have also followed this path. In 2009, for example, the Mexican Group Bimbo acquired Weston Foods, the U.S. fresh bread and baked goods division of Canadian conglomerate George Weston. The acquisition encompassed a premium brand portfolio in bakery goods as well as 22 bakeries and more than 4,000 distribution routes.

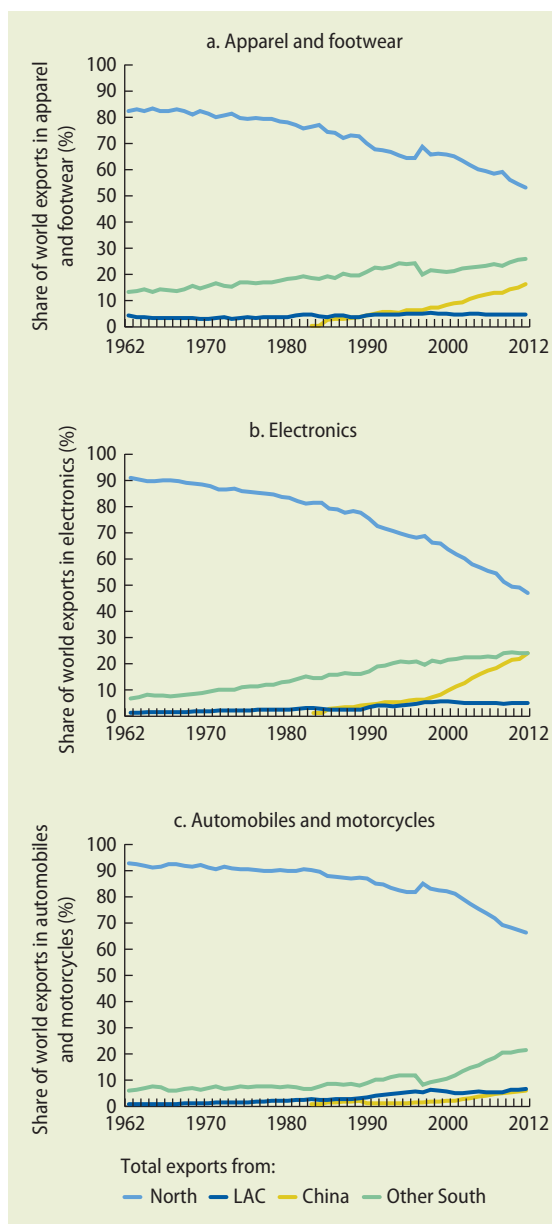
The explicit efforts of lead firms in global value chains (GVCs) to simplify their supply chains in order to deal with a smaller number of highly capable and strategically located suppliers is also part of the story behind the shift in production from the North to the South in the global economy. In fact, the trend toward specialization and fragmentation in GVCs is evolving as firms place more emphasis on strategic collaboration among companies within GVCs (Gereffi 2014). For instance, as both lead firms and suppliers gain market share, they become increasingly aware of the strategic vulnerabilities with respect to access to supplies of raw materials (Lynn 2005). Consumer goods firms such as Cadbury, Coca-Cola, and Unilever, for example, are expanding their direct involvement in the procurement and sustainability of the raw material sides of their production chains. Manufacturers of automobiles and electronic goods worry about the availability of raw materials such as lithium and coltan.

a. Krugman (1991) developed an important theoretical framework for understanding the dispersion of production tasks away from the North and toward the South. He argues that the location of industrial firms depends on both dispersion and agglomeration forces. Dispersion forces are related to actual costs, such as factor prices and potential production subsidies, as well as to gains from specialization, such as gains related to economies of scale and learning-by-doing. Agglomeration forces are related to separation costs; they include transmission and transportation costs, risks and managerial time, and knowledge spillovers. The dynamics of this trade-off between dispersion and agglomeration forces varies across firms/industries, leading to different locational outcomes for different firms/industries. See Baldwin and Venables (2013) for a theoretical analysis of this trade-off in GVCs.

b. See Sturgeon and Van Biesebroeck (2011); Morris, Staritz, and Barnes (2011); UNCTAD (2011); and Baldwin (2012a), among many others.

from offshore stages, especially stages associated with the manufacturing and assembly of products (Baldwin 2012a). In fact, the

discrepancy between where final goods are produced and exported and where value is created and captured seems to have grown.²⁷

FIGURE 2.4 The rise of the South in selected global value chains

Sources: Calculations based on data from Comtrade; classification of intermediate goods into three major global value chains is from Sturgeon and Memovodic (2010).

Note: The North includes the G-7 members and other Western Europe countries; other South includes all other economies except Latin America and the Caribbean (LAC) and China.

Apple's iPod illustrates the allocation of value added along the production chain. Of the \$299 retail price in the United States in 2005, U.S. firms and workers captured \$155, out

of which \$80 went to Apple for its invention and overall coordination of production and \$75 went to distribution and retail. In contrast, assembly in China added at most a few dollars to the product's value (Dedrick, Kraemer, and Linden 2010).

Overall, GVCs have created many opportunities for South countries. Participation in GVCs can be a synonym for accessibility to larger markets, which can enable the classical efficiency gains from trade through specialization. The potential for employment and export generation can be large. GVCs can facilitate the capturing of scale economies and positive externalities that may be unavailable within local markets. This benefit may be particularly important for smaller economies, which may be able to specialize in tasks in which they have comparative advantage rather than in goods that need to be fully developed and produced internally. The international division of labor (or tasks) in the production process can also lead to productivity increases that generate important welfare gains that can ultimately drive economic growth. These gains can arise through learning-by-doing effects, direct technology transfers, and increased efficiency and productivity as a result of international competition. Involvement in GVCs can also yield indirect benefits, by providing mechanisms for technology and knowledge spillovers in particular and capacity building and economic development more widely, thus having the potential to lead to virtuous circles.²⁸

While greater integration into GVCs implies greater complementarity of domestic and foreign productions, it also implies more exposure to external shocks through both forward and backward linkages. It leaves firms vulnerable to shocks in access to intermediate inputs and demand for their final output. In fact, GVCs have helped reshape the elasticity of international trade. The 2008 global crisis revealed a higher trade elasticity to external shocks through trade. These changes in elasticities at least partly reflect the so-called "bullwhip effect"—the fact that the farther away firms are from the

final customer, the more affected they are by shocks in final demand.²⁹ Greater exposure to external shocks may be associated with greater macroeconomic uncertainty and volatility—and hence lower economic growth.³⁰

In addition, not all of the benefits discussed above accrue automatically. Indeed, there are growing concerns that the economic gains of participating in global supply chains have not yielded the hoped for benefits. South economies in particular seem uneasy about working conditions, employment instability, extended reliance on low value-added activities, and technological dependence on foreign firms. Firms and entire industries within countries may be locked into segments of GVCs that do not require upgrading of human capital and are relatively unprofitable, greatly limiting the potential benefits of participation.

The extent to which the benefits of participation in GVCs materialize depends on the capabilities of local firms, the structure of individual GVCs, and the general policy framework in host countries.³¹ Production chains include economic activities of all levels, from small-scale household-based work to high-skilled, technology-intensive, and knowledge-intensive work. A key issue is thus whether participation in GVCs is inclusive or exclusive in terms of facilitating economic upgrading, especially of lower-level firms in the chain.³²

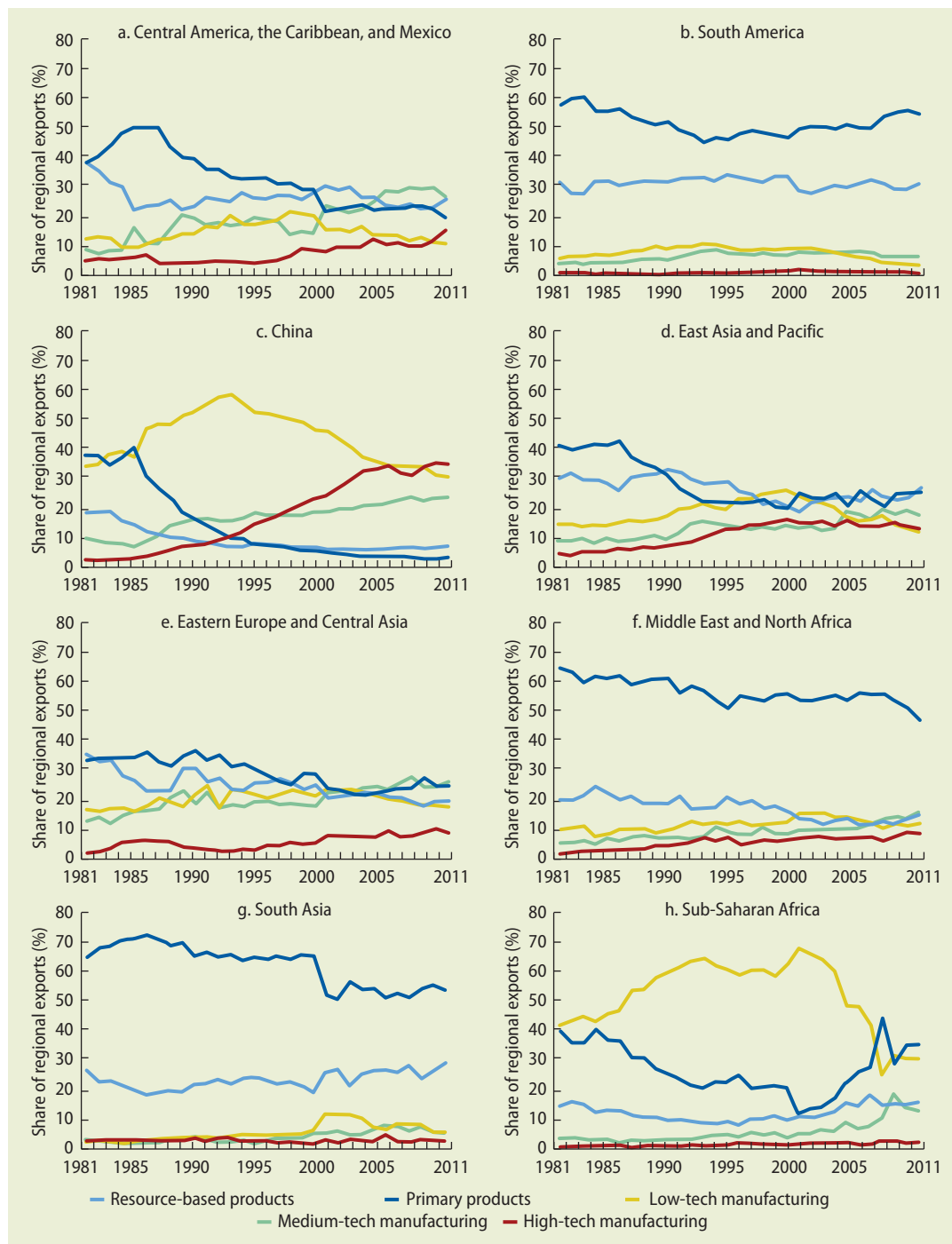
Not all firms in all South countries face the same opportunities and challenges associated with economic upgrading in GVCs. As the literature shows, the recent trend toward consolidating suppliers may have different effects on different firms depending on their capabilities to meet higher standards. Quality standards, one of the key mechanisms governing supply chains, can push out suppliers unable to comply, or they can trigger upgrading. Moving up the chain toward more formal and skill-intensive work means that the likelihood of enforceable standards probably rises. Meeting these higher standards is not just costly, it also requires a literate and competent labor force that may be beyond the reach of many small-scale enterprises.³³

Upgrading can occur in many ways. The standard form typically cited in the innovation literature is upgrading of products and processes of production. One way to assess this type of upgrading is to look at shifts in the technology content of countries' exports.

From the 1960s to the 1980s, countries in LAC typically exported primary products and resource-based manufactures (figure 2.5, panels a and b).³⁴ Beginning in the 1990s, significant changes took place in Central America, the Caribbean, and Mexico. By the late 2000s, a significant share of their exports were medium-technology manufactures (this share reached 30 percent in 2010). The share of high-technology manufactures also increased, from practically zero in the late 1960s to 15 percent in 2011. Over the same period, the share of low-technology manufactures, resource-based manufactures, and primary products declined significantly. These changes in the technology intensity of manufactures occurred largely since the late 1990s, during which time the export structure of these countries was transformed from one based on raw materials to one in which medium- and high-technology manufactures are more representative. In contrast, the export structure of South American countries remains concentrated in primary goods and resource-intensive manufactures; it changed little between the 1980s and the 2000s. If anything, South American countries increased the share of exported primary products during the 2000s. Similar patterns are observed in their connections with both North and South countries.

To put these trends in perspective, figure 2.5 shows the export structure of other South regions. A major shift in the export structure of the East Asian economies took place beginning in the late 1960s, when low-, medium-, and high-technology goods started to replace primary goods and raw material-intensive manufactures in their export baskets. Since the late 1990s, low-technology manufactures have given some ground to more technology-intensive ones. By 2011 medium- and high-technology-intensive goods accounted for almost 70 percent of

FIGURE 2.5 Technological composition of exports from the South, by region



Sources: Calculations based on Comtrade database; classification of the technological composition of exports is from Lall (2000).
 Note: See annex table 2A.1 for details on how the indicator on the share of traded goods with different technological intensities was constructed. Regions follow the World Bank classification.

the total exports of the East Asian Tigers and about 33 percent of the exports of other economies in East Asia and Pacific (EAP) region. A similar transition has taken place in China. Medium- and high-technology goods, which represented just 23 percent of China's exports in 1990, accounted for 60 percent of its exports by 2011.³⁵ Across ECA countries, low- and medium-technology-intensive goods have gained space, accounting for 45 percent of the region's exports in 2011. A more subdued expansion has taken place for high-technology-intensive goods, which accounted for 10 percent of total exports. Not all South regions have undergone these transformations. For instance, there is little evidence of a significant shift toward these higher-technology-intensive exports in South Asia.

Another form of upgrading, which is particularly relevant in the context of participation in GVCs, is the upgrading of function. It occurs when firms in particular and countries more broadly move toward activities requiring more skilled work, within or across production chains.³⁶ Hence the location of firms and even countries in GVCs matters for productivity and growth prospects. The distribution of profits and risks is intrinsically related to the positioning of a firm/country within the GVC and the organizational arrangement of the GVC. For instance, importing intermediates in order to export final goods (backward supply chain) may have very different effects from exporting parts so that other countries can export final goods (forward supply chain).³⁷ In backward chains, an increase in overall productivity can be achieved as non-productive sectors get outsourced to other countries and the newly freed resources are allocated toward more productive sectors. In forward chains, the creation of tighter linkages can result in finer specialization, with gains arising through learning-by-doing effects and technology transfers. Moreover, given the importance of complementarities in supply chains, it is possible that increasing the efficiency of one segment of the value chain will increase the productivity of the chain as a whole. This mechanism linking supply chain

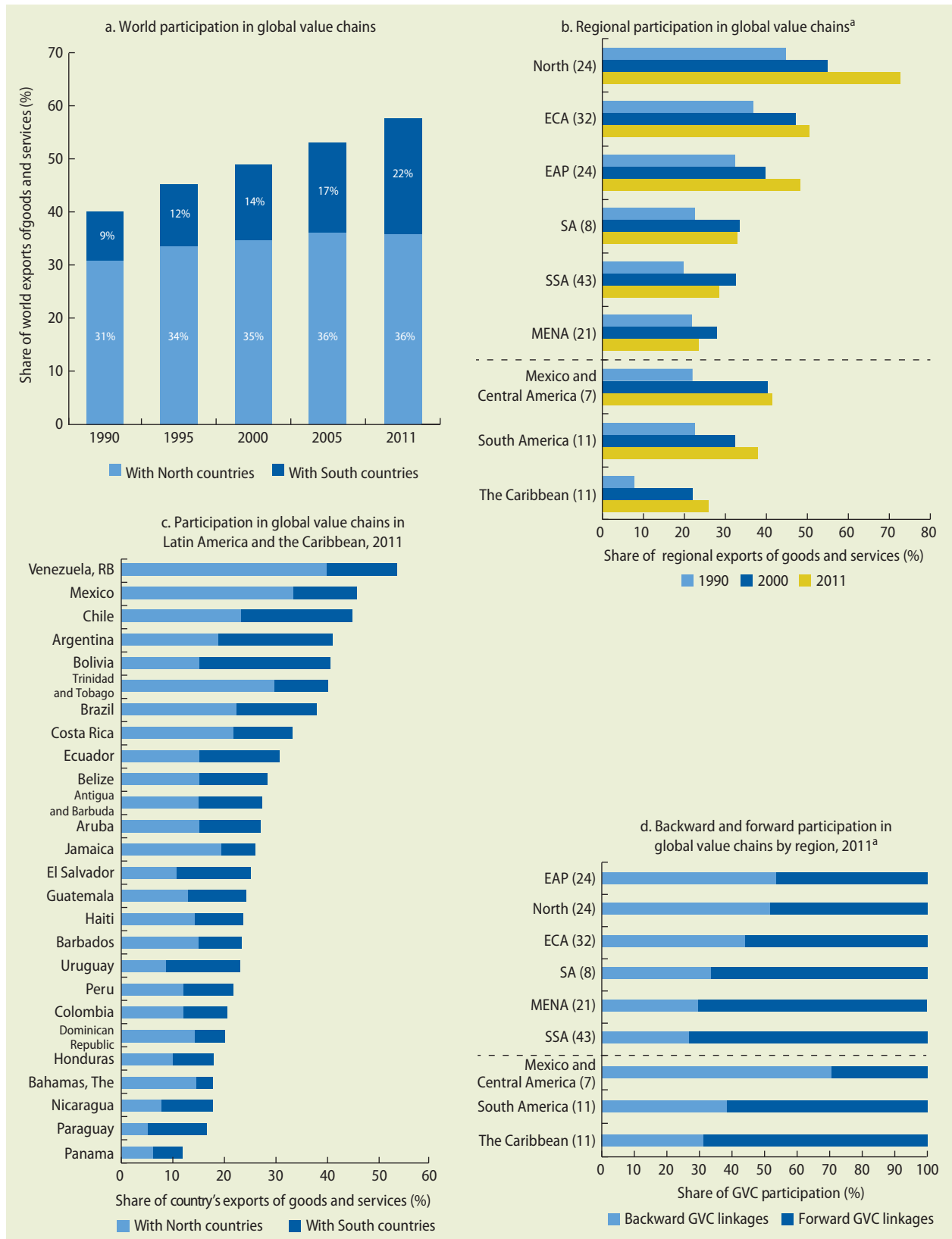
trade and economic growth remains largely unexplored.

GVCs are mostly regional, not global (as discussed in Set of Facts 3 in chapter 1). They may have played an important role in the regional bias in trade and financial connections. An aspect that has not yet been explored is how countries are integrating into GVCs. One indicator measures countries' participation in GVCs by separately taking into account the participation of countries in GVCs as users of foreign inputs (backward linkages or upstream component) and as suppliers of intermediate goods and services used in other countries' exports (forward linkages or downstream component).³⁸ Input-output matrices provide a comprehensive assessment of the extent to which countries are integrated vertically in global production chains. Backward linkages are measured by the foreign value added in exports, whereas forward linkages are measured by the share of exported goods used as imported inputs to produce other countries' exports.

The aggregate GVC participation index, constructed based on the Eora trade in value added database, is consistent with the other indicators shown above. There has been a global trend toward greater participation into GVCs, especially by South countries during the 2000s (figure 2.6, panel a). There is significant heterogeneity in the ways in and extent to which countries integrate into GVCs around the world.³⁹

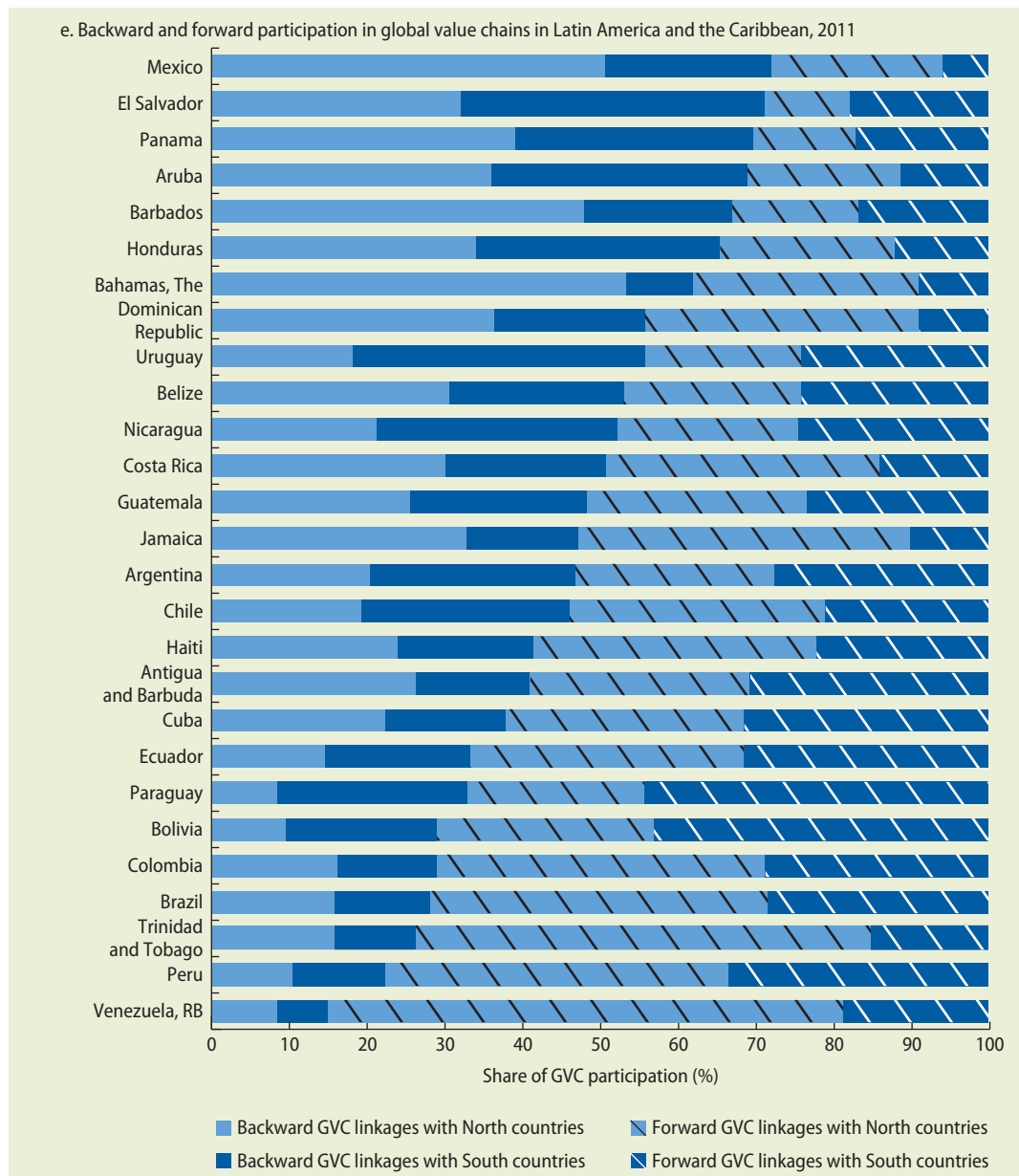
First, there are large differences in the extent to which countries have joined GVCs. Although there has been a significant increase in the South's participation, North countries, especially European countries, still have the largest GVC participation shares (figure 2.6, panel b). Within the South, economies in East Asia, ECA, Central America (especially Costa Rica), and Mexico are the most integrated into GVCs. South American countries also have relatively high participation ratios. Countries in Sub-Saharan Africa (SSA), the Middle East and North Africa (MENA), and the Caribbean are the least integrated into cross-country production networks.

FIGURE 2.6 Participation in global value chains



(continued)

FIGURE 2.6 Participation in global value chains (continued)



Sources: Calculations based on data from Eora MRIO and World Development Indicators (WDI).
 Note: Participation in global value chains (GVCs) is proxied by the share of a country's export that is part of a multistage trade process. This measure is constructed by adding the foreign value added used in a country's own exports (backward GVC linkages) to the value added supplied to other countries' exports (forward GVC linkages) and scaling this total by the country's total exports of goods and services. Panels b and d report cross-country averages. The North includes the G-7 members and other Western Europe countries; the South includes all other economies. EAP = East Asia and Pacific; ECA = Europe and Central Asia; MENA = Middle East and North Africa; SA = South Asia; SSA = Sub-Saharan Africa.
 a. Numbers in parentheses are number of countries in each region.

LAC countries' participation in GVCs increased dramatically between 1990 and 2011. Participation in the North grew about 62 percent. In contrast, participation

rose 68 percent in South America, 90 percent in Mexico and Central America, and 224 percent in the Caribbean, making LAC the fastest-growing region in the world on

this measure (the next fastest-growing South region was EAP, where GVC participation expanded almost 50 percent). There is great heterogeneity in LAC, with growth rates ranging from less than 10 percent in Uruguay and Peru to more than 200 percent in some Caribbean countries.

Second, there is significant cross-regional and cross-country variation in the ways in which countries integrate into GVCs. One source of variation is the composition of partners within GVCs (see figure 2.6, panel c). On average, Mexico and countries in Central America and the Caribbean have higher GVC participation rates with North countries than with other South countries (Jamaica and Trinidad and Tobago are notable examples). In contrast, Bolivia, Paraguay, and Uruguay have joined GVCs mostly with other South countries. On average, South American countries display similar participation rates with North and South countries.

Third, the placement of countries within GVCs is heterogeneous. South American and Caribbean countries typically have higher forward participation rates, whereas Mexico and Central American countries have higher backward participation rates (see figure 2.6, panels d and e). On average, South American countries are mostly suppliers of inputs: about 26 percent of their exports are used as inputs in other countries' exports. In contrast, this figure is just 12 percent in Mexico and Central America. The countries in the region with the highest forward GVC participation rates are Argentina, Bolivia, Brazil, Chile, Ecuador, and Trinidad and Tobago. This finding is not surprising, given the large share of primary products in their exports. These goods typically require few foreign inputs for their production and are generally used at the initial stages of GVCs. South America's forward GVC linkages are among the most extensive in the world, comparable to the linkages of countries in ECA. Only North economies have greater forward participation in GVCs. In 2011 about 35 percent of their exports were used as inputs in other countries' exports. This figure is higher than the figure for South America (26 percent) or

ECA (28 percent). Mexico and countries in Central America, along with some East Asian Tigers and MENA countries, have the lowest downstream component of the GVC participation index.

Mexico and Central America have joined GVCs mostly through backward linkages—that is, their exports contain a significant share of foreign value added. In 2011 Mexico (33 percent value added), El Salvador (18 percent), and Costa Rica (17 percent) were among the most integrated countries in LAC in this regard. Their backward participation (29 percent) is on a par with that of East Asian economies (26 percent). In both regions, processing industries account for a significant share of exports. The backward participation rates of countries in South America (12 percent of exports) and the Caribbean (10 percent) are among the lowest in the South. Countries in SSA, South Asia, and MENA also have low downstream components of GVC participation, averaging about 10 percent or less of exports.

This decomposition of GVC participation into forward and backward linkages can shed light on the position of countries within GVCs. South American countries tend to join GVCs at their initial stages, by providing inputs to other countries. Brazil, Chile, Peru, and Trinidad and Tobago send a larger share of inputs to North than to South countries, whereas Bolivia and Paraguay send a larger share to South countries (see figure 2.6, panel e). Mexico and Central America seem to be at the end of GVCs, given the high share of foreign inputs used in their exports relative to the share of their exports used in other countries' exports. This pattern reflects in large part the direction of their exports toward the domestic market in the United States for final consumption rather than further transformation.

Countries with equally high backward and forward GVC participation rates can also appear toward the middle of GVCs. Notable examples are economies in East Asia that import a large fraction of the inputs embedded in their exports, which in turn are used as intermediate inputs in other countries' exports.

New empirical evidence at the country level suggests that being part of GVCs, especially the middle of GVCs, is associated with higher growth rates and thus plays a role in the way international trade fosters economic growth (see, for example, IMF 2013 and UNCTAD 2013). This analysis approximates participation in GVCs using the degree of upstreamness embedded in goods traded in different industries, constructed according to the measure developed in Antràs and others (2012). In column 5 of table 2.1, this measure considers insertion into three phases of GVCs: beginning (exports of primary goods), middle (exports of intermediate goods), and end (exports of final goods). The last category is omitted; the estimated effects should therefore be interpreted as relative to insertion at the final segments of GVCs.

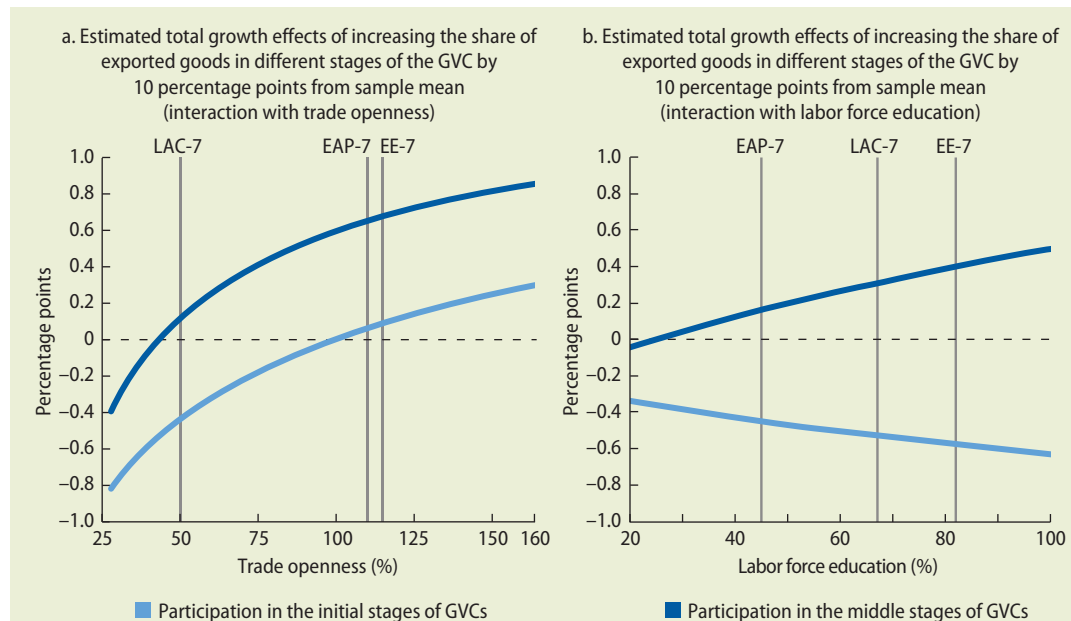
The estimation results show that an increase in the share of traded goods that typically belong to the middle of GVCs (accompanied by a decline of the same magnitude in the share of traded goods typically

associated with the last stages of GVCs) is associated with positive and significant effects on growth. In contrast, increasing the share of goods in the initial stages of GVCs (accompanied by a similar decline in the share of traded goods related to the last stages of GVCs) is associated with negative and statistically significant effects on growth.

The total growth effect of an increase of 10 percentage points in the share of traded goods in the middle segments of GVCs is positive when trade openness is superior to 40 percent of GDP (figure 2.7, panel a). Gains in per capita income growth can be as large as 0.9 percentage points when a country is highly integrated into global markets. In contrast, for levels of trade openness below 100 percent, the point estimates indicate that increasing the share of the most upstream traded goods is generally accompanied by negative growth outcomes.

Nonlinear effects between participation at the different stages of GVCs and the degree

FIGURE 2.7 Growth effects of the stage of the participation in global value chains



Source: Didier and Pinat 2015.

Note: Indicator is based on the degree of upstreamness embedded in exported goods in different industries. See annex table 2A.1 for details on how it was constructed; see Didier and Pinat (2015) for details on how the total growth effects were calculated. LAC-7: Argentina, Brazil, Chile, Colombia, Mexico, Peru, and República Bolivariana de Venezuela. GVC = global value chain. EAP-7: Cambodia, China, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. EE-7: Bulgaria, the Czech Republic, Hungary, Lithuania, Poland, the Russian Federation, and Turkey.

of labor force education are also observed. For countries with secondary or tertiary enrollment of more than 25 percent of the active population, increasing the share of traded goods in the middle of GVCs is associated with positive effects on per capita income growth (see panel b of figure 2.7). The more educated the labor force, the greater the growth effects accompanying the increase in the share of traded goods in the middle of GVCs. This increase reaches about 0.5 percentage points for countries with highly educated labor forces. In contrast, the effects of increasing the share of traded goods that fall in the initial stages of GVCs is associated with a negative growth impact, whatever the level of labor force education. For LAC-7 countries, a 10 percentage-point increase in the share of exported goods in the middle of GVCs is associated with growth effects of about 0.25 percentage points.

These results indicate that insertion into the middle of GVCs is associated with the largest increases in growth. Moreover, the growth effect appears to be larger the greater the level of trade openness; it is particularly strong for countries with high levels of labor force education. The underlying notion is that the more the economic activities of a country are connected to global production chains—particularly the middle range of such chains—and the more capable the country's labor force is, the more productivity-enhancing learning and innovation effects can take place.

The end market of GVCs also affects the potential for upgrading opportunities, independent of firms' or countries' placement within GVCs (Palpacuer, Gibbon, and Thomsen 2005; Gibbon 2008). In particular, consumer preferences and government standards are typically different in developing countries and more developed economies. Price is typically the central consideration in South countries; product differentiation based on variety and quality are less important (Kaplinsky and Farooki 2010). On the one hand, firms in GVCs targeting South economies as their end market may face lower entry barriers and impose looser standards for their products, making it easier for South firms to engage in higher value-added activities, such as product

development and design (Kaplinsky, Terheggen, and Tijaja 2011). On the other hand, these firms may be locked in intense competition and face tight profit margins.

Overall, economic development today is to some extent inherently linked to upgrading within rather than independently of GVCs. Yet participation in GVCs does not automatically translate into additional gains from trade beyond the gains associated with increased export volumes. As discussed above, several factors, most intrinsic and particular to individual GVCs, affect the dynamics of opportunities and challenges to thrive in these supply chains. Firms' and countries' competitiveness in GVCs reflects not only their capacity to join and remain part of GVCs over time but also their ability to upgrade within or across GVCs. In turn, this ability to upgrade reflects the capacity of producers to generate, import, and apply new technologies.⁴⁰

The role of governments may seem limited in this context, as policymakers may not have sufficient knowledge about the intricacies of individual industries, GVCs, and market dynamics. But the ease with which countries can design adequate policies is not independent of the extent of their sector-specific knowledge, including knowledge of potential constraints domestic firms face. Moreover, the evidence presented in this section is suggestive of positive externalities associated with the way in which firms and countries integrate into GVCs. Market failures—from the provision of infrastructure to the accumulation of human capital and the resolution of coordination failures within existing industries—also abound. Therefore, there seems to be some scope for policy intervention. In particular, policymakers can play a key role in providing an appropriate set of incentives and support policies to help firms prosper in this new global economic landscape, in which GVCs are an integral part.

The nature of trading partners

Trading with North countries is associated with larger growth effects than trading with South countries, as shown above. Hence an

important aspect of the trade-growth nexus is the composition and identity of trading partners. The four channels through which trade and growth are related (discussed earlier) may work in different ways depending on the composition of trade partners. Trading with fast-growing and/or more advanced economies may be associated with positive growth effects partly as a result of aggregate demand effects for the goods in which the country has a comparative advantage. Arora and Vamvakidis (2005), for example, provide empirical evidence that trading partners' growth and relative income levels have strong positive effects on domestic growth. Greater integration with more advanced economies can also open up and enhance communication channels that facilitate greater technology diffusion and learning spillovers.

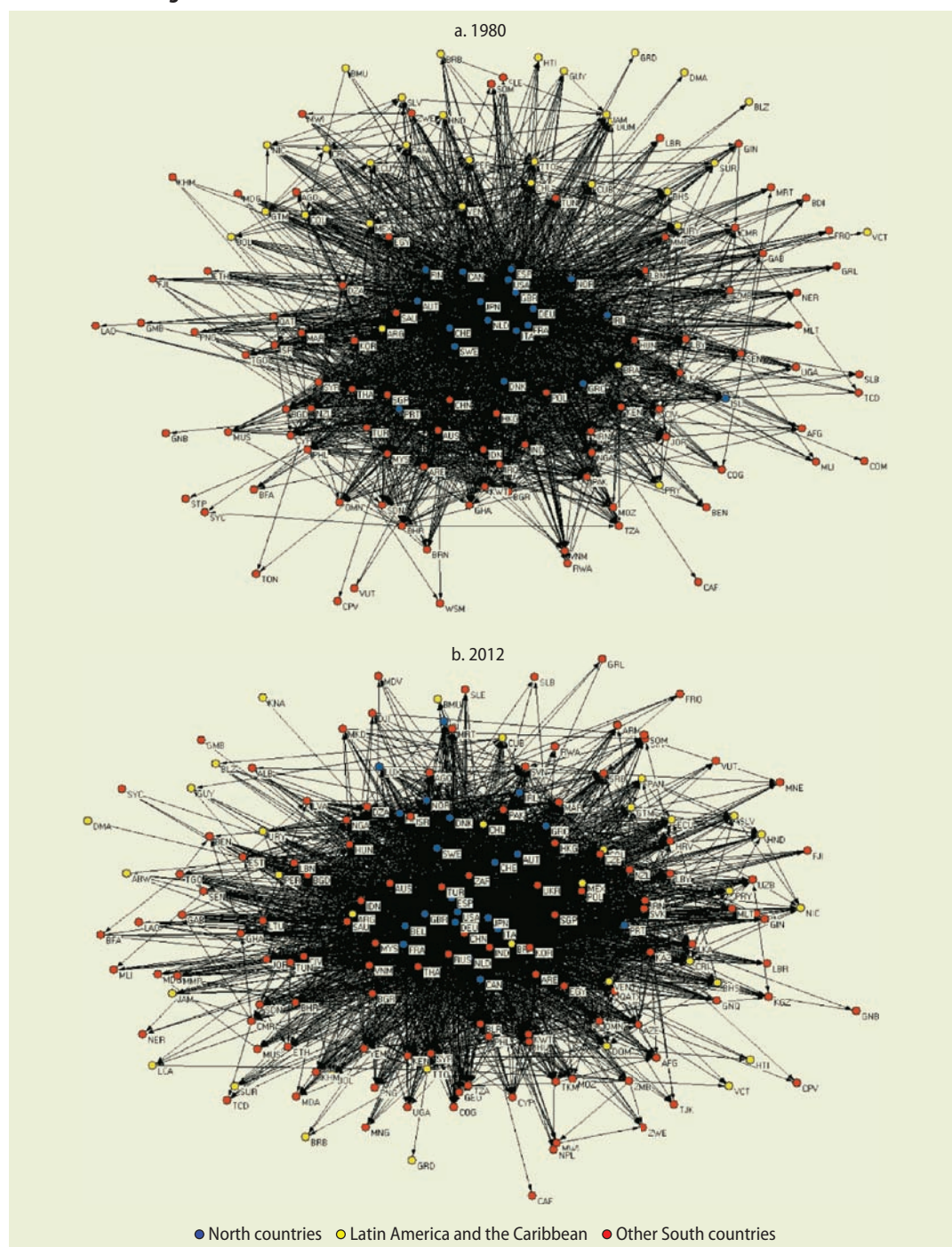
Trading with less developed countries can also be growth enhancing, to the extent that it may lead to specialization in sectors or tasks that are prone to technological and knowledge spillover effects. Increased competition from greater trade integration can encourage entrepreneurs to pursue new and distinctive ideas and technologies, but under certain circumstances, competition by dissimilar countries can hurt growth outcomes. Intense competition from larger trading partners may reduce the profitability of investments in knowledge in relatively smaller economies if knowledge spillovers are national in reach. Increased competition with a more technologically advanced trading partner can slow innovation and growth in a country that begins with some disadvantage in research productivity if spillover effects are geographically concentrated (Grossman and Helpman 1991a).

The composition of trading partners may also be associated with growth outcomes through the volatility channel. Export baskets concentrated in few destinations may lead to increased volatility—as a result of fluctuations in trading partners' economies, import-export patterns, or relative prices—and hence be associated with worse growth outcomes (Loayza and Raddatz 2007; Haddad, Lim, and Saborowski 2013; Di Giovanni and Levchenko 2012). It may also

lead to more economic and political dependency (Dolan and Tomlin 1980; Pakenham 1992). The extent to which the composition and identity of trading partners matter for economic growth is thus an empirical question, which the rest of this section assesses.

Whether trading partners are at the center of the global trade network or on its periphery may affect the growth prospects associated with their trade connections. The channel of technology diffusion and knowledge spillovers may be particularly important in this regard. Independent of their level of economic development or technological sophistication, the central countries in the global trade network, which are more closely connected to a wider range of countries, are more exposed to the technology and knowledge frontiers. To the extent that firms get new production-related ideas and technology by learning from firms with which they do business (or compete), the establishment of strong ties with countries more exposed to the frontiers of ideas and technologies may lead to stronger growth effects.⁴¹ The quality and intensity of the feedback effects between buyers and sellers engaged in global trade, for example, may be greater if one of the countries involved is at the center of the network. Trade with central countries may also be associated with a selection effect of putting domestic producers in contact with the most efficient (subject to trade costs) foreign producers. All these factors enhance the likelihood of technology diffusion and learning spillovers. For a given country, then, the potential for exposure to a wider set of ideas and technologies increases with the strength of its trade ties with more central countries.

Core countries—countries with strong connections to a large number of countries—are more centrally located in the graphical representation of the global trade network shown in figure 2.8. Each node in the figure represents a country, and each link corresponds to an active connection between a pair of countries. As discussed in Set of Facts 2 in chapter 1, during most of the 1980s and 1990s, the global trade network centered on a small set of developed countries: the United States, Germany (as well as a few

FIGURE 2.8 The global trade network

Source: Calculations based on data from IMF Direction of Trade Statistics (DOTS).

Note: Networks drawn using the Kamada-Kawai algorithm. Each node represents a country. Each link corresponds to an active connection (positive trade flow) between a pair of countries. Arrows capture the direction of these connections. Only trade flows greater than \$10 million in 1980 and greater than \$100 million in 2012 are reported. The North includes the G-7 members and other Western Europe countries; the South includes all other economies.

other Western Europe countries), and Japan. During the 2000s, several South economies, including Brazil, China, India, the Russian Federation, and Turkey, among others, joined this club.

Few countries occupy central places in the global trade network, although there is no widely accepted definition of how many and which countries can be considered core countries. Two alternative definitions of these countries are adopted here. Using network analysis, countries are ranked according to their share of world trade, their number of trading partners, and the position of their partners in the global trade network.⁴² This ranking changes over time to reflect the changes in the global trade network discussed above. Based on this ranking, two proxies to characterize countries' composition of trading partners are constructed: (a) the total share of trade with the top three countries in the network and (b) the share of trade with countries in the top 5 percent of the network (the so-called core countries). To put the results in perspective, the analysis uses as benchmarks the share of a country's trade with its top three trading partners in terms of the total value of trade and the share of its trade with countries in the 6th–30th percentiles (the so-called inner-periphery countries) of the network.

LAC countries are generally as connected to countries in the center of the global trade network as other South regions, but the degree of connectivity to inner-periphery countries is more limited (figure 2.9, panels a and b). The average share of trade with core countries is almost 50 percent in LAC—similar to the shares observed in most other regions. Only in countries in ECA and South Asia is the trade share with core countries below 40 percent. The average trade share with inner-periphery countries is just 35 percent—well below the 54 percent in South Asia, the 45 percent in East Asia, and the 43 percent in ECA.

There is significant heterogeneity across countries in LAC though. The share of trade with core countries ranges from 33 percent in Argentina to 81 percent in Mexico (driven

mostly by its strong ties with the United States and Canada). The share of trade with inner-periphery countries ranges from about 15 percent in Honduras and Mexico to almost 60 percent in Bolivia and Uruguay. On average, South American countries have larger trade shares with inner-periphery countries than do countries in Central America and the Caribbean.

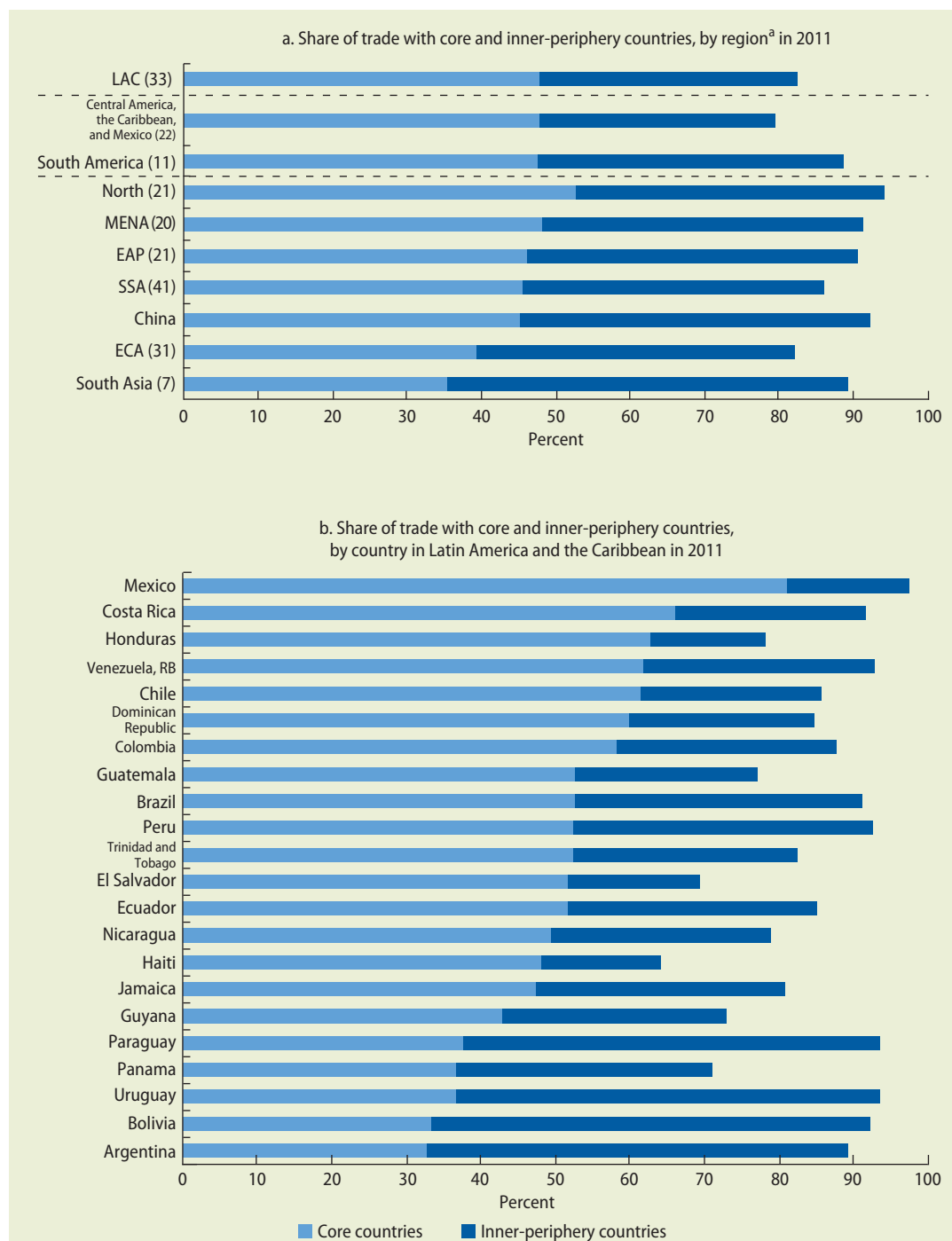
To what extent are stronger trade ties with countries in the center of the global trade network associated with higher growth? Column 1 of table 2.2 reports the estimations associated with the share of trade with the top three countries in the global trade network. To contrast the effects of trading with these center countries with simply more concentrated trading relations, the regressions also include an analogous proxy to capture countries' share of trade with their main partners. The coefficient on the share of trade with the most central countries in the global trade network is positive and statistically significant; the coefficient on the share of trade with a country's main trading partners is negative and statistically significant. The differential effect is economically large—about 0.8 percentage points. An increase of 10 percentage points in the share of trade with the top three most central countries is associated with an increase in growth of about 0.3 percentage points, whereas a similar increase in the share of trade with the top three main partners leads to a decline in growth of about 0.5 percentage points.

Figure 2.9 shows the total growth effect associated with an increase of 10 percentage points in the share of trade with the most central countries and with the main trading partners. It reveals how these effects vary with the degree of trade openness (panel c) and the level of human capital development (panel d). For low enough levels of trade openness, increasing trade ties with a country's main trading partners is accompanied by a positive effect on per capita income growth, though the effect becomes negative at about 35 percent of trade openness. In contrast, the total growth effect associated with an increase in the share of trade with the most central countries in the global

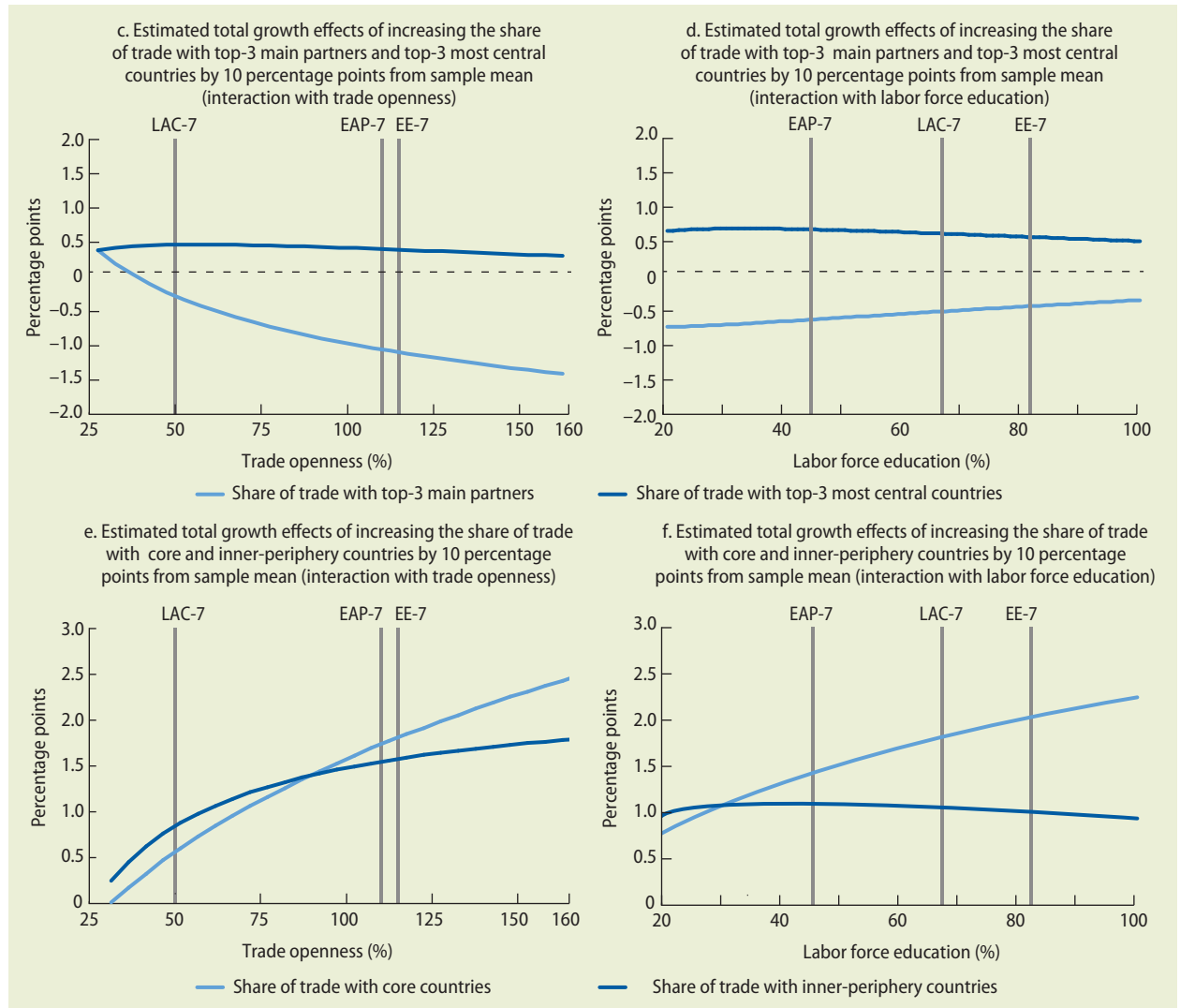
trade network increases, albeit only slightly, at low levels of trade openness and remains positive throughout the range of observed levels of trade openness. There is also some

nonlinearity in the growth effect related to the degree of human capital development. The total growth effect for an increase of 10 percentage points in the share of trade with

FIGURE 2.9 Composition of trading partners



(continued)

FIGURE 2.9 Composition of trading partners (continued)

Sources: Calculations in panels a and b are based on data from DOTS; calculations in panels c–f are based on Didier and Pinat (2015).

Note: See annex table 2A.1 for details on how countries were classified as core or inner periphery. See Didier and Pinat (2015) for details on how total growth effects were calculated. LAC-7: Argentina, Brazil, Chile, Colombia, Mexico, Peru, and República Bolivariana de Venezuela. EAP-7: Cambodia, China, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. EE-7: Bulgaria, the Czech Republic, Hungary, Lithuania, Poland, the Russian Federation, and Turkey. The North includes the G-7 members and other Western Europe countries; the South includes all other economies. EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MENA = Middle East and North Africa; SSA = Sub-Saharan Africa.

a. Numbers in parentheses are number of countries in each region.

the most central countries is typically positive, though declining, for countries in which more than 30 percent of the labor force education. The effect on growth associated with trading with the top three main trading partners is negative, though increasing with the level of labor force education.

Column 2 of table 2.2 reports the estimations on the share of trade with countries in the top 5 percent (core countries) and the

share of trade with countries in the 6th–30th percentiles (inner-periphery countries) of the global trade network. The coefficients on the trade shares with core countries are positive and statistically significant, reinforcing the previous findings. The effects associated with the share of trade with countries in the inner periphery are typically larger: the average effect of an increase of 10 percentage points in the share of trade with core

TABLE 2.2 Regression results on the effects of the composition of trading partners on economic growth

	Dependent variable: Growth rate of real GDP per capita					
	(1)	(2)	(3)	(4)	(5)	(6)
Initial GDP per capita	-0.276*** [0.080]	-0.873*** [0.070]	-0.634*** [0.073]	-0.961*** [0.093]	-0.839*** [0.070]	-0.893*** [0.082]
Labor force education	1.418*** [0.126]	1.887*** [0.124]	1.687*** [0.102]	1.729*** [0.125]	1.623*** [0.110]	1.617*** [0.126]
Trade openness	1.656*** [0.126]	2.088*** [0.149]	1.804*** [0.155]	1.257*** [0.165]	1.522*** [0.148]	1.501*** [0.137]
<i>Share of trade with:</i>						
Top three partners	-6.946*** [0.738]					
Top three most central countries in the global trade network	4.371*** [0.568]					
Core countries		13.819*** [1.199]	8.887*** [1.526]	8.836*** [1.434]	10.269*** [1.987]	9.209*** [2.181]
Inner-periphery countries		15.678*** [1.263]	6.816*** [1.565]	5.625*** [1.583]	10.252*** [1.833]	8.691*** [2.218]
Growth of core countries (trade-weighted average)			0.273*** [0.035]			
Growth of inner-periphery countries (trade-weighted average)			0.881*** [0.028]			
Participation in GVCs (share of total trade)				8.595*** [0.830]	6.637*** [0.948]	6.330*** [0.880]
<i>Participation in GVCs:</i>						
Intermediate goods traded with core countries (as share of GVC participation with core countries)					-1.166*** [0.236]	
Intermediate goods traded with inner-periphery countries (as share of GVC participation with inner-periphery countries)					1.937*** [0.354]	
Final goods traded with core countries (as share of GVC participation with core countries)						1.775*** [0.306]
Final goods traded with inner-periphery countries (as share of GVC participation with inner-periphery countries)						-0.470** [0.229]
Number of observations	809	809	809	744	744	744
Number of countries	114	114	114	113	113	113

Source: Didier and Pinat 2015.

Note: This table reports the regressions of real gross domestic product (GDP) per capita growth on a number of indicators capturing the composition of trading partners. See text and annex table 2A.1 for details on indicators used. Robust standard errors are shown in brackets. GVC = global value chain. All regressions include time dummies.

