CHAPTER 2

Benefits of More Global and Regional Financial Integration in Latin America

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After a period of endemic economic and financial crises during the 1980s to 1990s, many Latin American countries opened up their previously closed economies to international financial institutions at the turn of the millennium, aiming to attract capital, gain technical expertise, and cushion themselves against regional instability. In some extreme cases, such as Mexico and Uruguay, the financial system came to be completely dominated by global banks, with few or no domestic banks remaining. In addition, their experience with financial crises prompted most Latin American countries to implement stricter financial regulations. The strategy of importing global institutions and know-how, together with tighter regulations, appeared to have served the region well: with the exception of the Argentine and Uruguayan crises of 2001–02, none of the largest Latin American banking systems have suffered a financial crisis in the new century. Even the global financial crisis of 2008–09 caused relatively little harm, with high commodity prices fortuitously buffering exports and growth in this resource-rich region.

Nevertheless, the global financial crisis marked a turning point; in its aftermath, global banks, particularly from the United States and Europe, began retreating from Latin America and other emerging markets to their home bases and core markets, weakened by slow growth in advanced economies and encumbered by significantly tighter banking regulations. Adding to this, the end of the commodity super-cycle and the slowdown in China saw the main growth driver of the Latin American region evaporate, indicating a new reality and a need to identify alternative, noncommodity avenues for growth. Developing these new avenues would require fresh investment and deep financial markets. The retrenchment of global banks from Latin America began at a time when the countries of the region faced a need to further develop and deepen their financial systems and markets rather than see them shrink. Although this was certainly inopportune, it has perhaps created an opportune moment for Latin American countries to look to each other for potential synergies that could provide the scale and support their financial systems needs. In other words, if current circumstances preclude the possibility of advancing financial integration at the global level, the timing may now be as propitious as ever to investigate the scope for enhanced regional integration in Latin America, and to act on this.

Regional integration would not be a substitute for the goal of expanding ties with the global economy but rather a complementary subset of this broader goal. Given the current trend among global banks to continue withdrawing from Latin America and other emerging market economies, increased regional integration, to the degree economically feasible, can serve as a useful step toward further global integration in the future. If for example, as a result of regional integration, Latin American countries were to assimilate technical know-how and regulatory and operational best practices from regional leaders, this would raise financial standards across the region, leaving the countries well prepared for eventual deeper linkages with advanced economies and others.

Important initiatives are underway to promote financial integration within Latin America, and they seem to have garnered a considerable degree of political support. For example, in 2011 the Pacific Alliance countries (Chile, Colombia, Mexico, and Peru) put forward the Latin American Integrated Market (MILA) initiative, which seeks to establish a unified capital market among these countries. Progress has been limited and activity on the platform has been minimal, but this appears to be due to a lack of coordination among the Pacific Alliance countries on technical, logistical, and regulatory elements rather than to a lack of political support, which has been ample. In addition, the relatively dormant Mercosur alliance (comprising Argentina, Brazil, Paraguay, Uruguay, and Venezuela), established in 1991 with the ultimate objective of establishing a common market among its members through harmonized regulations and taxes, may have a chance at revival given the recent change of regime in Argentina.

Taking all this into account, the timing seems ripe to pursue greater regional financial integration in Latin America; failure to capitalize on this situation would represent a significant missed opportunity. This chapter examines the scope for further financial integration in Latin America, based on economic fundamentals and comparisons with other emerging market regions, and quantifies the potential macroeconomic gains that such integration could bring. The analysis focuses specifically on seven Latin American economies: Brazil, Chile, Colombia, Mexico, Panama, Peru, and Uruguay (LA-7). The chapter is structured as follows. The first section defines the concept of financial integration and describes the various indices of financial integration constructed and used in our analysis. The second section examines whether there is a deficit of global and regional integration in Latin America compared with other regions and compared with the countries' own socioeconomic fundamentals. The third section lays out the pros and cons of greater financial integration in Latin America and quantifies the potential macroeconomic gains from integration.

DEFINITION AND MEASUREMENT OF FINANCIAL INTEGRATION

This section defines the concept of financial integration and proposes a number of indicators to measure it, based on a principal component analysis. These indicators are used in the two analytical sections that follow.

Defining the Concept of Financial Integration

Financial integration is the process through which the financial markets of two or more countries or regions become more connected to each other. Financial integration can take many forms, including cross-border capital flows (for example, firms raising funds in foreign capital markets), foreign participation in domestic markets (for example, a parent bank's ability to set up a subsidiary abroad), sharing of information and practices among financial institutions, or unification of market infrastructures. Financial integration can have a regional or global dimension, depending on whether a country's financial market is more closely connected to neighboring countries or to global financial centers/institutions.

Financial integration is a multifaceted concept with no universally accepted definition. From a theoretical point of view, integration may be signaled by the convergence of the prices of assets with the same characteristics (law of one price). Perfect integration exists if similar assets have the same price even if they are traded on different markets. To work with a more tractable indicator, we define financial integration by two main criteria:

- The first criterion is the degree of *cross-border financial activity*. In this sense, the concept of integration is very close to that of financial globalization, defined as "the extent to which countries are linked through cross-border financial holdings, and proxied by the sum of countries' gross external assets and liabilities relative to GDP" (IMF 2008). According to this criterion, any barrier to exchange or market access impedes the free movement of capital and limits integration.
- The second criterion is the degree of *convergence and consolidation across markets*. Financial openness and free access are not sufficient conditions for integration. Two markets can be perfectly open to each other but still imperfectly integrated because, for example, they retain very distinct market structures.[1] In their definition of an integrated financial market, Baele and others (2004, 6) include the feature that market participants "face a single set of rules when they decide to deal with financial instruments and/or services." According to this criterion, a single (common and fully harmonized) market is the ultimate form of financial integration.

These two criteria are interconnected. The convergence of market structures facilitates and creates incentives for cross-border capital flows, while financial openness offers opportunities to import financial institutions and know-how from abroad, paving the way for greater harmonization across markets.

In practice, financial integration is always imperfect. Segmentation stems from various sources, including capital flow restrictions (some of which have a prudential purpose), technical constraints hindering cross-border flows, insufficient

[1] For instance, the discussion on financial fragmentation in the euro area (and its implications for the transmission of the European Central Bank's monetary policy) has focused at least as much on the absence of common firewalls (resolution and deposit insurance funds and supervisory mechanisms) as on the need to revive bilateral financial flows.

harmonization of financial regulations, cultural barriers, and country-specific risks that deter foreign investors.

Building Indicators of Financial Integration

Building on the foregoing definition, this chapter constructs a number of composite indicators of financial integration that combine information from various dimensions of the concept (Table 2.1).

Our *baseline* composite index combines financial openness and financial convergence. The first component is the de facto openness of the financial account measured by the sum of stocks of foreign assets and liabilities as a share of GDP. The second component is the regional dispersion of stock market returns measured by the standard deviation of returns of Morgan Stanley Capital International indices across countries of the same region (lower standard deviations would imply greater convergence). Although this indicator of regional convergence is widely used in the literature (Baele and others 2004), it presents obvious drawbacks (in particular, that differences in returns may be related to idiosyncratic risks), but the analysis is limited by data availability. To combine the two indicators, a principal component analysis (PCA) is used, in which the weights of the standardized variables are the squared factor loadings.[2]

The analysis also uses three *alternative* integration indices:

- The first alternative index replaces the traditional broad indicator of external openness (stock of external assets plus liabilities as a ratio of GDP) with the narrower external liability-to-GDP ratio. Indeed, some countries may hold large proportions of financial assets abroad, while having a low level of de facto integration. These assets, which may coexist with capital controls, could reflect past capital outflows (for example, Argentina) or large current account surpluses (for example, China). Limiting the measure of openness to include only external liabilities is one way to circumvent this problem.
- In the second alternative indicator, the first two components are identical to those used in the baseline index but a third component is added, which is the ratio of private sector credit provided by banks to GDP. There are two reasons why a measure of financial depth may enter the integration index. First, since financial integration allows savers to invest in a broader range of investment and risk-sharing instruments while enabling borrowers to tap a broader range of financing and risk management instruments at home and abroad, the concepts of integration and depth are closely related. Second, to reap the full benefits of integration and be a meaningful contributor to an integrated playing field, individual markets need to have a certain size. Thus, the depth criterion excludes markets that are too small, even if they meet the other two criteria.

[2] The objective of the PCA is to reduce the number of variables of interest into a single factor, which captures most of their variances (for the indices constructed in this exercise, the first component explains more than 50 percent of the total variance).

