

# Conference on Capital Flows, International Financial Markets and Financial Crises

Financial markets throughout the world have become increasingly more developed in recent decades. At the same time, global financial integration has risen: Cross-border financial flows and asset holdings have increased significantly over time, showing deepening financial-market linkages between countries. Economists in various fields have been addressing the effects of more sophisticated financial markets and international financial integration, but many open issues remain. These include evaluating the degree and the macroeconomic effects of financial integration, assessing the role of regulating financial intermediaries and understanding the emergence and transmission of financial crises.

The current global financial crisis has brought to light the need to develop a better understanding of these issues and their implications for policymaking. To this end, on Nov. 13–14, 2009, the Federal Reserve Bank of Dallas and the Bank of Canada cosponsored a conference on capital flows, international financial markets and financial crises.<sup>1</sup> The purpose of the conference was to bring together researchers working on various aspects of financial markets and financial crises. Many of the papers presented at the conference addressed one of two broad questions. The first is, how integrated are international financial markets and how effective are they at sharing resources and risk? Second, what are the channels through which financial

markets—and their regulation—impact the rest of the economy? Specifically, do they result in stabilization or amplification of macroeconomic fluctuations in response to shocks? The remainder of this summary explains why this research is fruitful in the context of the current financial turmoil and summarizes the researchers' contributions.

## Why We Need Better Models

Two of the conference papers nicely illustrate how the global dimension of the current financial crisis underscores the need to develop and apply new theoretical models to address these questions. **Steve Kamin** from the Federal Reserve Board presented evidence (in a paper coauthored with Laurie Pounder from the Federal Reserve Board) on the degree to which direct financial links with the U.S. help explain the different effects on foreign countries' financial markets. Specifically, Kamin and Pounder ask whether the exposure of a country's financial sector to U.S. mortgage-backed securities (MBS) or its dependence on U.S. dollar funding can explain how the financial sector in that country fared early in the crisis. This question is motivated by the fact that, up until late 2008, the crisis had very different effects on many foreign

<sup>1</sup>The papers presented can be found online at [dallasfed.org/institute/events/09capital.cfm](http://dallasfed.org/institute/events/09capital.cfm). The names mentioned in bold throughout this summary are those of the presenters at the conference.

countries. If these differences depend closely on how much those countries were linked to the markets for U.S. MBS or short-term U.S. dollar funding—arguably the markets where the financial crisis originated—then the way the financial crisis was transmitted abroad would be fairly clear. Foreign financial institutions that directly held a lot of U.S. MBS would have sustained tremendous losses when the market for these assets turned sour, and foreign institutions dependent on dollar funding would have run into trouble when funding in these markets dried up. However, interestingly, Kamin and Pounder find that these direct financial links explain very little of the decline in financial sector indicators in foreign countries; some with very little exposure to U.S. MBS had quite negative effects on their financial institutions, and vice versa.

In a paper coauthored with Shang-Jin Wei from Columbia University, **Hui Tong** from the IMF also addressed the issue of how the effects of the current crisis were transmitted abroad. Tong and Wei's paper, in contrast to Kamin and Pounder's, looks at how nonfinancial firms fared in countries with different levels of dependence on foreign capital flows. The paper asks whether firms operating in sectors that tend to depend heavily on outside financing experienced more severe liquidity problems in countries more dependent on foreign capital inflows. Tong and Wei find that while higher overall inflows of foreign capital were associated with more severe effects on firms, the composition of capital flows matters as well. Foreign capital in the form of foreign direct investment (FDI) was less a culprit than non-FDI capital. The reasoning behind this may be that FDI, in the form of foreign multinationals buying out existing firms or creating subsidiaries, is a more stable source of foreign financing than non-FDI capital, including debt or portfolio equity investment.