Significance level: * = 10 percent, ** = 5 percent, *** = 1 percent.

countries (from its sample mean) is associated with an increase in growth of about 0.8 percentage points for the average country, whereas the effect reaches almost 1.2 percentage points for a similar increase in the share of trade with countries in the inner periphery.

This perhaps counterintuitive result is explained, at least in part, by the differential growth rates of inner-periphery countries. If these countries typically grow faster than countries at the core of the global trade network, trading with them is more likely to be accompanied by larger growth effects—associated, for instance, with direct aggregate demand effects. Indeed, the weighted-growth rates of core and inner-periphery countries have a positive impact on growth of per capita GDP (column 3 of table 2.2). When this growth differential is controlled for, the effects associated with the share of trade with core countries become larger than the effects associated with the share of trade with inner-periphery countries—and the growth differential is statistically significant.

These results also reflect greater insertion into GVCs with inner-periphery countries. The degree and manner in which countries participate in GVCs affects the dynamics of trade and growth. To the extent that countries participate more in GVCs with inner-periphery (rather than core) countries, part of the growth differential actually reflects this insertion in GVCs.

The regression in column 4 of table 2.2 explores this possibility. Consistent with the results in the previous section, participation in GVCs is positively associated with growth prospects. When this participation is controlled for, the growth effect associated to the share of trade with inner-periphery countries is smaller than the effect associated with the share of trade with core countries—and the positive growth differential is statistically significant.

The findings in the previous section also indicate that insertion into the middle segments of a GVC is associated with the largest improvement in the trade-growth nexus. The results in columns 5 and 6 of table 2.2

show that there is actually some heterogeneity in these results depending on the composition of partners in the production chain. The growth effects associated with participation in GVCs with inner-periphery countries are largest in the middle and initial stages. In contrast, for participation in GVCs with core countries, the growth effects associated with participation in the final stages of the chain are greatest.

There is a strong nonlinearity in the total growth effects associated with increases in trade shares with these central countries on trade openness and the human capital development, as shown in panels e and f of figure 2.9. These growth effects are not only positive but actually increasing with trade openness, albeit at different degrees. At lower levels of trade openness (below 80 percent), an increase in trade shares with inner-periphery countries is associated with slightly larger (though not statistically significant) growth effects than an increase in the share of trade with core countries. The opposite is observed for higher levels of trade openness. Similar nonlinear patterns are observed for the relation between the degree of labor force education and the total growth effects accompanying an increase in the share of trade with core countries in the global trade network. The differential in growth effects associated with increases in the share of trade with core and inner-periphery countries increases with both the degree of trade openness and labor force education. The higher the level of trade openness and the greater the degree of labor force education, the larger are the growth effects associated with an increase in the share of trade with core countries relative to inner-periphery countries.

Overall, the estimation results indicate that for sufficiently integrated countries, an increase in trade links with countries at the center of the global trade network is accompanied by strong growth in income per capita, even after controlling for the overall volume of trade flows and a country's trade share with its main trading partners. Furthermore, the results are indicative of a

differential impact on growth for different levels of openness. They suggest some form of complementarity between trade openness and the share of trade with the central countries in the global trade network. They also indicate that countries need to have educated labor forces to be able to benefit most from trading with core countries, suggesting that human capital development is key for the absorption of foreign technology and knowledge. These results are consistent with the idea that the growth effects associated with trade openness are not related simply to the development of strong trade ties with a single country but rather to the establishment of such ties with countries that are more exposed to the frontiers of ideas and technologies.

The results in this section may interact with and complement the results of the previous section, which characterized the interactions between growth and the nature of traded goods. The results on participation in GVCs and the composition of trading partners provide only a glimpse of these potential interactions, because the S-GMM procedure is limited to a relatively restricted set of explanatory variables in the estimated regressions if overfitting bias is to be avoided (see box 2.1). This methodology constrains a more thorough analysis of these interactions, which is therefore left for future research.

Potential frictions affecting trade and growth dynamics

A variety of factors could act as barriers to the efficient allocation of resources within and across countries and thus affect trade and growth dynamics. Distortive government policies, such as policies embedded in trade agreements or direct trade barriers, could encourage the inefficient growth of a specific sector or change the mix of a country's exports. High trading costs associated with the transport of goods or clearance at the border could also play a role. This section focuses on two sets of frictions that are particularly important for LAC countries and

that may affect the linkages between trade integration and economic growth.

The quality of transport networks

The ability of economies to integrate efficiently into the global economy depends to a great extent on the quality of hard and soft infrastructure services, ranging from transportation, telecommunications, and financial services to border processes and customs practices to the business and regulatory environments.^{43, 44, 45} In fact, internal (domestic) trade and transaction costs can have a large impact on a country's external (international) competitiveness. The extent of red tape and access to efficient transport networks feature prominently among the cost factors that determine whether firms can meet external demand in a competitive and timely fashion.

The quality of transport infrastructure is increasingly perceived as a determinant of participation in GVCs. This measure includes not only the existence of physical assets but also the efficiency and availability of transport services, such as trucking and transportation, storage and packaging facilities, and consolidation centers.

The World Bank's Doing Business database captures the internal costs associated with shipping goods from the factory gate to ports (for exports) and from ports to retail outlets (for imports) through its "cost of trading" index. This indicator measures the fees (excluding tariffs and trade taxes) associated with exporting and importing a standardized cargo of goods by sea transport, accounting for the time and cost necessary to comply with every official procedure (the time and cost for sea transport itself are not included) (Djankov, Freund, and Pham 2010).

The results show that on average, it is more expensive to export and import in the South than in the North (East Asian economies are a marked exception) (figure 2.10, panel a). On average, LAC countries are well positioned with respect to other South economies, with internal costs associated with cross-border trading lower than in all regions except

MENA and EAP. There is, however, great heterogeneity within LAC (figure 2.10, panel b). Panama is the least expensive country (ranked 38th worldwide), followed by Peru (52nd) and Chile (53rd). At the other extreme, among the most expensive countries in the world for trade are República Bolivariana de Venezuela (175th), Colombia (162nd), and Brazil (156th).

Access to efficient and competitive international transport networks is also crucial for integration into global markets. The availability of effective transport connections, including ancillary services, affects the location decisions of production. Trade in intermediate goods is especially sensitive to transport costs (World Bank 2009). Transportation infrastructure may also play a role in facilitating knowledge diffusion and spillovers (Agrawal, Galasso, and Oettl 2014).

The relatively poor quality of transport networks in LAC countries seems to act as a trade barrier, constraining the ability of economies in the region to integrate efficiently into the global economy. On average, LAC countries seem to underperform both North countries and some other South countries on a range of indicators capturing accessibility to and the quality of transport networks. There is some evidence that the region is not spending sufficiently or effectively on infrastructure, even though infrastructure development offers significant potential to speed the pace of growth in the region (Calderón and Servén 2010; Fay and Morrison 2007). There is wide heterogeneity within the region, however.

Land transport Detailed data on the value of trade by different modes of transportation are sparse, but data on the United States and LAC indicate that trade with land neighbors occurs mostly by surface modes (such as truck, rail, and pipeline); only 10 percent of trade takes place by air or ocean (Hummels 2007). About 10–20 percent of total trade by LAC countries is with land neighbors. The development of the land transport network is therefore an important factor behind intra-regional integration.

FIGURE 2.10 Average cost of trading in 2013



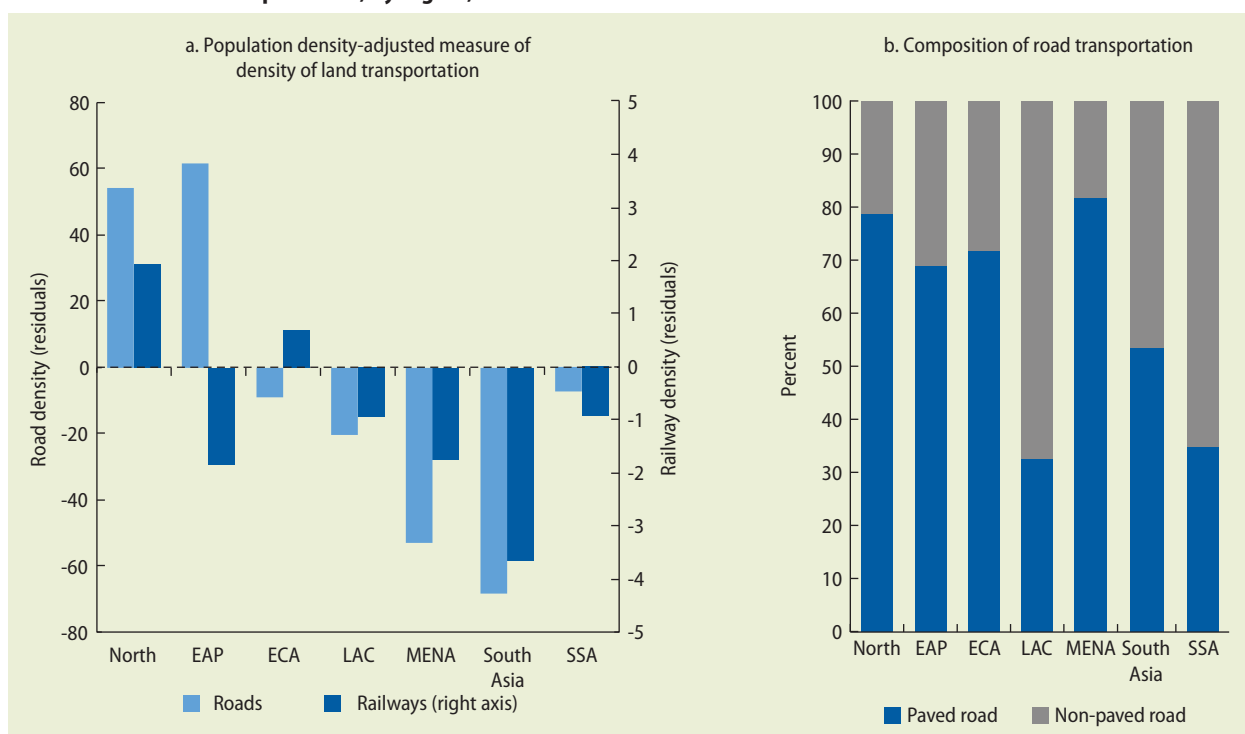
Source: Calculations based on the World Bank Doing Business Indicators.
 Note: The cost of trading is measured by the average cost associated with exporting and importing a standardized cargo of goods by sea transport. It is measured by fees (in U.S. dollars) levied on a 20-foot container (excluding tariffs). Fees cover costs associated with completing all procedures required to export or import goods. For exporting goods, procedures range from packing the goods into the container at the warehouse to their departure from the port of exit. For importing goods, procedures range from the vessel's arrival at the port of entry to the cargo's delivery at the warehouse. For land-locked economies, these include procedures at the inland border post, since the port is located in the transit economy. The North includes the G-7 members and other Western Europe countries; the South includes all other economies. EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MENA = Middle East and North Africa; SSA = Sub-Saharan Africa.

Data on road and railway density reveal a gap between North and South countries. Adjusted by population density, these measures indicate that LAC lags behind North countries, though the evidence is more nuanced with respect to other South regions. (figure 2.11, panel a).⁴⁶ On average, LAC outperforms MENA and South Asia in both road and rail density and performs about the same as SSA. LAC has denser railway networks but sparser road coverage than EAP. A caveat of this analysis is that measures of road and railway density are imperfect indicators of the quantity of transport services, especially services relevant for the development of cross-border linkages, because they do not indicate whether production centers

are effectively connected to markets or trade outlets.

Data on the quality of land transport infrastructure suggest some scope for improvement in LAC. The quality of the road network, proxied by the share of unpaved roads, is relatively poor when contrasted with other South regions: almost 70 percent of the roads in LAC are unpaved—a far larger share than in EAP and MENA (less than 30 percent) and South Asia (less than 50 percent) (see figure 2.11, panel b). LAC also seems to lag behind in the quality of its railway network. Panama is the highest-ranked LAC country in terms of the quality of its railroad infrastructure (ranked 30th in the Global Competitive Forum Index); no other LAC

FIGURE 2.11 Land transportation, by region, 2011



Sources: Calculations based on WDI.

Note: Panel a reports residuals of regressions of measures of density of land transportation (road density and railway density) against population density at the country level. Cross-country averages are reported. Density of land transportation is measured by the number of kilometers of roads or rails per 100 squared kilometers of land area. Rail lines are the length of railway route available for train service, irrespective of the number of parallel tracks. Paved roads are roads surfaced with crushed stone (macadam) and hydrocarbon binder or bituminized agents, with concrete or cobblestones. All other roads are considered unpaved. The North includes the G-7 members and other Western Europe countries. Singapore and Hong Kong SAR, China, are excluded from the EAP average because of the physical characteristics of these economies. EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MENA = Middle East and North Africa; SSA = Sub-Saharan Africa.

country features in the top 50. Moreover, 10 of the world's 20 worst performers, including Brazil, Colombia, and Peru, are in LAC.

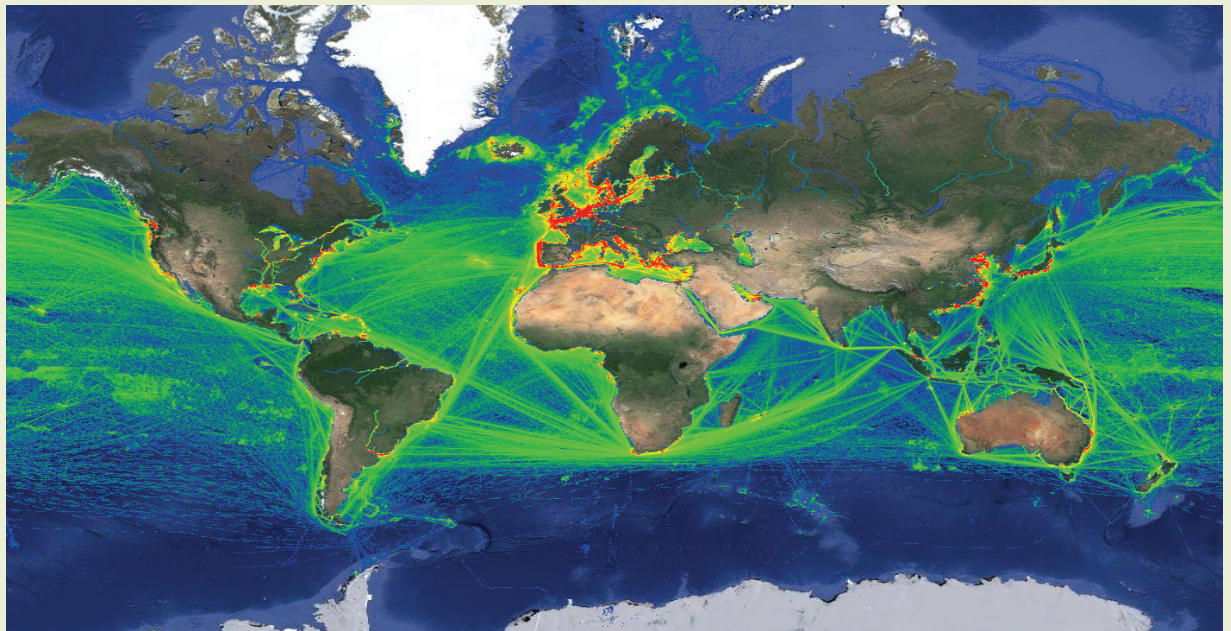
Maritime transport For trade with non-neighboring countries, which corresponds to about 80 percent of world trade by value, nearly all goods trade moves by ocean and air (Hummels 2007). Most manufactured and semimanufactured goods are transported in liner vessels, as are bulk commodities like oil and petroleum products, iron ore, coal, and grains. The international shipping industry carries about 90 percent of world trade in terms of volume, according to the Maritime International Secretariat Services (2013). The quality of maritime shipping services is thus an important determinant of competitiveness. It directly affects countries' engagement in global trade and indirectly increases per capita income.

The use of maritime transportation is not homogeneous across countries. Some freight

routes are much more developed than others as most shipping companies adopt a hub-and-spoke operating structure. This operating structure consists of hub ports, lateral ports, main lines (long haul lines that connect hub ports and involve a set of sequential port calls typically across the oceans), and branch lines (short-haul lines connecting several lateral ports in one region to serve the main lines), which together form a complex transportation network system (Rodrigue and Comtois 2006; Ducret and Notteboom 2012). This hub-and-spoke arrangement has led to an unbalanced geographical distribution of hub ports around the world, with most of them located in Asia and Europe (Hu and Zhu 2009). Ports in Hong Kong SAR, China; Singapore; and Rotterdam (the Netherlands) are central hubs in the global network. Panama and Kingston (Jamaica) are hubs in LAC.

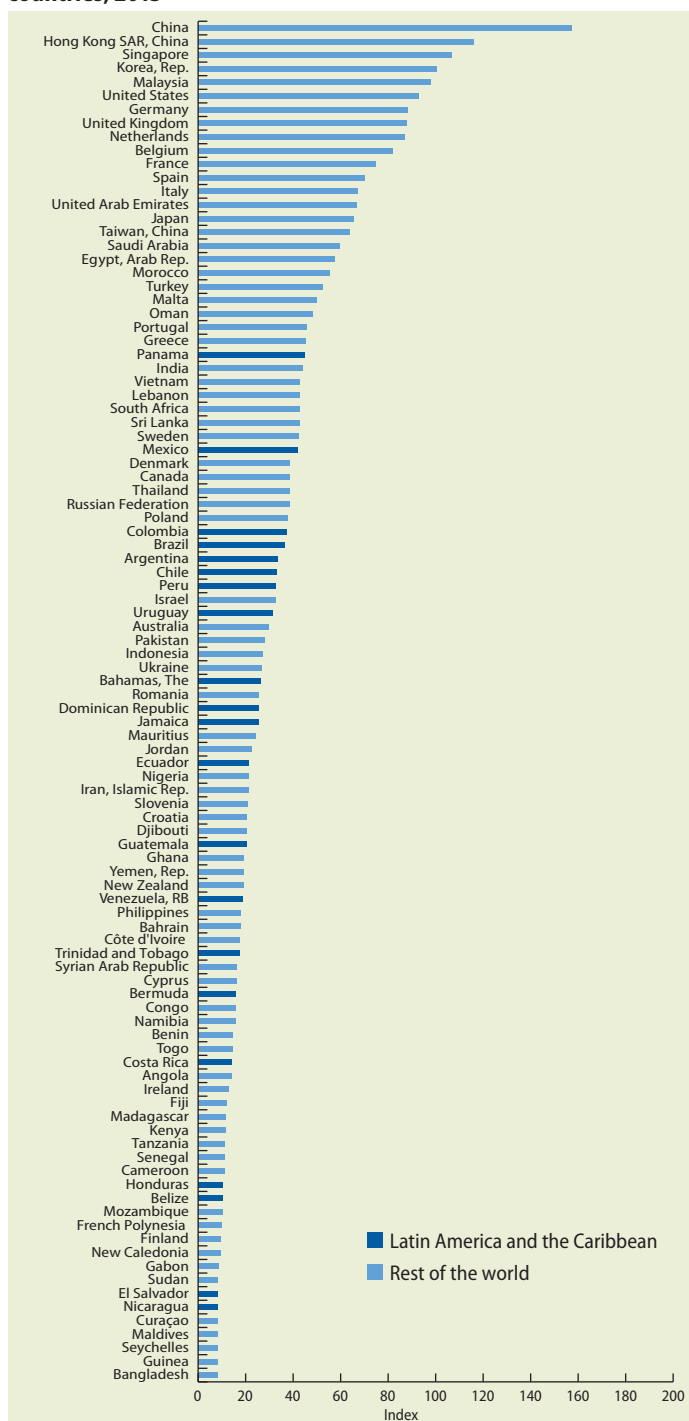
A map of marine traffic for cargo ships during the second half of 2013 shows this heterogeneity (figure 2.12). The highest

FIGURE 2.12 Ship and port activity, second half of 2013



Source: © marinetraffic.com. Used with permission. Further permission required for reuse.

Note: The map follows a red-yellow-green scheme from high to low to show the intensity of marine traffic and port activity. Passenger as well as cargo vessels and tankers are considered in this map.

FIGURE 2.13 Liner shipping connectivity index in selected countries, 2013

Source: Calculations based on UNCTAD data. Underlying data come from Containerization International Online.

Note: Index is based on five components of the maritime transport sector: the number of ships, their container-carrying capacity, the maximum vessel size, the number of services, and the number of companies that deploy container ships in a country's ports. The highest value (100) represents the value for the country with the highest average index in 2004. All reported values are relative to this country-year observation. Only the top 100 countries are reported.

intensity of marine traffic is in Europe, the United States, and the Pacific coast of Asia. Traffic along Latin American coasts is significantly less dense.

Data from the World Shipping Council (n.d.) confirm that LAC countries are not at the center of the world's main shipping routes. In 2012 only 3 million 20-foot equivalent units (TEUs, a standard measure of container ship capacity) were shipped between Asia and South America, the most active route for LAC countries. This volume is a fraction of the 22 million TEUs shipped along the main trading route between Asia and North America.

LAC countries have accessibility to this global network, through its branch lines. A proxy for the ease of access to high-capacity and high-frequency global maritime freight transport systems is the Liner Shipping Connectivity Index (figure 2.13).⁴⁷ In 2013 the export-oriented economies of East Asia took the top five spots: China and Hong Kong SAR, China, were the highest-ranking economies, followed by the transshipment hub of Singapore. North countries, including Belgium, Germany, Japan, the Netherlands, the United Kingdom, and the United States, took most of the other top 15 spots.

Within LAC only Panama features in the top 30 (at 25th). Mexico is the second-highest ranking country in the region (32nd), followed by Colombia (38th) and Brazil (39th). In general, Central America and Caribbean countries typically reveal more restricted use of the liner shipping network than South American countries. Adjusting the index for country size (proxied by population and land area) does not improve the rankings of LAC countries—the top countries in the region actually move significantly down: Mexico falls to 80th place, Brazil to 76th, and Colombia to 86th. The top three East Asian economies remain at the top of the ranking.

The spatial design of the maritime transport network reflects an equilibrium outcome in which both demand and supply effects are at play. Demand factors include demand for containerized transport and demand for specific transport service characteristics. Central to supply-side considerations are the

strategies of container shipping liners, which aim to maximize profits and take advantage of increasing economies of scale through the strategic choice of market coverage (the hub-and-spoke operating structure is particularly important in this regard). Other important factors are port infrastructure, port system development, and internal transport and logistics infrastructure in the hinterland for port access (see, for example, Notteboom 2009).

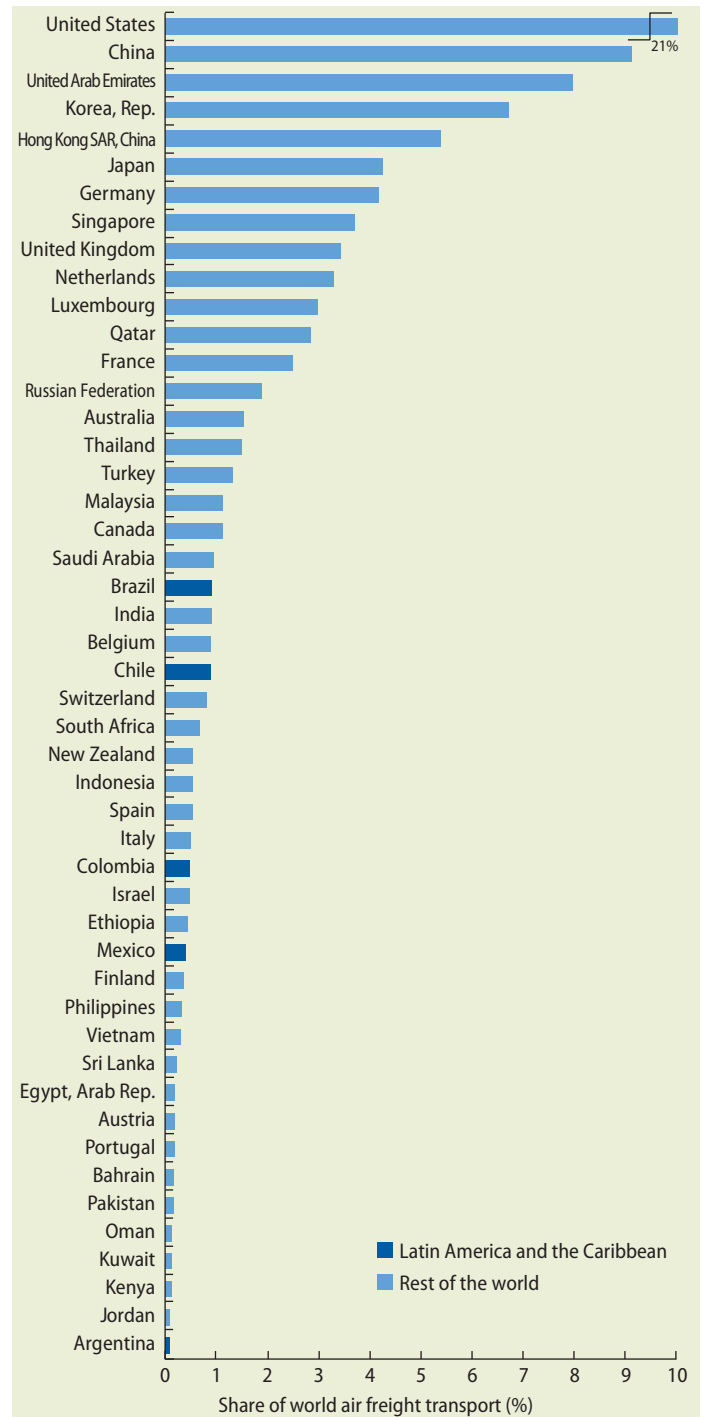
These factors may be a constraint in many LAC countries, where port performance is typically poor, although there is wide heterogeneity within the region.⁴⁸ Panama is one of the top 10 countries in the world in port efficiency, but Bolivia (ranked 142nd), Brazil (131st), and Costa Rica (128th) are among the least efficient, according to the Global Competitiveness Report 2013–14 (Schwab and Sala-i-Martin 2013). The determinants of port efficiency include excessive regulation, the prevalence of organized crime, congestion, and the general condition of the country's infrastructure.

Air transport Although the global air cargo industry is still relatively small compared with the maritime shipping industry, it has become a viable alternative for high-value and low-volume as well as time-sensitive products. A growing emphasis on speed in cross-border shipments—which has accompanied the expansion of just-in-time business models—highlights the increased importance of air freight transport.⁴⁹

Global air cargo grew significantly between 1990 and 2013, more than doubling in volume, from 56 billion ton km to almost 175 billion ton km.⁵⁰ According to the International Air Transport Association (IATA), 35 percent of world merchandise trade in value was transported by air in 2013.

Air traffic is concentrated in North countries, which accounted for almost 50 percent of all air freight transport in 2013 (figure 2.14). Within the South, EAP (20 percent of world air freight) and MENA (13 percent) captured the largest shares of world air freight. LAC accounted for just

FIGURE 2.14 Share of world air freight transport by selected countries, 2013



Source: World Bank Doing Business Indicators.

Note: Air freight is measured by the volume of freight, express, and diplomatic bags carried at each flight stage (operation of an aircraft from takeoff to next landing), measured in metric tons times kilometers traveled. Only countries with at least 0.01 percent of world air transport are reported.

3 percent. Brazil (21st), Chile (24th), and Colombia (31st) were the highest-ranked countries in the region (although once country size, proxied by population and land area, is controlled for, these countries drop significantly in the rankings).

Like the maritime transport network, the air transport network is characterized by a hub-and-spoke structure. This structure may explain at least in part the geographical heterogeneity in the concentration of air traffic.

Emerging asymmetry in the quality of trade agreements

Like the quality of transport networks, trade policies can hamper economic ties. They may be thought of as cost factors (or subsidies) that affect the way in which countries integrate in global markets.

The rise of the South in international trade has brought significant changes in commercial policies around the world. In particular, the number of regional trade agreements (RTAs) has multiplied, especially among South countries, arguably at the expense of multilateral agreements under the World Trade Organization (WTO).^{51, 52} According to the WTO's Regional Trade Agreements Information System (RTA-IS), more than 260 RTAs were in force in 2013, up from less than 20 in 1990. This growth in RTAs can be traced to several factors, including the development of GVCs, geopolitical considerations, the rise in protectionist tendencies, the need to reduce trade and investment barriers, and the slow progress in the WTO Doha Round of trade negotiations after more than a decade.⁵³

Regionalism was an important early feature of this drive to expand and deepen economic integration, which began in the mid-1980s. Efforts started in the United States and Europe, but groups of South countries around the world established and strengthened their own regional groupings (WTO 2011).

During the 2000s, regionalism declined and a trend toward a broader geographical scope of RTAs began developing, especially for RTAs that are under negotiation

or were recently signed. The expansion of cross-regional RTAs may reflect the fact that many prospects for agreements within regions have already been exploited (Fiorentino, Touqueboeuf, and Verdeja 2007).

The increase in the number of RTAs has produced overlapping membership. Countries typically negotiate different trading terms in each RTA with every country (or group of countries), each agreement with its own loopholes, exceptions, and regulations. In turn, those countries negotiate their own agreements and exceptions with others, turning the geographical representation of these agreements into a "spaghetti bowl" (Bhagwati 1995, 2008).

The coexistence in a single country of different trade rules applying to different RTA partners is a common feature of the global economy. These multiple rules of origin, standards, and trade rules in overlapping RTAs raise transactions costs for business. Dealing with this multiplicity of rules may be particularly problematic for small and medium-size enterprises.

Countries in LAC have undergone sustained episodes of trade liberalization since the early 1990s, when the region began a process of unilateral, multilateral, and preferential trade reforms. Many countries have maintained relatively open trade regimes, particularly over the first decade of the 2000s. Although there is substantial heterogeneity in the institutional commitments in the region, under the aegis first of the General Agreement on Trade and Tariffs (GATT) and later of the WTO, most countries bounded their import tariffs.⁵⁴ Moreover, countries applied tariffs that were well below the bounded levels. In addition, numerous LAC countries gained market access for their exports and agreed to follow certain commercial policy disciplines embodied in RTAs.

The policy issues raised by these trade reforms are varied and complex; there is little consensus on the effects of the proliferation of this heterogeneous set of discriminatory trade agreements on world trade or economic growth.⁵⁵ One issue, discussed in box 2.3, is how LAC countries have managed their trade

BOX 2.3 Asymmetry in the use of temporary trade barriers

The increasingly complicated and overlapping array of multilateral agreements (including the World Trade Organization [WTO] membership) and preferential trade agreements may have constrained the conventional use of trade policy instruments, such as import tariffs, to respond to political-economic shocks. Policymakers in Latin America and the Caribbean (LAC) have been pressed to adjust to the changing patterns of exposure to external economic influences. LAC economies have faced the emergence of large South economies, especially China, with their hands tied, especially as political pressures emerged to protect certain industries.

Countries in the region have not responded to negative economic shocks with major trade policy reversals, at least not major increases in applied import tariffs. This response stands in contrast to earlier periods, when negative external shocks led to increases in import protection.⁵⁸ For most LAC countries, especially Brazil, Chile, Mexico, and Peru, the applied most-favored-nation (MFN) import tariffs (the nondiscriminatory tariffs that are offered to all WTO member countries with which a country does not have a preferential relationship) were higher in the early 1990s than they were in 2010.

How have LAC countries managed their trade policy in light of these changes and constraints? Simply because national tariff policies may no longer react countercyclically does not imply that trade policy is no longer responsive to transitory economic shocks.

A detailed study prepared for this report that draws on a new database reveals that LAC countries are still making frequent changes to their trade policies and that some of them have been consequential in the aggregate (Bown 2014). These trade policy changes encompass a relatively new (for these countries) set of policy instruments that are not typically captured by classical measures of tariff protection. In particular, since 1990 LAC countries have increasingly adopted temporary trade barrier (TTB) policies (a term coined by Bown 2012)—such as antidumping, countervailing, and safeguard duties—as instruments of protection.⁵⁹ TTBs are applied as additional import protection above the existing applied tariffs that would otherwise be due on imported products; they are often applied at rates exceeding 100 percent. These policy instruments are permitted under the rules of the General Agreement

on Trade and Tariffs (GATT)/WTO multilateral trading system; governments may use them to implement new import restrictions in response to certain types of economic shocks.⁶⁰

Although each individual act of import protection under TTB policies may be relatively small in scale—in that it may affect only a small group of imported products or a targeted set of trading partners—the cumulative use of such policies can become economically meaningful. Indeed, Bown (2011) shows that for the largest countries in LAC (including Brazil and Mexico), the trade coverage and frequency of use of these policies increasingly rivals the United States and countries in the European Union.^a Those countries have a much longer history of applying low rates of tariff protection overall and using TTB policies to manage their trade policy in order to ensure a continued level of relative openness in the face of political-economic shocks.

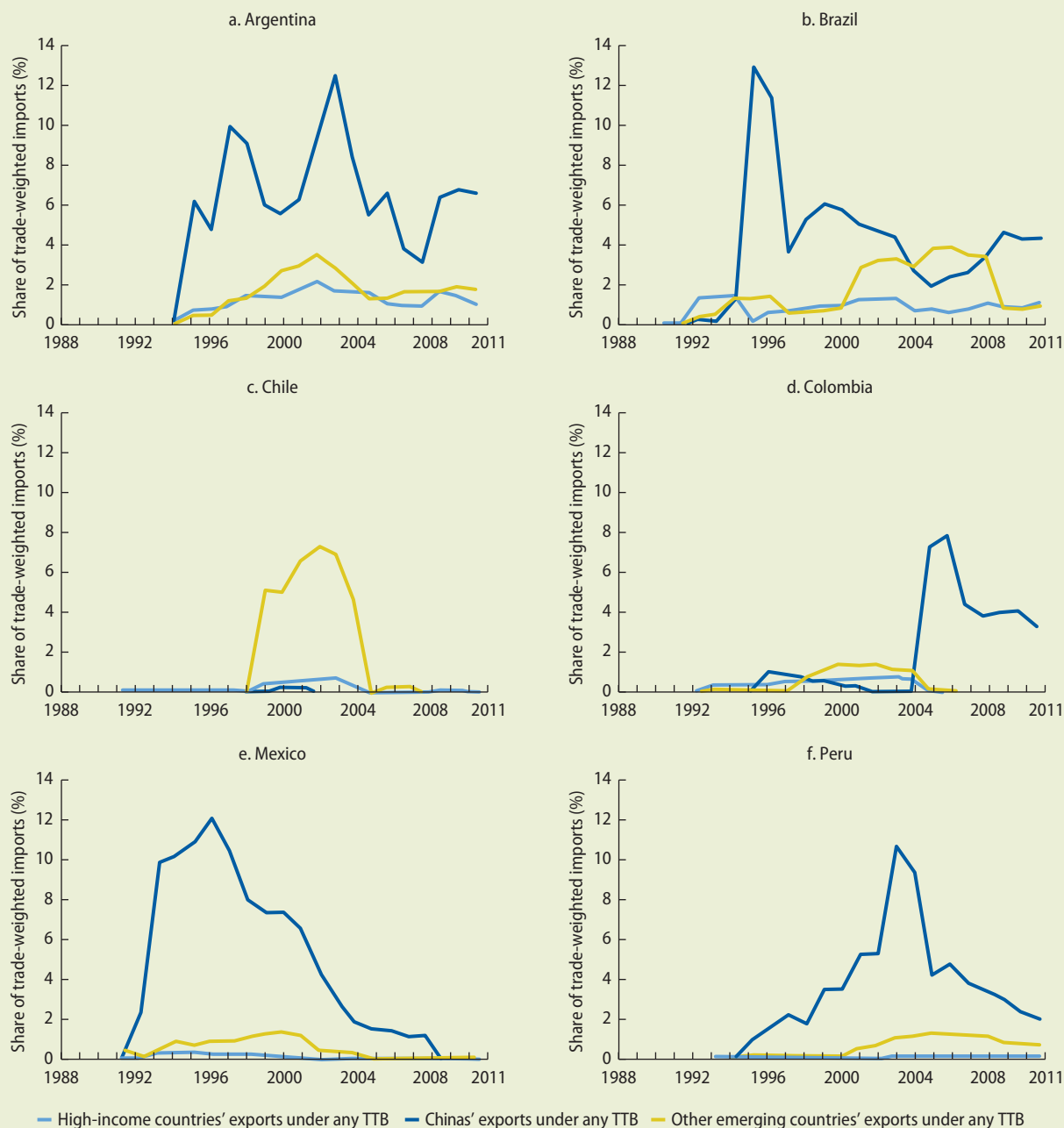
A key feature of TTBs is that they have a great capacity to be imposed in bilateral, or at least more targeted, ways. Indeed, LAC countries have used TTBs in an asymmetric way, targeting other South countries more than North countries. In fact, with the exception of Chile, they have disproportionately targeted imports from China with TTBs, though the use of these measures declined in the second half of the 2000s (figure B2.3.1). At its peak in 1993, Mexico imposed TTBs on nearly 45 percent of its imports from China.^b At their peaks, Peru imposed TTBs on 20 percent, Argentina and Brazil on almost 13 percent, and Colombia on almost 8 percent of imports from China. Even as late as 2011, Argentina imposed TTBs on nearly 7 percent, Brazil on more than 4 percent, and Colombia and Peru on more than 3 percent of imports from China. Although the number of such measures imposed on China appears to have been disproportionately high, the volume of trade affected by TTBs appears to have been low: LAC-imposed TTBs affected only 1.9 percent of China's exports to LAC countries in 2012.^c

These patterns are not specific to LAC. The use of TTBs has proliferated across South countries. More South countries had a significant share of their imports covered by TTBs in 2012 than in 1998. Notable examples of non-LAC South countries that increased their use of TTBs between 1990 and 2012 are China, India, Indonesia, and Turkey. South

(continued)

BOX 2.3 Asymmetry in the use of temporary trade barriers *(continued)*

FIGURE B2.3.1 Foreign targets of temporary trade barriers imposed by selected countries in Latin America and the Caribbean



Source: Bown 2014.

Note: Temporary trade barriers include antidumping measures, countervailing duties, global safeguards, and China-specific transitional safeguards. TTB = temporary trade barrier.

(continued)

BOX 2.3 Asymmetry in the use of temporary trade barriers (*continued*)

countries, including China and the Russian Federation, are also the major targets of TTBs, especially from other South countries. LAC countries are an exception to these trends, at least partially because of the nature of their exports (commodities are not frequently targeted with TTBs; the most targeted industries are steel, chemicals, and textiles/apparel).

Bown (2014) provides strong evidence that for a wide set of countries in LAC, increases in import protection through TTBs are associated with transitory aggregate shocks, even after controlling for important changes in the institutional environment

arising from the implementation of trade agreement commitments since the early 1990s. In particular, declines in domestic economic growth or increases in domestic unemployment rates, real exchange rate appreciations, and surges in bilateral import growth are associated with subsequent increases in import protection through these policy instruments. These patterns suggest not only that countercyclical import protection is still in use in LAC but also that the rise of the South in the global economy has had a significant impact on the use of trade policies in the region.

a. The study covers 11 LAC countries: Argentina, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, Jamaica, Mexico, Panama, and Peru.

b. Beginning in 1993, Mexico used antidumping measures against China to protect more than 20 percent of its imported product lines. These import restrictions remained in place until 2008, when they were removed. This share is smaller on a trade-weighted basis, because Mexico applied these import restrictions before it had significant imports of these products from China.

c. TTB statistics were constructed using the methodological approaches described in Bown (2011, 2013) applied to updated data provided in Bown (2012).

policy against the backdrop of these changes in the nature of trade agreements. The box suggests that there has been an asymmetry in the use of trade barriers imposed on North and South countries.

Have the RTAs negotiated by LAC countries been comprehensive enough to cover issues that most analysts believe are directly related to commercial policy disciplines and the international diffusion of knowledge and technology? In a background paper for this report, Wignaraja (2014) reviews the qualitative information of RTAs, examining whether the trade agreements in which LAC and EAP countries have participated are “comprehensive” in the sense of covering aspects that go well beyond traditional commercial policies. He assesses the scope and depth of RTAs in three key areas: the speed and coverage of tariff liberalization, the number of service sectors covered, and the coverage and depth of “new issues,” such as FDI, intellectual property rights, trade facilitation, and competition.⁵⁶

Overall, he finds that North-South RTAs are deeper and more comprehensive than South-South RTAs in several ways.⁵⁷ First, they generally differ in their tariff schedules:

North-South RTAs in Asia typically eliminate tariffs much more rapidly than South-South RTAs. For example, about 55 percent of North-South RTAs eliminated tariffs on trade in virtually all goods within two to five years of their entry into force. In contrast, only 23 percent of South-South RTAs did so. The majority of RTAs between EAP and LAC (15 of 22) in effect as of 2013 included relatively fast liberalization processes.

Second, North-South RTAs are more comprehensive than South-South RTAs in their liberalization of services sectors. About 73 percent of North-South RTAs in Asia are deemed comprehensive in covering at least five key services, and another 18 percent provide coverage of two to four key sectors. The remaining 9 percent have general provisions for liberalizing services and are in the process of negotiating their services commitments. North-South RTAs thus seem to have progressively liberalized the services sectors of their participants and provided for deeper regulatory cooperation in services. In contrast, South-South RTAs provide far less coverage of services, with 47 percent of all such RTAs either excluding or including only limited services sector coverage. About

36 percent of South-South RTAs provide some coverage; only 17 percent include comprehensive coverage.

RTAs between EAP and LAC appear to be more comprehensive than other South-South RTAs: about half of these agreements provide substantial coverage in services. The key service sectors covered in the majority of these RTAs are labor mobility and entry of business persons, which are probably included to promote two-way FDI flows and new business opportunities between the two regions. However, some subsectors of business, communications, transport, financial services, tourism, and education services are excluded from coverage of key obligations, such as national treatment, local presence, and market access. The LAC countries in these RTAs typically exclude from national treatment subsectors in tourism services, recreational services, and radio and television broadcast services. In contrast, Asian countries' exclusion lists consist mostly of subsectors in business, transport, distribution, and education services.

Last, North-South RTAs in Asia tend to favor deeper integration among their members. South-South RTAs lag in this regard, providing only traditional coverage of liberalization of trade in goods and services. More than half of North-South RTAs comprehensively cover four new areas (investment, competition policy, government procurement, and trade facilitation), and all North-South RTAs cover at least one area beyond trade liberalization. Examples of these deeper North-South RTAs include Japan's bilateral agreements with Indonesia, Mexico, the Philippines, Singapore, and Thailand. The coverage in South-South RTAs is much

more restricted, with only 13 percent covering these four areas. EAP-LAC RTAs follow the same trend. The prevailing approach of these RTAs to the deeper integration issues remains moderate. Some EAP-LAC RTAs adopt a somewhat cautious approach to liberalization of sensitive regulatory barriers in areas such as investment, competition, and government procurement, arguably reflecting the influence of domestic business interests and lobbies as well as geopolitical issues. Six agreements are classified as low-depth and 12 as medium-depth RTAs. Only four EAP-LAC RTAs are deemed to be of high depth: the Republic of Korea-Peru FTA (2011), the Trans-Pacific Strategic Economic Partnership Agreement (2006), the Australia-Chile FTA (2009), and the Singapore-Costa Rica FTA (2013). These RTAs share features with the best Asian RTAs, though they may still fall short in some key areas of deep integration.

Evaluation of these agreements suggests that progress has been made in using RTAs to reduce overall trade and regulatory barriers between EAP and LAC in particular and countries of the South more broadly, albeit to varying degrees. Goods and services are generally well covered; there has been much less progress in more difficult regulatory issues. More remains to be done to reduce residual barriers to trade in goods and services and to intensify deep integration between EAP and LAC. A one-size-fits-all good practice template of RTA provisions is difficult to develop, but the provisions in the four deep EAP-LAC agreements offer insights on good practices for future interregional RTAs, particularly on important issues such as investment, intellectual property rights, and competition.

Annex 2A

ANNEX TABLE 2A.1 Data description and sources

Variable	Description	Source
Growth in gross domestic product (GDP) per capita	Growth rate of GDP per capita based on real GDP per capita PPP measured in 2005 constant dollars	Penn World Table 7.1
Initial GDP per capita	GDP per capita measured in 2005 constant dollars PPP in first year of each five-year period	Penn World Table 7.1
Labor force education	Percentage of population older than 15 years that attained secondary or tertiary schooling	Updated database from Barro-Lee (2010)
Public infrastructure	Average number of telephone lines per capita	World Development Indicators
Terms of trade	Ratio of export unit value indexes to import unit value indexes, measured relative to base year (2000)	World Development Indicators
Trade openness	Sum of exports and imports, scaled by GDP	Penn World Table 7.1
Trade linkages with North or South countries	Sum of exports and imports with North or South countries, scaled by GDP	Penn World Table 7.1
Intraindustry trade (IIT)	Calculated using the Grubel and Lloyd (1975) methodology; degree of IIT ranges from 0 (pure interindustry trade) to 1 (pure intraindustry trade)	Calculations based on two-digit Standard International Trade Classification (SITC) Revision 2 data of Feenstra and others (2005), updated with Comtrade data
Classification of traded goods based on factor intensity	Calculated using the definition of Hinloopen and van Marrewijk (2001). Traded goods are classified into five categories: primary products, natural resource-intensive manufactures, unskilled labor-intensive goods, skilled labor-intensive goods, and high-technology-intensive goods. Shares of traded goods in each category are calculated based on both exports and imports.	Calculations based on three-digit SITC Revision 2 data of Feenstra and others (2005), updated with Comtrade data
Classification of traded goods based on technology intensity	Calculated using the definition of Lall (2000). Traded goods are classified into five categories: primary products, natural resource-intensive manufactures, low-technology-intensive goods, medium-technology-intensive goods, and high-technology-intensive goods. Shares of traded goods in each category are calculated based on both exports and imports.	Calculations based on three-digit SITC Revision 2 data of Feenstra and others (2005), updated with Comtrade data
Degree of upstreamness of exports	Calculated using the upstreamness measure presented in Antràs and others (2012) for the United States. This measure is applied to the basket of exported goods of every country in the sample. Goods are divided into three categories based on their degree of upstreamness: beginning of global value chains (GVCs) (exports of primary products), middle of GVCs (exports of intermediate goods), and end of GVCs (exports of final goods).	Calculations based on four-digit SITC Revision 2 data of Feenstra and others (2005), updated with Comtrade data
Share of trade with top three main trading partners	Calculated as share of country's exports and imports with top three trading partners (partners with largest value of bilateral total trade in a given year)	Calculations based on DOTS
Share of trade with three most central countries in the global trade network	Calculated as share of a country's exports and imports with three most central countries in the global trade network—the countries with the highest values of the random walk betweenness centrality measure developed by Newman (2005) and Fisher and Vega-Redondo (2006). This classification is made for every year in the sample period.	Calculations based on DOTS
Share of trade with core and inner-periphery countries	Calculated as share of a country's exports and imports with countries in the core and in the inner periphery of the global trade network. Core countries are countries ranked in the top 5 percent of the cross-country ranking given by the random walk betweenness centrality measure developed by Newman (2005) and Fisher and Vega-Redondo (2006). Inner-periphery countries are those ranked between percentiles 70 and 95. This classification is made separately every year in the sample period.	Calculations based on DOTS

(continued)

ANNEX TABLE 2A.1 Data description and sources (continued)

Variable	Description	Source
Participation in global value chains (GVCs)	Calculated as the ratio of trade in three major GVCs to total trade. The three major GVCs are apparel and footwear, electronics, and automobiles and motorcycles and are defined as in Sturgeon and Memevodic (2010).	Calculations based on Broad Economic Categories (BEC) SITC Revision 1 classification
Participation in GVCs: Share of intermediate goods traded and share of final goods traded	The share of intermediate goods traded is calculated as the ratio of intermediate goods traded to total trade in the three major GVCs. Analogously, share of final goods traded is calculated as the ratio of intermediate goods traded to total trade in the three major GVCs. The share of intermediate plus final goods traded sum to 100 percent. The three major GVCs are apparel and footwear, electronics, and automobiles and motorcycles and are defined as in Sturgeon and Memevodic (2010). This ratio is calculated separately for GVC trade with core and inner periphery countries.	Calculations based on BEC SITC Revision 1 classification

Notes

- Theoretical papers that emphasize the channels through which trade affects growth include Arrow (1962); Vernon (1966); Krugman (1979); Helpman and Krugman (1985); Romer (1990, 1993); Grossman and Helpman (1991a); Rivera-Batiz and Romer (1991); Matsuyama (1992); Eaton and Kortum (1999); and Hummels and Klenow (2005).
- Seminal papers on the efficiency gains from trade include Ricardo (1817), Heckscher (1919), and Ohlin (1933). On economies of scale and externality, see, for example, Marshall (1879, 1890); Caballero and Lyons (1990, 1992); Chan, Chen, and Cheung (1995); and Segoura (1998). On product diversity, see, for example, Dixit and Stiglitz (1977), Krugman (1980), Lancaster (1990), and Romer (1990).
- For instance, Armington's (1969) models emphasize the intensive margin, whereas monopolistic competition models (for example, Krugman 1981) focus on the extensive margin and vertical differentiation on the quality margin (for example, Flam and Helpman 1987; Grossman and Helpman 1991b).
- See, for example, Fernandes and Paunov (2009) for evidence for Chile and Iacovone and Javorcik (2008) for evidence for Mexico.
- Nickell (1996), Thoenig and Verdier (2003), Ederington and McCalman (2008), Bustos (2011), and Bastos and Straume (2012), among others, explore the positive effects of innovation. Miyagiwa and Ohno (1997), Matsubara (2005), and Dhingra (2013), among others, discuss the "Schumpeterian" effect. Aghion and others (2005) find an inverted U-shape relationship between competition and innovation by considering counteracting "escape competition" effects versus "Schumpeterian" effects on innovation depending on firm or industry distance to the technological frontier.
- There is some debate over whether (and under what conditions) these procompetitive gains from trade are positive. Models with variable markups have yielded contradicting predictions. For recent discussions of these procompetitive effects of trade, see, for example, Arkolakis and others (2012) and Edmond, Midrigan, and Xu (2013).
- Using a foreign intermediate good in the production of a final output involves the implicit usage of the technology of that good in embodied form. There is a spillover in this process of international technology diffusion to the extent that the intermediate good costs less than its opportunity costs, which include the research and development costs of product development. See, for example, Grossman and Helpman (1991b), Rivera-Batiz and Romer (1991), and Eaton and Kortum (2002). Keller (2004) provides a survey of the channels through which technologies can diffuse from one country to another. See also Goldberg and others (2010) and references therein for a discussion and some empirical evidence on how changes in product mix represent a potentially important channel through which resources are reallocated from less to more efficient uses following trade shocks.
- Grossman and Helpman (1991c) provide a theoretical framework in which knowledge accumulation by domestic industrial agents

- depends on the extent of contact with their foreign counterparts and thus on their levels of commercial exchange with foreign firms, so that the evolutions of comparative advantage and technological progress are interlinked and jointly determined. See also Lucas (1988); Young (1993); Keesing and Lall (1992); Blundell, Griffith, and Van Reenen (1995); Piore and Ruiz Durán (1998); Clerides, Lach, and Tybout (1998); Gereffi (1999); and Castellani (2002), among many others.
9. See, for example, Easterly and Levine (2001); Kose, Prasad, and Terrones (2004); Broner, Martin, and Ventura (2006); Giovanni and Levchenko (2012); Kose and others (2009); and Loayza and Raddatz (2007), among many others.
 10. Papers on trade and income include Irwin and Tervio (2002); Alcalá and Ciccone (2004); Rodrik, Subramanian, and Trebbi (2004); Felbermayr (2005); Noguera and Siscart (2005); and Dufrenot, Mignon, and Tsangarides (2010). Papers on trade and growth include Dollar (1992), Edwards (1992), Jones (2000), Rodríguez and Rodrik (2001), Wacziarg (2001), Easterly and Levine (2001), Dollar and Kraay (2003), and Lee, Ricci, and Rigobon (2004). Singh (2010) provides a review of this literature.
 11. This result is consistent with the empirical literature. Studies typically find a lack of statistical significance, or even a negative coefficient, on the variable capturing the level of human capital development (see, for example, De Gregorio 1992; Benhabib and Spiegel 1994; Islam 1995; Caselli, Esquivel, and Lefort 1996; and Pritchett 2000).
 12. For a broad discussion of the links between commodities and economic growth and development in Latin America, see Sinnott, Nash, and De la Torre (2010).
 13. There are several caveats to the externalities argument. One is that expanding a sector with potential externalities does not necessarily imply that those externalities will automatically occur if the sector is not organized appropriately (Baldwin 1969). Another is that if one country can explore an externality in a good, so can others. If this is the case, then the supply of that good will already have expanded and prices fallen to the point where the benefit of the externality will have been completely offset (Rodríguez-Clare 2010). This argument is mitigated somewhat in the case of interindustry externalities. See Harrison and Rodríguez-Clare (2010) for a review of the literature.
 14. Hausmann, Hwang, and Rodrik (2007) develop an index of complexity (based on the basket of goods that higher-income countries typically export) to rank countries' export baskets. They find a statistically significant association between complexity and growth: countries whose export baskets rank high on their complexity index tend to grow more rapidly.
 15. This point of view questions the tendency to attribute special growth-enhancing virtues to certain type of goods (say, high-tech manufactures) over others (say, mineral commodities or services). In fact, Lederman and Maloney (2012) provide evidence against the natural resource curse. They argue that institutions and policies mediate whether natural resources turn into a blessing or a curse. When adequate, institutions and policies can help maximize the dynamic upsides and minimize the dynamic downsides of natural resources. It is these underlying fundamentals, rather than the products themselves, that help explain the contrast between, say, oil-rich Venezuela, which is trapped in rent-seeking dynamics, and mineral-rich yet prosperous Australia.
 16. A classification of goods at the two-digit Standard International Trade Classification (SITC) industry level is adopted. The IIT measure based on this broad industry classification captures the effects of trade of related but different goods rather than trade of products with some degree of horizontal differentiation, which would be captured by a more narrow definition of IIT at the four- or six-digit level. This broader classification is more indicative of possible technology diffusion and learning spillovers than a narrower one, which can be associated with the love for variety, as in Krugman (1979). For example, "optical glass and elements of optical glass" and "glass mirrors, unframed, framed" belong to the same two-digit SITC category (industry code 66, "nonmetallic mineral manufactures") but are not in the same four-digit SITC category (the former is classified as industry code 6642, the latter as industry code 6648).
 17. See, for example, Helpman and Krugman (1985, 1989); Bernstein and Nadiri (1989); and Badinger and Egger (2008).

