

ABSTRACT

Title of Document: THE AMERICAN BANKER AS
INTERNATIONAL INVESTOR: HAVE THE
NEW BANKING POWERS IN THE U.S.
INCREASED THE VOLATILITY OF
LENDING INTO EMERGING ECONOMIES?

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Directed By: Professor I.M. Destler
Maryland School of Public Policy

Using U.S. cross-border bank exposure data, this study establishes a line of arguments and findings, which together constitute the following observation: “Deregulation of U.S. banks, via consolidation and a volatile earnings stream, increased volatility in bank lending to emerging economies, and, in due course, worsened the financial crises in emerging economies.” The volatility of U.S. bank lending to emerging economies has increased during the past twenty years. To explain the across-the-board, increasing volatility of U.S. bank emerging market claims, this study turns to the supply side of the equation: the deregulation in the U.S. banking sector that imparted this commonality to their banks’ investment patterns to emerging economies. In so doing, it unveils the linkages through which U.S. banking deregulation ratcheted up the volatility of U.S. bank lending into emerging economies. It starts with the

detection of a particular feature of U.S. bank emerging market lending that warrants further attention — increasing volatility over time. Unlike bank lending from Europe or Japan, U.S. bank lending exhibited the unique feature of increasing volatility over time, regardless of its destination. By looking into domestic push factors that could have contributed to this characteristic, this study identified a temporal association between important deregulation initiatives in the U.S. banking industry and the volatility of emerging market lending by U.S. banks during the same period. This association was then explained by the linkages between the major outcomes of deregulation — consolidation of the banking industry and diversification of banking activities — and the increased volatility of lending into emerging economies. Together, it argues that the U.S. banking deregulation had the unintended and unanticipated side effect of increasing the volatility of U.S. bank lending into emerging economies.

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HAVE THE NEW BANKING POWERS IN THE U.S. INCREASED THE
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By

HYUN KOO CHO

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**Advisory Committee:
Professor I.M. Destler, Chair
Professor Peter Reuter
Professor Carlos Vegh
Professor Virginia Haufler
Professor Randi Hjalmarsson**

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To H.J. Cho — May the force be with him.

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Chapter 1 Introduction

The 1990s witnessed a series of financial crises — currency, banking, or both — in many emerging economies.¹ Starting with Mexico in 1994, the list of emerging economies affected by these crises had been growing when Argentina declared the biggest sovereign default in history in January 2002.² The impact of some of these crises remained local, while others had fundamentally global implications. Even where the crises' impact remained local, however, there was hardly a case in which the mishap sprang from purely local roots. The intertwined nature of modern financial crises defies a simple taxonomy of their “systemic” origins. Still, anecdotal evidence of the global drivers of financial crises abounds. Roubini and Setser (2004) provide detailed accounts of such dynamics.

The Mexican government, for example, replaced peso-denominated debts (cetes) with domestic dollar-denominated bonds (tesobonos) to finance its budget deficit in 1994.³ Many of the Mexican banks borrowed in the international inter-bank market to finance tesobono purchases. International banks, mostly American, made short-

¹ The term “emerging economies,” as practiced by the IMF, refers to “developing countries.” The list of emerging economies for the main data used in this study, which is from the Federal Financial Institutions Examination Council (FFIEC) database, is provided in Appendix D.

² In order of the first year of the crisis, the affected countries were: Mexico (1994), Korea (1997), Thailand (1997), Indonesia (1997), Malaysia (1997), Russia (1998), Brazil (1998), Ecuador (1998), Pakistan (1998), Ukraine (1998), Turkey (2000), Argentina (2001), Uruguay (2001), Brazil (2002).

³ The stock of tesobonos increased from 6% of domestic debt in early 1994 to 50% at the end of November 2004, just before the devaluation.

term loans in dollars to Mexican banks. When the crisis hit in the wake of political shocks, American banks did not want to roll over their loans to Mexican banks, and Mexican banks did not want to roll over their domestic claims to the government. The near default of the Mexican government caused the peso to plunge, and the resulting bank bailout cost over \$50 billion.

Another example is the Russian government, which sold high-yielding domestic debt securities (GKO) to finance its growing fiscal needs. Foreign owners of the GKOs, such as the New York hedge fund Long Term Capital Management, often wanted to hedge against the risk that the ruble would be devalued. Russian banks met this demand and sold dollars forward at a fixed rate as insurance against a fall in the ruble. When things turned bad, the Russian banking system was in no position to take on this currency risk with few liquid dollar assets to honor the contracts. The ensuing currency, banking, and sovereign debt crisis in Russia led to capital controls on the local banking system in 2002. Regardless of the nature and location of an emerging market crisis, linkages to the U.S. financial market — either through U.S. dollar-denominated debt or the direct involvement of American institutions — were a major factor.

For the 1990s as a whole, the U.S. economy enjoyed the longest post-war economic boom the country had seen, sustaining its place in the world as a stalwart of prosperity in a sea of financial turmoil. The big, money-center banks in the U.S. fared surprisingly well for the decade of 1990s despite all the “manias, panics, and crashes,” domestic and international (Kindleberger 2000). For the two biggest banks in America, for instance, the glut of corporate bankruptcies in 2001 and 2002 —

including the two biggest of all time, Enron and Worldcom — hardly registered a tremor on their balance sheets.⁴ Nonetheless, episodes such as the Enron and the Worldcom debacles uncovered weaknesses previously deemed immaterial in the plumbing of the market. These ranged from the commission structure of stock brokers, to conflicts of interest between analysts who recommend certain stocks and the investment bankers who hire them, to the treatment of stock options and financial derivatives in corporate balance sheets, to the independence of auditors who seek consulting work from the same firms they audit. Indeed, the role of large financial institutions in fueling the boom-bust Enron episode highlights the conflicts of interest that existed between traditional loan activity, investment banking, and equity analysis. Bankers at some of the largest U.S. financial institutions allegedly engaged in questionable financing arrangements with Enron in return for a promise to receive Enron's investment banking business. Also, an equity analyst at one financial institution was fired for giving unfavorable equity ratings to Enron (The Economist 2004c).⁵ Against this backdrop, it is natural to ask how changing incentives in the U.S. affected investment decisions into emerging economies.⁶

⁴ Citigroup's profits for the second quarter of 2003 were \$4.3 billion (12% more than the same period a year earlier), and those of J.P. Morgan Chase were \$1.8 billion for the same period (78% higher than the second quarter of 2002) (The Economist 2003).

⁵ JP Morgan Chase, Citigroup, and Merrill Lynch together paid a total of \$366 million in fines for their roles in the Enron scandal.

⁶ About Argentina's recent fall, Paul Blustein of *The Washington Post* reported (August 3, 2004),

Big securities firms reaped nearly \$1 billion in fees from underwriting Argentine government bonds during the decade 1991-2001, and those firms' analysts were generally the ones producing the most bullish and influential reports on the country... Just as in the world of stock market investing, where money managers aim to beat the Standard & Poor's 500-stock index, many professional investors in emerging markets are judged every quarter or so by how well their portfolios fare in comparison to a benchmark... During much of the 1990s, Argentina had the heaviest weighting in the index of any nation, peaking at 28.8% in 1998 — not because of its economic size, but simply because its government sold so many bonds. The index virtually forced big investors to lend vast sums to Argentina even if they feared that

As to the international aspect of these crises, each of the financially battered emerging economies of the 1990s presented a unique set of financing methods, actors, and ultimately hybrid creditor/debtor relationships. Even the role played by the U.S. capital market in funneling funds into different emerging economies was unique in each case. In some countries, U.S. banks were the main actors in investing and later withdrawing their financial resources for whatever reasons, while in others it was U.S. investment banks that underwrote the sovereign bond issues that engineered capital inflows into these countries. Nonetheless, it is possible, and indeed important, to identify one critical player that has remained at the epicenter of financial activities reaching emerging economies throughout time and geography: money-center banks in New York.

The Problem of International Bank Lending

Many existing studies on emerging market financial crises converge on the view that emerging economies “need to be concerned about the form in which they borrow, perhaps even more than with the level of borrowing” (Williamson 2005). Sources of vulnerabilities in emerging market financing are numerous, starting from large macroeconomic imbalances, fixed or semi-fixed exchange rates, and weak financial systems in borrowing countries to commodity price shocks or interest rate changes in major suppliers of funds like the U.S. High on the list of such concerns is the form in

the country was likely to default in the long run, several money managers said. Although default would hurt their portfolios, they would still lose less than the index as long as they were a bit “underweight,” meaning they held a smaller percentage of Argentine bonds than the index dictated. They did not dare be too far underweight. Money managers who shunned Argentine bonds were taking a huge risk, because their portfolios would almost certainly underperform the index in the event Argentine bonds rallied.

which these countries finance their funding needs — with short-term, foreign-currency debt rather than equity. According to Roubini and Setser (2004), the dangers in such a financing method are evident in the risk created by mismatches between a country's existing debt stock and its assets.

If short-term debts exceed liquid assets, a government, bank, or firm risks not being able to roll over its short-term debt, thus being forced to seek a restructuring or default (*maturity mismatch*)... If a substantial portion of debts is denominated in foreign currencies, a mismatch between foreign currency debts and revenues can lead to an increase in real debt burdens without a commensurate increase in the ability to pay (*currency mismatch*)... If a country finances itself with debt, it will suffer from lack of buffers in times of trouble. Debt payments are fixed even in bad times when dividends on equity can be reduced in a way that shares downside risk as well as upside gains (*capital structure mismatch*).

Despite such inherent weaknesses, debt flows remain an important vehicle for emerging market financing. *Table 1.1* compares the snapshots of external debt stock in emerging economies with the stock of inward foreign direct investment (FDI). As a share of GNI of emerging economies, total debt stock was solidly on the rise before tailing off in the 2000s. FDI, while stagnating in the 1970s and 1980s, exploded starting in the late 1980s following a welcoming stance from most emerging economies. Among different categories of debt stock, bank loans mirrored the movements in total debt stock, while bond investments picked up momentum after the introduction of Brady Bonds in 1989.⁷

⁷ The introduction of the Brady Bonds in 1989 was a catalytic event bringing about transformation in

In due course, the share of bank loans in total external debt stock fell relative to bond placements. Even after short-term debts, consisting mostly of inter-bank loans, are included in bank loans, the share falls from 58% in 1980 to 39% in 2003. On the other hand, the share of external bonds skyrocketed from 2% to 22% over the same period. Indeed, international bond placements have become a major source of funding, especially for governments in emerging economies.

Table 1.1 Total external debt & FDI stock in emerging economies

Stock of external capital	1970	1980	1990	2000	2003
	(\$ billions at current prices, percent of GNI in parentheses)				
Total debt stock ^a	70 (.10)	554(.20)	1,352 (.34)	2,305(.39)	2,433(.37)
Long- and medium-term ^b	61	410	1,101	1,923	1,960
bank loans (private)	19	191	310	608	580
bonds (private)	2	13	105	465	523
others ^c	7	56	136	70	52
Short-term	n.a	132	216	323	364
FDI inward stock	56(.08)	106(.04)	370(.09)	1,756(.30)	2,148(.33)
GNI, emerging economies	667	2,772	3,961	5,849	6,604

Notes: ^a Total debt stock includes the use of IMF credits. ^b Long- and medium-term debt stock includes credits from official lenders, such as national governments. ^c Other private debt stock includes credits from manufacturers, exporters, and bank credits covered by a guarantee of an export promotion agency.

Sources: World Bank *Global Development Finance* (2004). UNCTAD *World Investment Report* (2006).