These two papers show how thinking about the current financial crisis brings one back to the two main questions raised above. If financial markets in different countries are so integrated that

crises in one market affect others, it is important to understand financial integration in the first place—the degree to which it has progressed and the reasons it has done so. Moreover, the various channels of international financial transmission are not obvious, so it is also important to understand what they are and how they work.

### How Integrated Are Financial Markets?

It is common to point to the rise of cross-border asset holdings as evidence of international financial integration. While such observations tell us a lot about how integrated economies are, they leave open the questions of why this trade in financial assets matters, and what exactly are the frictions or conditions that make financial markets more or less imperfect. For these reasons, a long line of research has used theoretical models to understand the role of financial market integration and the degree to which certain market frictions can rationalize the observed data. In the context of short-run economic fluctuations, standard theory provides a role for international financial markets to move resources to their most productive location, as well as to share risk. International trade in financial assets allows a country with a boom to receive investment from abroad, temporarily importing more than it exports. In addition, domestic and foreign households trade financial assets to smooth out fluctuations in their income stream and consumption. The level of financial market integration can in part be understood from measuring how effective these mechanisms are, and four of the conference papers approach this task from different angles.

The basic idea of shifting resources to where they can be most productively used implies that country pairs with highly integrated financial markets should have less synchronized output fluctuations than country pairs with less financial integration. However, the rise of global financial integration has coincided with more international business cycle synchronization, not less.

**Sebnem Kalemli-Ozcan** from the University of Houston, in a paper with Elias Papaioannou from Dartmouth College and José Luis Peydró from the European Central Bank, sheds some light on this apparent contradiction. Their paper considers data on cross-border banking—the amounts of foreign assets and liabilities banks in a country have—to reevaluate the relationship between financial integration and output synchronization. Kalemli-Ozcan, Papaioannou and Peydró find that when financial integration is measured at the level of individual banks, country pairs that are more integrated do have less synchronized business cycles; that is, there is evidence of the standard resource shifting mechanism. The main difference with previous work is the authors' ability to use the microlevel bank data to control for common global factors that have increased both financial integration and business cycle synchronization over time. Importantly, however, the paper considers a time

*Steve Kamin from the Federal Reserve Board and Alessandro Rebucci from Inter-American Development Bank*



frame and set of countries that do not include major financial disruptions, so it aims to understand the functioning of financial markets in “normal” times. Whether this is different from the transmission effects of financial markets during periods of financial stress is a topic that comes up in several other conference papers.

Looking at implications for consumption rather than output, **Robert Kollmann** from Université Libre de Bruxelles presented a paper addressing the risk-sharing role of international financial markets. Models with perfect financial markets predict that relative consumption between two countries should be tightly linked with the real exchange rate—the relative price of national consumption baskets, expressed in a common currency. This means that the functioning of financial markets ensures that households in a country whose consumption basket is relatively inexpensive compared with that of a trading partner temporarily consume relatively more. Again, this is another prediction that is not borne out in the data, where there is a very weak relationship between relative consumption and real exchange rates. Kollmann presented a model in which some households do not have access to financial markets, a feature motivated by a widely noted observation that a large fraction of households in the U.S. actually hold no financial assets and therefore just consume their income. In Kollmann’s model, the presence of these “hand-to-mouth” consumers can break the link between aggregate consumption and real exchange rates. The lesson of the paper is that, from the perspective of sharing consumption risk, international financial integration is far from complete, but this has more to do with households’ access to financial assets than with the development of financial markets.

In another paper highlighting the difference between international and domestic financial markets, **Diego Valderrama** from the Federal Reserve Bank of San Francisco (in joint work with Katherine Smith from the U.S. Naval Academy) considers

why the composition of capital flows in developing economies is so different from that in industrialized economies. Specifically, developing countries have large inflows of FDI and outflows—or smaller inflows—of debt, while developed economies tend to have the opposite pattern. Smith and Valderama build on the observation that it is costlier in developing countries for firms to issue debt than it is in developed economies. This provides multinational firms the incentive to purchase firms in developing countries and use their more developed financial markets to finance debt; FDI provides the channel for this. At the same time, households would like to save some of their income to smooth out fluctuations; they do this by lending abroad because of the higher costs domestic firms face to borrow. The message in this paper is again that seemingly incompatible observations can be rationalized as the product of individuals' participation in financial markets, as imperfections in these markets affect their decisions and therefore also affect macroeconomic aggregates.