TABLE 2.1

Principal Components for Financial Integration (FI) Indicators

	FI: baseline	FI: alternate 1	FI: alternate 2	FI: alternate 3.1	FI: alternate 3.2	FI: alternate 3.3	FI: alternate 3.4
Measures of global financial openness							
Stock of external assets plus liabilities vis-à-vis the rest of the world, ratio to GDP	✓		✓	✓	✓	✓	
Stock of external liabilities vis-à-vis the rest of the world, ratio to GDP		✓					✓
Measures of regional convergence							
Eight-region world: Standard deviation of equity returns among countries of the same region[1]	✓	✓	✓	✓		✓	✓
Four-region world: Standard deviation of equity returns among countries of the same region[2]					✓		
Financial system depth							
Banking system credit to the private sector, ratio to GDP			✓				
Measures of regional financial openness							
Eight-region world: Stock of external assets plus liabilities vis-à-vis countries of the same region, (eight regions) share of total external position[1]				✓			
Four-region world: Stock of external assets plus liabilities vis-à-vis countries of the same region, (four regions) share of total external position[2]					✓		
Proximity based: weighted average distance vis-à-vis all other countries of the world: weighted by reporting country's share of external assets plus liabilities to each partner[3]						✓	
Proximity based: weighted average distance vis-à-vis all other countries of the world, weighted by reporting country's share of external liabilities to each partner[3]							✓

Source: IMF staff compilation.

[1] Divides the world into one "region" of advanced economies and seven emerging market regions: Africa, Asia, Europe, Latin America, Middle East and North Africa, Commonwealth of Independent States, and other small states.

[2] Captures the integration of both emerging market and advanced economies within one of four large geographic regions: Asia, Europe, the Western Hemisphere, and other countries.

[3] Observes the degree to which international financial partner countries are geographically close or distant. First, distances between country pairs are normalized as one minus the distance divided by the global maximum such that near countries are scored close to 1 and far countries are scored close to zero. Distances are normalized by dividing all distances by the maximum distance between any two countries. Next, normalized distances are weighted by the reporting country's share of either external assets + external liabilities or just the external liabilities vis-à-vis each of its partners.

- The third alternative index provides a better picture of regional integration by including a measure of relative regional openness (ratio of regional assets and liabilities to total foreign assets and liabilities of a given country) alongside global financial openness and regional convergence. The theory is that countries are regionally integrated in a meaningful way when they fulfill three conditions: they have to (1) be open globally, (2) be relatively more open to their neighbors, and (3) present signs of financial convergence. We include global openness (defined in absolute terms) in addition to the regional openness measure (defined in relative terms) to ensure that the concept of regional integration is meaningful and captures both the scale and the direction of financial flows. For example, a country could be a closed economy with the exception of small linkages with one neighbor. If we did not include the global openness measure, this country would appear to be highly regionally integrated despite the fact that it is a de facto closed economy.

Several variants of the relative regional openness concept are developed, as defining regions can be challenging. The first variant is an eight-region world (advanced economies, Africa, Asia, emerging Europe, Latin America and the Caribbean, the Middle East and North Africa, the Commonwealth of Independent States, and other small states), based on IMF *World Economic Outlook* classifications, which emphasize regionalism among emerging market/developing economies. The second approach consolidates the world into just four regions (Asia, Europe, the Western Hemisphere, and the rest of the world) and captures the observed behavior that emerging market/developing countries tend to integrate with nearby advanced economies (for instance, Mexico with the United States or eastern with western Europe). The third variant replaces predetermined regions with distance-based weights whose values rise when countries are geographically close. Bilateral financial positions (using external assets and liabilities) are then weighted with this distance, so that the regional openness indicator increases continuously when countries are more financially open to geographically close partners. Finally, the fourth variant uses the same methodology as the third, but focuses solely on external liabilities.

IS THERE A DEFICIT OF FINANCIAL INTEGRATION IN LATIN AMERICA?

This section assesses the dearth of global and regional integration in Latin America, based on a descriptive comparison to other regions and an econometric analysis to estimate an integration gap relative to what would be predicted by countries' (or regions') own macroeconomic fundamentals.

How Does Integration in Latin America Compare with That in Other Regions?

By the turn of the century, most countries in Latin America had embarked on a process of financial liberalization. This process has been characterized by a

reduction of impediments to cross-border financial transactions, increased participation of foreign banks in the local banking systems, and greater cross-border capital market activity. Today most Latin American countries have fewer de jure restrictions on capital flows than Asian economies do (Galindo, Izquierdo, and Rojas-Suárez 2010).

However, de facto integration of Latin America with the rest of the world remains low. To assess the degree of financial integration, Figures 2.1 and 2.2 use three measures of cross-border capital flows:[3]

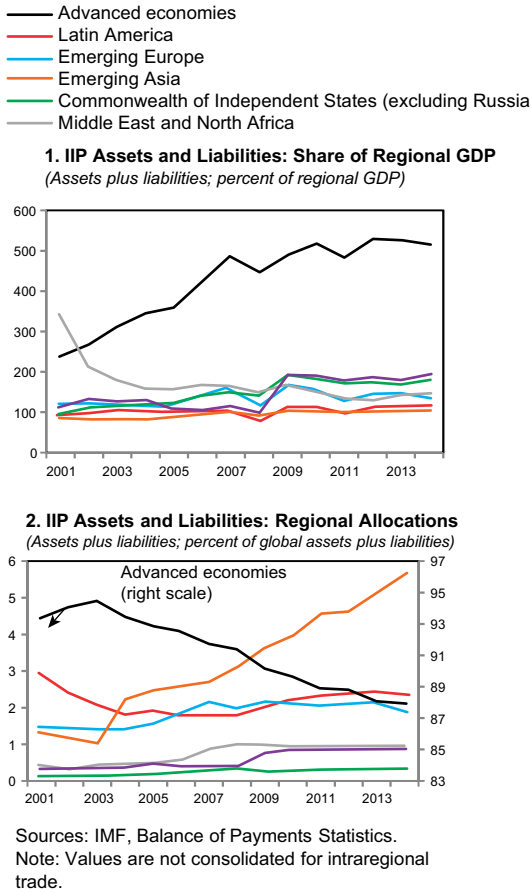
- The first, and most common, is international investment positions (IIPs), presented here as the sum of foreign asset and liability stocks outstanding. Although the dollar value of international assets and liabilities among all Latin American countries has grown over the past decade, the region has not increased its international exposure (foreign assets plus liabilities in percent of regional GDP). Nor has the region's relative importance as a partner in international finance improved, unlike the allocation of international financial positions vis-à-vis emerging Asia, which doubled between 2004 and 2013 (Figure 2.1).
- The second measure looks at cross-border claims held by Bank for International Settlements (BIS)-reporting banks. These data include not only traditional loans (across borders) but also portfolio equity and debt holdings of BIS-reporting banks. Here again, the broad group of all Latin American countries has garnered a relatively low 3 percent to 5 percent of BIS claims over the past 10 years (Figure 2.2, panel 1).
- The third indicator uses the data sets of bilateral portfolio and foreign direct investment (FDI) stocks outstanding reported in the IMF's Coordinated Portfolio Investment Survey and Coordinated Direct Investment Survey.[4] Although technically these are components of the IIP data, their bilateral nature permits investigation of regional integration. This indicator reiterates the relatively low (and potentially declining) participation of the Latin American region while highlighting the importance of FDI flows relative to portfolio investments (Figure 2.2, panel 2).

Intraregional integration in Latin America also seems less advanced than in other emerging market regions. Figure 2.3 shows that there is greater intraregional investment, through FDI and portfolio flows, among the Association of Southeast Asian Nations countries, reflecting both the fruits of long trade and financial negotiations and the important presence of a large, diversified trade and financial center (Singapore). Regarding the evolution of regional integration over time, the available indicators of financial regionalism show different trends, depending on how it is measured. For portfolio assets, there is an apparent diversification

[3] In principle, the best measures of financial integration should be price-based. However, in light of the difficulty of adequately identifying homogeneous assets across countries, this section relies on quantity-based indicators.

[4] Data available at http://cdis.imf.org and http://cpis.imf.org.

Figure 2.1 Global Financial Integration in Latin America and the Caribbean: International Investment Positions (IIPs)



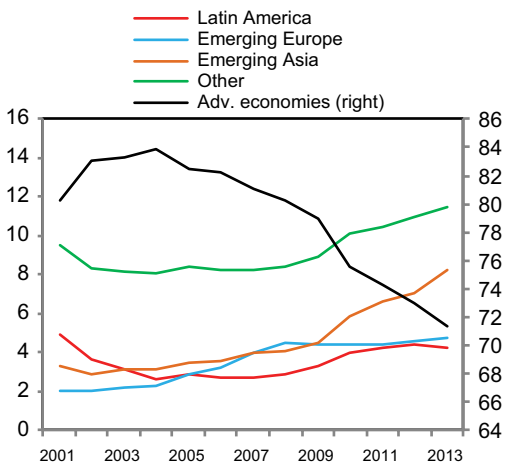
Sources: IMF, Balance of Payments Statistics.
Note: Values are not consolidated for intraregional trade.

away from regional assets in Latin America, as the intraregional share has fallen from over 10 percent to under 5 percent since 2008 (Figure 2.4, panel 1). The data for FDI, available only since 2009, suggest a declining trend (Figure 2.4, panel 2). However, indicators of cross-border bank lending do point to some momentum in Latin America. Table 2.2 highlights the expanding positions that Latin BIS-reporting banks are taking in neighboring countries.[5] Since 2005, the share of claims on other LA-7 countries has risen most dramatically in Chile and Brazil.

