

Banks and Cross-Border Capital Flows: Policy Challenges and Regulatory Responses

Committee on International Economic Policy and Reform



SEPTEMBER 2012

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Preface

The Committee on International Economic Policy and Reform is a non-partisan, independent group of experts, comprised of academics and former government and central bank officials. Its objective is to analyze global monetary and financial problems, offer systematic analysis, and advance reform ideas. The Committee attempts to identify areas in which the global economic architecture should be strengthened and recommend solutions intended to reconcile national interests with broader global interests. Through its reports, it seeks to foster public understanding of key issues

in global economic management and economic governance. Each Committee report will focus on a specific topic and will emphasize longer-term rather than conjunctural policy issues.

The Committee is grateful to the Alfred P. Sloan Foundation* for providing financial support and to the Brookings Institution for hosting the committee and facilitating its work. Quynh Tonnu provided excellent administrative and logistical support to the Committee.

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Executive Summary

In our previous report, *Rethinking Central Banking*, we made the case for a broader mandate for central banks and for monetary policy coordination. In this report, we lay out a complementary framework for cross-border banking flows and for improved regulatory coordination.

The traditional policy prescription for capital account opening is that the benefits of capital flows can be reaped by removing the impediments to unfettered capital movements one by one. Some allowance is made for emerging and developing economies to liberalize more slowly, given their weak institutions. However recent experience, such as the capital flow reversals in Europe, has shown that even advanced economies may be vulnerable to the unintended consequences of capital account liberalization when the procyclicality inherent in capital flows is not adequately addressed.

The procyclicality of capital flows can in principle be addressed through coordinated global regulation and globally coordinated monetary policy. However, in practice such coordination is not straightforward to design or implement, even when the interests of countries overlap or are congruent. And even when coordination is globally optimal, it may generate tensions with the valued prerogative of national governance.

Given the obstacles to global coordination, countries may have little choice but to design frameworks that mitigate the risks of cross-border flows at the national level. We provide a number of recommendations from the perspective of national policy makers.

Our main conclusions and recommendations are as follows:

- The policy maker's goal is to reap the benefits from cross-border capital flows while guarding against potential financial stability costs. Reaping the benefits requires, first and foremost, resisting vested interests that push for barriers to capital flows as a way of avoiding necessary structural reforms and fiscal adjustments. Good macroeconomic and structural policies form the bedrock of financial stability.
- Guarding against financial instability starts with keeping track of the complete matrix of gross cross-border capital flows and gross external asset and liability positions. Focusing on net flows is not enough. The detailed features of national balance sheets, at the level of gross flows, determine whether financial integration promotes risk sharing across countries or increases financial contagion.
- Persistent current account imbalances pose financial stability risks and have implications for the sustainability of net external asset positions. Discussions of global rebalancing should be linked to the broader debate on capital flows, including specifically the connections between capital flows and financial stability, the procyclical nature of such flows, and the role of monetary policy spillovers in magnifying that procyclicality.
- Foreign direct investment and equity portfolio investment are conducive to

increased international risk sharing and tend to be stabilizing. In contrast, credit flows, which are not always conducive to efficient risk sharing, have a greater potential to be destabilizing. Therefore, current biases in favor of debt financing over equity financing should be reduced.

- Most cross-border capital flows are channeled through global banks and are heavily procyclical. The procyclical nature of cross-border bank-intermediated credit flows has given rise to serious economic and financial instabilities. Effective regulation of cross-border banking is essential for domestic and global financial stability in a highly financially integrated world economy.
- The organizational and financial structure of global banks is important for the transmission of imbalances and therefore requires careful regulatory attention. Banks that are funded by stable deposits or long-term funding pose the least risk. In contrast, banks that rely on short-term wholesale funding represent a greater risk, irrespective of whether they are domestically-owned or branches/subsidiaries of foreign banks.
- Globally-enforced financial regulation together with global monetary policy coordination can reduce distortions sufficiently to allow countries to reap the benefits of capital flows while limiting risks to stability. In practice, though, political realities are likely to complicate multilateral discussions of banking regulation, while monetary policy tends to be conducted with domestic rather than global imperatives in mind.
- The incremental liberalization of capital flows in the pursuit of the ideal of the frictionless First Best outcome has not worked as advertised. The crisis in the euro area

shows that the flaws with the incremental First Best approach are not simply a result of underdeveloped or inadequate domestic institutions, as traditionally argued in the emerging market and developing country context.

- Given the difficulties of attaining a unified global regulatory framework and efficiently coordinating monetary policies across countries, governments may need to resort to a Second Best approach in which they seek actively to manage capital flows. Macro-prudential policies can play a key role in this process by imposing targeted regulations on banks engaged in cross-border activities.
- Macro-prudential policies should operate on the asset side of a bank's balance sheet, as do loan-to-value and debt-to-income caps, and the liability side, through devices such as levies on the non-core liabilities. These policies should attempt to influence balance sheet management by banks through instruments like countercyclical capital requirements.
- For the euro area, the First Best outcome may still be attainable through sufficiently robust financial regulation together with banking integration. A full banking union with a single regulator, as has been proposed recently by the European Commission, would be an effective means to this end. Alternatively, national banking systems that are conservatively regulated at the national level—for instance, through macro-prudential measures that limit banks' reliance on short-term wholesale funding—would help moderate capital flows that could otherwise exacerbate procyclical behavior and generate risks. But the middle ground of fragmented financial systems with unimpeded capital flows has been shown by recent events to be untenable.

Introduction

The world has become more integrated, not just through trade but through financial flows. Financial integration offers many benefits but also poses risks. This observation in turn points to the question of how best to benefit from greater financial integration while limiting adverse effects. A complicating factor in improving the benefit-cost tradeoff from financial integration is that banks often play a central role in intermediating these flows. Banks behave in ways that differ from those predicted by textbooks of atomistic participants in financial markets. In addition, they are subject to uncoordinated regulatory and political forces that are and hard to predict.

In this report, we draw on the growing body of evidence on cross-border capital flows in an effort to better understand their effects in practice. Building on this analysis, we suggest ways in which policy should be adapted to reap the benefits of the flows while minimizing their costs. While bank flows cannot be studied in isolation, our analysis and policy recommendations focus on banks, as they intermediate a substantial fraction of cross-border capital flows, are highly volatile, and pose specific regulatory and policy challenges.

The textbook case for financial integration is well known. It allows capital to flow from capital-rich to capital-poor economies, where returns should

be higher. These flows complement limited domestic saving in capital-poor countries and reduce their cost of capital, thus boosting investment and growth. Financial integration can also help cushion the impact of adverse shocks, since consumption can be smoothed by external borrowing even if incomes are volatile, while capital flows can help to sustain investment. Financial integration can provide risk diversification by allowing residents to transfer domestic risks to foreign investors while gaining exposure to foreign investment opportunities.

In addition, financial flows may have “collateral” or indirect benefits. Foreign direct investment (FDI) can bring new technologies, along with managerial and organizational expertise, to the receiving country. International investors tend to demand more transparency and better governance of local firms. By providing risk-bearing capital, financial integration can help domestic firms specialize, fostering faster productivity growth. Monitoring by international investors can discipline macroeconomic policies, encouraging governments to pursue sustainable fiscal policies and enlightened prudential strategies. These indirect benefits of financial openness thus promise faster economic growth.

Even diehard proponents of liberalized, open financial markets make some allowance for a

slower pace of financial integration for developing or emerging economies, citing their weaker institutions and more limited capacity to absorb and benefit fully from the inflows of capital.¹ In their view, however, the ideal of full capital account convertibility should still serve as the North Star that emerging-economy to which policy makers should navigate, even if they must steer close to land initially so as to avoid the perils of the open ocean that only advanced economies can navigate safely.

At the same time, recent events, from the subprime crisis in the United States to capital flow reversals and the banking crisis in Europe, have shaken faith that even advanced economies can harness the benefits of greater financial flows and deepen financial integration without incurring costs. The advanced countries that have been swept up first by the subprime crisis and now by the eurozone crisis are not the stereotypical emerging economies with weak institutions. Spain, for example, ranks high on traditional yardsticks of financial development such as the ratio of commercial bank assets to GDP, or of markers of financial integration such as cross-border liabilities as a proportion of GDP. And yet, those same measures of financial integration and development that were held up as yardsticks of progress have turned out instead to be the engines of financial distress as capital flow reversals have gathered pace in Europe. In contrast, it has been the emerging economies with what were presumed to be “weak” institutions and underdeveloped financial markets that have best weathered the storm.

These topsy-turvy outcomes have been disorienting for those who believed in the desirability of moving toward the ideal of liberalized, open financial

markets in incremental steps. In this report, we will take stock of the traditional case for financial liberalization and offer our perspective on which principles have withstood the test of recent events and which ones now need rethinking.

What’s So Special about Cross-Border Flows?

In practice, a sizeable portion of cross-border flows is intermediated by the banking sector. These are of the wholesale funding variety, much of it short term, that is liable to reverse quickly when financial conditions deteriorate. Why cross-border flows tend to be wholesale funding flows is an interesting research question in and of itself. For the policy maker, the intellectual quest to understand the reasons may be of less relevance than the fact that the underlying causes of the observed pattern may be difficult to dislodge, at least in the short term.

The border is also relevant as it is associated with the boundaries in policy making. When policy produces spillovers but coordination is less than perfect, the border becomes relevant in assessing policy alternatives. Whereas monetary, regulatory, and fiscal policies tend to be coordinated within a jurisdiction, coordination is more difficult across borders. These problems are particularly acute with regard to bank flows, which not only account for a large proportion of total cross-border flows but are also more volatile.²

Consider bank regulation. Without a global rule-book, there is the danger that policy measures that are in a nation’s interest take priority over the globally optimal policy measure. For example, national

¹ Clear-cut evidence on the positive effects of financial integration on growth has been elusive, however. Some studies show capital flows are beneficial in developing countries provided they have strong institutions and that there are thresholds effects (Prasad et al., 2003, Arteta et al, 2001). But the survey by Kose et al. (2009) concludes that the cross-country evidence lacks robustness. Prasad et al (2007) and Gourinchas and Jeanne (2007) note that emerging market and developing countries that have grown most rapidly did so without much foreign capital. The meta-analysis of Jeanne et al (2012) points to a threshold effect in which rich country growth rates are positively associated with financial integration but notes the lack of clear-cut general evidence.

² Subsidiarization does not resolve this problem, as the examples of Hungary and other emerging East European countries that are subsidiaries of Western European banks show. We return to this issue later in our report.

regulators in Europe did not force their banks to recapitalize but instead allowed them to shed foreign assets and withdraw from foreign markets. A second example is ring fencing. In this case each country attempts to grab the assets of a weak multinational bank before the other countries and thereby endangers a possibly viable bank. Common ground rules for banking regulation should be established to prevent these costs being imposed by one country on another.

The multilateral process governing reform of banking regulation led by the G20, Financial Stability Board (FSB), and the Basel Committee on Banking Supervision (BCBS) has shown how difficult such discussions can be. The negotiations over the new Basel III rules on international banking started with great fanfare in the aftermath of the 2008 crisis but soon morphed into a long-running set of trade negotiations where delegates felt impelled to be patrons of domestic banking interests. In retrospect, some delegates (especially from Europe) may now feel that their resistance to tougher capital requirements in the early stages of the Basel III negotiations (when their banks still had access to equity markets) may even have been detrimental to their own domestic public interest, as well as holding back better global banking rules.

In addition, the fact that the appropriate pace and sequencing of regulation may differ across countries creates tensions around the negotiating table. The different timing in implementation of the Basel guidelines across main financial centers (the U.S., for example, implemented Basel II more slowly than the Europeans) similarly creates distortions and opportunities for regulatory arbitrage.

Analogous distortions are also present in the conduct of monetary policy. Here, the monetary policy of the Federal Reserve takes on particular importance given the role of the U.S. dollar as the currency that underpins the global banking system. Given the political realities that make domestic economic policy paramount in determining a country's monetary strategy, global coordination

of monetary policy is even further removed from the realms of realistic procedural goals than is global financial regulation [see our earlier report *Rethinking Central Banking*].

First Best vs Second Best

In light of the above discussion, we take a step back to consider how we may progress from a set of far-from-ideal circumstances to a better outcome.

The First Best approach takes as its ideal the frictionless model of the economy and regards the deviations from the frictionless model as sufficiently small that policies that eliminate those deviations one by one are presumed to take the economy closer to the frictionless outcome.

The First Best approach rests on the premise that markets are self-correcting through the virtuous circle generated by the stabilizing interactions of market signals and the decisions guided by those signals. Unwise and misguided policies can be removed and other market imperfections can be eliminated one by one, after which the market mechanism will push the economy to a better outcome. The views associated with the Washington Consensus, or more generally any listing of independent guiding principles, would be an example of the First Best perspective.

The Second Best approach, in contrast, rests on a more cautious view of the durability, stability, and desirability of unfettered capital markets. Because it takes distortions as more permanent, it does not presume that markets are self-correcting. As a result of such distortions, the Second Best approach allows the possibility that the interaction between market signals and decisions guided by those signals may not generate a stabilizing virtuous circle.

Thus the Second Best approach rests on a more pessimistic view of whether distortions in global capital markets and the incentives governing its key participants as well as its regulators can be

removed or altered materially. As long as these distortions are present in global capital markets, policy makers might be prudent to take those distortions as givens and adapt policy accordingly.³

Crucially, the Second Best approach has less faith that a piecemeal method of removing one distortion at a time will improve economic outcomes. Although regulatory interventions distort the working of the market mechanism, they may end up neutralizing other deep-seated distortions, so that the outcome with two distortions (e.g., procyclicality and interventions) may be better than the outcome with just one (e.g., procyclicality alone).

Even if one acknowledges the validity of the Second Best approach as an abstract proposition, extracting specific policy prescriptions is more difficult. This entails identifying not just impediments to frictionless markets (the task of the First Best approach) but also establishing how they interact and figuring out what combination of interventions will help enhance the net benefits of capital flows. This is a harder task, and clearly one subject to potential error. But it is the one we must attempt insofar as we believe that the frictionless ideal is impossible to achieve in short order.

Our report can be seen as an attempt to shed light on the considerations that could be invoked in formulating policy prescriptions by operationalizing the Second Best approach. The Second Best approach will suggest policies that attempt to manage capital movements rather than allowing them to flow freely. Of course, if the reason that the benefits of financial integration cannot be obtained is the lack of policy coordination, then a political framework that allows for a better coordination and integration of fiscal, prudential, and monetary policies should allow the benefits of free capital flows to outweigh the stability costs.

For the euro area, which could be seen as having the most favorable conditions for achieving close policy coordination, more thoroughgoing integration of financial systems may be superior to the direct control of flows. Observers may differ in their assessments of where the exact boundary beyond which full integration is the better route. However, the case for full integration as the solution to the eurozone crisis can be presented coherently and is consistent with arguing for greater fragmentation elsewhere.

Capital Flows in the Euro Area

The euro area already has institutions for conducting joint monetary policy within its borders. The euro area comes closest to replicating the features that are generally characteristic of a single sovereign jurisdiction. All is not well in Europe, to be sure, and the fact that it is experiencing severe disruption in cross-border financial flows should push us to think harder about how this has happened. It should also spur us to understand the limits of financial integration and what the corresponding policy remedies are.

The euro area is part of the wider EU where capital controls were made illegal with the introduction of the Single Market in 1992.⁴ This provision applies to capital flows both within the EU and with the rest of the world, although some controls are still permitted under exceptional circumstances. Furthermore, the European single market prohibits giving preferential regulatory or tax treatment to domestic assets. While French legislation can treat euro-denominated assets and dollar-denominated assets differently, it cannot treat French and German stocks and bonds differently. Responsibility for bank supervision and resolution remains in national hands (at least so far; plans for a

³ See Rodrik (2011) for further elaboration on the difference between the First Best and Second Best approaches to capital flows.

⁴ There are some limited exceptions provided for in Article 65 of the EU Treaty.

banking union among euro area members are being discussed by heads of state and government) albeit on the basis of a common rulebook. Bank support is monitored by the European Commission, which can and has intervened to limit distortions to fair competition. In this sense, the euro area could be described as a pure monetary union (without a financial union) embedded in a single market for financial products.

Starting in 2009, the euro area has been subject to major disruptions of cross-border capital flows, amounting to a classic “sudden stop” well known in the context of emerging market economies.⁵ It would be fair to say that this abrupt capital flow reversal surprised most European policy makers. Until it happened, conventional wisdom held that current account deficits within the monetary union would be financed in the same way they are financed within a single sovereign jurisdiction.

How can capital flow reversals take place within a monetary union when it does not take place in other single sovereign jurisdictions? One can put forward three reasons:

- Banks, though increasingly diversified, still exhibit home bias. National regulators are reluctant to push banks to engage in further cross-border diversification, perhaps because of turf issues or the desire to protect domestic economic interests. Declining real estate prices and doubts about the solvency of the sovereign and private agents then give rise to doubts about the solvency of the national banks.
- Responsibility for resolution of failed banks still resides at the national level. Consequently the creditworthiness of the sovereign is directly affected by concerns about the solvency of banks in its jurisdic-

tion. Some bank balance-sheets are oversized relative to the fiscal capacity of the sovereign. Moreover, banks hold a substantial quantity of sovereign bonds issued by their governments. Through the interaction of these various factors, domestic bank solvency and sovereign solvency are linked.

- Since there is no credible fiscal oversight within the euro area, a country’s government could overspend if its debt were commonly guaranteed by the entire euro area. This makes market discipline necessary—that is, fiscal spending has to be disciplined by the possibility of debt default. For this reason, the European Central Bank’s mandate precludes purchasing sovereign debt in the primary market and the ECB has (until very recently) been reluctant to purchase large amounts of sovereign debt in the secondary market.

Despite the consequent scope for sudden stops within the euro area, Europe’s monetary union can nonetheless be seen as the ideal case study for full integration as the optimal treatment of international capital flows. It represents perhaps the most favorable environment in which the First Best perspective of a fully integrated financial system may be a guide for policy. An analogy would be the financial development of the United States and how it overcame the borders between individual states. Much therefore hangs on the success or failure of the European policy response. If the First Best approach fails in the euro area, it is likely to be inappropriate in other settings where the preconditions are less favorable.

With this as preamble, let us turn now to examining key aspects of capital flows.

⁵ See Merler and Pisani-Ferry (2012) for the parallels between the capital flow reversals in the Euro area and emerging economy “sudden stops”.

Some Key Features of Capital Flows

We start this section by arguing that *gross* as well as *net* foreign exposures matter from a financial stability perspective. Next, we differentiate between different types of capital flows and argue that the propensity of banks to make lending decisions that accentuate the business cycle—procyclical behavior—is a destabilizing force that undermines the self-correcting tendencies of the markets. The next section then studies how banks’ funding models further accentuate procyclicality. We pay particular attention to wholesale funding, which is the dominant form of funding in the international context. We then consider different organizational forms of cross-border banking in order to understand whether any of them can mitigate these effects. We discuss the roles of valuation effects, international balance sheet effects, flights to safety, and dollar shortages. Finally, we summarize the research on how exchange rates and capital flows interact.

Gross Flows and Net Flows

Capital flows are traditionally viewed as the financial counterpart to savings and investment decisions, in line with the narrative of capital flowing “downhill” from capital-rich countries with lower

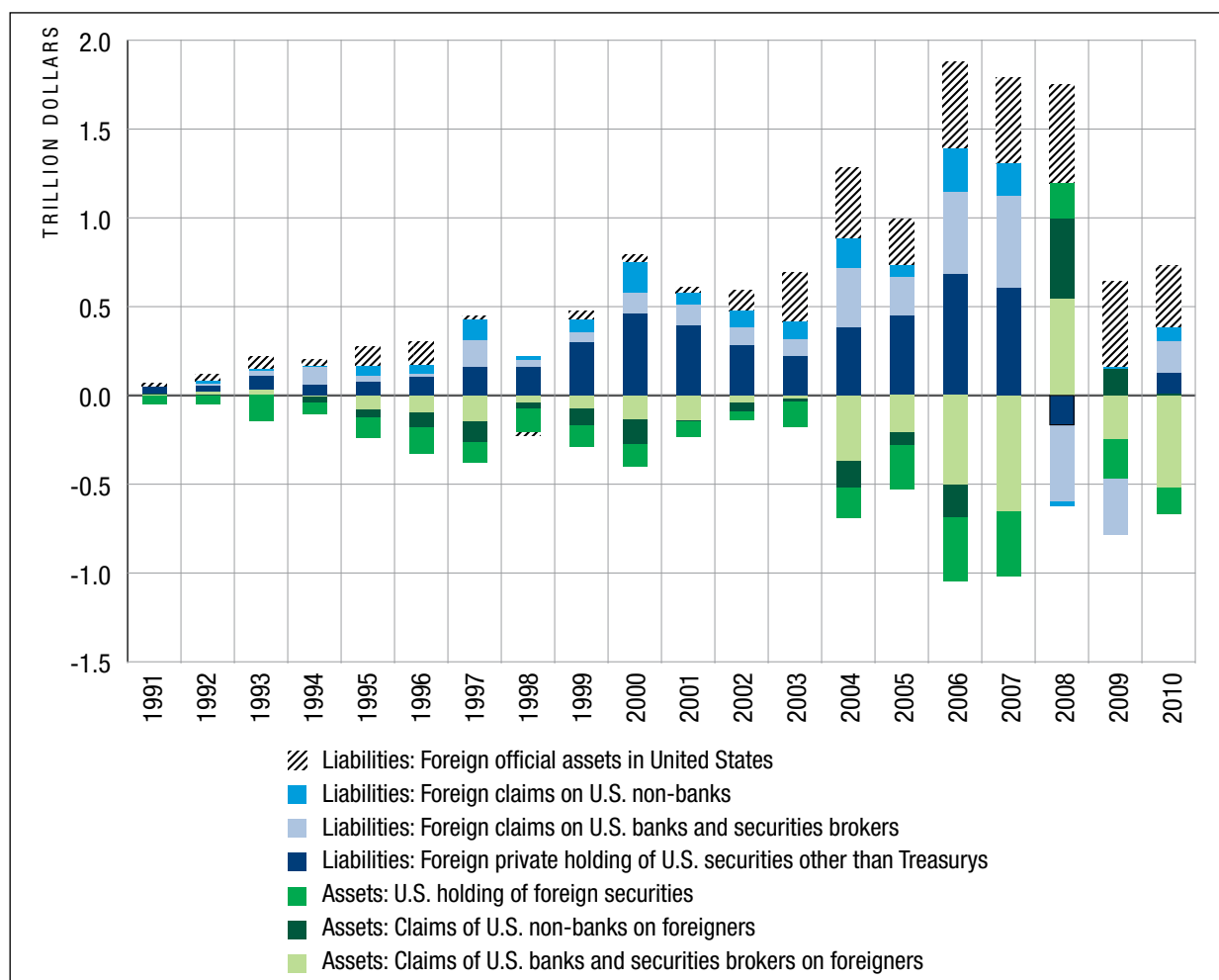
rates of return to capital-poor countries with higher returns. From this perspective, the focus is typically on *net* capital flows, since that is what counts for funding a country’s borrowing requirements.