While international trade in financial assets certainly has effects on consumption, output and the composition of capital flows, its most direct mechanical manifestation is simply in the balance of trade in goods. A country that imports more than it exports is borrowing from its trading partners, and a country whose exports outstrip imports is lending to its trading partners. Indeed, without cross-country trade in financial assets, there can be no gap between a country's exports and imports. In reality, trade imbalances are significant—most clearly illustrated by the large and persistent trade deficit of the U.S. with the rest of the world. In her paper at the conference, **Wei Dong** from the Bank of Canada asks what can account for the behavior of the U.S. trade balance in recent decades. The question is motivated by the observation that, prior to the early 1990s, a standard mechanism naturally stabilizing the trade balance seemed to be working: A country with a large trade deficit would experience an exchange rate depre-

ciation and expenditure on imports would decline, closing the deficit. Since the early '90s, however, the U.S. has run a sustained trade deficit, despite a persistent depreciation of the U.S. dollar. Dong's paper attributes this largely to the fact that imports and exports have become less sensitive to changes in their relative prices. She points to higher costs for domestic distribution and increased rigidity in prices as possible explanations for why changes in import and export prices do not pass through as strongly to the quantities of goods imported and exported. The paper addresses the need to think about international financial markets in the context of a broader environment, including international trade in goods.

### Channels of Financial Transmission

The second broad set of questions addressed in the conference papers covers the mechanisms by which shocks are transmitted through the financial system to the rest of the economy. These questions are of direct relevance when thinking about the current financial crisis, and the papers covered various ways in which frictions in financial markets can propagate or amplify shocks to generate severe recessions.

Three papers addressed in detail the effects of collateral and leverage in the financial system: those by **Anton Korinek** from the University of Maryland (coauthored with Olivier Jeanne from Johns Hopkins University), **Michael Devereux** from the University of British Columbia (coauthored with James Yetman from the Bank for International Settlements, Hong Kong) and **Enrique Mendoza** from the University of Maryland. These papers all study a basic mechanism by which small shocks can trigger large real macroeconomic effects through asset prices. In the presence of a collateral constraint (alternatively a leverage constraint), individuals—such as banks, households or firms—cannot borrow more than a certain fraction of the value of their assets. When this constraint is binding, a small negative shock to asset prices can

generate large effects: The value of collateral falls, causing borrowing and consumption to decline, which can reduce the value of assets further, causing a cycle of asset price declines and reduced borrowing and consumption. The three papers apply this basic mechanism in various ways.

Jeanne and Korinek explain how an economy borrowing from abroad can experience credit booms and busts that are inefficiently large from a social perspective. Rising asset prices increase the value of collateral and so allow further borrowing, making it more likely that the collateral constraint is eventually hit, triggering the decline described above. This is socially inefficient because of an externality: An individual who takes on more debt does not take into account the effect this action has on asset prices and therefore on others' borrowing constraints. As such, Jeanne and Korinek propose the classic solution to dealing with an externality: a tax on individuals' borrowing. They

argue that moderate taxes on foreign borrowing inhibit excessively large credit booms and therefore reduce or eliminate the chances of an economy experiencing severe credit busts.