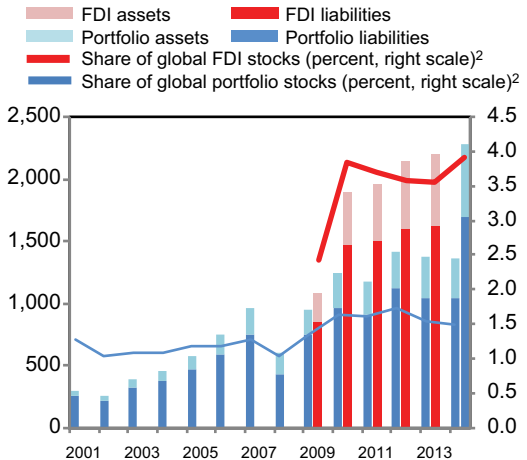
[5] BIS bank lending data are available for only four Latin American countries.

Figure 2.2 Global Financial Integration in Latin America and the Caribbean (LAC): International Bank Claims, Portfolio, and Foreign Direct Investment

1. Consolidated International BIS Bank Claims on Selected Regions[1]
(Percent of total consolidated BIS international claims)

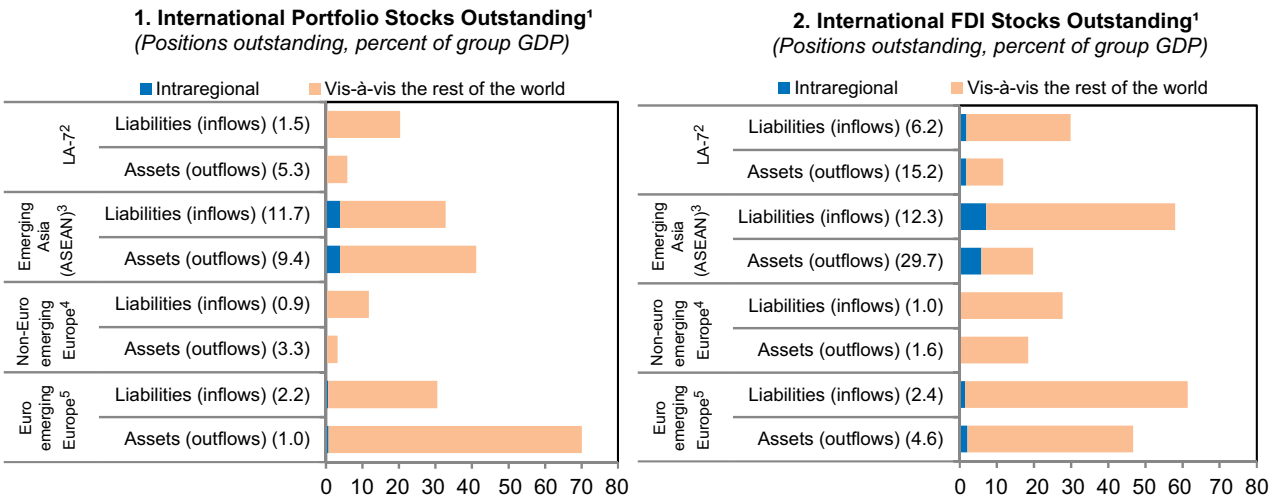


2. LAC: Portfolio and FDI Stocks Outstanding[2]
(Billions of U.S. dollars)



Sources: Bank for International Settlements, Consolidated Banking Statistics; IMF, Balance of Payments Statistics; Coordinated Portfolio Investment Survey and Coordinated Direct Investment Survey.
Note: Values are not consolidated for intraregional trade. BIS = Bank for International Settlements; FDI = foreign direct investment.
[1] BIS bank lending, immediate borrower basis. Foreign claims include cross-border lending, holdings of debt and equity securities, and local currency lending to residents.
[2] Aggregate assets plus liabilities of Latin America, in percent of aggregate assets plus liabilities of all reporting countries.

Figure 2.3 Intraregional Component of Global Integration: Portfolio and Foreign Direct Investments, 2014



Sources: IMF, Coordinated Portfolio Investment Survey and Coordinated Direct Investment Survey.

[1] Numbers in parentheses report the share of intraregional assets or liabilities in total assets or liabilities of the region.

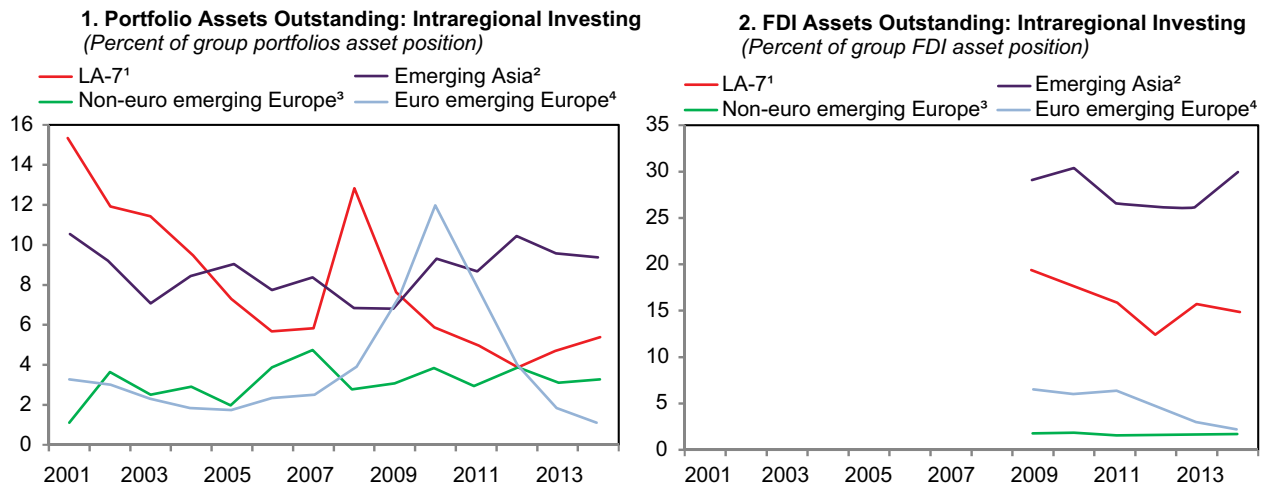
[2] LA-7 Includes Brazil, Chile, Colombia, Mexico, Panama, Peru, and Uruguay.

[3] Emerging Asia includes Brunei, Cambodia, Indonesia, Lao P.D.R., Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. ASEAN = the Association of Southeast Asian Nations.

[4] Non-euro emerging Europe includes Bulgaria, Hungary, Poland, Romania, and Russia.

[5] Euro emerging Europe includes Cyprus, Estonia, Greece, Latvia, Malta, Slovak Republic, and Slovenia.

Figure 2.4. Evolution of Intraregional Integration
(Stocks outstanding, percent of group GDP)



Source: IMF, Coordinated Direct Investment Survey.
[1] LA-7 Includes Brazil, Chile, Colombia, Mexico, Panama, Peru, and Uruguay.
[2] Emerging Asia includes Brunei, Cambodia, Indonesia, Lao P.D.R., Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam.
[3] Non-euro emerging Europe includes Bulgaria, Hungary, Poland, Romania, and Russia.
[4] Euro emerging Europe includes Cyprus, Estonia, Greece, Latvia, Malta, Slovak Republic, and Slovenia.

TABLE 2.2

Consolidated Foreign Claims on the World by BIS-Reporting Banks in Four Latin American Countries *(Percent of GDP)*

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Brazil	3.3	2.7	3.1	2.5	3.2	3.7	3.4	4.1	5.0
of which: claims on other LA-7	*0.0*	*0.1*	*0.1*	*0.1*	*0.4*	*0.5*	*0.5*	*0.7*	*0.8*
Chile	2.4	2.1	2.1	1.7	1.9	1.9	2.6	5.2	4.8
of which: claims on other LA-7	*0.6*	*0.4*	*0.5*	*0.6*	*0.7*	*0.6*	*0.7*	*2.9*	*2.3*
Mexico	0.6	0.5	0.6	0.7	0.9	0.6	0.4	0.4	0.5
of which: claims on other LA-7	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Panama	66.2	48.1	51.7	48.3	47.0	44.5	44.9	42.0	42.7
of which: claims on other LA-7	*11.7*	*12.5*	*14.0*	*10.9*	*10.8*	*12.0*	*12.4*	*10.6*	*11.6*

Source: Bank for International Settlements, Consolidated Banking Statistics.