However, a distinguishing feature of the recent period has been the rapid increase in *gross* flows that do not always show up in the net capital flow statistics. For most countries, net capital flows are small relative to GDP, whereas gross capital flows were above twenty percent of GDP for the advanced economies and about ten percent for emerging economies in the mid-2000s.⁶ International banking has been at the heart of the expansion in gross flows, with many cross-border banking activities involving an expansion in the levels of both foreign assets and foreign liabilities.

The distinction between gross and net flows is illustrated by the experience of the United States. Figure 1 shows several categories of capital flows. Positive quantities (and bars) indicate gross capital inflows (the increase in claims of foreigners on the United States), while negative quantities indicate gross capital outflows (the increase in the claims of U.S. residents on foreigners).

⁶ A growing recent literature emphasizes gross capital flows, including Borio and Disyatat (2011), Forbes and Warnock (2011), Obstfeld (2012a, 2012b), Lane (2012), Shin (2012), and Shularick and Taylor (2012).

FIGURE 1: Categories of gross capital flows for the United States



Source: Shin (2012), data from U.S. Bureau of Economic Analysis

The grey shaded bars indicate the increase in claims of official creditors to the United States. This includes the increase in claims of China and other current account surplus countries. While official flows are large, private sector gross flows are larger still. The negative bars before 2008 indicate large outflows of capital from the U.S. (principally through the banking sector), which then re-enter the country through the purchases of non-Treasury securities. We cover this in more detail in Appendix B, where we highlight the role of European global banks in driving such flows.

The upshot of the pattern of gross flows in Figure 1 is that European banks played an important role in influencing credit conditions in the United States by providing U.S. dollar intermediation capacity, even though net flows between Europe and the U.S. were small. Effectively, European global banks sustained the “shadow banking system” in the United States by utilizing U.S. dollar funding in the wholesale market to lend to U.S. residents through the purchase of securitized claims on U.S. borrowers. Money market funds in the United States were a particularly important source of wholesale bank funding for global banks.⁷

⁷ See Shin (2012) for more detailed evidence of such “round-trip” flows of capital from (and back to) the United States via the European banks.

Types of Capital Flows and Procyclicality of Banking Flows

Capital flows differ depending on the nature of the claim (equity, debt), the maturity (short, long), the currency of denomination (domestic, foreign), and the nature or control of the investor (portfolio investment, foreign direct investment, bank). We now ask which kinds of flows cause the greatest concern from a stability perspective.

FDI and Equity Portfolio Investments

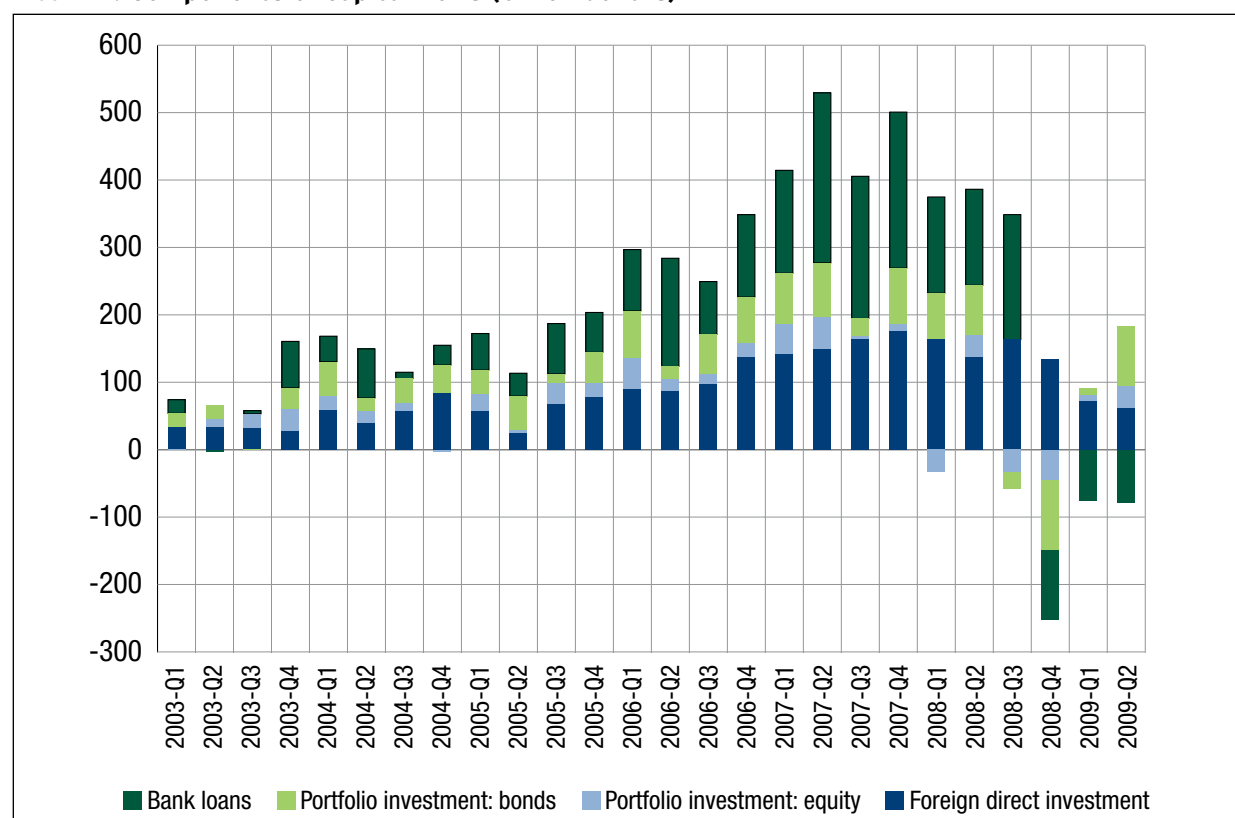
Typically, aggregate FDI flows are steady, while portfolio equity flows are small in net terms. In principle, equity-type liabilities should be helpful in a crisis, since foreign investors take an automatic hit if the market value of liabilities declines. The typical equity investor (corporation, pension fund, or mutual fund) is not leveraged, so foreign direct

investment (FDI) and portfolio equity flows are less likely to reverse abruptly. Even when they do, the impact may be less damaging than a “sudden stop” associated with bank flows. In the case of portfolio equity flows, for example, foreign sellers of stocks in a crisis face the double penalty of lower local currency prices when they sell, as well as a sharply depreciated exchange rate when they exit. The domestic currency-equivalent outflow associated with the repatriation of portfolio equity sales proceeds is small compared to the pre-crisis market-to-market value of foreign holdings of equity.

Instability of Credit Flows

However, debt-type inflows intermediated by banks can generate adverse dynamics, especially in an environment in which GDP is shrinking, price deflation is occurring, and default risk is rising. Although bank-related flows are just one component of overall capital flows, they are an especially

FIGURE 2: Components of capital flows (billion dollars)



Source: IMF Global Financial Stability Report, April 2010 p. 123

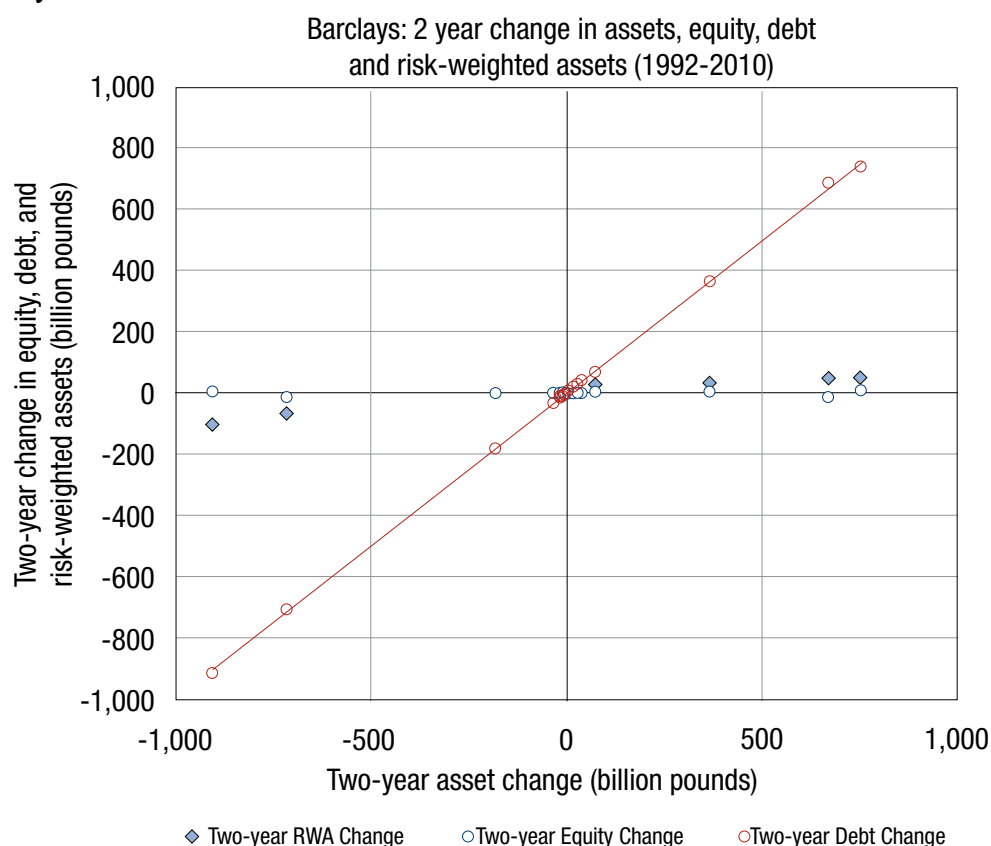
procyclical and volatile one that is important for transmitting financial conditions. To illustrate this, consider Figure 2, which is from the IMF’s *Global Financial Stability Report* of April 2010. It shows the capital inflows into forty-one countries, including many emerging economies. The negative green bars starting in 2008Q4 are particularly striking, indicating the sharp withdrawal of bank flows.⁸

Also apparent in the figure is how the volatility of banking-sector credit flows is quite different from the volatility of other types of capital flows.

Procyclical Behavior of Banks and Asset Price Amplification

The outsized impact of bank-related capital flows derives in part from how banks manage their balance sheets. Bank lending is highly procyclical, rising significantly in good times and falling in bad times, perhaps even more than the availability of projects deserving of funding would imply. Bank lending appears to respond not just to the creditworthiness of projects, but also to slack in the balance-sheet capacity of banks—in other words, their ability to take on additional risk.⁹

FIGURE 3: Scatter chart of two-year change in assets of Barclays against change in equity, debt, and risk-weighted assets



Source: Bruno and Shin (2012), data from Bankscope

⁸ This pattern is confirmed in the econometric results reported by Milesi-Ferretti and Tille (2011), who find that the sudden stop in capital flows during the crisis was primarily concentrated in bank-related flows. Cowan et al. (2008) show that sudden stops are as frequent in emerging markets as in developed countries. The difference traditionally has been that in developed countries these sudden stops of inflows are offset by a reversal of outflows. During the European crisis, however, there have not been offsetting stoppages of outflows to the sudden stop of inflows. Indeed, crisis-hit countries have experienced a “sudden start” of outflows.

⁹ Procyclicality of banking is a familiar theme in financial economics and has generated an extensive recent literature. See Brunnermeier and Sannikov (2011) for a recent formal exposition.

This slack is tied to various measures of the market price of risk. Figure 3 shows the relevant scatter plot for Barclays, a typical global bank. It plots how much a change in the balance sheet size of the bank is financed through equity and how much through debt. (The chart looks similar for other banks.)

Figure 3 shows a virtually one-for-one relation between the change in assets and the change in debt. In effect, assets expand or contract dollar for dollar (or pound for pound) through a change in debt. What is especially notable is how the risk-weighted assets of the bank (its assets weighted by Basel capital risk weights, which in turn determines capital requirements) barely change, even as the raw assets change by hundreds of billions of pounds.

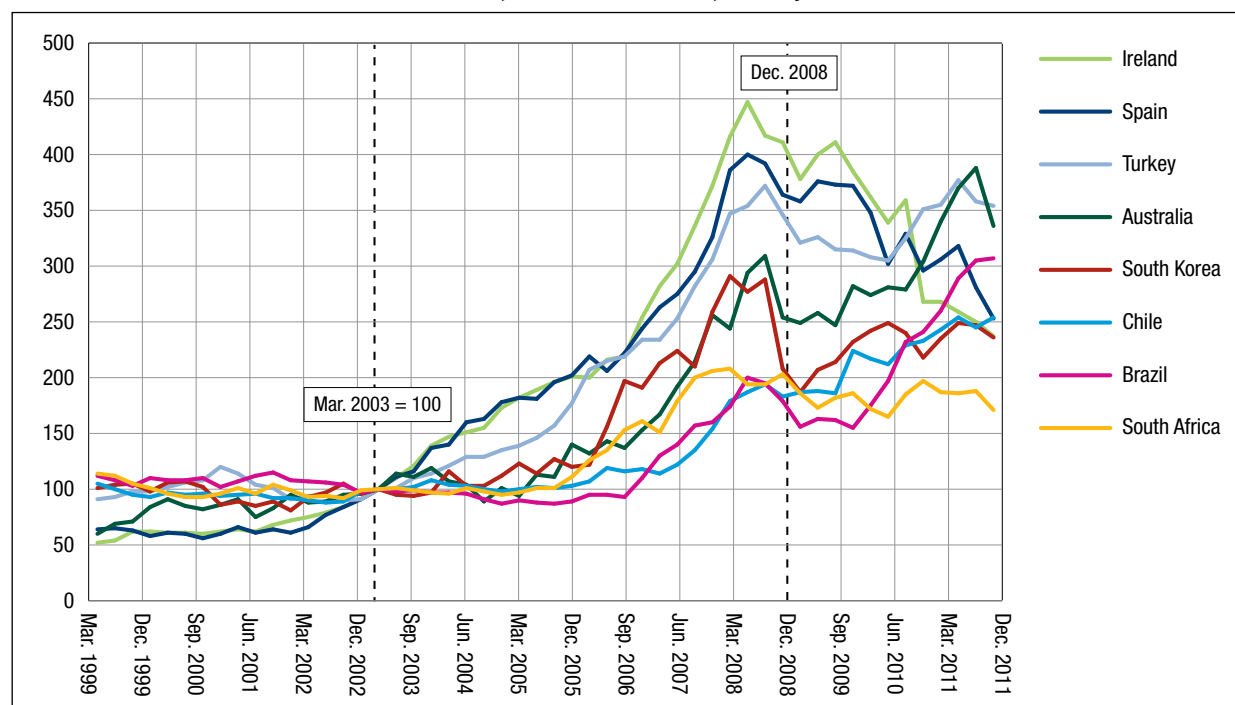
This phenomenon has a number of explanations. First, during the boom banks added assets that attracted a low risk weight, such as highly rated mortgage-backed securities, while hiding higher risk assets off their balance sheet. Second, measured risks tend to fall during upswings. The fall

in perceived and actual volatility during the boom also leads lenders to sacrifice various margins of safety, making them willing to operate at much higher leverage ratios.¹⁰

Bank lending thus expands to fill spare balance sheet capacity so long as measured risks are low. Causation in the reverse direction may also be at work—that is, the rapid increase in credit supply chasing available borrowers reduces risk spreads, as well as the likelihood of distress, so long as the credit boom lasts. In the presence of this two-way causality, there is the potential for a feedback loop in which greater credit supply and the compression of risk spreads interact to amplify the credit boom.

This procyclical lending behavior in turns has consequences for capital flows. When credit is expanding rapidly, outstripping the pool of available retail deposits, the bank will turn to other sources of funding to support credit growth, typically other banks operating as wholesale lenders in the capital market. BIS data confirm that the vast bulk

FIGURE 4: External claims (loans and deposits) of BIS Reporting Banks (March 2003 = 100)



Source: Bruno and Shin (2011), data from BIS Locational Statistics Table 7A

¹⁰ See Brunnermeier and Pedersen (2009).

of cross-border debt is intermediated through the domestic banking system.¹¹

The ability of banks to raise cross-border funding then fluctuates over time in line with prevailing “risk on/risk off” conditions in global credit markets. To illustrate this point, Figure 4 plots banking sector capital flows as revealed in external claims (loans and deposits) of BIS reporting-country banks vis-à-vis several emerging and advanced economies.

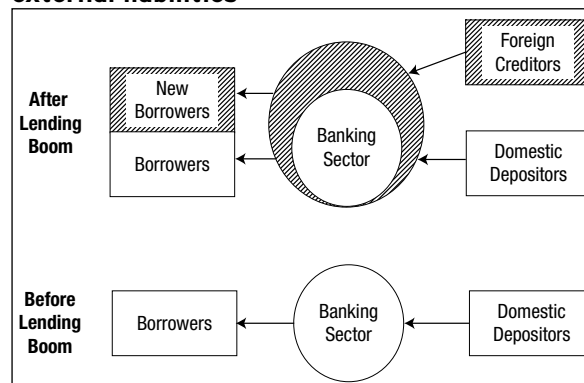
The synchronization of banking sector flows across disparate recipient regions is striking, notably in the period ending in 2008. This synchronization suggests the presence of global factors driving cross-border bank-related capital flows in a number of otherwise very different countries.¹²

Funding Models and Wholesale Funding Markets

The connections between the external liabilities of the banking sector and financial vulnerability can also be viewed from the perspective of balance sheet management. As intermediaries that borrow in order to lend, banks must raise funding to extend credit to borrowers. In an economy with domestic savers, the retail deposits of the household sector are the main source of funding available to banks—the “core liabilities” of banks. However, retail deposits typically grow in line with the size of the economy and the wealth of the household sector, not any faster. When credit is growing faster than the pool of available retail deposits, banks will turn

to wholesale funding (their “non-core liabilities”) to support credit growth.¹³ Short-term wholesale funding from foreign creditor banks is less stable than retail funding, as it is associated with the lending decisions of global banks in international capital markets—the banks whose procyclical behavior we have already commented upon.¹⁴

FIGURE 5: Non-Core banking funding and external liabilities



Source: Hahm, Shin and Shin (2011)

The schematic in Figure 5 depicts the role of external liabilities in financing credit growth in the upswing of the credit cycle. The lower diagram in Figure 5 depicts lending during normal times when domestic deposits finance lending. In contrast, the upper diagram in Figure 5 indicates lending during booms, when domestic deposits are insufficient to finance the growth in lending so that banks draw on external funding. Figure 5 suggests that non-core liabilities of banks may convey useful information on the stage of the financial cycle, possibly serving as an early warning signal of burgeoning risks to financial stability.¹⁵

¹¹ Domestic non-banks can obtain debt financing from outside the local banking system by issuing international bonds and other types of portfolio debt or by cross-border borrowing from foreign banks. However, direct cross-border debt flows are small relative to bank-intermediated cross-border flows.

¹² See Forbes and Warnock (2012) and Bruno and Shin (2011) for the role of global factors in driving capital flows.

¹³ A key question, of course, is why banks do not issue equity to help support the expansion in borrowing. A large literature (see Calomiris and Kahn (1991) and Diamond and Rajan (2000, 2001)) is devoted to explaining why banks may prefer demandable or short-term debt to longer term debt or equity. Moreover, during the boom when lending margins are shrinking, banks may be intent on using their capital more intensively than on raising more capital.

¹⁴ In this and the subsequent discussion, our major concern is about short-term sources that tend to dominate banks’ wholesale funding. In Chile, banks have been issuing long-term bonds as substitutes for their shrinking deposit funding base (as pension funds switch out of bank deposits to other investments).

¹⁵ Hahm, Shin and Shin (2011) conduct a panel probit study of the susceptibility to financial crises using the non-core liabilities of the banking sector as the conditioning variable. They find that non-core bank liabilities, especially the liabilities to the foreign sector, emerge as consistently the most robust indicator of the vulnerability to a crisis, both of a collapse in the value of the currency as well as a credit crisis in which lending rates rise sharply.

The role of non-core bank liabilities in signaling vulnerability may hold more generally, as its predictive power rests on the cyclical nature of the risk-taking by the bank itself. Figure 6 shows the liabilities of Northern Rock, the now notorious U.K. bank whose failure in 2007 heralded the global financial crisis. In the nine years from 1998 to 2007, Northern Rock's lending increased 6.5 times. This increase in lending far outstripped the funds raised through retail deposits (in light green), with the funding gap filled by wholesale funding (in dark green and light blue).