This transformation was evident in the crisis episodes in Mexico (1994), Russia (1998), and Argentina (2001), in which soaring sovereign bond spreads in international markets virtually cut additional private funding options off the table. However, stock figures tell only so much. They do not show the short-term variability in each form

emerging market lending. During the 1980s, a small number of commercial banks, linked through syndication, held loans to governments in Latin America, for example. After a decade of defaults and financial turmoil in the region, many of these loans were turned into Brady Bonds — named after Nicholas Brady, the then-Treasury Secretary of the U.S. — and consequently the composition of creditors to Latin American countries shifted from commercial banks to retail investors.

of external capital in and out of emerging economies, not to mention capital flight by residents of the crisis-hit economies. Much of the problem in emerging market financing resides in the quick reversibility of capital flows, not the magnitude.

Had flows been reasonably stable close to their averages, it would have been difficult to argue big problems would have arisen from the inflows.... It is the extreme variability around those levels that made the capital account a problem (Williamson 2005).

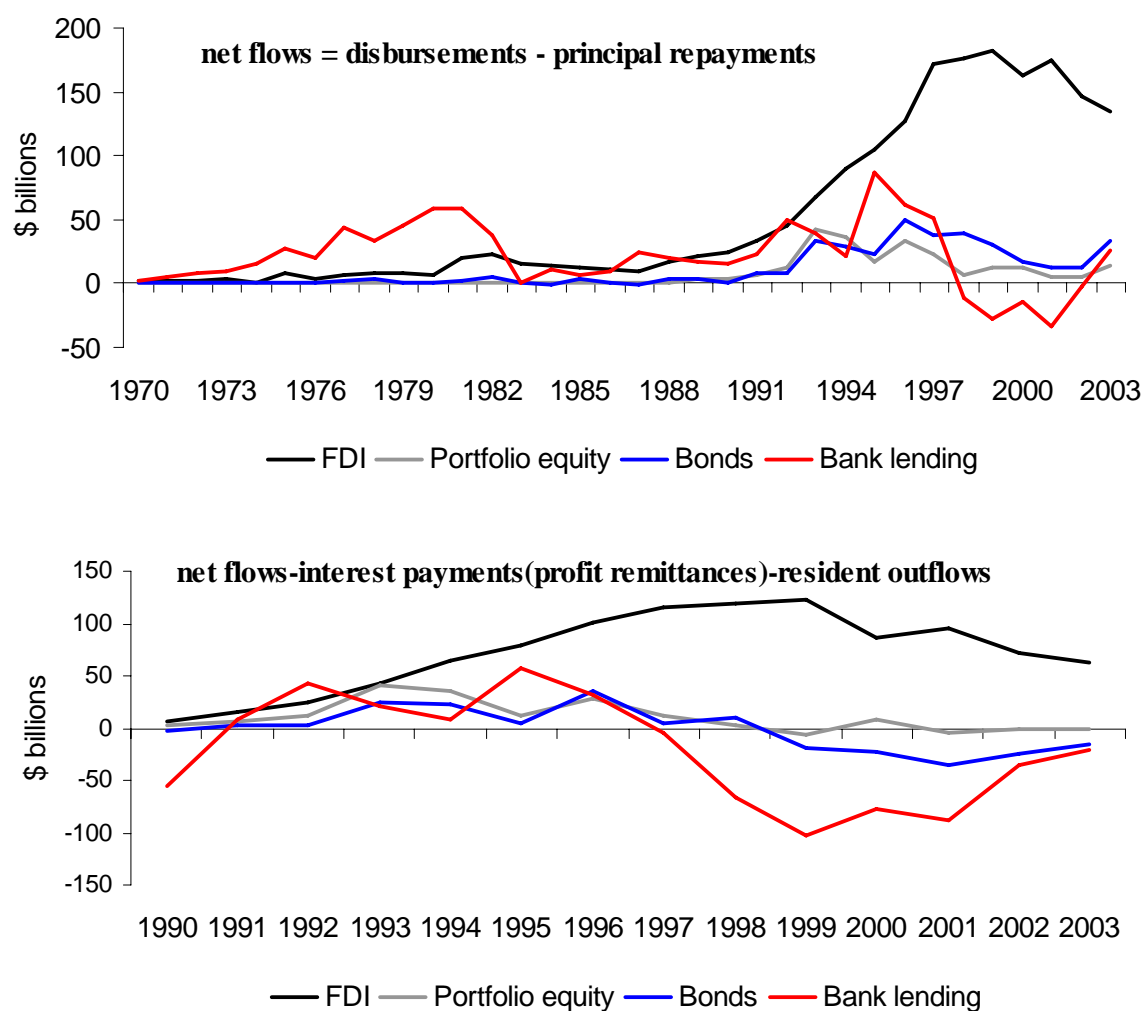
Obtaining an accurate picture of capital getting in and out of emerging economies is itself a complex task. Different sources give somewhat different pictures, depending on the classification methods. Appendix A provides the juxtaposition of the different data sets, classified in roughly the same way to provide useful insights about the capital flows data. *Figure 1.1* comes from the Global Development Finance (GDF) database of the World Bank, the most comprehensive source with disaggregated data for emerging market debt. The first figure reflects net flows, disbursements minus principal payments. The second figure subtracts from the net figures important reverse flows: interest payments for loans & bonds, profit remittances for FDI, and resident outflows (bank deposits and portfolio investments).⁸

Together, the charts in *Figure 1.1* clearly point to a problematic form of capital flowing into emerging economies: bank loans and deposits. When interest payments and resident outflows are subtracted from net flows, cumulative bank lending since 1990 has been in the negative range of \$280 billion. When it comes to bank lending,

⁸ Resident outflows are from IMF sources since the GDF does not provide these movements. Bank deposits abroad from residents are subtracted from bank lending, while portfolio investments abroad are divided in half and each subtracted from portfolio equity and bonds flows.

net resources have been transferred out of emerging economies, to use the World Bank terminology. Bonds have not been helpful in funneling capital into emerging economies either, especially after the Asian crisis broke out, with cumulative flows since 1990 remaining in the negative range of \$10 billion. These debt flows stand in sharp contrast to the positive cumulative FDI (\$1,005 billion) and portfolio equity flows (\$230 billion) in the 1990s and onwards.

Figure 1.1 Net private capital flows to emerging economies, by type



Sources: World Bank. *Global Development Finance*. (various issues). IMF. *International Financial Statistics*. *Balance of Payments Statistics* (various issues).

The volatile nature of bank flows manifested itself in each crisis episode, although rising international bond spreads triggered more recent crises such as in Mexico (1994) and Argentina (2001). In *Table 1.2*, annual changes in exposure of private creditors to each battered economy are listed, starting one year before the onset of crises. Both types of debt flows — bonds and bank loans — were quick to turn around at the onset of crises, if not before. Everyone fled the scene if they could. Noteworthy is the bigger scale of reversal from bank lending in each case. Bank reversals from Thailand and Indonesia, amounting to 40% of the average GDP over the five years in the case of Thailand, are not surprising because a sudden stop to inter-bank credit lines was a well-known contributor to the Asian financial crisis. However, in every one of the six crisis episodes in *Table 1.2*, bank loans were a bigger source of capital flight than external bonds. Even in the case of Argentina, the international bond crisis par excellence, more money left the country in repaying bank loans than bonds. Roubini and Setser (2004) confirm this finding and note (*italics added*),

Wild swings in market prices matter a lot to those holding the bonds but don't always correspond to wild flows in and out of the crisis country.... Mexico, Russia, Turkey, and Brazil all turned to the IMF because of prospective difficulties in making payments on their domestic sovereign debt, not their international sovereign bonds.⁹ The rolloff of *short-term cross-border bank claims* was a bigger source of stress in Asia, Turkey, Brazil, and even Argentina than an inability to refinance maturing international bonds. The crises in Argentina and Uruguay demonstrated how residents' willingness to

⁹ "Mexico, Russia, Brazil (1998 and 2002), and Turkey faced difficulties because of the sovereign's domestic debt, not international bonds. The Asian Crisis countries faced difficulties because of a rolloff of cross-border bank loans to private creditors. The rolloff of bank loans was also an important factor in Brazil and Turkey." Roubini and Setser (2004). p 363.

shift from dollar-denominated bank deposits (local assets) to dollars and dollar assets abroad (foreign assets) can put enormous pressure on a country's reserves.

Table 1.2 Net transfers^a in private bonds and bank lending

(\$ billions)

Country (crisis)	Start	Net bond flows – interest payments						Net bank lending ^b – interest payments					
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	sum ^c	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	sum ^c
Thailand (1997)	1996	3.1	1.0	-1.4	-2.1	-1.9	-1.3 (-.01)	5.8	-15.8	-12.1	-15.2	-16.0	-53.4 (-.40)
Indonesia (1997)	1996	3.4	2.4	-1.1	-2.4	-2.9	-0.6 (.00)	5.6	-0.2	-16.1	-8.8	-4.6	-24.0 (-.15)
Russia (1998)	1997	5.2	10.7	-1.8	-3.0	-3.2	8.0 (.03)	-2.7	-0.4	-2.4	0.3	1.2	-4.0 (-.01)
Brazil (1998)	1997	-3.3	-1.5	-2.0	-5.6	-4.1	-16.5 (-.03)	-7.1	-13.2	-23.1	-4.7	-15.3	-63.5 (-.10)
Turkey (2000)	1999	2.5	4.0	-2.5	-1.2	-	2.8 (.02)	4.1	4.6	-16.9	2.7	-	-5.5 (-.03)
Argentina (2001)	2000	-2.2	-11.2	-0.4	-	-	-13.8 (-.07)	-4.2	-12.9	-0.7	-	-	-17.8 (-.08)

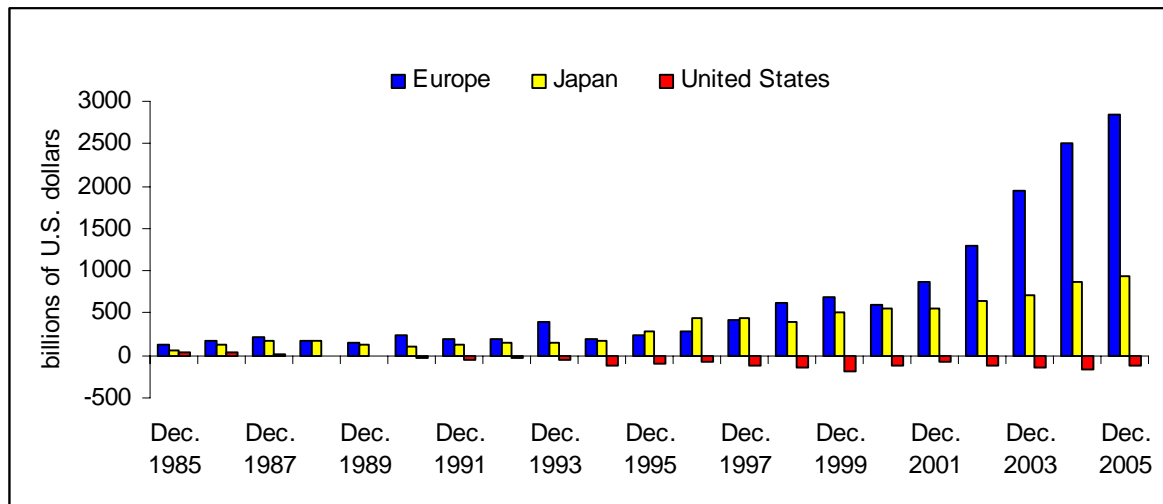
Notes: - Not available. ^a Net transfers equal to net flows (disbursements – principal payments) minus interest payments on bonds and bank loans. ^b Changes in bank exposure includes private bank lending to public and private sectors plus changes in short-term debts. ^c Share of average GDP in parentheses. Sources: World Bank *Global Development Finance* (2004).