Cross-border mergers and acquisitions provide anecdotal evidence of global fragmentation and increased regional integration after the global financial crisis. Although the trend in Latin America seems less pronounced than in emerging Europe or emerging Asia, several global banks have withdrawn from Latin America since the global financial crisis to refocus on their core markets and activities, and regional or domestic banks have taken over their activities. For example, in 2015 Grupo Financiero Inbursa of Mexico purchased the banking operations of Standard Chartered in Brazil, and in 2012 Corpbanca (Chile) acquired Santander's banks in Colombia. LA-7 institutions are also seizing the opportunity to expand into Central America: Grupo Aval, the largest conglomerate in Colombia, acquired BBVA activities in Panama, and the Ficohsa group of Panama purchased Citibank's operations in Honduras and Nicaragua. Nonbank financial institutions have also been subject to advanced country divestitures. One of the largest moves was the BBVA sale of its pension fund management firms in Chile, Colombia, Mexico, and Peru to regional and local buyers.

Another dimension of regional integration is the MILA initiative that began in 2011. Unlike the Pacific Alliance, whose agenda for integration is set by the political leadership of the member countries (Chile, Colombia, Mexico, and Peru), MILA is a private sector initiative of the four Pacific Alliance stock exchanges and custodians/depositories, which seek to mutually increase trading volumes by facilitating cross-border trading. Early accomplishments include the cross-listing of share prices on all exchanges and the full cross-listing of initial public offers.[6] Furthering integration will require agreement on facilities for

[6] Share prices on the secondary market are quoted for all firms listed on all MILA exchanges in the currency of the home exchange, but this is not considered full cross-listing, as cross-border trades are conducted via correspondent brokers and settlement is often conducted via the back offices. An intermediary achievement in the pursuit of full integration is the treatment of initial public offerings, which are simultaneously and fully listed on all exchanges and so do not require correspondent brokers for trading.

direct trading across exchanges, payment and settlement facilities to mitigate counterparty risks, and broadening of securities to include fixed-income instruments. Beyond the MILA framework, regional exchanges are also integrating through ownership agreements. In 2009 the Bolsa Mexicana purchased an ownership stake in Bolsa de Lima, and in 2015 BM&F Bovespa bought into the Santiago Exchange. Through cross-ownership relationships, exchanges can explore synergies in trading platforms, settlement, and cross-listing.

Measuring the Extent of Financial Integration of Latin American Countries

The measurement of financial integration can be refined further. Simple cross-country comparisons may paint a distorted picture of the degree of integration of Latin American markets relative to other regions, for instance, because countries that are less advanced economically often have shallower financial markets. This section attempts to quantify the extent to which Latin American markets are underintegrated *given their economic fundamentals* by controlling for factors such as the level of economic development (proxied by GDP per capita in purchasing power parity dollars), trade openness (exports plus imports divided by GDP), countries' past history of financial crises (as compiled by Reinhart and Rogoff[7]), the public-debt-to-GDP ratio (which, as a stock variable, cannot be easily modified by the government), and the quality of the institutional framework (measured by the investment profile subcomponent of the PRS Group's International Country Risk Guide Index[8]). Variables that are more directly and immediately affected by economic policy—such as the extent of capital controls—are not included, as the purpose of our econometric analysis is not to provide the best fit for the data but to control for exogenous factors.

The models relate financial integration to a set of control variables. In each specification, a measure of financial integration is regressed (either the baseline or to the alternative composite indices of financial integration presented earlier or their subcomponents) on its macroeconomic determinants and fixed effects. The degree of under- or overintegration is then calculated as the difference between the estimated country (or region) fixed effect and the sample average of all country (or region) fixed effects. Because the purpose of the regressions is to filter out the effect of certain fundamentals and not to interpret a causal model, the endogeneity problem inherent in this type of analysis is less of a concern. The following equation is estimated over a sample of 67 countries between the mid-1980s and 2014:

$$FI_{it} = \beta.X_{it} + \alpha_i + \varepsilon_{it}$$

where FI_{it} denotes the financial integration indicator, X_{it} is a vector of control variables, and α_i are the country fixed effects.

[7] Data available at http://www.reinhartandrogoff.com/data.
[8] Data available at http://www.prsgroup.com/about-us/our-two-methodologies/icrg.

The econometric results (shown in Annex Tables 2.1 to 2.5) confirm that the LA-7 countries are underintegrated as a whole, although there are important differences between countries and across the various dimensions of financial integration. In each model, the sign of the control variables is consistent with prior results. The main result is that although the LA-7 countries do not appear underintegrated from the perspective of international cross-border capital flows, once broader measures of integration are used through the composite integration indices, these countries *do* appear to be underintegrated on the whole, even after controlling for fundamentals. The extent of integration varies across the LA-7, with Panama appearing more integrated than the rest in most specifications, likely owing to its sizable offshore financial sector and its role as a regional hub for Central American countries.

- Annex Table 2.1 shows the outcomes of various models explaining the degree of global financial openness (measured either as the ratio of gross external assets and liabilities to GDP or as the liability ratio, both in logarithm). The results of Annex Table 2.1 suggest that LA-7 countries are relatively well integrated from an openness perspective compared with the sample average, but this result is partly driven by Panama and Chile, which show a greater degree of openness than the other countries.
- Annex Table 2.2 presents the results using the baseline consolidated index of financial integration described earlier. After combining the dimensions of financial openness and financial convergence, it appears that the LA-7 countries are indeed underintegrated, with the exception of Panama, which shows a level of integration in line with the sample average after controlling for fundamentals. This result suggests that the relatively high degree of global openness of countries such as Chile and Peru is more than offset by the lack of regional convergence exhibited by their financial markets.
- Results using the first alternative consolidated index of financial integration, which combines the ratio of convergence and external liabilities to GDP as a measure of openness, are shown in Annex Table 2.3. The results using this narrower measure of openness (which helps preclude cases in which large external assets do not correspond to integration) corroborate the findings of the baseline index. With the exception of Panama, LA-7 countries show a degree of underintegration virtually identical to the baseline results presented in Annex Table 2.2. In this case, Panama stands out as the one LA-7 country whose level of integration is above the sample average.
- Annex Table 2.4 presents the findings using the second alternative consolidated index of integration, incorporating three components: openness, convergence, and depth. The results support the outcomes shown in Annex Tables 2.2 and 2.3, confirming that even with the added dimension of depth, the LA-7 countries—excluding Panama—are underintegrated relative to the sample average, after controlling for fundamentals. An interesting nuance of these results is that after adding depth, the integration outcomes for the LA-7 worsened relative to the two-component indices, with

the exception of Panama and Chile. Panama's result was not only above the sample average but significantly stronger than its outcomes using the two-component indices of integration. Regarding Chile, although the integration outcome was still negative (indicating underintegration), the magnitude of underintegration was halved relative to previous results, suggesting a relatively deep market. Combined with Chile's positive result in the openness models presented in Annex Table 2.1, one could conjecture that Chile's underintegration comes largely from a lack of convergence with the region rather than a lack of global openness or financial depth. For the remaining five LA-7 countries, only the results shown in Table 2.1—gauging global openness—were positive, putting the onus of their underintegration on the lack of regional convergence and depth of their financial markets.

- Annex Table 2.5 displays the findings of the third alternative consolidated index of integration, which includes a measure for relative regional openness in addition to the measure for global financial openness and regional convergence. The results including the regional measure stand out from the previous findings in that all LA-7 countries, including Panama, exhibit underintegration relative to the sample average. That said, Panama still shows the lowest degree of underintegration among the LA-7 countries. This may suggest that Panama's high degree of financial integration, demonstrated in the other findings, largely reflects extra- rather than intraregional integration. Another interesting finding that emerges using this index is that Brazil, Colombia, Peru, and Uruguay are less underintegrated relative to the sample than Chile and Mexico. Mexico's result may reflect its higher degree of integration with the United States (which is not included in the same regional grouping as Mexico for this exercise) compared with its integration with the region. In the case of Chile, which showed a relatively high degree of openness and depth compared to other LA-7 countries in the previous indices, the results confirm our theory that the interconnections of its relatively deep financial markets principally stem from outside the region rather than within.

BENEFITS OF FURTHER INTEGRATION IN LATIN AMERICA

This section describes the benefits of greater financial integration and provides a quantitative estimate of these benefits on growth using econometric analysis.

The Pros and Cons of Greater Financial Integration

By expanding possible financing options and vehicles for saving in a country, *global financial integration* can enhance financial development, which in turn has been linked to higher economic growth (Sahay and others 2015). There are at least three key channels of transmission to growth. First, integration may stimulate capital accumulation through financial deepening in the host country. If

capital is brought from outside, competition among financial institutions can be enhanced, particularly when the domestic financial sector contains few institutions and maintains high spreads between borrowing and lending rates, and economies of scale can be exploited by pooling larger amounts of savings. The monetary transmission mechanism can also be enhanced if the banking sector becomes more competitive. All these factors are likely to lower borrowing costs and stimulate investment. Second, better resource allocation and importation of technology and knowledge may create opportunities for efficiency gains and boost productivity, which is another source of growth. Third, financial integration can promote growth indirectly by exposing policy decisions and corporate actions to greater financial market scrutiny.