Although Northern Rock was an outlier in terms of its aggressive use of wholesale funding, its case illustrates the general point that the increase in bank lending outstrips the increase in core deposit funding available to a bank during a credit boom. As the boom progresses, the bank resorts to non-core

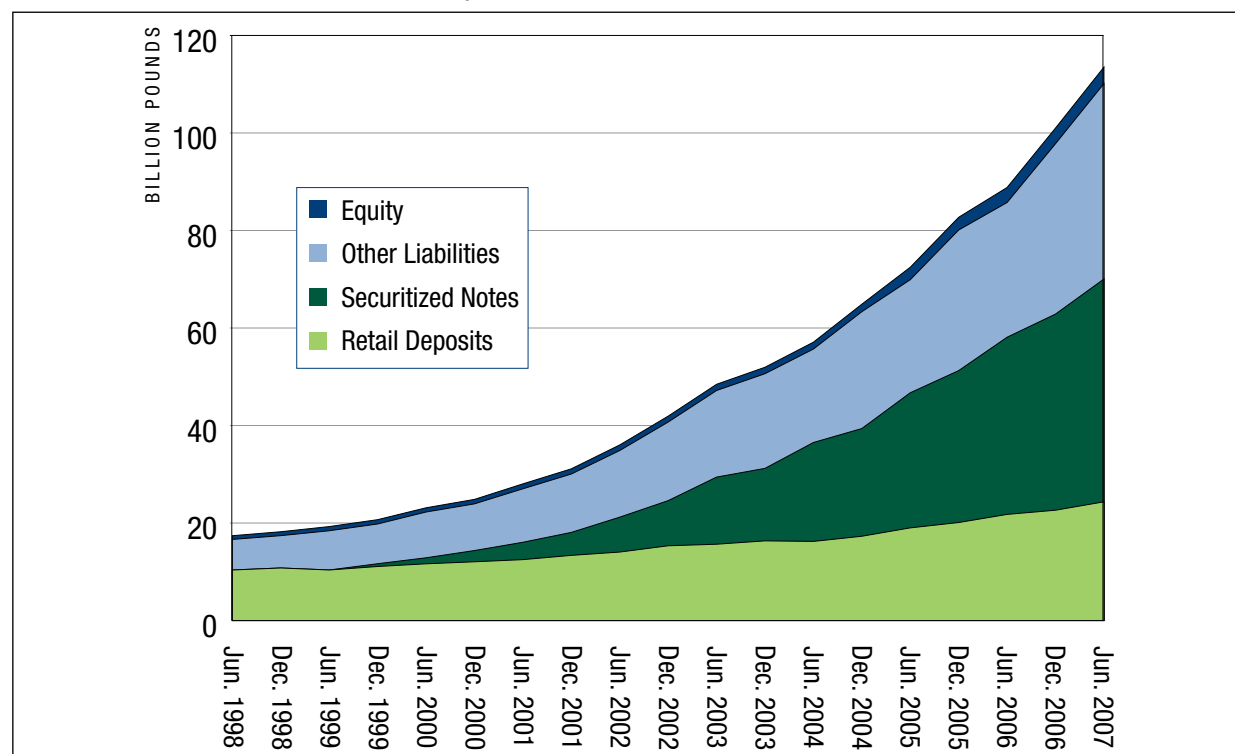
liabilities to finance its lending. As a rule of thumb, the higher the proportion of non-core liabilities, the greater the boom, and the greater the vulnerability to a setback.

Significantly, the composition of liabilities provides a better early warning of potential vulnerability than conventional asset-side indicators such as non-performing loans or Basel-style capital ratios. It is useful to recall that, in the case of Northern Rock, such ratios were perfectly healthy even on the eve of the crisis.

Cross-Border Banking Groups: Organizational Structure

The organizational structure of international banking also matters for the relationship between international capital flows and financial stability.¹⁶

FIGURE 6: Northern Rock's Liabilities, 1998 - 2007



Source: Shin (2009)

¹⁶ There are several types of claims in the BIS banking statistics. Cross-border claims are those extended to non-residents. International claims are cross-border claims plus local claims on affiliates of foreign banks in foreign currency. Finally, foreign claims are international claims plus local claims on affiliates of foreign banks in local currency. This last definition allows us to distinguish local versus foreign funding.

Multinational vs International Banks

Here it is important to distinguish between the cross-border transactions among non-associated banks and cross-border transactions that are internal to global banking groups.¹⁷ Within the general category of global banking groups, McCauley et al (2010) further distinguish between “multinational” banks (collection of affiliates, each mostly relying on local funding) and “international” banks (institutions in which decisions are centrally taken by HQ, with funding pooled from each source and then redistributed from the center). Each type raises a distinct set of policy issues.

The polar case of a “multinational” bank is when an institution operates as a collection of country affiliates, each with purely local funding and purely local assets. While there are no cross-border credit flows, the fortunes of the country affiliates are still tied together by the global profitability and capital of the parent, since this will influence its strategic decisions about country-by-country capital levels and lending policies. The value of the global banking group depends on the profits/losses of each affiliate. Thus even a multi-national bank can transmit shocks between countries. Arguably, such shocks could be smoothed out by the center, and any consequences will be felt only with a lag insofar as they are transmitted through changes in affiliate capital.

In contrast, the international bank could transmit shocks more directly and quickly through changes in its affiliates’ funding.

Subsidiarization and Funding

In both cases but especially the “international” bank model, an important organizational choice is

whether to structure country affiliates as branches or subsidiaries. Subsidiaries are fully incorporated entities in the host country and must meet the host country standards for capital adequacy and other regulations. They have their own capital requirements and limits on the relationships with the parent bank, including assets and liability transfers, local boards of directors, and so on. Such “ring-fencing” should make it easier for the host country to implement an effective macro-prudential framework while also making cross-border resolution easier in case of a crisis.¹⁸

A related but distinct dimension is the funding model. The local operations of the foreign bank can be funded mainly from local deposits, or they may rely substantially on wholesale funding from the parent bank or wholesale market. When lending expands faster than core deposits, those deposits tend to migrate to non-core-funding reliant banks, as we have seen. If foreign-owned banks rely on short-term wholesale funding for a substantial share of their lending, procyclicality will be built into their balance sheet management regardless of whether they are branches or subsidiaries.

Foreign-owned banks in Central and Eastern Europe had the legal form of subsidiaries, to take a prominent case in point. While these banks raised considerable local funding, a further source of cross-border credit was inter-office funding channeled by Western European parents through their subsidiaries. In this way, the operations of foreign-owned banks permitted a faster rate of credit growth than would have been possible otherwise. In turn, this also set the stage for a potentially costlier contraction. The decision by a major foreign bank to contract lending in the host country (for instance, in response to regulatory pressures in

¹⁷ See Cetorelli and Goldberg (2010, 2011) and Claessens and van Horen (2012).

¹⁸ That said, host-country regulation of subsidiaries might not be sufficient. Ranciere et al. (2010) show that foreign-owned banks evaded host-country controls on lending volumes by switching some lending from the local affiliate to direct lending by the parent bank, where these direct loans were brokered by the local affiliate.

the headquarters' country to conserve capital or liquidity) could lead to a slowdown in growth in the host country, which in turn could affect the decisions of others foreign lenders. The host economy might find funding abruptly curtailed. Agreements among banks, such as the Vienna Initiative brokered by the EBRD, sought to slow the pace of credit contraction, but the vulnerability of Central and Eastern European economies in the absence of such coordination was clear.

By contrast, Latin America, a region that has traditionally been severely affected by international financial turbulence, was relatively resilient during the global financial crisis. High levels of indebtedness, weak banks and currency mismatches had been amplifying factors in previous episodes of global financial turbulence, but this time was different.

Macroeconomic policies—in particular fiscal conservatism, monetary policy geared to a price stability objective, high degrees of exchange rate flexibility, and sound prudential regulation of the banking system—all help to explain Latin America's resilience. However, the model of integration with foreign banks certainly played a role, especially when compared to emerging Europe. Foreign banks that want to do retail business and take deposits in the great majority of cases incorporate in the host country as a subsidiary, that is, a stand-alone bank rather than as an office. This creates a structure of corporate governance that is more consistent with local financial stability than one in which the affiliate is a branch that follows instructions and policies dictated by the parent bank.¹⁹

An important component of the regulation of foreign affiliates is a strict limit on deposits that the affiliate can make in the parent bank, so the risk of using the local bank to fund the parent bank is

limited. There may be some ways to circumvent the regulation, but when the bank is a subsidiary the responsibility is on the local management and the local board. In this organizational structure, the host country imports the foreign bank's management expertise, brand, and technology without necessarily suffering from financial contagion in the case of a crisis in the parent bank's economy.

To be sure, requiring subsidiaries to rely on local funding and to ring fence their capital has some costs—it segments financial markets and hampers international movements of capital at times when they might be beneficial. To the extent that cross-border capital flows are not impeded but instead are pushed into safer channels, however, the stability-enhancing benefits of requiring locally funded subsidiaries may dominate.

Local funding did not prevent a reduction in domestic credit in Latin America after the Lehman collapse, but that reduction was not necessarily triggered by procyclical behavior of foreign banks. Indeed, the 2009 recession was accompanied by a sharp reduction in domestic credit. This was due, however, not just to tighter financial conditions on the side of lenders but also to the decline in demand for credit. In any case, credit recovered once economic conditions improved. See Appendix A for a detailed examination of the Latin American case.

Valuation Effects, Dollar Funding, and Flight to Safety

We have seen the importance of not just net capital inflows and the current account but also gross inflows and outflows and their composition. The stock counterparts of gross outflows and inflows are foreign assets and liabilities, respectively. The values of these stock positions and, hence, a

¹⁹ Many countries adopt the same regulation for branches and subsidiaries. The most relevant difference is that branches do not have a local board, while subsidiaries do. With branches, the foreign bank is responsible for any problem in its foreign office. Subsidiaries limit contagion across affiliates. In addition, subsidiaries can have local or other partners. These are strong incentives for banks to use the subsidiary model to expand across regions, when regulation is mostly the same for all foreign affiliates.

country's net foreign asset position can vary substantially. With the spectacular increase in the holdings of foreign assets and foreign liabilities, these valuation effects can swamp current account imbalances.²⁰ It is possible that the valuation channel is systemically stabilizing for some countries and shocks but destabilizing for others. This matters at the macroeconomic level; it is also important for financial stability, due to valuation effects on bank balance sheets, but also in relation to the balance sheets of the banks' stakeholders (households, firms, and the government).

Differences in Foreign Currency Exposures

For example, differences in foreign-currency exposures between emerging Asia and Latin America (on the one side) and emerging Europe (on the other) have had important implications for the stability of their financial sectors. Since the first group is long in foreign-currency assets in net terms, currency depreciation generates a valuation gain. Financial and macroeconomic stability is thus enhanced if currency depreciation typically occurs during downturns. In contrast, emerging Europe has net foreign-currency liabilities, so currency depreciation has an adverse impact on balance sheets.²¹

Risk-Sharing Channel

A second dimension relates to the risk sharing properties of net international equity positions and net FDI positions transmitted through valuation effects. When the world is hit by global shocks, countries with net equity and FDI assets absorb losses from countries with net equity and FDI liabilities.

Large foreign equity liabilities can insulate a country from domestic shocks, since domestic losses

are shared with foreign investors. For example, the losses from domestic banking crises have been partially absorbed by foreign equity investors, both through portfolio equity stakes and the value of FDI equity positions in foreign-owned banks.

This risk-sharing channel is heavily shaped by the different external balance sheet structures of countries and their heterogeneous weighting of risky versus safe assets on both sides of the balance sheet. It is particularly important in times of high global volatility. In such an environment, valuation effects are particularly large and may lead to substantial wealth transfers across countries.

The United States, as the country at the center of the international monetary and financial system and the issuer of the reserve currency, can be seen as an insurance provider in crisis periods.²² Unlike that of other countries, its external balance sheet is short on "safe" or liquid securities and long on "risky" or illiquid ones. For instance, the share of bank loans and debt instruments in U.S. external liabilities was sixty-three percent on the eve of the crisis in 2007, while the share of direct investment and equity claims in gross external claims was sixty percent.

The value of U.S. government bonds, which constitute a large part of the country's external debt liabilities, remained stable or actually increased at the height of the crisis. Meanwhile the value of its external assets (dominated by riskier equity and FDI) plummeted. Thus the net foreign asset position of the U.S. declined dramatically. Between 2007Q4 and 2009Q1, the U.S. net foreign asset position deteriorated by twenty-one percent of GDP.²³ In this way, the United States provided insurance to the countries holding U.S. government bonds and shared in the losses of collapsing equity prices around the world.

²⁰ Lane and Milesi-Ferretti (2007) and Gourinchas and Rey (2007).

²¹ Interestingly, Asian economies had net dollar liabilities during the Asian crisis of 1997-1998, and that exposure proved especially destructive.

²² See Gourinchas et al. (2012) for elaboration of this argument.

²³ For further details, see Gourinchas, Rey and Truempler (2012) and Milesi-Ferretti (2009).

Other Safe Havens

Other countries like Germany and Switzerland also served as safe havens, albeit on a smaller scale and only regionally. For example, Switzerland's debt liabilities fell very little (\$6 billion in dollar terms) between 2007Q4 and 2009Q1, while the value of Swiss external claims collapsed, partly due to a decline in the value of Swiss external bond holdings. On net, Switzerland made a net transfer of approximately \$53 billion (4 percent of Swiss GDP) to the rest of the world.

The ability of countries to benefit from such insurance depends on the characteristics of their external portfolios and not simply on whether they invest in safe-haven countries. While the extensive U.S. government bond holdings of the People's Bank of China insured China against valuation losses during the financial crisis, the large U.S. corporate ABS holdings of European banks had the opposite effect. This underscores one of the main points of this report: large cross-border investment positions can facilitate risk sharing but can also transmit financial contagion. The specific structure of the external portfolio is critical for determining the balance of the two effects.

Capital Flows and the Exchange Rate

Economists have traditionally seen exchange rate appreciation driven by capital inflows as self-correcting. Once the currency has appreciated sufficiently, the investors responsible for the capital inflows will recognize the change in the risk-return configuration and will therefore slow their investment. Indeed, the standard prescription of the official sector continues to follow a lexicographic ordering in which the real exchange rate should be allowed to appreciate sufficiently, and all the domestic macroeconomic policy responses should be exhausted before (and as a last resort) deploying measures to stem the capital inflows directly.²⁴

Standard caveats, of course, accompany the standard prescription. Domestic distortions could be responsible for both the capital inflows and the exchange rate appreciation. For example, very high domestic interest rates may explain why foreign investors are willing to take long positions in the domestic economy, in particular in the short run. In this case there may be a positive correlation between short-term inflows and exchange rate appreciation, but the ultimate cause will be a third factor: the distortion in domestic yields. Problems will then be exacerbated if the country authorities then attempt to limit appreciation. Anticipated appreciation plus the high domestic interest rate will attract additional inflows, dooming the attempt to limit appreciation. The implication is that policymakers should not attempt to use capital controls to defend policy inconsistencies, which often are not possible to resolve in the short-run. (Chile's experience in the 1990s, and Brazil's more recently, are especially informative in this context.)

When bank credit constitutes the bulk of inflows, there is an additional caveat to the standard prescription of letting the currency appreciate. As noted earlier, the behavior of banks and other leveraged institutions is influenced by their capital positions and the perceived risks. Currency appreciation and strong profitability coupled with tranquil economic conditions can be seen by banks as a cue to further expand lending, leading to further capital inflows. This is in contrast to the behavior of textbook investors, who see an appreciation as a cue to start selling the domestic currency.

Consider the example of a foreign bank branch that lends in dollars to local borrowers, who then convert the proceeds of the dollar loan into local currency, possibly to hedge the currency risk from long-term export receivables, or to engage in outright speculation that the local currency will appreciate further against the dollar. In such a situation, an initial appreciation of the recipient coun-

²⁴ Ostry et al. (IMF 2010, 2011)

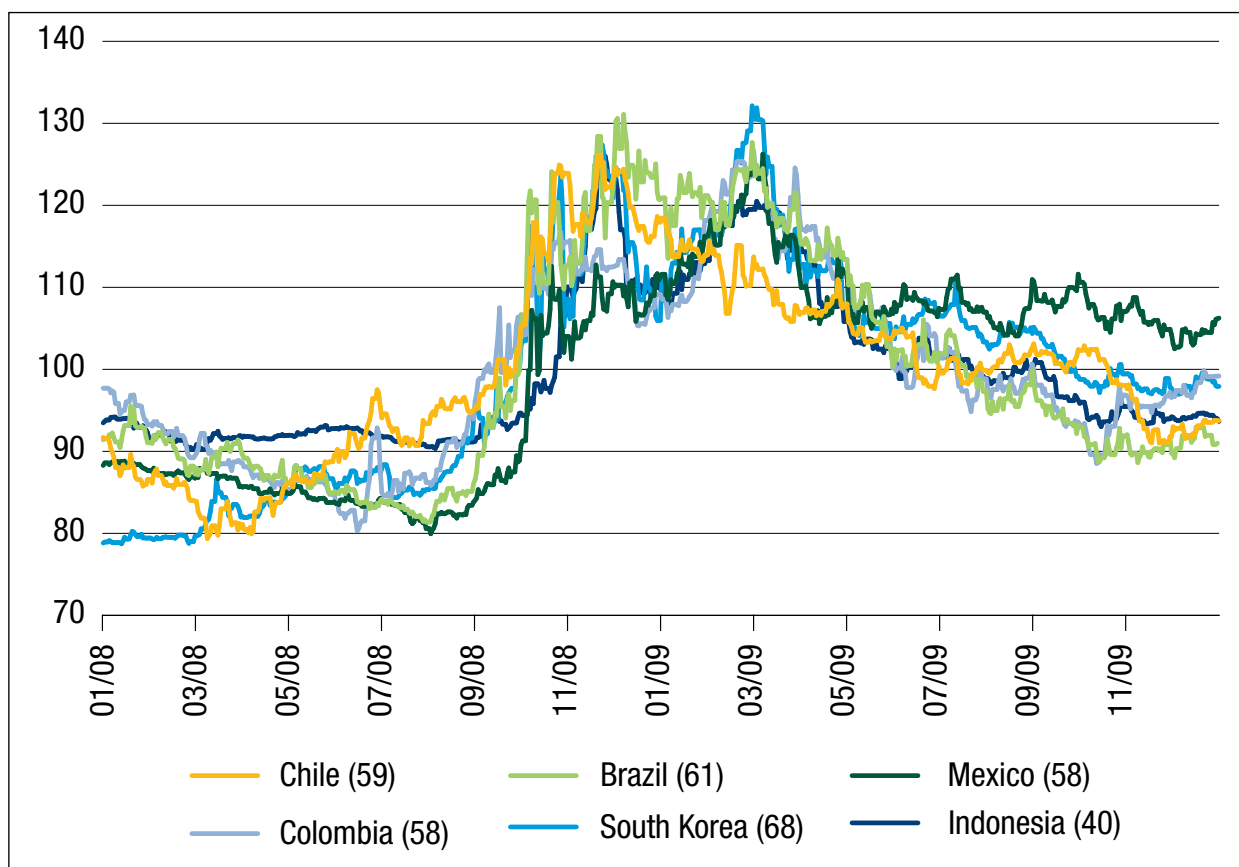
try's currency will strengthen the balance sheets of domestic borrowers who have borrowed in dollars. Since borrowers become more creditworthy, bank loan books will become less risky, creating additional capacity to lend. In this way the initial impulse from the appreciation of the domestic currency can be amplified through a reinforcing mechanism in which greater risk-taking by banks reduces credit risk, which elicits even greater risk-taking by the banks and further appreciation of the domestic currency, thereby completing the circle.²⁵

In such a setting, an appreciation of the domestic currency may not have the presumed effect of curtailing capital inflows. The upward phase of the

cycle will give the appearance of a virtuous circle, in which the mutually reinforcing effect of real appreciation and improved balance sheets operate in tandem. Once the cycle turns, however, the amplification mechanism operates in reverse, reinforcing the financial distress of borrowers and the banking sector.

The basic philosophical divide is therefore between those who do and do not believe that real appreciation eventually chokes off capital inflows due to a reassessment of the attractiveness of the destination currency. Members of the first camp (the traditional view) believe that capital flows are driven by textbook portfolio investors who are motivated by fundamental assessments of currency values,

FIGURE 7: Exchange rates in Latin America and Asia during the global crisis: index, average 2008-2009=100



Source: Bloomberg. An increase is depreciation, numbers in brackets are percent depreciation from bottom to peak. Depreciations were significant and financial systems were resilient.

²⁵ The potential for feedback between capital inflows and compressed credit risk in the recipient economy generates a potential channel for cross-border monetary policy spillovers. See Bruno and Shin (2012).

while members of the second camp believe that capital flows are driven not only by assessments of fundamental value but also by the short-term imperatives of bank balance sheet capacity and what Borio and Disyatat (2011) refer to as the “excess elasticity” of credit.

During the last few years, the tension between these two views has become apparent in policy circles and multilateral organizations such as the IMF and BIS, who have begun to reassess the traditional lexicographic ordering of policy options. Domestic distortions in the capital receiving countries may not be the only important distortions, in other words. To the extent that “excess elasticity” in sending country institutions is also a problem, an adequate policy response can take place only at the global level.

Second Best Again

There is, of course, another way. Given the bad experience during previous crises, financial systems in emerging markets, in particular in Latin America and Asia, have become much more resilient to exchange rate fluctuations. Figure 7 shows exchange rate fluctuations during the recent crisis.

The figure shows the large fluctuations in emerging market currencies. The number in brackets is the percentage depreciation, from minimum to maximum, over that period. All Latin American currencies in the figure depreciated roughly sixty percent, while the Korean won depreciated almost seventy percent, and the Indonesian rupiah depreciated by forty percent. Other emerging markets not shown in the figure experienced more moderate depreciations on the order of twenty percent.

In earlier periods, these exchange rate fluctuations would have threatened financial stability. This time,

however, banking systems were more robust. Part of the explanation is the more robust health of sovereigns, which could support their banks as needed. In addition, the foreign-currency exposures of emerging Asia and Latin America shifted radically over the last decade.²⁶ Many of these countries are now “long” foreign currencies, with foreign-currency assets (mostly reserves) exceeding foreign-currency liabilities. This allows them to undertake currency depreciations without damaging the aggregate balance sheet. For their part, regulators and bank management are also more wary about allowing asset liability mismatches to build up.