18. The impact of trade openness and IIT on income growth reflects the net effects of larger markets, competition, technology diffusion and learning spillovers, and volatility, as discussed in the previous section.
19. The underlying regression specification includes both simple and quadratic interaction terms; the same approach is taken throughout this chapter, as indicated in box 2.1. Therefore, the total growth impact shown in the figures in this chapter accounts for the effects of both the interaction terms and the openness variable itself, taking as given the initial level of income and the remaining explanatory variables.
20. Several theoretical papers—including Ethier (1982), Sanyal and Jones (1982), Jones and Kierzkowski (1990), Lüthje (2003), Yi (2003), Burda and Dluhosch (2002), Grossman and Rossi-Hansberg (2008), and Baldwin and Robert-Nicoud (2014)—analyze the underpinnings of the fragmentation of productions.
21. See, for example, Hanson, Mataloni, and Slaughter (2005); Harrison and McMillan (2011); and Becker and Muendler (2010).
22. Baldwin (2012b) argues that since 1985, managerial and technical know-how have become more mobile as offshore stages of production need to seamlessly merge into onshore ones. Hence countries have been able to industrialize by joining GVCs rather than by building entire supply chains at home.
23. Several papers document this structural break in global trade. See Feenstra (1998); Hummels, Ishii, and Yi (2001); Brühlhart (2009); Johnson and Noguera (2012); and Koopman, Wang, and Wei (2014), among many others.
24. Trade in intermediate goods is far from an ideal measure of GVC participation; it is indicative only of participation in GVCs, as fragmented production processes require that parts and components cross borders—sometimes more than once—before finished goods are shipped to final markets. As such, GVCs can expand without significant growth in intermediate goods trade, as trade statistics do not contain information about trade in services or the ownership of assets.
25. Changes in the relative prices of intermediate goods can also affect the ratio. If prices of intermediates increase more slowly than prices of other goods, the ratio may decrease.
26. Lead firms (typically multinational corporations) are firms that control and define the main activities of individual GVCs. The other participants in GVCs are supplier companies, which produce goods and services used at different stages of the production chain.
27. The dynamics of the interplay of power among the participants in GVCs determines the allocation of profits and risks along the production chain. Lead firms, such as large multinational corporations, have greater market power, as a result of product differentiation and branding. The fierce competition across firms (located even in different countries) for a place in GVCs may give even more bargaining power to these lead firms, leaving other participants in the chain with little leverage. Of course, the balance of bargaining power across participants varies with the specific organization of individual GVCs. In building these international production chains, lead firms decide not only about location but also about the governance structure of these chains, varying from ownership (through FDI) to no control through arms-length trade or licensing and including everything in between. The bargaining power of different parts of the GVC varies with these arrangements (see, for example, Gereffi, Humphrey, and Sturgeon 2005). Timmer and others (2014) argue that in most GVCs, there is a strong tendency for value to be added by capital and high-skilled labor rather than by less-skilled labor. They claim that North economies increasingly specialize in activities carried out by high-skilled workers.
28. See, for example, Lall (2000), Humphrey and Schmitz (2002), and Narula and Dunning (2010).
29. See, for example, Forrester (1961); Escaith, Lindenberg, and Miroudot (2010); Alessandria, Kaboski, and Midrigan (2011); and Altomonte and others (2012).
30. During the 2008 global financial crisis, lead firms and large intermediaries within GVCs provided some support to smaller firms to mitigate the impact of the crisis. For example, some retailers and buyers in the apparel sector offered financial support to their suppliers (Frederick and Gereffi 2011).
31. For example, Acer subsidiaries in Taiwan, China, successfully applied knowledge learned from one part of their production process to supply customers in other markets. In contrast, very few firms in Mexico have been able to use their links to automotive GVCs to internalize technology (UNCTAD 2013).

32. The literature also discusses the concept of social upgrading, which refers to improvements within a firm in employment conditions, including remuneration, worker rights and benefits, and workplace safety. The extent of social upgrading is tightly linked to the extent of economic upgrading, but other institutional factors also affect it (see, for example, Barrientos, Gereffi, and Rossi 2011).
33. In food GVCs, for example, large manufacturers and supermarkets have generally worked with a small group of large-scale suppliers that are capable of meeting their stringent and costly requirements to ensure food safety and quality at all stages of the production chain. Small farms, typically unable to comply with the rigorous standards and lacking the required skills, often find themselves outside these chains (Dolan and Humphrey 2004; Maertens and Swinnen 2009). Higher standards have also spurred participation, however, with some firms developing niche markets for organic products, for example (Humphrey 2008).
34. Relative price effects can partly explain these trends.
35. For a detailed analysis of China's upgrading strategy, see, for example, Lall and Albaladejo (2004) and Rodrik (2006).
36. These categories of upgrading are important, because buyers typically have their own interests to protect and thus are generally interested in limiting the upgrading path of their suppliers. In the furniture global value chain, for example, large global buyers such as Ikea encourage process upgrading by their suppliers that reduces costs, but they zealously guard the design and branding functions (Kaplinsky, Morris, and Readman 2002).
37. For example, Costinot, Vogel, and Wang (2012) develop a model in which the position of workers on production chains affects the degree of wage inequality. Lopez-Gonzalez and Holmes (2011) provide empirical evidence of a hump-shaped relation between backward supply chains and per capita income. As countries get richer, they tend to use more intensively imported intermediate inputs to export up to a certain threshold, after which they diminish the imported content of their exports. In contrast, a *U*-shaped relation is observed for forward supply chains: after a certain per capita income threshold, countries tend to supply more parts.
38. This approach provides a more detailed and accurate description of countries' participation in GVCs than the share of intermediate goods in exports. It is more difficult to use, however, because data are available for a much shorter time period (typically only the 1990s and the 2000s) and it requires input-output matrices at the country level.
39. This database is derived from the EORA global multiregion input-output table (World MRIO). It uses many data sources, interpolating and estimating missing data points, to provide broad, consistent coverage of value added trade data for about 180 countries from 1990 to 2011. For a detailed description of this database, see, for example, Lenzen and others (2012, 2013) and UNCTAD (2013).
40. Maloney and Valencia Caicedo (2014) provide an interesting discussion of innovative capacities based on historical examples contrasting the experiences of the United States and Latin America.
41. Alvarez, Buera, and Lucas (2013) adopt a similar concept, in which the flow of ideas is an engine of economic growth. In their model, trade serves as a vehicle for technology diffusion and learning spillovers and hence can lead to increased economic growth.
42. The random walk betweenness centrality measure is used to rank countries. This measure is widely used in network analysis and has been applied to global trade and financial networks. See, for example, Newman (2005); Fisher and Vega-Redondo (2006); and Reyes, Garcia, and Lattimore (2009).
43. The relevance of the quality of transport networks for the trade and growth dynamics would ideally be assessed with the regression framework adopted throughout this chapter. However, lack of data constrains such analysis, as most indicators are available only since the 1990s at best and only for the 2000s in most cases. This section therefore presents a more qualitative assessment.
44. The literature provides some evidence that domestic trading costs and the economic business environment are significant determinants of the volume of trade between countries. See, for example, Limao and Venables (2001); Wilson, Mann, and Otsuki (2003); Anderson and Marcouiller (2002); and Hoekman and Nicita (2011).
45. These infrastructure services, especially data and telecommunication services, may also

- play a role as enablers and facilitators of knowledge exchange. As transmission costs have declined and speeds soared over the past decade, the methods and mechanisms for transmitting data and communicating have also proliferated. Mobile money and mobile agriculture are examples of mobile technology applications developed and consumed especially in the South.
46. Data on the quality of road and railway infrastructure are from the World Economic Forum's *Global Competitiveness Report* (2013–14) (Schwab and Sala-i-Martin 2013). Data on road and railway density are from the World Bank's World Development Indicators.
 47. The Liner Shipping Connectivity Index (LSCI) captures countries' level of integration in the liner shipping network. Liner shipping is typically used for general cargo on fixed trade routes and on fixed timetables. The higher the index, the easier it is to access a high-capacity and high-frequency global maritime freight transport system.
 48. For discussions of access to liner shipping and port infrastructure in LAC, see, for example, Clark, Dollar, and Micco (2004); Morales Sarrineria and others (2013); Wilmsmeier (2014); and ECLAC (2014).
 49. Evans and Harrigan (2005) provide some evidence that the growing importance of speed in shipping to final markets has led to a resourcing of U.S. imports from Asia to Mexico and the Caribbean.
 50. About two-thirds (in weight) of all air cargo in LAC travels by passenger aircraft. Air cargo statistics may therefore underestimate the importance of air transport for the cross-border flows of goods.
 51. For details on the debate on regionalism and multilateralism, see, for example, Plummer (2007), Bhagwati (2008), and WTO (2011).
 52. According to the WTO, RTAs are reciprocal trade agreements between two or more partners not necessarily belonging to the same geographical region; preferential trade agreements (PTAs) involve unilateral trade preferences. RTAs include free trade agreements (FTAs) and customs unions. PTAs include the European Union's Generalized Scheme of Preferences, nonreciprocal preferential schemes for products from least developed countries only, and other nonreciprocal preferential schemes that have been granted a waiver by the General Council, such as the Africa Growth and Opportunity Act (AGOA) and the Caribbean-Canada Trade Agreement (CARIBCAN). This section refers to trade agreements broadly as RTAs, though it covers some PTAs as well.
 53. See, for example, ADB and IDB (2009); WTO (2011); ADB, IDB, and ADBI (2012); and Kawai and Wignaraja (2013).
 54. For example, Argentina, Brazil, Paraguay, and Uruguay initially undertook deeper ties by creating first a free trade area and then the Mercosur customs union in the early 1990s. Mexico undertook trade liberalization by initially joining the GATT in 1986 before freeing trade with high-income partners through formation of the North American Free Trade Agreement (NAFTA). Chile, Colombia, Peru, and several Central American countries created regional preferential trade areas and signed agreements with the United States, among others.
 55. See, for example, Cernat (2001); Venables (2003); Carrère (2006); Baier, Bergstrand, and Vidal (2007); and Baldwin (2008).
 56. The vast majority of the agreements analyzed in this subsection are FTAs. For a list of the agreements studied, see Wignaraja and Lazaro (2010) and Wignaraja (2014).
 57. The definition of North in this subsection is slightly different from the definition in the rest of the report. North-South RTAs have at least one developed country member, such as Japan, the United States, the European Union, Australia, New Zealand, or members of the European Free Trade Association (EFTA).
 58. Some pressures have arisen through acute economic shocks, such as the contagion triggered by the 2008 global financial crisis. Others have emerged from continued exposure to longer-term trends, such as the sustained increases in global commodity prices and China's continued export expansion and global dominance in manufacturing.
 59. These import taxes are in principle imposed on a temporary basis to help economies deal with import surges (safeguards), import surges associated with cheap imports priced at below cost by foreign exporting firms (antidumping duties), or cheap imports associated with subsidies by foreign governments (countervailing duties).
 60. For example, domestic governments are charged with conducting investigations and verifying evidence of injury on firms of an import-competing domestic injury caused by increases

in imports that have either been sold at a low price (antidumping), subsidized (countervailing duties), or are simply surging (safeguards).

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Big Emerging Markets, Big Labor Market Dislocations?

3

The evidence presented in this chapter indicates that the ongoing restructuring of the global economy has affected labor markets in Latin America and the Caribbean (LAC) in various ways. Labor market adjustments triggered by the rise of the South depend on differences in the composition of import and export baskets of new economic heavyweights versus traditional ones (such as the United States, Japan, and European countries), and the similarity of trade structures between emerging market and LAC economies affects the adjustments. Of all emerging markets, China stands out as a particularly apparent force in the process of global restructuring, with asymmetric consequences across industries. Specifically, the rise of China embodies both supply and demand shocks. The former reduced the prices of manufactures, the latter raised commodity prices. Frictions in LAC labor markets probably resulted in large and long adjustments—but not necessarily in substantial long-term changes in wages and employment. Economies in which manufacturing employed large shares of the workforce likely faced adjustments that resulted in lower economywide real wages or reductions in labor force participation even in the long run as a consequence of the rise of China.

One of the main features of the rise of large developing economies in global markets is that their economic structures differ from Northern economies' (chapter 1 highlights trends in global market shares in agriculture, mining, and manufacturing). The biggest newcomer in the early 21st century is China, which has become the world's largest exporter of manufactured products as well as one of the world's largest importers of agricultural and mining products. In contrast, as this chapter shows, the United States tends to be a large net importer of manufactured goods, a relatively large exporter of agricultural goods, and a modest importer of mining

products. Among the large global economies, Japan's trade structure is perhaps most similar to China's, although its share of global manufacturing is declining. The European Union (with its 25 members) has trade structures that are similar to the United States.

From the viewpoint of Latin American and Caribbean (LAC) economies, what matters most are changes in giants' global market shares across industries, as the size of economic "shocks" faced by a given industry in a given (relatively small and open) economy will be proportional to the change in large economies' global market share. Put another way, developing countries adjust to changes

in the structure of the global economy rather than to the levels of market shares.

Given the above, we are interested in studying how changes in the structure of the global economy have been associated with asymmetric changes across markets for different types of goods. Such an analysis is relevant because the global demand for and supply of various products likely changes the relative demand for labor across industries. If this is the case, the labor market implications for LAC could be substantial, as some industries will shrink while others expand.

Chapter 2 reviews potential growth effects of the structure (or quality) of exports associated with South-South versus North-North trade. It suggests that LAC's bilateral trade with the South is less pro-growth than its bilateral trade with the North, though there is significant heterogeneity across countries in the region. New research by Bown (2014) reviewed in chapter 2 suggests that LAC governments have tended to impose temporary trade barriers (such as antidumping, countervailing, and safeguard duties) against China and other emerging markets, particularly when rising foreign competition seems to have affected domestic labor markets. Real exchange rate appreciation, which may also have affected manufacturing industries, could also have provided impetus for the imposition of such trade restrictions.

This chapter examines how changes in the structure of global markets affect domestic labor markets in LAC in five steps. First, it documents trends in global market shares (for imports and exports) of selected emerging markets, including China as well as other major economies from the North and South, in manufacturing, agriculture, and mining.

Second, it analyzes similarities and differences between the structure of exports in LAC and the major global players from both the North and the South, emphasizing exports of manufactures. The evidence suggests that some LAC countries have export structures that are similar to those of China and other major global economies, whereas others are quite dissimilar. A key question is the size of the economic shocks emanating from the restructuring of global markets

given the similarity of trade in LAC and China. Indexes of the impact of China's importance in global manufactures, agriculture, and mining markets on a large sample of LAC countries reveal heterogeneous impacts on exports within the region. It is therefore likely that the impacts of the rise of China in global markets on domestic labor markets also differ within LAC.

Third, the chapter examines trends in the employment shares of formal and informal manufacturing sectors in Argentina, Brazil, and Mexico to provide insight into the employment structure of LAC economies. The data suggest that in these economies the share of manufacturing employment—especially formal employment—has declined since about 2000. The drop in the share of formal manufacturing employment was most apparent in Mexico, one of the countries most severely hit by the rise of China. The descriptive evidence suggests that the impact of China was greatest in LAC labor markets in which the trade effects from China were largest.

Fourth, the chapter presents the results of an empirical analysis commissioned for this report on the impact of the rise of China on LAC labor markets since 2001, when China surged onto the global stage after joining the World Trade Organization (WTO). The focus is on China because it has been the most important South economy in the restructuring of the global economy. This part of the chapter studies the labor market adjustment paths of Argentina, Brazil, and Mexico.¹ The results, provided by Artuç, Lederman, and Rojas (2015), indicate that the impact of China was substantial in the short run but modest in the long run; labor market frictions increased the short-run pain of the adjustment for workers, but the opposing impacts of China through exports (of manufactures) and imports (of agriculture and mining) tended to cancel each other out in the long run, at least in Argentina and Brazil. Mexico probably fared a bit worse: the model estimates suggest that the negative effects on labor demand in manufacturing were too large to be compensated for by the relatively small effects on labor demand in agriculture and mining.

Last, the chapter speculates on the potential impact of labor market adjustments on the income of LAC households in the bottom 40 percent of the income distribution. It does so by discussing the “intensity” of each sector’s use of workers that belonged to households in the bottom 40 percent of the distribution. Agriculture appears to employ a relatively larger share of workers from the bottom 40 percent than mining or manufacturing. Hence to the extent that China’s rising demand for agricultural commodities was strong, the resulting adjustments may have worked in favor of the bottom 40 percent, particularly in countries such as Argentina and Brazil.

In addition to summarizing the main findings, the chapter’s conclusion draws on Ribe, Robalino, and Walker (2010) and Hollweg and others (2014) to suggest that it may be worthwhile for policymakers to think about how social protection policies can help reduce labor market adjustment costs when economies face long-lasting structural changes emanating from the permanent reconfiguration of the global economy.

The rise of the South and the restructuring of global markets in manufacturing, agriculture, and mining

It cannot be overstated that the economic impact of the restructuring of the global economy through trade flows has differed across sectors. Chapter 1 documents such trends by examining changes in global export and import shares across groups of countries and China. This chapter takes a closer look at the role of large economies’ weight in global trade flows in the manufacturing, agriculture, and mining sectors.

Figure 3.1 shows the evolution of global export shares for China, the Republic of Korea, and the Russian Federation on the one hand and the United States, Japan, and the European Union on the other. These figures largely confirm the central tenet of this report—that since 2000 large emerging markets have risen in importance in global markets while the weight of the North has declined.²

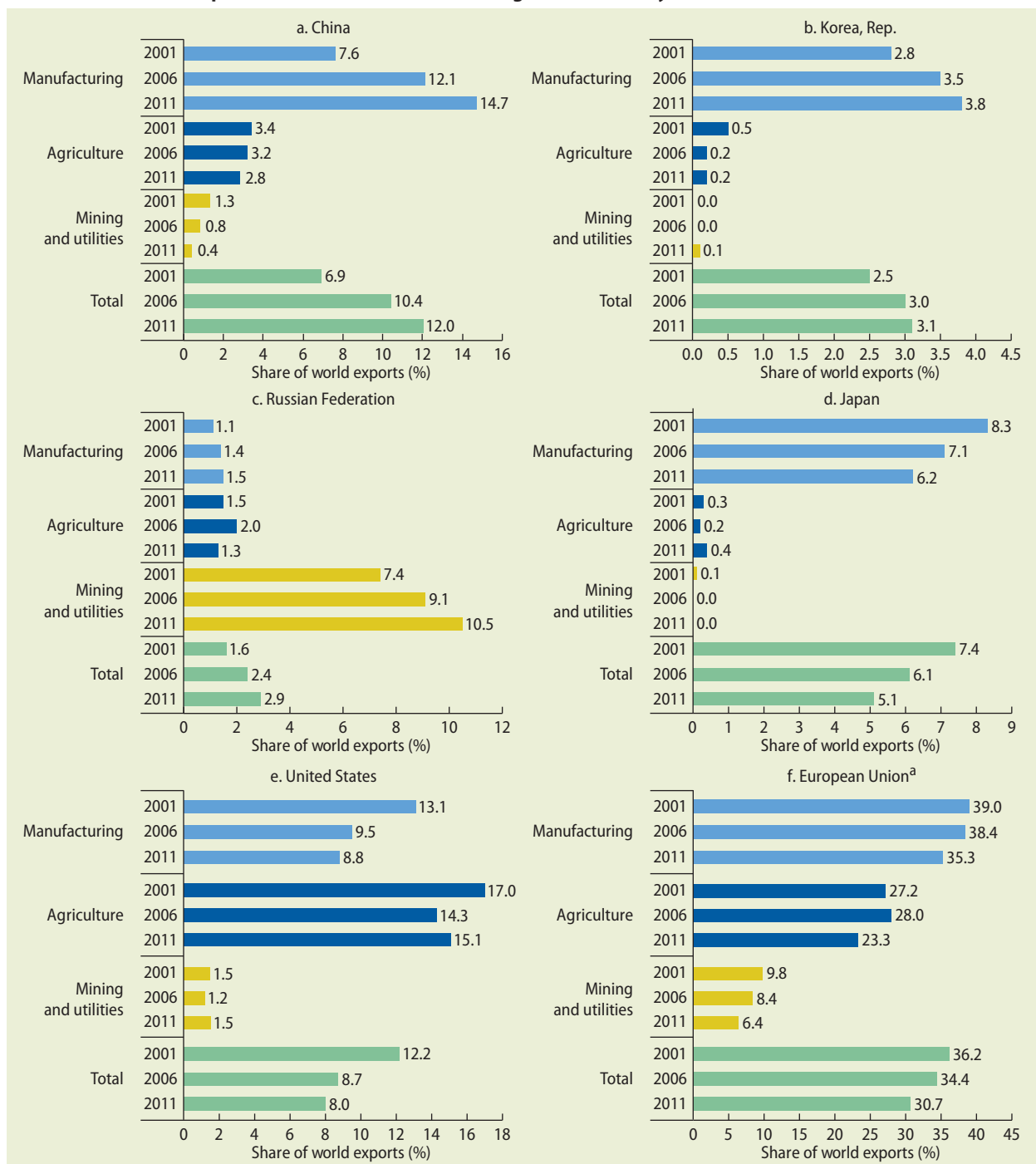
China played the leading role in the process of global economic restructuring. Its share of global manufacturing exports rose from 7.6 percent in 2001 to 14.7 percent in 2011. This epic increase was accompanied by its increased appetite for commodities (that is, decreasing export shares) as well as declines in the export shares of agriculture and mining (including energy). China’s share of world exports for all sectors rose from 6.9 percent in 2001 to slightly more than 12 percent in 2011. Exports of manufactured products from Korea also grew, albeit on a smaller scale than China’s, rising from 2.8 percent of global exports of manufactures in 2001 to 3.8 percent in 2011. Similar to the case for China, its share of commodities exports declined, and its share of total global exports rose, from 2.5 percent to 3.1 percent.

In contrast, Russia’s rise in global markets exhibited different patterns. Its natural resource wealth enabled it to gain global market share in mining and energy, increasing its global share of exports in this sector from 7.4 percent in 2001 to 10.5 percent in 2011. Unlike in China and Korea, the share of manufacturing (and agricultural) exports remained stagnant during this period. Hence, the rise of the South appears to have affected different industries differently, depending on the size and endowments of the emerging markets themselves.

The global trade structure of North (or high-income) economies greatly differs from that of emerging markets. Indeed, in contrast to China, Korea, and Russia, the United States experienced a dramatic decline in its share of global manufacturing exports, from more than 13 percent in 2001 to less than 9 percent in 2011 (see figure 3.1). Japan’s share of global manufactures exports also declined, from 8.3 percent to 6.2 percent, during this period, while the European Union’s share fell from 39 percent to less than 36 percent. As their performance in commodity sectors did not compensate for the drop in manufactured product exports, all three economic powerhouses experienced declines in their shares of total global exports.

On the demand side, as on the supply side, China appears to be a central

FIGURE 3.1 Global export market shares of selected large economies, by sector, 2001, 2006, and 2011



Source: Calculations based on data from World Integrated Trade Solution (WITS)/Comtrade.
 Note: Sectoral classification of trade flows is based on the International Standard Industrial Classification (ISIC), Revision 3. The agriculture sector corresponds to ISIC codes 0111–0500, mining to ISIC codes 1010–1429, and manufacturing to ISIC codes 1511–3699.
 a. The European Union includes 25 member countries.

player (figure 3.2). Its global share of agricultural imports rose from 4.7 percent in 2001 to 13.2 percent in 2011. Its share of global imports of mining and energy rose even more dramatically, from 3.4 percent to 15.3 percent. Korea did not come close to China in importance, as its global share of imports remained virtually unchanged across the three broad industries. For its part, Russia increased its share of global manufacturing imports (from about 0.7 percent in 2001 to more than 1.9 percent in 2011) and of agricultural imports (from 1.3 percent to 2.9 percent over the same period).

In the high-income North, the United States and Japan have been the mirror image of China: their agriculture and mining import shares have fallen as China's have risen. In contrast, the European Union's global import shares have remained roughly constant across the three broad industries.

Overall, the story of the global restructuring across industries is clear. The increasing weight of China in particular has had asymmetric consequences for different sectors. The rise of China—and to a smaller extent Korea—flooded global markets for manufactured products and increased imports of agricultural and mining commodities.

It is likely that the effect on workers has also varied across sectors. Labor markets in countries with manufacturing trade structures similar to that of China have probably been more severely affected, as China poses a direct threat to the competitiveness of major manufacturing exports.

A closer look at manufactures exports and the role of China through the lens of export similarity

Figure 3.3 presents data on the evolution of similarity between manufactured product exports of Latin American economies and various large economies (from North and South) as well as the world as a whole. To ease exposition, the panels focus on Argentina, Brazil, and Mexico.³ These three countries cover the spectrum of trade structures in the region in terms of exposure, particularly to

the rise of China. The export similarity index, first proposed by Finger and Kreinin (1979), has been widely used in the international trade literature.⁴ It measures the percentage of a country's export basket of products that is also exported by another country.

Argentina's export structure is least similar to that of China and most similar to that of the European Union (followed closely by the world as a whole). Brazil is only slightly different from Argentina. Indeed, only roughly 30 percent of its manufacturing exports coincided with exports from China over the whole period (versus about 20 percent in Argentina). Like Argentina, Brazil is most similar to the European Union, with about 60 percent of its exports also exported by the European Union. South Africa and the United States are also similar to Brazil in terms of export structure.

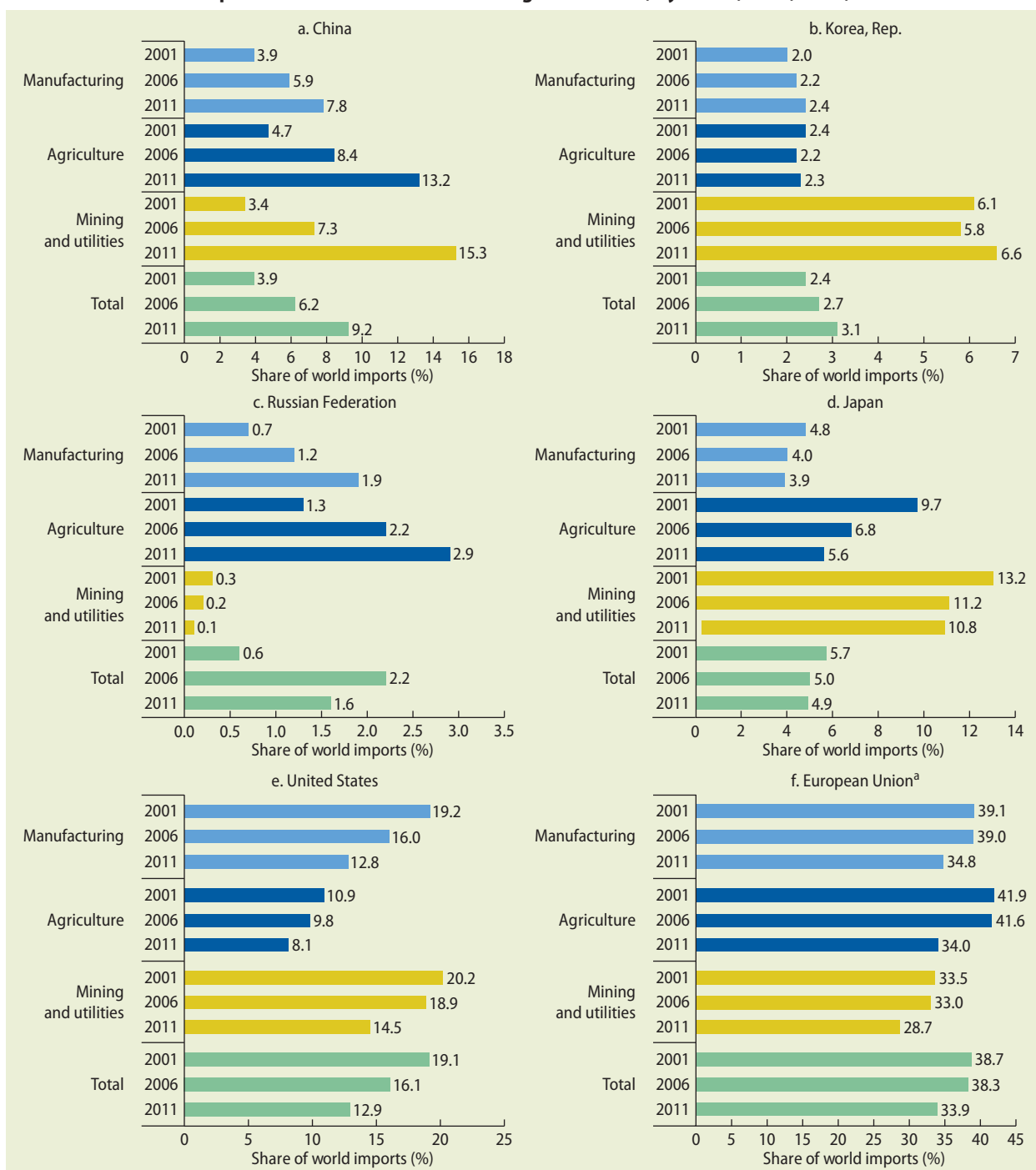
Mexico, in contrast, is quite different: about 55 percent of its manufacturing exports are also exported by China, a level only slightly below that of Japan (and the world). The large commodity exporters from the developing world (namely, Russia and South Africa) appear to be the most dissimilar to Mexico in terms of export structure.

In sum, it appears that on the export side, Mexico has remained quite similar to, and thus a competitor of, China for most of the 21st century. In contrast, Argentina and Brazil have export structures that are different. They have much more overlap with advanced economies, such as the United States and the European Union. Consequently, one can speculate that the rise of China probably has presented more severe challenges for economic adjustment for Mexico than for Argentina or Brazil.

Figure 3.4 presents findings by Artuç, Lederman, and Rojas (2015) on the potential gains and losses of export growth for a large sample of LAC countries. Their export index is closely related to the indexes used by Lall and Weiss (2004), Hanson and Robertson (2009), and Freund and Ozden (2009).

Lall and Weiss (2004) compare Latin American and Chinese exports at the four-digit International Standard Industrial Classification (ISIC) level to identify categories

FIGURE 3.2 Global import market shares of selected large economies, by sector, 2001, 2006, and 2011

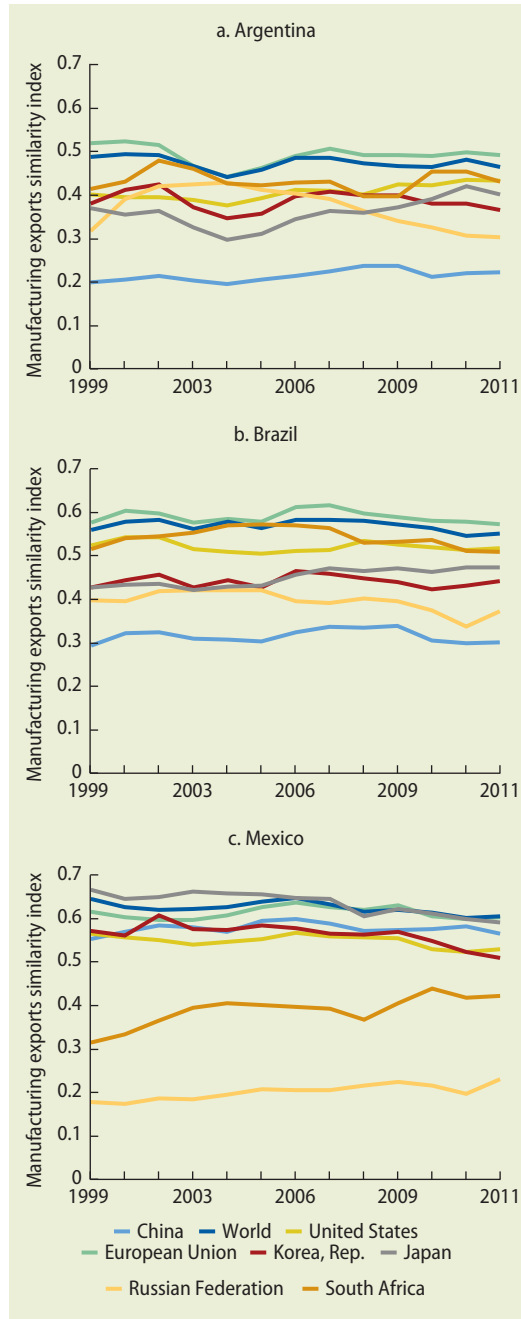


Source: Calculations based on data from WITS/Comtrade.

Note: Sectoral classification of trade flows is based on the International Standard Industrial Classification (ISIC) classification, Revision 3. The agriculture sector corresponds to ISIC codes 0111–0500, mining to ISIC codes 1010–1429, and manufacturing to ISIC codes 1511–3699.

a. The European Union includes 25 member countries.

FIGURE 3.3 Export similarity indexes in manufacturing for Argentina, Brazil, and Mexico, 1999–2011



Sources: Calculations based on data from WITS/Comtrade; index proposed by Finger and Kreinin 1979.

Note: The higher the index, the greater the similarity between the manufacturing export baskets of two economies.

in which China gained market share at the expense of Latin America between 1990 and 2002. They find that 30 percent of trade in 1990 was in industries in which Chinese exports were increasing and Latin American exports were decreasing but that the threat from China gradually decreased: by 2002 China seemed to be negatively affecting only 11 percent of Latin American exports. Lall and Weiss (2014) conclude that over time, Latin American trade structures evolved to complement those of China. These findings are somewhat different from the ones presented in the previous section on export similarity, which indicate that the similarity of exports between the three LAC countries and China remained relatively stable between 1999 and 2011.

Freund and Ozden (2009) find that China's export growth had only a small negative effect on overall Latin American exports. They show that the rise of China hurt Mexico's industrial exports but had no significant impact on the rest of Latin America. For Mexico they find that a 10 percent increase in China's industrial exports reduced Mexico's industrial export growth by 7.9 percent. However, they conclude that China's continuing export growth may be affecting the wage distribution, because export growth is concentrated in high-wage industries. This evidence is largely consistent with the export similarity indexes presented above.

Box 3.1 presents the index proposed by Artuç, Lederman, and Rojas (2015), which measures the trade impact of the changes in China's global market shares. The index is consistent with the assumption that the growth of global markets during the 21st century was exogenous to the performance of LAC economies—that is, the growth rates of China and the rest of the world were unaffected by the policies of LAC economies or their growth performance. By relying on this assumption, the index measures how the increase in China's global share of manufacturing exports reduced “residual demand” for LAC exports of manufactures (of the products in which China gained market share). On the demand side, the index measures the increase

BOX 3.1 Construction of the China effect index

For each good g in group G , exports from China and the world in t_1 are given. Defining the rest of the world (ROW) as the world excluding China, this assumption implies that the ROW's share in world's exports in t_1 is also given. Let r_g^i be country i 's export growth rate of good g between t_1 and t_2 such that

$$X_{g,t_2}^i = (1 + r_g^i)X_{g,t_1}^i \quad (\text{B3.1.1})$$

Total exports of goods G are obtained by summing over all products g , as follows:

$$X_{G,t_2}^i = \sum_{g \in G} X_{g,t_2}^i = \sum_{g \in G} (1 + r_g^i)X_{g,t_1}^i \quad (\text{B3.1.2})$$

The percentage change in total exports of G between t_1 and t_2 can be calculated by dividing equation (B3.1.2) by total exports of G in t_1 (and subtracting 1):

$$\text{Index} = \sum_{g \in G} r_g^i \frac{X_{g,t_2}^i}{\sum_{g' \in G} X_{g',t_1}^i} \quad (\text{B3.1.3})$$

To distribute the growth of China among the economies in the ROW while excluding other sources of export growth, it is assumed that world exports do not change from t_1 to t_2 (that is, China's export growth perfectly crowds out the ROW's exports). This assumption implies that $X_{g,t_2}^W = X_{g,t_1}^W$. If it is also assumed that the export growth rate of good g is the same for all countries, equation (B3.1.1) can be written as follows:

$$\frac{X_{g,t_2}^i}{X_{g,t_2}^W} = (1 + r_g) \frac{X_{g,t_1}^i}{X_{g,t_1}^W} \quad (\text{B3.1.4})$$

Summing across countries, ROW exports in t_2 can be expressed as follows:

$$X_{g,t_2}^{\text{ROW}} = (1 + r_g) \frac{X_{g,t_2}^W}{X_{g,t_1}^W} X_{g,t_1}^{\text{ROW}}$$

As it is assumed that ROW exports are given, from this expression r_g is defined as

$$r_g = \left(\frac{X_{g,t_2}^{\text{ROW}}}{X_{g,t_2}^W} \right) \left(\frac{X_{g,t_1}^W}{X_{g,t_1}^{\text{ROW}}} \right) - 1$$

which can be rewritten as

$$r_g = - \left(\frac{X_{g,t_2}^C}{X_{g,t_2}^W} - \frac{X_{g,t_1}^C}{X_{g,t_1}^W} \right) \left(\frac{X_{g,t_1}^W}{X_{g,t_1}^{\text{ROW}}} \right) \quad (\text{B3.1.5})$$

Substituting equation (B3.1.5) into equation (B3.1.3) yields the desired index (which represents the percentage change in country i 's exports of G), defined as follows:

$$\text{Index} = - \sum_{g \in G} \left(\frac{X_{g,t_2}^C}{X_{g,t_2}^W} - \frac{X_{g,t_1}^C}{X_{g,t_1}^W} \right) \left(\frac{X_{g,t_1}^W}{X_{g,t_1}^{\text{ROW}}} \right) \frac{X_{g,t_1}^i}{\sum_{g' \in G} X_{g',t_1}^i}$$

The index for imports is obtained from this relationship (by changing China's exports by the additive inverse of imports and substituting the world's exports by the world's imports).

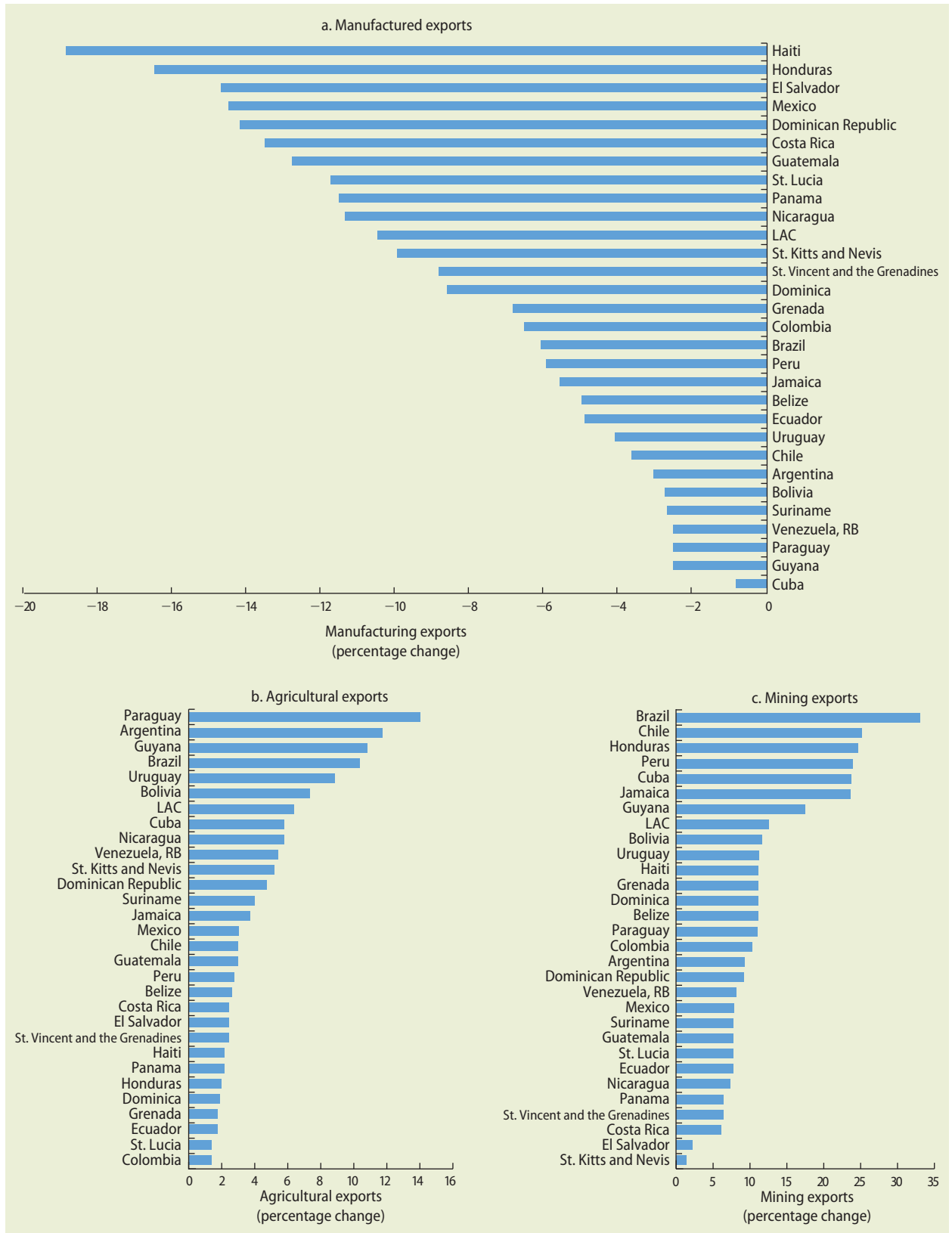
in LAC agricultural and mining exports of products that China increasingly demanded as its share of global imports rose.

Panel a of figure 3.4 shows the estimation results of the China effect for manufactures exports over the period 2001–11. The index demonstrates that Haiti would be hit hardest, losing 19 percent of its manufactures exports (mainly textiles and apparel). The

least affected country in this sample would be Cuba. For LAC as a whole, manufactures exports would grow by 10 percent less than they would have if China's global share had not risen.

Given that the analyses to be discussed throughout the remainder of the chapter focus on Mexico, Brazil, and Argentina, it is worth noting that Mexico (along with

FIGURE 3.4 Effects of the rise of China on gross exports of selected countries in Latin America and the Caribbean, by sector, 2001–11



Source: Artuq, Lederman, and Rojas 2015, based on data from World Integrated Trade Solution (WITS)/Comtrade.
 Note: LAC = Latin America and the Caribbean. Sectoral classification of trade flows is based on the International Standard Industrial Classification (ISIC), Revision 3. The agriculture sector corresponds to ISIC codes 0111–0500, mining to ISIC codes 1010–1429, and manufacturing to ISIC codes 1511–3699. See box 3.1 for details.

Central America and the Caribbean) was among the most affected economies. It suffered greatly because of a large overlap with China on a broad set of exported manufactured products, including textile and apparel as well as electronics. Because the export structures of Argentina (and Chile and Uruguay) are less similar to that of China, the impact on their manufacturing exports was milder.

These results are consistent with evidence derived from different empirical methods. To analyze the effect of China's export growth on LAC economies, Hanson and Robertson (2009) use a gravity model of trade in which exporters produce differentiated goods and compete with Chinese exporters under monopolistic competition. They first estimate the changes in exporter "fixed effects" associated with export growth. They then simulate manufacturing export growth in LAC after setting China's export growth rate to zero within a counterfactual scenario. Their results indicate that China impeded manufacturing export growth by 1.1 percent in Argentina, 1.4 percent in Brazil, 2.3 percent in Chile, and 3.1 percent in Mexico.

China's growth increased other countries' agricultural and mining product exports, as its global share of imports of these commodities ballooned after 2000. Panels b and c of figure 3.4 show the effects on LAC countries' exports of these commodities.

Regarding agricultural exports, the estimation predicts that Paraguay would benefit most, through its global exports of soy, with Argentina a close second (panel b). Regarding mining, Brazil would benefit the most among this sample of LAC economies, driven mainly by China's imports of iron ore. Chile is just 5 percentage points behind, given its high dependence on copper exports, which China imported heavily after 2000. Peru is also a major exporter of copper and other mining commodities. Honduras falls between Chile and Peru on this index; it benefitted mainly from China's increase in imports of nonferrous mining products, such as zinc.

Overall, the trade analysis presented thus far suggests that China had a negative effect

on LAC's exports of manufactured goods but a positive and often large effect on those in agriculture and mining sectors. How much these trade patterns affected LAC labor markets is an important economic and empirical question.

Recent trends in manufacturing employment in Latin America and the Caribbean

One place to start the discussion of the labor market implications of the rise of China is employment in manufacturing. The focus is on Argentina, Brazil, and Mexico; survey employment data are also available for other countries (results available upon request).⁵

Figure 3.5 shows trends in the shares of formal and informal employment in manufacturing industries. The trends are divided into periods just before or around 2000 and after 2000. (Several years of data were pooled into time periods to avoid sampling errors in the data, as the surveys were not designed to be representative of workers at the industry level). The objective is to determine whether the years after China's inclusion in the global trading system (through its accession to the WTO) show evidence of declines in the share of employment in manufacturing in countries where competition from China was strongest.

In Argentina both formal and informal employment in manufacturing declined after 2000 (relative to observed employment shares in the 1990s). The share of formal employment in manufacturing industries fell from about 14.7 percent of the employed labor force in 1991–99 to 8.8 percent in 2000–05 and rose only slightly, to 9.9 percent, in 2006–12. Informal employment declined from 5.8 percent of the employed labor force in 1991–99 to 5.5 percent in 2000–05 and 4.5 in 2006–12.

The trends for Brazil are less stark. Formal employment in manufacturing industries fell from more than 10.1 percent in 1990–99 to 9.3 percent in 2001–05, followed by a slight increase to 9.9 percent in 2006–11. But the share of employment in informal

manufacturing rose, from 3.6 percent in the 1990s to 4.7 percent in 2001–05 and 4.3 percent in 2006–11. Overall, the figures show stagnant, if not declining, trends in manufacturing employment.

Formal manufacturing employment in Mexico fell from 13.4 percent of the employed workforce in 2000–04 to 9.8 percent in 2006–12. This 3.6 percentage point decline is dramatic, given the short amount of time between the two periods. Informal employment in manufacturing was relatively stable during this time, hovering slightly above 8.2 percent in 2000–04 and 2006–12.

Thus in the three LAC economies under study, manufacturing employment, especially in the formal sector, appears to have fallen or remained stagnant at best. Much caution is needed, however, in identifying the causes of employment trends, as these economies experienced numerous shocks during this time.

The next section relies on research by Artuç, Lederman, and Rojas (2015) that was commissioned for this study. It assesses the quantitative importance of the rise of China in global markets as a determinant of labor market outcomes. Their analysis combines empirical analyses with theoretical modeling to make inferences about the role of China in shaping domestic labor markets.

Labor market adjustment paths in response to the rise of China

One approach to analyzing the effect of the rise of China on foreign labor markets has been to estimate “reduced-form” econometric models. Such specifications model the impact of the rise of China in global markets on local labor markets as proportional to the share of workers employed in industries in which China had substantial exports over time.⁶

A good example of this approach is the article by Autor, Dorn, and Hanson (2013), which studies the implications of the rise of China on local labor markets (defined as “commuting zones”) within the United States through imports of Chinese goods. The authors argue that changes in Chinese imports

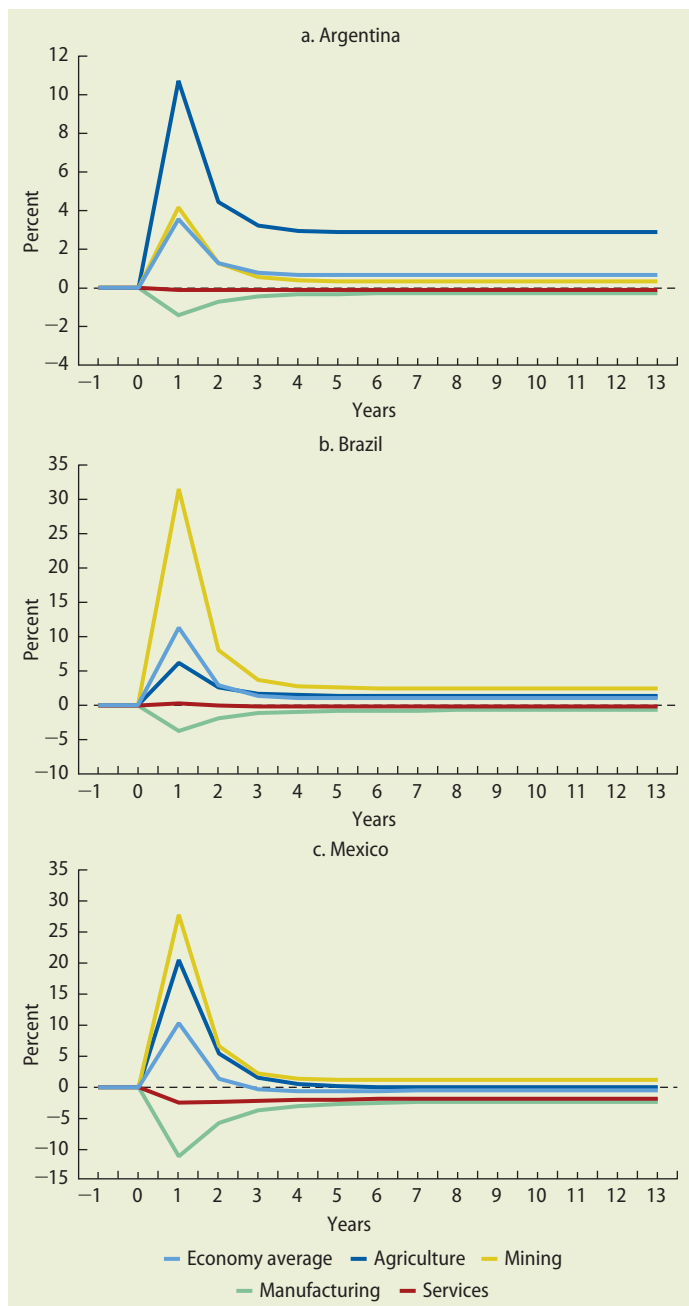
FIGURE 3.5 Employment shares in the formal and informal manufacturing sectors of Argentina, Brazil, and Mexico, before and after 2000



Sources: Calculations based on data from Encuesta Permanente de Hogares-Continua (EPHC) in Argentina, Pesquisa Nacional por Amostra de Domicilios (PNAD) in Brazil, and Encuesta Nacional de Ingresos y Gastos de los Hogares (ENIGH) in Mexico.

Note: Informal workers are defined as workers without social security benefits.

by other high-income countries (used as an instrumental variable) increased unemployment, reduced labor force participation, and reduced wages in local labor markets in the United States that housed import-competing manufacturing industries. Preliminary results of similar research on Mexican labor markets underway at the Central Bank of Mexico, led

FIGURE 3.6 Simulated short- and long-run impacts of the rise of China on wages in Argentina, Brazil, and Mexico, by sector

Source: Artuç, Lederman, and Rojas 2015.

Note: The model assumes that shocks to all sectors occurred simultaneously. See Artuç, Lederman and Rojas (2015) for technical details.

by Daniel Chiquiar, are qualitatively similar to those reported by Autor, Dorn, and Hanson for the United States.

The study by Autor, Dorn, and Hanson relies on clever econometrics to identify the impact of imports from China on local U.S. labor markets. The study by Artuç, Lederman, and Rojas (2015) uses a combination of econometrics and theory. Their approach can be summarized in two steps. First, the authors estimate industry-specific labor mobility costs. They compute intersectoral employment transitions from individual worker panel datasets for Argentina, Brazil, and Mexico by following the methods described in Arias and others (2014). Broadly speaking, sectors with larger numbers of incoming workers as a share of industry employment are identified as having lower entry costs than sectors with smaller numbers of incoming workers.

Second, the authors use standard industry-level data and a simple model of labor demand across industries to trace the impacts of trade shocks emanating from China on manufacturing industries, agriculture, and mining. Figures 3.6–3.8 show the simulated impact of China on industry wages,⁷ informal employment shares, and labor force participation (called the “residual sector”).

Across industries the authors report high overall interindustry labor mobility costs, with estimates for the three countries ranging from 0.5 times the average annual wage (for entry into informal agriculture for workers coming from formal agriculture) to roughly 8 times the average annual wage (for entry into the formal mining sector from any informal sector). These magnitudes are consistent with estimates by Hollweg and others (2014); Artuç, Lederman, and Porto (2015); Artuç, Chaudhuri, and McLaren (2010); and Dix-Carneiro (2014).

As in Arias and others (2014), three features regarding labor mobility costs are common to Argentina, Brazil, and Mexico. First, it is less costly to become formal if a worker stays in the same industry. Second, the highest entry costs involve moving from the informal sector in one industry to the formal sector in another. Third, the lowest entry costs are associated with movements from the formal to the informal sector within the same industry.

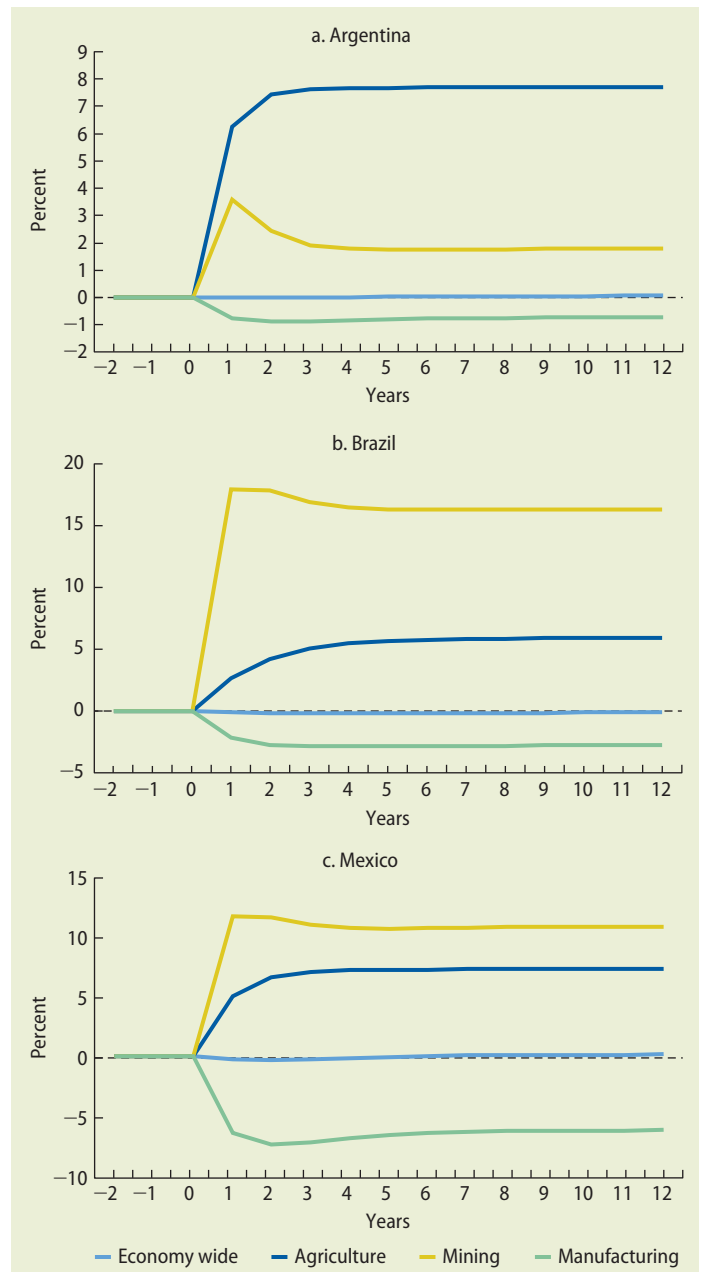
In Argentina and Mexico, the lowest entry costs are incurred in moving from formal to informal employment within the restaurant and hotel sector. In Brazil the lowest entry cost is associated with moving from formal to informal employment within agriculture. In all three countries, the highest cost is in moving from informal employment in any sector besides agriculture or mining to formal employment in these sectors. This cost limited the movement of workers into these sectors—precisely the ones positively affected by the rise of China.

The sectors most affected by China were agriculture in Argentina, mining in Brazil, and manufacturing in Mexico. As expected, in Argentina employment in the agricultural sector increased in both the formal sector (16.0 percent) and the informal sector (7.7 percent). Employment in the mining sector also increased, with formal employment rising 5.6 percent and informal employment rising 2.0 percent. The negative shock to the manufacturing sector reduced employment in that sector, with formal employment falling 2.3 percent and informal employment 1.0 percent.

Although the percentage increases are larger for agriculture and mining than for manufacturing, the reduction in employment in manufacturing offset the increase in employment in the other sectors because of its weight in the overall economy. Formal manufacturing employs about 9 times as many workers as formal mining and about 45 times as many workers as formal agriculture. Informal manufacturing employs about 41 times more workers than informal mining and 8 times more than informal agriculture.⁸ The aggregate estimated effect of the rise of China was thus a reduction in employment—that is, an increase in the residual sector—of about 0.3 percent (see figure 3.8).