Of course, the troubles caused by soaring spreads in secondary bond markets do not stay offshore. They raise refinancing costs for governments and firms with foreign-currency debt. With devalued local currency, sustaining current account deficits on top of repaying foreign-currency debts often requires running down on reserves. A beleaguered government often turns to the domestic banking sector, if not the central bank, for emergency liquidity, causing a ripple effects of higher interest rates and further contraction of the economy.¹⁰ Things get out of control

¹⁰ A sovereign that borrows in its own currency is also subject to moral hazard, because it is able to reduce the real cost of servicing the debt by inflating it away (Reinhart, Rogoff, and Savastano 2003).

when bank credit lines are cut off and residents pull their funds out of local banks and deposit them abroad. It is no surprise that net transfers in bonds and loans in emerging economies move closely together in *Table 1.2*.

Figure 1.2 Bank international claims (net)*, by residence of lenders



Notes: * Net assets (assets minus liabilities) of BIS reporting banks at the end of each year. BIS locational statistics provide gross on-balance asset and liability positions of banks in Europe, Japan and the U.S. vis-à-vis entities (banks, non-banks, public sector) located in other countries worldwide. Europe includes 16 countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. Source: BIS Locational Banking Statistics.

On a net basis, that is, assets minus liabilities in this case, U.S. banks received more money from international investors than they made investments abroad throughout the 1990s (*Figure 1.2*). Much of this phenomenon undoubtedly stems from the fact that the U.S. had been financing its current account deficits with massive capital inflows. However, it would be fair to say that much of the capital flight, including resident outflows from the crisis economies, headed for the U.S. Accordingly, the volatility of U.S. bank lending to emerging economies should carry more weight in any comprehensive analysis of the issue. As will be shown in

Chapter Two, U.S. bank lending to emerging economies has been unique in that its volatility has been increasing over the past twenty years, when bank lending from Europe or Japan, while more volatile on average, does not show any trend. It leads one to wonder if there has been any particular feature of U.S. bank lending that distinguished the U.S. from other industrial countries.

Deficiency in Existing Studies

The issue of “fickle” capital flows creating boom and bust cycles in emerging market financing has been an important theoretical topic since the 1980s, with the models of self-fulfilling balance of payments crises (Obstfeld 1996, Krugman 1999) and contagion effects (Eichengreen *et al.* 1996, Kaminsky and Reinhart 2000, Frankel and Schmukler 1998). Despite increasing focus on different types of capital flows and their reversibility during the financial crises in emerging economies, however, few studies have directly tackled the issue of “volatility” in capital flows, let alone bank lending volatility (Alfaro *et al.* 2004). It is not that the volatility of international bank lending compared to other forms of capital flows has gone unnoticed. Dobson and Hufbauer (2001), for example, explicitly measured the volatility of different types of capital flows by taking absolute deviations, standard deviation of different capital flows divided by the average of each flow, and concluded that bank lending had been the most volatile form of capital flows into emerging economies.¹¹

¹¹ “Bank loans are illiquid fixed price instruments. They cannot easily convert to cash, although they can be bundled into securities. Once loan terms have been agreed on, the only way a bank can adjust for shifting market conditions is by changing the quantity of its exposure. When a borrower runs into trouble, the bank can mix and match from two menus: it can roll over existing loans and extend new credits, or it can call some part of existing loans and attempt to recover the principal.

Rather, the deficiencies in explaining the “volatility” of capital flows, as the authors point out, lie in the asymmetric emphasis given to the issue. A wide array of literature focuses on the pull factors, such as macroeconomic policies, the structure of financial systems, legal origins, political regime change, or the degree of corruption in host economies. Not enough attention has been devoted to the supply side of the problem. With respect to financial crises in emerging economies, the debate within the club of rich countries has been mostly concerned with whether private-sector players should bear more of the costs of resolving crises *when they occur* (Dobson and Hufbauer 2001).

No doubt as important in explaining problematic bank lending to emerging economies are the dynamics in home countries from which the lending originates. Calvo, Leiderman, and Reinhart (1996), for example, show that low interest rates in the U.S. played an important role in accounting for the renewal of capital flows to emerging economies in the 1990s. After the contagion of the Asian financial crisis to Russia and Brazil in the late 1990s, the presence and role of common lenders in spreading a crisis to countries otherwise unrelated to the crisis-hit countries have been emphasized (Kaminsky and Reinhart 2000, Caramazza, Ricci, and Salgado 2000). Calvo and Mendoza (2000) suggest that the change in capital flows is driven not by fundamental weaknesses in the emerging economy but by investors’ fickleness, sudden changes in risk appetite, and, more generally, conditions in the financial markets of advanced economies, the so-called “sudden stop.” There also exists convincing evidence showing how strong regulatory changes relate to the banks’

When trouble brews, all banks encounter the same conditions; in the aggregate, they prefer less exposure, and following credit restrictions lead to volatile bank lending.” (Dobson and Hufbauer 2001).

international activities by framing underlying incentives in a certain way. The Basel I Accord on minimum capital requirements offers one such example. Under the Accord, short-term loans maturing in less than a year required a 20% risk weight, whereas those maturing after more than a year required a 100% risk weight. Inter-bank lending was thus favored. Loans to banks in OECD countries required less capital than loans to private firms in the same countries, creating the anomaly that inter-bank loans to Korean banks required less capital than loans to General Electric (Dobson and Hufbauer 2001). Nonetheless, conspicuous by its absence is a systemic analysis of the linkages between regulatory changes affecting banks in industrial countries and the same banks' lending behavior internationally, especially to emerging economies.

In fact, there have been fundamental changes taking place in the banking industry — nowhere more so than in the U.S. — in the past twenty years toward deregulation of banking activities. As will be elaborated in Chapter Three, U.S. banks no longer face the geographic and activity restrictions that tied their hands for much of the past century. They are now free to engage in any financial activities under the holding company structure. Part of this transformation in banking regulation reflects the innovation in information technology and financial techniques that left the old regulatory framework obsolete. As such, the new environment under which banks have to compete with each other is not particular to the U.S. banks and their regulators. However, the uniqueness of U.S. banking dictated by the tradition — “unit bank” (one office) with no interstate branching — and historical events — the Great Depression — made the wholesale deregulation in the 1990s all the more

spectacular. The aftermath of U.S. banking deregulation is still unfolding, with ramifications being analyzed from various angles. What has been missing to date is an examination of the potential impact of this breakthrough on the international activities of U.S. banks, especially their lending to emerging economies that suffered one crisis or another during the same period.

On the domestic front, benefits from the economy of scope, as well as potential risks from allowing non-banking activities, were widely debated in the 1990s, each shaping the direction of the actual deregulation taking place (Ramirez 1995; Berger and Udell 1996; De Young and Roland 1999). Much discussion was devoted to the possible spillover effects on small business and community lending from banking consolidation, one important outcome of deregulation (Peek and Rosengren 1998; Strahan and Weston 1998). On the international front, however, the mainstream analysis of U.S. banking deregulation has addressed the issue in the context of enhancing international competitiveness of the banking industry (Saunders and Walter 1994, Canals 1997). Seldom has the issue of emerging market lending of U.S. banks been the topic of discussion about banking deregulation. Given the domestic nature of the debate and the status of emerging market claims as a junior asset class, the lack of attention is understandable. However, it is this gap in the existing scholarship that this study aims to bridge.

Arguments and Organization

Using U.S. cross-border bank exposure data, this study establishes a line of arguments and findings, which together constitute a simple observation:

Deregulation of U.S. banks, via consolidation and a volatile earnings stream, increased volatility in bank lending to emerging economies, and, in due course, worsened the financial crises in emerging economies.

1. Volatile bank lending worsened, though apparently did not trigger, financial crises.

Bank lending has been the most volatile form of private capital flows to emerging economies during the past twenty-five years. When it comes to specific incidences of crisis, portfolio flows — bond investments in particular — are at the center of recent crises, such as Mexico (1994) and Argentina (2001). Nevertheless, bank lending increasingly took the form of short-term flows to private borrowers, which are liable to quick reversals at the outset of crises. Further, in the case of U.S. bank lending, volatility shows a consistent negative association with the level of U.S. bank claims across countries in different regions.

2. Volatility of U.S. bank lending to emerging economies increased with deregulation.

There was an unmistakable trend in U.S. banks' overseas claims towards higher volatility, especially to emerging economies, as the U.S. banking sector underwent a historic transformation in its regulatory environment, unmatched in its depth and breadth by regulatory changes in Japan or in Europe. This pattern of increasing volatility is unique compared to the volatility of bank lending from Europe

or Japan. In no region other than the U.S., does bank lending volatility show any trend.

3. There were structural shifts in volatility after important U.S. deregulation initiatives.

In every single case, be it regional or country exposure to Asia and Latin America, there was an increase in average volatility after the two major deregulation initiatives: (1) the introduction of Section 20 affiliates in 1987; and (2) the passage of the Gramm-Leach-Bliley (GLB) Act in 1999. Further, dummy variable regressions detect statistically significant structural breaks in volatility after these two deregulation initiatives after a time lag of approximately two years. These upward shifts take place irrespective of the changing level of bank claims in different regions. U.S. bankers were pulling money out of Latin America and investing in Asian countries at the same time that the volatility of U.S bank lending was experiencing similar structural shifts in both regions.

4. Banking deregulation led to consolidation and a volatile earnings stream.

Through a gradual deregulation process over the past twenty years, age-old barriers in banking regulation have been all but eliminated, paving the way for universal banking in the U.S. As a result, the U.S. banking industry experienced a wave of consolidation. With the passage of the GLB Act, financial holding companies were created that can combine any activities “financial in nature” within their holding company structure. Existing studies illustrate that, partly owing to this

diversification of the banking industry, earnings for these universal banks have skyrocketed over time. Despite greater returns from non-bank activities, however, there are an increasing number of studies which illustrate that these increased returns are associated with higher volatility from taking on new risks.

5. Consolidation played a catalytic role linking deregulation with lending volatility.

Consolidation of the U.S. banking industry created fewer banks with much smaller shares of their assets devoted to emerging market exposure. Big money-center banks that emerged from mergers and acquisitions are driving up the trend in volatility in almost every category by type or maturity. By contrast, smaller banks show decreasing volatility over time in many categories, such as lending to private non-bank entities. When deregulation dummies are used as instrumental variables, a clear picture emerges in which deregulation raises the volatility of U.S. bank emerging market lending via a reduction in the number of banks making investments into emerging economies. Furthermore, the share of emerging market claims (in total assets) of these reporting banks experiences a drastic downfall as the average size of the bank gets larger. As the importance of emerging market claims in asset classes declines, positive gains in the share increase the volatility of such claims.

6. Diversification led to earnings volatility, which in turn increased lending volatility.

Diversification, the dealing of mixed financial products by commercial banks,

is shown to increase bank earnings volatility. In fact, bank earnings have become more volatile after major deregulation initiatives, with the trend heading upward over the past twenty years. At the same time, when earnings volatility of U.S. banks is regressed against lending volatility (to emerging economies), there emerges a temporal causality. Bank earnings volatility Granger-causes the lending volatility to emerging economies, after a time lag of approximately two years. This temporal causality is pronounced in short-term, private, non-bank claims, and has a shorter time lag in Latin America than in Asia.

This study consists of five chapters. Chapter One raises and illustrates the problem of bank lending in aggravating emerging market crises. It is aimed at emphasizing the issue of volatility in emerging market bank lending, with a focus on U.S. bank lending. Chapter Two measures the volatility in U.S. bank lending from quarterly data from the Federal Financial Institutions Examination Council (FFIEC).¹² It shows a clear upward trend in volatility of U.S. bank lending to emerging economies over the past twenty years, addressing the negative impact of volatile bank lending and the determinants of volatility. It uncovers the particulars of U.S. bank lending that warrant more attention compared to the banks from other financial centers such as Europe and Japan. Chapter Three elaborates on U.S. banking deregulation as a common backdrop against which U.S. bank lending to emerging economies takes place, and deregulation's impact on consolidation and diversification. Chapter Four empirically tests the linkage between deregulation and bank lending volatility through these two channels — (1) consolidation of the banking industry; and

¹² The data used for this study has been obtained directly from the Federal Reserve Board through the Freedom of Information Act (FOIA).