Devereux and Yetman consider the effects of collateral constraints on the international transmission of shocks. The motivation for this question is the widely noted observation that the current financial crisis spread very quickly to many countries, even between those that did not have close links through international trade. The more important links between these countries may be through financial markets, but the channel of transmission through international financial linkages is not clearly understood. (In fact, the general intuition described in the previous section, and one of the paper's results, indicate that in normal times financial links should in fact dampen transmission of shocks.) Devereux and Yetman argue that the basic mechanism working through collateral constraints can explain international transmission of shocks through financial linkages. Since investors in a country diversify their asset holdings between domestic and foreign assets, shocks to the foreign country that decrease foreign asset prices can lower the value of the domestic investor's collateral and therefore lower domestic borrowing and consumption because of a tighter collateral constraint.

Mendoza's paper is a contribution toward understanding if the effects of collateral constraints matter quantitatively for macroeconomic aggregates. Specifically, under standard assumptions on economic behavior, would we ever expect these constraints to have large macroeconomic effects? If so, what are the conditions for that to happen? Mendoza shows that, in fact, introducing collateral constraints into a standard quantitative theoretical framework can result in financial crises as infrequent, but recurrent, events. Importantly, a shock does not need to be exceptionally large or of unusual nature for a financial crisis to occur. The buildup of debt can bring the economy close

*Igor Livshits from the University of Western Ontario and Robert Kollmann from the Université Libre de Bruxelles*



to its collateral constraint, when a small shock can trigger the declining asset price–collateral–borrowing cycle described above. This type of event would be infrequent because households typically accumulate precautionary savings, which keeps them out of the region of debt where constraints threaten to bind.

Two other papers in the conference, by **Igor Livshits** from the University of Western Ontario (coauthored with Koen Schoors from the University of Ghent) and **Ali Dib** from the Bank of Canada, illustrate the role of the banking sector in the transmission of shocks. Regulation on banks' capital adequacy and leverage has been at the center of the discussion on reforming the financial system, so it is important to understand the banking system and how bank regulation affects the economy.

Livshits' paper addresses questions on how banking regulation should respond to changes in the riskiness of assets. Prudential banking regulation aims to curtail excessive risk taking, and it is standard practice to do this by providing incentives for banks to hold safe assets. However, when the risk of safe assets rises, the failure of banking regulation to recognize this change can make the banking system vulnerable. Livshits illustrates this with a stark example: In 1998, bank regulation in Russia considered the government's debt to be safe, even as the risk of default on this debt was rising. This policy encouraged banks to gamble on risky currency securities to the point that when the government did finally default, the banking system crashed. This paper, therefore, carries important lessons on the effects of bank regulation and raises questions about the best way to induce efficient investment by banks.

Dib's paper makes progress on understanding the macroeconomic effects of banking by introducing a banking sector that intermediates credit into a variant of the models used by many central banks for policy analysis. Typically, these models

are silent on the effects of financial frictions and the transmission of shocks through financial intermediaries, but Dib's work presents a framework in which these effects can be studied. He finds that the presence of an active banking sector with a frictional interbank market can amplify the effects of supply-side shocks but dampen the effects of financial shocks. In addition, his framework provides a role for the sorts of unconventional monetary policies pursued by the Fed and many central banks over the past year, including liquidity injections and asset swaps.

The overall lessons from the papers at this conference reflect the progress that comes with sharing insights among researchers working in various fields. Indeed, some of the clearest implications for understanding the current crisis in the U.S. may come from the work on emerging-market debt crises, as in the papers presented by Mendoza and Korinek. Another theme of the conference papers, aside from the topics each one addressed, was the integration of the analysis of "normal" economic conditions with the study of crisis periods. From the perspective of understanding why crises happen and what the policy implications are, this is an extremely important step. The policy implications of some of the work presented at the conference reflect the importance of this integration. For example, both Korinek and Jeanne's results and Mendoza's paper show that it is important to consider how policies affect the incentives to accumulate debt before a crisis. More generally, many of the other papers presented illustrate the need to understand the degree of integration of financial markets and the channels of financial transmission in order to form policy that works through their operation. The overall picture is encouraging for future research developing these ideas further.

—*Ananth Ramanarayanan*