In addition to raising the growth trend, financial integration may foster economic resilience and reduce volatility around the trend. Output volatility can be mitigated through two main factors. First, financial integration is likely to increase the depth of financial markets, leading to greater market liquidity: possibilities to buy and sell securities will increase with the emergence of new players and new instruments. Second, financial integration offers new opportunities for risk-sharing and intertemporal consumption smoothing through the diversification of portfolios across asset classes, sectors, and countries. Overall, this stabilization effect should be particularly beneficial in Latin American countries, where production bases are concentrated and there is a heavy dependence on agricultural activities or the extraction of natural resources (IMF 2015b).[9]

On top of these overarching advantages of integration, *regional financial integration* can bring a number of additional benefits for both the home and host countries:

- Cross-border financial activity (bank and nonbank) both follows and can be followed by cross-border trade and thus could help foster wider regional economic integration. A larger common market creates new growth opportunities, which may be influential in Latin America in a context of lower commodity prices and tighter global financial conditions.
- Regional banks (robustly supervised with sufficient high-quality capital to support their cross-border operations) and regional markets may have a better understanding than global institutions of the needs of the region. They may be able to provide expertise particularly suited to the host country, such as in the area of improving financial inclusion. The homogeneous importance of commodity exports across the region is also fertile ground for transplanting expertise in trade and industrial credit.
- At the regional level, capital market integration creates scope for economies of scale, especially when individual markets are relatively small. In many Latin American countries, the small size of national markets (in some cases owing partly to domestic regulatory factors) constrains financial sector

[9] It should be noted that the scope for mutual benefits from regional risk-sharing may be limited by the synchronization of economic cycles in commodity-exporting countries.

growth and efficiency, contributing to higher costs, a narrower range of financial products, and the exclusion of many from formal financial services. Addressing regulatory limitations and facilitating regional integration could help loosen these constraints by allowing governments, financial intermediaries, and corporations to access a regional market with greater depth and liquidity. In addition, larger inflows of foreign capital to the region may follow, as a larger and more liquid regional market may be more attractive to international investors.

- Regional banks can fill the hole left by retrenching global banks. Since the global financial crisis, financial pressures and increased regulatory oversight have led some global institutions to reduce their cross-border activities and pull back into their core markets (IMF 2015a). Responding to the withdrawal of these banks, intraregional acquisition activity has been growing rapidly in a number of emerging markets, particularly in Asia and emerging Europe (BIS 2014). This trend has so far been less pronounced in much of Latin America, where it has been more common for domestic institutions to absorb the assets of departing global banks. Regional integration could help avoid increased consolidation of domestic financial sector activity and mitigate a possible credit squeeze if North American and Spanish banks were to continue reducing their presence in the region. Although this strategy could lead to the emergence of large regional banks and bring the risk of concentration at a regional level, it would nonetheless foster greater competition and diversification of risks within domestic markets.
- Regional integration can also alleviate the pressure on domestic markets arising from the significant growth of the nonbank financial sector (particularly pension funds) in Latin American countries in recent years. Current regulations governing pension fund investments in Latin American countries compel the funds to invest the vast majority of their portfolios in domestic assets. Given the relatively small size of many Latin American financial markets, the investment options available to these pension funds are severely limited, and most end up overweighted in domestic government securities. Although the motivation behind these investment restrictions is the preservation of savings and financial stability, the development of domestic financial markets in most Latin American countries has not kept up with the growth of their pension funds, and the restrictions may paradoxically lead to the creation of bubbles and instability. If regional integration—through the harmonization of regulations and more coordinated supervision—were to widen pension funds' permissible investment options to include other countries in the region, this could be a solution.
- Almost all Latin American countries currently face the urgent need to improve their physical infrastructure. However, upgrades to logistics and transport infrastructure typically require sizable investments, necessitating deep and well-developed financial markets. While pension funds in some Latin American countries have invested in domestic infrastructure projects,

the caps on their permissible investments in such projects are dwarfed by the size of the projects. Thus, given the absence of deep domestic markets, the need for economies of scale is yet another reason to carefully assess the possibility of advancing regional financial integration in Latin America. Investment vehicles could then be established at a regional level to pool resources for infrastructure projects around the region.

Financial integration has its fair share of critics, and the aforementioned advantages of global and regional integration are not assured unless accompanying measures are in place, particularly enhanced supervision. Cross-border financial activity also brings risks, including adverse spillovers if there is insufficient official capacity to exercise necessary oversight. Critics of financial integration point to financial crises following capital account liberalizations in Mexico (1994), east Asia (1997), and Russia (1998). In fact, efforts to identify empirically positive results from financial integration often struggle to generalize results and must narrow the findings to selected forms of integration (FDI and equity are statistically favored over debt instruments) or acknowledge necessary preconditions such as high levels of economic development, institutional quality, or financial development. Greater integration could also render countries' macroprudential policies less effective and easier to circumvent through cross-border leakages and provision of credit (IMF 2014).

One particular concern is that increased cross-border banking sector integration may adversely affect financial stability through the transmission of international shocks. Giannetti and Laeven (2012) and Jeon, Olivero, and Wu (2013) describe how stresses in the home country of parent banks widen the funding spreads in subsidiary and branch markets and even pit operations in different emerging market countries against each other for liquidity from parent banks.[10] Degryse and others (2009) find that foreign banks tend to reinforce credit segmentation whether they enter via greenfield investment and target the most transparent and creditworthy borrowers or via merger/acquisition, in which case the composition of loan portfolio credit quality changes little. Furthermore, evidence of financial integration and foreign bank presence leading to enhanced financial inclusion and depth is mixed: several studies—including Detragiache, Gupta, and Tressel (2008) and Claessens and van Horen (2014)—associate the prominence of foreign banks with lower credit-to-GDP ratios in developing countries.

Nonetheless, proponents of integration maintain that although integration brings both costs and benefits, the latter outweigh the former, particularly when preconditions for successful integration, such as consolidated supervision and enhanced cross-border information sharing, are in place. For example, Rancière, Tornell, and Westermann (2006, 2008) show that the direct effects of financial

[10] Dependence on local funding and lending in local currency, as is common in Latin America, can insulate domestic credit by subsidiaries from crises in the home countries of parent banks (Kamil and Rai 2010).

liberalization on growth outweigh the negative indirect effect of higher propensity to crises. In their analysis of the costs and benefits of financial globalization, Kose and others (2006, 1) also recognize the existence of conflicting results but conclude that the empirical literature "lends some qualified support to the view that developing countries can benefit from financial globalization, but with many nuances. On the other hand, there is little systematic evidence to support widely-cited claims that financial globalization by itself leads to deeper and more costly developing country growth crises."

How Large Could the Potential Macroeconomic Gains from Greater Financial Integration in Latin America Be?

To quantify the benefits of further integration in Latin America, a model relating financial integration to economic growth is estimated. The specification, which follows Beck and Levine (2004) and Sahay and others (2015), includes the standard control variables of growth equations: initial income per capita, trade openness, inflation, government expenditure-to-GDP ratio, investment-to-GDP ratio, population growth, and several measures of institutional framework quality (proxied by the International Country Risk Guide [ICRG] indicators of country risk). The sample is similar to the one used earlier and includes 76 countries between the mid-1980s and 2014.

In light of the endogeneity of the integration variable with respect to growth, the baseline model uses an instrumental variable (IV) panel estimator with the following instruments: the first lag of the integration variable; the capital controls indicator by Fernández and others (2015); the occurrence of a banking crisis 10 years earlier; and a subcomponent of the ICRG political risk index, which describes the extent to which profits can be transferred or repatriated out of a country. All the instruments are assumed to impact integration directly but affect growth indirectly. Admittedly, it is very difficult to find fully exogenous instruments in a macroeconomic setting. This chapter assumes that the institutional framework (capital controls, profit repatriation rules) is exogenous with respect to growth, which may be justified by the fact that these variables are slow-moving.

The estimated equation is therefore:

$$y_{it} = \alpha_i + \beta_1 \times FI_{it} + \beta_2 . X_{it} + \varepsilon_{it}$$

where y_{it} denotes GDP growth, FI_{it} the financial integration indicator defined earlier, X_{it} the control variables, and α_i the fixed effect. Time dummies are also included in some specifications.

