———. 2001. "The Six Major Puzzles in International Macroeconomics: Is There a Common Cause?" In *NBER Macroeconomics Annual 2000*, edited by Ben Bernanke and Kenneth Rogoff. Cambridge, MA: MIT Press, 339–90. Reviews the major puzzles (or better outcomes inconsistent with widely held views) in international macroeconomics.

MICHELE FRATIANNI

■ financial crisis

The financial system is a set of institutions and markets that provides financial intermediation by transferring savings into productive investment. In most developing countries the bulk of financial intermediation has been done via the banking system, with the stock market gaining importance in countries with more advanced institutions. Financial intermediation entails maturity transformation—funding a longer-term tangible investment with shorter-term savings. As such, financial intermediation is exposed to financial fragility, in which heightened perceived risk may lead to liquidation, putting the financial system at risk.

Financial crisis refers to a rapid financial disintermediation due to financial panic. In practice, this involves a "flight to quality," where savers attempt to liquidate assets in financial institutions due to a sudden increase in their perceived risk, moving their savings to safer assets, such as foreign currency and foreign bonds in open economies, or currency, gold, and government bonds in closed economies. The ultimate manifestation of financial crises includes bank failures, stock market crashes, and currency crises, occasionally leading to deep recessions.

The economist Hyman Minsky (1964) theorized that financial fragility—which is related to the business cycle and to leverage—is a typical feature of any capitalist economy. These considerations are at the heart of the large literature propagated by the stock market crash of 1929 and the Great Depression (Bernanke 1995).

Financial Crises and Financial Integration During the last quarter of the 20th century, observers focused attention on the growing role of international triggers for financial crises—an outcome of the collapse of the Bretton Woods system (the post–World War II framework for international trade and financial stability), the rapid increase in the importance of emerging markets in the global economy, and the growing financial integration of countries with the global financial system. The resumption of capital flows to developing countries in the early 1990s led to waves of "sudden stops" (the abrupt cessation of foreign capital inflows) and reversals of capital flows, starting with the Mexican crisis of 1994–95, continuing with the Russian and the East Asian crises in the second half of the 1990s, and culminating with the Argentinean meltdown in the early 2000s (Calvo 1998; and Edwards 2004).

Most of the financial crises in the 1990s and early 2000s affected developing and emerging markets, leading to a heated debate regarding their causes and the needed remedies. There is solid evidence that financial opening (that is, the dismantling of capital controls) increases the chance of financial crises. There is more tenuous evidence that financial opening contributes positively to long-run growth. Hence there may be a complex trade-off between the adverse intermediate run and the beneficial long-run effects of financial opening. These findings pose a challenge to policymakers: how to supplement financial opening with policies that would improve this intertemporal trade-off.

To place this issue in a broader context, the debate about financial opening is a reincarnation of the earlier immiserizing growth literature in economics. In particular, while financial opening increases a country's overall welfare when the only distortion is restricting intertemporal trade across countries, financial opening may be welfare-reducing in the presence of other distortions (an economic distortion occurs when an inefficiency prevents an economy from reaching its full potential). An example of such a distortion is moral hazard, which frequently acts as an implicit subsidy to borrowing and investment, ultimately leading to overborrowing and crisis

(McKinnon and Pill 1999; and Dooley 2000). Moral hazard arises when investors believe that they will be bailed out of their bad investments by the taxpayer and, therefore, have little incentive to undertake proper monitoring of their investments. This bailing out may be carried out by the treasury, the central bank, or by international agencies. In these circumstances, the taxpayer subsidizes the investment. A frequent rationale for the bailing out is the "too big to fail" doctrine—the fear that allowing large borrowers to go under will trigger a systemic crisis.

Key factors contributing to an exposure to financial crises are balance-sheet features in the form of maturity and currency mismatches between the assets and the liabilities of the banking system, leading to financial fragility. A currency mismatch occurs when residents of the country are not adequately hedged against a change in the exchange rate. This is frequently the case in countries with few foreign assets, serving large external debt denominated in foreign currency, so that a large depreciation generates a large increase in the domestic valuation of the foreign liability, inducing a fall in the economy's net worth, usually accompanied by a large fall in output and insolvencies on the part of firms and banks. Maturity mismatch occurs when the average duration of the liabilities differs from that of the assets. Frequently, banks' liabilities have shorter maturity than banks' assets; hence large withdrawals by consumers may lead to a bank run. Developing countries are more susceptible to balance sheet fragilities and are characterized by debt intolerance: the inability of emerging markets to manage levels of external debt that are manageable for developed, high-income countries (Reinhart, Rogoff, and Savastano 2003).