(2) diversification of banking activities. Dummy tests for structural breaks establish the temporal association between the two separate developments. The two-stage least squares (2SLS) model and Granger-causality test respectively illustrate the impact of deregulation on the volatility of emerging market lending through consolidation and diversification. Finally, the determinants of U.S. bank lending volatility are revisited with deregulation dummies and bank earnings volatility as additional explanatory variables. Chapter Five sums up the findings and suggests policy considerations.

Chapter 2 Volatility of U.S. Bank Lending to Emerging Economies

This chapter directly addresses the issue of volatile U.S. bank lending to emerging economies by constructing a measure of volatility from bank foreign exposure data. For any relevant analysis, it is critical to have the right measure from high frequency data to begin with. What follows is the description of the database and the measure of volatility.

Data Overview

Following the International Lending Supervision Act of 1983, a report on foreign exposure must be filed by every U.S. chartered insured commercial bank, provided that the bank has, on a fully consolidated bank basis, total outstanding claims on residents of foreign countries exceeding \$30 million in aggregate. Regulators began providing that information to the public in 1984 through the Country Exposure Lending Survey (CELS), which is published by the Federal Financial Institutions Examination Council (FFIEC).¹³ Reporting banks fall into one of three categories: (1) money-center banks; (2) other large banks; and (3) all other reporting banks. For each bank group, the CELS reports two categories of foreign exposure: (1) cross-border claims; and (2) local claims. The reporting institution is also asked to break

¹³ The FFIEC is an umbrella organization that collects and warehouses data for the Federal Reserve, Office of the Comptroller of the Currency, and Federal Deposit Insurance Corporation. Much of the information collected via the FFIEC is made public, aggregated over all reporting banks, via the Country Exposure Lending Survey (FFIEC Statistical Release E. 16).

down the outstanding cross-border claims by the type of borrower (banks, public sector entities, other) and by the time remaining to maturity (less than one, one to five, and over five years).

According to this data, U.S. banks engaged in international lending have become more consolidated since the 1980s, with fewer banks overall, and the remaining banks increasingly polarized in terms of size and portfolio allocation. Starting from a high of 185 banks in the mid 1980s, the number of U.S. banks with foreign exposures declined to 140 by the mid 1990s and further declined to 71 banks in 2004. There were nine banks classified as large money-center banks in 1982, controlling a total market share of about 58% in foreign exposure. As a result of mergers, that number declined to four, and their market share increased to 80%. In 2005 Q4, the four organizations in this group were Bank of America, Taunus Corp. (the U.S. affiliate of Deutsche Bank), J.P. Morgan Chase, and Citigroup.

Table 2.1 provides an overview of U.S. bank external claims. Total claims in emerging economies, in nominal terms, declined during most of the 1980s in response to the LDC debt crises, which significantly eroded bank capital. For example, between 1982 and 1994, emerging market claims declined from \$151 billion to \$123 billion, with the cross-border claims in 2002 still well below the level reached in 1982. The reduction in exposure stands out in cross-border lending. Over the twenty years from 1982 through 2002, cross-border claims in emerging economies fell more than one-third from initial exposure. By sharp contrast, local claims in emerging economies underwent tremendous growth. Notwithstanding various emerging market crises along the way, local claims increased to ten times their 1982 level. In

1997, when the Asian crisis erupted, local claims overtook the size of cross-border claims in emerging economies. This phenomenon can be, in part, explained by the efforts of U.S. banks to establish a long-term local presence in expectation of higher profits, as well as an intent to avoid the severe exchange rate volatility that accompanies many emerging market crises (Palmer 2000). By the same token, it suggests that much of the volatility comes from cross-border lending.

Table 2.1 U.S. bank external claims, by type and region

Item	1982	1986	1990	1994	1998	2002
	Total claims (billions of U.S. dollar)					
Developed countries and banking centers	279	287	269	281	467	611
Cross-border	213	186	152	160	259	374
Local	65	101	117	121	208	237
Emerging market countries (A)	151	133	85	123	176	219
Cross-border (B)	137	116	62	80	84	82
Local (C)	14	17	23	43	93	136
Asia-Pacific (<i>as share of A</i>)	47(.31)	37(.28)	32(.38)	51(.41)	63(.36)	70(.32)
Cross-border (<i>as share of B</i>)	41(.30)	28(.24)	18(.29)	27(.34)	23(.27)	24(.29)
Local (<i>as share of C</i>)	6(.43)	8(.47)	14(.61)	24(.56)	40(.43)	46(.34)
Latin America (<i>as share of A</i>)	91(.60)	89(.67)	49(.58)	65(.53)	102(.58)	126(.58)
Cross-border (<i>as share of B</i>)	84(.61)	81(.70)	40(.65)	49(.61)	55(.65)	50(.61)
Local (<i>as share of C</i>)	7(.50)	8(.47)	9(.39)	16(.37)	47(.51)	75(.55)
	Private non-bank claims as % of cross-border claims					
Developed countries and banking centers	0.26	0.23	0.27	0.38	0.37	0.41
Emerging market countries	0.25	0.20	0.22	0.39	0.60	0.63
	Short-term claims as % of cross-border claims					
Developed countries and banking centers	0.68	0.70	0.62	0.74	0.81	0.68
Emerging market countries	0.41	0.43	0.48	0.61	0.76	0.58
	Money-center bank claims as % of cross-border claims					
Developed countries and banking centers	0.54	0.56	0.58	0.69	0.81	0.79
Emerging market countries	0.63	0.65	0.77	0.75	0.73	0.68

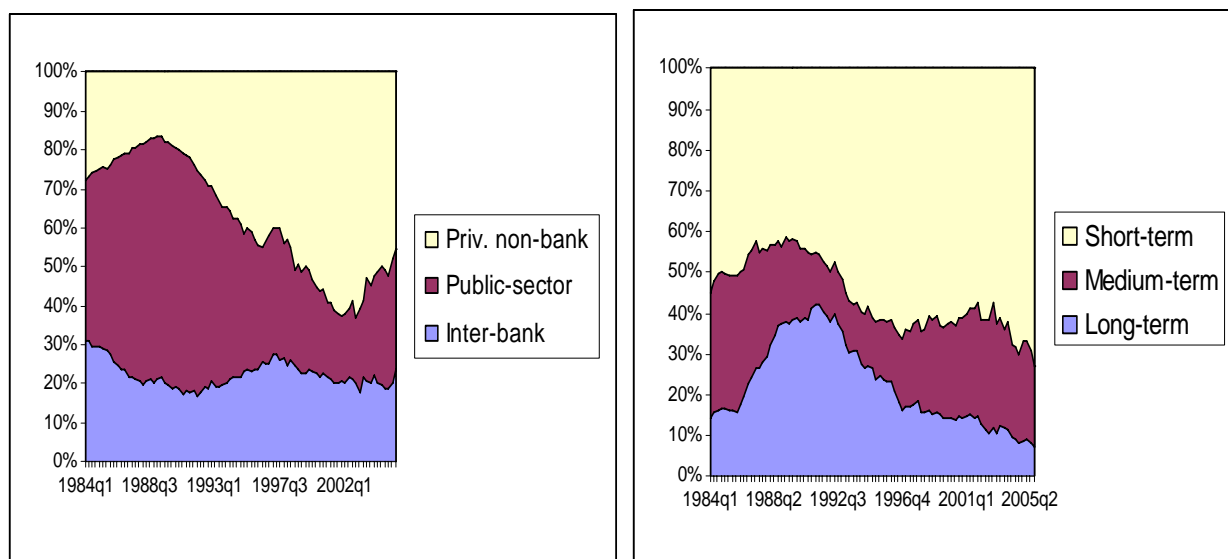
Source: FFIEC, Country Exposure Lending Survey (various issues)

The regional composition of U.S. banks' claims has also changed since 1982. By the end of 2002, emerging economies accounted for just 26% of U.S. banks' foreign claims, compared with a share of 36% in 1982. The share of emerging economies in *cross-border* claims dropped from 39% to just 18% over the same period, while the emerging economies' share in *local* claims increased from 19% to 36%. Within emerging economies, regional discrepancies stand out as well. Asia's share in U.S. banks' emerging market exposure increased from 31% in 1982 to 41% in 1994, only to fall back to 32% in 2002. On the other hand, exposure in Latin America seesawed around the 60% range. Furthermore, the growth in foreign lending in the 1990s and onward was driven by the growth in the foreign exposure of a small number of money-center banks. Currently, money-center banks represent 80% of *total* exposure, and 75% of total *cross-border* lending exposure. All of the growth in cross-border lending has been concentrated in money-center banks, with a near-flat share for smaller banks. Money-center banks also dominate totals in *local claims*. Although this dominance is less than what it was in the 1990s (around 90%), it still exceeds 80% of the total.

Figure 2.1 shows the changing shares of the recipients of U.S. banks' foreign exposure. Over time, inter-bank lending and lending to public entities declined, while lending to a broader group of non-bank private sector recipients has expanded. The relative share of private non-bank claims (from 28% in 1984 to 46% in 2005) has skyrocketed while inter-bank (31% in 1984 to 21% in 2005) and public sector (41% in 1984 to 31% in 2005) claims declined. From this remarkable stride in volume, private non-bank claims presumably came to dominate the movement of total

emerging market claims.

Figure 2.1 Composition of U.S. bank emerging market claims, by type



On the other hand, short-term credits, or those with maturities less than one year, still dominate U.S. international lending. Their share increased from 55% in 1984 to 73% in 2005. This stands in sharp contrast to the dwindling shares of medium-term claims (31% in 1984 to 20% in 2005) and long-term claims (14% in 1984 to 7% in 2005). The high proportion of international lending accounted for by short-term credits is explained by a commercial bank preference for international trade-related finance, concerns over default risk, and borrowers in emerging economies seeking cheaper external financing. All in all, most international banks have preferred to extend short-term credit, especially to private non-bank clients in emerging economies.

Measure of Volatility

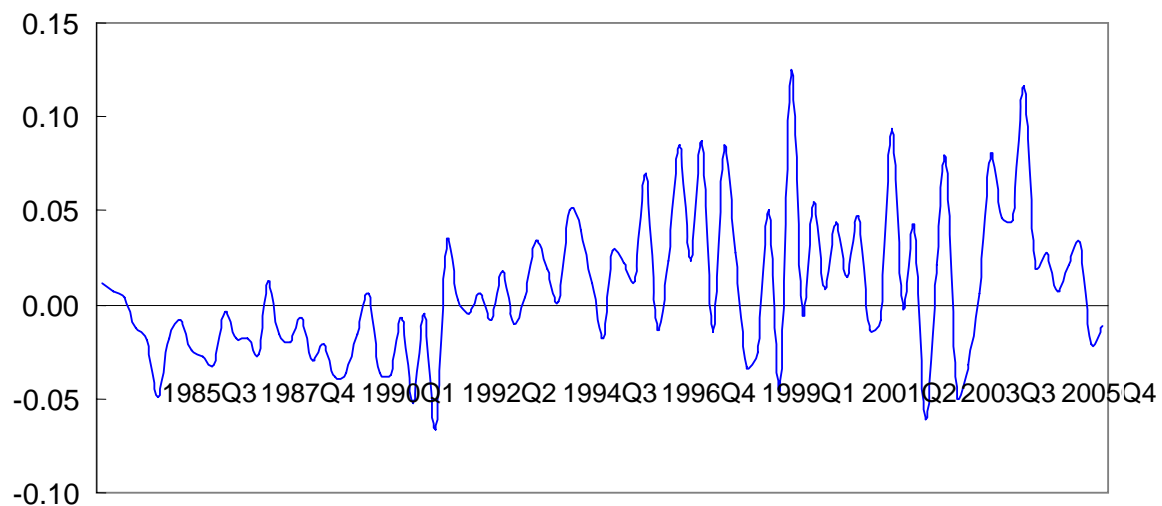
Existing studies of capital flows often address the issue of volatility in emerging

market lending by explaining the *size* and *direction* of the fluctuations in capital flows. One such effort is found in Goldberg (2001), who sets out to see if fluctuations in U.S. bank claims are econometrically explained by changes in the fundamentals of countries where these banks have claims. For the measure of fluctuations in U.S. bank claims, she first takes the log of U.S. bank claims in country c and time t , then first difference the measure to avoid “estimation problems potentially arising from the unit root properties.”

$$\Delta \log f(x) = \Delta x * (f'(x) / f(x)) = \Delta x * [\{f(x + \Delta x) - f(x) / \Delta x\} / f(x)] = \{f(x + \Delta x) - f(x)\} / f(x)$$

With this measure, she is measuring the changes in bank claims normalized by the size of the claims in each period. In fact, with discrete values such as U.S. bank claims at the end of each quarter, it is no more than a percentage change in U.S. bank claims for each period. *Figure 2.2* illustrates the percentage change in total U.S. bank external claims over time in both developed and emerging economies, replicating the measure used in Goldberg (2001). It shows the direction of change over time, with net negative flows in the 1980s and net positive flows in the 1990s, with overall higher fluctuations later on.