This is not to say that foreign-currency risks have been eliminated. In Brazil, Korea, and Mexico, some non-financial corporations engaged in currency speculation, resulting in losses to the financial system, and in some cases prompting some central banks to intervene in order to limit currency depreciation. However, the problems never rose to the point of threatening financial stability. All this suggests that in the absence of global rules and regulations, domestic regulations that ensure banks are cautious about asset liability mismatches, and that ensure the financial system is resilient to large changes in asset prices, can make an important difference.

Contrast the more cautious approach followed by the authorities in Asia and Latin America with that in Central and Eastern Europe.²⁷ For peggers such as Latvia, the foreign-currency debt was a major constraint on adjustment to the crisis. In Latvia, with its debt denominated in euros, devaluation would have had a devastating impact on the balance sheets of banks and other borrowers with foreign-currency liabilities. Lack of access to foreign-currency liquidity meant that adjustment pressures were greater for these countries than for otherwise similar economies, a problem that was

²⁶ See Lane and Shambaugh (2010) for the changes over this time.

²⁷ Descriptively, much of the foreign-currency debt was intermediated through foreign-owned banks in these countries. However, for a sample of emerging European banks, Brown and De Haas (2012) estimate that there is no difference between foreign-owned and locally-owned banks in their propensity to make foreign-currency loans.

ameliorated if not solved through official funding by the IMF and the European Commission.

In contrast, for countries with flexible exchange rates, such as Hungary, currency depreciation had cross-cutting effects. A weaker currency was good for the trade balance, but it created balance sheet problems by increasing the local-currency value of euro and Swiss franc liabilities.

Capital flows within the euro area are a useful testing ground of the relationship between a common currency and credit flows. The empirical evidence is that the elimination of currency risk among the member states strongly promoted cross-border credit flows, as was evident in rapid growth in the inter-bank market, money markets, and bond markets after the creation of the euro.²⁸ This increased the dispersion of credit growth rates across euro area member-states by encouraging wholesale funding flows to banks in faster-growing countries from banks in slower-growing countries.²⁹

Faster-growing countries also typically experienced higher inflation rates. With a common nominal interest rate, real interest rates were lower in the faster-growing countries, exacerbating differences in spending levels and borrowing patterns. In principle, countervailing measures could have been taken. However, fiscal policies were not strongly counter-cyclical during this period, to put an understated gloss on the point.³⁰ National bank regulators did not use macro-prudential policies to rigorously control credit growth.

Finally, the European Central Bank has been an important buffer mechanism for the euro area during the crisis. The large-scale exit of private credit flows from the deficit countries has been replaced by ECB lending through its liquidity operations. This has moderated the impact of the sudden stop, although the exposure of the ECB to deficit countries poses tail risk to the general membership if banks in deficit countries default on their official obligations.

²⁸ See Lane (2006, 2010) for details.

²⁹ See Lane and McQuade (2012).

³⁰ See Benetrix and Lane (2012).

Policy Implications

The previous sections have shown that the increasing complexity of financial markets and high level of international financial integration generate significant risks both within and across national borders. Capital flows can act as a channel for the build-up of financial sector imbalances as well as the transmission of risks across national borders. For these reasons, our Committee has placed better regulatory policies at the national level and coordination of regulatory and macroeconomic policies across countries as being critical ingredients for the maintenance of global financial stability.

The coordination of monetary and macroeconomic policies was the focus of our previous report, *Rethinking Central Banking*. In this report, which can be thought of as a complement to its predecessor, we focus instead on capital flows and financial regulation, especially of the macro-prudential type. International coordination is every bit as important in this context. The problem is that it is all too rare. What makes international capital flows special—and, sometimes, especially dangerous—is that policy makers do not always internalize the externalities that their policies impose on other countries. This failure to coordinate regulatory policies provides a rationale for paying special attention to capital flows.

Furthermore, our analysis has highlighted the special risks posed by cross-border banking flows. It is in this area that appropriate regulatory and macroeconomic policies can have the greatest impact in terms of improving the benefit-risk tradeoff from financial integration. Hence, we focus on bank regulation in discussing the policy implications of our analysis.

The spillover effects of individual country policies transmitted through financial channels suggest that coordination of policies, especially in terms of banking regulation, would be broadly beneficial. We therefore turn now to some specific areas where such coordination can be helpful and suggest how they should be implemented, ideally at the global level.

Of course, international policy coordination is not a panacea, and it may not always be feasible, given political constraints. In the absence of adequate international coordination, it may be necessary to depart from the First Best approach that takes as its ideal the frictionless model of the economy and regards any policy that introduces further deviations from the model as being unlikely to improve outcomes. In this case, policy makers should instead adopt a Second Best approach with which they might intervene to introduce a new friction to offset an existing one. The combination could improve efficiency.

This Second Best approach requires a more comprehensive evaluation of the entire system to see what interventions might help. It is therefore more demanding of policy makers and is potentially more prone to policy errors.

A particular danger with this approach is that it can provide license for all manner of interventions, including some with the potential to worsen outcomes. Each and every anti-market campaigner could appeal to a hypothetical distortion to justify his or her favorite intervention. The antidote to such policy adventurism is evidence, both in the analysis leading up to policy formulation and in decisions of whether to implement and maintain a policy.

Coordination of Regulatory Policies

The coordination of financial regulation can occur on four levels. The weakest form of coordination is information sharing about systemically important institutions. Applying common rules across jurisdictions and creating a common level field is more ambitious. Common enforcement through shared cross-border regulatory and supervisory agencies, as is currently under discussion in the European Union, is stronger still. The strongest form of coordination entails a willingness to share losses from supervisory failures among countries, leading ultimately to an arrangement that is similar to what we observe within unitary and federal states.

Data Sharing

Data sharing is a first step toward a better-coordinated outcome. In the context of bank-intermediated flows, for example, it is difficult to evaluate potential spillover effects that foreign fund providers can have on the domestic market if the domestic regulator has only an incomplete picture of the financial soundness of the fund providers. This information is obviously critical for systemically important financial institutions (SIFIs), but it is also important for smaller institutions. For non-SIFIs, it

is important to share information about the extent to which their holdings are correlated. Many small foreign fund providers can become systemic if they behave as a herd, thus triggering contagion. Finally, regulators should also share their action plan in case of a crisis to minimize externalities. Overall, mutual data sharing arrangements help build trust in an international regulatory community.

Common Enforcement – Banking Union

Data sharing and common rules are important building blocks for internalizing the cross-border externalities that can flow from supervision and regulation at the national level. Rules, however, are no better than their enforcement. At a minimum there should be a court of arbitration to overcome disputes about enforcement of various rules similar to the one that allows countries to resolve WTO trade conflicts. A stronger version would be a “banking union”, which is currently under discussion in Europe. In its strongest form, this would entail a single central regulator with powers of regulation and resolution backed up by national regulators who complement the work of the cross-border regulator, especially in overseeing smaller financial institutions.

Loss Sharing – Mutual Insurance

Closer coordination involves some form of loss sharing in the absence of a full banking union and a single resolution authority but rather common enforcement of national rules. To avoid moral hazard, national governments should control the design and enforcement of financial regulation and bear the losses. When responsibility is shared, it is important to have in place loss-sharing arrangements ex ante, since these are notoriously difficult to introduce after the losses have materialized. They should be organized before a crisis (“under the veil of ignorance”) in the form of a mutual insurance scheme. One specific organizational form in this context is a common deposit insurance scheme of the sort that is currently under discussion in Europe.

Policy Implications for Europe

Even if one agrees that strict regulation of capital flows and renationalization of financial systems is appropriate in some instances, there is no presumption that renationalization is the universal answer in all cases. The euro area is a case in point, given the very severe disruptions that would be caused by any attempt to return to separate national currencies and segmented financial systems. The euro area is therefore a case where prescriptions may differ substantially from those appropriate for an emerging economy. Rather than requiring renationalization of the financial system, a more thoroughgoing integration at the level of the monetary union should be the objective of policy.

The euro area already has the institutions for conducting a common monetary policy. In this respect, it comes closer than any other collection of countries to replicating features generally characteristic of a single sovereign jurisdiction. However, the euro area still lacks a banking and financial union. This gives rise to a number of problems:

- Since investors face no exchange rate risk, the build-up of imbalances can be even higher than in an environment with separate national currencies.
- The existence of a single currency makes it more difficult to use monetary policy to lean against credit booms in individual countries. This heightens the importance of putting in place appropriately designed national and regional macro-prudential institutions and tools.³¹
- While the euro area has a common monetary policy, bank regulation remains fragmented. Europe has relied on a division

of labor between home and host authorities that assigns responsibility for financial institutions to the first (in the case of branches) and responsibility for country-wide financial stability to the second. While the EU has created a pair of transnational regulatory bodies, the European Systemic Risk Board (ESRB) and the European Banking Authority (EBA), neither of these has direct powers. They can issue warnings, but they can only request action from national authorities.

- Differences in the fiscal condition and macroeconomic policies of different governments, actual and perceived, have led to differences in the financing costs faced by similar firms in different countries.
- Banks in the euro area still exhibit a strong home bias in their credit and bond portfolios, which makes them sensitive to domestic macroeconomic and financial events.³² A collapse in real estate prices, doubts about the solvency of the sovereign, or problems in the corporate sector can give rise to doubts about the solvency of the banking system, given the concentrated domestic exposures.
- With seventeen independent national fiscal authorities, the euro area is at risk of drifting into a “fiscal dominance regime” in which the central bank loses power over monetary policy if some fiscal authorities do not follow a responsible debt path.³³ The central bank will then face two unpleasant alternatives: higher inflation or sovereign default. A fiscal union or a stronger disciplining mechanism is essential to avoid this problem.

³¹ See, for example, Brunnermeier (2010).

³² See Brunnermeier (2010).

³³ For the fiscal theory of the price level at which a central bank has to deal with several fiscal authorities see, e.g., Sims (1999) and Canzoneri et al. (2010).

In recognition of the necessity for a banking union, the allocation of primary regulatory authority to the ECB is currently under negotiation although the division of responsibility between the ECB and national regulators is not yet settled. However, this has to be reinforced by agreement among the member countries in relation to the fiscal backstop for the banking union, in terms of common deposit insurance and a common resolution fund.

In many respects, the capital flow reversal that occurred in Europe in 2009-10 was a surprise for policy makers. Until the crisis, the conventional wisdom held that current account deficits would be financed automatically in the monetary union in the same way they are financed within a country. Research seemed to concur, with the notable exception of Garber (1998), who foresaw that the TARGET system, through which imbalances among members of the European System of Central Banks are settled, was susceptible to a financial-account crisis.³⁴

The logical conclusion is that deeper integration of the financial system through a fully-fledged banking union is the correct prescription for Europe's current problems. The case for a banking union is stronger still if one believes that the common monetary policy in place within the euro area achieves better implicit coordination than would policies chosen by countries based primarily on domestic considerations. Since the absence of coordinated monetary policy is an important reason for choosing the Second Best approach to capital flows, the euro area does not face this particular impediment to deeper integration.³⁵

Nevertheless, it is far from guaranteed that the strategy for full financial integration being pursued by

European policy makers will be met with success, given the unfavorable economic backdrop and shifting political imperatives in each country. For the moment, the euro area is best characterized not as a true economic and financial union but as a monetary union embedded in a single market for financial products. For the arrangement to survive, this will have to change.

One thing is certain. The euro crisis and responses now being proposed set an important benchmark for thinking about the policy toward unfettered capital flows. If deeper integration can't work in Europe, then it will be difficult for it to work well elsewhere. The experience of the euro area should be seen as a litmus test for the First Best approach to capital flows. It represents perhaps the most favorable environment where the vision of the fully integrated financial system in the First Best perspective may be used as a guide for policy. The analogy would be the financial development of the United States and how it overcame the borders between the individual regions and States. It is for this reason that much hangs on the success or failure of the European policy response. If the First Best approach fails in the euro area, then it is probably inappropriate in other contexts.

Operationalizing the Second Best Approach

While we have made a case for coordination of regulatory policies as a necessary component of the First Best approach to managing capital flows, the ideal of enlightened global financial regulation remains elusive, and not just in Europe. This points to the need to think systematically about how to implement the Second Best approach.

³⁴ Target, or Trans-European Automated Real-time Gross Settlement Express Transfer System, is essentially a settlement system for inter-bank transactions among banks in the euro zone. More recently, Sinn (2012) has drawn attention to the growing imbalances in the TARGET system.

³⁵ Of course, coordination is best achieved when each country has its own policy but they sit together to discuss spillovers and necessary policy adjustments. With a common monetary policy, coordination is implicitly and imperfectly achieved by considering the one-size-fits-all policy that works best for the zone as a whole.

But even if one accepts the validity of the Second Best approach, formulating the policies that flow from it remains challenging. The challenge is not just to identify the impediments to frictionless markets (the task of the First Best approach) but also to figure out what combination of interventions and mitigation of impediments will help enhance the net benefits of capital flows. Operationalizing the Second Best approach is thus a formidable task. It has great potential for error and is susceptible to capture by special interests.

The suitable sequencing and combination of policy options, both internal and external, will depend on the circumstances faced by the policy maker. It will not be easy to create simple “hierarchies” of policy options that require the use first of one tool then, only when it loses the power to influence, another (for instance in the oft-repeated prescription that central banks should first exhaust regulatory measures before they resort to the interest rate tool in fighting credit and asset price booms). In practice, policy measures have non-trivial trade-offs depending on the severity of the respective distortion. The slope of the trade-off will rarely be zero or infinite, as envisaged by the simplistic recommendations of a “policy hierarchy” that puts the full burden of adjustment on first one set of policies, then another.

Before discussing implementation of the Second Best approach, it is instructive to consider why, despite the potential benefits to coordination of regulatory policies, progress to date has been so limited. The multilateral process governing the reform of banking regulation led by the Group of Twenty, the Financial Stability Board (FSB), and the Basel Committee on Banking Supervision (BCBS) has shown how difficult regulatory reform discussions can be.

The 2008 crisis created an unusual receptiveness to proposals for bold reform of financial regulation, reflecting shock that the global economy could be thrown into a crisis of such magnitude. The initial proposals for reform of capital adequacy requirements by the Basel Committee for Banking

Supervision (BCBS (2009)) reflected that sense of urgency. The centerpiece of the initial proposals for Basel III was a substantially strengthened common equity buffer together with newly introduced liquidity requirements and a leverage cap, and a countercyclical capital buffer together with a capital surcharge for the systemically important financial institutions (SIFIs).

However, momentum dissipated as detailed discussions moved through the Financial Stability Board (FSB) and the Basel Committee on Banking Supervision (BCBS). Negotiations came up against the familiar tension between the role of banking supervisors as guardians of financial stability and their role as champions of domestic banking sector interests. In the latter role, supervisors take on the role akin to trade negotiators, their objective to secure the “best deal” for domestic interests.

European global banks that had seen some of the fastest lending growth in the years before the Lehman crisis in 2008 were among the institutions that stood to be adversely affected by the proposed strengthening of capital standards. In this context, the trade negotiation aspect of the multilateral bank regulatory reform process took on increasing importance. The initial proposals of the Basel Committee (BCBS (2009)), which reflected the initial round of negotiations between national regulators, were further watered down along several key dimensions, and even the weakened proposals were only accepted when the adjustment period for their adoption was extended to 2019—a full nine years from the date of agreement. The purported rationale for this delay was to prevent too massive a deleveraging process in the context of a weak world economy, but in reality that was only part of the story. Overlooked was the fact that forcing the banks to issue new equity would have addressed the need to hold more capital without aggravating deleveraging, and destabilizing the economy.

The dilution of even the most basic measures to strengthen bank regulation in the course of these negotiations throws into relief the difficulties of

reaching agreement in a multilateral setting when advancing domestic interests are an important objective of national negotiators.³⁶ Regulating the shadow banking systems and OTC markets for derivatives have encountered similar difficulties.

From the Second Best perspective, the inability of multilateral bodies to coordinate effectively means that individual countries will have to pursue national solutions. Prudential tools that limit capital imports or direct capital controls should be seen as examples of this national approach.

The Macro-Prudential Framework

The existing micro-prudential approach to financial regulation rests on the role of capital as a buffer against loss, with the focus on the “loss absorbency” of bank capital. There are two important shortcomings of such an approach.

- Loss absorbency does not directly address excessive asset growth during booms, when the vulnerabilities to financial crises build up.
- The preoccupation with loss absorbency diverts attention from the liability side of banks’ balance sheets and vulnerabilities from the reliance on unstable short-term funding and short-term foreign currency funding.

This points to the importance of supplementing traditional micro-prudential tools with macro-prudential policies. Macro-prudential policies

are aimed, in the first instance, at dampening the pro-cyclicality of the financial system. They act by leaning against excessively rapid growth of credit in booms, thereby helping achieve more sustainable long-term loan growth, while at the same time reducing the liability side’s vulnerability to sharp reversals in global liquidity conditions.

A macro-prudential policy framework consists of:

- A set of indicators that shed light on the procyclicality of the financial system and signal potential vulnerability to financial instability; and
- A set of policy tools that can complement existing micro-prudential regulatory tools in order to mitigate the build-up of risks.

Asset price booms fueled by short-term credit deserve special attention, since the bursting of credit bubbles leads to more deleveraging and stronger amplification mechanisms.³⁷ In this case, potential relevant macro-prudential indicators are the rate of growth of private credit relative to GDP and the rate of growth of key credit-fueled asset prices such as those of housing. In addition, this report provides some rationale for taking note of specialized monetary aggregates such as the “non-core liabilities” of the banking sector as indicators of financial vulnerability.

Monetary policy also has implications for capital flows, non-core liabilities, and the balance sheet composition of domestic and global banks [see *Rethinking Central Banking*]. Hence, monetary

³⁶ Some simple steps could certainly be taken to improve information sharing among supervisors and investors across major financial centers. For example, the divergence between accounting standards on both sides of the Atlantic prevents straightforward and accurate comparisons of the balance sheets of large banks. The leverage ratios released in the public domain of U.S. Banks and European banks are not comparable, creating much confusion among the general public and some analysts. The leverage ratios of U.S. banks appear generally lower, as in the U.S. accounting-standards the derivatives exposures with the same counterparty are reported netted, while European banks report gross derivative positions, which makes risk exposure more transparent. There are also some differences on the (non) reporting of off-balance sheet items. If an agreement cannot be reached by the IASB, the private body in charge of these issues on harmonizing accounting standards, then, at least large banks (SIFIs) should be asked to report under both standards. This would enhance transparency and enable supervisors who have to monitor risk of subsidiaries of large banks within their jurisdictions to have fully comparable data across entities.

³⁷ An immediate question is why supposedly rational market participants find it more profitable to ride the trend “as long as the music is playing” rather than lean against it. In a setting in which a correction occurs only after a sufficiently large number of market participants change course, it is possible that each individual waits for others to move (see, for example, Abreu and Brunnermeier (2003)). As a consequence, the necessary correction often occurs after large imbalances have already developed.

policy has important financial stability effects. By the same token, macro-prudential policy that curtails loan growth will have an impact on aggregate demand and real economic activity, and hence will have a direct impact on the stabilization of macroeconomic activity. It is thus worth reemphasizing here that a neat division between monetary policy and policies aimed at financial stability is unlikely to be useful in principle, or viable in practice.

Turning to specific macro-prudential tools that can complement more traditional monetary policy tools, capital requirements that lean against overly rapid credit expansion can mitigate the lending cycle. The idea that the required capital buffer should vary over the financial cycle has been discussed for some time.³⁸ The framework for countercyclical capital buffers as envisaged in the Basel III framework has focused on the ratio of credit to GDP as an appropriate indicator of the stage of the financial cycle.³⁹

There are measurement challenges, however, even for something as seemingly straightforward as credit growth. To serve as a signal of pro-cyclicality, any measure should mirror risk-taking attitudes or market risk premiums. The need for judgment is especially important in emerging and developing economies insofar as rapid financial development renders statistics on credit growth less useful as a gauge of risk appetite. Further research will be necessary to determine to what extent the simple credit to GDP ratio can serve as a finely calibrated signal that can support the use of automatic tightening of bank capital standards, as envisaged in the Basel III framework.

Caps on bank leverage may be a useful supplementary way of limiting asset growth by tying total assets to bank equity. The rationale for leverage caps rests on the role of bank capital as a constraint on new

lending rather than the Basel approach of bank capital as a buffer against loss. Leverage constraints are de facto capital requirements with no risk weights. The main constraint on credit expansion is bank equity, which may be regarded by the bank as being a more expensive funding source than short-term debt. By requiring a larger equity base to fund the total size of the balance sheet, the regulator can slow down asset growth. Of course, without a countercyclical link these measures can be counterproductive, as they lead to more constraints in the downturn and thereby amplify volatility.⁴⁰

Removing tax subsidies for debt would eliminate an important distortion to bank capital structures. However, the key concern for banks is not leverage per se but short-term leverage. Removing the tax advantage of debt would do little to move banks to longer funding maturities. Similarly, forcing banks to raise more capital can contribute to stability, but it will also dampen intermediation if banks find short-term debt to be less expensive. We need new ways to raise effective bank capital that also take into account the behavior of bank management.⁴¹

In addition to regulatory tools that influence the bank's balance sheet management, there are administrative tools that act as brakes on bank asset growth directly, such as caps on loan-to-value (LTV) ratios and debt-service-to-income (DTI) ratios. LTV regulation restricts the amount of the loan so as not to exceed some percentage of the value of the collateral asset. DTI caps operate by limiting the debt service costs of the borrower so as not to exceed some fixed percentage of verified income.

The macro-prudential rationale for imposing LTV and DTI caps is not only to limit bank lending so as to prevent both the build-up of non-core liabilities to funding such loans but also to lean against the decline in lending standards that is associated with

³⁸ The Geneva Report on bank regulation (Brunnermeier, Crockett, Goodhart, Persaud and Shin (2009)) develops this theme.