Panel a of figure 3.6 shows the adjustment path of real wages in Argentina. Right after the shock, wages increase in agriculture and mining and fall in manufacturing, as the demand for labor increases in the two rising sectors and decreases in manufacturing. In the long run, as labor is reallocated

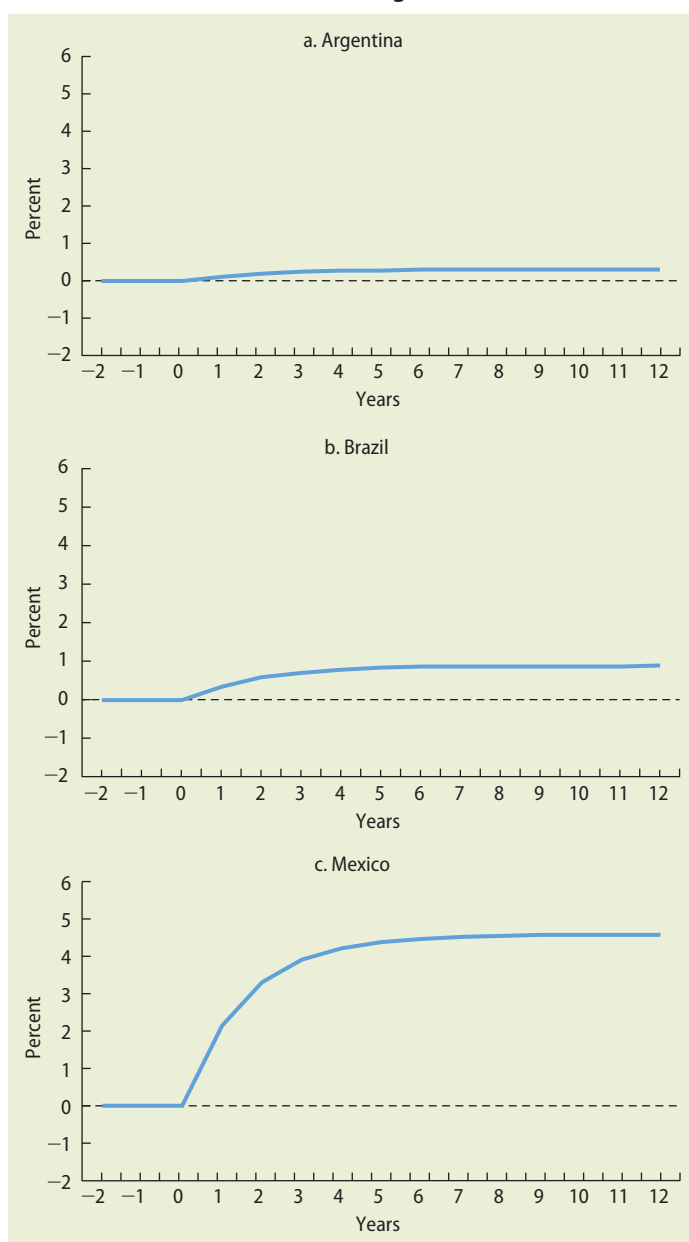
FIGURE 3.7 Simulated short- and long-run impacts of the rise of China on informal employment in Argentina, Brazil, and Mexico



Source: Artuç, Lederman, and Rojas 2015.

Note: The model assumes that shocks to all sectors occurred simultaneously.

across sectors, wages tend to move toward their initial level. In the new steady state, there is an increase in the agriculture real wage (of about 3 percent); real wages in the

FIGURE 3.8 Simulated short- and long-run impacts of the rise of China on the residual sector in Argentina, Brazil, and Mexico

Source: Artuç, Lederman, and Rojas 2015.

Note: The residual sector includes unemployed workers and workers who drop out of the labor force. The model assumes that shocks to all sectors occurred simultaneously.

other sectors remain close to their original level. The negative shock on manufacturing may offset the positive shock on agriculture and mining, keeping wages and the aggregate level of labor almost at their preshock levels. Although the aggregate level of labor remains

constant in the long run, it is reallocated from the manufacturing to the agriculture and mining sectors.

Artuç, Lederman, and Rojas (2015) find similar results for Brazil. Their simulations show that mining employment rises about 40 percent in the formal sector and 16 percent in the informal sector. There is also an increase of about 10 percent in the number of workers in formal agriculture. In the negatively shocked sector (manufacturing), the number of formal workers falls by about 6 percent and the number of informal workers falls by roughly 3 percent.

Brazil's manufacturing sector employs substantially more workers than does mining or agriculture. The rise of China therefore leads to a reduction in the aggregate level of employment, albeit a small one. In the simulations, the residual sector increases about 1 percent (figure 3.8, panel b). Thus, as in Argentina, the positive shock on mining and agriculture offsets the negative shock on manufacturing, leaving the aggregate level of employment similar to that before the shock. Moreover, when the shocks from China hit Brazil, real wages in the mining sector rise about 31 percent. Nonetheless, as labor moves from manufacturing to mining, real wages begin to decline, eventually reaching roughly the same initial level in the new long-run equilibrium, after the process of adjustment has taken its course. In short, there is a reallocation of labor from manufacturing to mining and agriculture, leaving real wages and the aggregate level of employment almost unchanged in the long run. In the short run, real wages in the mining sector rise.

Mexico experiences an increase in formal and informal employment in agriculture and mining and a decrease in formal and informal manufacturing employment. Informal employment decreases 6 percent in manufacturing and increases 10 percent in mining and 7 percent in agriculture. Formal employment in manufacturing falls (by about 14 percent) and rises in mining (by 25 percent) and agriculture (by 6 percent). Total employment falls. The residual sector increases 5 percent in the long run (see panel c of figure 3.8). In the short run, there is a 28 percent increase in real

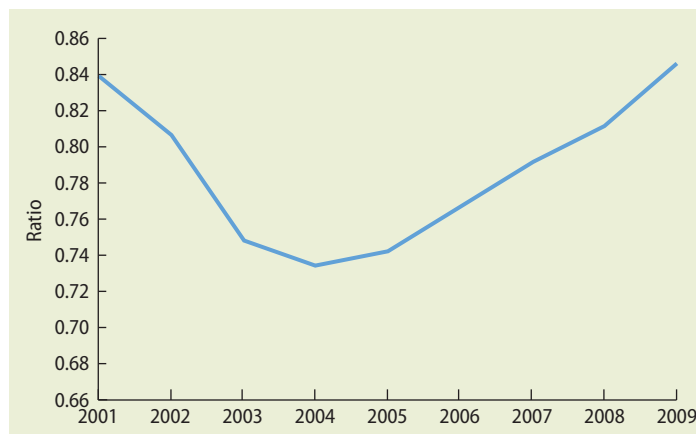
wages in mining and an 11 percent decrease in real wages in manufacturing. In the long run, however, there is only a slight decrease in real wages in manufacturing and services, and a slight increase in real wages in mining.

In sum, for Argentina and Brazil, the positive shocks on agriculture and mining offset the negative shock on manufacturing, leaving the total level of employment and real wages almost at their initial level. In both countries, a larger positive shock on mining and agriculture is needed to offset a smaller shock on manufacturing, because manufacturing employs a larger proportion of workers. In Mexico the larger shock on manufacturing reduces employment in the long run and lower wages. These simulation results are consistent with observed data on wages in Brazil and Mexico. As shown in Figure 3.9, the ratio of Brazil's average wage relative to Mexico's rose since the early 2000s.

These simulation results are inextricable from the modeling of the labor markets in the three countries and should thus be interpreted with caution. The results could be overstating the impact of China in both the short and long run for three key reasons. First, the index of the China effects for each of the selected broad industries focuses on the gross rather than net impacts on exports: the authors used only Chinese exports of manufactures, not Chinese imports of manufactures as well. For most LAC countries that appear in figure 3.4, the net effect of China (after taking account of the fact that China also imports some manufactured goods that LAC economies export) is somewhat smaller than the gross effects.⁹

Second, the underlying assumptions of the simulations posit that the rise of China affected LAC labor markets instantly at the beginning of the 21st century, but the changes in global market shares that drive the estimated effects of China through global trade shares occurred gradually after 2000 (recall the trends depicted in figure 3.1). Consequently, the simulations may exaggerate the magnitude of the China effects in the short run but not necessarily the relationship between the short-term dynamics and the long-term effects. This dichotomy of biases

FIGURE 3.9 Evolution of relative wages in Brazil to Mexico, 2001–09



Sources: National average wages in local currency are from the International Labour Office. They were converted to international purchasing power parity constant 2005 US dollars using the conversion factor from World Development Indicators.

reflects the fact that the estimates of labor mobility costs, which are high, drive the sharp short-term adjustments relative to the milder long-term adjustments.

Third, the rise of China probably shaped the trade structure of other large emerging markets, such as Korea, Russia, and South Africa. A proper analysis would need to take the changing trade patterns of these (and other) countries into account. In particular—and as discussed previously—Russia controlled a rising share of global commodity markets but imported a growing share of manufactures; Korea (like China) increased its export share of manufactures. The United States' and Japan's shares of global manufactured products exports fell while China's rose. Thus to the extent that China's trade impacts were associated with some compensating effects from other large markets (relative to the size of LAC's trade flows), the simulated labor market implications of the rise of China may be overstated.

These important caveats notwithstanding, recent research also provides grounds to think that the long-run impacts of China reported here may be understated. New research suggests that labor mobility may be even more handicapped than Artuç, Lederman, and Rojas (2015) estimate. Autor, Dorn, and Hanson (2013) find persistent effects across

U.S. “commuting zones,” which implies that labor may not be mobile enough across such zones to equalize (or attenuate) the interindustry wage differential when industries are concentrated (or agglomerated) across physical space. Ongoing research by the Central Bank of Mexico could corroborate the results with Mexican data (Chiquiar 2014).

New research on Brazil also seems to suggest that a lack of labor mobility across geographic space can cause long-lasting impacts of trade shocks that permanently change relative prices across industries. A first piece of evidence comes from Dix-Carneiro and Kovak (2014). Using an approach comparable to that of Autor, Dorn, and Hanson (2013), they find long-lasting interindustry and interregional effects within Brazil of the trade reforms implemented in the late 1980s and early 1990s. The authors examine regions of Brazil that had manufacturing industries that employed large numbers of workers and were exposed to tariffs. They find long-lasting declines in real wages in those industries and regions as well as differential wage effects that tended to grow rather than decline over time. These results are in stark contrast to the findings of Artuç, Lederman and Rojas (2015). This over-time magnification effect can reflect a variety of explanations that share one thing in common: lack of interregional labor mobility. If workers choose not to move from, say, São Paulo to rural areas, then declines in the relative price of manufactured production in São Paulo because of trade reforms (or the rise of China) will result in permanent relative effects on manufacturing wages in São Paulo relative to wages elsewhere. (In the case of Brazil, these trends would lead to wage convergence, as wages in São Paulo are higher than wages in rural Brazil.) The sluggish adjustment of sector-specific capital could magnify such effects: as capital (or machines employed) in the manufacturing industry of São Paulo (for instance) begins to depreciate, the real wages of workers still employed in the region’s manufacturing industry would fall further, with a corresponding reduction in the marginal product of labor as the capital workers have to work with declines.

Costa, Garred, and Pessoa (2014) use Brazilian census data to show that between 2000 and 2010, manufacturing wages and in-migration rates grew more slowly and wage inequality widened more in local labor markets that were more affected by Chinese import competition.¹⁰ They cannot discuss adjustment dynamics because of data limitations (namely, the census provides information on only two points in time, 2000 and 2010). Still, their findings could imply long-lasting effects that are at odds with the model-driven results of high short-term displacements provided in the analysis presented above.

Another piece of evidence comes from Morten and Oliveira (2014). They study how transport networks, mainly roads, affect the extent of labor market integration across territorial units within Brazil. Their paper is motivated by highly persistent wage differentials between Brasília and other regions even within categories of skilled labor. They find wage differentials over time associated with (the lack of) road transport linkages, which affect labor mobility. The high costs of physical mobility in Brazil may thus be driving persistent wage differentials across geographic space.

Potential distributional implications of China-induced labor market adjustments

The World Bank Group and other organizations, including the International Monetary Fund, have recently pushed to put distributional issues at the forefront of the development policy debate. In 2013 the World Bank Group and its shareholders set two new long-term objectives: eradicating extreme poverty and raising the incomes of the bottom 40 percent of the income distribution within countries. Although the analyses of the labor market adjustments in LAC brought about by the rise of China were not designed to assess the distributional consequences of these adjustments, the results can be used to speculate about how China’s demand and supply shocks may have affected demand for workers from the bottom 40 percent of the distribution.

TABLE 3.1 Percentage of workers in bottom 40 percent of income distribution in Argentina, Brazil, and Mexico, by sector

Sector	Argentina	Brazil	Mexico
Agriculture	53.8	65.2	75.9
Mining/utilities	11.0	15.6	10.8
Manufacturing	32.0	28.4	38.2
Services	41.9	40.1	36.5
Average (excluding respondents who did not report sector)	34.8	37.4	40.6
Respondents who did not report sector of employment	27.1	47.9	24.8

Sources: Calculations based on the following surveys: Argentina: EPHC (urban coverage only), 2006–12; Brazil: PNAD (urban and rural coverage), 2004–11; Mexico: ENIGH (urban and rural coverage), 2000–02.

Note: Only individuals with positive income are included. All surveys are pooled by country; computations are based on sample expansion weights.

Table 3.1 shows the share of employees in total employment that fall in the bottom 40 percent of the distribution in agriculture, manufacturing, mining, and services. This measure can be interpreted as an indicator of the intensity of the use of poor workers. Industries with higher ratios can be seen as pro-poor in the sense that when demand for output from these industries rises, demand for poor workers tends to rise more in industries that use poor labor relatively intensively. The ratio is analogous to factor intensities in production functions but has the advantage of not requiring the computation of factor intensities (that is, the use of unskilled labor relative to skilled labor in the production of a unit of output in each industry), which would then need to be mapped to the “assets” of the poor (mainly unskilled labor). Examining the use of “poor” labor is thus a shortcut that requires little data manipulation while still providing a clear picture of relative labor demands.

The data tell a consistent story across the three economies: agriculture employs a larger share of workers from the bottom 40 percent of the income distribution than other sectors (53.8 percent in Argentina, 65.2 in Brazil, and 75.9 percent in Mexico) across countries. This relatively larger share implies that agriculture disproportionately employs workers belonging to the bottom 40 percent, as the shares for this industry exceed 40 percent.

In contrast, the shares for mining are 11.0 percent in Argentina, 15.6 percent in Brazil, and 10.8 percent in Mexico. The figures for manufacturing (32.0 percent in Argentina, 28.4 percent in Brazil, and 38.2 percent

in Mexico) indicate that this industry tends to employ workers at rates that fall between agriculture and mining. The services sector employs a slightly larger share of poor workers than manufacturing in Argentina (41.9 percent) and Brazil (40.1) but a slightly smaller share in Mexico (36.5 percent).

Given these industry-specific intensities in the use of poor workers, several points can be made about the impact of the rise of China on the distribution of income within LAC. First, it is likely that the positive demand shock on agriculture resulted in a relative increase in the demand for labor provided by poor households. Second, the positive shock on mining probably led to the opposite effect: an increase in the relative demand for labor provided by households in the top 60 percent of the distribution. Third, in the best of cases, manufacturing seems to be neutral in Argentina and Mexico (its ratios are close to 40 percent in these countries); manufacturing industries in Mexico are more frequently tilted in favor of demand for labor from the upper deciles of the distribution. Thus no simple conclusions can be drawn regarding the distribution of income, although there are clear indications of the direction of the various effects.

In summary, the impact of the rise of China is complex and not easily identified because it was characterized by multiple shocks that pushed LAC labor markets in opposite directions. Ultimately, for the distribution of income, what matters most is the size of the positive demand shock on agriculture. In countries where this shock was large, such as Argentina and to a lesser extent Brazil, the

overall effect was probably more egalitarian than in Mexico, although the negative impact on manufacturing in Mexico may have contributed to a more egalitarian distribution of income. This analysis, however, does not yield a definitive conclusion regarding income distribution within countries.

Concluding remarks

Hollweg and others (2014) argue that the costs of physical mobility, as well as other factors, such as industry-specific skills that limit the employment mobility of workers across industries, may explain high estimated labor mobility costs. Such costs seem to be much more binding than the usual suspects of regulatory barriers to hiring and firing workers. The evidence reviewed in this chapter suggests that policy makers in LAC should pay more attention to these types of costs, especially in the context of shifting global trade patterns that are neither static nor inconsequential for the well-being of workers in the region.

The ongoing restructuring of the global economy has affected LAC economies in different ways and with different magnitudes. The effects depend on the extent to which the newly emergent global economic heavyweights export and import goods that differ from the goods traded by the United States, Japan, and Europe. China has been the dominant force in this process of global restructuring, with asymmetric consequences across industries. The rise of China can thus be seen as embodying both supply and demand shocks, with supply shocks dominating in manufacturing industries and demand shocks dominating in commodity markets.

Of the three countries analyzed in detail (Argentina, Brazil, and Mexico), Mexico seems to have experienced the most adverse consequences. It was hardest hit because a large share of its employment was in manufacturing and its export structure was most similar to China at the beginning of the 21st century. As a result, it lost jobs, as the increase in demand for labor in agriculture and mining

were not large enough to compensate for the decline in the demand for labor by manufacturing industries. Indeed, it is plausible that wage inflation was subdued in Mexico during the period analyzed, at least relative to Argentina and Brazil. Wage data from employment surveys in Mexico and Brazil suggest that wage inflation was higher in Brazil than in Mexico, especially in 2003–09.

The positive shock on agriculture from the rise of China was probably beneficial for sharing prosperity with the bottom 40 percent of the income distribution in LAC. However, the decline of prices of manufactured goods may have been marginally favorable for the bottom 40 percent only in Mexico, where manufacturing industries appear to have employed relatively few poor workers. Given the multiple effects across industries, however, tracing the distributional consequences of China's rise for LAC economies remains a task for future research.

The technical literature from both the World Bank Group and academia identifies two key policy areas to examine: (a) the sluggish adjustment of labor markets because of labor mobility costs across both industries and space, especially when industries are spatially concentrated, and (b) skills mismatches and transport costs, which may be slowing adjustments. Hollweg and others (2014) argue that developing countries could deal with the first issue with social protection strategies that focus on displaced workers' capacities to find employment in other industries. A complicating factor in designing trade adjustment assistance programs in LAC and elsewhere in the developing world is that a complex network of social assistance programs (such as various types of conditional cash transfer programs often in force simultaneously together) and various types of worker training and retraining programs already exists. It is not clear whether or not it is wise to implement yet another type of worker assistance program to deal with permanent (or long lasting) trade shocks.

In dealing with the root causes of labor mobility costs a consensus is beginning

to emerge in the academic literature that goes beyond regulations that raise the costs of labor churning from the viewpoint of employers. In this light, taking a cold-headed look at the role of domestic transport infrastructures might end up being a long-term policy agenda well worth pursuing. Looking forward, the distinction between global supply and demand shocks is important for understanding other sources of development challenges associated with the rise of the South in global markets. Of particular relevance may be the nature of LAC's net connections with the global economy (where "net" refers to the region's persistent current account deficits, the broadest measure of an economy's net trade balance with the rest of the world). Persistent external deficits may be a symptom of persistently low domestic savings (or put another way, persistently high consumption relative to output). To the extent that the rise of the South—which has been dominated by emerging markets such as China that have persistently high external surpluses—has manifested itself in further persistent declines in LAC savings rates (and thus external deficits), it is likely that engineering economic growth with low savings will continue to be an analytical and policy priority for the region. Chapter 5 takes on this complex topic of growth with low domestic savings in a changing global economy.

Notes

1. These countries were selected because of the availability of panel data for workers employed in both the formal and informal sectors.
2. For the sake of brevity, this chapter analyzes only a few countries. Results for other major developing economies are available upon request. None of the omitted emerging markets seem to have had global industry shares above 1 percent or increases of more than a fraction of a percentage point.
3. Results are available for numerous other LAC countries as well (results are available upon request).
4. The export similarity index, proposed by Finger and Kreinin (1979), provides information

on export patterns from country to country. It is defined as follows:

$$\text{Similarity}_{i,j} = \sum_{g \in G} \min(x_{g,i}, x_{g,j})$$

where i and j are countries; G is a group of products (for example, manufactured goods); and $x_{g,i}$ is the share of product g in total exports of goods G in country i . The index varies from 0 to 1, with 1 indicating identical export composition among two countries (perfect similarity).

5. The data required for this analysis come from household employment surveys with information on industry of employment as well as workers' formality status, defined as eligibility for social security (retirement benefits). Results are very similar when using access to health insurance. In addition to Argentina, Brazil, and Mexico, such data are available for Bolivia, Chile, Costa Rica, Ecuador, El Salvador, Peru, Paraguay, and Uruguay. Overt-time coverage varies across countries. The data for Argentina, Brazil, and Mexico include a panel component, which allows analyses of labor mobility across industries and formality status. Panel data were not available for other countries, which were therefore excluded from the analysis.
6. Costa, Garred, and Pessoa (2014) characterize the approach of Autor, Dorn, and Hanson (2013) as "shift-share methodology," because it relies on employment shares as the indicator of exposure to changes in China's global shares. Bartik (1991) developed this approach. Topalova (2007) applied it to study the impact of trade reforms across territories within India after 1991.
7. Figure 3.6 shows the average wage by industry for both formal and informal workers. The results refer to the simulation of three simultaneous shocks on agriculture, mining, and manufacturing.
8. The size of manufacturing relative to other sectors was calculated using the panel component of the household employment surveys, the sample used for the simulations of the labor market adjustment paths.
9. These results are available upon request.
10. They define "local" labor markets as Brazilian "microregions," a territorial unit defined by the Brazilian statistics agency (IBGE) according to a criteria related to the level of economic integration. It is somewhat comparable to the U.S. "commuting zones" used by Autor, Dorn, and Hanson (2013).

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The Changing Patterns of Financial Integration in Latin America and the Caribbean

This chapter expands the stylized facts documented in chapter 1 to describe how Latin America and the Caribbean (LAC) has been integrating financially with both the North and the South. It shows that the largest increases took place in LAC's investments abroad, although the investments of the rest of the world in LAC (including investment by other LAC countries) also rose. Higher gross domestic product (GDP) growth alone does not explain these patterns: LAC countries have become more important in global financial transactions even relative to their GDP. The changes reflect significant increases in portfolio investments, syndicated loans, and merger and acquisition (M&A) flows (growth of greenfield investment, which was already high, was more subdued). Despite these increases, cross-border investments into LAC countries far outweigh foreign investments by LAC countries, and LAC countries have been losing ground with respect to other South regions as receivers of North flows. Moreover, although M&A flows to LAC increased, there is no evidence that they have raised labor productivity, as North-North flows often do.

Chapter 1 documents several important facts about how the South has been growing and integrating with the North in both trade and finance. This chapter complements those facts by addressing four questions about financial integration in Latin America and the Caribbean (LAC):

- How are LAC countries connecting financially with countries in the North, countries in other regions of the South, and other countries in LAC, and how did these connections evolve during the 2000s?
- What role did new connections play in the evolution of these flows?
- Did LAC receive investments in the sectors in which it has a comparative advantage, or were inflows related to the comparative advantage of the country sending the capital?
- To what extent were these flows associated with labor productivity growth?

To shed light on these questions, this chapter analyzes how LAC has been integrating financially with the rest of the world and how important it is in international financial

transactions. The chapter also examines the extent to which LAC's financial integration is related to its trade integration and the degree to which foreign direct investment (FDI) has increased labor productivity.

Four main patterns emerge from the analysis. First, like the rest of the South, LAC countries appear to be increasingly connected with the rest of the world in terms of both cross-border portfolio holdings and capital flows. The largest increases took place in LAC's investments abroad, although the investments of the rest of the world in LAC also increased across all types of financial flows.

Second, despite these increases, cross-border investments into LAC countries far outweigh foreign investments by LAC countries. LAC is more important as a receiver than as a sender of investments.

Third, LAC's connections with other South countries grew more rapidly than with North countries, especially during the second half of the 2000s. This growth has increased the participation of South countries as senders of resources, particularly in merger and acquisition (M&A) flows, to LAC countries. In addition, North-LAC flows have been increasing at a slower pace than North-South flows. LAC countries have therefore been losing ground with respect to the South as receivers of North flows. Despite these changes, the North remains by far the principal source (receiver) of the flows to (from) LAC countries.

Fourth, within-LAC flows have increased substantially, in some cases more than flows to the North, reflecting a higher degree of connectivity among the countries of the region.

What is behind these patterns of integration? Although higher gross domestic product (GDP) growth explains much of the growth, the data indicate that LAC countries have become more important in global financial transactions even relative to GDP. The patterns reflect large increases in portfolio investments, syndicated loans, and M&A flows, the types of investments that experienced the highest growth rates. Greenfield

investment grew less than other flows in recent years, but these cross-border investments were already well established at the beginning of the 2000s, especially between LAC and countries elsewhere in the South.

The increase in flows from LAC has occurred in both the primary and the heavy manufacturing sectors. In contrast, the main trends driving flows to LAC have been M&A and syndicated loans in the primary sector. The different growth trajectories across types of investment may reflect the fact that as LAC has become more developed, investors have become more comfortable conducting more arms' length transactions and shifting to types of contracts that require less or no actual production in the target countries (providing loans and purchasing securities rather than opening a foreign plant, for example).¹

Increases in both the number of new connections (extensive margin) and the intensity of preexisting connections (intensive margin) improved LAC's connections with the rest of the world. For portfolio investments, the intensive margin explains almost all of the growth in cross-border holdings. In contrast, for syndicated loans, M&A, and greenfield flows, the extensive margin plays a more important role, especially in connections between LAC and countries in other South regions and within LAC. North-LAC flows were well established in the 1990s; the intensive margin drove their growth.

The dynamics of trade flows partly explain these patterns. Greenfield investment and trade seem to be complements: countries in the North and South invest in the sectors in which they have a relative comparative advantage, not necessarily in the sectors in which LAC has a comparative advantage. This complementarity is also observed in South-LAC flows of syndicated loans. It is not observed in M&A flows or North-LAC syndicated loan flows. In these cases, foreign investments have gone to sectors in which the receiver country has a comparative advantage.

The search by companies for improvements in efficiency by dispersing production

stages across countries could explain the increase in flows, especially FDI flows, across countries. Therefore, the rising participation of South economies in global financial flows, particularly FDI, can be perceived as a potential driver of economic growth. FDI not only directly eases financing constraints in recipient economies, it can also be a major conduit of technology diffusion and learning spillovers.

The findings in this chapter provide some evidence that North-North M&A flows in the manufacturing sector generally have a positive impact on labor productivity growth, whereas North-South, South-North, and South-South flows do not. These findings suggest that the rise in South connections has not led to increases in labor productivity in LAC. Differences in the sectoral composition of M&A flows or differences in the structure of ownership of target companies by North and South countries do not explain these patterns. Trade costs are also an unlikely explanation.

What do the patterns documented in this chapter mean for policymakers, researchers, and practitioners interested in LAC? Although inevitably speculative in nature, the broad set of stylized facts presented here leads to some conclusions and predictions. They also raise several questions.

First, the observed dynamics of financial flows shed some light on where future expansion might be. The patterns suggest that LAC is gaining ground in the types of investments that are more arms' length. To the extent that it makes North and South countries more willing to invest in LAC using new instruments, improving the financial contracting environment can ease further expansion of these investments. Expansion of LAC's financial transactions might take place even when LAC is more connected to the rest of the world financially than on the real side, in particular because its financial connections with the South and other LAC countries are still small relative to investments from the North.

Second, LAC has received more flows than it has sent abroad. One could argue that these

trends might change at some point and that the more rapid increase in LAC's investments abroad might be evidence of this shift. In net terms, the patterns are the counterpart of the persistent current account deficits run by many countries in the region. To the extent that these deficits are reduced, net capital inflows to LAC will diminish. To the extent that LAC will have to repay the money it has borrowed, investments in LAC are likely to stabilize. Furthermore, as LAC becomes richer, it will invest more abroad, particularly in the North, with which the growth differentials are more consistently positive in LAC's favor.

Third, the recent expansion in capital flows within LAC and between LAC and other regions of the South reflects an increase in the extensive margin. To the extent that these new connections are stable and countries learn to invest in one another, it is possible that growth in the intensive margin will accelerate, following growth in the extensive margin, as countries may invest more and more in the links that have already been established, especially if there is dynamic learning in these connections.

Fourth, under some plausible assumptions, the analysis on M&A and growth provides some evidence that North-North flows generally have a positive impact on labor productivity growth whereas South-South flows do not. This finding is surprising, as one might expect South-South flows to have a positive impact on growth in recipient countries for several reasons. For instance, technologies from a South country may be closer to technologies of the South recipient country and thus more easily adopted. Although technology and knowledge spillovers may still take place, the effects of reallocations, economies of scale, and increased competition may be large enough to offset them.

Part of the explanation for the positive effect of North-North on labor productivity may be the "absorptive capacity" of firms operating in high-income environments. These firms are characterized by high-skilled labor forces, superior management practices, and higher rates of investment in innovation.

Exploring these possibilities more formally remains an important topic for future research. In light of the increased importance of South flows for LAC countries, a more in-depth analysis of the differentiated effect that source countries can have on the potential for growth-enhancing effects of FDI also seems to be in order. The role of distance (including all of its aspects, such as trade and financial barriers, cultural differences, and the degree of information asymmetries) between source and receiver countries merits further examination as well. South countries still send and receive the majority of their cross-border financial investments to and from North countries, but neighboring South countries come in second place as a share of these investments: countries in LAC typically invest in other LAC countries. The largest non-North recipients of FDI from LAC countries are other LAC countries, which account for 32 percent of M&A flows and 60 percent of greenfield investment.

The role of Latin America and the Caribbean in international financial transactions

Chapter 1 describes some important facts about international financial transactions. It provides evidence that South countries have been gaining space in the global economic landscape (Set of Facts 1). The growth of the South is manifested in increasing South-South connections, in addition to South-North and North-South ones (Set of Facts 2). A strong degree of regional clustering is observed in both trade and financial connections (Set of Facts 3).

What is the role of LAC in these three sets of facts and other related patterns discussed in chapter 1? To address this question, this chapter presents the results of analyses using bilateral data on portfolio investments, FDI, and syndicated bank loans. Data on portfolio assets come from the Coordinated Portfolio Investment Surveys (CPIS) conducted by the International Monetary Fund (IMF) for 2001–11; they cover 75 source countries and 207 recipient countries.² Data on FDI come

from firm-level transaction data on M&A from Thomson Reuters' SDC Platinum and on (announced) greenfield investment from the *Financial Times*' fDi Markets. The M&A data are for 1990–2011; they cover 139 source and 162 recipient countries. The greenfield investment data are for 2003–11; they cover 157 source and 193 recipient countries. Data on syndicated loans come from Thomson Reuters' SDC Platinum transaction-level database for 1996–2012; they cover 111 source and 183 recipient countries. The analysis excludes offshore financial centers. Box 4.1 compares this bilateral data with the balance of payments data. Because the CPIS data are on stock holdings, the estimates on portfolio assets are much larger than the estimates on syndicated loans, M&A, and greenfield investment, which are based on annual transactions. Therefore, these different datasets cannot be compared in terms of size. The evolution of these transactions and the differences within these datasets are very informative, however.

South countries have been growing more rapidly than North countries. As a result, they now capture an important share of these flows. Across all types of transactions, LAC has been gaining ground, as both a receiver and a sender (table 4.1).

LAC countries are increasingly connected with the rest of the world. Investments of the rest of the world to LAC have increased in almost all categories. The largest increases, however, have been in LAC's investments abroad. LAC countries' portfolio holdings in the rest of the world (North and South countries) rose from an average of \$45.3 billion (in 2011 U.S. dollars) in 2001–05 to an average of \$152.5 billion in 2006–11. Growth in cross-border syndicated loans and M&A flows has been substantial as well. Between 2001–05 and 2006–11, the average annual volume of syndicated loan from LAC to the rest of the world jumped from \$2.1 billion to \$4.0 billion and the volume of M&A flows rose from \$4.2 billion to \$12.9 billion. When using a longer time span the growth is even more impressive. Greenfield growth has been more subdued, but these cross-border

TABLE 4.1 Cross-border investment, by pairs of regions and type of investment (annual average, millions of 2011 U.S. dollars)

Region A	Region B	Financial flows from region A to region B										
		Portfolio investments of region A in region B		Syndicated loans			Mergers and acquisitions			Greenfield investment		
		2001–05	2006–11	1996–2000	2001–05	2006–12	1990–95	1996–2000	2001–05	2006–11	2003–05	2006–11
LAC	North	44,325	146,054	598	2,055	3,614	1,362	2,331	4,193	10,065	1,991	2,705
LAC	South	928	6,442	9	49	357	0	342	56	2,791	3,858	4,051
North	LAC	291,555	573,452	59,914	46,498	64,932	6,489	46,961	23,333	30,935	70,923	79,262
South	LAC	1,847	10,527	968	1,591	5,623	517	876	405	7,579	15,348	14,894
LAC	LAC	3,475	11,370	109	558	1,619	709	3,388	3,627	6,054	10,069	10,054

Sources: Calculations based on data from International Monetary Fund (IMF) Coordinated Portfolio Investment Survey (CPIS), SDC Platinum, and FDI Markets.

Note: Portfolio data are stockholdings; data on syndicated loans, mergers and acquisitions, and greenfield investment are annual transactions. The North includes the G-7 members and 19 other European countries. The South includes all other economies (excluding countries in Latin America and the Caribbean [LAC]). Sample excludes offshore centers.

investments were already better established at the beginning of the 2000s (compared with syndicated loans and M&A).³

Although there has been an important rise in the role played by LAC as a sender region, cross-border flows to LAC countries far outweigh flows from LAC countries. For syndicated loans, M&A, and greenfield investment, total flows to LAC countries from North and South countries in 2006–11 were almost nine times larger than flows from LAC countries to North and South countries. These sharp differences may explain why LAC's financial connections in all types of financial transactions have increased more as a sender than as a receiver, especially with respect to other South countries.

Another notable feature of the growth in LAC's financial integration with the rest of the world is that (except for greenfield investment) LAC's connections with other South countries have been growing faster than its connections with North countries, especially during the second half of the 2000s. This growth has increased the participation of South countries as financiers of LAC countries, particularly in M&A. Annual flows from South to LAC countries averaged \$1.6 billion for syndicated loans

and \$0.4 billion for M&A during 2001–05. In 2006–11 they reached \$5.6 billion (an increase of 253 percent) and \$7.6 billion (an increase of 1,771 percent), respectively. In contrast, average annual North-LAC flows of syndicated loans rose just 40 percent (from \$46.5 billion to \$64.9 billion), and flows of M&A increased just 33 percent (from \$23.3 billion to \$30.9 billion). Moreover, because North-LAC flows increased at a slower pace than North-South flows, LAC countries lagged other South countries in this regard.⁴

Flows within LAC countries have also increased substantially, in some cases more than flows to the North, reflecting a higher degree of connectivity within the region. Portfolio holdings averaged \$3.5 billion during 2001–05; for 2006–11 they reached \$11.4 billion (an increase of 227 percent). Between 2001–05 and 2006–11, the average annual volume of syndicated loans within LAC rose from \$0.6 billion to \$1.6 billion (an increase of 190 percent), and M&A flows soared from \$3.6 billion to \$6.1 billion (an increase of 67 percent). In contrast, greenfield investment—the level of which was already high in the first half of the 2000s (compared with syndicated loans and M&A)—remained stagnant.

BOX 4.1 How do bilateral data compare with balance of payments data?

How do the bilateral data used in this chapter compare with the flows reported by the financial account of the balance of payments (BoP)? In particular, do bilateral flows systematically underestimate or overestimate the flows reported by the BoP, or do they move in a manner that is consistent with the flows derived from the BoP?

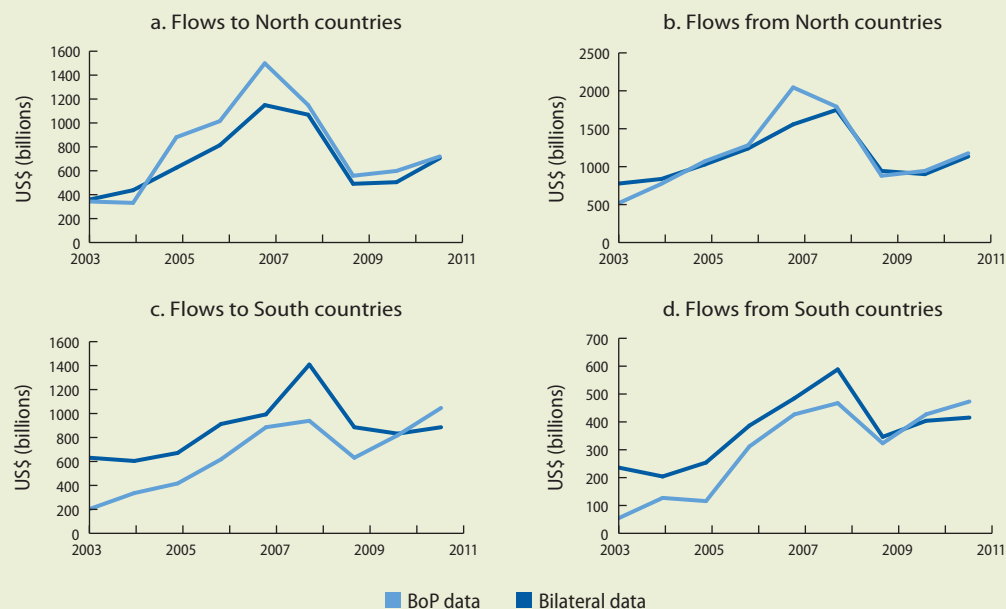
BoP data come from the International Monetary Fund, which provides annual country-level information for 1970–2012 on different types of capital flows, measured in current U.S. dollars. The data are divided into the current account and the financial account. The financial account is divided into four subcategories: direct investments, portfolio investments, other investments, and international reserve assets. The BoP data provide aggregate figures for each country with respect to the rest of the world. The bilateral data need to be aggregated before the two databases can be compared.

For foreign direct investment (merger and acquisition and greenfield flows), the two databases can be compared directly (figure B4.1.1).

At the region-year-level, figure B4.1.1 shows similar values and a significant positive correlation between the two datasets. However, for South countries (both inflows and outflows), the bilateral data seem to slightly overestimate the flows reported in the BoP accounts, possibly because the bilateral data are gross inflows whereas the BoP data are net inflows (net of inflows and outflows of foreigners). In addition, the greenfield data used in this chapter reflect announced investments; they may differ from the actual flows recorded in the BoP data. Still, at the country-year-level, the correlation between the bilateral data and the BoP data is still high (0.89 for outflows and 0.86 for inflows).

For syndicated loans, direct comparison between the bilateral data and the BoP data is not possible,

FIGURE B4.1.1 Comparison between bilateral and balance of payments account data on mergers and acquisitions and greenfield investment, 2003–11



Sources: Calculations based on data from SDC Platinum and fDi Markets (bilateral data) and IMF (balance of payments data).

Note: BoP = balance of payments. The North includes the G-7 members and 19 other European countries. The South includes all other economies (including countries in Latin America and the Caribbean). Offshore centers are excluded from the sample.

(continued)

BOX 4.1 How do bilateral data compare with balance of payments data? (continued)

because the “other investment” category in the BoP database covers not only syndicated loans but short- and long-term trade credits, loans, currency, and deposits (transferable and other, such as savings and term deposits, savings and loan shares, and shares in credit unions), as well as accounts receivables and payables (IMF 1993). Thus syndicated loans enter only as part of the other investment category in the BoP.

For portfolio investments, the BoP database covers transactions in equity and debt securities, whereas the bilateral database used in this chapter (the Coordinated Portfolio Investment Survey [CPIS]) contains information about the holdings of portfolio investment securities (that is, the stock of bilateral investments). In principle, the holdings information could be used to estimate the investment flows. However, according to the CPIS guide, flows reflect changes associated with both transactions and other flows (IMF 2002). “Other flows” covers changes recog-

nized under three broad subcategories: “revaluations due to changes in exchange rates,” “revaluations due to price changes,” and “other changes in volume.” The CPIS does not contain enough information to distinguish between transactions and other flows. Cross-border securities transactions can therefore be derived from the CPIS only with significant noise.

These caveats notwithstanding, the analysis computes a proxy for transactions using the CPIS holdings and measures the correlation between this variable and the flows covered in the BoP database. Because the CPIS database does not include information on revaluations caused by price changes, the proxy variable simply computes the difference between the holdings at the end of the period and the holdings at the beginning of the period. Despite these shortcomings, the correlation between the two variables is significant (0.69 for outflows and 0.82 for inflows).

Although flows between LAC and South countries have increased more rapidly, the North is still by far the principal source (receiver) of the flows to (from) LAC countries. Figure 4.1 shows that North countries are still the main destination of LAC cross-border flows in portfolio investments, syndicated loans, and M&A. During 2006–11, North countries accounted for 89 percent of LAC’s portfolio investments abroad, 65 percent of LAC’s syndicated loans, and 53 percent of LAC’s M&A flows. Greenfield investment is the only type of flow for which North countries are not the main destination of LAC flows.

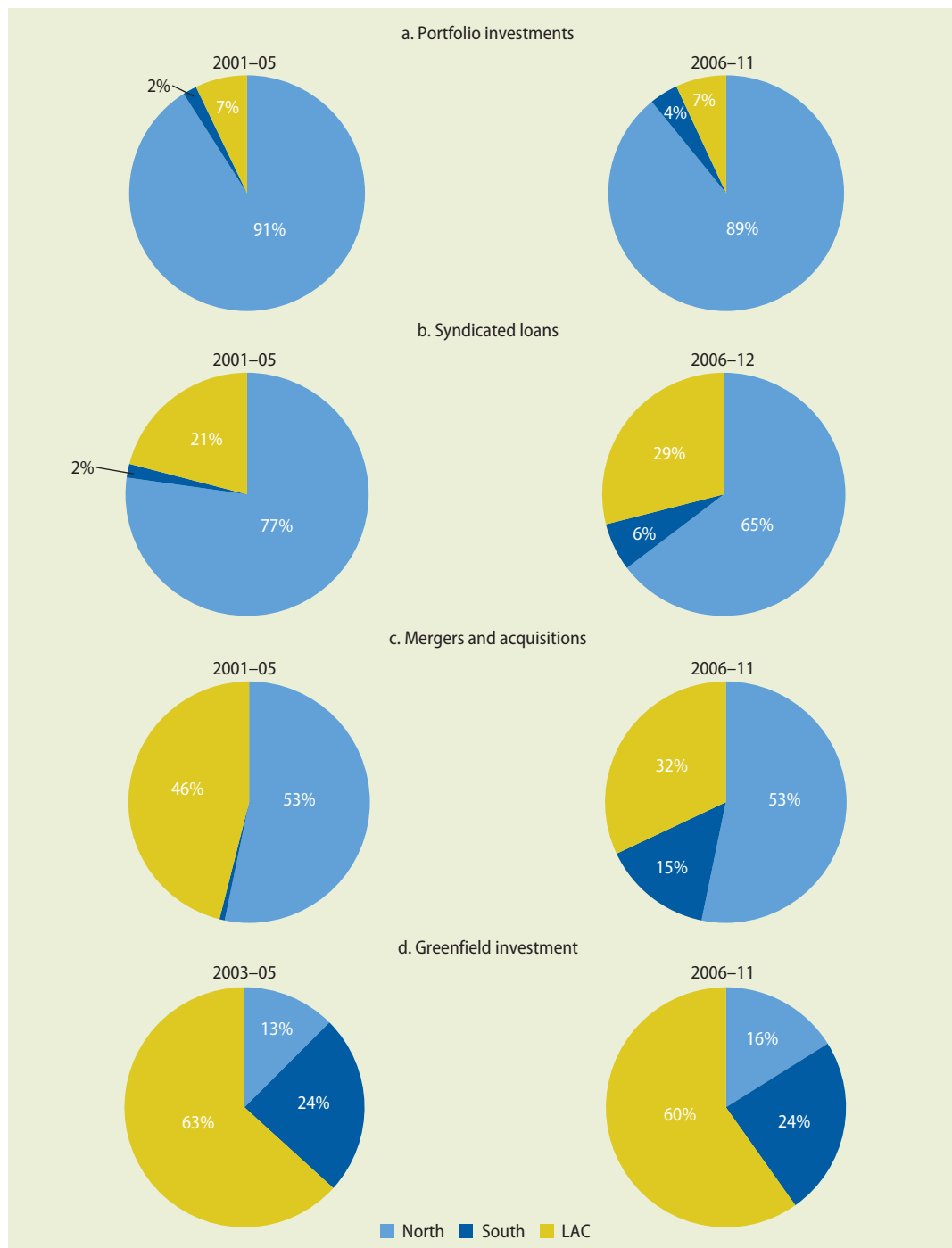
The South increased its participation as receivers of M&A flows during 2006–11 (from 1 percent to 15 percent), whereas participation by LAC countries declined (from 46 percent to 32 percent). Two large transactions affected these results. The first was the 2006 acquisition of the Canadian mining company Inco by the Brazilian company Vale. This \$17.2 billion deal accounted for 28 percent of LAC–North flows between 2006 and 2011. The second was the 2007 acquisition of the Australian Rinker Group by the Mexican

cement company Cemex. This \$14.2 billion transaction accounted for 85 percent of LAC–South flows between 2006 and 2011. Excluding these two transactions, non-LAC South countries would have received just 4 percent of LAC M&A flows in 2006–11 and LAC countries would have received 44 percent.

North countries are by far the main source of cross-border flows to LAC countries, accounting for 96 percent of portfolio investments, 90 percent of syndicated loans, 69 percent of M&A, and 76 percent of greenfield flows in 2006–11 (figure 4.2). Given the faster growth of South connections, however, there has been a gradual decline in the share of North countries, particularly in M&A.

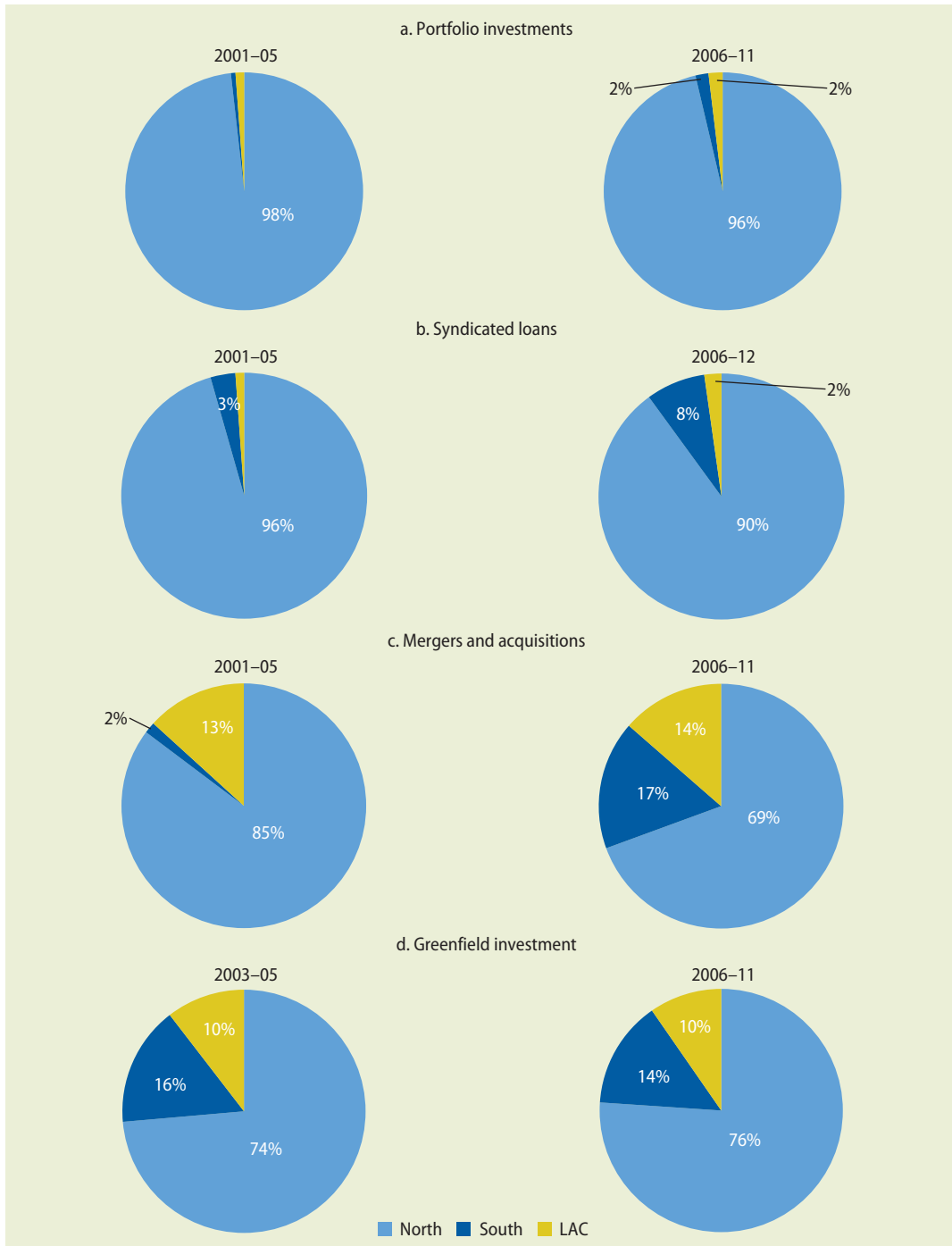
Because the patterns documented are expressed in constant dollars, they could have been driven by the fact that real economic activity was growing relatively rapidly in LAC countries. However, even relative to LAC’s GDP, cross-border portfolio holdings, syndicated loans, and M&A flows to and from LAC rose (exceptions are North-LAC syndicated loans and M&A flows) (table 4.2). In contrast, greenfield flows grew more slowly than LAC’s GDP.⁵

FIGURE 4.1 Cross-border investment shares by Latin America and Caribbean (LAC) countries in North, South, and other LAC countries, by type of investment, selected years



Sources: Calculations based on data from CPIS, SDC Platinum, and fDi Markets.
 Note: The North includes the G-7 members and 19 other European countries. The South includes all other economies (excluding countries in Latin America and the Caribbean [LAC]). Offshore centers are excluded from the sample.

FIGURE 4.2 Cross-border investment shares by North, South, and Latin America and Caribbean (LAC) countries, by type of investment, selected years



Sources: Calculations based on data from CPIS, SDC Platinum, and fDi Markets.
 Note: The North includes the G-7 members and 19 other European countries. The South includes all other economies (excluding countries in Latin America and the Caribbean[LAC]). Offshore centers are excluded from the sample.

TABLE 4.2 Shares of cross-border investment by source and receiver region, normalized by GDP of Latin America and the Caribbean (annual average, percent)

Region A	Region B	Portfolio investments of region A in region B		Financial flows from region A to region B								
				Syndicated loans			Mergers and acquisitions			Greenfield investment		
		2001–05	2006–11	1996–2000	2001–05	2006–12	1990–95	1996–2000	2001–05	2006–11	2003–05	2006–11
LAC	North	1.63	3.15	0.02	0.07	0.08	0.06	0.08	0.16	0.24	0.08	0.06
LAC	South	0.03	0.14	0.00	0.00	0.01	0.00	0.01	0.00	0.07	0.14	0.09
North	LAC	10.83	12.43	2.11	1.74	1.43	0.28	1.67	0.88	0.67	2.63	1.69
South	LAC	0.07	0.22	0.03	0.06	0.12	0.02	0.03	0.02	0.15	0.55	0.33
LAC	LAC	0.13	0.25	0.00	0.02	0.03	0.03	0.12	0.14	0.14	0.35	0.22

Sources: Calculations based on data from CPIS, SDC Platinum, and fDi Markets.

Note: GDP = gross domestic product. Portfolio figures are based on stockholdings; figures on syndicated loans, mergers and acquisitions, and greenfield investment are based on annual transactions. The North includes the G-7 members and 19 other European countries. The South includes all other economies (excluding countries in Latin America and the Caribbean [LAC]). Sample excludes offshore centers.

Figure 4.3 shows the annual evolution of different types of LAC flows. It indicates that the integration of LAC countries with the rest of the world has not been smooth. Cross-border flows to and from LAC have been characterized by boom and bust patterns. Moreover, the growth periods for different types of investments seem to be correlated, particularly in syndicated loans and M&A (the data for which the sample periods are longer) and for LAC as a receiver. In both cases there was an increase in flows to LAC countries during the mid-1990s, a decrease at the beginning of the 2000s, and a rise since then and until the 2008–09 global financial crisis. The global financial crisis seems to have had a different effect on these two types of investments (box 4.2).

Growth in the intensive and extensive margins

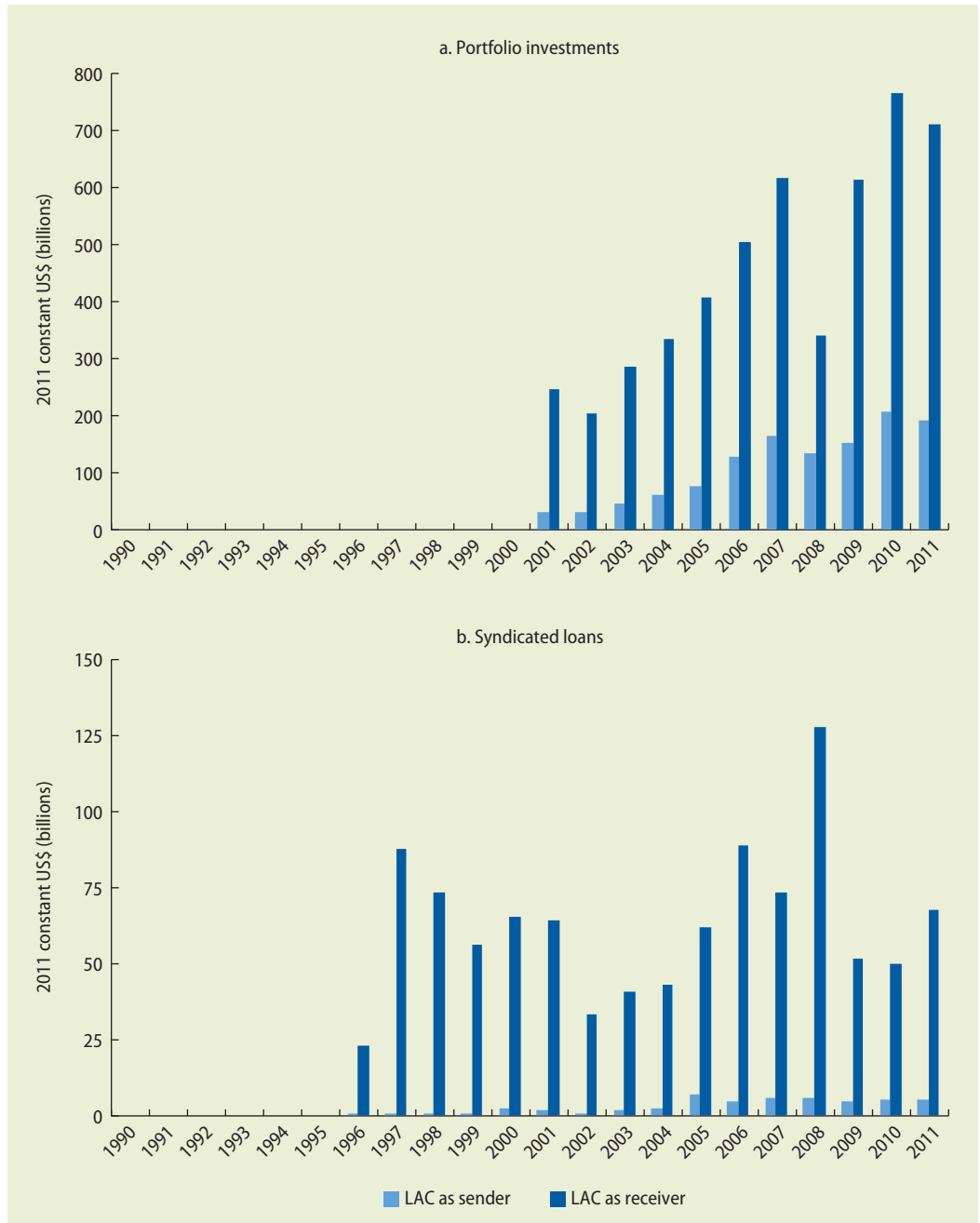
How much of the growth in LAC's connections reflects growth in the intensive margin (which captures increases in the value of transactions for existing connections) and how much reflects growth in the extensive margin (which captures increases in the proportion of active connections)? The analysis in this section shows that the growth of

LAC's connections with the rest of the world reflects increases in both margins.