This literature has led to a spirited debate concerning the wisdom of unrestricted capital mobility between high-income countries and emerging markets. Advocates of financial liberalization in the early 1990s argued that external financing would alleviate the scarcity of savings in developing countries, inducing higher investment and thus higher growth rates. The 1990s experience with financial liberalization suggests that the gains from external financing are overrated—the bottleneck inhibiting economic growth has less to do with the scarcity of saving and more to do with other factors, such as the scarcity of good governance (Rodrik 1998; Gourinchas and Jeanne 2003).

Notwithstanding this debate, the strongest argument for financial opening is the pragmatic one. Like it or not, greater trade integration erodes the effectiveness of restrictions on capital mobility (see Aizenman 2004). Hence, for successful emerging markets that engage in trade integration, financial opening is not a question of if, but of when and how. Instead, the hope is that proper sequencing of policies (see McKinnon 1991) and improved coordination will reduce the severity of financial crises, thereby improving the odds of a positive long-run welfare effect of financial opening.

Financial Opening and Financial Crises: The Evidence The recent research has two common themes: it validates empirically the assertion "Goodbye financial repression, hello financial crash" (Diaz-Alejandro 1985). Yet it also has found tenuous evidence that financial liberalization tends to increase growth over time. Both observations suggest an intertemporal trade-off. In the short-run, the fragility induced by financial opening leads frequently to crises. Yet, if these crises force the country to deal with its structural deficiencies, financial opening may induce a higher growth rate in the long run (see Ranciere, Tornell, and Westermann 2005).

Kaminsky and Reinhart (1999) found that problems in the banking sector typically precede a currency crisis; that a currency crisis deepens the banking crisis, activating a vicious spiral; and that financial liberalization often precedes banking crises. Glick and Hutchison (1999) investigated a sample of 90 countries during 1975–97, covering 90 banking crises, 202 currency crises, and 37 twin crises. They found that banking and twin crises have occurred mainly in developing countries, and their number increased in the 1990s. Twin crises are mainly concentrated in financially liberalized emerging-market economies. The costs of these crises are substantial—currency (banking) crises are very costly, reducing output by about 5 percent–8 percent (8–10 percent) over a two- to four-year year period (Hutchison and Noy 2005).

A useful survey of financial liberalization is found in Williamson and Mahar (1998), which focused on 34 countries that undertook financial liberalization between 1973 and 1996. Overall, the authors found a mixed record of financial liberalization—the gains are there, but the liberalization carries the risk of a financial crisis. Financial liberalization has yielded greater financial depth and increased efficiency in the allocation of investment. Yet it has not brought the boost in saving. The main recommendations emerging from their study are akin to those in Hellman, Murdock, and Stiglitz (2000)—start with macroeconomic stabilization, improve bank supervision, while delaying capital account convertibility to the end of the process. Maintaining high spreads may be needed in a transition until banks are able to work off the legacy of bad debt inherited from the period of financial repression, preventing moral hazard associated with a "gamble for resurrection."

The overall effect of financial opening on growth remains debatable. Rodrik (1998) failed to detect any positive effects of financial opening on investment, growth, and inflation. Bekaert, Harvey, and Lundblad (2001) found that equity market liberalizations, on average, lead to a 1 percent increase in annual real economic growth over a five-year period. The investment/gross domestic product ratio increases postliberalization, with the investment partially financed by foreign capital, inducing worsened trade balances. The liberalization effect is enhanced by a large secondary school enrollment, a small government sector, and an Anglo-Saxon legal system.

In summary, recent financial crises affecting developing countries are the outcome of financial fragilities, reflecting the downside of growing financial integration. The challenge is mitigating the pain in ways that enhance growth and economic welfare.

See also asymmetric information; banking crisis; Bretton Woods system; capital flight; currency crisis; deposit insurance; financial liberalization; financial repression; international reserves; lender of last resort; original sin; sequencing of financial sector reform

FURTHER READING

Aizenman, Joshua. 2004. "Financial Opening and Development: Evidence and Policy Controversies." *American Economic Review* 94 (2): 65–70. Greater trade integration erodes the effectiveness of restrictions on capital flow. Thus, for a country that engages in trade integration, financial opening is not a question of if, but of when and how.