After correcting for endogeneity, financial integration—proxied by the baseline index of Table 2.1—is found to be positively correlated with growth. In models without this correction, integration is either statistically insignificant or negatively correlated to growth. With the IV correction, the elasticity is clearly positive, regardless of the number of control variables (shown in Annex Table 2.6, columns 1–3), whether the equation is saturated with time dummies (column 4), or whether real growth or real growth per capita is used as a dependent variable

(column 5). Results are also robust to removing the banking crisis instrument, the inclusion of which presents the disadvantage of reducing the sample size, as the variable denotes the existence of a crisis 10 years earlier and is not available for some countries (column 6). The results of a dynamic model estimated by the Arellano–Bond generalized method of moments (GMM—see Bond, Hoeffler, and Temple 2001), with lagged GDP growth as the explanatory variable, are also presented, and the financial integration variable coefficient is broadly unchanged (column 7).[11]

Another potential issue is that the lagged GDP-per-capita level is generally endogenous in growth equations (Bond, Hoeffler, and Temple 2001). To circumvent this problem, an equation is presented that excludes the variable and finds that the integration coefficient is broadly unchanged (column 8). The endogeneity of both the integration variable and the lagged GDP level are corrected by rewriting the growth regression as a dynamic model in levels[12] and estimating it with the first-differenced Arellano–Bond GMM estimator; alongside the lagged (first-differenced) variables, the additional instruments mentioned above (capital controls indicator, occurrence of a banking crisis 10 years earlier, and profit repatriation rule) are included. The effect of financial integration is again positive and significant (column 9), but the regression suffers from the traditional GMM shortcomings, including a high sensitivity to the number of lags used for the instruments. Finally, the possibility of nonlinear relationships was accounted for through interaction terms and a quadratic form of the integration indicator. However, the nonlinear models did not produce robust results.

Annex Table 2.7 shows the results of specifications with the alternative measures of integration. The following indicators (described earlier and in Table 2.1) are used: a two-component index with the ratio of external liabilities to GDP (column 1); a three-component index that adds a measure of financial depth (column 2); and variants of the three-component index including regional openness (columns 3–6). Column 3 measures regional integration as the ratio of a country's regional assets and liabilities to total foreign assets and liabilities in an eight-region framework. Column 4 replicates the indicator with a four-region split. Column 5 measures regional integration by weighting the sum of assets and liabilities with the distance between countries. Column 6 measures regional integration by weighting liabilities with the distance between countries. In all these specifications, the effect of financial integration remains positive and significant.

As a last sensitivity exercise, we conduct regressions with simpler measures of financial integration. The last three columns show that simple financial openness ratios are positively related to growth. Column 7 reports the results of a regression

[11] In this case, the elasticity of the financial integration variable cannot be directly compared with the other specifications because of the lagged dependent variable term. This coefficient should first be multiplied by 1 over 1 minus the coefficient of the lagged GDP growth to get the long-term elasticity.

[12] See Bond, Hoeffler, and Temple (2001), equation 16. By rewriting a growth model as a dynamic model in level (with the GDP level on the left-hand side), the control variable on the right-hand side becomes the lagged level of GDP rather than the lagged level of GDP per capita.

with global openness measured as financial assets plus financial liabilities in percent of GDP. Columns 8 and 9 replicate the results with regional openness indicators—defined in a similar way (ratio of regional assets plus regional liabilities to GDP), with an eight- or four-region split.

Overall, financial integration and economic performance are found to be positively correlated. The various specifications return elasticities of 0.01–0.02 for the regional integration variable. Using the measure of underintegration calculated earlier, it is possible to estimate the effect of closing the integration gap in the LA-7 countries. Specifically, combining the two steps, the analysis predicts a growth effect in the range of 1/4 to 3/4 percentage point on average if the gap is fully closed.[13] (The growth dividend would be lower if progress is partial.) These results should be treated with caution, as most variables in growth regressions are endogenous, creating potential estimation biases that IV and GMM estimators cannot always correct.

CONCLUSION

There has seldom been a better moment to advance regional financial integration in Latin America. The aftermath of the global financial crisis has brought significantly tighter banking regulations and a trend of de-risking. Consequently, global banks have been withdrawing from Latin America and other emerging markets to return home. At the same time, the commodity boom is over, and with slower growth foreseen in China over the medium term, Latin America's commodity producers will face hard times unless they are able to establish alternative avenues of growth. These avenues would require investment and deep capital markets. This is not a juncture at which Latin American countries can comfortably afford to see their financial markets contract. Enhanced financial integration within the region provides one possible solution. Providentially, initiatives to promote regional financial integration, such as the Pacific Alliance and MILA, are currently enjoying political support.

The analysis in this chapter finds strong evidence of financial underintegration in the LA-7, from both a descriptive and an econometric perspective. Moreover, this integration gap applies to both global and regional financial integration. Other emerging market regions, such as east Asia and eastern Europe, seem to be more integrated with each other and with the outside world compared with our Latin American sample. Furthermore, the LA-7 countries appear to be underintegrated given their own macro- and socioeconomic fundamentals. Latin America would benefit greatly from reducing this degree of financial underintegration. Our econometric results suggest that the positive impact on growth of closing the integration gap could be 1/4 to 3/4 percentage point, on average. Of course, given the traditional challenges involved in estimating causal effects with

[13] In the first step, the difference between the country fixed effect and the sample average is used to estimate the degree of underintegration. In the fixed effect models, this gap averages 0.3–0.4 in LA-7 countries. With an elasticity of 0.01–0.02, the growth effect is therefore 0.3–0.8 percentage points.

macroeconomic data, our results, although robust to alternative specifications, should be treated with caution.

To move the baton of enhanced regional financial integration forward and realize the macroeconomic benefits, the following chapters suggest a number of concrete steps that could be taken by the Latin American countries in question. While there has been considerable political traction for projects such as MILA, to get the process effectively rolling would require the logistical and economic nuts and bolts to be firmly in place. In particular, the countries would need to harmonize their accounting, regulatory practices, and taxation schemes, and establish coordinated and consolidated supervision, enhanced cross-border information sharing, and macroprudential policies. All this would require substantial investment, but without it the risks of integration could outweigh the benefits by undermining the resilience of financial systems. The case for enhanced regional financial integration in Latin America is clear. If all stakeholders are brought on board and the requisite regulatory and supervisory innovations instituted, success is well within grasp.

ANNEX 2.1. ECONOMETRIC RESULTS

ANNEX TABLE 2.1

Financial Market Integration: Financial Openness					
	Stock of Gross External Assets + Liabilities/GDP			Stock of Gross External Liabilities/GDP	
	OLS (1)[1]	OLS (2)[1]	FE[2]	OLS[1]	FE[2]
Log of GDP per capita	0.31***	0.43***	0.62***	0.25***	0.54***
Purchasing power parity	*8.44*	*8.20*	*3.85*	*4.94*	*3.69*
Government debt/GDP		0.37***	0.48***	0.34***	0.52***
		5.20	*6.28*	*4.40*	*6.85*
Trade openness		0.66***	0.43***	0.68***	0.43***
		6.53	*2.86*	*6.30*	*2.90*
Institutional quality[3]		0.04***	0.05***	0.04***	0.05***
		2.77	*4.38*	*2.96*	*4.01*
History of bank crises (t – 10)[4]		–0.14**	–0.06	–0.11*	–0.07*
		–2.38	*–1.66*	*–1.98*	*–1.82*
LA-7 dummy[5]	–0.13***	0.16***		0.20***	
	–6.18	*5.98*		*3.83*	
Non-LA-7 dummy[5]	0.01***	–0.02***		–0.02***	
	8.44	*–7.17*		*–4.74*	
Brazil dummy[5]			–0.34***		–0.19***
			–3.55		*–3.54*
Chile dummy[5]			0.54***		0.62***
			3.11		*3.10*
Colombia dummy[5]			–0.01***		0.10***
			–3.50		*3.50*
Mexico dummy[5]			–0.65***		–0.48***
			–3.84		*–3.85*
Peru dummy[5]			0.12***		0.33***
			3.50		*3.43*
Panama dummy[5]			0.89***		0.79***
			3.03		*3.13*
Uruguay dummy[5]			–0.19***		–0.30***
			–3.56		*–3.74*
Number of observations	5,681	1,336	1,336	1,336	1,336
R-squared	0.23	0.71	0.91	0.57	0.85

Note: Time dummies have been incorporated in all specifications. Robust T-statistics are in italics. LA-7 = Brazil, Chile, Colombia, Mexico, Panama, Peru, and Uruguay.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

[1] The OLS regressions are ordinary least squares regressions with standard errors adjusted for clustering at the country level for a panel of 67 countries from 1986 to 2011. Selected country and/or regional dummies are included.

[2] The FE regressions estimate country fixed effects for all countries in the sample, but only the LA-7 results are reported in this table.

[3] The investment profile subcomponent of the International Country Risk Guide political risk index is used to gauge institutional quality.

[4] Indicator of past banking crises following Reinhart and Rogoff (2009). Data available at http://www.reinhartandrogoff.com/data.