Figures 4.4–4.7 show the evolution of the extensive margin for each type of investment and the total value of these connections. To measure the active connections, the analysis computes the number of country pairs that have a positive flow in each year as a share of the number of country pairs with a positive or zero flow. Annex figure 4A.1 shows the number of active connections.⁶ When comparing the level of the extensive margin of portfolio investments with the level of syndicated loans, M&A, and greenfield flows, one needs to recall that portfolio investments are stocks and the other measures are flows. The extensive margins for these types of transactions are thus expected to be very different.⁷

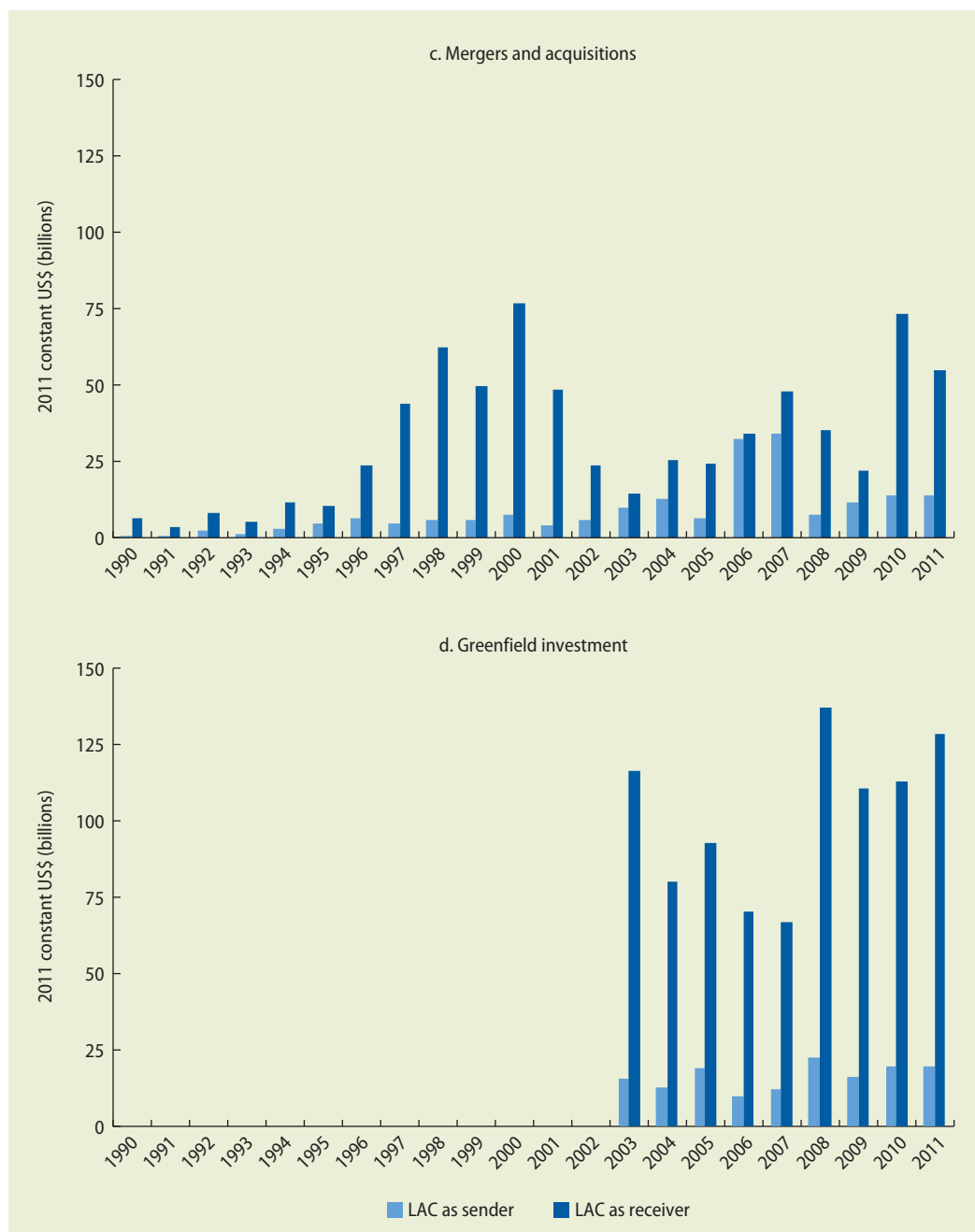
In general, the evidence shows that for all types of investment, LAC countries are connected with a higher percentage of North countries than South ones. Nevertheless, since the beginning of the 2000s, LAC countries have broadened their connections with the South, including other LAC countries. Moreover, for syndicated loans and M&A flows, there is a noticeable downward trend in the percentage of North-LAC active connections. The evidence also shows that the percentage of active connections is greater

FIGURE 4.3 Cross-border investment to and from countries in Latin America and the Caribbean



(continued)

FIGURE 4.3 Cross-border investment to and from countries in Latin America and the Caribbean (continued)



Sources: Calculations based on data from CPIS, SDC Platinum, and fDi Markets.
 Note: Offshore centers are excluded from the sample. LAC = Latin America and the Caribbean.

BOX 4.2 How did the global financial crisis affect investment in and by the region?

The effects of the 2008–09 global crisis varied across types of investment, as figure 4.3 indicates. Portfolio holdings and syndicated loan flows to Latin America and the Caribbean (LAC) countries declined more than flows from LAC countries. This finding is consistent with evidence showing that foreign investors pulled out sharply from emerging economies when the crisis hit (Broner and others 2013). In contrast, merger and acquisition (M&A) flows from LAC fell more than M&A flows to LAC. The crisis did not appear to affect greenfield flows to or from LAC. This finding is consistent with a large body of literature showing that foreign direct investment tends to be more stable than other types of flows (Sarno and Taylor 1999; Levchenko and Mauro 2007).

Several examples illustrate the behavior of different types of flows and the magnitude of their collapse during the global financial crisis. Portfolio investments by LAC countries abroad decreased by 18 percent in 2008. This decline was much more moderate than the 44 percent drop of foreign portfolio investments in LAC. However, both reductions are significant given that these values are stocks (not flows). These effects were temporary, however: by 2009 both holdings were very close to their 2007 values.

The behavior of asset prices during the crisis may explain the size of these fluctuations. As De la Torre and others (2010, 2012) note, foreign investors held equity positions in LAC, whose value dropped substantially during the crisis, whereas LAC investors held debt abroad (including U.S. Treasury bonds and

other developed countries' sovereign debt), whose prices fell by much less.

The crisis did not affect flows of syndicated loans from or to LAC countries until 2009, when it sharply hit flows to and to a lesser extent from LAC. In both cases the effects have persisted: even in 2011 flows to and from LAC were smaller than they were in 2007.

M&A seems to be the only case in which flows from LAC were affected significantly more than flows to LAC. M&A flows from LAC decreased 77 percent in 2008. Part of this decrease reflects the fact that the 2007 flow was very large because of the \$14.2 billion acquisition of the Australian Rinker Group by the Mexican cement company Cemex, which represented 41 percent of 2007 LAC M&A outflows. Even excluding this deal, however, the decline was significant (61 percent) and much larger than the decrease in flows to LAC (26 percent). In addition, the contractionary effects of the crisis lasted longer in the case of flows from LAC.

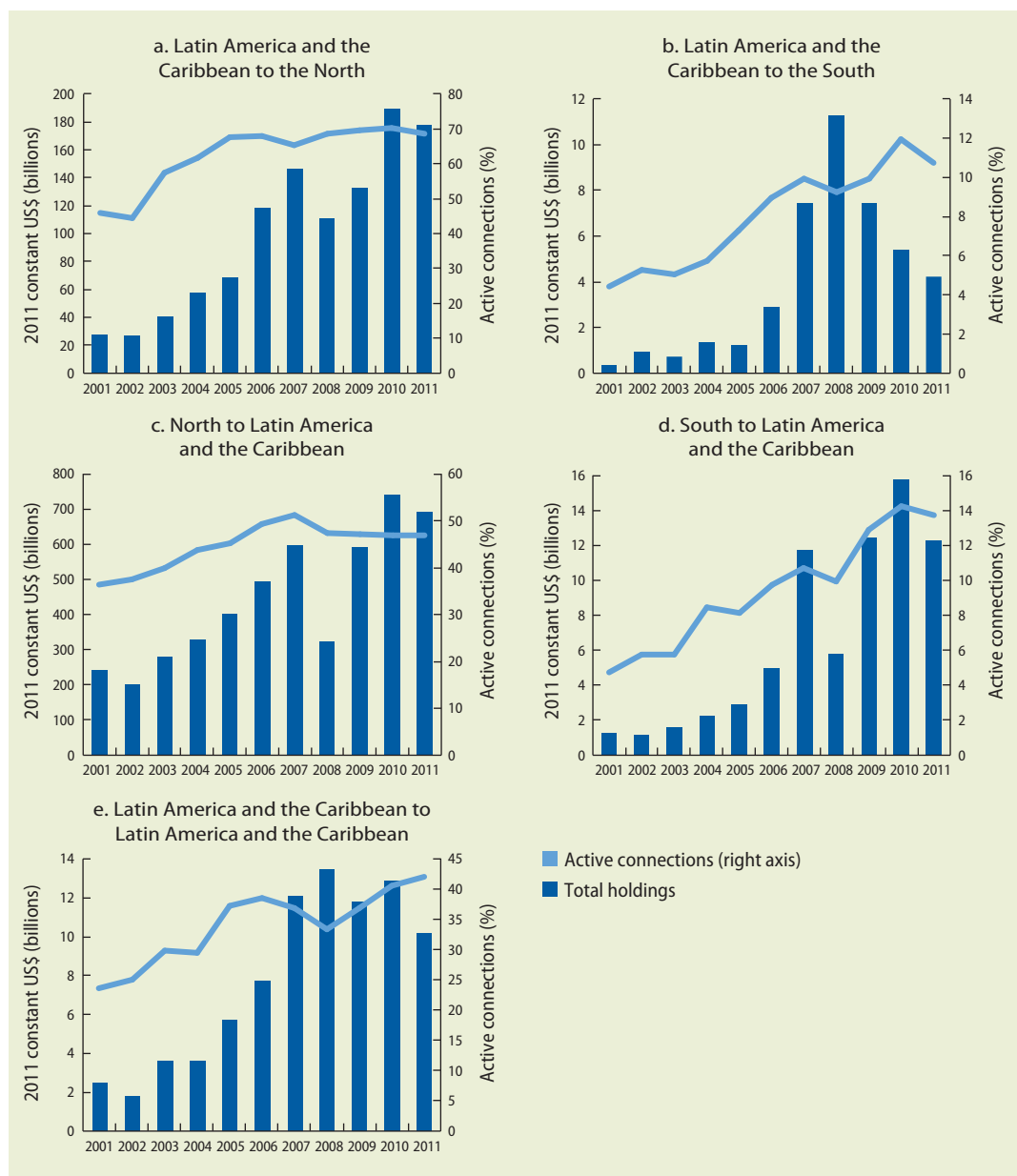
The crisis also affected the extensive margin of the cross-border investments, especially for North-LAC connections. Following the crisis, the percentage of active North-LAC connections decreased for portfolio holdings, syndicated loans, and M&A flows. Although the downward trend for syndicated loans and M&A flows started at the beginning of the 2000s, the decrease was steeper after the crisis. In contrast, for portfolio holdings the extensive margin of North-LAC connections had been increasing steadily until 2007; it has decreased every year since the crisis.

when LAC is a receiver: the percentage of active North-LAC links is larger than the percentage of active LAC-North links (except for portfolio investments), and the percentage of active South-LAC links exceeds the percentage of active LAC-South links.

Regarding portfolio investments, figure 4.4 shows that LAC countries are connected (as both receivers and senders) with a much higher percentage of North countries than South ones. Over the entire sample period, the percentage of active connections from

LAC to North countries was around seven times greater than the percentage of active connections between LAC and South countries. Since the beginning of the 2000s, however, LAC countries have broadened their connections with the South, including other LAC countries. The share of active LAC-South connections increased from 4 percent in 2001 to almost 11 percent in 2011, for example, and the share of active LAC-LAC connections rose from 24 percent to 42 percent.

FIGURE 4.4 Cross-border holdings of and extensive margin for portfolio investments, 2001–11



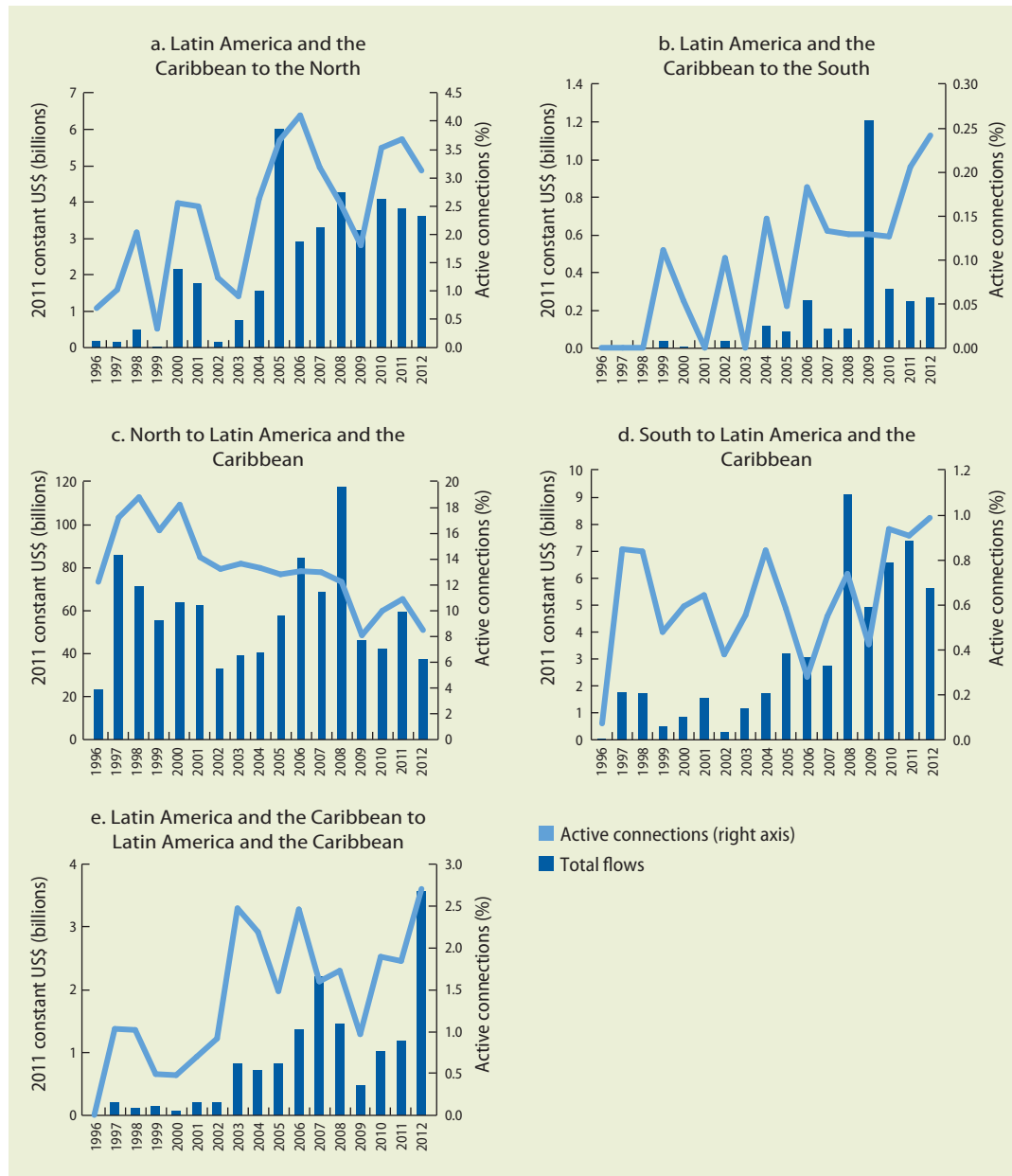
Source: Calculations based on data from CPIS.

Note: The extensive margin is the percentage of active connections—the number of country pairs that have a positive investment in each year divided by the number of country pairs with a positive or zero value in the last year of the sample. The North includes the G-7 members and 19 other European countries. The South includes all other economies (excluding countries in Latin America and the Caribbean). Offshore centers are excluded from the sample.

Figure 4.5 shows that for syndicated loans, LAC countries as receivers are much more connected with North countries than with South countries, including other countries in LAC. In 2011 the share of active connections

was 11 percent for North-LAC connections and less than 2 percent for South-LAC and LAC-LAC connections. The larger number of banks in the North that have traditionally engaged in syndicated loans may explain

FIGURE 4.5 Cross-border flows of and extensive margin for syndicated loans, 1996–2012



Source: Calculations based on data from SDC Platinum.
 Note: The extensive margin is the percentage of active connections—the number of country pairs that have a positive flow in each year divided by the number of country pairs with a positive or zero flow in the last year of the sample. The North includes the G-7 members and 19 other European countries. The South includes all other economies (excluding countries in Latin America and the Caribbean). Offshore centers are excluded from the sample.

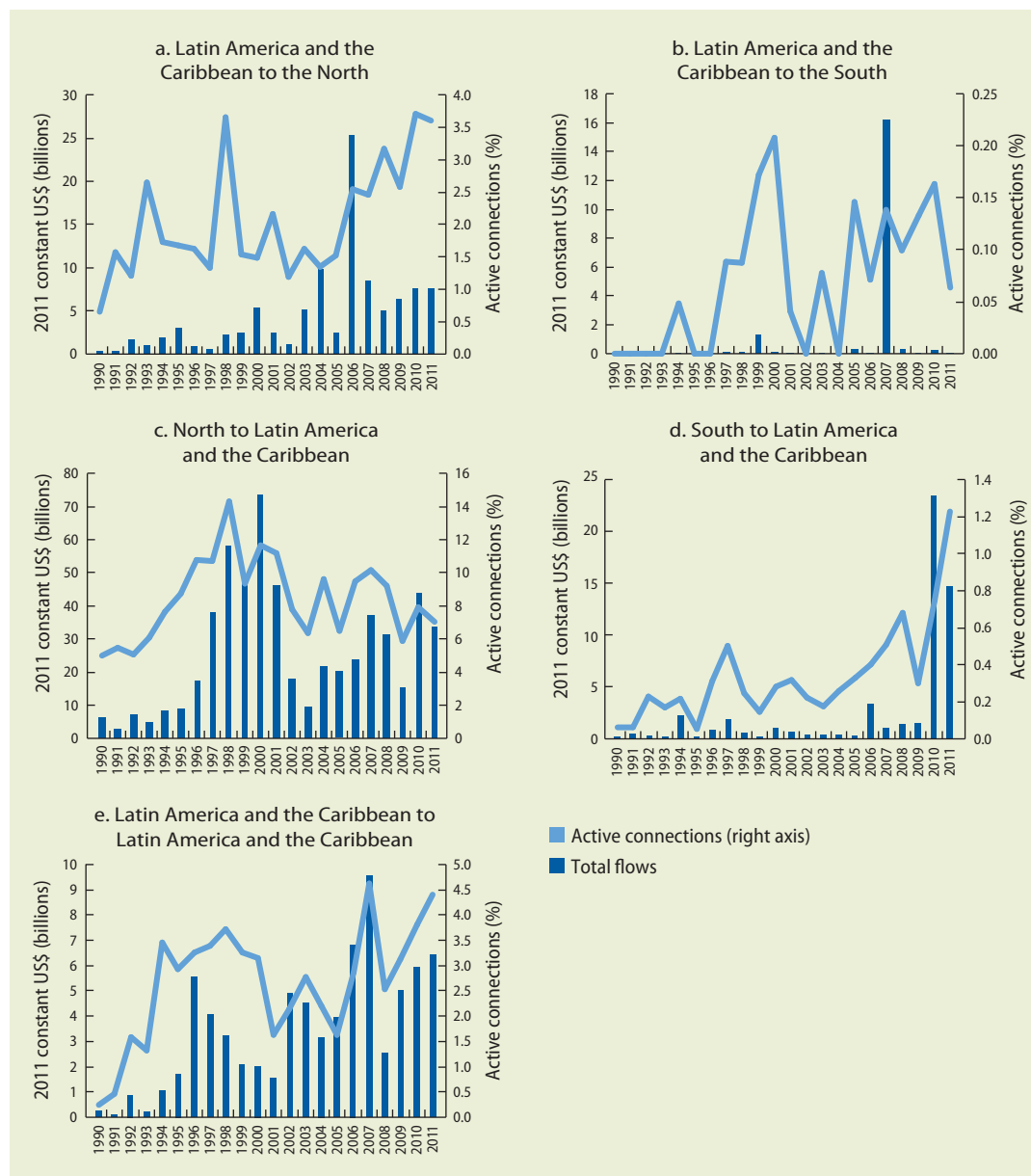
these figures. However, there is a clear downward trend in both the extensive margin and total flows of North-LAC connections (especially during the crisis years) and an upward trend in connections from South to LAC and

within LAC. The percentage of active sender connections and the total amount financed by LAC in other regions is very low, suggesting that banks in LAC are still not engaging in this type of transaction across borders. For

example, flows from LAC to other countries reached \$5.3 billion in 2011, about 8 percent of North-LAC flows. Possibly because of the small share of the extensive margin, syndicated loans display the greatest degree of volatility in the percentage of active connections.

In line with the previous findings, figure 4.6 shows that during the 1990s, LAC countries as receivers of M&A were much more connected with North countries than with South countries, including countries in LAC. In 1999 the share of active connections

FIGURE 4.6 Cross-border flows of and extensive margin for mergers and acquisitions, 1990–2011



Source: Calculations based on data from SDC Platinum.

Note: The extensive margin is the percentage of active connections—the number of country pairs that have a positive flow in each year divided by the number of country pairs with a positive or zero flow in the last year of the sample. The North includes the G-7 members and 19 other European countries. The South includes all other economies (excluding countries in Latin America and the Caribbean). Offshore centers are excluded from the sample.

was almost 10 percent for North-LAC, 0.1 percent for South-LAC, and 3 percent for LAC-LAC connections. However, since the 2000s there has been a downward trend in the extensive margin of North-LAC connections and an upward trend in the extensive margins of LAC-LAC and South-LAC connections. Although these developments have narrowed the gap in the extensive margin across regions, the North-LAC percentage of active connections still remains larger. In 2011, 7 percent of North-LAC, 4 percent of LAC-LAC, and 1 percent of South-LAC links were active. As senders, LAC countries are equally connected with North countries and other LAC countries: in 2011 the share of both types of active connections was about 4 percent. In contrast, the share of active connections (and the total amount financed) by LAC in South countries is very low and displays significant volatility.

Figure 4.7 shows that greenfield flows to and from LAC countries share three characteristics that are not observed in the other types of investments. First, the share of active connections within LAC (6 percent) is larger than it is for LAC-North links (4 percent). Second, the average value of LAC-South and LAC-LAC links is higher than the value of LAC-North connections. Third, there is an upward trend in the percentage of active North-LAC connections, reflecting the increasing number of North countries investing in LAC.

To explicitly capture the growth of the intensive margin, table 4.3 shows both the evolution of the flows for different regions with respect to LAC and the share of the increase in these flows that is driven by new connections relative to the initial period (for each type of flow) and the previous period.

Overall, the intensive margin accounts for almost all of the growth of cross-border portfolio investments. It also explains North-LAC flows. For other types of investments, the extensive margin plays a more important role, especially in LAC-South and within LAC links.

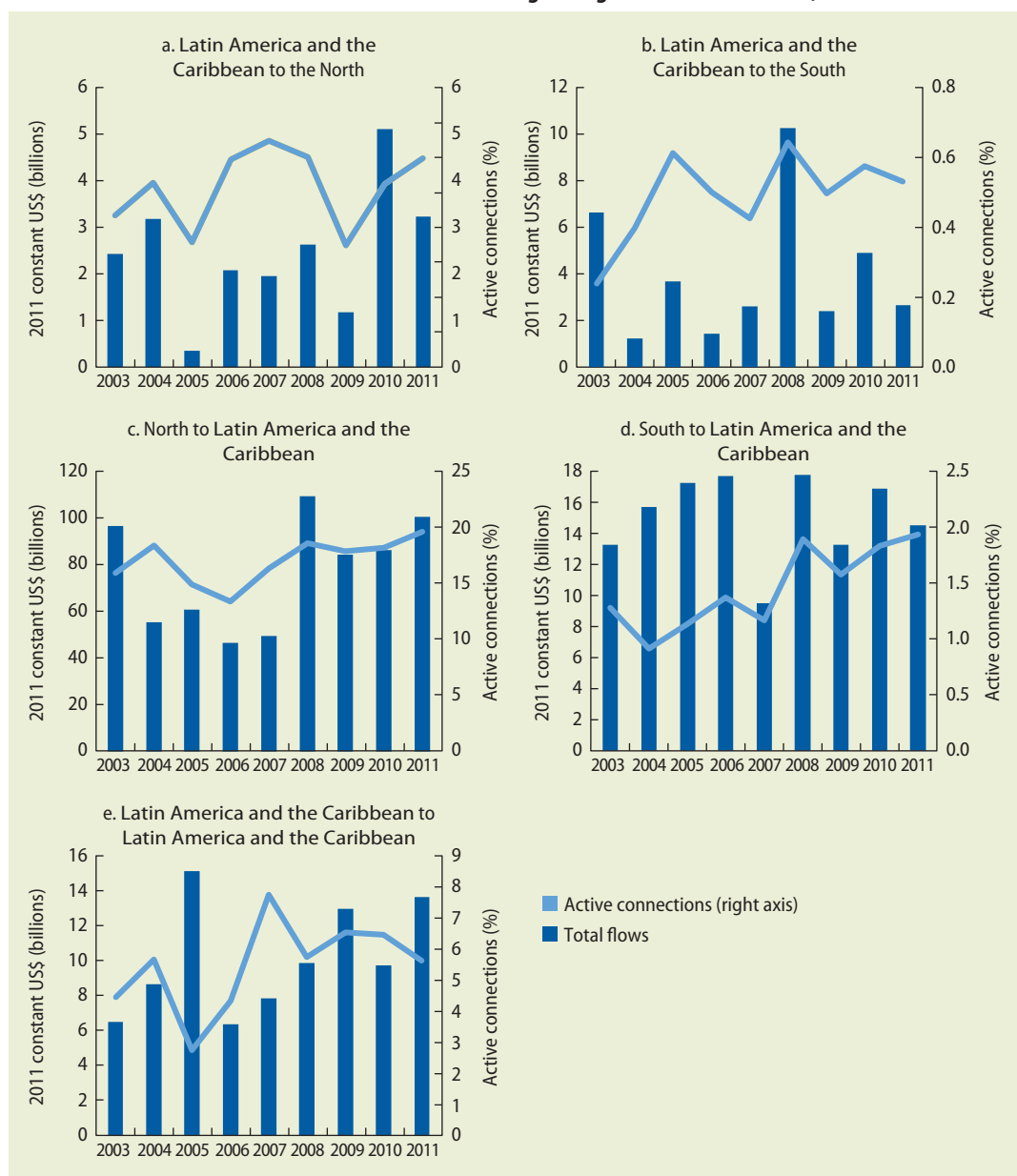
For portfolio investments, although there was an important increase in the value of

stock holdings during 2006–11, few new connections were created; the increase reflects a deepening of the intensive margin (see table 4.3). Average LAC-North holdings increased from \$44.3 billion in 2001–05 to \$146.1 billion in 2006–11, but only 0.08 percent of the increase was attributable to new connections. The increase in North-LAC investments attributable to new connections was only 0.1 percent. This pattern reflects the fact that even at the beginning of the 2000s, the extensive margin (or the portfolio links) between LAC and North countries had already been well established. For South-LAC and LAC-LAC links, there was some increase in investments as a result of new connections, but this increase represents less than 10 percent of the expansion in cross-border holdings.

For syndicated loans and M&A, new connections played a more important role in augmenting cross-border flows, especially LAC-South and LAC-LAC flows. For example, within LAC, 92 percent of syndicated loan flows during 2006–11 were attributable to connections established since 1996–2000. New connections represented 57 percent of 2006–11 M&A flows. Even between 2001–05 and 2006–11 there was a significant increase in flows between South and LAC (and within LAC) as a result of new connections, suggesting that syndicated loan and M&A links are still expanding. New connections represented a much smaller fraction of North-LAC flows in 2006–11 (2 percent for syndicated loans and 18 percent for M&A). This result suggests that North-LAC links were already well established in the 1990s. For greenfield investment, a large fraction of the 2006–11 flows was attributable to new connections, mostly LAC-South and South-LAC links.

To capture the growth in the extensive and intensive margins more formally, tables 4.4 and 4.5 show the results of regressions that include source and receiver fixed effects and gravity controls. The extensive margin regressions (table 4.4) are probit regressions in which the dependent variable is an indicator variable that takes the value of 1 when there

FIGURE 4.7 Cross-border flows of and extensive margin for greenfield investment, 2003–11



Source: Calculations based on data from fDi Markets.

Note: The extensive margin is the percentage of active connections—the number of country pairs that have a positive flow in each year divided by the number of country pairs with a positive or zero flow in the last year of the sample. The North includes the G-7 members and 19 other European countries. The South includes all other economies (excluding countries in Latin America and the Caribbean). Offshore centers are excluded from the sample.

is a positive bilateral flow between the two countries involved and 0 otherwise. These regressions include gravity control variables, which help explain different levels of financial flows between each country pair based on the geographic distance between the countries,

differences in latitude and longitude, differences in time zones, whether they share a common language, whether they have a common legal origin, and whether the receiver (sender) country is (or was) a colony of the sender (receiver). The regressions also control

TABLE 4.3 Intensive margin of financial connections across regions

Region A	Region B	Item	Portfolio investments of region A in region B		Financial flows from region A to region B							Greenfield investment	
			2001–05	2006–11	1996–2000	2001–05	2006–12	1990–95	1996–2000	2001–05	2006–11	2003–05	2006–11
LAC	North	Value of investment (millions of 2011 dollars)	44,325	146,054	598	2,055	3,614	1,362	2,331	4,193	10,065	1,991	2,705
		Investment due to nonexisting links during initial period (percent)	0.08	0.08	35	62	13	5	11				11
		Investment due to nonexisting links during previous period (percent)	0.08	0.08	35	16	13	59	13				11
LAC	South	Value of investment (millions of 2011 dollars)	928	6,442	9	49	357	0	342	56	2,791	3,858	4,051
		Investment due to nonexisting links during initial period (percent)	10	100	100	89	100	100	100	100	100	100	71
		Investment due to nonexisting links during previous period (percent)	10	100	100	96	100	100	100	100	100	100	71
North	LAC	Value of investment (millions of 2011 dollars)	291,555	573,452	59,914	46,498	64,932	6,489	46,961	23,333	30,935	70,923	79,262
		Investment due to nonexisting links during initial period (percent)	0.10	0.10	2	2	2	5	7	18			5
		Investment due to nonexisting links during previous period (percent)	0.10	0.10	2	2	2	5	3	10			5
South	LAC	Value of investment (millions of 2011 dollars)	1,847	10,527	968	1,591	5,623	517	876	405	7,579	15,348	14,894
		Investment due to nonexisting links during initial period (percent)	6	6	9	25	79	80	85				42
		Investment due to nonexisting links during previous period (percent)	6	6	9	29	79	66	56				42
LAC	LAC	Value of investment (millions of 2011 dollars)	3,475	11,370	109	558	1,619	709	3,388	3,627	6,054	10,069	10,054
		Investment due to nonexisting links during initial period (percent)	6	6	72	92	55	26	57				16
		Investment due to nonexisting links during previous period (percent)	6	6	72	28	55	3	33				16

Sources: Calculations based on data from CPIs, SDC Platinum, and FDI Markets.

Note: This table provides statistics on portfolio investments, syndicated loans, mergers and acquisitions, and greenfield cross-border flows and shows how much of the increase was driven by new connections relative to the initial period and relative to the previous period. The North includes the G-7 members and 19 other European countries. The South includes all other economies (excluding countries in Latin America and the Caribbean). Sample excludes offshore centers. LAC = Latin America and the Caribbean.

for source- and target-country dummies and region-pair dummies (North-North, North-South, North-LAC, South-North, South-South, South-LAC, LAC-North, LAC-South, and LAC-LAC). Having controlled for these factors, the regressions measure the trends

in financial connections across regions. The reported results correspond to the differences between these trend coefficients.

The regressions in table 4.5 are ordinary least squares regressions with the log of the bilateral flows (the value of the connections)

TABLE 4.4 Extensive margin of cross-border financial flows

	Dependent variable: 1 if investment > 0, 0 otherwise			
	Portfolio investments	Syndicated loans	Mergers and acquisitions	Greenfield investment
<i>Differences between trend coefficients</i>				
(LAC-North) trend – (South-North) trend	0.014	0.008	–0.002	–0.021
(LAC-South) trend – (South-South) trend	–0.051***	0.013	–0.016	–0.009
(LAC-LAC) trend – (LAC-South) trend	–0.012	–0.005	–0.002	0.019
(North-LAC) trend – (North-South) trend	–0.025***	–0.022***	–0.017***	0.024**
(South-LAC) trend – (South-South) trend	–0.042***	–0.011	0.008	0.027**
Number of observations	120,078	264,401	386,584	217,350

Sources: Calculations based on data from CPIS, SDC Platinum, and fDi Markets.

Note: Regressions are probit models in which the dependent variable is an indicator variable that takes the value of 1 when there is a bilateral positive flow (or investment holding) between two countries and 0 otherwise. Data are aggregated at the country-country level. The regressions include gravity control variables that help explain the levels of financial flows between each country pair based on the geographic distance between the countries, differences in latitude and longitude, differences in time zones, whether they share a common language, whether they have a common legal origin, and whether the receiver (sender) country is (or was) a colony of the sender (receiver). They also control for source- and target-country dummies and region-pair dummies. The North includes the G-7 members and 19 other European countries. The South includes all other economies (excluding countries in Latin America and the Caribbean [LAC]). Sample excludes offshore centers. Standard errors are clustered by country pairs.

Significance level: * = 10 percent, ** = 5 percent, *** = 1 percent.

TABLE 4.5 Region-to-region financial flows

	Portfolio investments		Syndicated loans		Mergers and acquisitions		Greenfield investment	
	Log(holdings)	Log(holdings scaled by GDP)	Log(flows)	Log(flows scaled by GDP)	Log(flows)	Log(flows scaled by GDP)	Log(flows)	Log(flows scaled by GDP)
<i>Differences between trend coefficients</i>								
(LAC-North) trend – (South-North) trend	0.049**	0.060***	–0.006	0.007	–0.056**	–0.046*	0.021	0.025
(LAC-South) trend – (South-South) trend	–0.018	–0.008	0.065	0.063	–0.095	–0.092	–0.082	–0.075
(LAC-LAC) trend – (LAC-South) trend	–0.066	–0.056	–0.092*	–0.067	0.004	0.028	0.115	0.115
(North-LAC) trend – (North-South) trend	–0.091***	–0.081***	–0.067***	0.051***	–0.056***	–0.044***	0.024	0.028
(South-LAC) trend – (South-South) trend	–0.116***	–0.107***	–0.051***	–0.036*	–0.068**	–0.057**	–0.085*	–0.079*
Number of observations	6,012	6,012	5,089	5,089	6,160	6,160	4,601	4,601
R-squared	0.968	0.987	0.982	0.992	0.933	0.980	0.969	0.988

Sources: Calculations based on data from CPIS, SDC Platinum, and fDi Markets.

Note: This table includes both country-region (outflows) and region-country (inflows) observations. When indicated, flows (or holdings) are scaled using the geometric mean between the sender's and receiver's GDPs. Control variables are country-region dummies. The North includes the G-7 members and 19 other European countries. The South includes all other economies (excluding countries in Latin America and the Caribbean [LAC]). Sample excludes offshore centers.

Significance level: * = 10 percent, ** = 5 percent, *** = 1 percent.

as the dependent variable. Unlike the regressions in table 4.4, these regressions use regional (not country-level) data. There is therefore no need to use gravity controls. Because the regressions drop all observations in which the bilateral flows are equal to zero (because of the use of logs), they isolate the effect of the extensive margin and thus capture changes in the intensive margin. However, this measure of the intensive margin differs from the more precise one used in table 4.3, which accounts only for the growth in the intensity of the connections that were previously established. The reported results correspond to the differences between the trend coefficients.

The main conclusion from tables 4.4 and 4.5 is that North-LAC connections are increasing more slowly than North-South connections in both the intensive and extensive margins, except for greenfield investment. LAC is therefore losing ground to other regions of the South in terms of flows from the North. In addition, the regressions for the intensive margin show that South-LAC connections are increasing more slowly than South-South connections. In contrast, for LAC as a sender, there is no clear evidence that LAC-North (LAC-South) connections are increasing more slowly than South-North (South-South) connections.

The maps in chapter 1 show how LAC has become more connected with the rest of the world. This chapter uses similar maps to show the connections between LAC and countries in other South regions and countries in LAC. This analysis highlights the role that large countries (in particular, Brazil and Mexico) have played. It shows that Brazil and Mexico seem to drive LAC-South connections but that their role in LAC-LAC links is more subdued.

Figure 4.8 depicts every connection within LAC with flows greater than \$1 million (measured at 2011 prices). It shows that between 2001–05 and 2006–11, the number of connections rose 18 percent for portfolio links, 46 percent for syndicated loans, 94 percent for M&A, and 107 percent for greenfield investment (because of data restrictions,

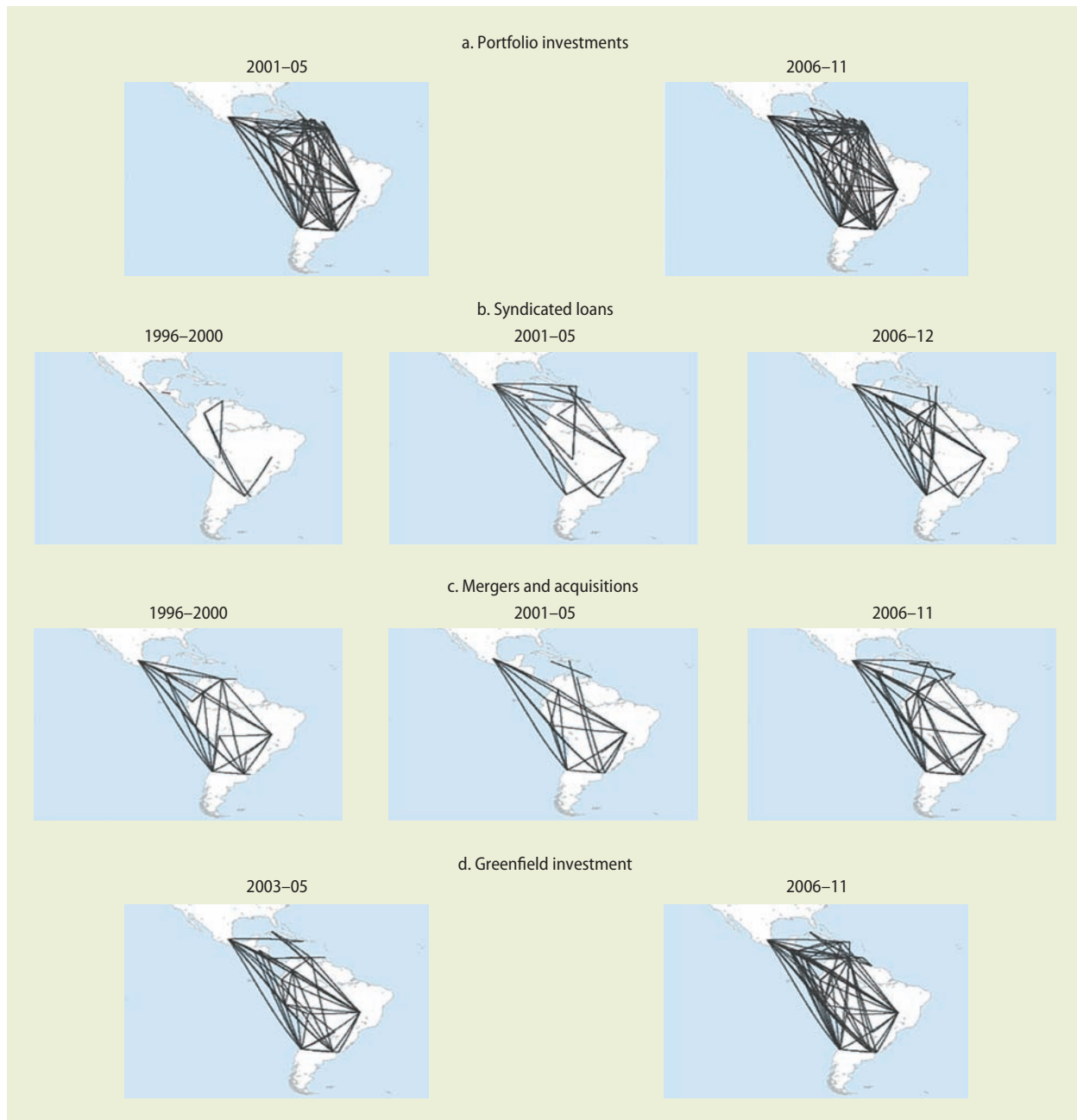
the initial period for greenfield is 2003–05 instead of 2001–05).

Portfolio holdings and greenfield flows exhibit a higher degree of connectivity, even in the first years of the 2000s. This pattern is expected in the case of portfolio holdings, given that they are stock measures. For greenfield investment, the result may indicate that this type of investment is the preferred mode by LAC participants investing within the region. There were 105 portfolio holding connections during 2001–05, and 59 greenfield flows during 2003–05. Greenfield links grew significantly in the years that followed, with the number of connections reaching 122 during 2006–11; the number of portfolio holding links increased less rapidly, to 124. During 2001–05 there were far fewer syndicated loan links (66) and M&A connections (38). The number of M&A links did not increase significantly over the 1996–2000 period, when there were 48 links within LAC. In contrast, the number of links for syndicated loans rose from just 10.

Figure 4.9 describes LAC-South connections. As in LAC-LAC links, there is increasing connectivity in all four types of investments. Except in the case of portfolio investments, however, the number of links is much lower than it is within LAC. Moreover, just two countries, Brazil and Mexico, seem to be driving the flows. Brazil accounted for 10 of the 17 connections between LAC and South countries for syndicated loans in 2006–11; these links represented 91 percent of the value of these flows. Mexico accounted for 7 of the 15 LAC-South links for M&A (93 percent of the value of these flows).⁸ For greenfield flows, Brazil and Mexico together accounted for 43 of the 69 links (83 percent of the value of these flows).

In contrast, Brazil and Mexico play a much less critical role as senders within LAC (see figure 4.8). Other countries, such as Chile or Colombia, are also important. Of the 38 syndicated loan connections within LAC in 2006–11, Brazil and Mexico accounted for just 7, representing 47 percent of the value of these flows. They accounted for 18 of the 62 M&A links (46 percent of the value

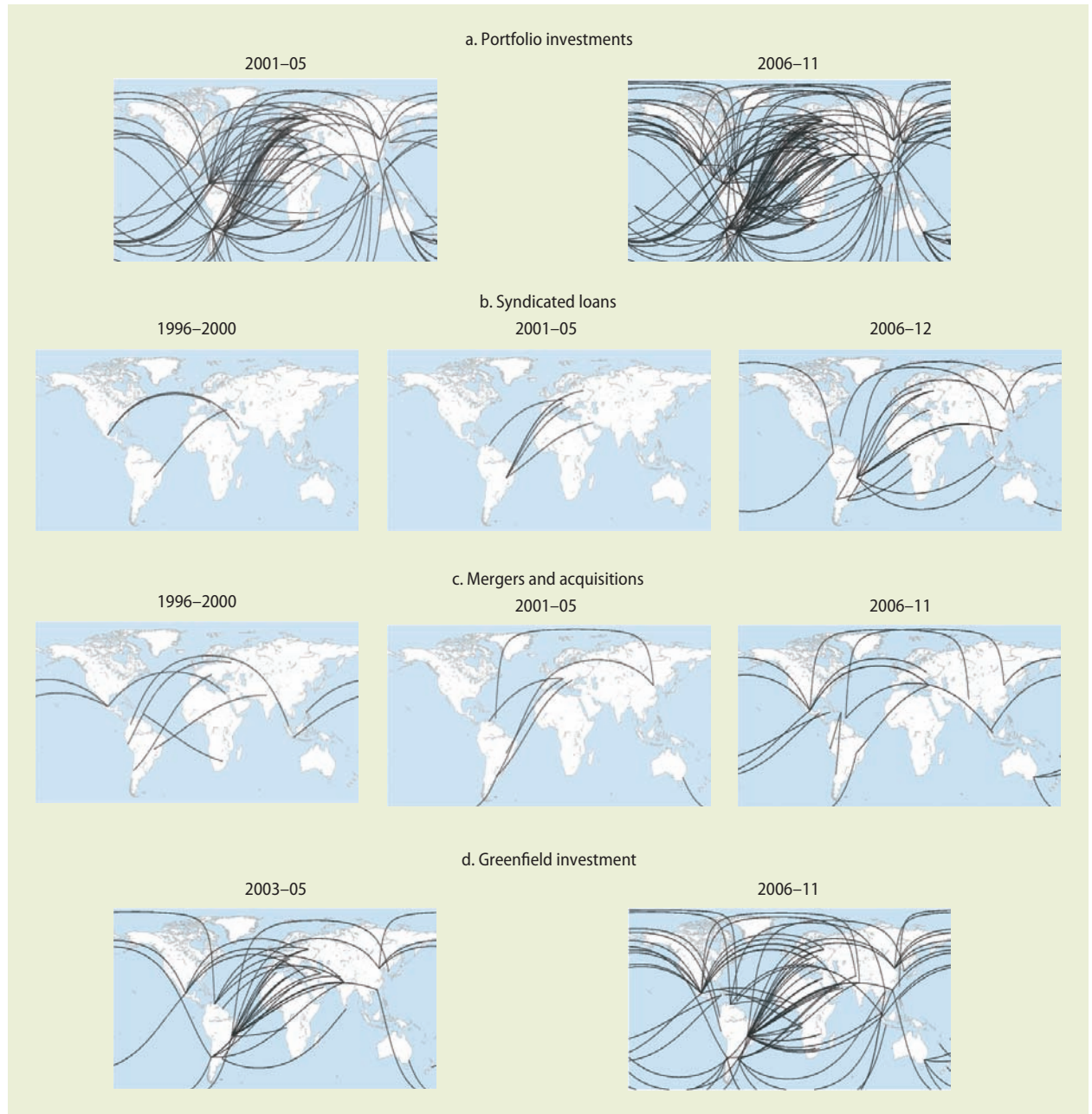
FIGURE 4.8 Extensive margin of cross-border financial flows within Latin America and the Caribbean, by type of investment, selected years



Sources: Calculations based on data from CPIS, SDC Platinum, and fDi Markets.

Note: Each line represents a flow or stock greater than \$1 million (measured at 2011 prices) between two countries in Latin America and the Caribbean. Offshore centers are excluded from the sample.

FIGURE 4.9 Extensive margin of cross-border financial flows from Latin America and the Caribbean to countries in other regions of the South, by type of investment, selected years



Sources: Calculations based on data from CPIS, SDC Platinum, and fDi Markets.

Note: Each line represents a flow or stock greater than \$1 million (measured at 2011 prices) between a country in Latin America or the Caribbean (LAC) and a country in another South region. The South includes all countries outside LAC that are not in the North (G-7 members and 19 other European countries). Offshore centers are excluded from the sample.

of these flows). In greenfield investment, the two countries accounted for only 30 of the 122 links but accounted for 62 percent of the value of the flows.

Financial flows and trade flows

The globalization of LAC, which started in the late 1980s and continued strongly during the 1990s, accelerated and intensified in the 2000s. A growing body of evidence suggests that the patterns of financial globalization changed during the 2000s.⁹ Chapter 1 documents some important facts about the nature of these changes. In particular, it shows that LAC is increasingly connected with other South countries in both trade and finance (Set of Facts 2).

In addition to size, one aspect of both trade and financial flows that has been changing significantly for LAC (as well as other South countries) is their composition. The sectoral composition of LAC's connections with other South countries is generally different from the composition of its connections with North countries, in both trade and finance (Set of Facts 3). An important question is the extent to which financial flows reflect the dynamics of trade connections. This section sheds light on the links between these two types of flows and the importance of the link for LAC.

Here the analysis studies the role played by the different sectors in the growth in financial flows to and from LAC countries. It also examines the links between trade and financial flows in LAC. Sector-level data on foreign investments (M&A and greenfield) and syndicated loans are matched with sector-level trade data from Comtrade covering 14 sectors in 215 countries during 1990–2012. For ease of exposition of the broad trends, the analysis groups these sectors into three broad categories: primary, light manufacturing, and heavy manufacturing sectors. The primary sector includes the following subsectors: agriculture, hunting, forestry, and fishing; mining; and crude petroleum and natural gas. The light manufacturing sector includes the following subsectors: food, beverages, and tobacco; textiles

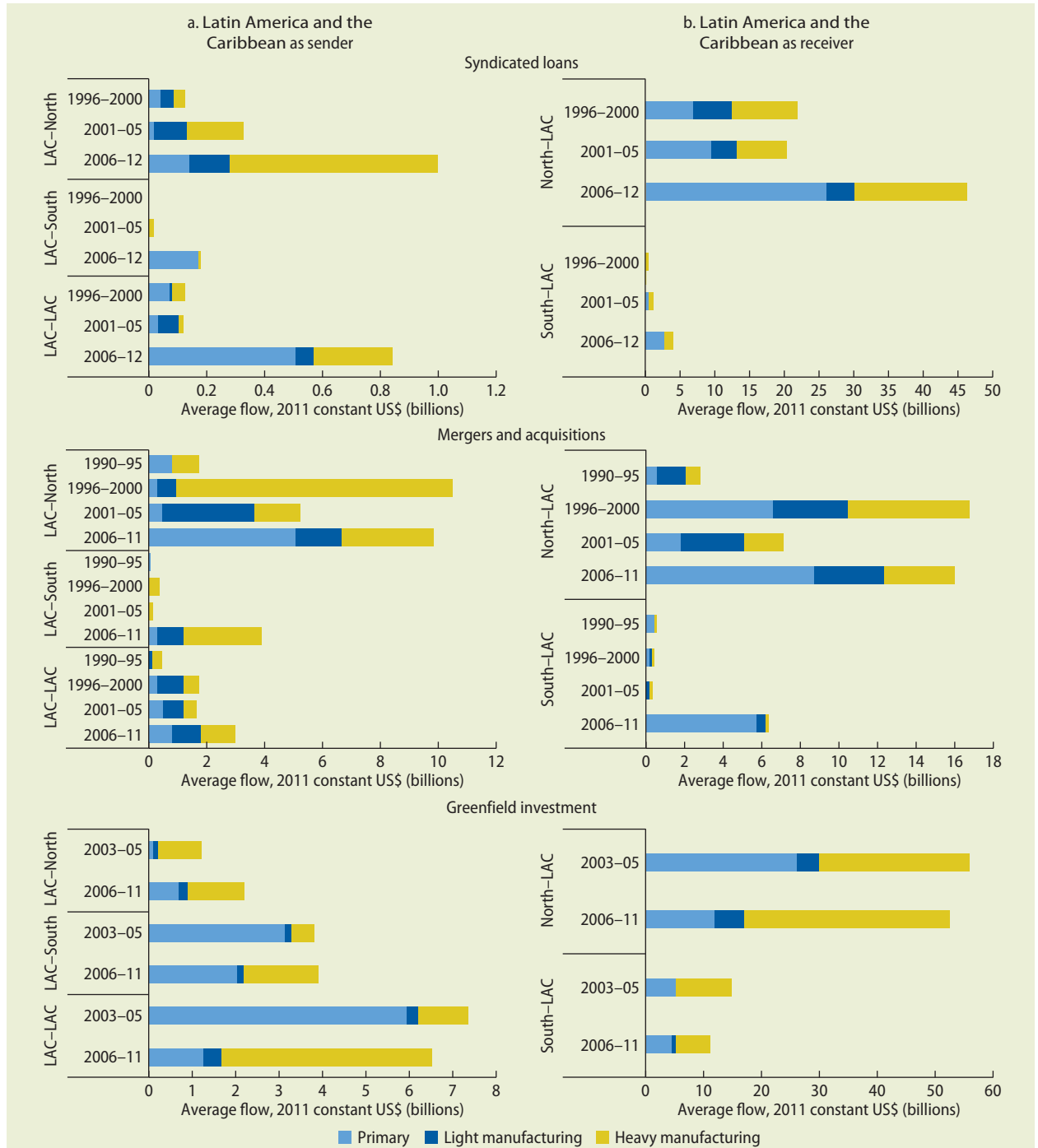
and apparel (including leather); and wood and paper-related products. The heavy manufacturing sector includes the following subsectors: refined petroleum and related products, chemicals and plastics, nonmetallic minerals, metals, machinery and equipment, and transport equipment.¹⁰

Figure 4.10 shows the average flows to and from LAC countries by receiver and sender region, as well as the sectoral composition of financial flows for different sample periods. The patterns for LAC as a sender show that no single sector explains the increase in financial flows from LAC countries. For LAC-South and LAC-LAC flows, the primary sector drove the growth in syndicated loans, and the heavy manufacturing sector largely accounted for the increase in M&A and greenfield flows. In contrast, for LAC-North flows, the heavy manufacturing sector accounted for most of the growth in syndicated loans, and the primary sector powered the increase in M&A and greenfield flows.

For LAC as a receiver, the primary sector drove the growth in syndicated loans and M&A flows. The value of North-LAC syndicated loans to the primary sector grew 175 percent between 2001–05 and 2006–11, and the value of M&A flows rose 360 percent. Flows to the heavy manufacturing sector also increased during this period, although growth was more subdued. In contrast, there was a small decrease in both North-LAC and South-LAC greenfield flows. The reduction in flows to the primary sector accounts for the decline in North-LAC flows, whereas the decrease in both the primary and heavy manufacturing sectors accounts for the drop in South-LAC flows.

There has been growing interest in understanding the link between international trade and financial flows. The classical Heckscher-Ohlin-Mundell paradigm predicts that trade is an important factor in international capital flows. It argues that exports are based on endowments, the North exports capital, and trade and capital flows are substitutes. Countries invest in countries to which they cannot export their goods, thereby gaining access to domestic markets.

FIGURE 4.10 Sectoral composition of cross-border financial flows to and from Latin America and the Caribbean, by type of investment, selected years



Sources: Calculations based on data from SDC Platinum and fDi Markets.

Note: Primary sector includes the following subsectors: agriculture, hunting, forestry, and fishing; mining; and crude petroleum and natural gas. Light manufacturing sector includes the following subsectors: food, beverages, and tobacco; textiles and apparel (including leather); and wood and paper-related products. Heavy manufacturing sector includes the following subsectors: refined petroleum and related products, chemicals and plastics, nonmetallic minerals, metals, machinery and equipment, and transport equipment. The North includes the G-7 members and 19 other European countries. The South includes all other economies (excluding countries in Latin America and the Caribbean [LAC]). Offshore centers are excluded from the sample.

As a consequence, trade integration reduces incentives for capital to flow to capital-scarce countries.

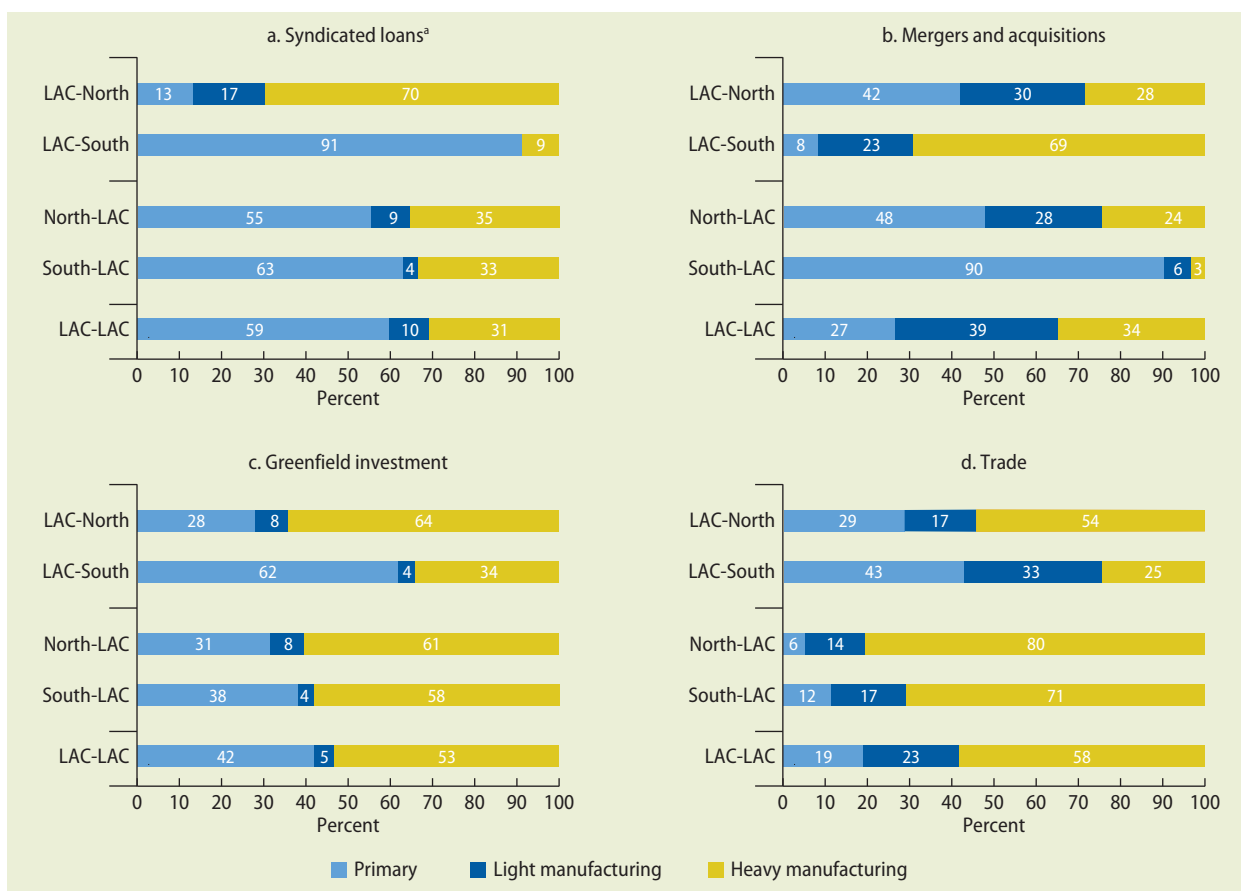
Recent theoretical work on international investments argues that trade and capital flows can be complements rather than substitutes and that the South exports capital to the North (Antràs and Caballero 2009; Ju and Wei 2011; Jin 2012). Part of these effects may be rooted in firm-level motives to export and invest abroad (Greenaway and Kneller 2007; Alfaro and Charlton 2009).