Figure 2.2 Changes in U.S. bank external claims



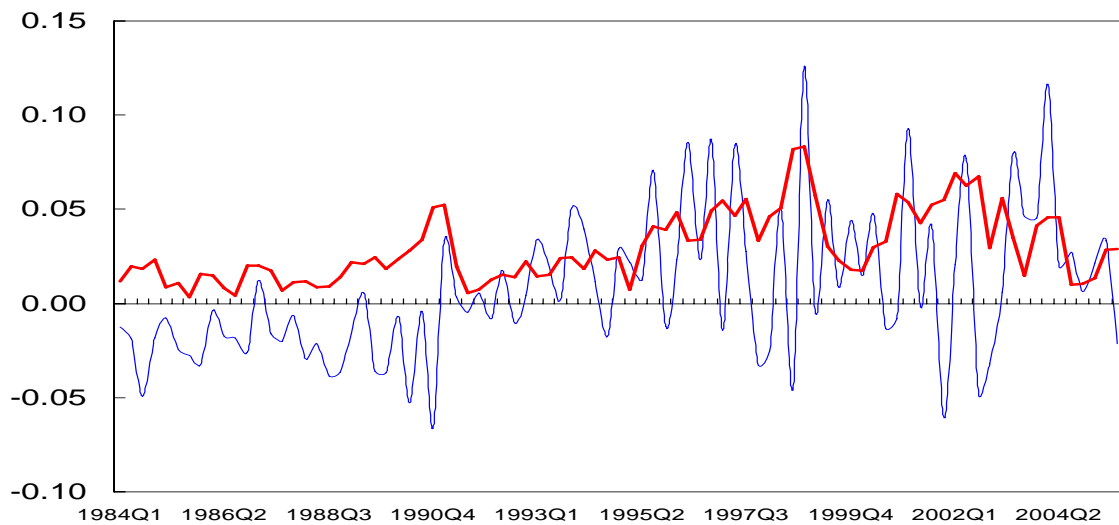
Nevertheless, this measure, while relevant for exploring the determinants of changes in U.S. bank claims, does not measure the *degree* of fluctuations in U.S. bank lending. It is one thing to witness the trend from quarterly fluctuations, but another to measure the actual volatility of U.S. bank claims. In other words, the right volatility measure should specifically reflect how the severity of up-and-down movements in U.S. bank overseas lending changed over time. To capture the degree of fluctuations, the following measure of “volatility” is introduced.

VOLATILITY = the three-quarter rolling standard deviation of quarterly changes in U.S. bank claims divided by the average claims over the same period.

This measure, the standard deviation normalized by the U.S. bank claims in the host country, makes possible a comparison in volatility between different periods, because it takes into account the varying magnitude of U.S. bank exposure over time

to avoid the dependence on the scale of flows.¹⁴ A similar measure has been proposed by Alfaro *et al.* (2004) and Dos Reis (2005). Constructed this way, the measure escapes from the unit root problem endemic in time-series variables, which will be reported later by the Dickey-Fuller test for unit roots in *Table 4.9*. With the same data on U.S. bank external claims, the measure of volatility is superimposed upon *Figure 2.2*. The red line in *Figure 2.3* represents the measure of volatility with a clear trend of its own. An implicit trend in *Figure 2.2* is now explicitly measured and illustrated.

Figure 2.3 Volatility in U.S. bank external claims

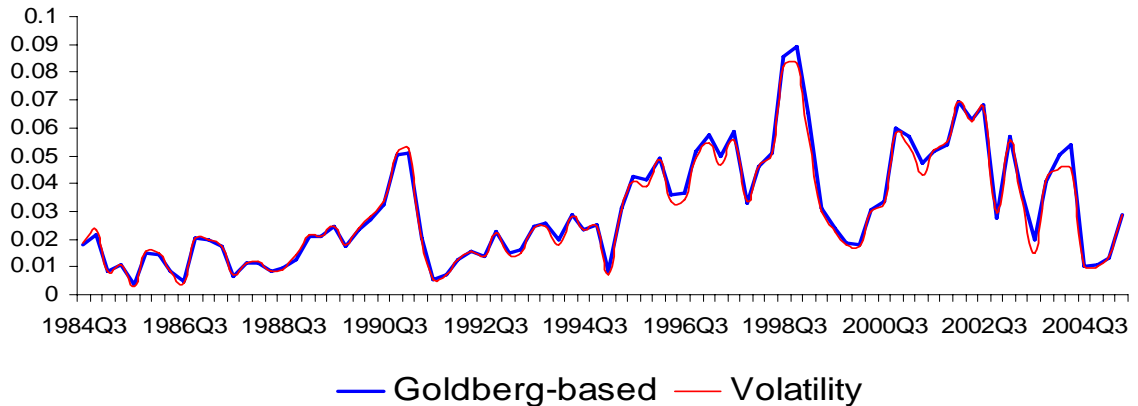


To cross-examine the validity of this definition of volatility, it is first compared against the three-quarter rolling standard deviation of the Goldberg measure of fluctuations for U.S. bank external claims in *Figure 2.4*. The two measures produce nearly identical results, suggesting that the volatility measure defined above is no

¹⁴ It is important to note that the volatility measure is normalized by average claims, not by average flows (changes in claims). For example, the movement of \$10 million in and out of a country is less significant in terms of its volatility when there is existing \$100 million stock in the country than when there is only \$10 million stock to begin with.

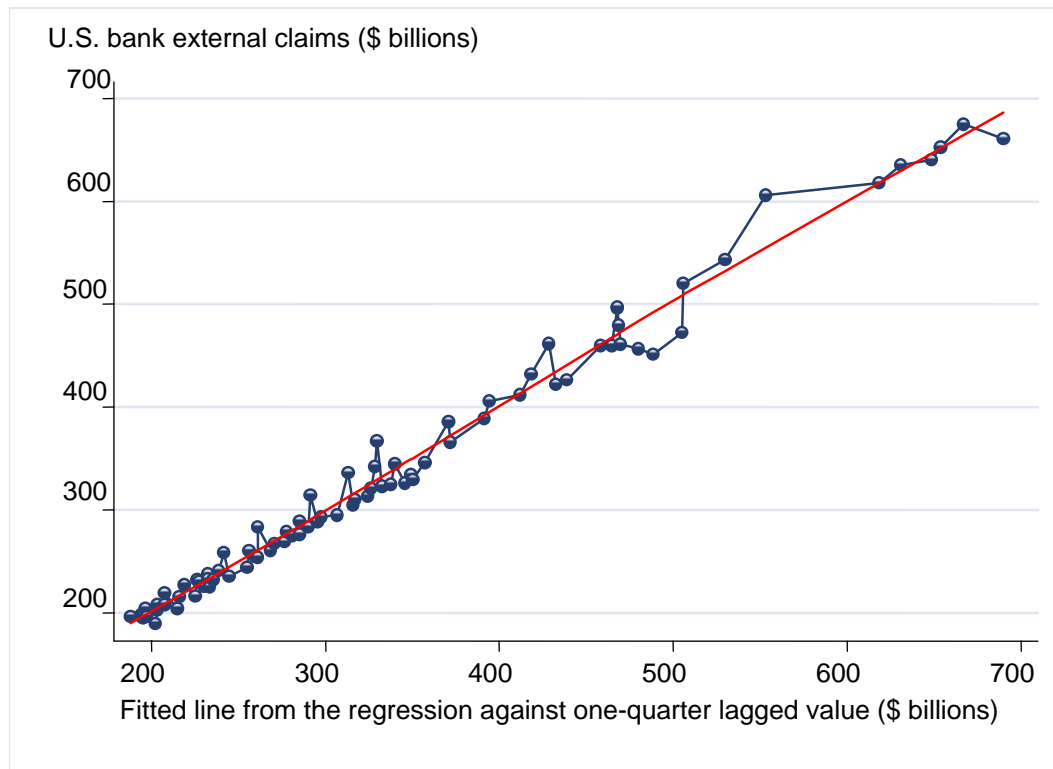
more than a smoothed-out version of the standard deviation from the percentage change in U.S. bank external claims.

Figure 2.4 Measure of volatility vs. Goldberg-based measure



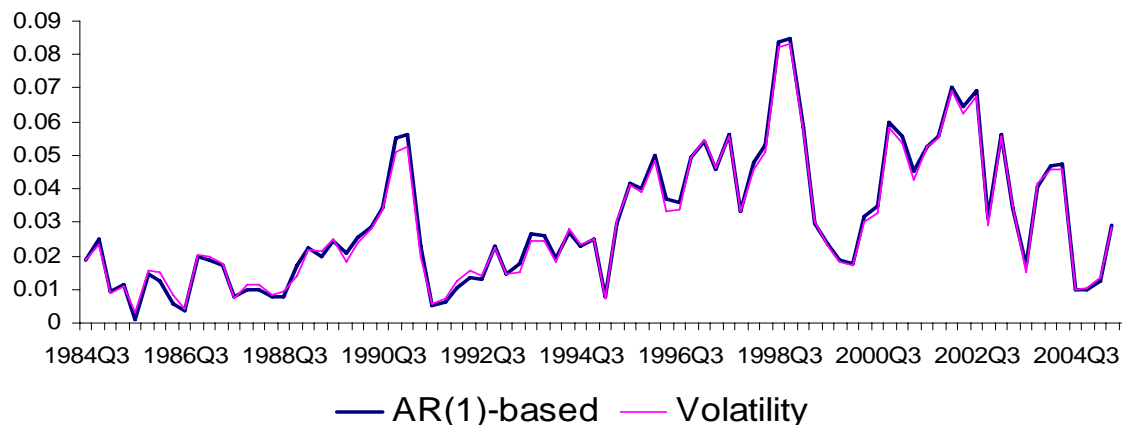
Secondly, the volatility measure is compared with the outcome of the AR(1) process for measuring volatility. The AR(1) process, as in Rajan (2005), identifies the residuals from the regression of U.S. bank claims in each period against its own one-quarter lagged value. In *Figure 2.5*, each residual is plotted against the fitted line between each claim and its lagged value. These figures represent the difference between actual and expected values. The non-stationary nature of the bank claim figures is evident with the coefficient of lagged variable close to one (unit root). With the slope close to one, it is no accident that residuals from the AR(1) process bear close similarity with the figures from the simple first-difference for quarterly changes of U.S. bank claims.