[5] Demeaned estimates: fixed effect estimates minus a sample average of fixed effects.

ANNEX TABLE 2.2

Baseline Financial Integration Index with Two Components, Openness and Convergence

	OLS (1)[1]	OLS (2)[1]	OLS (3)[1]	FE[2]
Log of GDP per capita	0.27***	0.27***	0.38***	0.79***
Purchasing power parity	*5.20*	*5.20*	*4.26*	*3.18*
Trade openness			0.63***	0.58**
			3.36	*2.34*
Government debt/GDP			*0.22***	
			3.59	
Institutional quality[3]			0.04**	0.06***
			2.34	*2.86*
History of bank crises (t – 10)[4]			–0.11	–0.21***
			–1.57	*–2.88*
LA-7 dummy[5]	–0.71***		–0.02***	
	–6.46		*–4.56*	
Non-LA-7 dummy[5]	0.08***	0.08***	0.00***	
	5.42	*5.41*	*4.40*	
Brazil dummy[5]		–0.93***		–0.07***
		–7.00		*–3.11*
Chile dummy[5]		–0.81***		–0.85***
		–6.68		*–3.61*
Colombia dummy[5]		–0.85***		–0.09***
		–7.06		*–3.29*
Mexico dummy[5]		–0.92***		–0.78***
		–6.83		*–3.52*
Peru dummy[5]		–0.72***		0.04***
		–6.97		*3.36*
Panama dummy[5]		–0.05***		0.07***
		–5.29		*3.32*
Uruguay dummy[5]		–0.76***		–0.51***
		–6.62		*–3.42*
Number of observations	3,901	3,901	1,289	1,601
R-squared	0.13	0.14	0.42	0.61

Note: Time dummies have been incorporated in all specifications. The dependent variable is a principal component from two variables: openness (external assets + liabilities as a ratio of GDP) and convergence. This is the baseline indicator described in Table 2.1. LA-7 = Brazil, Chile, Colombia, Mexico, Panama, Peru, and Uruguay.

Robust T-statistics are in italics.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

[1] The OLS regressions are ordinary least squares regressions with standard errors adjusted for clustering at the country level for a panel of 67 countries from 1986 to 2011. Selected country and/or regional dummies are included.

[2] The FE regression estimates country fixed effects for all countries in the sample; only LA-7 results are reported.

[3] The investment profile subcomponent of the International Country Risk Guide political risk index is used to gauge institutional quality.

[4] Indicator of past banking crises following Reinhart and Rogoff (2009).

[5] Demeaned estimates: fixed effect estimates minus a sample average of fixed effects.

ANNEX TABLE 2.3

Alternative Financial Integration Index with Two Components, External Liabilities and Convergence				
	OLS (1)[1]	**OLS (2)[1]**	**OLS (3)[1]**	**FE[2]**
Log of GDP per capita	0.21***	0.21***	0.36***	0.81***
Purchasing power parity	*4.03*	*4.03*	*3.88*	*3.18*
Trade openness			0.65***	0.53**
			3.58	*2.23*
Government debt/GDP			0.23***	
			3.78	
Institutional quality[3]			0.01	0.03
			0.78	*1.25*
History of bank crises (t – 10)[4]			–0.11	–0.20***
			–1.65	*–2.83*
LA-7 dummy[5]	–0.67***		0.02***	
	–5.25		*3.98*	
Non-LA-7 dummy[5]	0.08***	0.08***	0.00***	
	4.18	*4.18*	*3.89*	
Brazil dummy[5]		–0.90***		–0.17***
		–5.87		*–3.08*
Chile dummy[5]		–0.74***		–0.76***
		–5.48		*–3.50*
Colombia dummy[5]		–0.85***		–0.17***
		–5.96		*–3.25*
Mexico dummy[5]		–0.86***		–0.76***
		–5.68		*–3.43*
Peru dummy[5]		–0.66***		0.06***
		–5.70		*3.27*
Panama dummy[5]		0.10***		0.22***
		3.85		*3.18*
Uruguay dummy[5]		–0.76***		–0.53***
		–5.55		*–3.36*
Number of observations	3,901	3,901	1,289	1,601
R-squared	0.09	0.10	0.42	0.62

Note: Time dummies have been incorporated in all specifications. The dependent variable is the principal component from two variables: external liabilities as a ratio of GDP and convergence.

This is the financial integration, alternate 1, described in Table 2.1. LA-7 = Brazil, Chile, Colombia, Mexico, Panama, Peru, and Uruguay. Robust T-statistics are in italics.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

[1] The OLS regressions are ordinary least squares regressions with standard errors adjusted for clustering at the country level for a panel of 67 countries from 1986 to 2011. Selected country and/or regional dummies are included.

[2] The FE regression estimates country fixed effects for all countries in the sample; only LA-7 results are reported.

[3] The investment profile subcomponent of the International Country Risk Guide political risk index is used to gauge institutional quality.

[4] Indicator of past banking crises following Reinhart and Rogoff (2009).

[5] Demeaned estimates: fixed effect estimates minus a sample average of fixed effects.

ANNEX TABLE 2.4

Alternative Financial Integration Index with Three Components, Including Financial Depth

	OLS (1)[1]	OLS (2)[1]	OLS (3)[1]	FE[2]
Log of GDP per capita	0.63***	0.63***	0.85***	1.28***
Purchasing power parity	*8.02*	*8.01*	*6.52*	*3.78*
Trade openness			0.70***	
			2.93	
Government debt/GDP			0.29***	
			3.02	
Institutional quality[3]			0.09***	0.07**
			3.43	*2.53*
History of bank crises (t – 10)[4]			–0.34***	–0.28***
			3.63	*3.57*
LA-7 dummy[5]	–0.54***		–0.20***	
	–8.20		*–7.10*	
Non-LA-7 dummy[5]	0.06***	0.06***	0.02***	
	8.59	*8.57*	*7.08*	
Brazil dummy[5]		–0.80***		–0.69***
		–8.89		*–4.26*
Chile dummy[5]		0.19***		–0.37***
		7.15		*–4.01*
Colombia dummy[5]		–0.73***		–0.41***
		–9.1		*–4.33*
Mexico dummy[5]		–1.20***		–1.33***
		–9.25		*–4.42*
Peru dummy[5]		–0.67***		–0.17***
		–9.29		*–4.38*
Panama dummy[5]		0.69***		0.88***
		7.06		*3.88*
Uruguay dummy[5]		–0.78***		–0.81***
		–8.86		*–4.33*
Observations	3,271	3,271	1,160	1,456
R-squared	0.33	0.34	0.57	0.77

Note: Time dummies have been incorporated in all specifications. The dependent variable is the principal component from three variables: openness, convergence, and depth. This is the financial integration alternate 2 described in Table 2.1. LA-7 = Brazil, Chile, Colombia, Mexico, Panama, Peru, and Uruguay. Robust T-statistics are in italics.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

[1] The OLS regressions are ordinary least squares regressions with standard errors adjusted for clustering at the country level for a panel of 66 countries from 1986 to 2011. Selected country and/or regional dummies are included.

[2] The FE regression estimates country fixed effects for all countries in the sample; only LA-7 results are reported.

[3] The investment profile subcomponent of the International Country Risk Guide political risk index is used to gauge institutional quality.

[4] Indicator of past banking crises following Reinhart and Rogoff (2009).

[5] Demeaned estimates: fixed effect estimates minus a sample average of fixed effects.

ANNEX TABLE 2.5

Alternative Financial Integration Index with Three Components, Including Regional Openness

	OLS (1)[1]	OLS (2)[1]	OLS (3)[1]	FE[2]
Log of GDP per capita	0.36***	0.36***	0.28***	0.41**
Purchasing power parity	*6.25*	*6.23*	*4.56*	*2.45*
Trade openness			0.63***	0.48***
			3.81	*3.37*
Government debt/GDP			0.24***	
			2.83	
Institutional quality[3]			0.07***	
			2.78	
LA-7 dummy[4]	–0.61***		–0.35***	
	–7.11		*–6.94*	
Non-LA-7 dummy[4]	0.03***	0.03***	0.01***	
	6.65	*6.63*	*6.59*	
Brazil dummy[4]		–0.77***		–0.21**
		–7.39		*–2.36*
Chile dummy[4]		–0.63***		–0.58**
		–6.95		*–2.60*
Colombia dummy[4]		–0.66***		–0.25**
		–7.41		*–2.48*
Mexico dummy[4]		–0.85***		–0.69***
		–7.40		*–2.67*
Peru dummy[4]		–0.59***		–0.31**
		–7.41		*–2.59*
Panama dummy[4]		–0.29***		–0.22**
		–6.58		*–2.46*
Uruguay dummy[4]		–0.51***		–0.31**
		–6.88		*–2.46*
Observations	1,816	1,816	1,428	1,814
R-squared	0.17	0.18	0.30	0.65

Note: Time dummies have been incorporated in all specifications. The dependent variable is the principal component from three variables: global openness, regional convergence, and regional integration based on eight regions. This is the financial integration alternate 3.1 described in Table 2.1. Robust T-statistics are in italics. LA-7 = Brazil, Chile, Colombia, Mexico, Panama, Peru, and Uruguay.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

[1] The OLS regressions are ordinary least squares regressions with standard errors adjusted for clustering at the country level for a panel of 66 countries from 1986 to 2011. Selected country and/or regional dummies are included.