Some empirical papers use data from the early 2000s to understand whether

gravity models—in which aggregate trade is one of the key variables capturing distance and transaction costs—explain capital flows.¹¹ The most disaggregated level at which the links between financial and trade flows have been studied is the country pair level, generally using pooled data on both exports and imports.

The empirical relevance of the interaction between trade and capital flows is not yet fully understood. In particular, little is known about the cross-country sectoral allocation of capital and how it is related to the sectoral composition of exports. The analysis

FIGURE 4.11 Sectoral composition of cross-border financial flows to and from Latin America and the Caribbean, by type of investment, 2003–11 average



Sources: Calculations based on data from SDC Platinum, fDi Markets, and Comtrade.

Note: Primary sector includes the following subsectors: agriculture, hunting, forestry, and fishing; mining; and crude petroleum and natural gas. Light manufacturing sector includes the following subsectors: food, beverages, and tobacco; textiles and apparel (including leather); and wood and paper-related products. Heavy manufacturing sector includes the following subsectors: refined petroleum and related products, chemicals and plastics, nonmetallic minerals, metals, machinery and equipment, and transport equipment. The North includes the G-7 members and 19 other European countries. The South includes all other economies (excluding countries in Latin America and the Caribbean). Offshore centers are excluded from the sample.

a. The average for syndicated loans is for the 2003–12 period.

conducted here expands on the literature by exploring sectoral data in both trade and financial connections.

Figure 4.11 shows the sectoral composition for 2003–11, the period for which data are available for all types of investments (for a breakout by subregion within LAC, see annex figure 4A.2). Unlike figure 4.10, figure 4.11 shows only the percentage share of each sector; it does not display the volumes of the flows. It indicates that the sectoral composition of greenfield and trade flows is similar (for LAC as both a sender and a receiver). In contrast, the sectoral composition of syndicated loans and M&A flows tends to differ from the composition of trade flows.

For foreign investments by LAC countries, the sectoral composition of syndicated loans and (especially) greenfield flows is similar to the composition of trade flows. Heavy manufacturing captures the largest share of LAC-

For LAC-LAC links, greenfield and trade flows are also very similar. Both are tilted toward heavy manufacturing, which accounts for 53 percent of greenfield flows and 58 percent of trade flows within LAC. The patterns for syndicated loans and M&A are quite different from the patterns for trade, with primary industry accounting for the bulk of syndicated loans (59 percent of flows) and light manufacturing dominating M&A flows (39 percent of flows).

The regressions in table 4.6 explore in more detail the relation between financial and trade flows using country pair-level information at the sectoral level, covering all 14 sectors. In particular, they link financial flows with the comparative advantages of the source and receiver country. The relative comparative advantage (RCA) for both the source and receiver country is constructed following Vollrath (1991), as shown in equation (4.1):

$$RCA_{i,j,t} = \ln \left\{ \frac{X_{i,j,t} / (\sum_{\forall j} X_{i,j,t} - X_{i,j,t})}{(\sum_{\forall i} X_{i,j,t} - X_{i,j,t}) / [(\sum_{\forall i,j} X_{i,j,t} - \sum_{\forall j} X_{i,j,t}) - (\sum_{\forall i} X_{i,j,t} - X_{i,j,t})]} \right\} \quad (4.1)$$

North flows (70 percent of syndicated loans, 64 percent of greenfield flows, and 54 percent of trade flows), and the primary sector captures the largest share of LAC-South flows (91 percent of syndicated loans, 62 percent of greenfield flows, and 43 percent of trade flows). The patterns for M&A are different: LAC countries finance the primary sector in North countries (42 percent of LAC-North flows) and the heavy manufacturing sector in South countries (69 percent of LAC-South flows).¹²

For LAC as a receiver, greenfield flows are similar to trade flows, in the sense that both are substantially tilted toward heavy manufacturing from both the North and the South. In contrast, the patterns for syndicated loans and M&A differ from those of trade given the fact that North and South countries finance relatively more the primary sector. For example, in M&A the primary sector represents 48 percent of North-LAC flows and 90 percent of South-LAC flows.

where $X_{i,j,t}$ refers to the exports of country i in industry j in period t .

The dependent variable is specified as $\log(1 + \text{flows})$, in order to explicitly account for the large number of observations equal to zero. All regressions control for both fixed-source and host-country effects. The regressions also include sector dummies and gravity controls.

The first pattern that emerges from table 4.6 is that even after controlling with gravity variables for common factors that can jointly drive trade and lending decisions, countries in both the North and South invest more in countries with which they have larger trade flows (measured as the sum of exports and imports). This positive relation appears in all three types of investments considered (syndicated loans, M&A, and greenfield investment).

In general, there is a positive relation between the RCA of the source country and financial flows. In syndicated loans from South and LAC countries, in M&A flows

TABLE 4.6 Global financial and trade flows

	Dependent variable: Log(flows+1)					
	Syndicated loans		Mergers and acquisitions		Greenfield investment	
	North source countries (1)	South and LAC source countries (2)	North source countries (3)	South and LAC source countries (4)	North source countries (5)	South and LAC source countries (6)
Log(total trade+1)	0.0657*** (0.0050)	0.0064*** (0.0009)	0.0244*** (0.0023)	0.0333*** (0.0004)	0.0652*** (0.0038)	0.0096*** (0.0006)
RCA of source country	-0.0031 (0.0022)	0.0005* (0.0003)	0.0050*** (0.0009)	0.0001 (0.0001)	0.0180*** (0.0016)	0.0012*** (0.0001)
RCA of receiver country	0.0113*** (0.0024)	-0.0010** (0.0004)	0.0050*** (0.0010)	0.0000 (0.0002)	-0.0013 (0.0018)	-0.0006** (0.0003)
RCA of source country * LAC target dummy	-0.0004 (0.0041)	0.0000 (0.0003)	-0.0034*** (0.0012)	-0.0001 (0.0001)	-0.0089*** (0.0029)	0.0001 (0.0002)
RCA of receiver country * LAC target dummy	-0.0013 (0.0050)	0.0014** (0.0006)	-0.0012 (0.0017)	0.0005* (0.0003)	0.0035 (0.0034)	0.0004 (0.0005)
Number of observations	540,707	1,743,205	498,248	2,127,160	408,610	1,994,079
R-squared	0.208	0.043	0.089	0.019	0.172	0.031
<i>Sum of LAC coefficients</i>						
RCA of source country + RCA of source country * LAC target dummy	-0.0035	0.0005***	0.0017	0.0000	0.0091***	0.0013***
RCA of receiver country + RCA of receiver country * LAC target dummy	0.0100**	0.0004	0.0038**	0.0005*	0.0022	-0.0002

Sources: Calculations based on data from SDC Platinum, FDI Markets, and Comtrade.

Note: This table explores the relation between financial and trade flows using sector-level data. The dependent variable is the financial flow between two countries. Total trade is measured as the sum of exports and imports. Relative comparative advantage (RCA) is based on Volrath (1991). The Latin America and the Caribbean (LAC) target dummy equals 1 if the receiver is a LAC country. All regressions include gravity control variables that help explain levels of financial flows between each country pair based on the geographic distance between the countries involved, differences in time zones, whether they share a common language, whether they have a common legal origin, and whether the receiver (sender) country is (or was) a colony of the sender (receiver). The regressions also control for source- and target-country dummies and sector dummies. The North includes the G-7 members and 19 other European countries. The South includes all other economies (excluding LAC countries). Sample excludes offshore centers. Standard errors are clustered by country pairs.

Significance level: * = 10 percent, ** = 5 percent, *** = 1 percent.

from North countries, and in greenfield flows from both North and South and LAC countries, foreign investments have gone to sectors in which the source country has a comparative advantage.

The evidence on the relation between the RCA of the receiver country and financial flows is mixed. In general, North countries tend to invest more in sectors in which the receiver country has a comparative advantage, whereas South countries, including countries in LAC, invest more in sectors in which the receiver has a comparative disadvantage. In flows from North countries, there is a positive relation between the RCA of the receiver country and financial flows in syndicated loans and M&A flows but no significant relation for greenfield flows. In contrast, in flows from the South, including LAC, there is a negative relation for syndicated loans and greenfield flows and no statistically significant relation for M&A.

Using interaction variables for the cases in which LAC is a receiver, table 4.6 breaks down the relation between trade and financial flows in LAC countries. Most of the interactions variables are insignificant, suggesting that the relation between capital flows and the RCA is not significantly different for LAC.

In comparing the LAC-specific results with the aggregate results, two main differences emerge. First, when LAC is a receiver, the comparative advantage of North countries is less related to financial flows of M&A and greenfield investment (in fact, for M&A the RCA does not play any role). Second, regarding M&A flows to LAC, South and LAC countries tend to invest more in industries in which the receiver country has a comparative advantage. This pattern can be observed in figure 4.11, which shows that almost 90 percent of the M&A flows from South countries to LAC countries are related to the primary sector, the sector in which LAC has a comparative advantage based on natural resources.

Summing up, the evidence suggests that LAC's comparative advantage seems to have helped attract syndicated loans and M&A but not greenfield investment. Greenfield

flows to LAC countries from both the North and the South are substantially tilted toward heavy manufacturing, a sector in which (overall) LAC countries do not have a comparative advantage.

Foreign direct investment and GDP growth

As documented above and in chapter 1, the period between 1990 and 2010 was characterized not only by a sharp increase in financial flows across the world but also by the rise of South economies as important players in the global landscape of financial flows. Many observers view the rising participation of South economies in global financial flows broadly and in FDI in particular as a potential driver of economic growth. FDI flows can not only directly ease financing constraints in recipient economies, they can also be a major conduit of technology diffusion and learning spillovers.¹³ Indeed, policymakers in the South, including LAC, place attracting FDI and multinational corporations (MNCs) high on their agendas. They use incentives such as income tax holidays, tariff exemptions, and subsidies to infrastructure to attract foreign firms. According to a census of investment promotion agencies carried out by the World Bank in 2004, 78 of the 110 countries surveyed were offering fiscal or financial concessions to foreign companies that decided to set up production or other facilities within their borders (Harding and Javorcik 2011, 2012). Behind these efforts is the belief that foreign presence benefits the host country by potentially raising aggregate productivity in the economy; by introducing advanced technologies (both hard technologies, such as machinery and blueprints, and soft technologies, such as management techniques and information); and by fostering positive externalities to local firms through technological diffusion and knowledge spillovers.¹⁴ This section goes deeper into this issue by examining the nature of financial linkages and growth.

FDI in general and the activities of MNCs in particular may prompt productivity-enhancing reallocations within the host

economy even in the absence of (productivity) spillover effects on local firms.¹⁵ Labor and production may get reallocated toward more productive sectors and to relatively more productive firms within sectors. Theoretical work exploring firm heterogeneity highlights that firms self-select into becoming MNCs and that only the most productive establishments within a country can afford the extra cost of setting up production facilities abroad. MNCs are thus likely to belong to the upper tier of the productivity distribution of firms in their home country (Helpman, Melitz, and Yeaple 2004). They are also more likely to invest in local firms with higher productivity and greater growth potential. Fiercer competition in the host country market that could arise from the presence of MNCs may force local firms to use their existing resources more efficiently or to search for new technologies (Blomstrom and Kokko 1998). The least competitive local firms may exit the market as a result of more intense competition for factors of production or market share (“business stealing” effects).

There are also important theoretical reasons why MNCs can bring advanced technology and know-how to South host countries and, consequently, be closely linked to greater technological diffusion and knowledge spillovers. The theory of MNCs argues that these firms rely heavily on intangible assets, such as firm-specific technologies and management techniques and/or well-established brand names, which gives them an “ownership advantage” over other organizations (Dunning 1988). Subsidiaries operating in South economies could therefore potentially benefit from aggregate technological advantages from MNCs through direct transfers (Ethier 1986; Markusen 2004).

In addition, there can be spillover effects from MNC subsidiaries to local firms. These spillovers can be horizontal (affecting firms in the same industry) or vertical (affecting firms in different industries or along the production chain). They can take place through demonstration effects, labor turnover, imitation, and reverse engineering.

Horizontal spillovers can take place when local firms learn about new technologies, production processes, and marketing or management techniques by observing foreign affiliates operating in their industry or by hiring workers trained by foreign affiliates. MNCs may have incentives to prevent horizontal spillovers, which could benefit local competitors.

In contrast, they may have an incentive to facilitate vertical spillovers, especially through backward linkages.¹⁶ Transfer of knowledge and technology to local firms in upstream sectors (such as their suppliers of intermediate inputs) may lead to an improvement in the performance of intermediate input suppliers and to lower input prices. Similar effects can be achieved by subjecting local suppliers to more stringent requirements for product quality and on-time delivery, which provide them with incentives to upgrade their production management and technology.

In addition, the increased presence of MNCs may boost demand for intermediate products produced domestically, which may allow local suppliers to reap the benefits of scale economies. The forward linkage channel may also be at play. Domestic firms could become more productive through improved access to new, better-quality, or less expensive intermediate inputs produced by MNCs in more upstream sectors.

Ample evidence documenting the technological edge of MNCs over non-MNC firms backs these ideas. In 2002, for example, MNCs accounted for almost half of total global research and development (R&D) expenditure and almost 70 percent of global business R&D (Javorcik 2013). Patenting is another area where MNCs have a clear advantage. Across regions the headquarters of MNCs hold more patents than local firms in the country where the headquarters is located (Lederman and others 2014). Subsidiaries of MNCs also have productivity and managerial advantages over local firms in host countries. Lipsey (2002) reviews the empirical evidence on productivity differences between foreign-owned and local firms.

He reports that most studies find a positive and significant productivity advantage of foreign-owned over local firms. Bloom and others (2012) show that foreign-owned firms use better management practices than local firms.¹⁷ In LAC countries, the authors argue, the quality of management practices by foreign-owned firms is much closer to best practices than to local practices, giving support to the idea that multinational affiliates “import” knowledge from headquarters.

The evidence on the technological and managerial advantage of MNCs is overwhelming. In contrast, the literature finds mixed results regarding the effect of MNC activity on local firms, especially firms operating in the same industry as the MNC affiliate.¹⁸ Many researchers argue that these mixed results reflect the fact that spillovers from MNC presence are not automatic; they hinge on a range of factors, from the level of education and financial development of the host country to the initial level of productivity of local firms.¹⁹ Others provide some evidence that the negative competition effect outweighs the positive effect of knowledge spillovers, especially in developing countries.²⁰

An important aspect of the relation between FDI inflows and growth and spillover effects that has received much less attention in the literature is the identity of the host and home countries. Inherent to this issue are the motives for FDI. Often-cited theoretical reasons for FDI by North countries in South countries are differences in relative input costs (such as lower labor costs) and market access (Yeaple 2003). The rationale for cross-border FDI may be different for South countries, which are typically endowed with larger and cheaper labor forces than North countries. It is possible that South acquirers may relocate manufacturing activity to their home country while keeping the existing distribution networks in the host country (Chari, Wenjie, and Dominguez 2012). Technology transfer is less likely in South-North than in North-South transactions. For these reasons, the origin of foreign acquirers may have consequences for the postacquisition

performance of target firms in particular and of host countries more broadly.

Javorcik and Spatareanu (2011) are among the few researchers to tackle this issue. They use firm-level panel data from Romania to examine whether the origin of foreign investors affects the degree of vertical spillovers from FDI. They find that MNCs from the United States have a positive effect on Romanian firms, whereas MNCs from the European Union (EU) have no effect. According to the authors, trade costs (particularly distance and preferential trade agreements) can explain this finding. Compared with EU MNCs, U.S. firms find it more expensive to import inputs from the home country, leading to greater incentives to create backward linkages and more potential for technology and knowledge spillovers.

Other country characteristics could also affect the degree of spillovers from MNC activity. One is the level of development of the source and host countries. FDI from highly developed countries may bring more modern, state-of-the-art technologies and management practices and therefore lead to greater growth effects. However, these technologies may be too sophisticated for less developed target countries; the difference in the level of economic development of the source and target countries may be what matters. MNCs from North countries operating in other North countries potentially give rise to larger spillovers to the host country because more developed countries are typically closer to the world technological frontier and may be better able to absorb the technology, know-how, and intangible assets brought by foreign firms. Technologies from South countries may be more suitable, cheaper, and easier to adapt in other South countries.

Is there evidence of differential growth-enhancing effects of FDI inflows depending on the level of development of the home and host country? This question is particularly relevant given the increasing prominence of South countries as both senders and receivers of FDI flows.

Drawing on Didier, Nguyen, and Pienknagura (2015), the rest of this section examines

whether the impact of FDI from the North on productivity in the host country is different from the impact of FDI from the South. The outcome could depend on whether the recipient is a North or a South country. This issue is particularly relevant for LAC countries given the significant increase in LAC's connections with other South countries, especially during the second half of the 2000s.

Four types of FDI are studied: from North to North, from North to South, from South to North, and from South to South. Because of data limitations, the analysis examines only M&A flows. The exercise is conducted at the sectoral level, covering 23 host manufacturing sectors. The sample includes 52 host countries (18 North countries and 34 South countries, including 6 from LAC) and 98 source countries (22 North countries and 76 South countries, including 16 from LAC). The data cover 1993–2010. Unlike the previous part of this chapter, this part of the chapter includes LAC in the South.

Endogeneity is an important issue when addressing this question. Most of the empirical evidence on FDI and growth is about association, not causation.²¹ Theoretically, the relationship could go either way (or both ways): MNCs could invest in local firms (or countries) that are better performing (“cherry picking”), or MNC presence could lead to improvements in performance through the channels mentioned earlier.

It is key to identify the exogenous components of FDI that are not caused by but rather lead to growth-enhancing effects.²² The identification strategy adopted by Didier, Nguyen, and Pienknagura (2015) is similar to that of Fons-Rosen and others (2013). The idea is that financial investors do not actively manage their targets, at least in part because of their limited expertise on ways to improve their day-to-day operations. In contrast, industrial investors typically have the relevant expertise; they attempt to intervene and improve the target firm's operations and management in order to raise their profitability and productivity. The underlying assumption of the identification strategy is

that financial FDI (for example, investments by foreign financial institutions) only follows growth whereas industrial FDI (for example, investments by foreign manufacturing firms) both follows and alters growth. Put another way, growth prospects drive both industrial and financial FDI, but only industrial FDI potentially leads to growth. Hence the analysis focuses on the impact on productivity growth of the component of industrial FDI that is orthogonal to financial FDI. This component is not driven by the growth-following motive and can thus be considered exogenous to productivity growth. Box 4.3 provides details on the model setup and identification strategy.

Table 4.7 shows the estimates of the impact of FDI on labor productivity growth in manufacturing sectors around the world. It reports only the second-stage regressions, which estimate the impact of this exogenous component of industrial FDI on productivity growth. The results pooling all host countries show that FDI from the North improves labor productivity growth of the recipient sector in the host country, whereas FDI from the South has no effect on labor productivity (column 1). The increase in labor productivity growth following FDI inflows reflects the net effects of reallocations, technology transfer and knowledge diffusion, and economies of scale as well as the effects of increased competition resulting from foreign entry into the sector. This positive effect of FDI from the North on productivity takes place with a one-year lag.

The positive impact of FDI from the North on labor productivity growth is observed only in North recipient countries (columns 2 and 3 of table 4.7): North-North FDI flows affect labor productivity growth in recipient sectors, but North-South flows do not. Moreover, this positive effect of North-North flows is larger than the effect obtained for the pooled sample. These findings are consistent with the results of Chen (2011), who provides empirical evidence that public U.S. target firms exhibit greater gains in labor productivity when acquired by firms

BOX 4.3 Model setup and identification strategy

Drawing on Didier, Nguyen, and Pienknagura (2015), this box examines whether the impact on the productivity of the host country of FDI from the North is different from the impact of FDI from the South. Equation B4.3.1 gives the baseline regression specification:

$$\Delta \log(\text{Prod})_{c,s,t} = \alpha + \beta^N \left(\frac{\text{FDI}^N}{\text{Inv}} \right)_{c,s,t} + \beta^S \left(\frac{\text{FDI}^S}{\text{Inv}} \right)_{c,s,t} + \gamma_{c,t} + \gamma_{s,t} + u_{c,s,t} \quad (\text{B4.3.1})$$

where $\Delta \log(\text{Prod})_{c,s,t}$ is the growth of rate in labor productivity, measured as the ratio of real value added to total employment in host country c , host sector s , and time t ; $(\text{FDI}^N/\text{Inv})_{c,s,t}$ is the M&A component of FDI from North countries to host sector s in host country c at time t divided by total investment in host sector s in host country c at time t ; $(\text{FDI}^S/\text{Inv})_{c,s,t}$ is the M&A component of FDI from South countries to host sector s in host country c at time t divided by total investment in host sector s in host country c at time t ; $\gamma_{c,t}$ are country-time fixed effects; $\gamma_{s,t}$ are sector-time fixed effects; and $u_{c,s,t}$ is the error term. The regressions also include lagged values of the FDI to investment ratios.

This baseline regression specification suffers from endogeneity biases. MNCs can invest in well-performing sectors (“cherry picking”), or they can target low-performing sectors (with high growth potential) and then improve firm performance. To account for sector- and country-specific selection issues, the regressions include fixed effects. The country-time and sector-time fixed effects aim at capturing all time-varying changes within a country and within sectors that may attract MNC activity. These changes include the macroeconomic environment, a better location, policy reforms, technological improvements, and relative price changes. The identity of the investor is used to construct an exogenous instrument in order to deal with unobserved heterogeneity at the country-sector-time level. More specifically, the underlying assumption of the identification strategy is that only the growth-following component drives financial FDI (for example, investment by foreign financial institutions) whereas industrial FDI (for example, investment by foreign manufacturing firms) reflects both

growth-following and growth-enhancing motives. The growth-following motive does not drive the component of industrial FDI orthogonal to financial FDI, which can thus be considered exogenous to productivity growth.

Intuitively, this exogenous instrument can be thought of along the lines of a portfolio choice problem. Suppose a foreign bank expects host sector s in host country c to grow at an average annual rate of 5 percent over the next five years. Based on this expectation, the bank decides to invest \$1 million in the sector. Now suppose a foreign manufacturing firm has the same information set as the foreign bank does: it also expects host sector s in host country c to grow 5 percent a year over the next five years. However, this firm also believes that if it invests in this sector, it will boost growth to an average annual rate of 7 percent over the next five years. Hence the firm decides to invest more than \$1 million in the sector. The growth-enhancing component associated with the firm’s investment arguably drives this difference between the two entities’ investments.

A two-step procedure is adopted in order to deal with this endogeneity issue. First, the exogenous component of industrial FDI is constructed. Industrial FDI from the North to a given country-sector host in a given year is regressed against total financial FDI from the world (financial FDI from both the North and South) to that country-sector-year (equation B.4.3.2a). The assumption is that industrial firms are informed about investments by financial institutions around the world, not just in their own countries. The error term from this regression ($\epsilon_{c,s,t}^N$) is the exogenous component of industrial FDI from the North to host country c in sector s at time t . An analogous regression setup is used to construct the exogenous component of industrial FDI from the South to host country c , in sector s , at time t (equation B4.3.2b).²³

$$\left(\frac{\text{Ind FDI}^N}{\text{Inv}} \right)_{c,s,t} = \alpha^N + \phi^N \left(\frac{\text{Fin FDI}^W}{\text{Inv}} \right)_{c,s,t} + \gamma_{c,t} + \gamma_{s,t} + \epsilon_{c,s,t}^N \quad (\text{B4.3.2a})$$

$$\left(\frac{\text{Ind FDI}^S}{\text{Inv}} \right)_{c,s,t} = \alpha^S + \phi^S \left(\frac{\text{Fin FDI}^W}{\text{Inv}} \right)_{c,s,t} + \gamma_{c,t} + \gamma_{s,t} + \epsilon_{c,s,t}^S \quad (\text{B4.3.2b})$$

(continued)

BOX 4.3 Model setup and identification strategy (*continued*)

In the second step, the error terms from the two equations replace the FDI to investment ratios in equation B4.3.1. Equation B4.3.3 gives the regression specification of productivity growth on these residuals:

$$\Delta \log(\text{Prod})_{c,s,t} = \alpha + \beta^N \varepsilon_{c,s,t}^N + \beta^S \varepsilon_{c,s,t}^S + \gamma_{c,t} + \gamma_{s,t} + u_{c,s,t} \quad (\text{B4.3.3})$$

The results of the estimations of this two-step procedure are reported and discussed in the main text.

One important concern with this setup is that, for a variety of reasons, many South countries do not allow financial inflows. These inflow restrictions may restrict the level of financial FDI. The two-step setup described above is not able to fully eliminate the growth-following component in industrial FDI, because financial FDI is constrained at lower than expected levels. The residuals in equations (B4.3.2a) and (B4.3.2b) may thus be larger than expected and no longer fully exogenous to productivity growth. Exclusion of countries in the sample with no observed financial FDI mitigates this issue.

from developed countries than they do when they are acquired by developing country firms. The results in table 4.7 also show that FDI from the South typically has no impact on productivity growth, in either North or South countries (columns 2 and 3).

It is possible that FDI to or from the South occurs largely in sectors where positive spillovers are more limited, such as sectors with relatively short quality ladders, for example. Financial flows to LAC countries from the South are indeed biased toward the primary sector, as discussed in chapter 1. Particularly striking is the share of FDI flows from other South regions to LAC: on average, 90 percent of all M&A and 38 percent of all green-field investment went to the primary sector during the 2000s. The sectoral composition of the M&A component of FDI inflows within manufacturing sectors does not seem to explain the patterns documented so far, however. Increases in productivity growth in either light or heavy manufacturing sectors are typically observed in the aftermath of North-North flows but not North-South, South-North, or South-South flows.

The ownership structure of subsidiaries of MNCs is another important factor. The larger the stakes MNCs have in local subsidiaries, the more they control the production processes, operations, and management and the greater are their incentives to improve them (the “pushy parent” analogy in Arnold and Javorcik 2009). For instance,

foreign parent companies’ investment in staff training suggests that a significant increase in foreign ownership is likely to lead to improvements in the subsidiary’s performance. MNCs also typically transfer more sophisticated technologies and management techniques to their wholly owned affiliates than to their partially owned affiliates,²⁴ and they may be more likely to transfer technology to local suppliers, in order to increase their productivity and reduce input prices. Therefore, productivity improvements may be more marked when M&A investments lead to greater control of local firms.²⁵

To examine whether the extent of foreign ownership affects the results presented so far, the analysis considers only cross-border M&A transactions that lead to ownership of at least 50 percent of the target firm (columns 4–6 of table 4.7). The results are generally robust to this restriction on the magnitude of FDI transactions. They reveal a positive impact of FDI from the North on labor productivity growth in North recipient countries but not in South recipient countries. FDI from the South does not lead to systematic productivity effects in recipients in the North or the South.

One possible explanation for the lack of consistent positive effects of FDI from the North to the South is the difference in the level of development. South countries may be too far from the technology level of the North and thus not able to efficiently absorb the North’s technology in its production processes.

TABLE 4.7 Foreign direct investment and labor productivity growth in the host country

Source countries	Dependent variable: Growth in labor productivity in host country <i>c</i> sectors					
	Transactions in which posttransaction ownership is at least 50 percent of shares					
	All target countries	North target countries	South target countries	All target countries	North target countries	South target countries
(1)	(2)	(3)	(4)	(5)	(6)	
North FDI / Inv _{<i>t</i>}	0.005 (0.009)	0.008 (0.011)	-0.017 (0.016)	0.001 (0.009)	0.005 (0.011)	-0.025 (0.017)
North FDI / Inv _{<i>t-1</i>}	0.024** (0.010)	0.028** (0.013)	-0.000 (0.014)	0.024** (0.011)	0.028** (0.013)	-0.004 (0.014)
North FDI / Inv _{<i>t-2</i>}	0.009 (0.007)	0.007 (0.008)	0.020 (0.018)	0.006 (0.008)	0.005 (0.009)	0.020 (0.022)
North FDI / Inv _{<i>t-3</i>}	-0.010 (0.008)	0.000 (0.010)	-0.027 (0.018)	-0.008 (0.009)	-0.002 (0.011)	-0.022 (0.020)
South FDI / Inv _{<i>t</i>}	-0.045 (0.031)	-0.002 (0.025)	-0.078 (0.052)	-0.055 (0.037)	-0.038 (0.046)	-0.075 (0.057)
South FDI / Inv _{<i>t-1</i>}	-0.025 (0.023)	-0.008 (0.024)	-0.037 (0.037)	-0.024 (0.026)	0.015 (0.032)	-0.052 (0.040)
South FDI / Inv _{<i>t-2</i>}	0.022 (0.042)	-0.017 (0.024)	0.048 (0.068)	0.023 (0.045)	-0.017 (0.025)	0.050 (0.075)
South FDI / Inv _{<i>t-3</i>}	-0.012 (0.026)	-0.038 (0.028)	0.029 (0.040)	-0.029 (0.027)	-0.046 (0.029)	0.009 (0.046)
Number of observations	8,885	4,030	4,855	8,414	4,032	4,382
R-squared	0.354	0.394	0.373	0.363	0.395	0.389

Source: Didier, Nguyen, and Pienknagura 2015.

Note: This table shows the impact of FDI (foreign direct investment) on labor productivity growth in manufacturing sectors around the world. The estimation method is panel fixed effects. The regressions include country-year and sector-year fixed effects. Box 4.3 in the text describes the procedure followed and the identification assumption made. FDI is measured by the exogenous component of industrial FDI to investment ratio into the host country *c* sectors. The North includes the G-7 members and 19 other European countries. The South includes all other economies (including countries in Latin America and the Caribbean). Sample excludes offshore centers. Significance level: * = 10 percent, ** = 5 percent, *** = 1 percent.

Another possible explanation is related to trade costs. The share of intermediate inputs sourced locally by MNCs (which may be an important factor determining the potential for technology and knowledge spillover effects) is likely to increase with the distance between the host and the source economy. However, the distance between North countries is on average smaller than the distance between North and South countries, making this explanation unlikely.

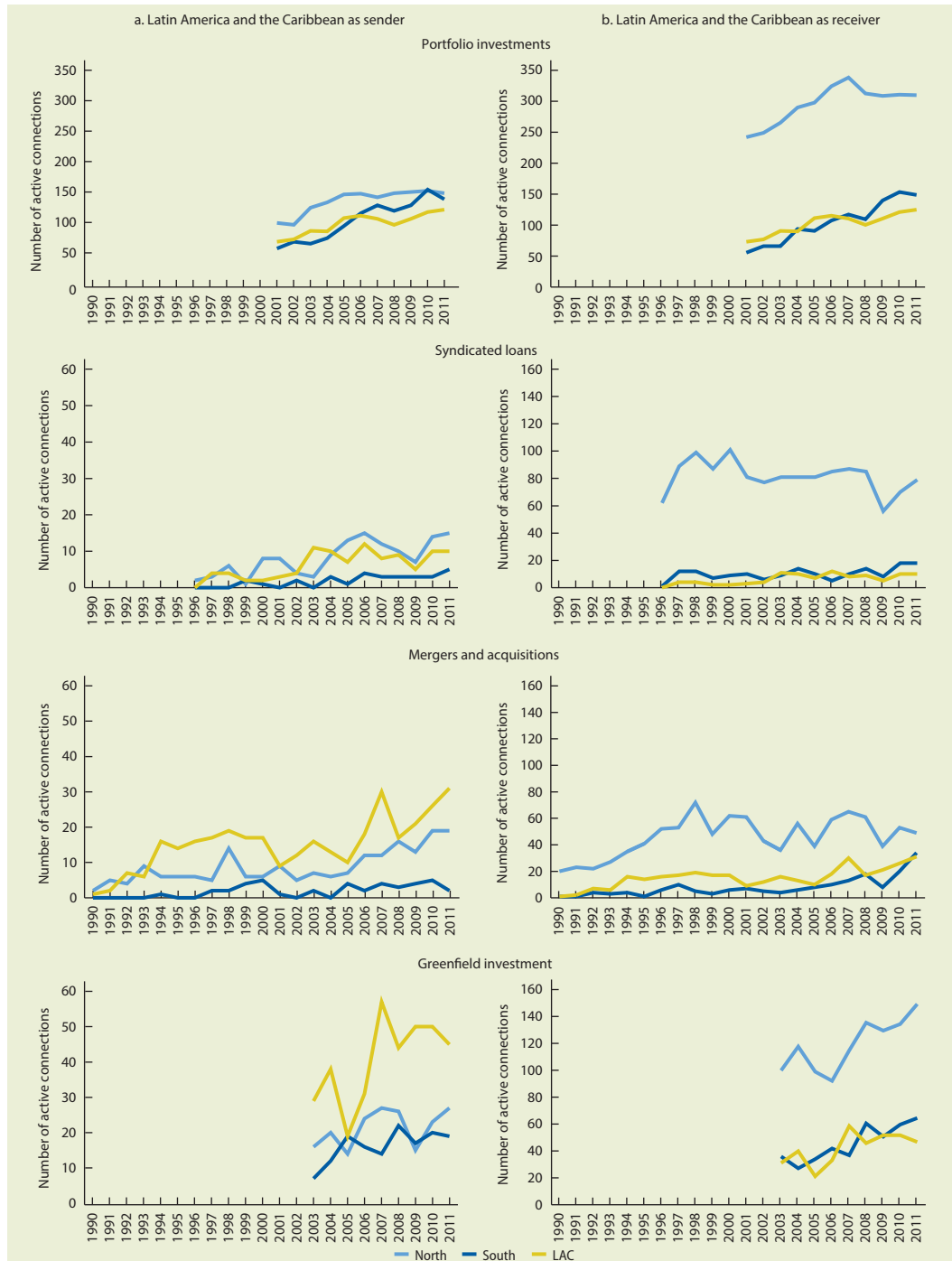
Although the no-effect of South-North FDI flows finding is not entirely surprising, one might have expected South-South flows to have a positive impact on growth outcomes of the recipient country. For instance, technologies from a South country may be closer to the technologies of the South recipient country

and thus more easily adopted. Although technology and knowledge spillovers may still take place, the effects of reallocations, economies of scale, and increased competition may be large enough to offset them.

Exploring these possibilities more formally is an important topic for future research. In light of the rise of South-South FDI flows over the past decade, a more in-depth analysis of the differentiated effects that source countries may have on the potential for growth-enhancing effects of FDI seems to be in order. The role of distance between source and receiver countries (including all aspects it may capture, such as trade and financial barriers, cultural differences, the degree of information asymmetries, and so on) also merits further examination.

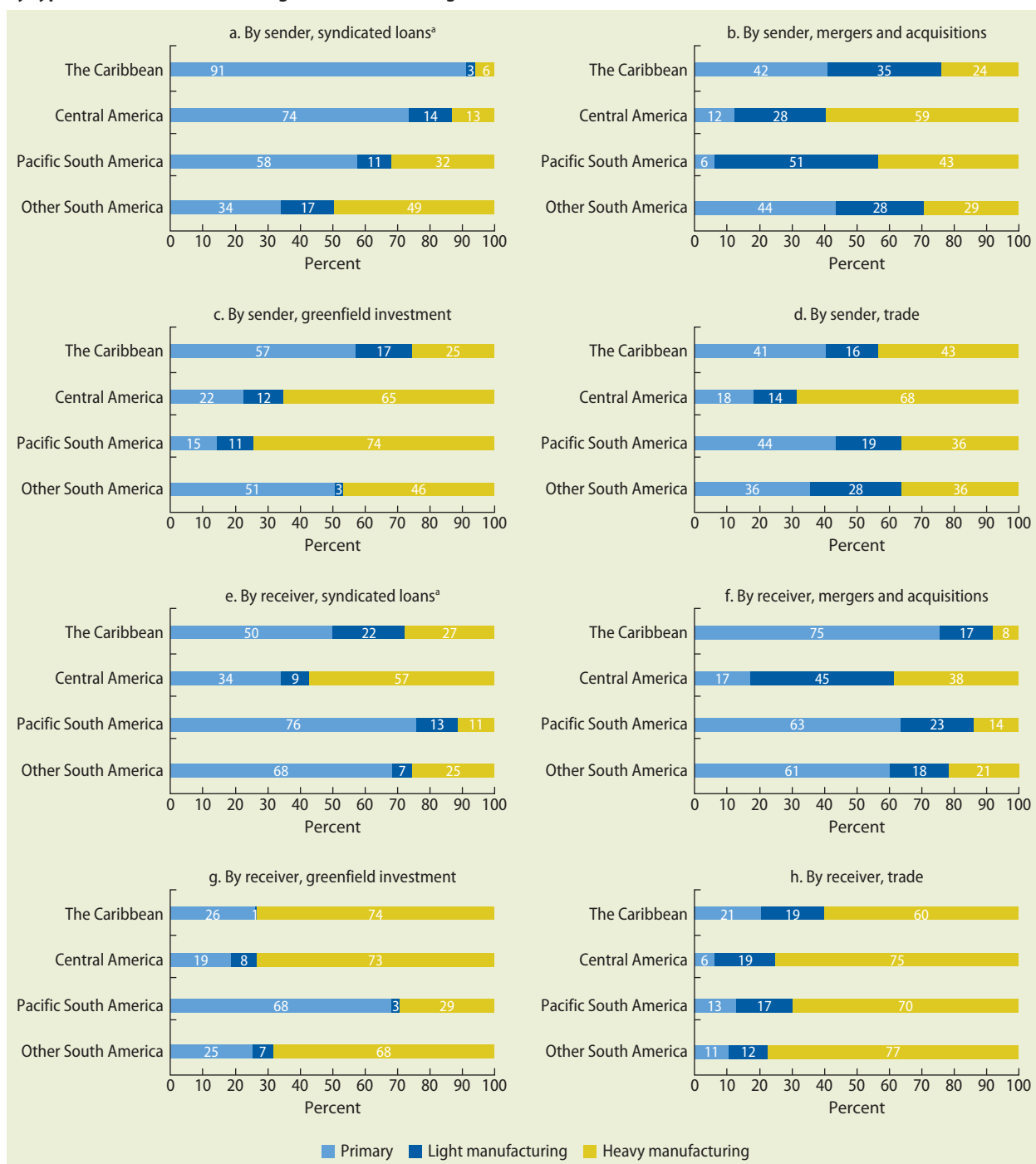
Annex 4A

ANNEX FIGURE 4A.1 Number of active cross-border connections, by type of investment and region



Sources: Calculations based on data from CPIS, SDC Platinum, and FDI Markets.
 Note: The North includes the G-7 members and 19 other European countries. The South includes all other economies (excluding countries in Latin America and the Caribbean [LAC]). Offshore centers are excluded from the sample.

ANNEX FIGURE 4A.2 Sectoral composition of cross-border financial flows to and from Latin America and the Caribbean, by type of investment and subregion, 2003–11 average



Sources: Calculations based on data from SDC Platinum, fDi Markets, and Comtrade.

Note: Caribbean: Antigua and Barbuda, Aruba, The Bahamas, Barbados, Belize, Bermuda, Cayman, Cuba, Dominica, Grenada, Guyana, Haiti, Jamaica, Puerto Rico, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, Turks and Caicos Islands, the Virgin Islands. Central America: Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama. Pacific South America: Chile, Colombia, Ecuador, and Peru. Other South America: Argentina, Bolivia, Brazil, French Guiana, Paraguay, Uruguay, and República Bolivariana de Venezuela. The primary sector includes agriculture, hunting, forestry, and fishing; mining; and crude petroleum and natural gas. The light manufacturing sector includes manufacturing of food, beverage, and tobacco; textiles and apparel (including leather); and wood and paper-related products. The heavy manufacturing sector includes manufacturing of refined petroleum and related products, chemicals and plastics, nonmetallic minerals, metals, machinery and equipment, and transport equipment. a. The average for syndicated loans is for the 2003–12 period.

Notes

1. For example, the average share of FDI flows (M&A and greenfield) from North and South to LAC countries decreased between 2003–05 and 2006–11 (the share of North-LAC links fell from 66 percent to 62 percent and the share of South-LAC links from 89 percent to 79 percent). However, this trend does not mean that LAC is receiving less equity investments. The results show a significant increase in the share of equity instruments for both North-LAC and South-LAC connections. For North-LAC links, the equity share increased from 43 percent to 59 percent between 2001–05 and 2006–11. For South-LAC links, the equity share grew even more, rising from 22 percent to 67 percent.
2. The CPIS covers portfolio investment securities held by monetary authorities but not their reserve assets. The central banks of many LAC countries (such as Brazil, Chile, Colombia, and Costa Rica) classify all their foreign securities as reserves assets. In these cases, the CPIS database does not cover the investments made by the central banks. Central banks from other LAC countries (such as Mexico, Panama, and República Bolivariana de Venezuela) do not classify all their holdings as reserves assets. For these countries, the CPIS survey covers all their holdings that are not reserves assets. As a consequence of these differences, the figures presented in the chapter may be lower than LAC countries' actual holdings in the rest of the world.
3. The dataset for syndicated loans also covers 2012; the later period is thus 2006–12. For simplicity, this period is referred to as 2006–11 throughout this chapter.
4. The volume of syndicated loans from North to South countries increased 86 percent and M&A flows 94 percent over this period. North-South portfolio investments increased 135 percent between 2001–05 and 2006–11, and North-LAC portfolio investments rose 97 percent. See tables 4.4 and 4.5 for details.
5. Another way to account for the expansion in the real economy is to use the average GDP of the two regions as a benchmark. In addition, the flows between two regions can be expressed as a fraction of total cross-border flows of each type of investment. In both cases, trends similar to the ones reported in table 4.2 are evident (results not reported).
6. Figures 4.4–4.7 show the percentage of active connections but they do not provide information regarding the number of active connections. Given that the South category includes many more countries, the extensive margin computed in these figures could be a misleading indicator of the number of active connections between two regions. Annex figure 4A.1 tries to account for this.
7. For portfolio investments, the extensive margin may be underestimated if investors in a country hold internationally diversified mutual funds that invest in many other countries. However, international mutual funds are not very well diversified (Didier, Rigobon, and Schmukler 2013). Therefore, even if some portfolio investments are in mutual funds, the degree of diversification or the extensive margin may not be significantly larger.
8. A large share of M&A flows is explained by the 2007 acquisition of the Australian Rinker Group by the Mexican cement company. Even after excluding this observation, however, Mexico represented 58 percent of total flows.
9. Given the relatively short time span of the data on gross capital flows explored in this chapter, it was not possible to disentangle the extent to which changes in the nature of financial integration of LAC countries are inherent to its globalization process or driven by changes in the global landscape, such as changes associated with the rise of the South.
10. Transactions classified as “other manufacturing” and “utilities and infrastructure” were dropped, as they do not clearly fit into either light or heavy manufacturing.
11. See, for example, Aviat and Coeurdacier (2007); Stein and Daude (2007); Daude and Fratzscher (2008); Lane and Milesi-Ferretti (2008); Dailami, Kurlat, and Lim (2012); and Okawa and van Wincoop (2012).
12. The two large transactions described earlier (the 2006 acquisition of the Canadian company Inco by the Brazilian mining company Vale and the 2007 acquisition of the Australian Rinker Group by the Mexican cement company Cemex) partly explain these differences. Excluding these two cases, heavy manufacturing accounts for a larger share of LAC-North (36 percent) than the primary sector (26 percent). The sectoral composition of LAC-North M&A flows therefore appears more similar to that of trade. However, even after excluding these observations, heavy manufacturing still accounts for a larger share of LAC-South flows (25 percent) than the primary sector (20 percent).

13. For example, for aggregate (rather than bilateral) flows, average FDI inflows in the South increased from about 1 percent of GDP in the 1980s to about 5 percent in the 2000s. Average FDI outflows from South countries rose from 0.15 percent of GDP to 1.8 percent, a staggering 12-fold increase in the span of three decades. Although the levels are different, the trends are similar to the ones reported in table 4.1. See Broner and others (2013) for an analysis of the dynamics of capital flows during tranquil and crisis times.
14. Romer (1993), for instance, argues that the presence of MNCs can narrow both the “object gap” (the shortage of physical goods, such as factories and roads) and the “ideas gap” (the shortage of knowledge used to create value added) in South economies.
15. As in the literature in international economics, the country that receives the MNC (or FDI) is labeled the “host country,” and the country of origin of the capital is labeled the “home country.”
16. See, for example, Rodriguez-Clare (1996), Markusen and Venables (1999), Pack and Saggi (2001), and Lin and Saggi (2007).
17. Bloom and Van Reenen (2007) find a positive correlation between productivity and management practices.
18. Many firm-level studies cast doubt on the existence of intraindustry spillovers from FDI in developing countries and transition economies (see Haddad and Harrison 1993 on Morocco; Aitken and Harrison 1999 on República Bolivariana de Venezuela; Djankov and Hoekman 2000 on the Czech Republic; Konings 2001 on Bulgaria, Poland, and Romania; Javorcik 2004 on Lithuania; and Javorcik and Spatareanu 2008 on Romania). Nonetheless, there is some evidence of positive spillovers from MNC affiliates to local firms through backward linkages. For empirical evidence on vertical spillovers more broadly, see Lopez-Cordova (2003); Javorcik (2004); Lopez-Cordova and Mesquita Moreira (2004); Kugler (2006); Blalock and Gertler (2008); Barrios, Görg, and Strob (2011); and Javorcik and Spatareanu (2011). See Harrison and Rodriguez-Clare (2010) for a comprehensive review of the literature.
19. Borenzstein, de Gregorio, and Lee (1998) find that the effect of FDI on growth depends on the host country’s human capital. Alfaro and others (2004) find that spillovers from FDI increase with financial development. Kokko, Zejan, and Tansini (2001) provide evidence that technological spillovers require a minimum initial level of technology in the local firms. Using data for Uruguay, they show that firms with higher initial levels of productivity experience larger positive spillovers from MNC activity. Blomstrom, Lipsey, and Zejan (1994) find similar results using cross-country data. They show that growth spillovers from inward FDI are positively correlated with a country’s wealth.
20. See, for example, Aitken and Harrison (1999), Djankov and Hoekman (2000), and Konings (2001).
21. See Barba Navaretti, Galeotti, and Mattozzi (2004) for a survey of the literature.
22. A few studies focus on the growth-enhancing effect in country-specific contexts. Arnold and Javorcik (2009) estimate the productivity effects of FDI for Indonesian firms, for example, and Guadalupe, Kuzmina, and Thomas (2012) study Spanish firms. Fons-Rosen and others (2013) focus on the causal effect of foreign investment on productivity using a global firm-level database.
23. These first-stage regressions are estimated with a tobit setup, as the dependent variable is a nonnegative variable with a large number of observations at zero.
24. This argument is in line with Grossman and Hart (1986) and Hart and Moore (1990). For some empirical evidence, see, for example, Mansfield and Romeo (1980), Ramachandaram (1993), and Javorcik and Saggi (2010).
25. One could also argue that spillovers could be more limited for full ownership of subsidiaries than for partial ownership. One reason often cited for the practice of transferring less sophisticated technologies and management techniques to partially owned affiliates than to wholly owned affiliates is the desire of MNCs to minimize the potential for technology and knowledge leakages to competitors in the host country. A local partner might use the knowledge acquired from a foreign investor in other operations not involving the foreign shareholders, for example. This practice may backfire for MNCs. Local competitors may be more able to absorb these less sophisticated technologies, which, combined with better access to knowledge through the actions of the local shareholders, may lead

to greater technology and knowledge spillovers. Moreover, firms with joint domestic and foreign ownership may face lower costs of finding local suppliers of intermediate goods and may thus be more likely to engage in local sourcing than wholly owned foreign subsidiaries. Shared domestic and foreign ownership may thus lead to higher productivity spillovers to local producers in the supplying sectors. For empirical analysis of this issue, see, for example, Haddad and Harrison (1993) for Morocco, Aitken and Harrison (1999) for República Bolivariana de Venezuela, and Javorcik and Spatareanu (2008) for Indonesia.

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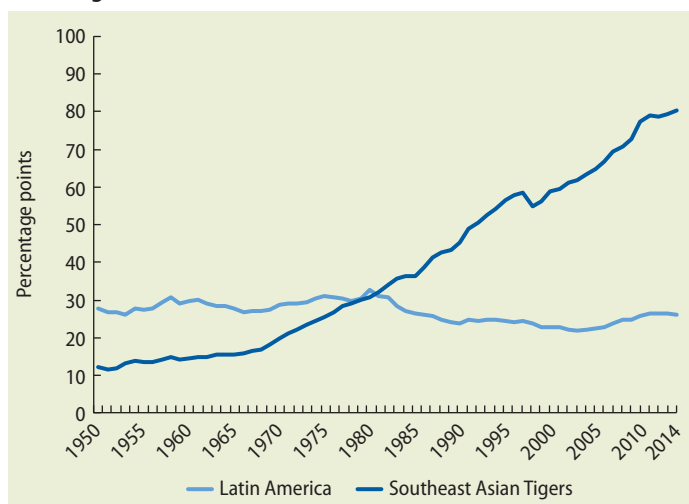
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Ascending with the South Winds: Will Low Saving in Latin America and the Caribbean Be a Drag?

This chapter analyzes the evolving connectivity between Latin America and the Caribbean (LAC) and the rising South based on net saving (domestic saving minus investment) and, hence, the relative importance of domestic versus external demand. It explores whether the low domestic saving rates in LAC impaired the region's growth potential in the past and may continue to do so in the future given changes in the world environment (particularly the rise of China and, more generally, the South). The chapter identifies three channels through which domestic saving can affect growth: the real exchange rate, the interest rate (by way of the country's risk rating), and the endogenous response of saving to growth, which exerts a multiplier effect on growth through the first two channels. The analysis finds that the interest rate channel hindered growth in the 1980s and 1990s and boosted it in the 2000s. However, given the region's significantly improved macro-financial policies and a more robust (equity-based rather than debt-based) form of international financial integration, LAC's low saving is more likely to hinder future growth through the real exchange rate channel. This effect is stronger for countries relying more on domestic demand-oriented growth strategies and hence incurring recurrent current account deficits. Although a good case for saving-enhancing policies that promote competitiveness can thus be made for such countries, external factors (weak world demand and ample availability of finance) as well as domestic factors (social policy pressures) are likely to create difficult policy tradeoffs and tensions.

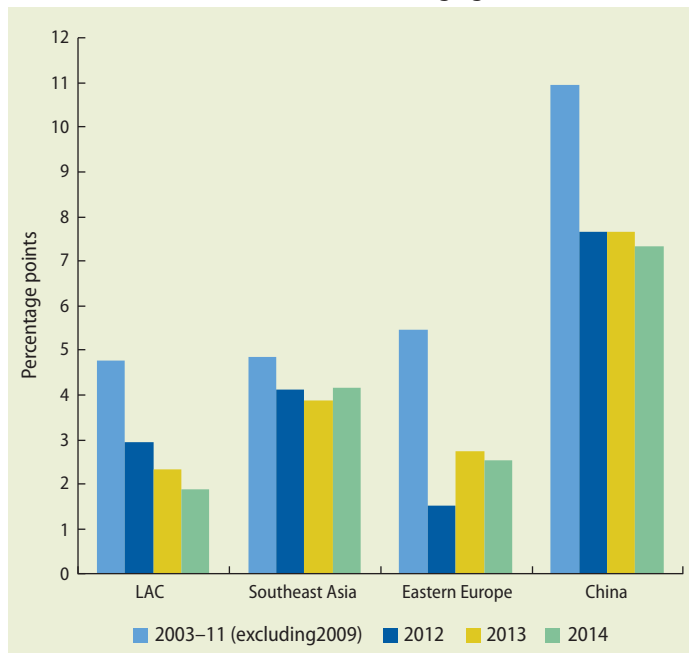
The long-run growth performance of Latin America and the Caribbean (LAC) has been unimpressive relative to the United States: the comparison reveals a history of convergence failure (figure 5.1). Given the slowdown that follows a decade of apparent improvement, concerns about low growth have risen to the forefront of the policy debate (figure 5.2).

A quick look at the data suggests that there may be some link between LAC's mediocre growth performance and its generally low saving rates. Except for República Bolivariana de Venezuela, all major LAC countries stand on the low side of the domestic saving distribution (after controlling for gross domestic product [GDP] per capita), and all Asian economies sit on the other side (figure 5.3).

FIGURE 5.1 Growth paths of Latin America and the Southeast Asian Tigers, 1950–2014

Sources: Based on data from the Maddison Project (Bolt and van Zanden 2013) and World Development Indicators.

Note: Figure shows the weighted-average of per capita gross domestic product (GDP) for each group of countries as a percentage of per capita GDP in the United States. Southeast Asian Tigers include Hong Kong SAR, China; the Republic of Korea; Singapore; and Taiwan, China.

FIGURE 5.2 Growth rates in selected emerging economies, 2003–14

Sources: Based on data from World Development Indicators (for 2003–11) and latest consensus estimates and projections by the World Economic Outlook (for 2012–14).

Note: LAC = Latin America and the Caribbean. Growth rates are weighted averages for each region. Emerging economies in Eastern Europe include Croatia, Estonia, Hungary, Lithuania, Poland, Romania, the Slovak Republic, and Turkey. Emerging economies in Southeast Asia include Indonesia, the Republic of Korea, Malaysia, the Philippines, and Thailand.

Low saving rates seem to be connected with appreciated real exchange rates. As measured by the Big Mac index, after controlling for GDP per capita, most LAC countries sit on the appreciated side of the distribution and most Asian countries stand on the other side (figure 5.4).¹ Yet while LAC's saving rates have been persistently low on average, its real exchange rates have not always been so appreciated. In fact, as this chapter shows, exchange rates have appreciated strongly and rapidly from the very depreciated levels that prevailed in the 1980s and 1990s, when sovereign risk ratings for LAC countries were substantially lower than the ratings of their East Asian peers.

These trends raise three important questions. The first is whether the roots of the region's low growth can at least in part be traced back to its low saving. The second concerns the role the exchange rate and sovereign risk ratings may have played in channeling the impact of saving on growth. The third is how changes in the world environment and LAC's macro-financial policy frameworks affected the saving-to-growth connection in the past and are likely to do so in the future. Key factors considered in analyzing these questions are the rise of the South (a main focus of this report) and LAC's much-improved macro-financial "immune system."²

Chapters 1–4 focus on the nature and implications of the evolving connectivity between LAC and the emerging South from a strictly microeconomic vantage point. They emphasize LAC's arguably insufficiently developed global value chains, excessive reliance on primary products, relatively undiversified trade structures, and underexploited trade and foreign direct investment (FDI) spillovers.