Figure 2.5 AR(1) residuals from U.S. bank external claims



As a result, the degree of fluctuations around the fitting line, a three-quarter rolling standard deviation of the residuals normalized by the average of the claims, is again almost identical with the measure of volatility (*Figure 2.6*). Thus, the adopted measure for volatility is compatible with other, similar measures of volatility used in the literature and will be employed throughout this study. Before looking into the trends and determinants of the volatility in U.S. bank emerging market lending, however, it is important to lay out the peculiarities of U.S. bank lending that warrant further emphasis, in comparison with bank lending from Europe or Japan.

Figure 2.6 Measure of volatility vs. AR(1) residuals-based measure



International Context

As briefly noted in *Figure 1.2* of Chapter One, U.S. banks have come to hold bigger liabilities than assets internationally, while European and Japanese banks have been accumulating their net assets overseas during the same period. This observation begs the question whether U.S. banks have been more volatile lenders to emerging economies over time. However, since the BIS Locational Banking Statistics used for *Figure 1.2* do not tally country-by-country bank claims/liabilities originating from U.S., Japan, or Europe, it is not possible to compare the *net* positions of these banks in emerging economies. The BIS Consolidated Banking Statistics, by contrast, were introduced in the early 1980s specifically to help monitor the exposures of national banking systems vis-à-vis emerging market countries, whose indebtedness had risen considerably in the wake of the oil shocks of the 1970s (BIS

2003).¹⁵

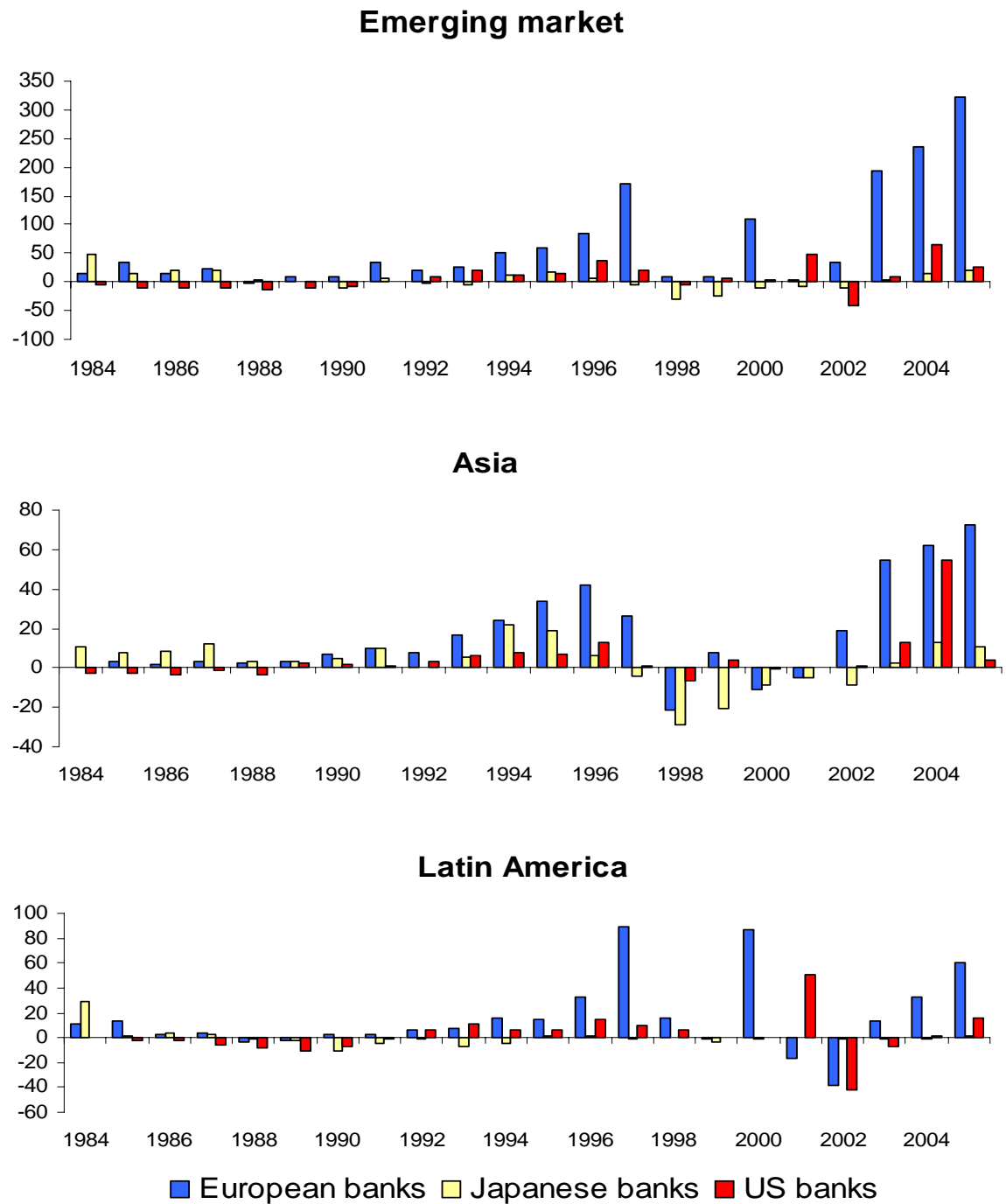
The statistics do not report the external liabilities of member banks. As a consequence, no international net-positions are available from the data. For emerging market exposure, however, the Consolidated Banking Statistics tally country-by-country bank assets originating from 27 member countries, allowing comparisons between U.S., Japanese, and European banks' emerging market exposure over time.

Figure 2.7 covers regional bank flows in emerging economies from European, Japanese, and U.S. banks over the past twenty years. It combines both cross-border and local claims of the reporting banks on the basis of the nationalities of the reporting banks, since the BIS Consolidated Banking Statistics includes the exposure of foreign offices while netting out inter-office transactions between home and branch offices. Bank loans from the three regions poured into emerging economies throughout the 1990s, and this trend accelerated after the Mexican crisis in 1994. European banks led the surge, more than tripling their assets in emerging economies between 1990 (\$272 billion) and 2000 (\$845 billion).

Despite a dramatic cut in their exposure following the Asian crises of 1997-99 and Argentine/Brazilian crises of 2001-2002, European banks persisted in achieving a higher profile in emerging economies. Japanese banks had built up a substantial exposure in emerging economies throughout the 1980s. In 1990, they had assets (\$125 billion) well over the size of the U.S. banks' assets (\$90 billion) and nearly half the size of European banks' assets (\$271 billion) from 16 countries combined.

¹⁵ The statistics provide information on international financial claims of domestic bank head offices on a worldwide consolidated basis, *i.e.*, including the exposures of their own foreign offices but excluding inter-office positions (BIS 2003).

Figure 2.7 Net bank lending to emerging economies (\$ billions)



Source: BIS Consolidated Banking Statistics

During the protracted depression of the 1990s at home, Japanese banks retracted most of their prior exposure in Latin America. After the onset of the Asian financial crises, they were the first to pull out from Asia, and they withdrew assets of much greater magnitude than their competitors from Europe and the U.S. At the end of 2005, Japanese banks' emerging market exposure (\$110 billion) was less than one-third of the U.S. banks' (\$314 billion) and U.K. banks' (\$347 billion) exposures.

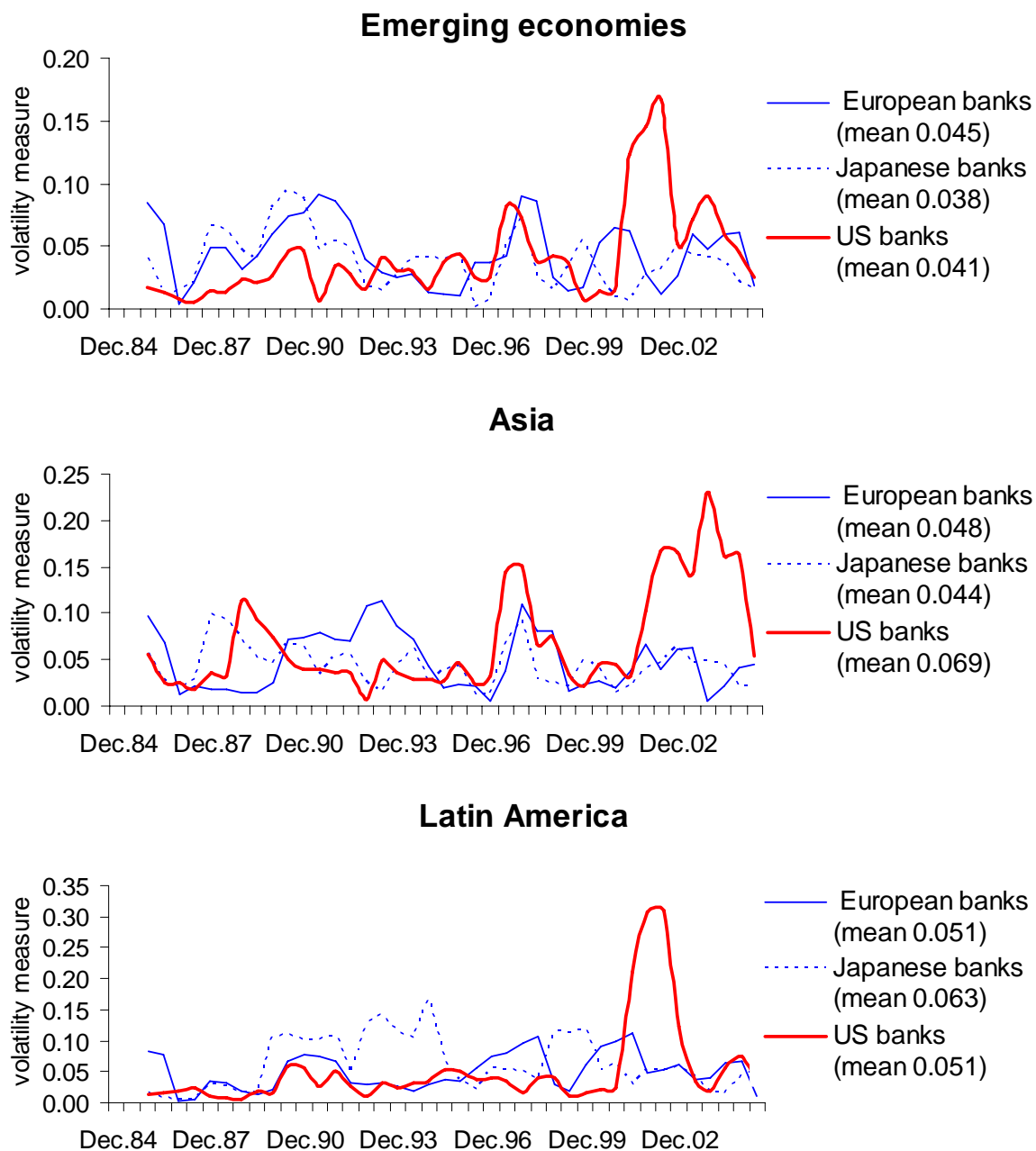
As such, it is hard to put all the blame on U.S. banks when it comes to the issue of the volatile bank lending that exacerbated the financial crises in emerging economies. In Asia, U.S. banks were slow to follow in the buildup phase of the early 1990s, with their exposure in Asia only half that of Japanese banks' in 1997. When things turned bad, it was Japanese and European banks who led the pull-out from the region. During the period 1998 through 2000, Japanese banks took out \$58 billion and European banks withdrew \$26 billion from the region, while the U.S. banks pulled out only \$3 billion from their initially modest exposure in the region. In Latin America, U.S. banks led the pullout at the onset of the debt crisis in early 1980s. Throughout the 1980s, they consistently cut exposure in the region. Upon resolution of the crisis in the early 1990s, however, the U.S. banks were the first to get back in. Over the course of the financial roller-coasters in Argentina and Brazil in 2001-02, the U.S. banks initially expanded their exposure by 50% in 2001, only to cut it back substantially. More recently, U.S. banks have begun to expand their Asian exposure more aggressively, nearly doubling their total claims in Asia between 2002 and 2005. As of 2005, Asia had become as big a destination for U.S. bank lending as Latin America.