³⁹ The work of BIS economists, especially Borio and Lowe (2002, 2004) has been influential in the shape of the Basel III bank regulation rules.

⁴⁰ See e.g. Brunnermeier and Sannikov (2011).

⁴¹ See, for example, Flannery (2005) or Kashyap et al. (2008).

rapid asset growth. Although LTV ratio caps are familiar tools, DTI caps are less widespread. DTI rules have the advantage that bank loan growth can be tied at least loosely to wage growth. However, DTI rules require considerable information and administrative capacity; they imply the ability to monitor total borrowing and the need for a centralized credit registry. Not all jurisdictions have such capacity—for instance, the United States has credit registries only at the county level, so it could not easily apply DTI rules. Since property market booms and busts have been particularly damaging, tools targeted at limiting credit growth in these markets when they overheat will be particularly valuable. Needless to say, a close look at the distortions induced by policies such as mortgage subsidies is also warranted.

Macro-prudential tools that act directly on lending growth could be dubbed “asset-side tools” as they act on the asset side of banks’ balance sheets. By analogy, liability-side tools operate on the liability side of bank balance sheets, thereby addressing the build-up of liquidity and currency mismatches and the underpricing of risk on global capital markets. The Korean levy on non-core liabilities in effect since August 2011 is a case in point. Banks pay a levy of twenty basis points per year on foreign-currency-denominated liabilities of less than twelve-month maturity. The revenues are paid into a special foreign exchange reserve account. A similar levy introduced by the U.K. in 2010 has the revenue paid into the general governmental fiscal account and is therefore better thought of as a fiscal measure rather than as a countercyclical macro-prudential measure.

Quasi-fiscal tools like the bank levy are relative newcomers compared to traditional capital control methods, such as the unremunerated reserve requirement (URR) pioneered by Chile during the 1990s and utilized subsequently by countries like

Colombia. Colombia put in place a URR in 2007-08, when the central bank required importers of capital to deposit a fraction of their balances at the central bank. This is equivalent to a tax on foreign inflows, whose rate depends on the opportunity cost of funding. The popularity of measures such as the URR may be due in part to the fact that central banks have been in charge of both prudential policy and monetary management. The central bank normally has had discretion to use URR policies without going through the legislative procedures associated with other types of capital controls such as levies and taxes.

A limitation of the URR is that its effectiveness is severely curtailed in an environment with low interest rates. Although the URR is an implicit tax on a balance sheet item, the implied tax rate will vary with the opportunity cost of funds and hence with the interest rate. The variability of the effective tax rate thus implies the need for regular adjustment of the reserve rate, for example by raising reserve requirements when interest rates are low.

The legislative process required to implement a levy can entail considerable delay.⁴² When the external environment is changing rapidly, long delays make the introduction of a levy impractical. Nevertheless, as in Korea’s case, alternative measures that rely on existing legislation or other temporary measures can be used in the interim until the longer-term policy measures come into force.

Capital Controls

Capital controls are close cousins of liability-side macro-prudential policies. The IMF has recently suggested the more neutral term, “capital flow management” (CFM) policies (IMF 2011).

The distinguishing feature of capital control measures is that they discriminate on the basis of the

⁴² In the case of Korea, discussions on the levy began in February 2010 (Shin (2010)), but the eventual announcement of the implementation followed in December 2010. The legislative hurdles were cleared in April 2011, and the levy implemented in August 2011. The whole process took 18 months, illustrating the practical challenges in setting up a new system.

residence of the investor. Examples include inflow taxes like Brazil's IOF as well as administrative measures that restrict or prohibit certain activities or investments by foreign investors. Although capital controls have been employed with the goal of limiting the rate of exchange-rate appreciation, their effectiveness in this context is contested. There is better evidence on the financial stability consequence of capital controls. Ostry et al. (2011) note that there is a strong empirical association between capital controls on the one hand and less severe forms of credit booms and FX borrowing on the other. The authors take the recent financial crisis as a natural experiment into the effectiveness of capital controls and conclude that the evidence is "suggestive of greater growth resilience in countries that had either capital controls (especially on debt liabilities) or prudential measures in place in the years prior to the crisis."⁴³ Of course, the countries that had controls or prudential measures in place are not a randomly selected sample. More work will be needed to place these findings on a firm footing.

Magud, Reinhart and Rogoff (2010) provide a "meta-analysis" of the survey literature on the effects of capital controls. Based on thirty-seven empirical studies, they find that controls on inflows seem to make monetary policy more independent, alter the composition of capital flows, and reduce real exchange rate pressures (although the evidence there is more controversial). The change in the composition of flows is key from a financial stability perspective. As argued earlier, long-term equity and/or FDI financing is relatively stable and hence should be welcomed. Capital controls on inflows seem not to reduce the volume of net flows or the current account balance. As to controls on

outflows, the instances of their use are much rarer, with the experiment by Malaysia during the 1997 Asian financial crisis standing as an example high on many observers' lists. In Malaysia, controls reduced outflows and may have given room for more independent monetary policy (the other poster child does not fare as well, in that our results are not as conclusive as for the Chilean controls on inflows). Apart from the Malaysian experience, there is little in the form of systematic evidence of "success" in imposing controls, however defined.⁴⁴

The Malaysian experience illustrates the stigma associated with controls on capital outflows, which can be seen as violating a basic undertaking by the host country to respect the rights of investors. However, the stigma does not stop there. There can be a similar though less severe form associated with controls on inflows. For countries that have signed up to legal obligations that prevent them from imposing controls, such as members of the European Union (and more loosely, members of the OECD), capital controls can not only carry stigma but also violate treaty obligations.

In any case, a distinctive feature of the controls on outflows imposed by Malaysia as well as Iceland and several other countries during crisis periods is that they were imposed in the midst of a financial meltdown and were intended to be temporary. The stigma associated with measures applied in financial emergencies may be less of a concern, especially in the context of those emergency situations when a country's broader credibility is already in question. By contrast, the imposition of capital controls on a longer-term basis to try and compensate for weak policies is only likely to delay painful adjustment.

⁴³ Ostry, Jonathan D., Atish Ghosh, Karl Habermeier, Marcos Chamon, Mahvash S. Qureshi, and Dennis B.S. Reinhart. "Capital Inflows: The Role of Controls," IMF Staff Position Note 10/04, 2010: 23.

⁴⁴ Magud, Nicolas, Carmen M Reinhart, and Kenneth S Rogoff. "Capital Controls: Myth and Reality – A Portfolio Balance Approach," NBER Working Paper 16805, February, 2011: 2.

Summary and Recommendations

This committee has consistently made a case for greater coordination across countries in both regulatory and macroeconomic policies. Our previous report, *Rethinking Central Banking*, laid out the case for monetary policy coordination. This one lays out a parallel framework for regulatory coordination to be disciplined and fine-tuned in light of evidence and experience.

We also recognize that in practice such coordination is not straightforward to design or implement, even when the interests of the relevant countries are congruent. Moreover, even when coordination is globally optimal, it still may generate tensions with national governance.

If effective international coordination proves to be impossible, then the best approach is for countries to design frameworks that mitigate the risks of cross-border flows at the national level. We also provide a number of recommendations from the perspective of individual country policy makers who may be virtuous themselves but often have to cope with the fallout from the weak regulatory and macroeconomic policies of other countries.

Our main conclusions and recommendations are as follows:

1. The policy maker's goal is to reap the benefits from cross-border capital flows while guarding against potential financial stability costs. Reaping the benefits entails resisting vested interests that push for barriers to capital flows as a way of resisting necessary structural reforms and fiscal adjustments. Good macroeconomic and structural policies form the bedrock of financial stability.
2. Persistent current account imbalances pose financial stability risks and have implications for the sustainability of net external asset positions. Multilateral discussions rightly place global rebalancing high on the global agenda. At the same time, such discussions should be linked to the broader nature of the debate on capital flows, and especially the connections between capital flows and financial stability, the procyclical nature of such flows, and the role of monetary policy spillovers in magnifying that procyclicality.
3. Guarding against financial instability requires tracking of the complete matrix of gross cross-border capital flows rather than focusing exclusively on net flows. The structure of international balance sheets is an important determinant of international transmission of shocks and needs to be monitored perhaps even more carefully than net flows or net asset positions. Depending on the characteristics of those balance sheets, they can either foster risk sharing across countries or increase financial contagion.

4. It is important to distinguish amongst different types of capital flows. FDI and equity portfolio investment lead to increased international risk sharing and tend to be stabilizing. In contrast, credit flows, which are not always conducive to efficient risk sharing, have the potential to be destabilizing. This implies that current biases in favor of debt financing over equity financing should be reconsidered.
5. The bulk of global capital flows are intermediated through cross-border banking channels. Effective regulation of cross-border banking is essential for domestic and global financial stability in a highly financially-integrated world economy.
6. The organizational and financial structure of global banks are important for the buildup and transmission of imbalances and should therefore require careful regulatory attention. A lesson from the experiences of different countries during the global financial crisis is that banks that are funded by stable deposits tend to pose fewer risks. Banks that rely on short-term wholesale funding represent a greater risk, irrespective of whether they are domestically-owned or branches/subsidiaries of foreign banks.
7. A system of globally-enforced financial regulation combined with global monetary policy coordination can in principle reduce distortions sufficiently to allow countries to reap the benefits of capital flows while limiting risks to stability. However, political realities imply that multilateral discussions of banking regulation tend to resemble trade negotiations more than rational mechanism design. They imply that monetary policy tends to be conducted with domestic imperatives rather than global imperatives in mind.
8. The incremental liberalization of capital flows in the pursuit of the ideal of the frictionless First Best outcome has not worked as advertised. Instead it has given rise to serious economic and financial instabilities, due primarily to the procyclical nature of cross-border bank-intermediated credit flows. The crisis in the euro area shows that the flaws in the incremental First Best approach are not simply a result of underdeveloped or inadequate domestic institutions, as traditionally argued in the emerging market and developing country context.
9. Given the practical difficulties of attaining a unified global regulatory framework and efficiently coordinating monetary policies across countries, governments would be well advised to adopt a Second Best approach to managing capital flows. Macro-prudential policies can play a key role in this process by imposing judicious and targeted regulations on banks engaged in cross-border activities.
10. Macro-prudential policies should operate on both the asset side of a bank's balance sheet, as do LTV and DTI caps, and the liability side, through devices such as levies on the non-core liabilities. They should attempt to influence balance sheet management by banks through instruments such as countercyclical capital requirements.
11. While some impediments to capital flows may have sound economic justification, in practice others may be the result of political economic pressures that seek to preserve vested interests and resist much-needed domestic policy adjustments. To maximize the former and minimize the latter, the introduction of capital-flow-related restrictions should be clearly and explicitly grounded in comprehensive analysis and careful reading of the evidence.
12. For the euro area, which already has institutions in place for a common monetary policy within its borders, the ideal of the First Best may still be attainable through sufficiently robust financial regulation together with full banking integration. A banking union with a single regulator with ultimate authority would effectively

help cope with both sets of issues. Alternatively, national banking systems that are conservatively regulated at the national level—for instance, through macro-prudential measures that limit banks’ reliance on short-term wholesale funding—would help moderate capital flows that

could otherwise exacerbate procyclical behavior and generate risks. But the middle ground of fragmented financial systems with unimpeded capital flows has been shown by recent events to be untenable.

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Appendix A: Subsidiarization

There are important sources of variation in both the legal form as well as the funding model of a foreign-related bank entity. Subsidiarization is a distinction about the legal form of the entity—whether it is a domestically incorporated subsidiary or a branch of the parent bank—while the funding model is about the composition of the liabilities side of the balance sheet. It is important to distinguish whether the bank is funded mainly from local deposits or is reliant substantially on wholesale funding, either from the parent bank or from the wholesale funding market. We have already discussed how the procyclicality of banking appears to be intimately tied to the funding structure of the bank. When lending expands faster than the core deposits that the bank would normally rely upon, it typically migrates to using non-core, wholesale funding to finance its lending growth. As such, if the foreign-owned banks rely on wholesale funding for a substantial part of their lending, then procyclicality would be built into their balance sheet management.

For instance, foreign-owned banks in Central and Eastern Europe took the legal form of subsidiaries. While these raised considerable local funding in the host economies, a key type of cross-border credit flow for these economies was inter-office funding channeled from their Western European parents. In this way, the operations of foreign-owned banks enabled a faster rate of credit growth than would otherwise have been possible. Conversely, fast repatriation of funding by the parent at the height of the crisis could create a credit crunch and endanger financial stability in the host country. The

decision taken by a major foreign bank to contract lending in the host country leads to a slow-down in economic activity in the host country, which in turn may affect the decision of others foreign lenders, implying that the host country economy may find its funding abruptly cut off. Hence, in such a situation, there is a clear externality and a need for international cooperation.

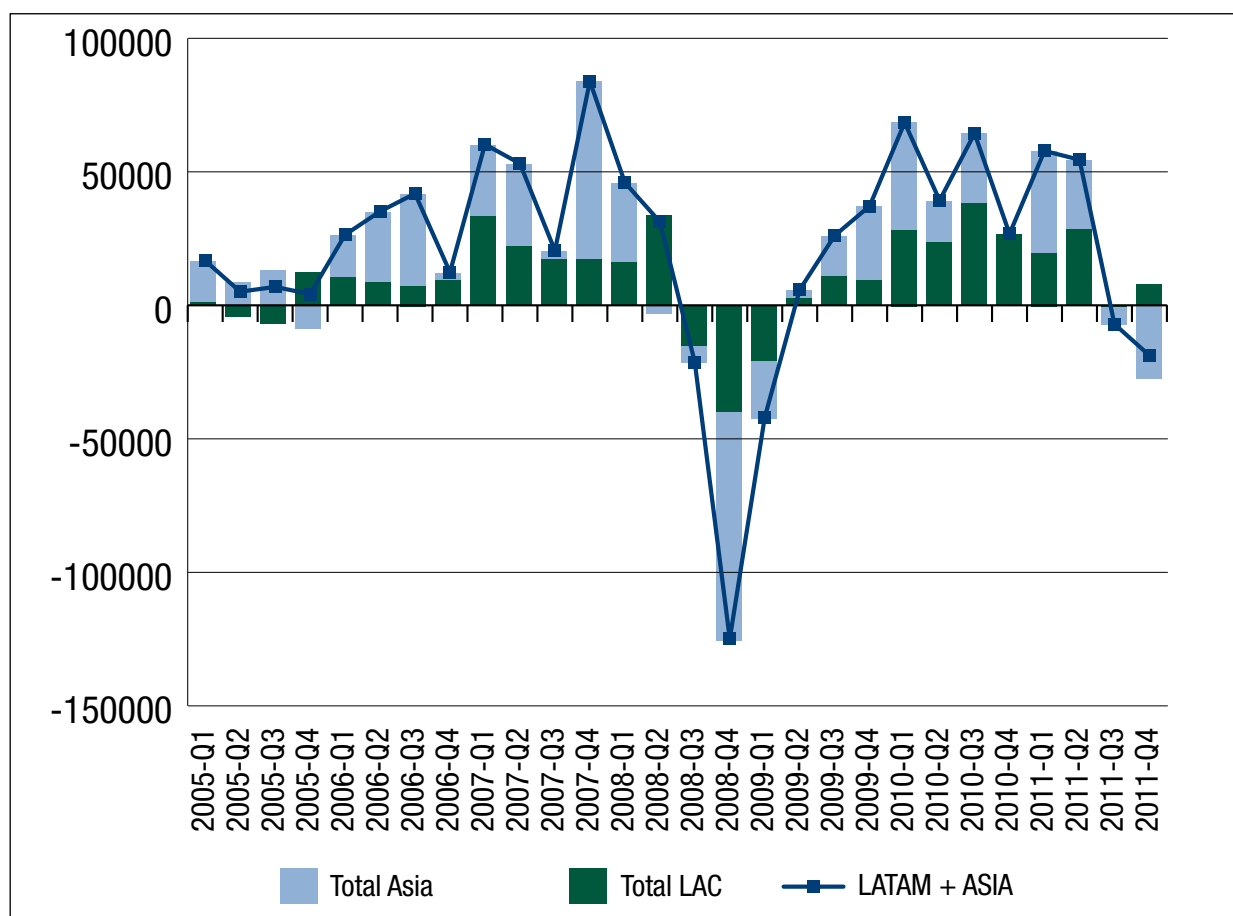
As noted by the BIS (2010) report, many (non-Spanish) European banks use a centralized funding model in which U.S. dollar funds are deployed globally through a centralized portfolio-allocation decision. Some of the funds raised will thus flow to Europe, Asia, and Latin America where global banks are active local lenders. At the margin, the shadow value of bank funding will be equalized across regions through the portfolio decisions of the global banks, so that global banks become carriers of dollar liquidity across borders.⁴⁵ However, the BIS report also notes that Spanish banks have pursued an “arm’s length” approach with regard to managing their subsidiaries.⁴⁶ The fact that foreign-owned banks in Latin America have been owned by Spanish parents has translated into a funding strategy in which most of the funding has been domestic (local) deposit funding, backed up by more stringent local regulation than in many advanced economies. In particular, the subsidiaries of Santander and BBVA are among the most important banks in the region.

Nevertheless, the large presence of Spanish banks has also been a source of concern for Latin American policy makers on the exposure of the banking

⁴⁵ Cetorelli and Goldberg (2009, 2010) provide extensive evidence that internal capital markets serve to reallocate funding within global banking organizations.

⁴⁶ BIS 2010 report by the CGFS on the funding model of global banks.

FIGURE 8: Quarterly Change in Cross-Border Claims (billions U.S. dollars)



Source: Consolidated Banking Statistics (immediate borrower basis), BIS (2012)

system to the financial crisis in Europe. The “arm’s length subsidization model” did not prevent Latin America from suffering a decline in foreign lending, although it was smaller than the one observed in Asia (Figure 8).⁴⁷

A recent IADB report (IADB, 2012) contains a detailed analysis of foreign banks in Latin America and its exposure to European banks.⁴⁸ Considering the sample of the eight largest countries in the region, Figure 9 shows the distribution of foreign claims across countries.

As can be seen, Spanish banks are the most important holders of foreign claims of the banking

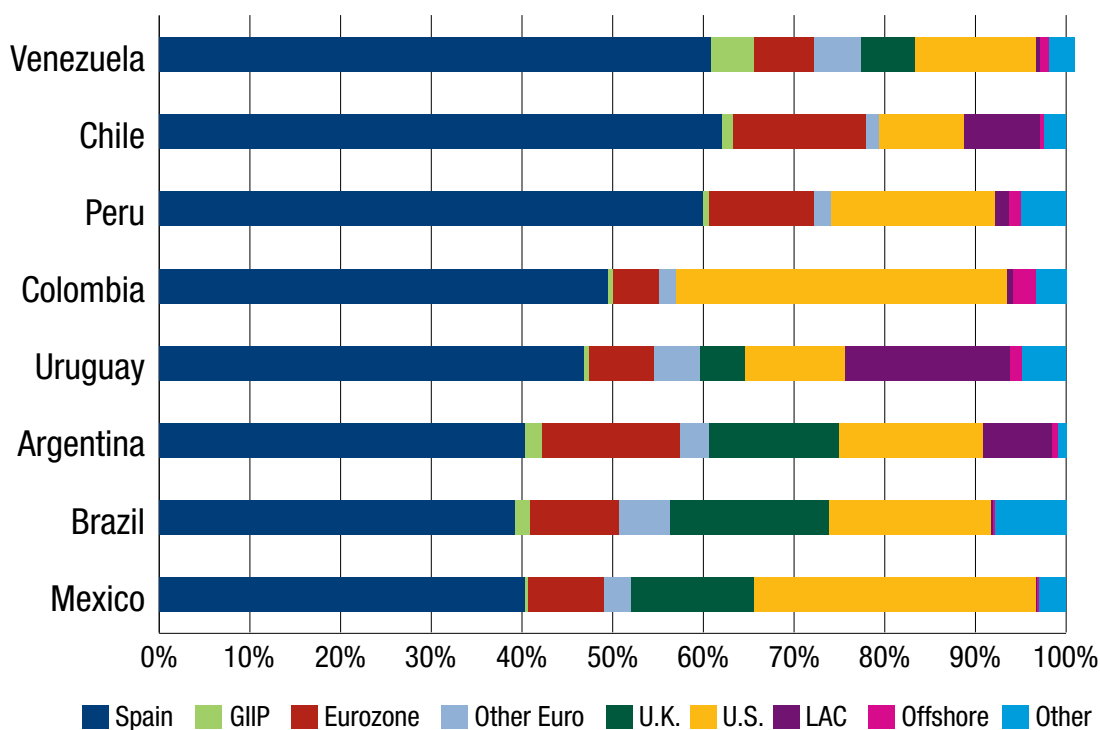
system, followed by the United States, which has a relevant size in Colombia and Mexico, but below the one of Spanish banks. As a consequence, foreign claims are quite important and concentrated in Spanish banks (Figure 10), reaching about half of domestic credit in the case of Peru. Foreign banks have been a significant source of financial deepening and “bancarization” of important segments of the population.

However, as already mentioned, most foreign claims are in a sense local claims (Figure 11): that is local funding in domestic currency, which reduces the exposure of Latin American banking systems to foreign financing. It is interesting to

⁴⁷ In this part we consider a subset of Latin American (Argentina, Brazil, Chile, Colombia, Mexico, Peru, Uruguay and Venezuela) and Asian countries (India, Indonesia, Korea, Malaysia, Philippines, and Thailand).