This chapter emphasizes a new, seldom explored connectivity dimension, which is based on the composition of aggregate demand—that is, the relative importance of domestic versus external demand (see Set of Facts 1 in chapter 1). An external demand-driven model of integration is one in which domestic saving is sufficient to ensure that

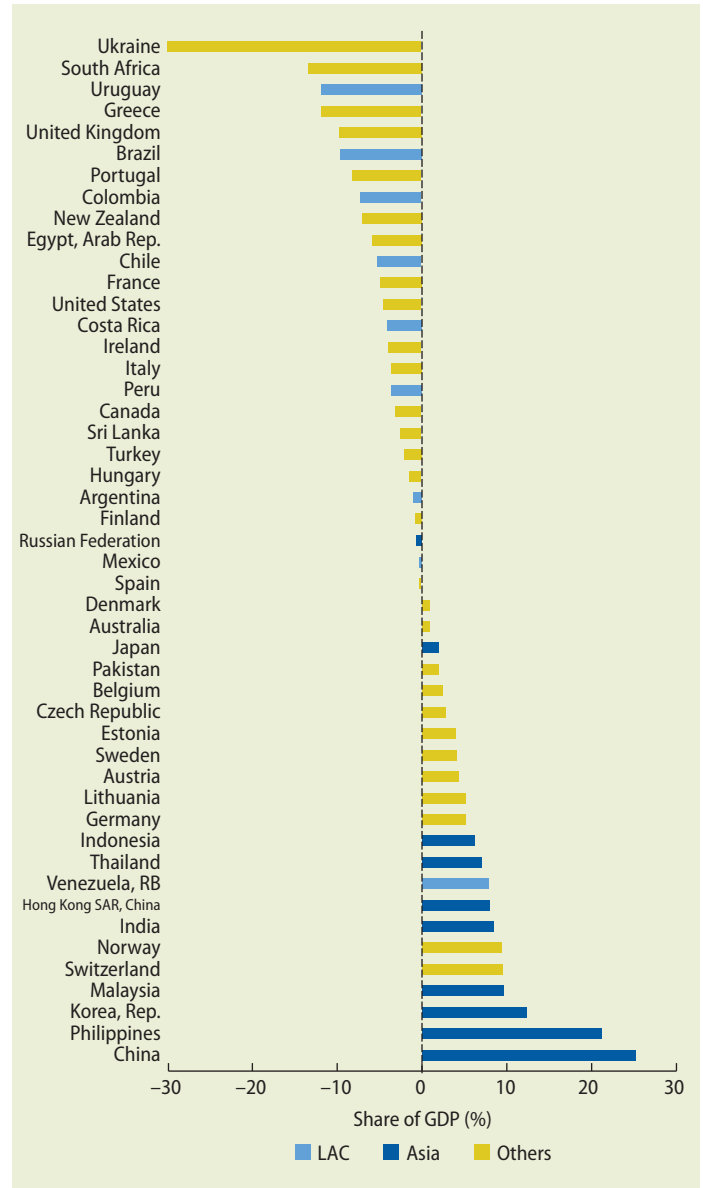
national income exceeds absorption (the sum of consumption and investment spending), giving rise to current account surpluses. In contrast, a domestic demand-driven model of integration features systematic current account deficits or, equivalently, a systematic excess of investment over domestic saving. The fact that persistent current account deficits can undermine growth by being accompanied by external debt viability problems or overvalued currencies naturally puts the spotlight on the links between domestic saving and growth.

The debate as to whether saving matters for or is just a corollary of growth is an old and familiar one.³

This chapter puts this old debate under a new light. It examines the medium-term relationship between domestic saving and trend (as opposed to cyclical) growth from the perspective of three possible channels, two of which go from saving to growth and one of which goes from growth to saving.

The first “saving-causes-growth” channel is the real exchange rate (ER) channel. It is associated with the current account of the balance of payments, external competitiveness, and the imperfect substitutability between tradable and nontradable goods. Because prices are likely to become more responsive to aggregate demand as economies approach their production frontier, the strength of the ER channel would be expected to rise in times of high current account deficits. The second “saving-causes-growth” channel is the interest rate (IR) channel. It is associated with the capital account of the balance of payments, the sovereign risk rating, and the imperfect substitutability between domestic and foreign financing. Given that the country risk rating is inherently a truncated variable (bounded by a zero probability of default for a AAA rating), one would expect the effects of low saving through the IR channel to also be nonlinear (gathering strength on the downside, as the risk of default and a balance of payments crisis rises, while tapering off on the upside, as balance of payments viability and capacity and willingness to pay is ensured). The two channels in turn interact

FIGURE 5.3 Domestic saving rates in selected economies, adjusted for per capita GDP, 2012



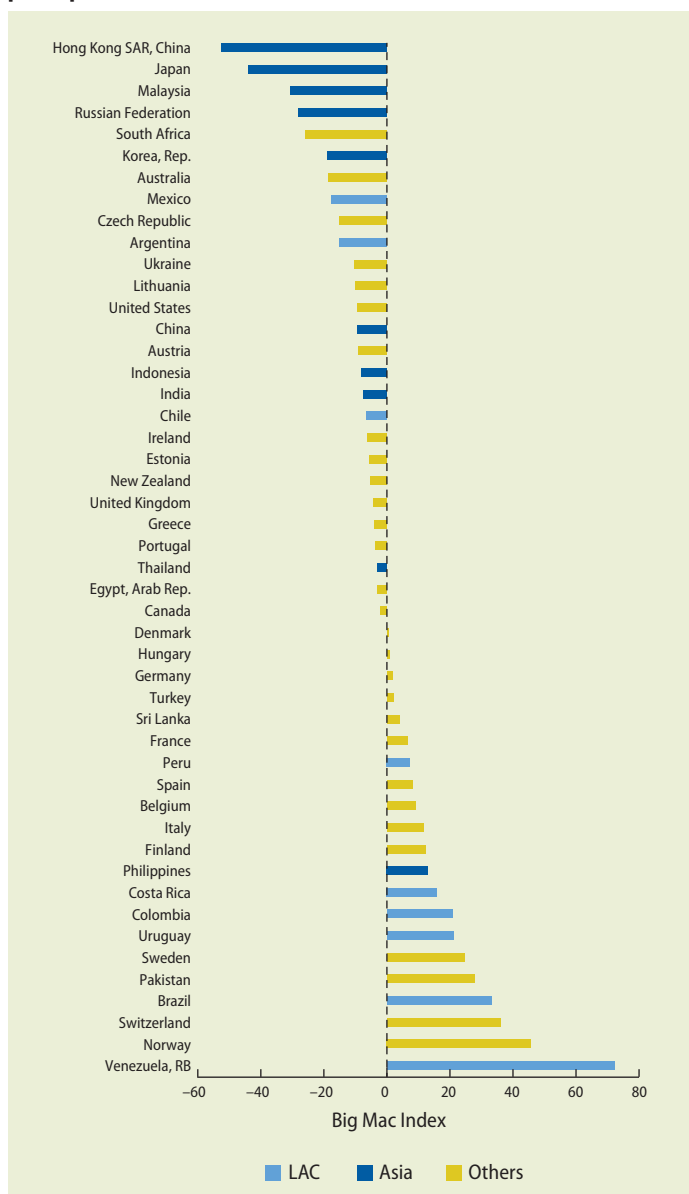
Sources: Based on data from United Nations and World Development Indicators.

Note: GDP = gross domestic product; LAC = Latin America and the Caribbean. The economies shown are the ones that appear in the Big Mac index. Figures shown are the residuals of a regression.

with a “growth-causes-saving” channel, the endogenous saving (ES) channel, which is associated with the endogenous response of domestic saving to growth.

These conceptual distinctions translate into distinct macroeconomic patterns linking

FIGURE 5.4 External competitiveness (Big Mac index), adjusted for per capita GDP, 2012



Source: Based on data from World Development Indicators.

Note: GDP = gross domestic product, LAC = Latin America and the Caribbean. Figures shown are the residuals of a regression.

saving, the exchange rate, the sovereign risk rating, and growth, thereby giving rise to several testable hypotheses. In particular, where the ER channel dominates, countries that undersave should have persistently overvalued currencies and grow at a slower rate. Where the IR channel dominates, countries

that undersave should grow at a slower rate despite having undervalued currencies. Where the ES channel dominates (the *ES-on-steroids* case), domestic saving should cease to constrain growth, as an autonomous marginal increase in investment should generate a marginal increase in domestic saving of an equal or larger magnitude.

In a background paper for this report, De la Torre and Ize (2015) develop a medium-term equilibrium model that assumes away all transient dynamics, including the short-term fluctuations around potential output and the exchange rate and interest rate dynamics around the risk-adjusted interest rate parity condition. This model lays the ground for a benchmarking framework, estimated with three-year data averages, that seeks to identify the long-run equilibrium footprints that set LAC apart from other South regions and differentiate countries within LAC.

The ER channel is found to dominate the data for the sample as a whole (that is, at the world level). In contrast, the IR channel has played a uniquely important role in LAC's recent history. During the 1980s and 1990s, it worked at full steam against growth, as a result of both domestic policy factors (poor macro-financial policies that led to capital flight and debt crises) and external factors (high world interest rates) that kept LAC sovereign ratings substantially below the ratings of the Southeast Asian middle-income countries. The adverse effects on growth of low country ratings and frequent crises more than offset the expansionary effects of deeply depreciated real exchange rates. Instead, the IR channel worked in favor of growth for LAC during 2003–211, reflecting a mix of domestic policy factors (sounder macro management leading to much improved country risk ratings) and external factors (very low world interest rates). These favorable effects more than offset the contractionary effects on growth of strong real exchange rate appreciation.

Looking forward, the potential consequences of low saving operating through the IR channel are likely to be mitigated for most major LAC countries—on the upside because of the IR channel's nonlinear nature (country

risk ratings have much less room to rise than in the past), on the downside because of the improved macro-financial policies and altered composition of external financing in favor of equity rather than debt.⁴ In contrast, the ER channel could become a significant hindrance to growth, as the region's low saving, in tandem with much lower sovereign risk premiums and the ample availability of external finance, could result in higher current account deficits and persistent pressures toward real exchange rate appreciations. The econometric estimates reported in De la Torre and Ize (2015) indeed suggest that, through the joint operation of the ER and ES channels, the impact on growth of a boost in saving could be substantial, particularly for countries with persistent current account deficits. Thus LAC countries that have consistently undersaved relative to their benchmark, thereby incurring recurrent current account deficits, would most likely benefit from broad-based saving mobilization efforts.

Given the importance of shocks in the macro-dynamics of the region—particularly global shocks, such as the rise of the South—the analysis complements the medium-term, three-year average equilibrium analysis with a structural vector autoregression (SVAR) model that emphasizes fluctuations and dynamics over time based on quarterly data. This approach, developed by Hevia and Servén (2014) in another background paper for this report, explores the dynamics of saving (consumption), investment, and the real exchange rate resulting from both domestic and global shocks.

The rise of the South, with China at its epicenter, has given rise to three distinct expansionary global shocks: a supply shock (reducing the prices of LAC manufacturing imports), a demand shock (raising the prices of LAC primary exports) and a monetary shock (maintaining low interest rates and easy access to foreign finance). Based on data for 1990–2012, the SVAR model finds that the mix of these three shocks would have naturally boosted the region's growth—as in fact it did. However, it also boosted consumption and appreciated real exchange rates. By

examining separately the impulse responses for pre- and post-2003 data, the SVAR finds that the traditional (pre-2003) tendency of LAC was to experience macro responses (especially in consumption and the current account) that were much more pronounced and persistent than in non-LAC emerging economies. As a result, domestic saving in LAC declined strongly and persistently. However, thanks to improved monetary and fiscal policy frameworks, such amplification and persistence effects in consumption (saving), investment, and the current account responses appear to have considerably dimmed after 2003, counterbalanced by larger changes in the real exchange rate (relative to LAC's past).

Looking forward, LAC's penchant for low saving, combined with weakness in world demand and the region's social policy priorities, could exert further appreciation pressures on real exchange rates, by calling for more stimulative spending policies in a context of easy access to foreign finance. If macro and debt management in LAC succeeds in keeping default risk from rising (thereby keeping the IR channel under control), these factors could boost the adverse ER effects of low saving on long-run growth through larger current account deficits and more appreciated real exchange rates. The region's policy makers may therefore face difficult trade-offs between short-run and longer-run objectives.

The rest of this chapter is structured as follows. The next section provides a conceptual discussion of the three channels linking domestic saving and growth and relating them to the literature. The following section looks at LAC's macro history from the perspective of these channels, first from a broad-brush perspective, then by establishing a typology of countries based on their macroeconomic footprints, and finally by breaking down the analysis into shorter sub-periods affected by different global or domestic shocks. The last section looks ahead, first by arguing that low saving is likely to affect growth in the future more through the ER than the IR channel, then by assessing the likely growth-enhancing impact of policies

aimed at boosting saving, and finally by briefly reviewing the tensions and challenges associated with such a policy agenda.

Concepts and literature review: When does saving matter for trend growth?

This section develops a conceptual framework on the links between domestic saving and trend (as opposed to cyclical) growth. This issue has been debated in the theoretical and empirical literature as far back as the 1950s. The analysis presented here adds value to this debate by identifying three well-defined channels through which saving may affect growth.

Domestic saving ceases to be a matter of interest for growth-oriented policy once any of the three following conditions is met. First, if private saving decisions are socially optimal given the constraints, the private sector is doing the best it can and the government, faced with the same constraints, has no comparative advantage over the private sector in improving the outcome. Hence there is no justification for saving-promoting policies.⁵ Second, if the supply of domestic saving is perfectly growth elastic (any increase in the demand for saving needed to accommodate higher growth is fully met by an increase in the supply of domestic saving), the saving needed for growth automatically emerges as soon as required. Third, if foreign and domestic saving are perfect substitutes, for any given level of desired investment, foreign saving compensates for any shortfall in domestic saving. Any change in the composition of saving (for example, from domestic to foreign) then alters only the distribution of growth dividends across beneficiaries (from local residents to foreigners), not growth itself.⁶

Hence if domestic saving were to be of consequence for growth, it would have to be because at least one of the above conditions is not met, which in turn connects with three possible channels linking saving and growth. Start by dropping the assumption of perfect substitutability of domestic and foreign

saving. Because imperfect substitutability can originate from the real side of the balance of payments (the current account) as well as the financial side (the capital account), abandoning this assumption gives rise to two possible channels through which saving may affect growth. The first is the real ER channel, which involves the current account and operates through the imperfect substitutability of tradable and nontradable goods. The second is the IR channel, which involves the capital account and operates through the imperfect substitutability of foreign and domestic assets. In either case the imperfect substitutability of goods or assets is itself associated with frictions that prevent the internalization of externalities. Thus private saving decisions are not socially optimal, and government policies can potentially improve the equilibrium.⁷

Abandon next the assumption of perfect growth elasticity of domestic saving. Doing so opens up a third channel, the ES channel, through which saving may affect growth, but this time it is through a multiplier effect on the action of the first two channels.

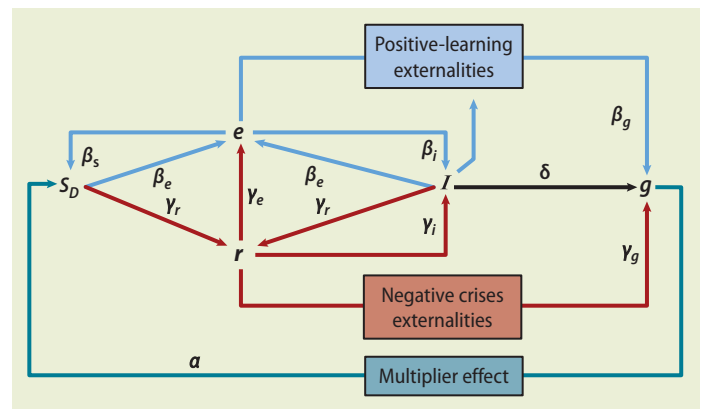
The workings of all three channels are illustrated in figure 5.5, which links the difference between domestic saving (S_D) and investment (I) to growth (g), through the real exchange rate (e) in the case of the ER channel and through the country risk rating (r) in the case of the IR channel. It also shows the ES channel, which links back growth (g) to domestic saving (S_D). The links across the channels are summarized in eight channel-specific elasticities (β_e , β_p , β_g , γ_e , γ_r , γ_I , γ_g , and α) and one general, productivity-related elasticity, δ , which links growth with investment. These elasticities set the basis for the medium-term macro model and benchmarking structure presented in detail in De la Torre and Ize (2015) and summarized in annex 5A, which is used as a basis for the analysis presented in later sections of this chapter. Because it focuses on medium-term structural relationships, the model assumes away all transient dynamics around the equilibrium, including the short-term fluctuations around potential output and

the exchange rate and interest rate dynamics around the sovereign risk-adjusted interest rate parity condition.

Consider first the ER channel (the blue arrows in figure 5.5), which involves imperfect good substitution, the current account, and the real exchange rate. Excess demand for domestic saving, which implies an excess of absorption over output, raises the demand for both tradables and nontradables. For a price-taking small economy, excess demand for tradables is resolved solely through quantities (a widening of the current account deficit as imports increase) at given world prices. In contrast, excess demand for nontradables raises their price relative to the price of tradables, thereby appreciating the real exchange rate. The extent of the appreciation depends on the elasticity of the real exchange rate with respect to the excess demand for saving, β_s , a key parameter to estimate. As noted above, this elasticity is likely to be nonlinear, rising in times of current account deficits, when the economy is more likely to be overheating. To the extent that tradables and nontradables are not perfect substitutes—tradables generating more positive growth spillovers than nontradables—less external competitiveness depresses growth. This effect is captured by β_g , the responsiveness of growth to changes in the real exchange rate. In addition, total investment may rise with a more undervalued exchange rate, either because the productivity spillovers of a larger tradable sector are partly internalized or because the tradable sector is more capital intensive. The elasticity of investment to changes in the real exchange rate, β_i , captures these effects. For its part, investment affects growth both indirectly, via the exchange rate and learning-by-investing externalities (through β_e and β_g), and directly, via factor accumulation (through δ).⁸

What does the literature report about the ER channel? The causal link from net domestic saving (the current account) to the equilibrium real exchange rate has been amply studied in the context of short-term, two-sector (tradables and nontradables) dependent-economy models.⁹ These models establish that if the economy is in full

FIGURE 5.5 The three channels linking saving and growth



Note: Blue arrows indicate the exchange rate (ER) channel, red the interest rate (IR) channel, and green (teal) the endogenous saving (ES) channel.

employment; tradable and nontradables are imperfect substitutes; and the external debt viability condition is met, then a rise in domestic demand relative to national income (an increase in investment relative to domestic saving) leads to an appreciation of the equilibrium real exchange rate.

In contrast, the links between domestic saving, the real exchange rate, and growth have received limited attention in the long-term growth literature. Several studies find that the countries that have relied the most on foreign saving are the ones that have grown the least (Aizenman, Pinto, and Radziwill 2004; Prasad, Rajan, and Subramanian 2007). Yet the empirical growth literature (Eichengreen 2008; Haddad and Pancaro 2010) has been generally skeptical or outright critical of the feasibility of using the exchange rate as a robust, durable lever for growth. By and large, this literature reflects a disequilibrium view of the exchange rate rather than one in which the real exchange rate is firmly grounded in fundamentals (that is, saving).

There is, however, an emerging strand of literature connecting saving, the exchange rate, and growth, albeit perhaps not yet as directly as it could. This literature arguably originated with Rodrik (2008), who focuses mainly on the second leg of the link. He finds that countries with more depreciated real exchange rates grow faster, leading him to posit that tradables are somehow special, in

that they produce more growth-enhancing positive externalities than nontradables.¹⁰ He therefore argues that maintaining a competitive real exchange rate is equivalent to a policy of across-the-board protection in favor of externalities-rich tradable activities.¹¹ Rodrik (2008) also provides empirical evidence on the other leg of the ER channel, the saving to real exchange rate link. He shows econometrically that countries that save more have more depreciated real exchange rates. But he does not attempt to tease out the direction of causality or elaborate on the rationale or policy implications of this link.¹²

In contrast, Korinek and Servén (2010) formalize both legs of the ER channel. They develop a model in which the relative productivities of the tradable and nontradable sectors—a key determinant of long-run equilibrium exchange rates (see for example Ricci, Milesi-Ferretti and Lee 2008)—become a function of aggregate demand (hence saving). At the same time, the positive growth externalities of the tradable sector derive from Romer-type learning-by-investing spillovers in a setting in which the tradable sector is more capital intensive (and hence generates more growth externalities) than the nontradable sector (Romer 1986). Because externalities are not internalized, private agents save and invest too little, the tradable sector is too small, and the economy grows less than optimally.

Itskhoki and Moll (2014) also explore both legs of the ER channel, but this time based on agency frictions (collateral constraints) as in Aghion and others (2009). They justify the need for public intervention based on uninternalized pecuniary externalities that give rise to constrained-inefficient equilibria. Boosting saving raises the profits of financially constrained firms, thereby promoting investment and growth. As in Korinek and Servén (2010), the link with the exchange rate derives from the fact that the tradable sector is more capital-intensive than the nontradable sector.

Consider now the IR channel (the red arrows in figure 5.5), which involves imperfect asset substitution, the capital account,

and the sovereign risk premium (hence the local interest rate). Excess demand for saving widens the current account deficit, increasing the external debt. To the extent that this buildup raises the risk of default, it reduces the country risk rating and raises the risk premium and the cost of capital, hindering investment and undermining growth.¹³ The strength of these effects depends on the size of γ_r (the elasticity of the country rating with respect to the current account) and γ_g (the elasticity of growth to changes in the rating). Because a balance of payments crisis is an extreme event (it occurs only at the tail of the distribution) and the risk premium is bounded below by zero (just as the risk rating is bounded by a zero probability of default), one would expect γ_r to be nonlinear. Improvement of the current account balance from a position of strength should have little or no impact on the rating; instead, improvement in the current account balance from a position of weakness should have a large impact. But country ratings also affect growth indirectly, both through investment (with an elasticity γ_i) and through the exchange rate (with an elasticity γ_e). Thus, while lower saving should appreciate the real exchange rate on account of the ER channel, by worsening the country's risk premium (hence the rating) it should depreciate the real exchange rate on account of the IR channel.¹⁴

What does the literature say about the IR channel? There is ample evidence that the world is very close to full capital market integration. Properly computed, marginal rates of return to capital are largely equalized across countries (Caselli and Feyrer 2006). Moreover, increases in world saving (say, as a result of a fiscal improvement in the United States) have a one-for-one impact on investment across the world (Feyrer and Shambaugh 2009). However, tightly integrated international financial markets do not necessarily imply that foreign and domestic saving are perfect substitutes. Indeed, a large body of literature links foreign debt accumulation to balance of payments crises (Eaton and Gersovitz 1981; Corsetti and others 2012). The adverse consequences on output and

growth of such crises has been analyzed from various angles, including from a theoretical perspective in which pecuniary externalities are formally modeled (Jeanne and Korinek 2010) and a broad-based historical perspective (Reinhart and Rogoff 2011).¹⁵

Finally, consider the ES channel (the green arrows in figure 5.5), in which domestic saving follows growth. In this case a reduction in the rate of growth leads to a decline in saving, of a magnitude determined by the growth elasticity of saving (α). This process sets in motion a reinforcing process that further reduces growth, through either a less competitive real exchange rate (the ER channel) or a higher sovereign risk premium (the IR channel). However, should the ES channel be sufficiently strong (the case of ES on steroids, where $\alpha\delta > 1$), a rise in investment could ignite a self-propelling increase in growth by boosting saving in excess of investment, thereby raising net saving and depreciating the exchange rate. In this case domestic saving no longer matters for growth, even if private saving decisions are not socially optimal or foreign and domestic saving are imperfect substitutes.

The literature on the ES channel explains the positive growth elasticity of saving, which underlies the ES channel, in various ways. On the household side, growth raises the income of middle-aged people, who save more than both the young and the old (Modigliani 1986). Moreover, consumption lags income growth as a result of habit formation (Campbell and Cochrane 1999). On the firm side, as income and profits expand, corporate saving can rise, as firms limit dividend distribution to mobilize internal finance (Fazzari, Hubbard, and Petersen 1988) or increase output prices relative to wages (Lewis 1954; Kaldor 1958). A more controversial strand of literature (Rowthorn 1982) supports the ES on steroids view by extending Keynesian concepts and constructs beyond the short run.

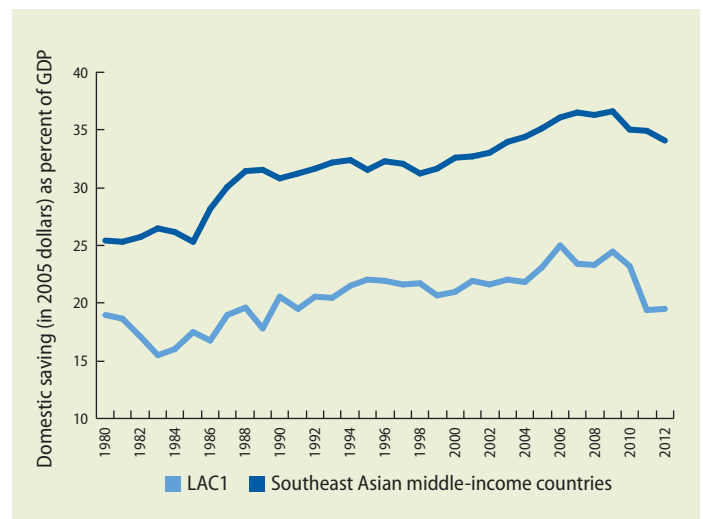
The empirical evidence generally corroborates that saving does follow growth. Panel regressions find output growth to be a significant determinant of private saving

(Loayza, Schmidt-Hebbel, and Servén 2000). In Granger causality studies, growth generally causes saving (Carroll and Weil 1993). Countries undergoing growth transitions end up with permanently higher saving rates (Rodrik 2000). A number of studies (Guariglia, Liu, and Song 2008; Yang, Zhang, and Zhou 2011) find that the Chinese growth acceleration of the past quarter of a century was largely a result of endogenous increases in corporate saving. However, the critical condition for self-propelling growth does not appear to have been tested or adequately discussed. Yet this condition provides another testable hypothesis—namely, that where the ES channel dominates, the critical condition $\alpha\delta > 1$ should hold.

Looking back: Latin America and the Caribbean under the spell of the interest rate channel

This section views LAC's recent macro history from the perspective of the saving and growth channels. The analysis suggests that

FIGURE 5.6 Saving rates of higher-income countries in Latin America and the Caribbean and middle-income countries in Southeast Asia



Sources: Based on data from United Nations and World Development Indicators.

Note: LAC1 includes countries in Latin America and the Caribbean with annual per capita gross domestic product (GDP) of more than \$5,000 (see annex table 5A.1 for list of countries). Middle-income countries in Southeast Asia include Indonesia, the Republic of Korea, Malaysia, the Philippines, and Thailand.

IR-type dynamics dominated in the past quarter of a century.

The section zooms in progressively from the general to the specific. It begins by taking a broad-brush view of the region in comparison with the world. It separates LAC into two groups based on their GDP per capita—LAC1 (higher-income countries) and LAC2 (lower-income countries)—and examines the structural relations between saving, the real exchange rate, the sovereign rating, and growth.¹⁶ The section then fine-tunes the analysis by breaking it down, first synchronically (by looking at the structural macro patterns for subgroups of countries within LAC1) and then diachronically (by contrasting the broad macro features of the crisis-and-stabilization period [1980–2002] with the features of the growth recovery period [2003–11]). In this last context, the analysis interprets the results of the SVAR

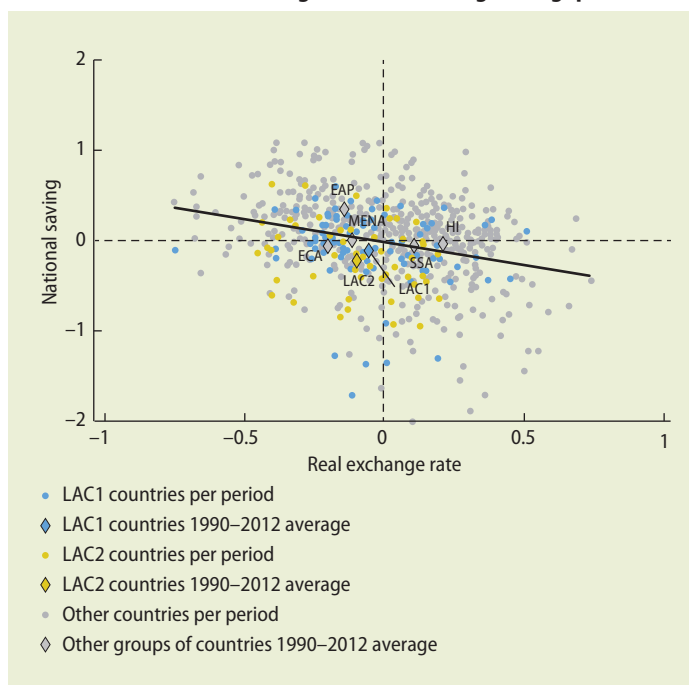
model on LAC’s macro responses to global shocks based on data for 1990–2011.

Latin America and the Caribbean and the world

Consider first the contrasting evolution of domestic saving rates in the higher-income LAC countries (LAC1) and the Southeast Asian middle-income countries (figure 5.6). After dipping sharply to about 15 percent of GDP during the early 1980s, the ratio of domestic saving to GDP in LAC1 underwent a sustained recovery during the 1990s. It stabilized around 22 percent by the early 2000s before jumping to just under 25 percent at the height of the commodity super-cycle (2005–08). This high rate of saving proved to be temporary, however: LAC’s domestic saving rate started to decline after 2009. Throughout the entire period, saving rates in LAC remained below the rates of the fast-growing Asian tigers by about 10 percentage points of GDP.

The region’s unimpressive saving performance stands out in the structural benchmarking exercise of De la Torre and Ize (2015). To focus on medium-term equilibrium relationships, they use three-year averages over 1981–2012 to estimate country-specific benchmarks and gaps. Benchmarks indicate where an individual country’s main macro variables are expected to lie, given the country’s level of economic development (GDP per capita), structural (nonpolicy-related) characteristics, exposure to global shocks (particularly as they affect its terms of trade), and the “typical” or average (policy-dependent) institutional features of its peers.¹⁷ Gaps reflect the distance between where a country is and where it is expected to be.¹⁸ Given the controls, they provide a rough measure of the country’s policy-related shortfall or excess relative to its peers. Both benchmarks and gaps are obtained based on a two-stage process. Simple benchmarks and gaps are first derived from the ordinary least squares (OLS) estimates of the structural model displayed in figure 5.5. By linearly combining these simple benchmarks and gaps, *equilibrium*

FIGURE 5.7 Domestic saving and real exchange rate gaps



Sources: Based on data from United Nations and World Development Indicators.
 Note: Each period is a three-year average. EAP = East Asia and Pacific, ECA = Europe and Central Asia, HI = high income, MENA = Middle East and North Africa, SSA = Sub-Saharan Africa. See table 5A.1 for list of countries in each group and annex 5A for details on how the benchmarks are calculated.

benchmarks and gaps are then obtained that are solutions of the structural model and, therefore, take into account the cross-equation linkages between endogenous variables.¹⁹ In this way the correlations across the gaps of different macroeconomic variables reflect the combined effect of the key elasticities of the model (see annex 5A for methodological details).

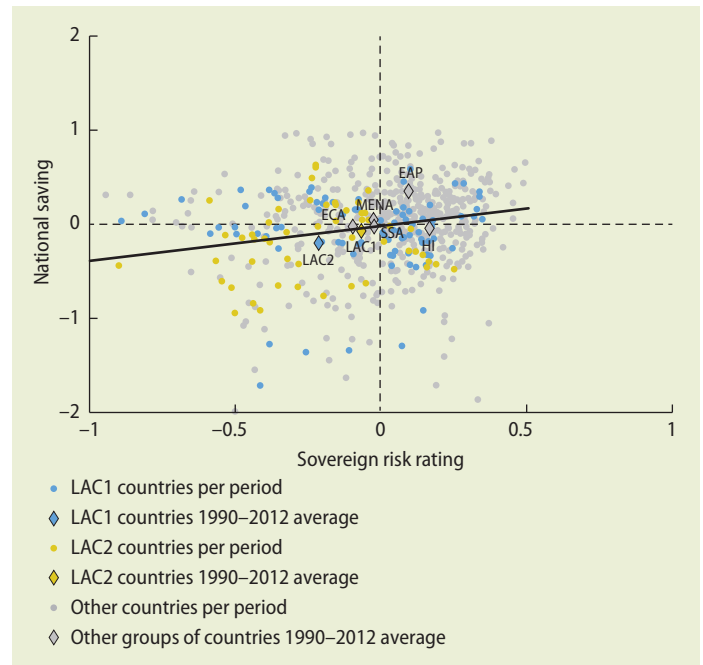
In particular, the saving and real exchange rate gaps should be negatively correlated if the elasticity of the exchange rate with respect to changes in the current account deficit is positive and significant.²⁰ Figure 5.7 confirms this relationship. It plots the saving and real exchange rate gaps (that is, the distances from the horizontal and vertical axes) for the full sample, per country per period, where each period is a three-year average. As the fitted line indicates, on average countries that saved more (less) than their benchmark throughout 1981–2012 had more (less) competitive real exchange rates.

This pattern, which clearly bears the signature of the ER channel, applies to every region in the world except LAC. For the 1990–2012 subperiod, both LAC1 and LAC2 are located in the lower-left-hand quadrant of figure 5.7: although they undersaved, their real exchange rates were undervalued. Such association points to a unique historical influence of the IR rather than the ER channel in LAC.²¹

Figure 5.8, which shows the correlation between the saving and sovereign rating gaps, confirms that both LAC groups had a rating problem. It shows that the IR of low (high) saving is associated with low (high) sovereign ratings, all relative to the benchmark. Although all regions of the world reveal this pattern, the two LAC groups again stand out, lying in the bottom-left-hand quadrant. Their undersaving is associated with large under-ratings, which in turn are consistent with the large real exchange rate undervaluations of figure 5.7.

That the adverse impact of low saving on growth in LAC occurred mainly through the IR channel can also be gleaned, indirectly from figure 5.9, which shows the correlation between the growth and real exchange rate

FIGURE 5.8 Domestic saving and sovereign risk rating gaps



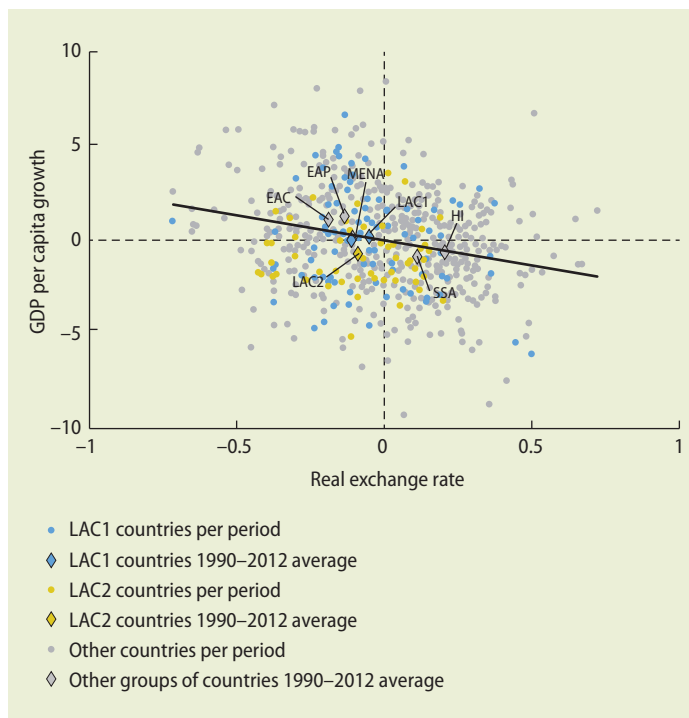
Sources: Based on data from United Nations, World Development Indicators, and Institutional Investor.

Note: Each period is a three-year average. EAP = East Asia and Pacific, ECA = Europe and Central Asia, HI = high income, MENA = Middle East and North Africa, SSA = Sub-Saharan Africa. See table 5A.1 for list of countries in each group and annex 5A for details on how the benchmarks are calculated.

gaps. This figure confirms Rodrik's (2008) result by neatly illustrating the second leg of the ER channel: countries with more (less) depreciated exchange rates grew more rapidly (slowly) than their benchmarks. The two LAC groups are the only ones in the bottom-left-hand quadrant: they grew more slowly despite their more depreciated real exchange rates, a finding that is again consistent with their having been under the spell of the IR channel.

Low savers and high savers

Not all LAC countries followed the same structural patterns, however. In particular, there are clear differences within the LAC1 group when countries are divided according to their 1990–2012 average saving and real exchange rate positions relative to the benchmarks.

FIGURE 5.9 Real exchange rate and growth gaps in selected country groups

Sources: Based on data from United Nations, World Development Indicators, and Institutional Investor.

Note: Each period is a three-year average. EAP = East Asia and Pacific, ECA = Europe and Central Asia, GDP = gross domestic product, HI = high income, MENA = Middle East and North Africa, SSA = Sub-Saharan Africa. See table 5A.1 for list of countries in each group and annex 5A for details on how the benchmarks are calculated.

Figure 5.10 (together with the underlying regression lines for the sample as a whole) shows the average saving and real exchange rate gaps (relative to benchmarks) of all 14 LAC1 countries, first for the period 1990–2012 as a whole (panel a) and then broken down by two subperiods, the 1990s and the 2000s (panel b).

Four well-differentiated groups of countries stand out in panel a. The first group, comprising Chile, Mexico, Panama, and Peru, occupies the top-left-hand quadrant. These countries saved more than their benchmark and had undervalued exchange rates. This pattern conforms to what one would expect for high savers under the ER channel.

On the polar opposite side (the bottom-right-hand quadrant of panel a) lies another

group of countries (the Bahamas, Barbados, Brazil, Costa Rica, and Uruguay), that also conform to the ER channel but on the low saving side. Their exchange rates were overvalued on average, and they saved less than their benchmarks.

As illustrated in figure 5.11 (which complements figure 5.7 by showing where the four LAC1 high savers and five LAC1 low savers were located during 1990–2012 in terms of their average saving and real exchange rate gaps), these two groups fit the ER pattern. The high savers are located above the fitted line, in the top-left-hand quadrant (oversaving and undervalued), while the low savers are located below the fitted line, in the bottom-right-hand quadrant (undersaving and overvalued).²²

The five remaining LAC1 countries can be assembled into two additional subgroups. The first, composed of Colombia, Ecuador, and Trinidad and Tobago, sits in the bottom-left-hand quadrant, with low domestic saving rates but undervalued exchange rates. This pattern is consistent with the IR channel, in which undersaving is associated with undervalued exchange rates caused by low ratings. Remarkably, as shown in figure 5.10, panel b, this group later migrated to the right, as its real exchange rates appreciated significantly, with Colombia joining the group of ER low savers. This massive rightward shift (a large real appreciation) reflects the gradual easing of the IR channel caused by steadily improving country ratings.

The last subgroup of LAC1 countries, Argentina and República Bolivariana de Venezuela, appears above the fitted line in panel a of figure 5.10, saving more than their benchmarks throughout the 1990–2012 period. They shifted positions between 1990–99 and 2000–12, from undervaluation to overvaluation in República Bolivariana de Venezuela and from overvaluation to undervaluation in Argentina (see panel b). Although in principle such a pattern could be consistent with the polar opposite side of the IR channel (that is, countries becoming overvalued as a result of stellar country

ratings), this explanation is not relevant here, as these countries had sovereign ratings well below those of the LAC1 countries as a group (figure 5.12). A more plausible explanation is the predominance of extensive exchange controls in both countries in the post–World War II period. Exchange controls reflected severe macroeconomic disequilibria with acute financial repression and chronic capital flight—hence excess saving and current account surpluses. At the same time, multiple exchange rate systems tended to show up in the reported data as overvaluations, given that the (more appreciated) official exchange rate was typically used to measure the purchasing power parity index.

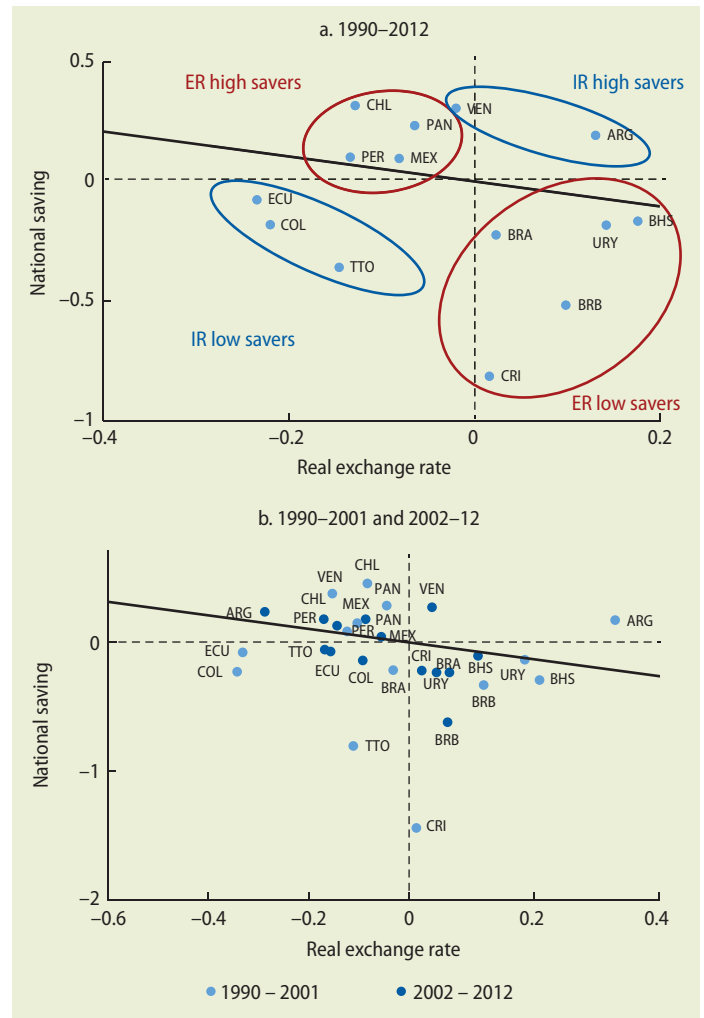
Even within the nine LAC1 ER countries, the macro-dynamics differed, depending on whether they were in the low-saver subgroup (the Bahamas, Barbados, Brazil, Costa Rica, and Uruguay) or the high-saver subgroup (Chile, Mexico, Panama, and Peru). Figure 5.13 shows the evolution of each of the main structural gaps for these two subgroups.

Consider first the saving gaps (panel a). High savers exceeded their benchmarks throughout most of 1981–2012, except for the most recent period, when their saving rates dipped somewhat below benchmark. The low savers, by contrast, fell short of their benchmark saving rates by a large margin throughout the entire period, especially during the 1990s.

Consider next the sovereign rating gaps (panel b). Following an initial dip, ratings rose steadily for both subgroups. In fact, after underperforming substantially relative to benchmark during the first part of the period, ratings ended up overperforming in the second part of the period, particularly among high savers.

Consider finally the real exchange rate gaps (panel c). Both high and low savers had substantially undervalued currencies in the 1980s and 1990s, and both experienced substantial appreciation during the 2000s. However, the real appreciation was much more pronounced among low savers, whose

FIGURE 5.10 Saving and real exchange rate gaps for higher-income countries in Latin America and the Caribbean

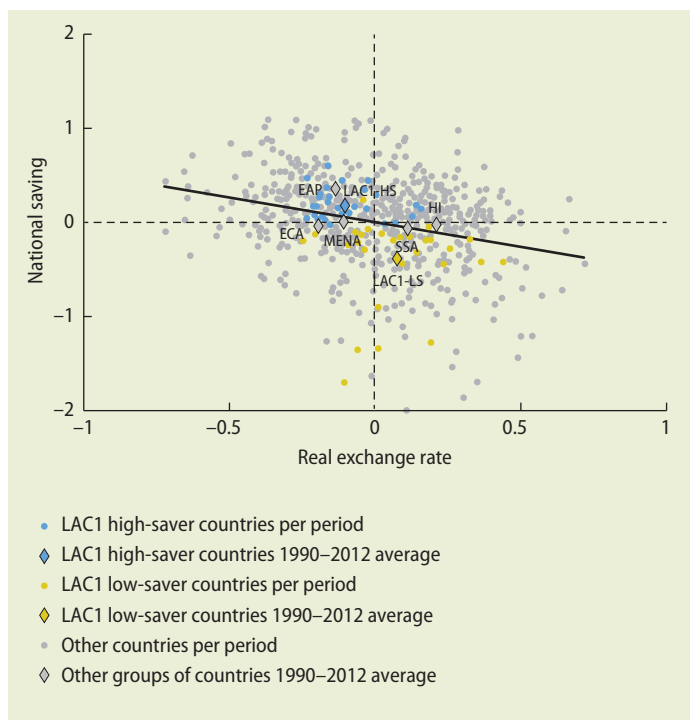


Sources: Based on data from United Nations and World Development Indicators.

Note: ER = exchange rate, IR = interest rate. The linear fit was calculated for the per-period version of the complete country sample for 1990–2012. Higher-income countries in Latin America and the Caribbean (LAC1) are countries with annual per capita gross domestic product of more than \$5,000 (see annex table 5A.1 for list of countries). See annex 5A for details on how the benchmarks were calculated. Three-letter country codes correspond to ISO 3166 standard.

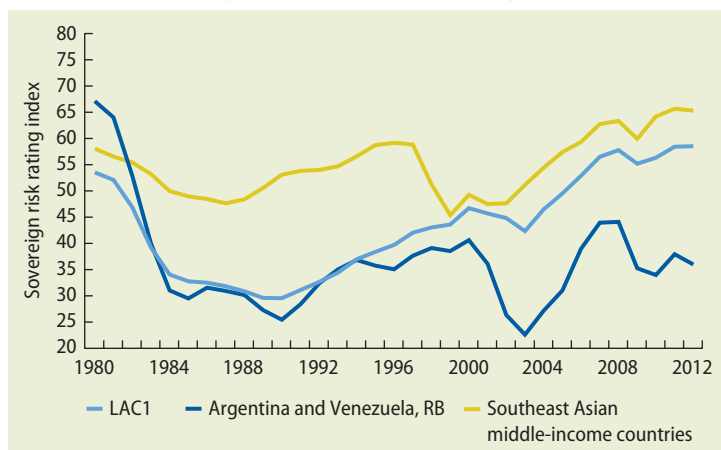
currencies became significantly overvalued by the end of the period. In contrast, high savers were able to retain somewhat undervalued currencies by the end of the period. Although the experience of both subgroups is, of course, also consistent with the rising rating trends under the IR channel, only the very substantial differences in the size and

FIGURE 5.11 Saving and real exchange rate gaps in selected country groups



Sources: Based on data from United Nations and World Development Indicators.
 Note: LAC1 countries are countries in Latin America and the Caribbean (LAC) with annual per capita gross domestic product of more than \$5,000 (see annex table 5A.1 for list of countries in all groups). LAC1-HS (high savers) includes Chile, Mexico, Panama, and Peru. LAC1-LS (low savers) includes the Bahamas, Barbados, Brazil, Costa Rica, and Uruguay. EAP = East Asia and Pacific; ECA = Europe and Central Asia; HI = high income; MENA = Middle East and North Africa; SSA = Sub-Saharan Africa. See annex 5A for details on how the benchmarks are calculated.

FIGURE 5.12 Country ratings for selected country groups



Source: Based on data from Institutional Investor database.
 Note: Middle-income countries in Southeast Asia include Indonesia, the Republic of Korea, Malaysia, the Philippines, and Thailand. LAC1 countries are countries in Latin America and the Caribbean (LAC) with annual per capita gross domestic product of more than \$5,000 (see annex table 5A.1 for list of countries).

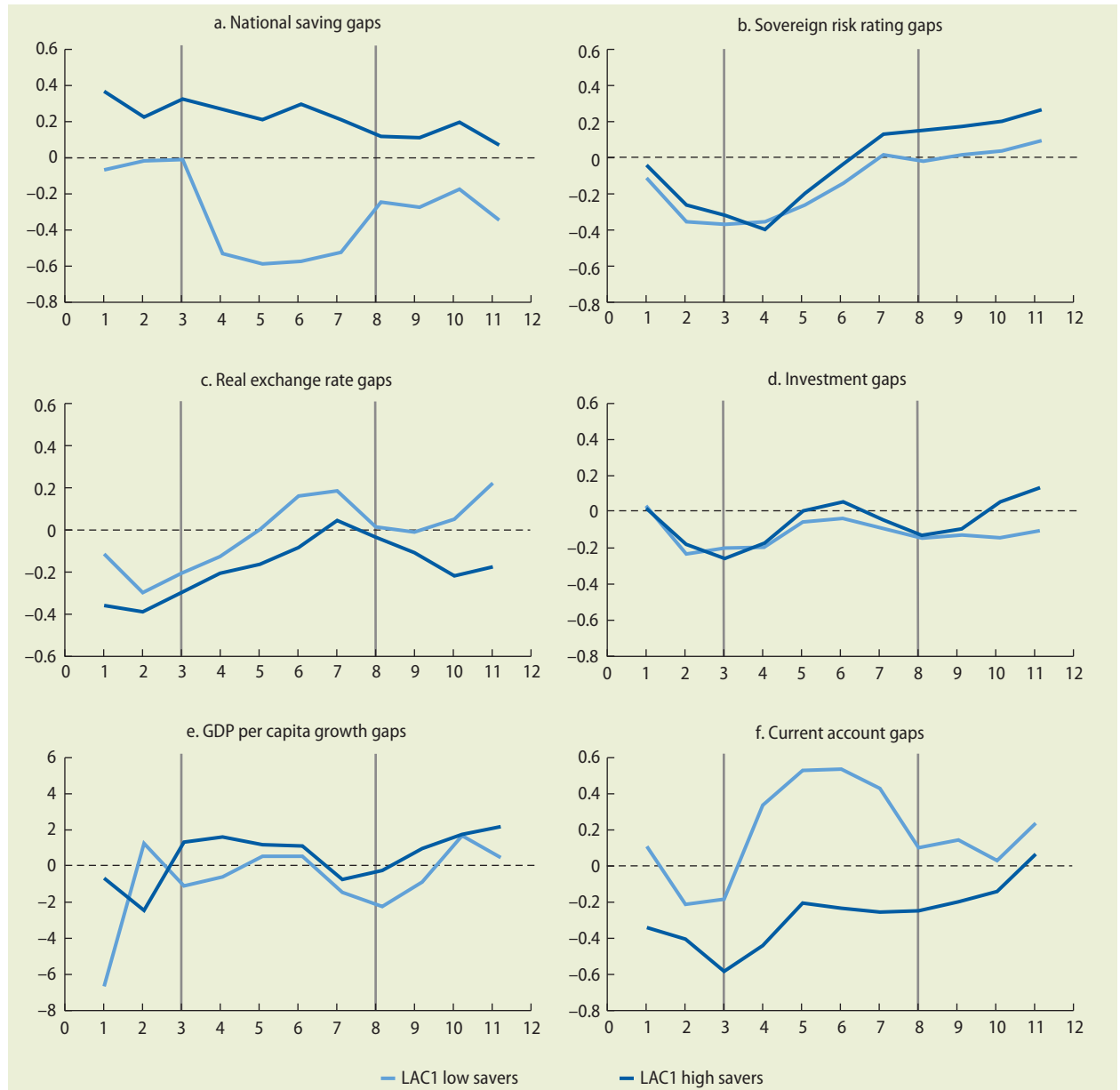
sign of their saving gaps can explain the stark differences between them by the end of the period. Low savers ended up paying a much heavier price in terms of exchange rate overvaluations, with significantly lower average investment and growth rates than high savers (panels d and e).

Shocks, crises, and recoveries

Sizable external and domestic shocks—the effects of which were not independent of LAC’s fundamental macro structure and policy framework—heavily influenced macroeconomic developments in LAC over the past three decades. To help isolate the dynamic impact of these shocks, the rest of this section combines the benchmarking analysis with the SVAR methodology of Hevia and Servén (2014), which is summarized in annex 5A and used to interpret the region’s responses to shocks during the following three subperiods: the crisis period of the 1980s (observations 1–3), the macro stabilization period of the 1990s and early 2000s (observations 4–8), and the growth recovery period that started in 2003 (observations 9–11).

Consider first the crisis decade of the 1980s. Major negative global shocks—including receding world demand in the wake of the second oil crisis and the U.S. Federal Reserve’s 1981–82 disinflation efforts, which brought world interest rates to historical highs—hit the region’s weak macroeconomic structures during this period. Low saving rates in LAC, together with high real interest rates in the United States (figure 5.14) and widespread capital flight (that is, saving invested abroad rather than at home), set the grounds for a perfect IR-style storm. Rising external debt rapidly unfolded into balance of payments and debt crises, undercutting growth. Indeed, this period recorded a peak number of crisis events, with LAC experiencing many more crises than did the middle-income countries of Southeast Asia (figure 5.15). The generally depressed terms of trade exerted further depreciating pressures on real exchange rates. But despite

FIGURE 5.13 Policy-adjusted gaps for high-saver and low-saver higher-income countries in Latin America and the Caribbean, 1981–2012



Sources: Based on data from United Nations, World Development Indicators, and Institutional Investor.

Note: Higher-income countries in Latin America and the Caribbean (LAC1) are countries with annual per capita gross domestic product of more than \$5,000 (see annex table 5A.1 for list of countries). Each period is a three-year average. See annex 5A for details on how the benchmarks are calculated.

frequent and significant currency devaluations (indeed, fear of depreciation was the order of the day), the heavily discounted exchange rates were not effective in promoting exports and growth, because of the drag exerted by macroeconomic imbalances and

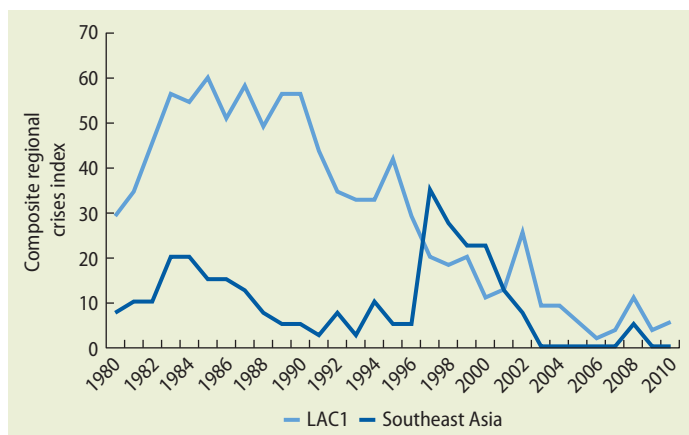
instability, as reflected in the sharp dips in sovereign ratings (see figure 5.12).

Although the SVAR exercise uses data that start only in 1990, it can be loosely extrapolated to this earlier period. The data suggest that shocks, particularly the negative

FIGURE 5.14 Real U.S. interest rate

Sources: Based on data from the Board of Governors of the Federal Reserve System and the Federal Reserve Bank of Cleveland databases.

Note: Series was constructed by deflating the (effective) monthly federal funds rate by the inflation rate for the previous 12 months.

FIGURE 5.15 Incidence of crises in Latin America and Southeast Asia, 1980–2010

Source: Based on data from Reinhart and Rogoff 2011.