As to the characteristics of U.S. banks' emerging market exposure, Goldberg (2001) argues that U.S. banks' emerging market lending has been relatively stable compared with other money-center banks from Japan or Europe. She attributes this to the fact that U.S. banks' external claims are highly correlated with U.S. macro conditions, but not with foreign demand situations. For example, she demonstrates that tighter lending conditions in the U.S. are associated with higher claims in Latin America, while net claims in Asia tend to contract when the U.S. economy is expanding.

In fact, when the same measure of volatility is calculated for the semi-annual data (Dec. 1984 - Dec. 2005) for each region of banks' emerging market exposure, U.S. banks do not exhibit higher volatility *on average*.¹⁶ In *Figure 2.8*, the volatility measures for semi-annual bank lending from Europe, Japan, and U.S. are plotted over time. In terms of the average volatility over the past twenty years, there do not seem to be material differences due to the nationality of lenders. For emerging market claims as a whole, the volatility of U.S. bank lending (0.041) falls between that of their Japanese (0.038) and European (0.045) counterparts. For Asian claims, U.S. bank lending (0.069) is more volatile than Japanese (0.044) or European (0.048) lending, but for Latin American claims, Japanese bank lending (0.063) shows higher volatility than the rest (0.051).

¹⁶ The BIS Consolidated Banking Statistics report consolidated international claims of reporting banks on a semi-annual basis up to December 1999. Starting in March 2000, quarterly data are available.

Figure 2.8 Volatility of emerging market claims, by nationality of lenders



Source: BIS Consolidated Banking Statistics

A closer look at the movement of volatility across different regions of banks reveals an interesting characteristic of U.S. bank lending, however. In no case other than U.S. bank lending does the measure of volatility show any consistent pattern of movements — a trend. Both to emerging markets as a whole and to the major destinations of Asia and Latin America, the volatility of U.S. bank lending has been increasing over time. Despite the differences in both regional background and the timing of major financial crises, U.S. bank lending became more volatile into the 2000s. Since the BIS Consolidated Statistics provide quarterly claims data starting from March 2000, the averages for each region's quarterly volatility measure after 2000 are compared to the averages for the semi-annual volatility measures reported in *Figure 2.8*. *Table 2.2* sums up this exercise.

Table 2.2 Average volatility of bank lending, by nationality of lenders

	Emerging market		Asia		Latin America	
	1984-2005*	2000-2005**	1984-2005*	2000-2005**	1984-2005*	2000-2005**
Europe	0.045	0.032	0.048	0.039	0.051	0.035
Japan	0.038	0.020	0.044	0.021	0.063	0.035
U.S.	0.041	0.040	0.069	0.072	0.051	0.063

Notes: *semi-annual claims **quarterly claims

Source: BIS Consolidated Banking Statistics

Given that quarterly figures tend to reduce the measure of volatility due to higher frequency, it is noteworthy that U.S. bank lending shows higher volatility during 2000-2005 (with quarterly data) than the period average (with semi-annual data) for Asia and Latin America. More remarkable is that, in every instance, U.S. bank lending after 2000 turns out twice as volatile as bank lending from their European or Japanese counterparts. Again, this observation reflects the fact that U.S. banks are

the only ones whose lending volatility was on the rise during the past twenty years. *Table 2.3* reports the trend coefficients for bank lending from each region of banks. Across regions, the trend coefficients for U.S. bank lending volatility are all positive and statistically significant at the 5% level. No comparable trend emerges from European or Japanese lending, other than that the financial crises in Latin America in the 2000s, such as the Argentine/Brazilian crises of 2001-03, seem to have increased volatility in these banks' lending to the region with opposite signs for trend coefficients. This particular feature warrants further attention beyond the problems on the receiving end (in emerging economies), because U.S. banks did not behave differently than the banks from Europe or Japan when confronted with emerging market crises (*Figure 2.7*), nor did they exhibit higher volatility on average (*Figure 2.8*).

Table 2.3 Trend coefficients for emerging market bank lending

	Emerging market	Asia	Latin America
European banks	-0.27 (-0.96)	-0.22 (-0.68)	0.54 (1.45)
Japanese banks	-0.44 (-1.79)*	-0.43 (-1.68)*	0.14 (0.32)
U.S. banks	1.39 (3.00)***	2.10 (3.03)***	2.02 (2.10)**

Notes: Dependent variable: (measure of volatility)*1000, independent variable: 1(Dec. 1984) through 42(Jun. 2005). T-statistics in parenthesis. Regressions include a constant and are estimated by OLS with White's correction of heteroskedasticity. ***1%, **5% *10% significance.

Volatility: Impact & Trend

Showing the general trend of volatility in U.S. bank overseas claims across types and regions is one thing. However, it would be meaningless if volatility did not have much of a negative implication to begin with. In other words, why does the volatility of U.S. bank lending matter? Does increasing volatility worsen the financial crises in emerging economies? The emerging market financial crisis is a

complex matter. It is unreasonable to expect that the volatility of U.S. bank lending alone could trigger such an event. The ebbs and flows of actual U.S. bank claims in emerging economies matter, however, since the rolloff of bank credit lines remains a critical, if not dominant, component of such crises. Accordingly, should the increase in volatility of U.S. bank lending be associated with the reduction of U.S. bank claims, it can be argued that U.S. bank lending gets more volatile when the banks pull out from the region, exacerbating, if not triggering, financial crises.

To test this hypothesis, a pooled regression was conducted for the panel of 19 countries between 1984 Q1 and 2005 Q3 (*Table 2.4*). U.S. bank claims in sample countries — six in the G-10, six in Latin America, and seven in Asia — represent over 90% of total claims in each region. First, the trend in U.S. bank exposure is easily discernible, with the claims in G-10 and Asia increasing while those in Latin America are cut back over time. After controlling for major macro variables of U.S. bank foreign exposure, however, the trend coefficients for the claims in Latin America and Asia move together, decreasing over time and significant at the 1% level. The upward trend in G-10 claims, by contrast, remains strong despite the inclusion of other explanatory variables.

Table 2.4 Pooled OLS regression of U.S. bank claims, by region

Dependent									
Variable: U.S. bank cross- border claims (\$ billions)	G-10 (6 countries)			Lat. America (6 countries)			Asia (7 countries)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Trend	0.39*** (12.5)	0.43*** (13.3)	0.66*** (4.64)	-0.05*** (-4.73)	-0.04*** (-3.81)	-0.11*** (-9.07)	0.01*** (4.12)	0.02*** (5.18)	-0.02*** (-5.97)
Volatility		-32.2*** (-3.78)	-26.7*** (-3.23)		-10.5 (-1.54)	-32.1*** (-6.91)		-2.57*** (-3.54)	-3.75*** (-5.78)
GDP (\$ billions)			0.00 (1.62)			0.02*** (27.4)			0.00*** (10.8)
GDP per capita (\$ thousands)			-1.47** (-2.07)			0.34*** (3.06)			0.39*** (17.8)
GDP growth			1.88*** (3.72)			-0.13*** (-3.06)			-0.11*** (-6.06)
Interest Rate			0.58 (1.35)			-0.00 (-0.99)			0.03*** (2.19)
U.S. GDP growth			1.16*** (1.99)			0.37*** (2.53)			0.32*** (5.24)
U.S. interest rate			-1.53** (-2.61)			0.19 (1.32)			-0.05 (-0.82)
<i>Number of obs.</i>	522	522	498	522	522	496	609	609	494
<i>Adjusted R²</i>	0.23	0.25	0.24	0.04	0.04	0.63	0.03	0.04	0.50

Notes: All regressions include a constant. GDP growth, GDP per capita, Interest Rates are in real terms and GDP, GDP per capita, GDP growth rates are annual, while the rest are quarterly figures. T-statistics are in parentheses denoting ***1%, ** 5% * 10% significance. G-10 countries include Canada, France, Germany, Italy, Japan, and the United Kingdom. The six Latin American countries are Argentina, Brazil, Chile, Colombia, Mexico, and Venezuela. The seven in Asia include China, Taiwan, Indonesia, Korea, Malaysia, Philippines, and Thailand. Durbin-Watson *d* value in each case is well over 0.5, suggesting the variables in the regression are cointegrated.

For the G-10 claims, the regression coefficients for the GDP growth of the U.S. and host economies are positive and significant at the 1% level. The level of the U.S. interest rate, which does not show statistical relevance for Latin America and Asian countries, has a negative and significant sign as expected. The coefficient for GDP

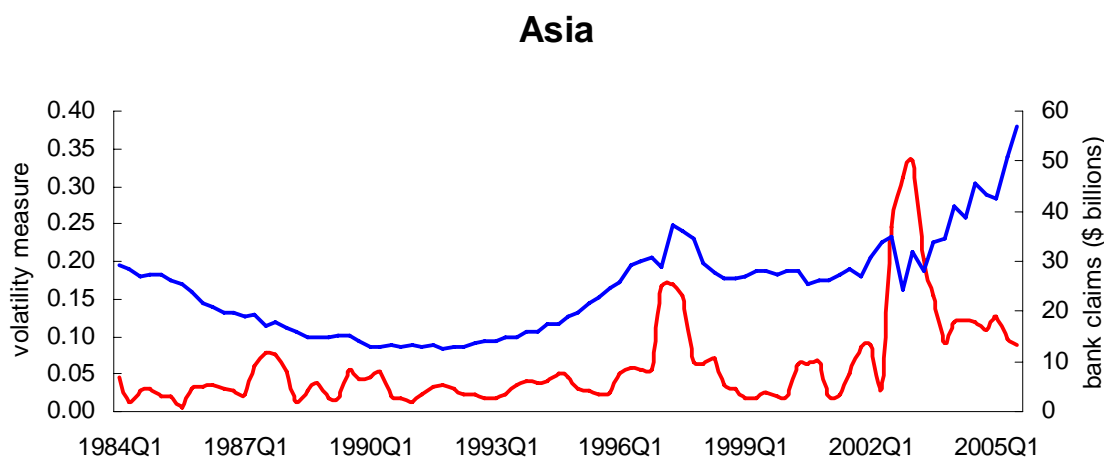
per capita has a negative and significant sign, suggesting that destinations of U.S. bank investments among developed countries have not much to do with the income level of the host economy. For the Latin American and Asian claims of the U.S. banks, however, the size (GDP) and the income level (GDP per capita) enter as important determinants of bank investments, both with significant and positive signs at the 1% level. Further, U.S. GDP growth has a positive coefficient for both regions, indicating larger investments in emerging economies when the U.S. economy is expanding. The common negative sign of the host country growth rates is puzzling, possibly suggesting that short-term investment behaviors of the U.S. banks are affected by something other than growing opportunities in host economies.