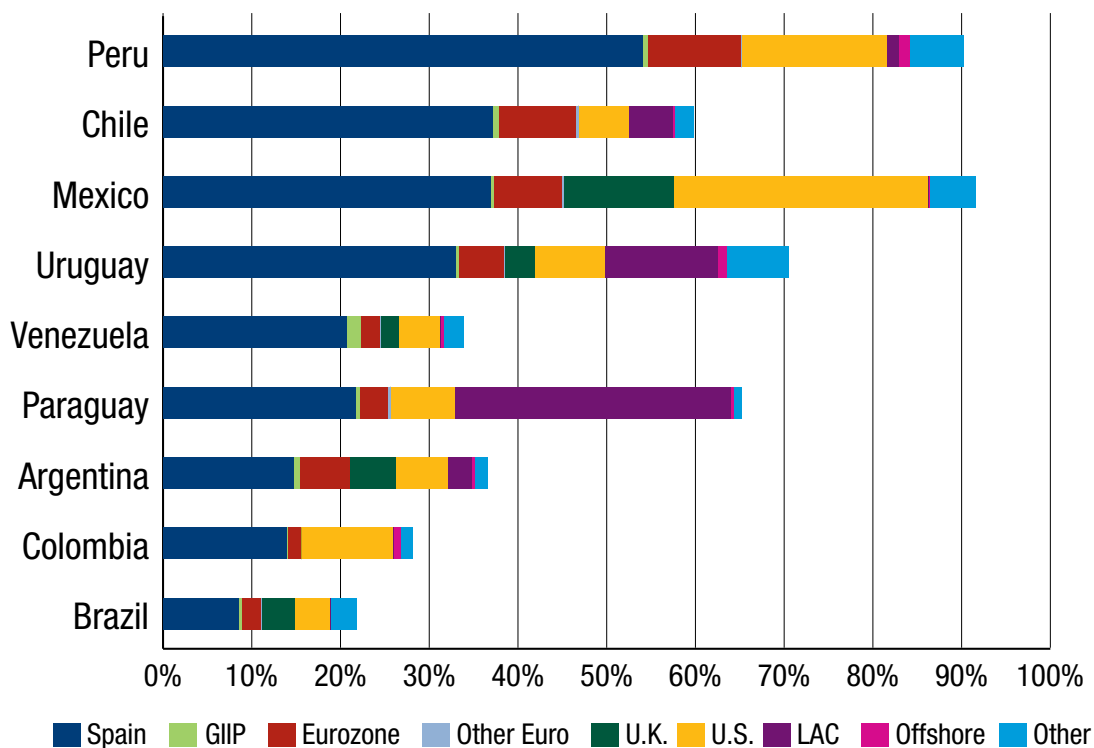
⁴⁸ The data in tables 9 to 11 were provided by IADB, and completed with data from Asia. More discussion can be found in IADB (2012), chapter 8.

FIGURE 9: Foreign Claims of Reporting BIS Banks (as of 2011:Q2)



Source: Consolidated Banking Statistics immediate borrower basis BIS.

FIGURE 10: Foreign Claims of Reporting BIS Banks as Percentage of Total Bank Credit to Domestic Sector (2011Q:2)



Source: Consolidated Banking Statistics immediate borrower basis BIS, and IFS, IMF.

note that some countries, such as Mexico, which has one of the largest levels of foreign claims with respect to domestic credit, is also a country where international claims make up only about a quarter of foreign claims. Therefore, despite the significant relevance of foreign banks in terms of credit, they are still financed mostly with local funds.

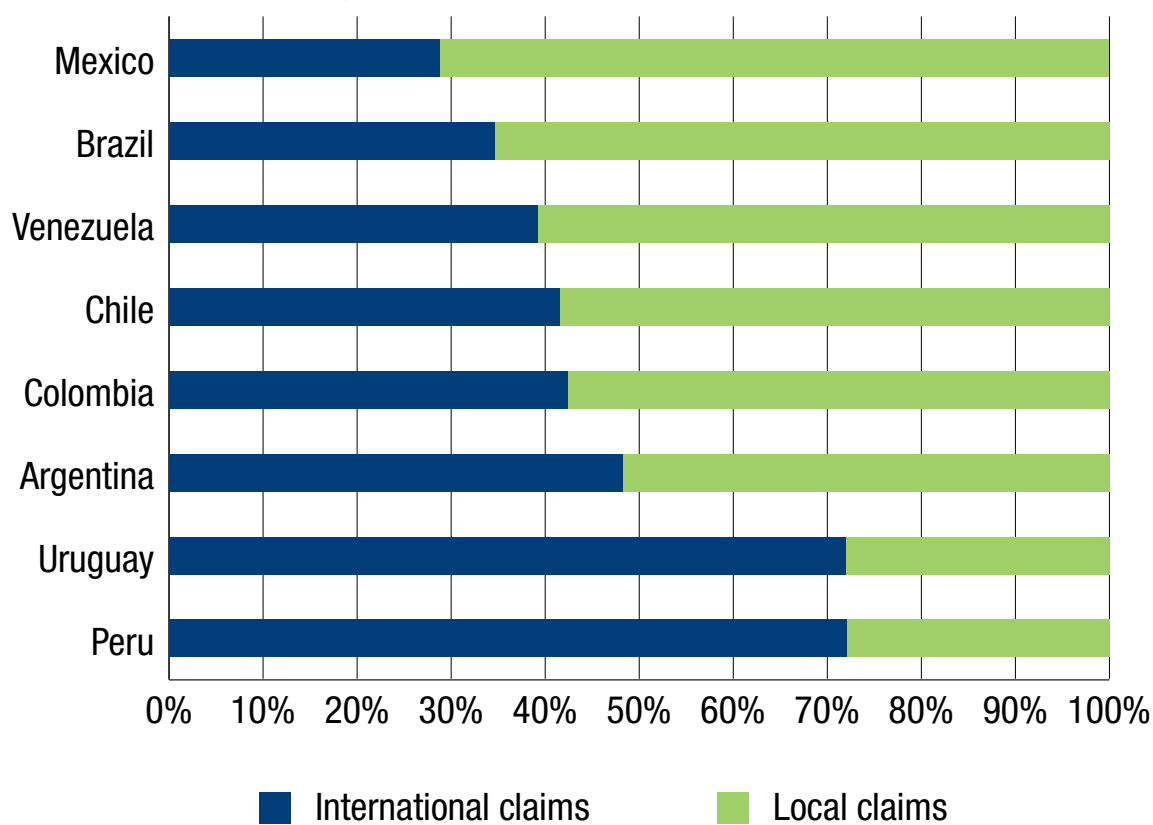
The proportion of local versus international claims implies differences in terms of procyclicality of banking activities. While cross-border flows have significant co-movements with global financial conditions, and Latin America did not escape this pattern during the global financial crisis, local funding provides a more stable source of financing. Indeed, while international lending fell in most Latin America countries during the crisis in 2008, in countries like Brazil and Chile foreign claims actually increased, indicating that local funding more than offset the decline in cross-border lending (IADB, 2012).

We can contrast the Latin American case with Asia. Figure 12 is the analogue of Figure 9, and compares the foreign claims of BIS reporting country banks on Latin American countries (the average from previous figures) and Asian countries.

We see that Spanish banks have far less exposure to counterparties in Asia, as compared to Latin America. Figure 13 is the analogue of Figure 10, and gives the percentage of total credit that is taken up by the foreign claims of the BIS-reporting banks. Again, we see that the presence of Spanish banks is far less visible in Asia as compared to Latin America. Overall, in the Latin American banking system foreign claims as a share of domestic credit are a much larger fraction than in Asian countries.

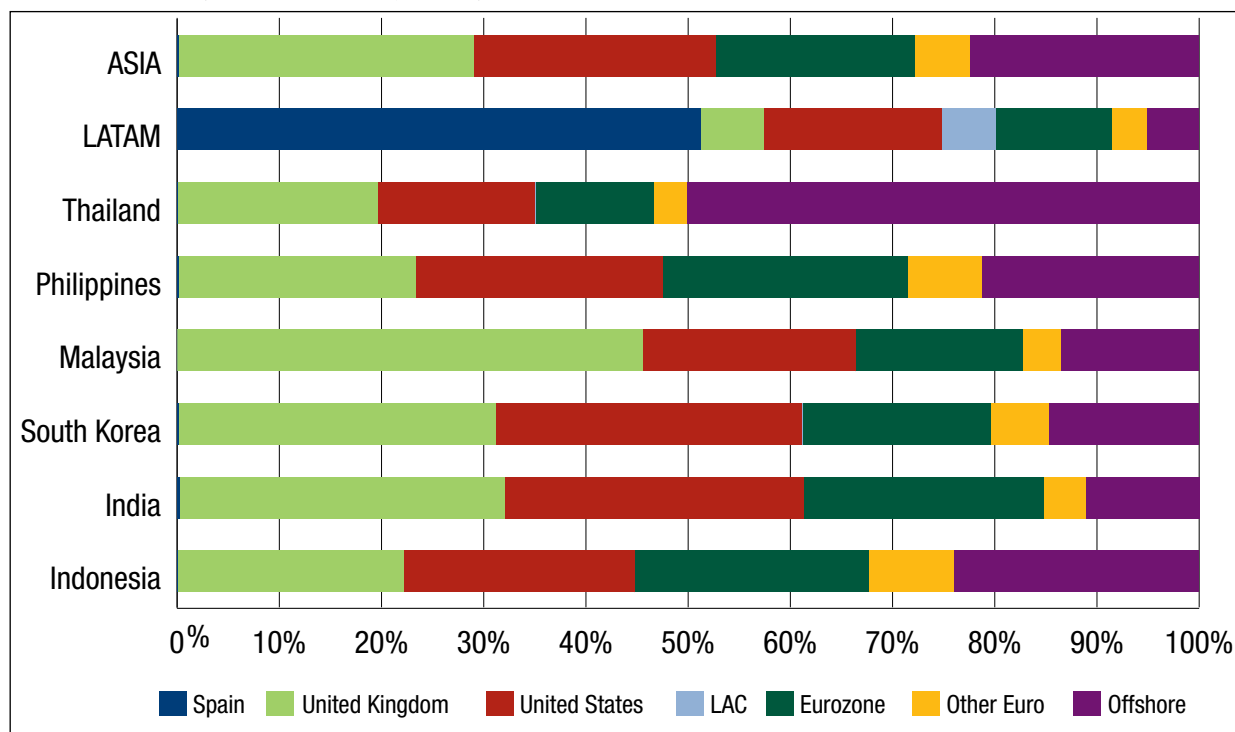
Finally, Figure 14 is the analogue of Figure 11 that compares the breakdown of the foreign claims between local claims and international claims as

FIGURE 11: Composition of Foreign Claims



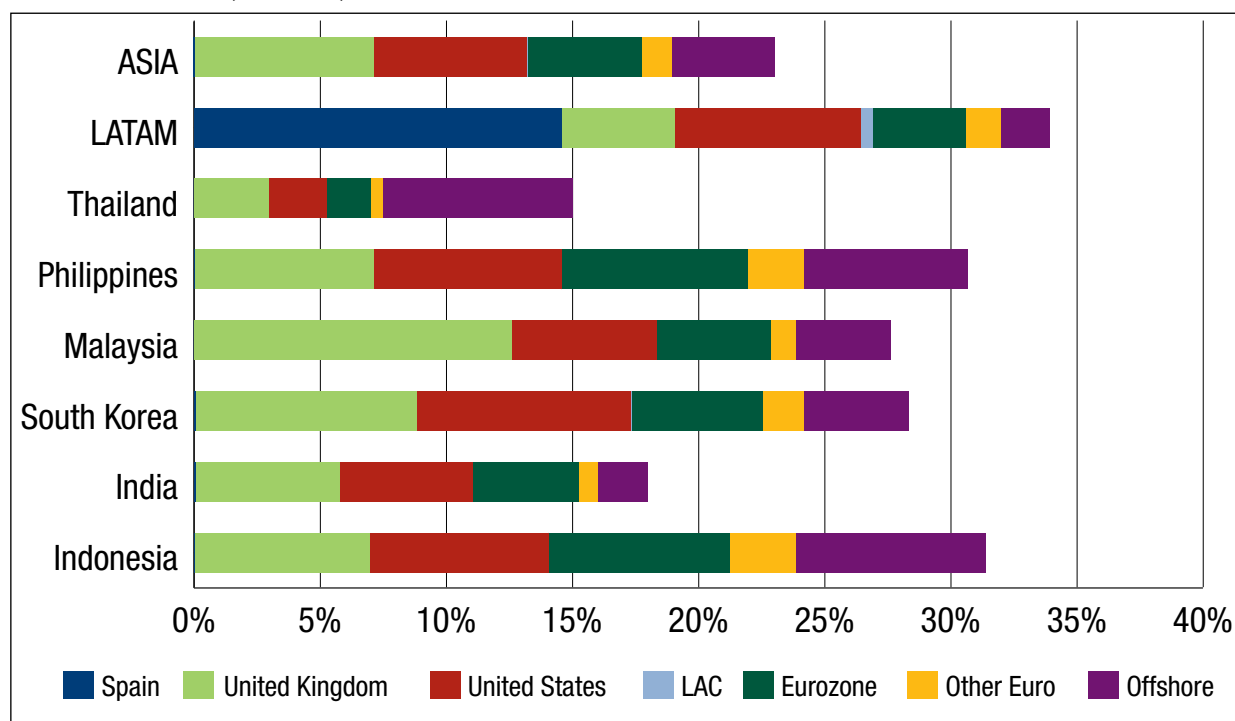
Source: Consolidated Banking Statistics immediate borrower basis BIS.

FIGURE 12: Foreign Claims of Reporting BIS Banks (as of 2011:Q2)



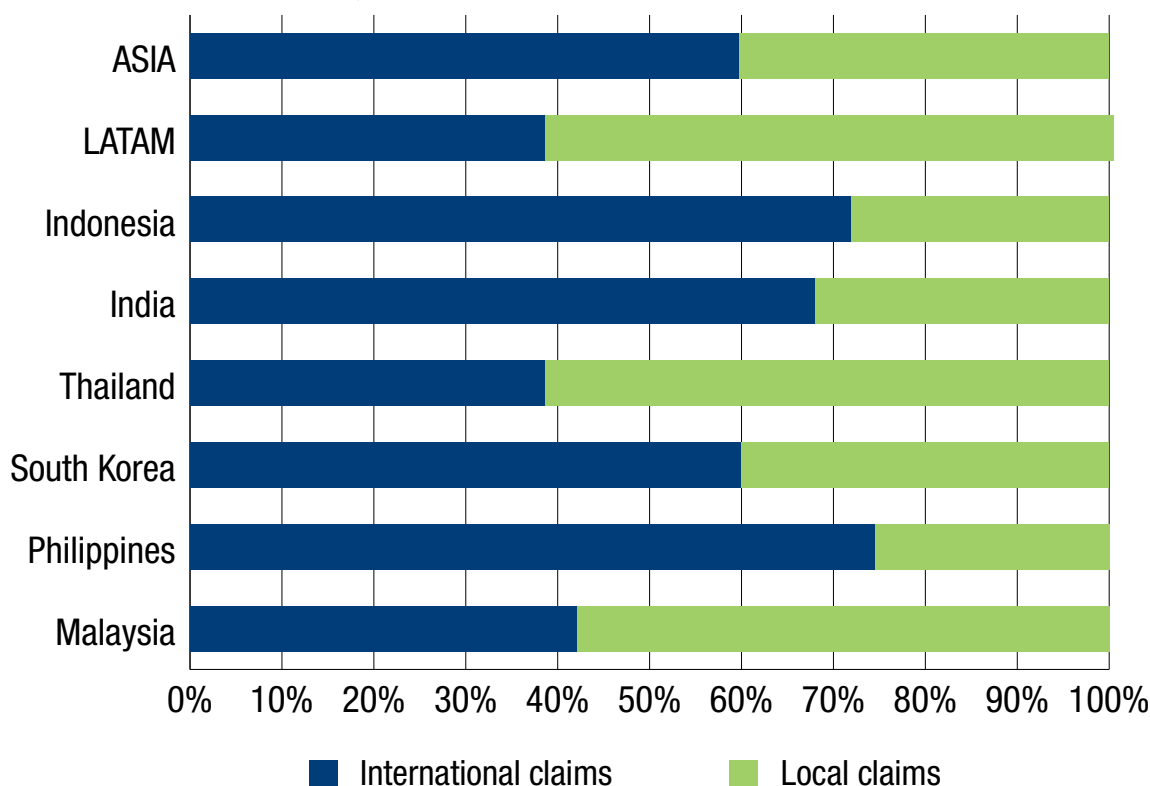
Source: Consolidated Banking Statistics (immediate borrower basis), BIS (2012).

FIGURE 13: Foreign Claims of Reporting Central BIS Banks as Percentage of Total Bank Credit to Domestic Sector (2011:Q2)



Source: Consolidated Banking Statistics (immediate borrower basis), BIS (2012); IFS 2012

FIGURE 14: Composition of Foreign Claims



Source: Consolidated Banking Statistics (immediate borrower basis), BIS (2012).

seen in Asia and Latin America. We see that the first two rows of Figure 14 show the greater reliance of Asian countries on international claims (red bars) as compared to local claims (blue bars). While about sixty percent of foreign claims in Latin America are local, this fraction declines to forty percent in Asia.

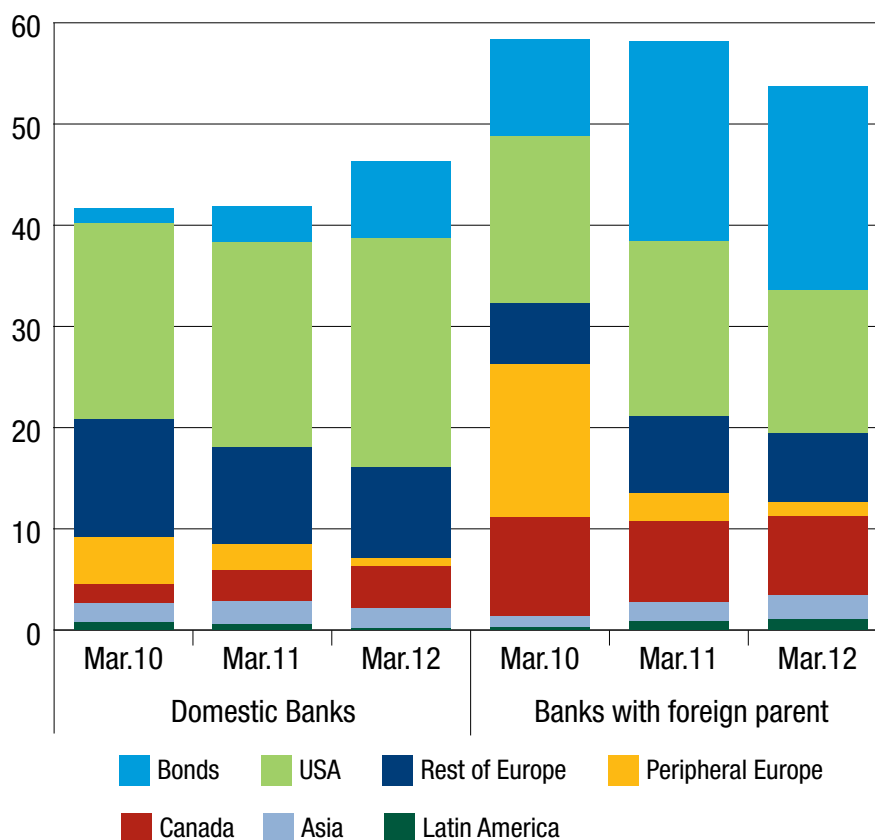
The evolution of cross-border and foreign claims did not prevent a reduction in domestic credit after the Lehman collapse, but this evidence suggest that it was not necessarily triggered by an especially procyclical behavior on the part of foreign banks. Indeed, the recession that ensued in 2009 came together with a severe reduction in domestic credit, but this was not only due to tightened financial conditions on the side of lenders, but also a decline in demand for credit.

Still it is possible that in this model of banking based on subsidiaries by multinational banks, there may still be strong dependence of local banks on the

health of the financial system of the parent country. Figure 15 shows the case of Chile, which illustrates how the local banking system can accommodate, over time, increased tensions in foreign funding. The figure shows how foreign debt from peripheral Europe, which includes Spain, has been declining sharply. Indeed, affiliates of foreign banks have reduced their lending coming from peripheral Europe from about fifteen percent in early 2010 to less than three percent two years later. There has been an important substitution from direct loans from peripheral Europe to bond issuances.

This evidence has a number of implications. Most importantly, Latin America, a region that has traditionally been severely affected by international financial turbulence, showed unusual resilience during the global financial crisis. High levels of indebtedness, weak banks, and currency mismatches were among the amplifying factors of previous bouts of global financial turbulence, especially in the 1980s and 1990s. This time has been

FIGURE 15: External debt of Chilean Banks by Region (% over the total)



Source: Central Bank of Chile, Financial Stability Report, 2012, First semester.

notably different, despite the exposure to European banks.