Note: The variable shown in the figure was constructed by summing all the dummy variables for the different kinds of crises (currency, inflation, domestic debt, external debt and banking) across the countries within each region, and then dividing the resulting sum by the number of countries in the region times the number of kinds of crises (5). Hence, if the variable were to take the value of 100 in a certain year, it should be read as “all the countries within the region experienced every kind of crisis that year.” Southeast Asia includes China; Indonesia; the Republic of Korea; Malaysia; the Philippines; Singapore; Taiwan, China; and Thailand. LAC1 includes countries in Latin America and the Caribbean with annual per capita gross domestic product of more than \$5,000 (see annex table SA.1 for list of countries).

world demand shock of the 1980s, may have depressed saving in LAC more deeply and permanently than in other emerging economies (figure 5.16).²³

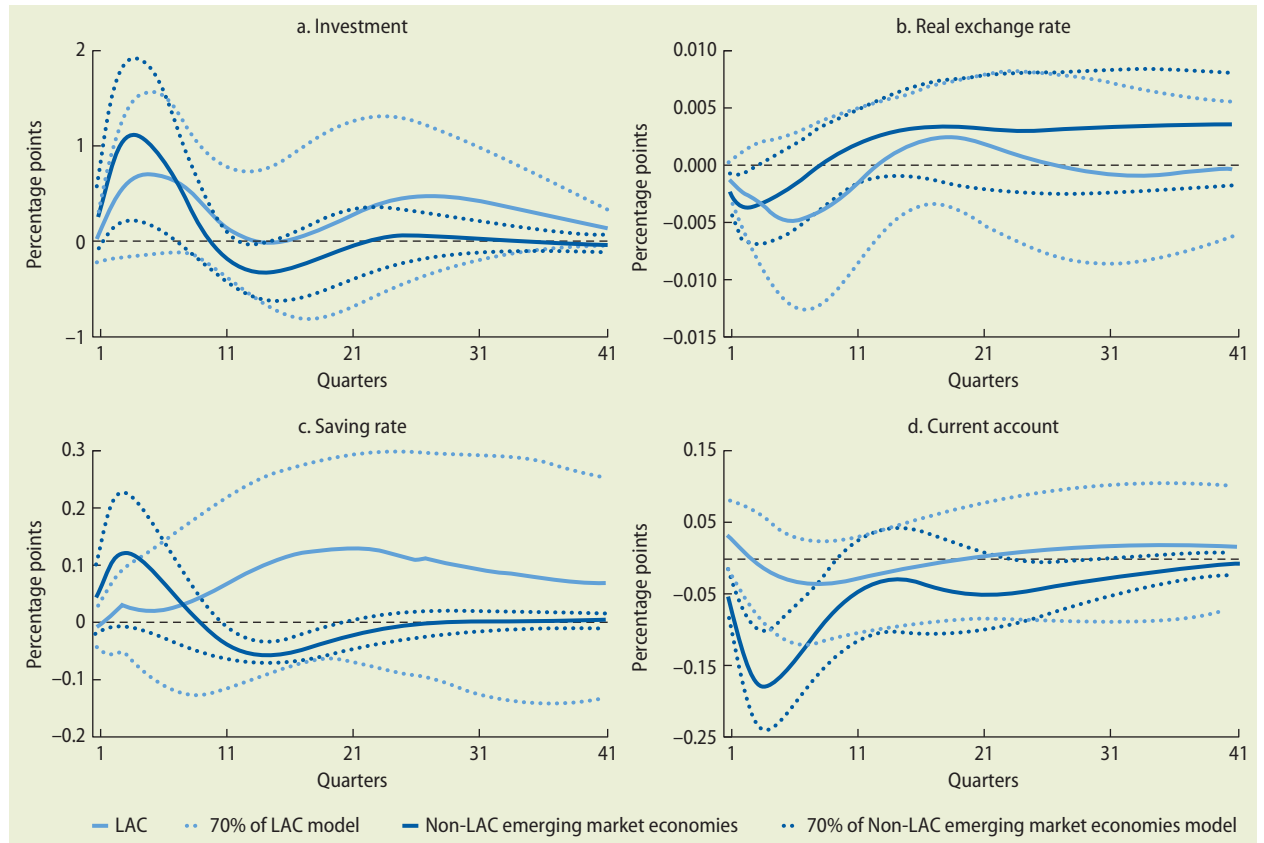
During the macro stabilization period of the 1990s, IR dynamics continued to undermine growth, as evidenced by the rising but

still low sovereign ratings (see figure 5.12), high world real interest rates (see figure 5.14), and falling but still high incidence of crisis events (see figure 5.15). Despite visible progress in the fight against inflation, IR dynamics fed policy makers’ intense fears of depreciation and concerns about sudden stops and reversals in capital flows.²⁴

Instead, the post-2002 growth recovery period saw a 180-degree shift in the direction of the IR winds. Real exchange rates in many LAC countries appreciated rapidly after 2002, wiping out much of the region’s traditional undervaluation relative to benchmarks and leading to significant currency overvaluation for the region’s ER low savers (see figure 5.13, panel c). Fear of appreciation became predominant. The substantial improvements in sovereign ratings largely contributed to these appreciations. Indeed, LAC country ratings converged to the level of the middle-income countries of Southeast Asia (see figure 5.12). The change largely reflected the region’s success in regaining macro stability thanks to significantly improved macroeconomic policy frameworks, particularly in countries that made an early shift toward robust inflation targeting. The adverse growth effects of these currency appreciations, however, were more than offset by the favorable IR winds. As a result, on average growth picked up strongly between 2003 and 2012, during which time LAC experienced a nontrivial process of convergence in GDP per capita (see figure 5.1).²⁵

Two key external factors contributed significantly to this post-2002 outcome: the rise of China and the sharp decline in world interest rates, to historical lows. The rise of China entailed a global supply shock (a rise in world output associated with declining prices for manufactured goods and hence lower global inflation) together with a global demand shock (which pushed commodity prices up). Taken jointly these two shocks unequivocally led to major gains for LAC’s terms of trade. However, because the supply shock was accompanied by large current account surpluses (that is, excess saving) at the epicenter of the shock (China and other East

FIGURE 5.16 Impulse responses in Latin America and the Caribbean and other emerging market economies to positive global demand shocks



Source: Hevia and Servén 2014.

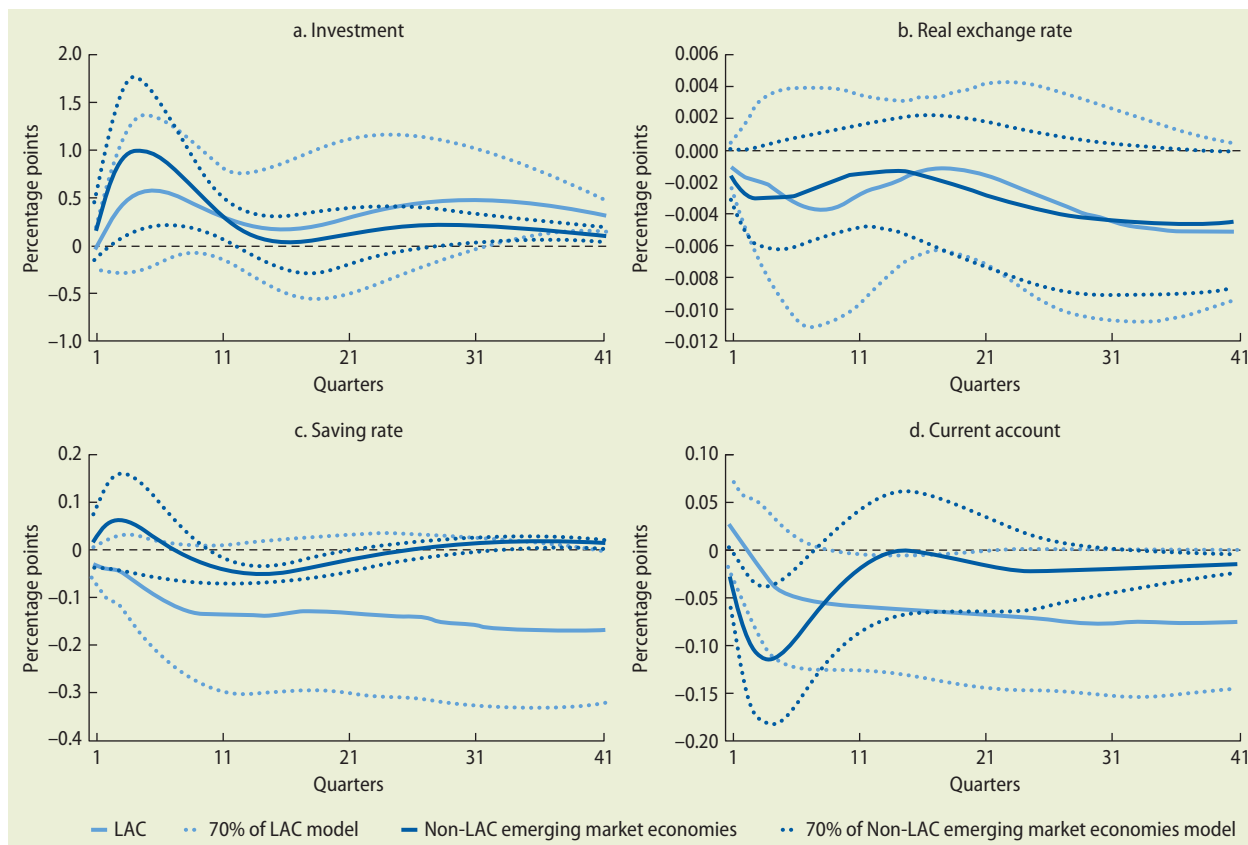
Note: Solid lines represent accepted model median deviation from the trend from a global demand shock, in terms of the sign restrictions defined by the authors for the model and the shock in Hevia and Servén (2014). Dotted bands encompass 70 percent of the accepted models. See table 5A.4 for details on the sign restrictions. Non-LAC (Latin America and the Caribbean) emerging market economies include Hungary, India, Indonesia, the Republic of Korea, the Philippines, Poland, the Russian Federation, South Africa, Thailand, and Turkey.

Asian economies), its effects are likely to have dominated the effects of the global demand shock. The historically low world interest rates that have generally prevailed since 2002 represented, in turn, a major positive global monetary shock that reflected the recycling in the North of current account surpluses originating in the South, particularly East Asia, as well as accommodative monetary policies in the North, particularly the United States.

Using the entire 1990–2011 period (that is, assuming unchanged economic structures and institutional setups), the SVAR exercise shows that LAC's responses were more pronounced and persistent than the responses of other South regions. In particular, the decline

in world interest rates led to an exchange rate appreciation and a sharp decline in the region's saving rates (figure 5.17). The increases in global demand and global supply resulting from the rise of the South also boosted LAC's growth and appreciated its real exchange rates (see figures 5.16 and 5.18). The two shocks had opposite effects on saving, but with the supply shock dominating the demand shock, the combined effect was a further reduction in LAC's saving rates and a deterioration of its current accounts. For LAC's commodity-exporting countries, a prolonged upswing phase of the commodity price supercycle further boosted the appreciation.

FIGURE 5.17 Impulse responses in Latin America and the Caribbean and other emerging market economies to global monetary easing



Source: Hevia and Servén 2014.

Note: Solid lines represent accepted model median deviation from the trend from a global monetary easing shock, in terms of the sign restrictions defined by the authors for the model and the shock in Hevia and Servén (2014). Dotted bands encompass 70 percent of the accepted models. See table 5A.4 for details on the sign restrictions. Non-LAC (Latin America and the Caribbean) emerging market economies include Hungary, India, Indonesia, the Republic of Korea, the Philippines, Poland, the Russian Federation, South Africa, Thailand, and Turkey.

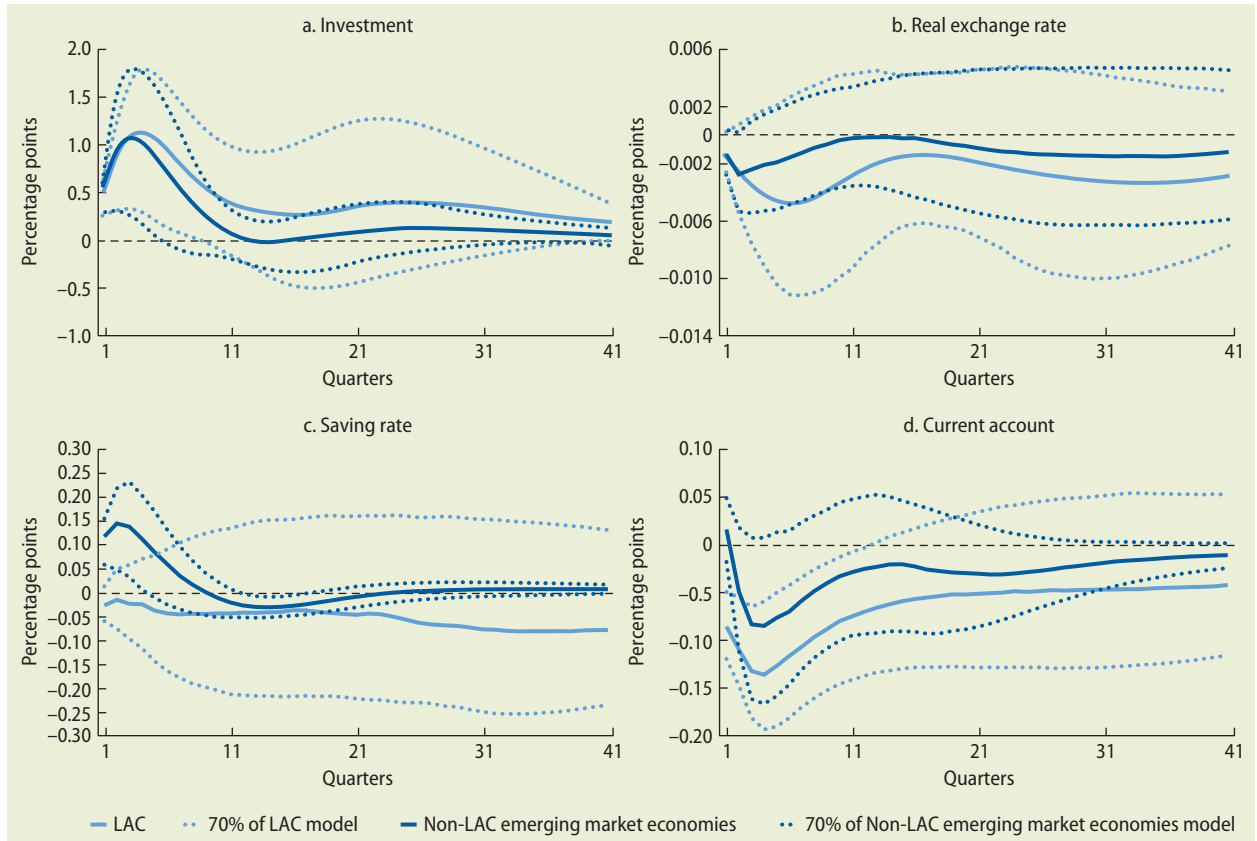
The regional pattern of accelerated growth, low and falling domestic saving, appreciated real exchange rates, and deteriorating current accounts that prevailed in many LAC countries over the period 2003–11 is therefore consistent with the domestic macro-policy improvements captured by the benchmarking exercise as well as the response to global shocks captured by the SVAR exercise. However, the De la Torre and Ize (2015) benchmarking exercise goes farther in explaining the differential patterns of appreciation across LAC countries. Structural saving differences made a huge difference in the extent of the appreciation across countries. Although saving rates declined for

both high savers and low savers, only the low savers continued to appreciate into overvaluation (see figure 5.13, panel c).

Looking ahead: Growth-improving effects of low saving through the exchange rate channel

This section builds on lessons from the recent past to look at the nature of the drag that low saving may exert on LAC's future growth potential. It first assesses the relative roles and importance of the ER and IR channels in light of current changes in world demand and improvements in LAC's macro-financial

FIGURE 5.18 Impulse responses in Latin America and the Caribbean and other emerging market economies to positive global supply shocks



Source: Hevia and Servén 2014.

Note: Solid lines represent accepted model median deviation from the trend from a global supply shock, in terms of the sign restrictions defined by the authors for the model and the shock in Hevia and Servén (2014). Dotted bands encompass 70 percent of the accepted models. See table 5A.4 for details on the sign restrictions. Non-LAC (Latin America and the Caribbean) emerging market economies include Hungary, India, Indonesia, the Republic of Korea, the Philippines, Poland, the Russian Federation, South Africa, Thailand, and Turkey.

immune system. It then discusses the desirability of boosting saving, based on preliminary results in De la Torre and Ize (2015) regarding the growth impact of increases in saving rates. It concludes with a brief review of policy tensions and challenges.

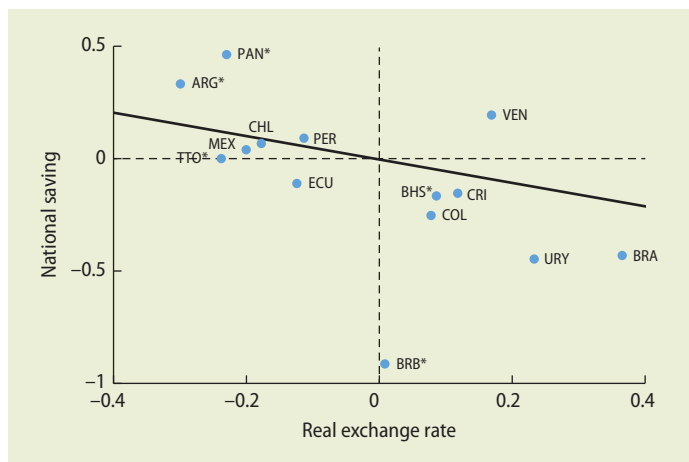
The coming threat of the exchange rate channel

With the end of the commodity price bonanza and low international interest rates, the problem of low saving is likely to come back to haunt most of the region, this time mainly through the ER channel. Indeed, except for a couple of outliers, the region is now much

closer to the regression line and neatly aligned along an ER pattern such that the lower the saving the more overvalued the exchange rates (figure 5.19).

Instead, the IR channel now looks more subdued. As long as the current world environment of low interest rates and constrained demand lasts, it should facilitate access to foreign finance. At the same time, thanks to public sector deleveraging and international reserve accumulation, LAC rebalanced its portfolio of net external liabilities from debt to equity, thereby achieving a more resilient form of international financial integration. LAC actually became a net creditor with respect to the rest of the

FIGURE 5.19 Saving and exchange rate gaps for higher-income countries in Latin America and the Caribbean, 2011–12 averages



Sources: Based on data from United Nations and World Development Indicators data.
 Note: The linear fit was calculated for the complete country sample for 1990–2012. The gaps were calculated as the difference between the actual and benchmark values for the variables. See annex 5A for details on how the benchmarks are calculated. Higher-income countries in Latin America and the Caribbean are countries with annual per capita GDP of more than \$5,000 (see annex table 5A.1 for list of countries). Three-letter country labels correspond to the ISO 3166 standard. * = due to missing data for 2011–12 period, the latest available period was used.

world in debt contracts (reflecting external debt deleveraging and international reserve accumulation). In addition, it became a more active user of foreign equity finance, which led to a rising net debtor position in risk-sharing equity contracts, particularly FDI, with respect to the rest of the world (figure 5.20). To be sure, the associated payment of dividends will still be a challenge for balance of payments viability. Moreover, some FDI (particularly FDI related to the commodity cycle) may actually reflect retained earnings from multinational corporations held in the form of liquid assets and hence prone to sudden stops. Overall, however, the change in composition should help shield the region's external liabilities from rollover and currency risks and dampen the impact on external financing costs once world interest rates start to rise.

Significant improvements in monetary policy (the shift in several of the major LAC countries to inflation-targeting-cum-exchange-rate-flexibility regimes) and fiscal policy (the introduction of sounder government debt management and fiscal responsibility rules in several LAC countries) have helped stabilize

sovereign ratings at high levels for much of the region. They will likely continue to do so in the future, further muting the downsides of the IR channel.²⁶ Indeed, the SVAR tests performed by Hevia and Servén (2014) find that the adoption of inflation targeting and prudent fiscal rules in the region have resulted in significantly smoother responses of output, consumption (hence saving), and investment to global supply and demand shocks, counterbalanced (at least in the case of the inflation targeters) by larger responses of the real exchange rate. These outcomes are consistent with the argument that LAC's low saving rates are more likely to constrain future growth through the ER channel than through the IR channel. LAC has been transitioning from an IR world dominated by fear of depreciation to an ER world dominated by fear of appreciation.²⁷

However, any mitigation of the IR problem will only exacerbate the ER problem. By enhancing access to foreign finance and allowing for higher current account deficits, it will surely generate further real exchange rate appreciation pressures. Indeed, the already worsening trend of the region's current account balances, as evidenced in figure 5.13 (panel f), is a reminder that policy action may become required in the future not just on macro stability-related grounds but also on growth-related grounds.²⁸

The scope for policy response

The scope for a policy response to such a threat ultimately depends on two key empirical findings. The first is the direction of causality, which needs to be carefully ascertained to make sure that the correlation between saving and growth reflects mainly the workings of the ER and IR channels rather than the ES channel (that is, reverse causality from growth to saving). The second is the range of possible policy impacts, which also needs to be established in order to justify the pain associated with policies designed to boost saving.

De la Torre and Ize (2015) report preliminary findings on both issues. They first conduct OLS-based estimates of the five

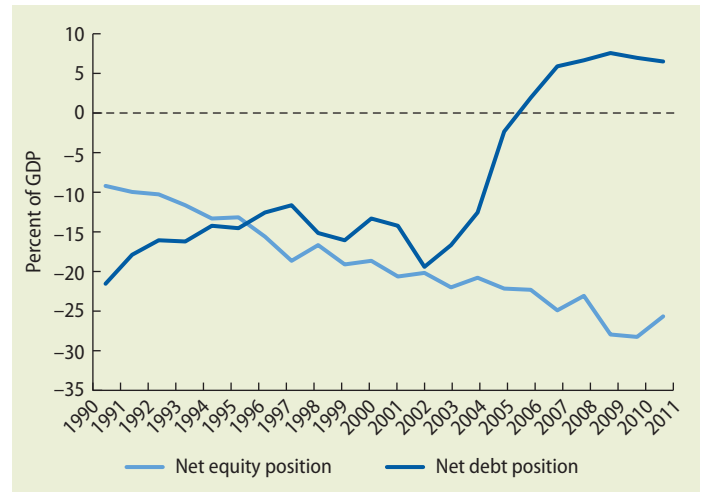
structural equations (one for each of the five endogenous variables) that underpin the model. (These equations are depicted in figure 5.5 and formalized in equations 5A.5–5A.9 in annex 5A.) These estimates produce a set of elasticities that are consistent with all three channels linking saving and growth.²⁹ Moreover, they also support the nonlinearity of the ER and IR channels (as expected, the responses of the real exchange and country rating to changes in the current account are higher in economies with current account deficits). Yet the OLS estimates are affected by endogeneity problems and, as they do not take the cross-equation correlations into account, yield very limited impacts.³⁰

To overcome these limitations, De la Torre and Ize (2015) conduct alternative estimates based on instrumented reduced forms (where the endogenous variables are regressed against all exogenous variables) instead of structural forms. These reduced forms use as instruments the exogenous variables that most strongly explain each of the endogenous variables when running the structural (OLS) equations. The structural elasticities for the instrumented variables are then calculated backward, based on the mathematical restrictions imposed by the model.³¹ By fully capturing the cross-equation linkages, this approach leads to considerably higher elasticities than the ones obtained through the structural form estimates.³² Remarkably, while the ES channel also comes out much stronger, the threshold condition for self-propelling growth ($\alpha\delta > 1$) is never verified.³³

Policy tensions and challenges

These results should be taken with some caution, as they are still preliminary and subject to confirmation. However, they suggest that for many LAC countries, particularly countries incurring recurrent current account deficits, a sustained effort to raise domestic saving would most likely yield substantial long-run growth benefits. Higher aggregate saving would promote growth through the ER channel and limit the protectionist

FIGURE 5.20 Composition of foreign assets and liabilities in selected countries in Latin America and the Caribbean, 1990–2011



Source: Based on data from Lane and Milesi-Ferretti 2007.

Note: GDP = gross domestic product, LAC = Latin America and the Caribbean. Figures are for LAC7 (Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Uruguay). Ratios are calculated at the country level and then averaged across countries.

pressures that might otherwise result from large real appreciations.³⁴ It would also help reduce the potential IR drag on growth arising from unsustainable balance of payment trajectories.

What can governments do to increase aggregate saving? Although economists often throw in the towel when pressed to think about saving as a policy variable, a saving-boosting reform agenda is not beyond reach. It could involve actions on the fiscal, financial sector, and social safety net fronts. On the fiscal side, public sector saving can be directly increased by raising revenues, reducing public consumption, or both, and tax and subsidy policy can be used to foster private saving at the household and corporate levels. Actions affecting the financial services sector might involve regulations to promote saving and investment rather than consumption (by, for example, facilitating the channeling of saving into long-term finance, expanding financial inclusion from the deposit-taking and payments side rather than the lending side,

and preventing credit-fueled consumption booms). On the social safety net side, fostering saving might require redesigns of the health, pensions, and unemployment safety nets that promote self-reliance (private saving) rather than excessive reliance on the state (public saving). However, efforts to raise aggregate saving could run into potentially acute policy conflicts, both macroeconomic (between short- and long-term growth objectives) and distributional (across generations and within the current generation).

On the macro side, LAC policy makers would first need to find the right policy balance and timing from a purely long-run trade-off between present and future consumption. Further complications are likely to arise, however, because policy makers also need to address the potential conflicts between short-term growth objectives (which rely on strong countercyclical aggregate demand management to close output gaps while keeping inflation low and stable) and long-term growth objectives (which require strong aggregate saving as a complement to supply-side productivity-enhancing reforms). Navigating such treacherous waters clearly requires good timing and proper use of off-setting policies, particularly monetary policies. A policy shift toward easier monetary and tighter fiscal, as well as further progress in building up the region's countercyclical fiscal and monetary policy capacity, should help in this regard.³⁵

These country-specific macro management difficulties are further complicated by the current world environment, as weak world demand puts a premium on spending, rather than saving. High-income countries, European countries in particular, are

counting on strong demand from the rest of the world to help pull them out of their current slump. At the same time, low-cost external financing remains readily available, especially for highly rated LAC countries, many of which have significant room to increase indebtedness. Prevailing world conditions can thus induce countries to maintain or expand domestic demand while externally financing larger current account deficits. Doing so would help sustain world demand but possibly at the expense of LAC countries' external competitiveness and hence long-run growth potential. In the extreme, it could weaken the balance of payments, thus resuscitating the IR channel. Conversely, current weaknesses in world demand exacerbate the risk for countries of falling into a slump when raising their saving rate.

On the distributional side, curtailing consumption today could benefit future generations, but it would do so on the shoulders of the current generation. This effort could run up against a brick wall, politically and socially, especially if the cuts in consumption fall on the poorer segments of the population, something that would be particularly explosive in LAC's unequal societies. Managing these conflicts would be facilitated by policies designed to encourage asset building among the poor by, for instance, investing in health, education, and housing. Cutting public spending, particularly public investment, without affecting the quality of the business-enabling environment could also be a major challenge. Double-duty work on productivity-enhancing supply-side reforms would help ease these conundrums and increase the government's maneuvering room.

Annex 5A The Benchmarking Approach

The growth model

On the demand side, consider the following IS-LM (investment-saving/liquidity preference–money supply) and interest rate parity equilibrium conditions, where e is the real equilibrium exchange rate (an appreciation raises e), ρ the domestic real interest rate, ρ^* the real world interest rate, r the country's rating, $\sigma(\cdot)$ the risk premium, and the p 's are exogenous variables (controls) affecting each macro aggregate or price that may reflect the country's level of development, structural characteristics, external shocks, policy choices, or catastrophic policy outcomes:

$$I(\bar{e}, \bar{\rho}, p_I) = S_D(\bar{g}, p_{S_D}) + S_F(\bar{e}, \bar{r}, p_{S_F}) \quad (5A.1)$$

$$\rho = \rho^* + \sigma(\bar{r}, p_\sigma) \quad (5A.2)$$

Plugging (5A.2) into (5A.1) and substituting the world interest rate and country premium-specific factors into an expanded set of investment factors p_I' , yields the following reduced-form IS-LM equilibrium condition:

$$I(\bar{e}, \bar{r}, p_I') = S_D(\bar{g}, p_{S_D}) + S_F(\bar{e}, \bar{r}, p_{S_F}) \quad (5A.3)$$

The model is completed on the supply side with a simple reduced-form growth equation:

$$g = g(\bar{I}, \bar{e}, \bar{r}, p_g) \quad (5A.4)$$

For estimation purposes, the above model can be linearized and the exchange rate and country ratings expressed as a function of net saving:

$$e = \bar{\beta}_e(I - S_D) + \bar{\gamma}_e r + \sum_{j=1}^n \nu_e^j p_j + \varepsilon_e \quad (5A.5)$$

$$r = \bar{\gamma}_r(I - S_D) + \sum_{j=1}^n \nu_r^j p_j + \varepsilon_r \quad (5A.6)$$

$$I = \bar{\beta}_I e + \bar{\gamma}_I r + \sum_{j=1}^n \nu_I^j p_j + \varepsilon_I \quad (5A.7)$$

$$S_D = \bar{\alpha} g + \sum_{j=1}^n \nu_S^j p_j + \varepsilon_S \quad (5A.8)$$

$$g = \bar{\delta} I + \bar{\beta}_g e + \bar{\gamma}_g r + \sum_{j=1}^n \nu_g^j p_j + \varepsilon_g \quad (5A.9)$$

The α , β 's, and γ 's are the elasticities associated with the ES, ER, and IR channels, respectively; δ is a structural elasticity linking growth to investment, which reflects productivity; and the ε 's are residuals. The main features of the model are highlighted in the following differential equations:

$$\frac{de}{dp_S} = -\frac{\beta_e + \gamma_e \gamma_r}{\Delta} \nu_S \quad (5A.10)$$

$$\begin{aligned} \frac{dg}{dp_S} = & -\frac{1}{\Delta} [\beta_e(\beta_g + \delta\beta_i) + \gamma_r(\gamma_g + \delta\gamma_i) \\ & + \gamma_e \gamma_r(\beta_g + \delta\beta_i)] \nu_S \end{aligned} \quad (5A.11)$$

$$\begin{aligned} \frac{de}{dp_I} = & (\beta_e + \gamma_e \gamma_r) \frac{d(I - S_D)}{dp_I} \\ = & \frac{(\beta_e + \gamma_e \gamma_r)(1 - \alpha\delta)}{\Delta} \nu_I \end{aligned} \quad (5A.12)$$

where

$$\Delta = 1 + \alpha A - \beta_I \beta_e - \gamma_I \gamma_e - \beta_I \gamma_e \gamma_r \quad (5A.13)$$

$$A = (\beta_e + \gamma_e \gamma_r)(\beta_g + \delta\beta_i) + \gamma_r(\gamma_g + \delta\gamma_i) \quad (5A.14)$$

Given $\Delta > 0$, equation (5A.10) indicates that the exchange rate depreciates in response to a positive saving innovation if $\beta_e + \gamma_e \gamma_r > 0$. Given $\gamma_r < 0$, this condition is satisfied if the β_e term (the ER channel) dominates the $\gamma_e \gamma_r$ term (the IR channel).

Equation (5A.11) indicates that the impact on growth of a saving innovation can be broken down as a sum of three terms, which provide a convenient means to size up the relative strengths of the ER and IR channels as well as the multiplier effect of the ES channel. The first term, $\beta_e(\beta_g + \delta\beta_i)$, sums up the growth effect, both direct (through growth) and indirect (through investment), of an increase in saving, as carried through the ER channel. Similarly, the second term, $\gamma_r(\gamma_g + \delta\gamma_i)$, sums up the direct and indirect growth effects of an increase in saving, as carried through the IR channel. The third term, $\gamma_e \gamma_r(\beta_g + \delta\beta_i)$, picks up the interaction of the two channels coming from the impact of the country rating on the exchange rate. Finally, given

$A < 0$, the αA term in (5A.13) indicates that any growth stimulus carried by the ER or IR channels is multiplied, in proportion to α , by the ES channel.

Equation (5A.12) indicates that the exchange rate appreciates in response to a boost in investment if net saving declines $d(I - S_D) > 0$, which will be the case as long as $\beta_g + \gamma_e \gamma_r > 0$ (the ER channel dominates the IR channel) and $\alpha \delta < 1$ (the ES channel is not on steroids).

Benchmarking

Benchmarks help make countries comparable. They provide an indication of where a country should be given its stage of economic development, its structural (nonpolicy-related) characteristics, and the level of policy-related variables that is “typical” (albeit not necessarily optimal) for countries at similar stages of economic development.

The benchmarking framework in De la Torre and Ize (2015) follows a three-step procedure. It first controls for the country’s

level of economic development (as proxied by its per capita GDP) and for country-specific structural (nonpolicy-related) features and external shocks. It then controls for deviations from the policy benchmarks set by the country’s peers. Gaps reflect country-specific policy choices associated with either deviations from benchmarks for all identified policy-influenced variables or any latent policy difference remaining embedded in the residuals.³⁶ Finally, gaps are expressed as solutions of the underlying macro model. As shown below, doing so ensures full model consistency and incorporates into the gaps the correlations across variables derived from the basic model elasticities.

Equations (5.A5)–(5.A9) can be expressed in vector form:

$$X_t^k = AX_t^k + BY_t^k + CP_t^k + N^k + M_t + L_t^k \quad (5A.15)$$

$$P_t^k = B' Y_t^k + D_t^k \quad (5A.16)$$

ANNEX TABLE 5A.1 Country group composition

Region	Countries
Higher-income countries in Latin America and the Caribbean (LAC1)	Argentina, the Bahamas, Barbados, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Panama, Peru, Trinidad, Uruguay, Venezuela, RB
Lower-income countries in Latin America and the Caribbean (LAC2)	Belize, Bolivia, Dominican Republic, El Salvador, Guatemala, Guyana, Honduras, Nicaragua, Paraguay
East Asia and Pacific (EAP)	Bangladesh, Bhutan, Cambodia, China, Fiji, Hong Kong, SAR, China, India, Indonesia, the Republic of Korea, Malaysia, Pakistan, Papua New Guinea, the Philippines, Sri Lanka, Thailand, Tonga, Vietnam
Europe and Central Asia (ECA)	Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, Georgia, Greece, Hungary, Kazakhstan, the Kyrgyz Republic, Latvia, Lithuania, Macedonia, Moldova, Mongolia, Romania, Slovenia, Tajikistan, Turkmenistan, Ukraine
High income	Australia, Belgium, Canada, Cyprus, Denmark, Finland, France, Germany, Iceland, Ireland, Israel, Italy, Japan, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, the United States
Middle East and North Africa (MENA)	Algeria, the Islamic Republic of Iran, Jordan, Lebanon, Morocco, Syria, Tunisia, Turkey
Sub-Saharan Africa (SSA)	Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Chad, Côte d'Ivoire, Equatorial Guinea, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Rwanda, Senegal, South Africa, Sudan, Swaziland, Togo, Uganda, Zambia

Note: The dividing line between LAC1 and LAC2 countries is per capita income of \$5,000 a year.

where X_t^k is a vector of endogenous macro variables for country k at time t ; Y_t^k is a vector of identifiable country-specific fundamentals or external shocks; P_t^k is a vector of identifiable policy choices; N^k are country-specific effects, which may reflect unidentified country-specific endowments, preferences, or policy choices; M_t are worldwide dynamic disturbances; and L_t^k are normally distributed country-specific dynamic disturbances. The policy controls contain a universal component, $B'Y_t^k$, which is a predictable function of the country's fundamentals, and a country-specific component, D_t^k , which reflects the country's choice (good or bad) to deviate from that predictable level.

Replacing P_t^k from equation (5A.16) in equation (5A.15) yields

$$X_t^k = AX_t^k + (B + CB')Y_t^k + (CD_t^k + N^k) + M_t + L_t^k \quad (5A.17)$$

For policies that match the policies adopted on average by other countries with similar fundamentals (that is, for which $CD_t^k + N^k = 0$), the solution of equation (5A.17) yields a set of policy-neutral benchmarks, \hat{X}_t^k , and policy-neutral average gaps, $\tilde{X}_t^k = E\{X_t^k - \hat{X}_t^k\}$, such that

$$\hat{X}_t^k = A\hat{X}_t^k + (B + CB')Y_t^k + M_t \quad (5A.18)$$

$$\tilde{X}_t^k = A\tilde{X}_t^k + E\{CD_t^k + N^k\} \quad (5A.19)$$

The gaps thus reflect country specificities, which can be unidentified endowments, preferences, or policy choices embedded in the N term, or identified policy deviations from peer choices embedded in the CD term. Because they are linearly related through the A matrix, the cross-correlations of the gaps reflect the elasticities embedded in the model.

Model specification

All equations are systematically controlled for the country's level of economic development, as measured by GDP per capita. Additional

controls for identifiable structural differences across countries include trade and capital openness, demographics, and dependence on natural resource extraction. Controls for differential country exposure to external shocks include terms of trade and safe haven effects. Policy controls include fiscal policy (the fiscal balance and public consumption) and the country's macroeconomic record, as determined by its exposure to inflationary or debt crises. The sample covers 119 countries with annual data over the period 1981–2011 (not all countries' data cover the whole period; see annex table 5A.2 for data definitions and sources). To better capture medium-term relations, three-year averages are used throughout instead of annual data.

The United Nations (UN) database, which provides national accounts in real terms (that is, where each component of aggregate demand is deflated by its own price deflator) is used to limit the possible biases that would otherwise result from terms of trade change. Consistent with other studies of saving (see Loayza, Schmidt-Hebbel, and Servén 2000), the income measure used to calculate domestic saving is gross national disposable income (GNDI), equal to GDP plus net factor income (that is, GNP) and net unrequited transfers; total domestic saving is then calculated as GNDI minus consumption expenditure. To facilitate comparison of exchange rates across countries (rather than across time for the same country), the World Bank's purchasing power parity (PPP) conversion factor divided by the country's nominal exchange rate with respect to the U.S. dollar (the national price index [NPI]) is defined as the exchange rate.³⁷ The real exchange rate and the country rating are both regressed against net domestic saving where the latter equals the current account and is expressed as the difference between investment and gross domestic saving (all as shares of GDP) with the coefficient of investment constrained to be the opposite of that of saving. Time clustering is used to control for serial correlation of errors, and time fixed effects are used to control for worldwide shocks.

ANNEX TABLE 5A.2 Data description and sources

Variable	Description	Source
Domestic saving	Domestic saving as a share of gross domestic product (GDP), expressed in logs. Domestic saving is gross national disposable income (GDP plus net factor income and net unrequited transfers). Gross saving/GDP is from United Nations (UN); net factor payments/GDP and net unrequited transfers/GDP are from World Development Indicators (WDI).	UN data and WDI
Investment	Investment as a share of GDP, expressed in logs	UN data
Sovereign risk rating	Country risk rating, expressed in logs	Institutional Investor database
GDP per capita growth	Per capita income growth rate	WDI
Real exchange rate	Ratio of purchasing power parity conversion factor to nominal exchange rate with respect to the U.S. dollar, expressed in logs	WDI
Current account	Calculated as difference between investment and domestic saving	UN data and WDI
GDP per capita	Per capita income, expressed in logs	WDI
Old-age dependency ratio	Ratio of old people in the working population to the total work population	WDI
Population	Total population	WDI
Population growth	Rate of population growth	WDI
Fuel exports	Oil exports as a share of GDP. Fuel exports are from WDI, with missing data filled through linear prediction using World Bank Wealth of Nations data.	WDI and Wealth of Nations data
Trade openness	Ratio of imports plus exports to GDP, expressed in logs	WDI
Capital openness	Capital openness index	Chinn and Ito (2006)
Net unrequited transfers	Net unrequited transfers as a share of GDP	WDI
Share of foreign direct investment (FDI) in total capital	Ratio of FDI to capital stock. FDI is from WDI; capital stock is from Penn World Table.	UNCTAD and Penn World Table 7.1
Policy-determined spending on nontradables	Public consumption as a share of GDP, expressed in logs	WDI
Fiscal balance	Fiscal balance as a share of GDP	<i>The Economist</i> Countries Profiles
Quality of institutional environment	Simple average of corruption and rule of law indexes	World Governance Indicators
Inflation crisis	Inflation crisis dummy	Reinhart and Rogoff (2011)
External debt crisis	External debt crisis dummy	Reinhart and Rogoff (2011)
Risk appetite–safe haven	Calculated as the VIX index times a safe haven dummy that is equal to 1 for the United States, Japan, and Switzerland and 0 for the rest of the world. VIX data are extrapolated backward using the S&P 500 index.	VIX and S&P 500
Terms of trade changes	Terms of trades expressed in logs. Data missing from WDI are completed through smooth pasting with data from International Financial Statistics.	WDI and International Financial Statistics

ANNEX TABLE 5A.3 Data definitions and sources

Variable	Definition and proxy	Source
Domestic		
Gross domestic product (GDP)	Real GDP (deviation from log-linear trend)	National sources, International Financial Statistics (IFS), Organisation for Economic Co-operation and Development (OECD)
Consumption	Aggregate private plus public consumption	National sources, IFS, OECD
Investment	Real aggregate investment	National sources, IFS, OECD
Current account	Current account as a share of GDP	National sources, IFS, OECD
Inflation	Consumer price index (deviation from log-linear trend)	National sources, IFS, OECD
Exchange rate	Logarithm of real effective exchange rate	National sources, IFS, OECD
Global		
Global economic activity	Proxied by real U.S. GDP (deviation from log-linear trend)	OECD
Global inflation	Proxied by U.S. consumer price index (deviation from log-linear trend)	OECD
Global short-term interest rate	Proxied by three-month U.S. Treasury rate	St. Louis Federal Reserve Bank
Global long-term interest rate	Proxied by slope of U.S. yield curve (defined as spread between 10-year and 3-month U.S. Treasury rates)	St. Louis Federal Reserve Bank
Spreads on emerging economies' sovereign debt	Barclays' corporate high-yield spread	Bloomberg
Commodity prices	Real global commodity index (deviation from log-linear trend)	International Monetary Fund

ANNEX TABLE 5A.4 Signs and length restrictions on global and domestic shocks

Sign restriction for domestic shock (for equation 5B.1)						
Type of shock	Output	Consumption	Investment	Inflation	Current account as share of GDP	Real effective exchange rate
Supply	+/3	+/3	?	-/1	?	+/1
Demand	+/3	+/3	?	+/1	?	-/1 ^a
Monetary	+/3	+/3	?	+/1	?	+/1
Sign restriction for global shock (for equation 5B.2)						
	World output	World inflation	Term premium	Credit spread	Commodity prices	Short-term interest rate
Supply	+/3	-/1	?	?	+/1	?
Demand	+/1	+/1	?	?	+/1	+/1
Monetary	+/1	+/1	?	?	+/1 ^b	-/1
Commodity	+/3	-/1	?	?	-/1 ^c	?

Note: Plus (minus) signs indicate that a positive (negative) restriction is imposed on the sign of the response to the shock; ? means no restrictions are imposed. Figures represent the number of quarters the shock lasted, including the quarter in which it occurred. The first row of the table should be read as "A domestic supply (noncommodity) shock is assumed to increase global output and consumption on impact and for the next two quarters, to reduce inflation on impact, and to raise the real effective exchange rate on impact."

a. The rationale for the drop in the real exchange rate is the following: an increase in domestic demand leads to an increase in consumption of both tradable and nontradable goods. The increased demand puts pressure on the nominal prices of both tradable and nontradable goods. Yet the price of tradable goods is fixed in international markets. Therefore, the demand shock leads to an increase in the relative price of nontradable goods (that is, to a real appreciation).

b. A global monetary shock reduces the short-term interest rate on impact. It is precisely this sign that allows one to disentangle demand from monetary shocks.

c. Note how the impact on commodity prices allows one to disentangle a commodity price shock from a supply (noncommodity) global shock.

Annex 5B The SVAR methodology

Hevia and Servén (2014) assess the contribution of domestic and foreign shocks to macroeconomic dynamics across LAC countries. The contributions of these shocks are estimated using structural vector autoregressions (SVARs) with exogenous variables. SVARs impose restrictions on a reduced form of vector autoregression (VAR) to identify, or recover, structural shocks or policy shifts with clear economic meaning.

Macro variables and shocks

The analysis focuses on the impacts of shocks on the evolution of six variables: GDP, aggregate consumption, aggregate investment, inflation, the current account, and the real exchange rate. Many of these variables display persistence and nonstationarity. The analysis is conducted at levels, extracting log-linear trends from GDP, investment, and consumption. Data limitations and the risks of overparametrization limit the number of endogenous domestic variables to six.

Shocks, identified based on sign restrictions, include four external shocks (global supply, demand, commodity, and monetary shocks) and three domestic shocks (domestic supply, demand, and monetary shocks). The external shocks are modeled as separate VARs independent of the domestic variables.³⁸ The assumption is that domestic variables do not affect the evolution of the global variables—that is, that the developing countries considered are small enough relative to the world that their actions do not affect global quantities and prices.³⁹ External factors are proxied by their U.S. counterparts.⁴⁰

Setup

The vector Y_{it} , which collects the macro variables of interest for country i at time t , evolves according to a panel VAR with common slope coefficients but individual country fixed effects α_i given the following econometric model:

$$Y_{it} = \alpha_i + \sum_{j=1}^p A_j Y_{it-j} + \sum_{b=0}^q B_b X_{t-b} + \epsilon_{it} \quad (5B.1)$$

where country $i = 1, 2, \dots, I$; time $t = 1, 2, \dots, T_i$ (thus allowing for unbalanced panel); A_j is a 6×6 matrix on lagged values for $j = 1, 2, \dots, p$; X_t is a $k \times 1$ vector with exogenous global variables; B_b is a $k \times k$ matrix capturing the impact of current ($b = 0$) and lagged ($b > 0$) exogenous variables on the variables of interest; and ϵ_{it} is a 6×1 vector of independent and identically distributed (i.i.d.) residuals with mean zero and covariance matrix Ω . Because of the relatively short span of the time series, A_j and B_b do not depend on the particular country i but capture instead generic properties for the “representative” country.

The vector of exogenous global variables X_t follows an independent VAR given by the following equation:

$$X_t = \beta + \sum_{j=1}^r C_j X_{t-j} + v_t \quad (5B.2)$$

where β is a $k \times 1$ vector of i.i.d. reduced-form shocks with covariance matrix Σ orthogonal to ϵ_{it} for all i and t .

Identification

Domestic and external shocks are not directly interpretable by tracing the impact of ϵ_{it} and v_t on the macroeconomic variables of interest, as these shocks are contemporaneously correlated and do not have any structural or economic interpretation. However, assuming those shocks are a linear combination of structural shocks and imposing sign restrictions on the impulse responses of the endogenous variables at different horizons allow a correct identification of the econometric specification (see table 5A.4).⁴¹

Empirical Implementation

Data availability, which varies by country, dictates the sample period used to estimate the panel. The period ranges from first quarter 1987 to fourth quarter 2012. Given the exogeneity of the global block of the model, equations (5B.1) and (5B.2) are estimated independently. Based on the Hannan-Quinn criterion, three lags are selected for the endogenous variables of panel VAR (1), only the contemporaneous response (no lag) is selected for the exogenous variables, and

two lags are selected for the global block in panel VAR (2). Once the parameters of the reduced-form models (1) and (2) are estimated, structural shocks are identified by imposing the sign restrictions, following Rubio-Ramírez, Waggoner, and Zha's (2010) procedure.⁴² Because all structural shocks are mutually orthogonal, it is possible to decompose the variance of the forecast errors of each variable into the portions attributable to each of the identified structural shocks. It is also possible to recover the realized history of identified shocks, domestic or foreign.

Notes

1. The Big Mac index is published by the *Economist* as an informal way of measuring the relative purchasing power of two currencies. It is obtained by dividing the price of a Big Mac in one country (in its currency) by the price of a Big Mac in another country (in its currency). This value is then compared with the actual exchange rate.
2. Various issues of the semiannual reports issued by the World Bank's Chief Economist Office for LAC (<http://go.worldbank.org/WTVI133GT0>) address the improvement in LAC's macro-financial policy management, starting with the April 2008 issue, entitled "Latin America's New Immune System: How Is it Coping with the Changing External Environment?"
3. This debate has been particularly hot in LAC. On one side are economists who emphasize the recessionary impact of fiscal frugality and argue in favor of a possible virtuous growth circle in which domestic demand (particularly public investment) induces growth and, through it, raises saving. On the other side are economists who note that past domestic demand-oriented policies in the region ended in a collapse of growth during the 1980s and to sluggish growth during the 1990s. They point out that the domestic demand-led high growth of the last decade (fueled as it was by favorable terms of trade and international liquidity conditions) is now losing steam.
4. See, for example, De la Torre and others (2010, 2012) for a discussion of the switch of external net liability positions from debt to equity across LAC.
5. In this case the government could improve the outcome only by easing the constraints faced by private agents, typically through policies aimed at enhancing the enabling environment.
6. Saying that domestic saving is immaterial to growth because foreign and domestic saving are perfect substitutes is tantamount to saying that current and capital account imbalances are immaterial to growth for the same reason.
7. The first-best approach—to internalize such externalities through Pigouvian taxes or subsidies—may not be feasible. The state may thus have to use second-best macro-oriented instruments (for example, fiscal policy, social security reforms) to directly raise the domestic saving rate. Public policy may itself contribute to the collective action failure underpinning the suboptimality of private saving. For example, social safety nets can lead to undersaving if private agents unduly rely on the state to support them in old age or unforeseen contingencies but the state fails to mobilize the fiscal saving required to uphold its promises.
8. Thus, while consumption and investment affect the exchange rate in the same way, their impact on growth is clearly different.
9. See, for example, Dornbusch (1980) and Vegh (2013).
10. Berg and Miao (2010) find some evidence in support of tradable sector externalities. However, the identification of greater positive externalities in tradables and their role in the link between real exchange rates and growth remains elusive. See, for instance, Giles and Williams (2000) and Harrison and Rodriguez-Clare (2009).
11. In a somewhat similar vein, Levy Yeyati, Sturzenegger, and Gluzmann (2013) find that countries that pursue exchange intervention policies geared at keeping or enhancing external competitiveness grow faster, although the transmission channel between the exchange rate and growth is via higher investment rather than increased exports.
12. This neglect arguably reflects the discomfort economists tend to have in viewing aggregate domestic saving as a policy-relevant variable. Indeed, in an earlier contribution (Rodrik 2000), Rodrik himself concluded that "the evidence provides no support for the view that domestic saving is the binding constraint to economic growth Policies geared towards raising domestic saving do not deserve priority."

13. In a short-run dynamic setting, the risk premium would also be expected to affect the exchange rate dynamically through the interest rate parity condition. This reverse effect is ignored in the model presented here, because in an equilibrium setting all transient dynamics are turned off. Thus the domestic interest rate is simply given by the world interest rate plus the country risk premium.
14. The ER channel dominates the IR channel when $\beta_r + \gamma_r \gamma_r > 0$ (see annex 5A).
15. Another potentially important negative growth externality of balance of payments crises is that by correlating exchange rate depreciations with downturns, they raise the risk premium on foreign-currency-denominated financial instruments in financially dollarized economies. The higher premium effectively “taxes” domestic saving, thereby inhibiting investment (particularly long-term investment such as infrastructure) and promoting capital flight (Ize 2013).
16. The dividing line between lower- and higher-income countries is per capita income of \$5,000 a year. See annex table 5A.1 for the list of LAC1 and LAC2 countries.
17. Controls include demographics, natural resources, the terms of trade, remittances, commercial and capital openness, fiscal policy, and several other factors (see a full description in annex table 5A.2). Moreover, the impact of global shocks is largely neutralized through the use of time fixed effects. These controls eliminate short-run fluctuations, thereby allowing a tighter focus on the medium-term equilibrium linkages and interactions between these variables. At the same time, by making countries comparable, they place countries (or regions) on the same map in a way that is both revealing and meaningful. Benchmarks are typical of what comparable countries do but are not necessarily optimal. Moreover, causality cannot be ascertained when the underlying elasticities are derived through simple (noninstrumented) ordinary least squares estimates.
18. To avoid mixing price and quantity effects, the benchmarks and gaps, as well as regression results from De la Torre and Ize (2015), presented throughout this chapter are based on the real ratios of aggregate demand components—consumption (hence saving), investment, and exports and imports—to GDP, with each component deflated by its own deflator. Nominal ratios to GDP underestimate (overestimate) the volume of investment, consumption, and imports in periods in which the terms of trade are rising (falling). Therefore, the national accounting data used in De la Torre and Ize (2015) essentially eliminate terms of trade–related valuation effects.
19. This procedure amounts to replacing, when calculating benchmarks, the *observed* values of the macro variables on the right-hand side of the regressions by their *equilibrium* values.
20. The real exchange rate is measured in units of foreign currency; hence a depreciation reduces its value.
21. Shifts along the regression line conform with the ER channel and fit the population as a whole. Instead, shifts away from the regression line conform with the IR channel and only fit the outlying LAC countries.
22. The fact that the low saving ER countries lie below the regression line in figure 5.11 suggests that had it not been for their low sovereign ratings (that is, the IR channel), their real exchange rates would have been much more overvalued.
23. Figure 5.16 shows a rise in LAC saving rates (rather than a decline) because it measures the impact of a positive (rather than negative) global demand shock.
24. Remarkably, low and high savers in the region exhibited very distinct saving behaviors (see figure 5.13, panel a). Although saving rates collapsed in the low-saving ER countries, they rose slightly and stabilized in the high-saving ER countries, suggesting that the high-saving ER countries managed to avoid or mitigate the (exchange rate–anchored) stabilization-induced consumption booms of the low-saving ER countries. As a result, the ER high savers avoided the large fluctuations in real exchange rates and overvaluation tendency that affected the ER low savers (see figure 5.13, panel c).
25. Most of the major LAC countries avoided an economic contraction in 2009, even as the advanced economies of the world were caught up in a great recession.
26. Chile, Colombia, Mexico, Peru, Trinidad and Tobago, and Uruguay are currently in the elite group of “investment-grade” countries.
27. LAC exchange rates did depreciate between 2012 and 2014. However, such depreciations—which under current macro and financial conditions in LAC play a helpful role in absorbing shocks and dampening the amplitude of the cyclical downturn—can be explained largely as short-term fluctuations derived from changes in the world

- environment (the U.S. Federal Reserve's expected tightening of monetary policy) and the worsening in the region's terms of trade. They are unlikely to be a durable way to avoid the spell of the ER channel.
28. In effect, the tendency for LAC to generate current account deficits—as a result of its low-saving, domestic demand-based macroeconomic structure—remained strong even in the midst of the recent commodity supercycle. The current account surpluses it generated were all too brief: already by the end of 2007 LAC taken as a whole was back in current account deficit territory.
 29. However, the key correlations are generally more significant for middle-income countries than for low- or high-income countries.
 30. Under the OLS estimates, for example, an increase of 10 percentage points of GDP in domestic saving (which would put LAC broadly on par with the middle-income countries of Southeast Asia) would raise annual per capita income growth through the ER channel by no more than about 0.2 percentage points of GDP. For the ES channel, from each dollar of additional investment, only about 9 cents would be self-financed by the induced increase in saving caused by the higher growth.
 31. Because the system is overdetermined (it has more equations than unknowns), the presence of some of the instruments in more than one structural equation can be taken into account when needed.
 32. An increase of 10 percentage points of GDP in domestic saving would boost annual per capita growth by up to 1.8 percentage points on account of the ER channel, 0.8 percentage points on account of the IR channel, and one full percentage point on account of the ES channel.
 33. Although only a range (instead of a point estimate) can be inferred for α , an additional dollar of investment would induce an increase in saving of about 40 cents at the middle of the range and 80 cents at the top of the range.
 34. The underlying market failure calling for government intervention under the ER channel (the lack of internalization of the positive learning spillovers associated with investment in and producing tradables) could in principle be addressed through investment subsidies or other promotion policies focused on specific exporting sectors. In an ideal world, such policies would boost domestic saving by raising expected returns. Experience shows, however (and the economic literature emphasizes), that investment or production subsidies targeted to specific sectors can be distortionary and wasteful, especially if the main obstacles to investment lie elsewhere (in poorly defined and deficiently enforced contract rights, for instance, or in skills constraints). In contrast, policy actions aimed at boosting aggregate saving can be more neutral and efficient. Korinek and Servén (2010) present a similar argument.
 35. Over time higher saving would facilitate countercyclical management by freeing monetary policy. It would reduce both the fear of appreciation that constrains the central bank's ability to raise the interest rate when the economy overheats and the fear of depreciation (and the associated pass-through effects) that constrains the central bank's ability to lower the interest rate when the economy goes into a slump.
 36. Admittedly, the residuals could also reflect unaccounted fundamentals rather than policy differences.
 37. Rodrik (2008) uses a similar index, albeit from a different database (the Penn World Table instead of the World Bank's World Development Indicators).
 38. This modeling follows a large body of empirical literature, including Raddatz (2007, 2008) and Canova (2005).
 39. Global variables taken into account include overall global economic activity, world short- and long-term interest rates, the cost to emerging economies of issuing debt, the level of global commodity prices, and a variable of inflation (see table 5A.3 for data definitions and sources).
 40. Tests of robustness give very similar results when considering Group of Seven aggregates.
 41. Fry and Pagan (2011) provide a critical review of structural VARs identified by sign restrictions.
 42. This approach consists of using an arbitrarily identified VAR—in this case a Cholesky decomposition of the covariance matrix of the reduced-form residuals—and randomly rotating this identification matrix until the required sign restrictions are satisfied. The random rotation is performed 1,000 times by postmultiplying the Cholesky identification matrix by an orthonormal matrix obtained by applying the QR decomposition to a random 6×6 matrix whose elements are drawn from a standard normal. Medians are reported.

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