[2] The FE regression estimates country fixed effects for all countries in the sample; only LA-7 results are reported.

[3] The investment profile subcomponent of the International Country Risk Guide political risk index is used to gauge institutional quality.

[4] Demeaned estimates: fixed effect estimates minus a sample average of fixed effects.

ANNEX TABLE 2.6

Impact of Financial Integration on GDP Growth

Variables	(1) Real GDP Growth	(2) Real GDP Growth	(3) Real GDP Growth	(4) Real GDP Growth[1]	(5) Real GDP Growth per Capita	(6) Real GDP Growth	(7) GMM: Real GDP Growth	(8) Real GDP Growth	(9) GMM: Log of Real GDP
Financial integration indicator: baseline[2]	0.02*	0.02**	0.02**	0.01*	0.02**	0.01**	0.01***	0.02**	0.01**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
Log of trade openness[3]		0.04***	0.03**	0.02	0.03**	0.03***	0.05***	0.02	0.04***
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Log of GDP per capita (t – 1)	–0.05***	–0.05***	–0.02*	–0.11***	–0.02*	–0.02**	–0.09***		
Purchasing power parity	(0.01)	(0.01)	(0.01)	(0.04)	(0.01)	(0.01)	(0.00)		
Log of investment-to-GDP ratio[4]	0.14***	0.14***	0.08***	0.09***	0.08***	0.07***	0.02***	0.07***	0.09***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Log of public-expenditures-to-GDP ratio[5]		–0.08***	–0.05**	–0.05**	–0.05**	–0.06***	–0.05***	–0.06***	–0.03***
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)
Log change in population		–0.83**	–0.61*	–0.51*	–1.62***	–0.33	0.51***	–0.61*	–0.90***
		(0.39)	(0.36)	(0.28)	(0.36)	(0.23)	(0.13)	(0.33)	(0.25)
CPI inflation rate		–0.08*	–0.02	0.03	–0.02	–0.04	0	–0.01	–0.03*
		(0.05)	(0.04)	(0.03)	(0.04)	(0.03)	(0.00)	(0.04)	(0.02)
ICRG composite index[6]			0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***
			(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Dummy year 2009			–0.03***		–0.03***	–0.03***	–0.02***	–0.03***	–0.03***
			(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

(*Continued*)

Impact of Financial Integration on GDP Growth (*Cont.*)

Variables	(1) Real GDP Growth	(2) Real GDP Growth	(3) Real GDP Growth	(4) Real GDP Growth[1]	(5) Real GDP Growth per Capita	(6) Real GDP Growth	(7) GMM: Real GDP Growth	(8) Real GDP Growth	(9) GMM: Log of Real GDP
Real GDP growth (t – 1)							0		
							(0.02)		
Log of real GDP (t – 1)									0.96***
									(0.01)
Constant							0.61***		0.52***
							(0.04)		(0.10)
Number of observations	716	678	678	678	678	864	2,705	678	677
R-squared	0.19	0.32	0.44	0.58	0.44	0.47		0.44	
Number of countries	59	59	59	59	59	76	124	59	59
Robust standard errors in parentheses									

Note: All specifications estimated with instrumental variable panel estimator except for specifications 7 and 9, which use the generalized method of moments (GMM). CPI = consumer price index; ICRG = International Country Risk Guide.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

[1] This specification is saturated with time dummies, which are not reproduced in the table.

[2] Principal component of two variables: global openness and regional asset price convergence. This is the baseline described in Table 2.1.

[3] Exports plus imports as a ratio of GDP.

[4] Private and public investment as a ratio of GDP.

[5] Current and capital expenditures of the general government as a ratio of GDP.

[6] ICRG composite index of political, economic, and financial country risks.

ANNEX TABLE 2.7

Impact of Financial Integration on Growth, Using Alternative Financial Integration Indicators

Variables	Real GDP Growth (1)	Real GDP Growth (2)	Real GDP Growth (3)	Real GDP Growth (4)	Real GDP Growth (5)	Real GDP Growth (6)	Real GDP Growth (7)	Real GDP Growth (8)	Real GDP Growth (9)
Financial integration (FI) indicator: alternative 1[1]	0.02**								
	(0.01)								
FI: alternative 2[2]		0.01***							
		(0.00)							
FI: alternative 3.1[3]			0.03*						
			(0.01)						
FI: alternative 3.2[4]				0.02*					
				(0.01)					
FI: alternative 3.3[5]					0.09*				
					(0.05)				
FI: alternative 3.4[6]						0.06**			
						(0.03)			
FI: global openness ratio[7]							0.01***		
							(0.00)		
FI: regional openness ratio (eight regions)[8]								0.01*	
								(0.01)	
FI: regional openness ratio (four regions)[9]									0.01**
									(0.01)
Log of trade-openness-to-GDP ratio[10]	0.03**	0.05***	0.06***	0.03**	0.02	0.02	0.02***	0.06***	0.05**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.02)	(0.01)	(0.02)	(0.02)
Log of GDP per capita (t – 1)	–0.02*	–0.03**	–0.04**	–0.03***	–0.04**	–0.04***	–0.04***	–0.09***	–0.10**
Purchasing power parity	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.03)	(0.04)
Log of investment-to-GDP ratio[11]	0.08***	0.07***	0.09***	0.11***	0.11***	0.11***	0.03***	0.05***	0.06***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)	(0.01)

(*Continued*)

Impact of Financial Integration on Growth, Using Alternative Financial Integration Indicators (*Cont.*)

Variables	Real GDP Growth (1)	Real GDP Growth (2)	Real GDP Growth (3)	Real GDP Growth (4)	Real GDP Growth (5)	Real GDP Growth (6)	Real GDP Growth (7)	Real GDP Growth (8)	Real GDP Growth (9)
Log of fiscal-expenditures-to-GDP ratio[12]	–0.05**	–0.08***	–0.07***	–0.06***	–0.01	–0.03	–0.03*	–0.05**	–0.04*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
Log of change of population	–0.57*	–0.52	–0.73*	–0.67**	–0.50	–0.42	0.74***	0.23	0.17
	(0.32)	(0.33)	(0.44)	(0.30)	(0.67)	(0.44)	(0.20)	(0.23)	(0.23)
Consumer price index inflation rate	–0.03	–0.01	–0.31*	–0.32***	0.03	–0.01	–0.00	–0.14***	–0.18***
	(0.04)	(0.03)	(0.17)	(0.11)	(0.09)	(0.08)	(0.00)	(0.05)	(0.07)
ICRG composite[13]	0.00***	0.00***	0.00***		0.01***	0.01***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Year 2009 dummy	–0.03***			–0.03***				–0.03***	–0.03***
	(0.00)			(0.00)				(0.00)	(0.01)
Number of observations	678	601	624	634	624	624	2,949	1,181	1,153
R-squared	0.45	0.41	0.23	0.40	–1.09	–0.09	0.15	0.26	0.21
Number of countries	59	59	59	59	59	59	124	120	117

Note: All equations are estimated with instrumented variable estimation. Robust standard errors in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

[1] Principal component of two variables: global integration of external liabilities and asset price convergence within an eight-region world.
[2] Principal component of three variables: global integration of external assets and liabilities, banking system credit to the private sector, and asset price convergence within an eight-region world.
[3] Principal component of three variables: global integration of external assets and liabilities, asset price convergence, and integration of external assets and liabilities within an eight-region world.
[4] Principal component of three variables: global integration of external assets and liabilities, asset price convergence, and integration of external assets and liabilities within a four-region world.
[5] Principal component of three variables: global integration of external liabilities, asset price convergence within an eight-region world, and average proximity of external asset and liability partners.
[6] Principal component of three variables: global integration of external liabilities, asset price convergence within an eight-region world, and average proximity of external liability partners.
[7] Global openness is measured as the log of external assets plus liabilities in percent of GDP.
[8] Regional openness (eight regions) is measured as the log of external regional assets plus liabilities (vis-à-vis narrow regional partners) as a ratio of GDP.
[9] Regional openness (four regions) is measured as the log of external regional assets plus liabilities (vis-à-vis broad regional partners) as a ratio of GDP.
[10] Exports plus imports as a ratio of GDP.
[11] Private and public investment as a ratio of GDP.
[12] Current and capital expenditures of the general government as a ratio of GDP.
[13] International Country Risk Guide (ICRG) composite index of political, economic, and financial risks.

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