Macroeconomic policies, in particular fiscal conservatism, monetary policy geared to a price stability objective, high degrees of exchange rate flexibility, and sound prudential regulation of the banking system, were all factors that help explain that resilience. However, the model of integration with foreign banks certainly played a role, especially when compared to emerging Europe. Foreign banks that want to do retail business and to take deposits need to incorporate in the host country as a subsidiary, that is, a stand-alone bank rather than as an office. This creates a structure of corporate governance that is more consistent with local financial stability than the case in which branches operate as retail banks but still follow the instructions and policies from the parent bank. In fact, an important component of the regulation governing parent-affiliate banks

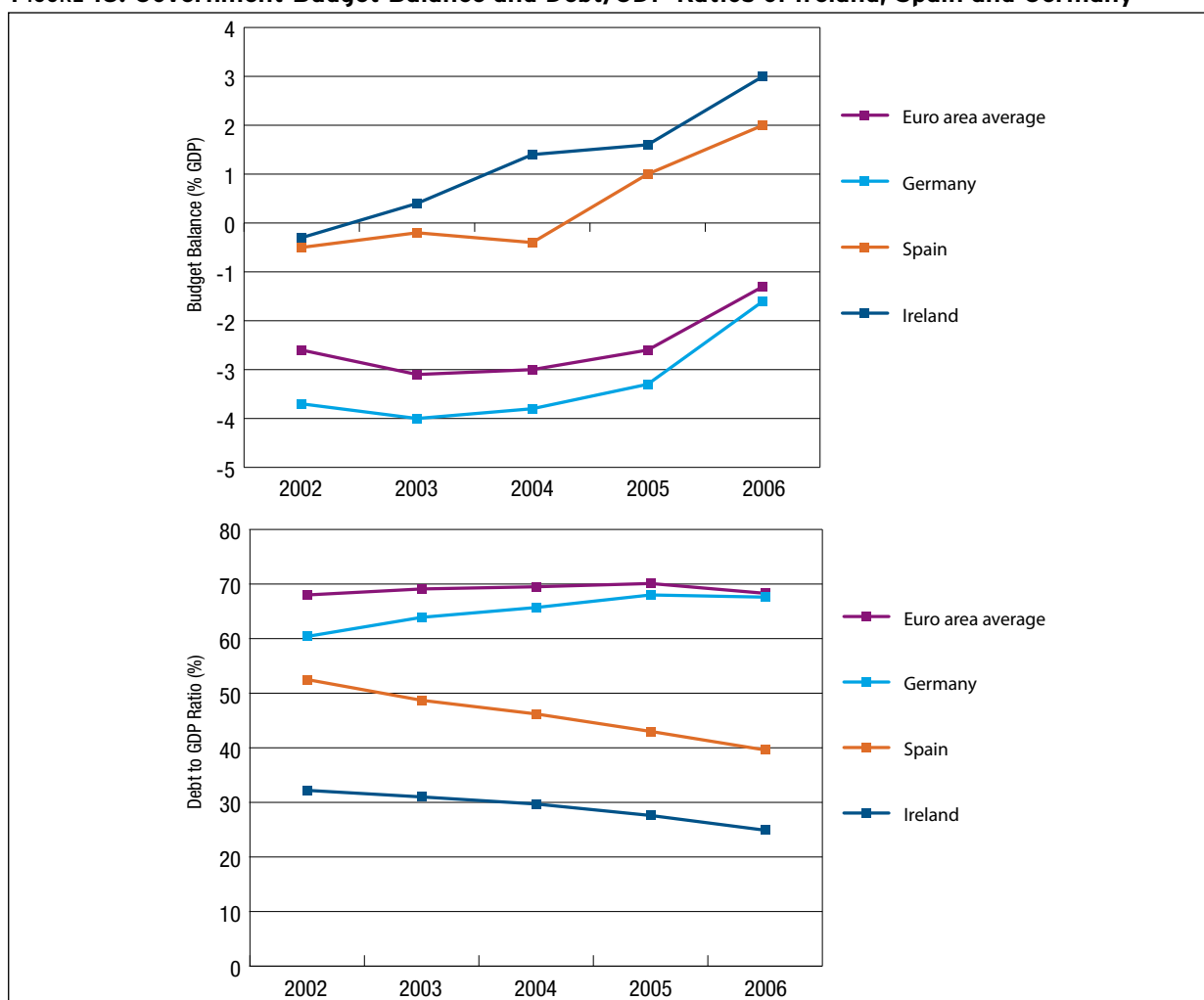
when the latter is a subsidiary usually establishes strict limits of deposits that the affiliate can make in the parent bank, so the risk of using the local bank to fund the parent bank is limited. There may be some ways to circumvent the regulation, but when the bank is a subsidiary the responsibility is on the local management and the local board. In this organizational structure, the host country potentially imports management expertise, the brand of the foreign bank, and other features associated with multinational banks without necessarily suffering from financial contagion in the case of a crisis in the parent bank's economy. On the other hand, and almost by definition, having subsidiaries relying mostly on local funding and ring fencing their capital is synonymous with more financial market segmentation and hampers international movements of capital at times when they could be beneficial, while branches allow a smoother and potentially more efficient allocation of liquidity internationally.

Appendix B: On Europe

The euro area crisis is sometimes portrayed purely as a sovereign debt crisis that is due to prolonged fiscal profligacy. While this may be true for Greece, Portugal, and Italy, the facts suggest a different cause for Ireland and Spain. Figure 16 shows the government budget balance of Ireland, Spain and Germany, together with the average budget balance for the countries in the euro area as a whole up to 2006.

The picture painted is of countries witnessing rapidly improving budget balances, with Ireland and Spain moving into budget surpluses, and with Germany and other euro area countries seeing a decline in their budget deficits. By the end of 2006, Ireland had a budget surplus of three percent of GDP, while Spain has a budget surplus of two percent of GDP. This is hardly consistent with recent commentaries emphasizing fiscal profligacy and

FIGURE 16: Government Budget Balance and Debt/GDP Ratios of Ireland, Spain and Germany



Source: European Commission, AMECO database.

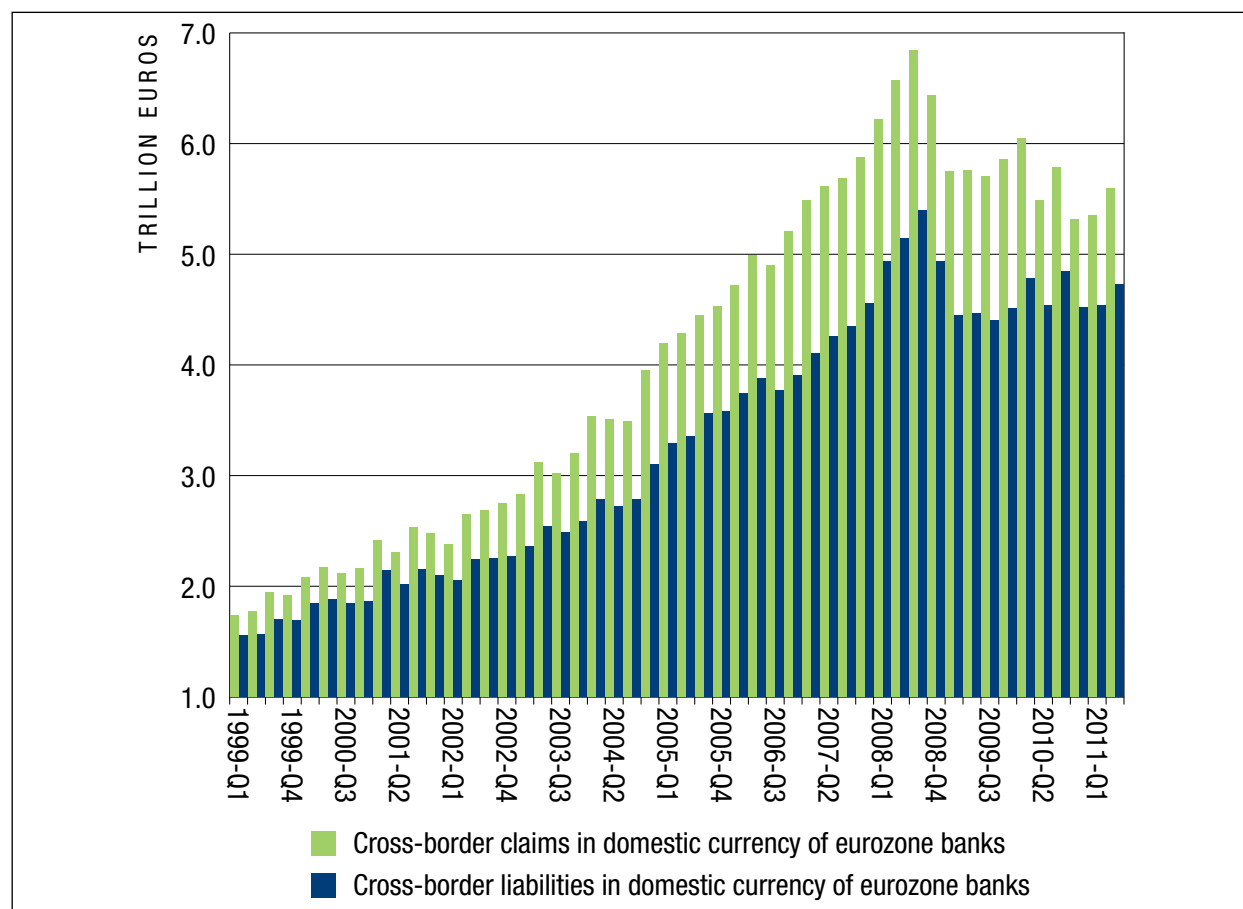
chronic budget deficits. Figure 16 also shows the debt-to-GDP ratio for Ireland, Spain, and Germany over the same period. Both Spain and Ireland had a debt-ratio that was lower than Germany's and was actually declining over this period. The debt-to-GDP ratio for Spain was below forty percent at the end of 2006, while the debt-to-GDP ratio for Ireland was only twenty-five percent and declining. Before the onset of the crisis, both Ireland and Spain had outwardly sound public finances, with no hint of the trouble that awaited them. The run-up to the boom masked severe hidden problems, and dangers of systemic risk building up in the background were ignored.

To understand Europe's current predicament, one needs to grasp the role played by the banking sector in financing the housing bubble. As seen from

the experience of Ireland and Spain, the bursting of a housing bubble can have very large negative consequences for public finances. As output slumps and economic activity falls during the crisis, both the fall in net receipts and the increased expenditures to meet the crisis can lead to very rapid deterioration. The country can move from what appears to be a very healthy budget surplus and negligible debt to very large deficits and ballooning debt.

Figure 17 shows that cross-border banking within the euro area experienced explosive growth, especially after around 2003, helping to fuel property booms in those countries that were recipients of the new cross-border lending. The cross-border liabilities of euro area banks denominated in euros rose from roughly 1.5 trillion euro to 5.5 trillion

FIGURE 17: Cross-Border euro-denominated assets and liabilities of euro area banks (Billion Euros)



Source: Bank for International Settlements, Locational Banking Statistics, Table 5A

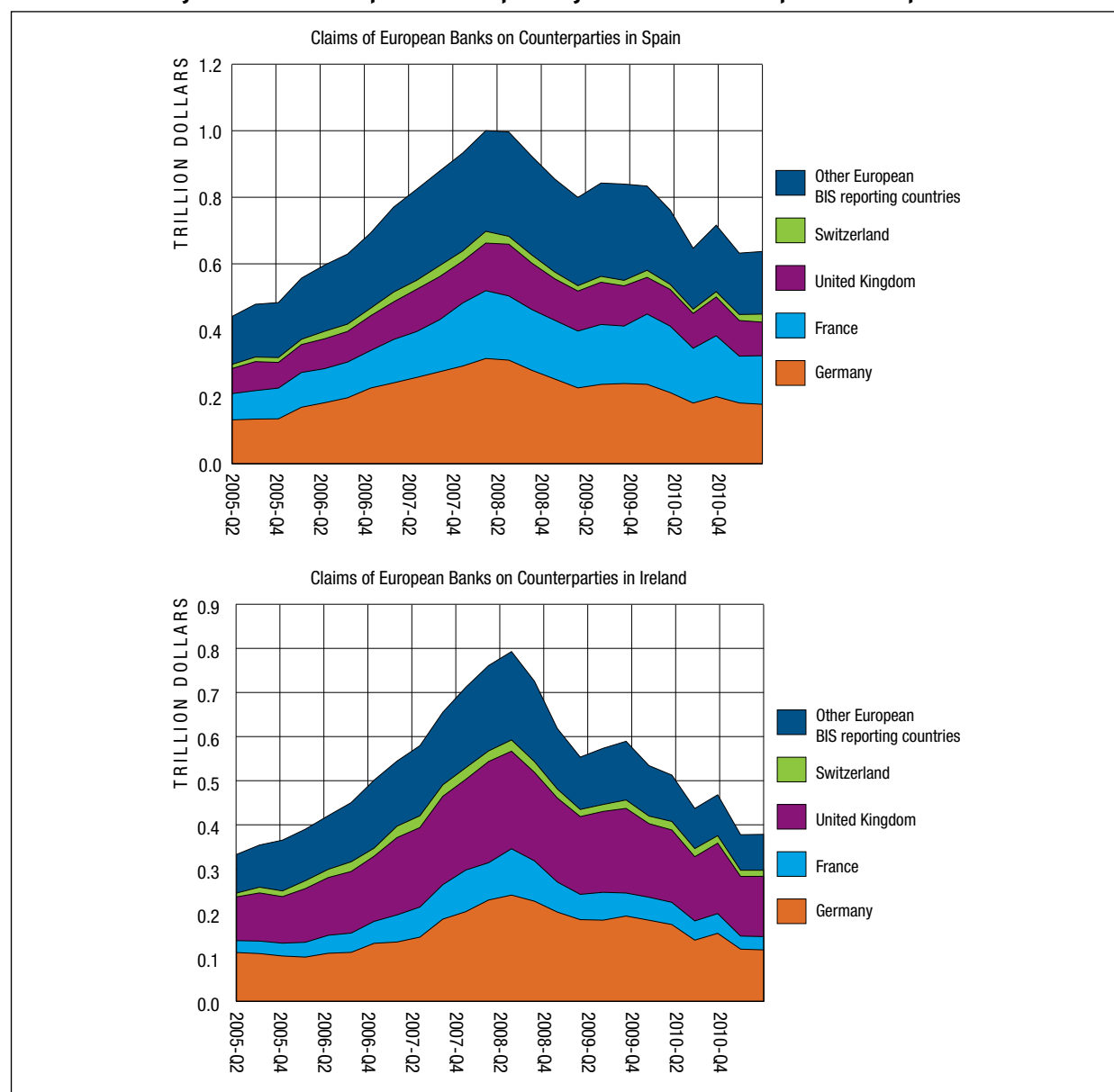
euro in the space of nine years from the introduction of the euro in 1999 to the eve of the crisis in 2008. The rapid increase in wholesale funding highlights the important role played by cross-border banking flows in fueling the housing bubble in Ireland and Spain.

In Spain, the share of construction in GDP rose from less than eight percent of GDP at the end of the 1990s to 12.3 percent in 2007. Meanwhile, residential house prices rose roughly three-fold from

1995 to 2007. Ireland's housing boom was, if anything, more dramatic than Spain's. Financing the housing booms in Ireland and Spain induced capital flows through the banking sector.

The consequences for borrowers in countries that underwent property booms, such as Spain and Ireland, meant that they were borrowing in increasing amounts from other European banks, as shown in Figure 18.

FIGURE 18: Foreign claims of European BIS-reporting banks on counterparties in Spain and in Ireland



Source: Shin (2012), data from BIS consolidated banking statistics, Table 9D

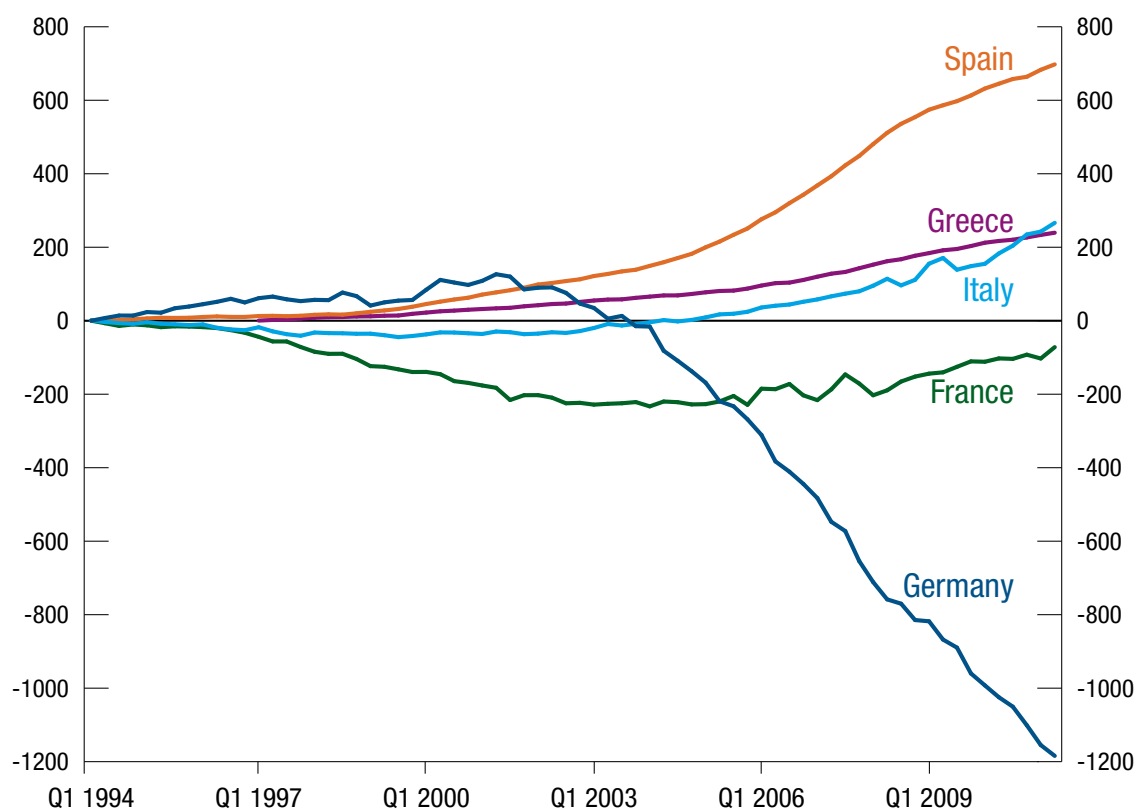
Compared to other dimensions of economic integration within the euro area, cross-border takeovers in the banking sector remained the exception rather than the rule. The introduction of the euro meant that “money” (i.e. bank liabilities) was free-flowing across borders in the euro area, but the asset side remained stubbornly mainly local and less mobile (though the (high) degree of home bias decreased to a larger extent within the euro area than in international markets, (see the recent survey of Coeurdacier and Rey (2012)). It is this contrast between the free-flowing liabilities but localized assets of European banks’ balance sheets that has been a contributing factor in the European crisis.

The capital flows that funded the property booms in Ireland and Spain were financed through the banking sector mainly through wholesale inter-bank funding. Starting in 2008, the euro area has

been subject to major disruptions of cross-border capital flows, amounting to a classic “sudden stop” well-known in the context of emerging-economy currency crises, as for example explained in Merler and Pisani-Ferry (2012). There has been a sudden stop of inflows and a sudden start of outflows, leading to a severe financial account reversal. The reversal of capital flows associated with the “sudden stop” has been compensated by the official flows of the ECB’s liquidity operations. The accumulated claims that have built up in the TARGET gross settlement system reflect these compensating official flows, which have mitigated the current account adjustments needed to compensate for the reversal of capital flows.

This is in line with the banking model outlined above, by which banks in booming economies can fuel extra domestic lending by rising cross-border

FIGURE 19: Accumulated net capital inflows across selected eurozone countries in billions of euro

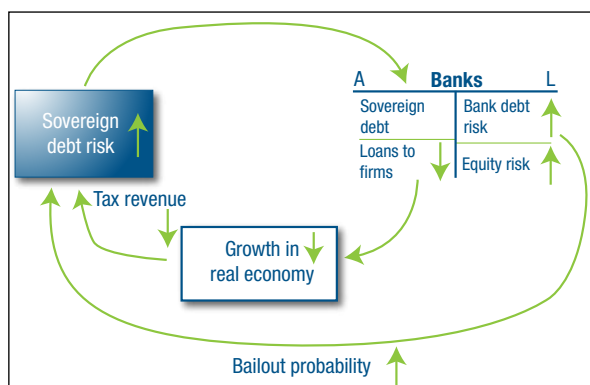


Source: Figure is taken from Euro-nomics (2011) based on Eurostat data.

wholesale funding obtained from banks in slower-growing economies, which is exacerbated in the presence of the “European passport” for banking activities. While there is an underlying efficiency case for such cross-border banking intermediation, it poses obvious dangers in amplifying unsustainable credit booms, especially in environments in which banking regulation is inadequate.

The sudden stop in capital inflows triggered a diabolic loop between sovereign risk and banking risk. Banks were considered to be less safe and cut back their lending to the real economy. This lowered real economic growth and tax revenues for the sovereign. Fiscal debt levels became less sustainable and foreign (and domestic) investors cut back their funding to sovereigns and banks. In addition banks need to be recapitalized through public funds, which in turn increases sovereign risk even further. Figure 20 depicts both diabolic loops.

FIGURE 20: Diabolic Loop between sovereign risk and banking risk



The analogies between the European crisis of 2011 and the emerging economy crises of the 1980s and the 1990s also extend to the policy prescriptions, both preventive and remedial. Mitigating the risks of crises entails an approach to financial regulation that has broad macro-prudential goals in sight. It is here that an emerging market perspective is especially useful.

In a boom when credit growth outpaces the pool of deposits, other sources of funding must then be tapped to fund the increased asset growth of banks

and other intermediaries. In advanced countries, the gap is made up by wholesale bank funding like securitized notes and repos. For emerging countries that operate with open capital markets, the growth in bank assets is fueled by short-term funds raised in foreign currency, so that the downturn in the financial cycle manifests itself as a “twin crisis” in which a banking crisis and currency crisis reinforce each other. The Asian financial crisis of 1997 and the turmoil in global financial markets in the autumn of 2008 are glaring instances of this vulnerability.

With the benefit of hindsight, a more stringent system of financial regulation that mitigated the lending booms in Ireland and Spain would have been appropriate. In the absence of other impediments to the free flow of capital through the banking sector, more stringent checks on credit growth through direct administrative measures may have been useful to slow credit growth. The system of LTV (loan-to-value) and DTI (debt-to-income) caps that are used by several emerging economies on residential bank lending (for example by the Korean banking authorities) comes to mind as an example of an administrative arrangement that can be applied on top of other prudential requirement on banks.

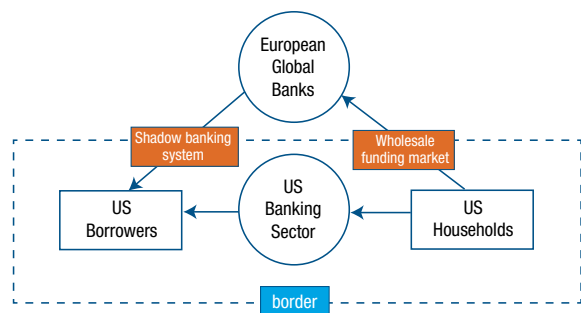
European Banks and their involvement in Global Financial Flows

European banks, including U.K. banks, were special, as they were major players in the global financial flows. They raised funds in dollars and invested them worldwide including in toxic U.S. papers. Most of the funding was less stable wholesale funding, invested partly in assets generated by shadow bank institutions.