Bekaert, G, C. Harvey, and R. Lundblad. 2001. "Does Financial Liberalization Spur Growth?" NBER Working Paper No. 6724. Cambridge, MA: National Bureau of Economic Research. In a large sample of countries since 1980, financial liberalization leads to a 1 percent increase on average in a country's annual growth rate over a five-year period.

Bernanke, Ben S. 1995. "The Macroeconomics of the Great Depression: A Comparative Approach." *Journal of Money, Credit, and Banking* 27 (1): 1–28. Monetary shocks as aggregate demand force behind the Depression; the induced financial crisis and sticky nominal wages are supply mechanisms by which nominal shocks had real effects.

Calvo, Guillermo A. 1998. "Capital Flows and Capital-Market Crises: The Simple Economics of Sudden Stop." *Journal of Applied Economics* 1 (1): 35–54. Articulates mechanisms through which a sudden stop in international credit flows may bring about financial and balance of payments crises, and examines factors triggering sudden stops.

Catao, Luis, and Sandeep Kapur. 2006. "Volatility and the Debt-Intolerance Paradox." *IMF Staff Papers* 53 (2): 195–218. Differences in macroeconomic volatility account for debt intolerance of developing countries—the ability to borrow is constrained by higher default risk that volatility engenders.

Chang R., and A. Velasco. 1999. "Financial Crises in Emerging Markets." *Economic Review* (Federal Reserve Bank of Atlanta) 84 (2): 4–17. A bank collapse multiplies the harmful effects of an initial shock. Under fixed exchange rates, a run on banks becomes a run on the currency if the central bank acts as a lender of last resort.

Demigüc-Kunt A., and E. Detragiache. 1998. "Financial Liberalization and Financial Fragility." IMF Working Paper No. 98/83. Washington, DC: International Monetary Fund. Banking crises are more likely to occur in liberalized financial systems; the impact of financial liberalization on banking sector fragility is weaker where the institutional environment is strong.

Diaz-Alejandro, C. 1985. "Goodbye Financial Repression, Hello Financial Crash." *Journal of Development Economics* 19 (1/2): 1–24. Unintended consequences of financial liberalization: intrinsic imperfections in financial markets imply that lifting of financial repression leads frequently to financial crash.

Dooley, Michael. 2000. "A Model of Crises in Emerging Markets." *The Economic Journal* 110 (460): 256–72. Variety of shocks generate capital inflows to emerging markets followed by successful and anticipated speculative attacks, liquidating reserve assets accumulated as self-insurance.

Edwards, Sebastian. 2004. "Financial Openness, Sudden Stops, and Current Account Reversals." *American Economic Review* 94 (2): 59–64. Restricting capital mobility does not reduce the probability of experiencing a reversal; flexible exchange rate regimes are better able to accommodate shocks stemming from a reversal.

Glick R., and M. Hutchison. 1999. "Banking and Currency Crises: How Common Are Twins?" In *Financial Crises in Emerging Markets*, edited by Reuven Glick, Ramon Moreno, and Mark Spiegel. New York: Cambridge University Press, 35–69. Crisis phenomenon is most common in financially liberalized emerging markets; banking crises are a leading indicator of currency crises in emerging markets. The converse does not hold.

Gourinchas, Pierre-Olivier, and Olivier Jeanne. 2003. "The Elusive Gains from International Financial Integration." NBER Working Paper No. 9684. Cambridge, MA: National Bureau of Economic Research. Welfare gains from switching from financial autarky to perfect capital mobility in neoclassical models are negligible relative to the welfare gain of a take-off in domestic productivity.

Hellmann, F. Thomas, Kevin C. Murdock, and Joseph E. Stiglitz. 2000. "Liberalization, Moral Hazard in Banking, and Prudential Regulation: Are Capital Requirements Enough?" *American Economic Review* 90 (1): 147–65. Competition can undermine prudent bank behavior in the presence of moral hazard. Pareto-efficient outcomes can be achieved by adding deposit-rate controls as a regulatory instrument.

Hutchison, Michael, and Ilan Noy. 2005. "How Bad Are Twins? Output Costs of Currency and Banking Crises." *Journal of Money, Credit, and Banking* 37 (4): 725–52. Currency (banking) crises are very costly, reducing output by about 5 percent to 8 percent (8–10 percent) over a two- to four-year period, no additional feedbacks associated with twin crises.

Kaminsky, Graciela L., and Carmen M. Reinhart. 1999. "The Twin Crises: The Causes of Banking and Balance-of-Payments Problems." *American Economic Review* 89 (3): 473–500. Problems in the banking sector typically precede a currency crisis; currency crisis deepens the banking crisis, activating a vicious spiral; financial liberalization often precedes banking crises.