The intermediation activities of European banks have been important in driving two-way gross flows into and out of the United States (see Shin (2012)). Until 2011, around eighty percent of the assets held by prime money market funds in the United States were the obligations of banks (and

fifty percent of the assets held were the obligations of European banks). As such, money market funds in the United States play the role of the base of the shadow banking system, in which wholesale funding is recycled to U.S. borrowers via the balance sheet capacity of banks, especially European banks.

FIGURE 21: European banks in the U.S. shadow banking system



Although European banks’ presence in the domestic U.S. commercial banking sector is small, its impact on overall credit conditions looms much larger through the shadow banking system. The role of European global banks in determining U.S. financial conditions highlights the importance of tracking gross capital flows in influencing credit conditions, as emphasized recently by Borio and Disyatat (2011). In Figure 21 the large gross flows driven by European banks net out and are not reflected in the current account that tracks only the net flows. Since the euro area has a roughly balanced current account while the U.K. is actually a deficit country, its collective net capital flows vis-à-vis the United States do not reflect the influence of its banks in setting overall credit conditions in the U.S.

More research is needed in order to answer two key questions. Why was it Europe that saw such rapid increases in banking capacity, and why did European (and not U.S.) banks expand intermediation between U.S. borrowers and savers? Two likely elements of the answer to both questions lie in the regulatory environment in Europe and the

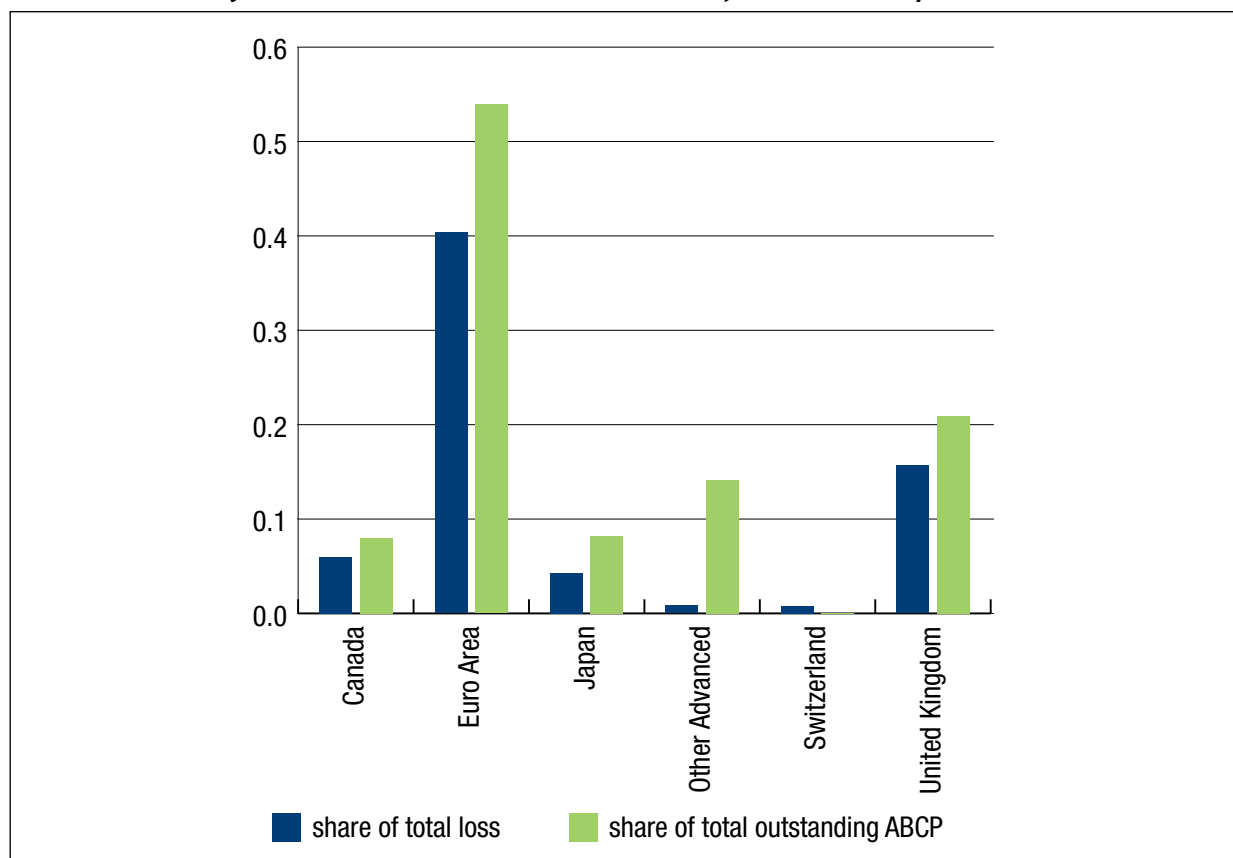
advent of the euro. The European Union was the jurisdiction that applied Basel II regulations more quickly, while the rapid growth of cross-border banking within the euro area after the advent of the euro in 1999 provided fertile conditions for scaling up the European banking sector. In contrast, Basel II was implemented more slowly in the U.S. and a cap on leverage was maintained (at least in the regulated banking sector; U.S. investment banks were of course exempt, as the sky high leverage ratios of Lehman, among others, exemplified).

The growing role of European banks in the U.S. financial system created a deep financial link between the U.S. and European financial systems, which has been a central feature of the crisis. In particular, the losses taken by European banks on their U.S. holdings were intertwined with the weakening of the European financial system and the decline in its resilience in the face of adverse developments in the European economy.

More precisely, a central transmission channel of the global financial crisis (in particular from the U.S. to Europe) has been the exposure of European banks to toxic U.S. assets—especially to the so-called private-label safe assets, which turned out to be not so safe. According to Bernanke et al. (2012), “savings glut” economies such as China and emerging Asia piled into government bonds, pushing their yields downward. This induced more advanced economies, such as the euro area and the U.K. to invest in higher-yielding securities, in the guise of Asset Backed Commercial Paper (ABCP) or Asset Backed Securities (ABS).

Acharya and Schnabl (2011) estimate that banks around the world manufactured over \$1,200 billion of ‘private-label’ safe assets by selling short-term Asset-Backed Commercial Paper (ABCP) via conduits to risk-averse investors and investing the proceeds primarily in long-term U.S. securities. As liquidity in the dollar money markets dried up in 2007, many banks were unable to roll over these ABCP and forced to consolidate their balance sheets, with significant losses.

FIGURE 22: Holdings of U.S. Asset-Backed Commercial Paper (2007 end year)



Source: Gourinchas, Rey and Truemptler (2012) using Acharya and Schnabl (2011) data for ABCP exposure.

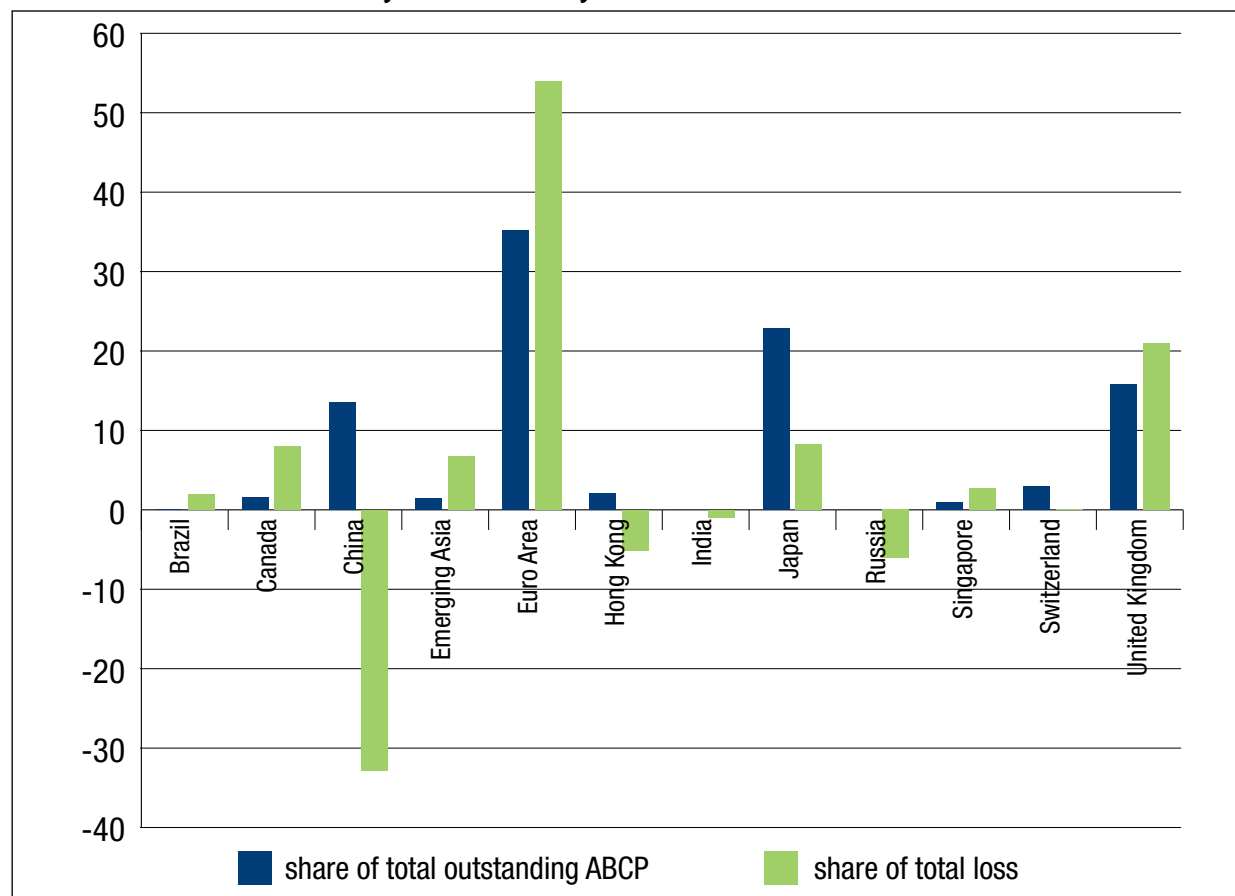
Notes: ABCP holdings expressed as a fraction of total ABCP outstanding and share of losses in total losses on debt claims between 2007Q4 and 2008Q4 vis-a-vis the United States.

Gourinchas et al. (2012) documents a close link between the losses countries sustained on their external debt portfolio vis-à-vis the U.S. and their investments in U.S. corporate ABS and in ABCPs. They illustrate the positive correlation between the share of ABCP conduits in countries' U.S. debt positions as of 2007 and the rate of losses on their U.S. debt portfolios between 2007Q4 and 2008Q4. Moreover, there is a strong link between the geographical distribution of losses and the share of the various areas in total ABCP holdings. The euro area ended up holding forty percent of total outstanding ABCP and as a result saw a massive decline in the value of its external debt to the tune of fifty-four percent of total losses. The U.K., which held sixteen percent of the total stock of ABCP, bore twenty-one percent of total losses.

Banks were also exposed through their holdings of longer-term asset backed securities (ABS), which figured heavily in the cross-border portfolios of a number of advanced economies. Just as in the case of ABCPs, there is a positive correlation between initial exposure to ABS and subsequent losses on the debt portfolio.

The 2007 liquidity crisis is also visible in the strong positive correlation between measures of dollar shortages in banking systems developed at the BIS by Von Peter and McGuire (2011) and the propensity of those systems to set up ABCP conduits. Those dollar shortage measures reflect (approximate) maturity mismatches between dollar assets (long term) and dollar liabilities (short term) for non-U.S. banks. They are constructed by assuming

FIGURE 23: Holdings of U.S. Asset-Backed Securities (2007 end year) as a fraction of total ABS outstanding and share of losses in total losses on debt claims between 2007Q4 and 2008Q4 vis-a-vis the United States. A negative loss is a gain on external debt claims vis -a-vis the U.S.



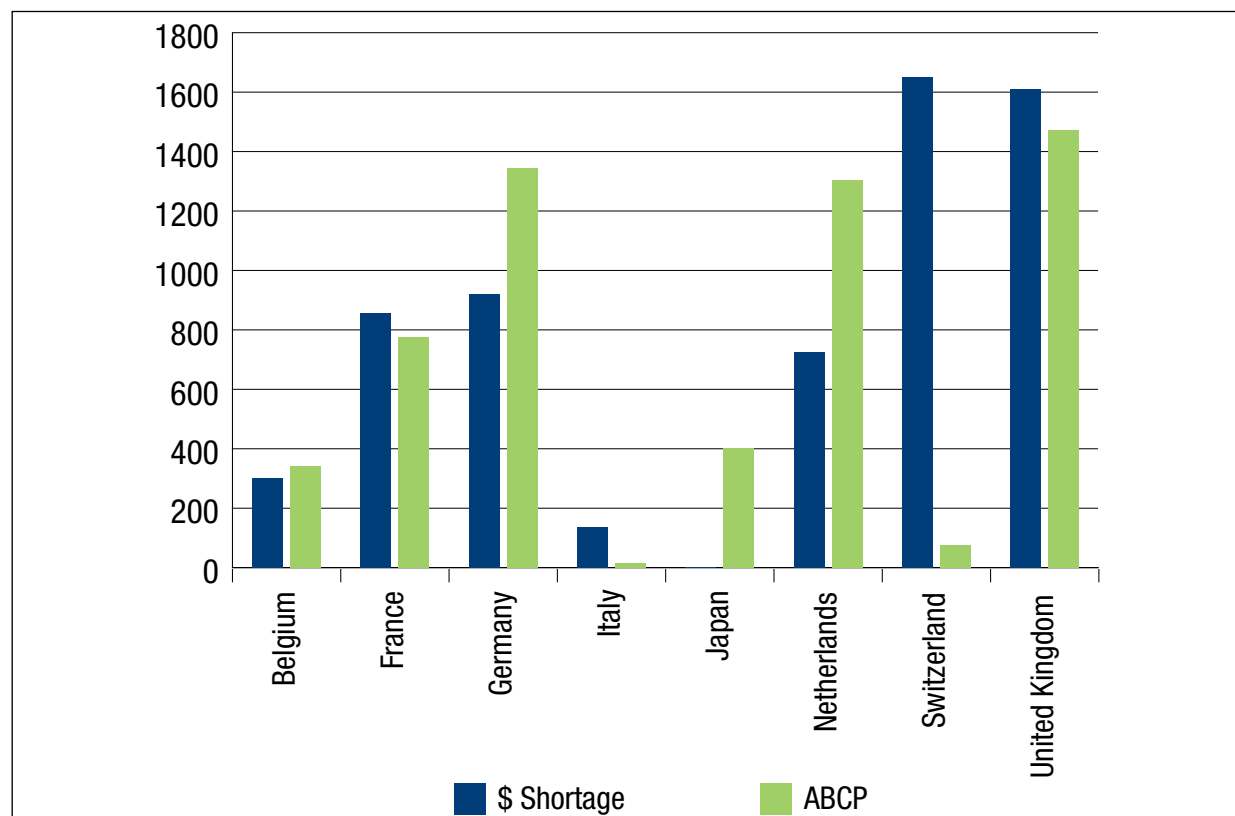
Source: Gourinchas, Rey, and Truempler (2012)

that net interbank borrowing in dollars, net borrowing on the FX swap markets in dollars (which the authors back out from the balance sheet identity assuming no open positions in FX), dollar borrowing from official monetary authorities, as well as liabilities to non-banks, are all short term. The difference between those short-term dollar liabilities and the longer-term dollar assets is by definition the dollar funding gap or dollar shortage of a country banking system. There is a clear correlation, as shown in Figure 24 between these approximate measures of dollar shortages and ABCP conduits (except for Switzerland).

Ad hoc U.S. dollar bilateral swap lines of the Fed with other central banks (in particular the ECB) were put into place to assuage this problem.

It has been pointed out (see Philippon and Resheff (2009)) that the two main periods of deregulation in the banking system (in the 1920s and in the 2000s) have been followed by the two main crises of the financial system. Figure 25, taken from Gourinchas et al (2012), illustrates this view. It shows that valuation losses on the external debt portfolios of countries vis-a-vis the U.S. correlates positively with indicators of the “quality” of the regulatory environment. These indicators should probably be better understood as indicators of market friendliness or tolerance for unfettered financial innovation. Countries with more liberalized credit markets tend to suffer larger valuation losses on their external portfolio. This finding is consistent with recent research by Giannone et al. (2011) showing that the severity of the crisis was strongly and

FIGURE 24: The figure reports the upper limit of the dollar shortage measures constructed at the group level together with ABCP exposure data at the country level



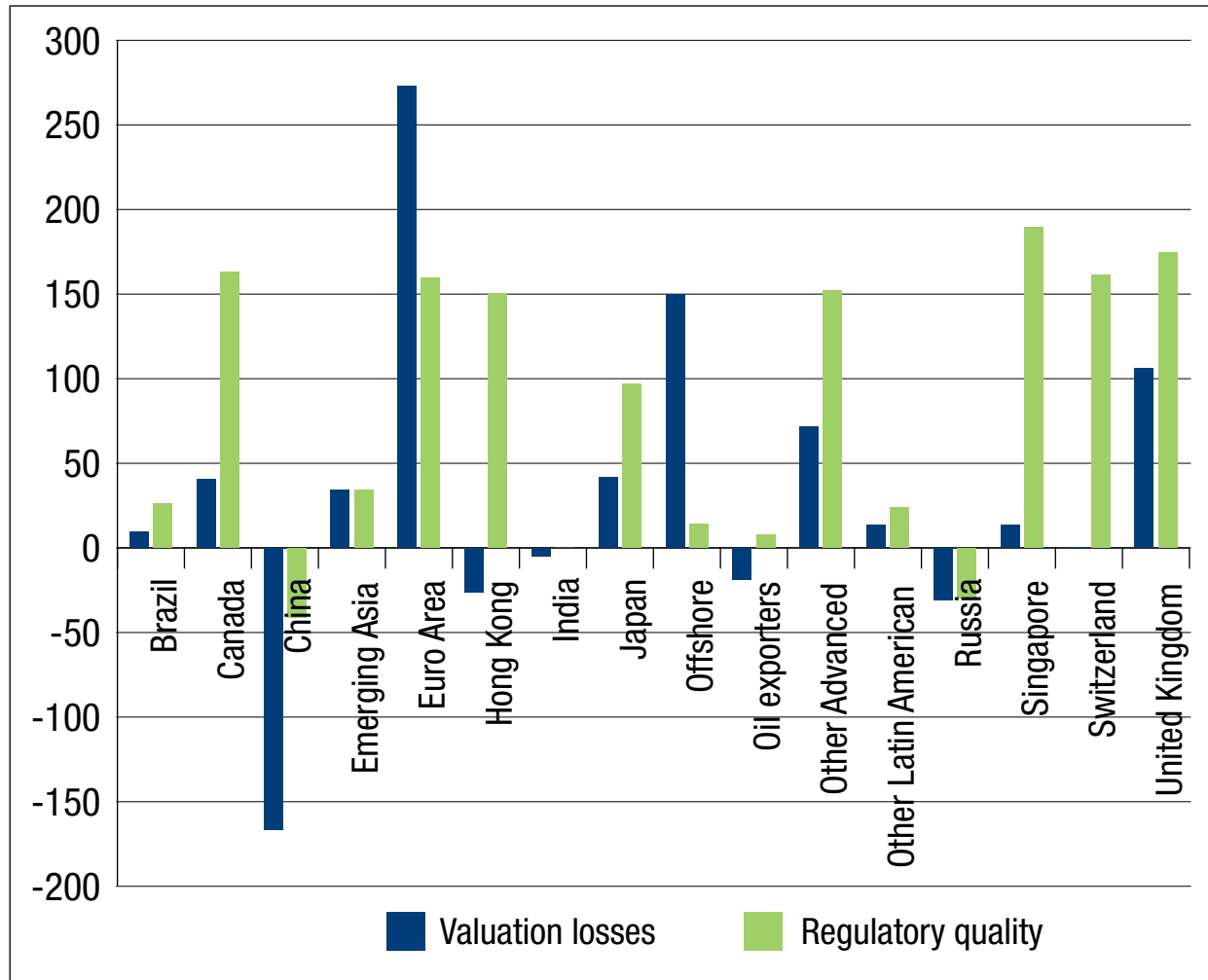
Source: Gourinchas, Rey, and Truempler (2012) using McGuire and von Peter (2009) for the dollar shortage measures, and Acharya and Schnabl (2010) for ABCP exposure. Units: ABCP exposure: 100mil U.S. dollars; U.S. dollar shortage: billions of U.S. dollars.

robustly positively-related to the degree of liberalization in credit markets, as measured by the same indicators or “regulatory quality.”

In summary, the international transmission of the 2008 crisis vividly illustrates the importance of understanding patterns in gross international capital flows and in particular gross banking flows. It was those countries with the largest gross exposures to the ABS/ABCP markets that suffered the biggest losses on their debt holdings, rather than those

countries running the largest current account surpluses. More generally, the implications of capital flows for financial stability and macroeconomic performance can only be fully understood by keeping track of the complete matrix of gross cross-border capital flows in terms of geographical and sectoral positions. Current accounts of deficits of surpluses, linked to net capital flows, miss important dimensions of the financial fragility of countries: countries’ entire external balance sheets should be scrutinized.

FIGURE 25: Regulatory environment and U.S. debt asset valuation losses, by country.



Note: The figure reports the index of regulatory quality from Kaufmann et al. (2010), together with valuation losses (+) or gains (-) on U.S. debt assets, expressed in billions of U.S. dollars, as calculated by Gourinchas, Rey, and Truempler (2012)

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