McKinnon, Ronald. 1991. *The Order of Economic Liberalization: Financial Control in the Transition to a Market Economy*. Baltimore: Johns Hopkins University Press. Financial control and macroeconomic stability are more critical to a successful transition than is any crash program to privatize state-owned industrial assets and the banking system.

McKinnon, Ronald, and Huw Pill. 1999. "Exchange-Rate Regimes for Emerging Markets: Moral Hazard and International Overborrowing." *Oxford Review of Economic Policy* 15 (3): 19–38. Investigates the overborrowing syndrome. A "good" exchange rate peg stabilizes the domestic economy while limiting moral hazard in the banking system.

Minsky, M. Hyman. 1964. "Longer Waves in Financial Relations: Financial Factors in the More Severe Depressions." *American Economic Review* 54 (2): 324–35. Firms' need to finance investment spending and capital externally explains longer and deeper swings in economic experience.

Ranciere Romain, Aaron Tornell, and Frank Westermann. 2005. "Systemic Crises and Growth." NBER Working Paper No. 11076. Cambridge, MA: National Bureau of Economic Research. Financial liberalizations facilitate risk-taking, increasing leverage and investment, leading to higher growth, but also to a greater incidence of crises.

Reinhart, C., K. Rogoff, and M. Savastano. 2003. "Debt Intolerance." *Brookings Papers on Economic Activity* 1: 1–74. Debt intolerance is the duress many emerging markets experience at debt levels that are manageable by advanced country standards, and is linked to default and inflation history.

Rodrik, Dani. 1998. "Who Needs Capital-Account Convertibility?" In *Should the IMF Pursue Capital Account Convertibility? Essays in International Finance No. 207* (May), edited by Peter Kenen. Princeton, NJ: Princeton University Press, 55–65. The magnitude of recent crises is not justified by changes in the fundamentals of the affected economies; capital account liberalization is not necessary as a tool for growth.

Williamson, John, and Molly Mahar. 1998. "A Survey of Financial Liberalization." *Princeton Essays in International Finance No. 211*. Princeton, NJ: Princeton University Press. Evidence that financial liberalizations lead to financial deepening and increase the efficiency of investment allocation, but frequently spawn financial crisis.

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■ financial integration

See capital mobility

■ financial liberalization

Financial liberalization, or *financial reform*, in the most general sense, refers to the transition away from a financial system characterized by state intervention and ownership and toward a more market-oriented system. Not only does financial liberalization need to be considered in discrete historical phases that differ by region and level of development, it also can and should be understood as it applies to the domestic and international spheres. Sometimes this distinction boils down to the difference between banking reform and capital market reform. Outward, or externally oriented, financial liberalization involves lifting state controls on the flow of finance between the country in question and international financial markets, including allowing for competition from international banks operating within the country. Internally oriented financial liberalization focuses on removing restrictions on competition and other business practices within the domestic financial markets.

Internally Oriented Controls and Liberalization One of the most common forms of restrictions placed on domestic banks in both developed and developing countries has been interest rate ceilings—that is, restrictions on the interest rate banks are allowed to pay depositors in order to compete for their deposits, and/or limits on the interest rate banks are allowed to charge borrowers on their loans. Deregulation or liberalization in this case entails removing such ceilings.

Another form of interest rate regulation takes a more microeconomic form. Governments can set different interest rate ceilings depending on the economic sector of the loan. In this way, governments gain control over where banks choose to direct financial resources and who has access to credit. This is sometimes referred to as sector-specific allocation of finance, which has been much more common among newly industrializing economies (NIEs) in Asia than in Latin America or advanced industrial countries. Another method of sector-specific allocation is the manipulation of marginal reserve requirements on bank deposits. For example, monetary officials could control the allocation of private investment by altering the level of reserves private banks are required to hold in the central bank. Sometimes the reserve requirements would be adjusted depending on the sector of the economy to which loans were destined. (For a more detailed discussion of how this worked in Mexico, see Auerbach 2001). Especially in Asia, directed finance was part of a broader industrial policy strategy of state-led industrialization.

The most direct way that governments have controlled the flow of domestic finance, particularly in developing countries, is through ownership of banks. Thus privatization, that is, the process of selling off these banks to the private sector, often becomes the cornerstone of financial liberalization for the domestic market. Even after the domestic banking sector has been privatized, however, governments often and to varying degrees retain some control over where private sector banks direct their