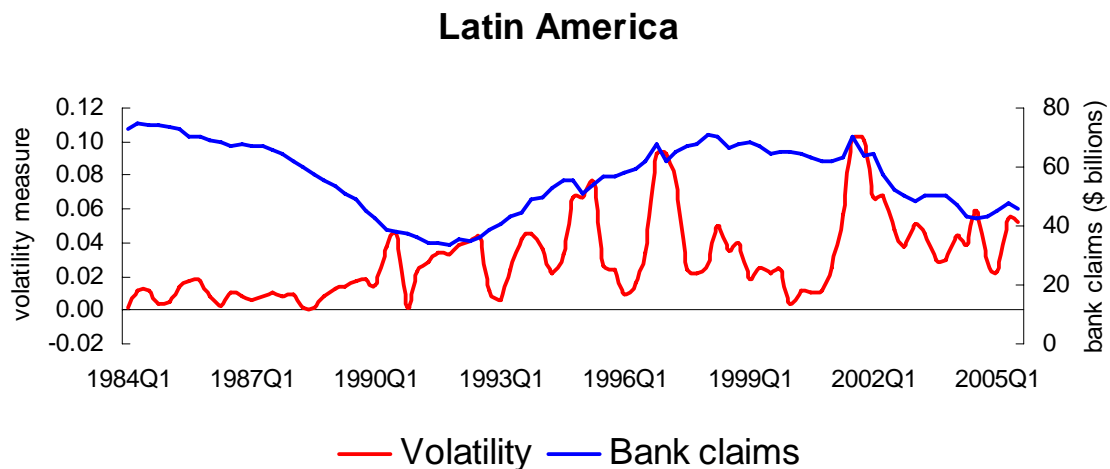
The most interesting feature of the OLS regression in *Table 2.4*, however, is the sign and significance of the coefficients for the volatility measure. Although it does not improve the explanatory power of the model all that much, it does have a consistent negative association with the level of U.S. bank claims across countries in different regions. It clearly points to the negative impact of volatile bank lending on the level of actual claims. Initially, it was suspected that the measure of volatility, normalized by the average of bank claims for each three-quarter period, could be inherently biased toward this negative association. For this suspicion to be valid, however, the standard deviation for each volatility measure would need to remain stable, which turns out not to be the case.

In *Figure 2.9*, it can easily be seen that regional totals of U.S. bank claims in Asia and Latin America do not have much of negative association with the volatility for each region. If anything, the regional total for the Asian claims seems to have a

positive association with the volatility measure. As the level of U.S. bank claims increases in Asia, the volatility also increases, denying the existence of a strong bias in the volatility measure itself. To the contrary, the volatility and level of claims in Latin America seem to have a negative association, although they do not share much of a trend. Despite the fact that the volatility measure has been constructed from claims figures, these two do not demonstrate any significant temporal association, positive or negative, over time. Accordingly, the significant negative coefficient for the volatility variable in *Table 2.4* can be interpreted to provide ample grounds why the volatility of U.S. bank lending has real impact on emerging market financing.

Figure 2.9 Movements of the level and volatility of U.S. bank claims

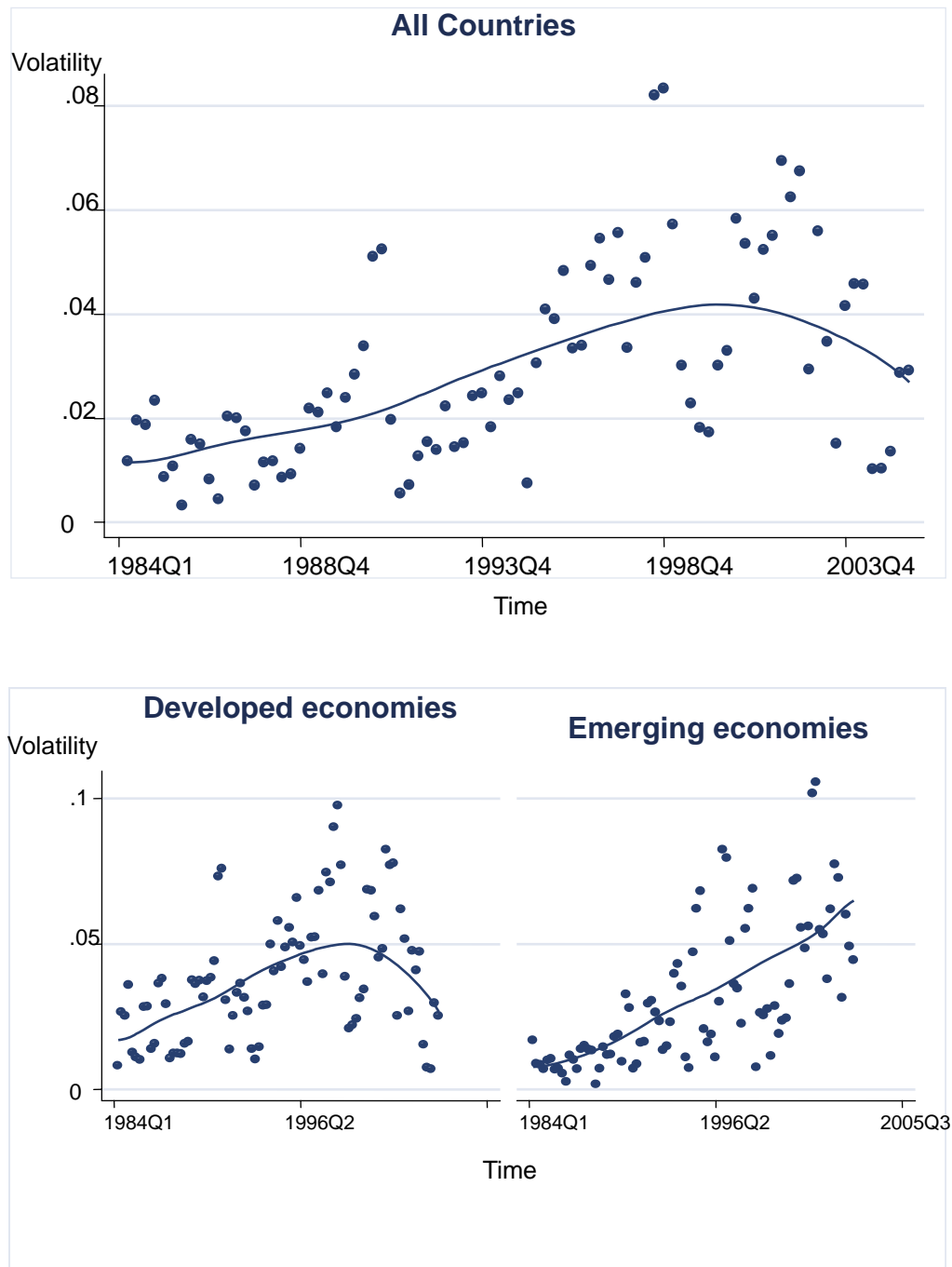


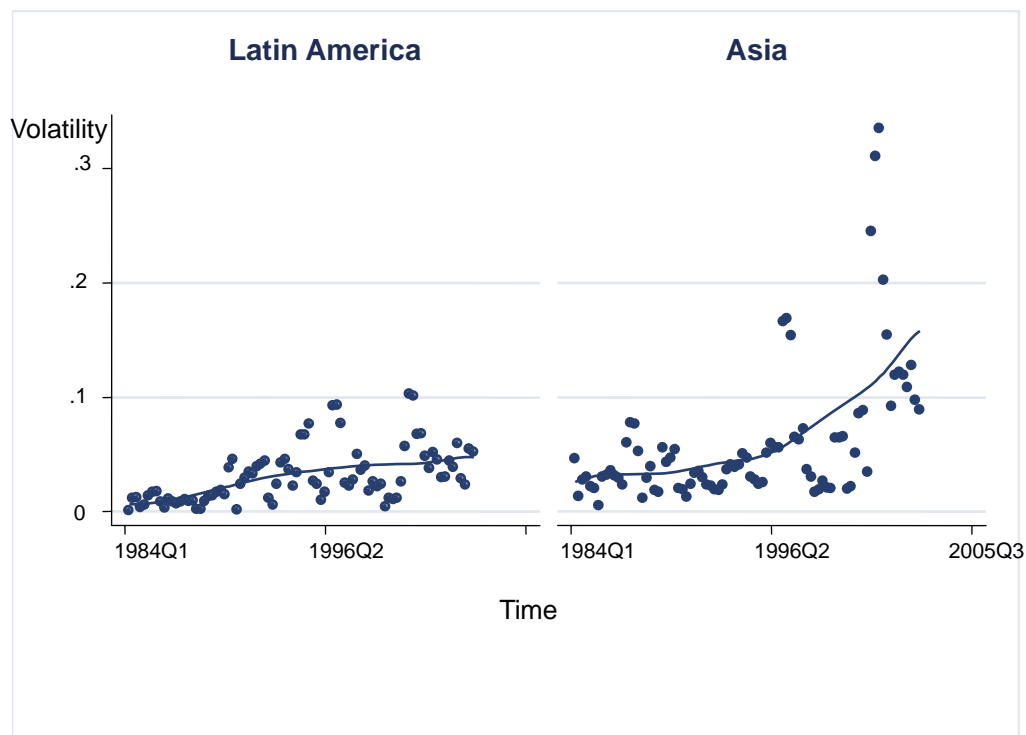


Given the negative effect of volatility on the actual level of U.S. bank claims, it is important to figure out how the volatility itself has changed over time. As a matter of fact, there has been an unmistakable trend in U.S. banks' overseas claims towards higher volatility, especially to emerging economies, during the past twenty years.

Figure 2.10 illustrates this trend across different regions. Regardless of the destination of U.S. bank lending, its volatility has worsened over time. It is on a consistent rising path for the exposures in emerging economies, while tailing off around 2000 for developed economies. Outbreaks of financial crises in emerging economies during the period do not seem to play a major role in accounting for the overall picture of volatility. While highly volatile U.S. bank lending took place in Asia around the Asian financial crisis of 1997, the highest volatility measure is witnessed in Asia in the early 2000s, with no further financial crises in the region. By contrast, the volatility measure for Latin American exposure is relatively stable even though it is heading upward and has had a few spikes around the crisis years, such as the Mexican crisis of 1994-95 and the Argentine sovereign default of 2001.

Figure 2.10 Trend of volatility in U.S. bank claims, by region





The richness of the Country Exposure Lending Survey (CELS) data makes it possible to see which type of U.S. bank lending tends to get more volatile over time. As noted, the CELS database details U.S. bank overseas claims by type of borrowers (banks, public sector entities, private non-bank entities) and by maturity of claims (less than one year, over one to five years, over five years). *Table 2.5* summarizes the regression results for different types and regions. In each case, the volatility measure is regressed against the trend variable. This table demonstrates that the overall volatility of U.S. claims has been increasing, regardless of the type or destination. In examining the lending by type of claims, one can see that lending to public sector entities in host countries demonstrates a steeper upward trend than lending to banks or other private entities. This phenomenon is accentuated in

lending to emerging economies, particularly to Asia. The share of public sector borrowing among the three types of borrowers in emerging economies remained above 50% until the early 1990s, but plummeted below 20% in the late 1990s and early 2000s (*Figure 2.1*). As such, explicit government guarantees behind public sector borrowing might have been instrumental in attracting bigger U.S. bank investments initially, but they were not able to stem the capital flight; rather, they seem to have encouraged boom and bust cycles in U.S. bank claims in emerging economies. In terms of maturity, short-term claims tend to show higher volatility over time in emerging economies, as expected. In Latin America, however, short-term claims do not show increasing signs of volatility. This rather unexpected result has to be put in context: portfolio flows, not bank lending, played a larger role in Latin America's external financing after the 1980s' debt crisis (Suttle 2003).

Table 2.5 Trend coefficients* for US lending volatility, by type & region

ALL BANKS	Total	Developed economies			Emerging economies		
		Sub-total	G-10	non G-10	Sub-total	Lat. America	Asia
Total	0.0004***	0.0003***	0.0003***	0.0003***	0.0006***	0.0005***	0.0012***
<i>by type</i>							
Banks	0.0009***	0.0010***	0.0010***	0.0012***	0.0007***	0.0010***	0.0007***
private non-banks	0.0004***	0.0006***	0.0007***	0.0005***	0.0003***	0.0004***	0.0006***
public sector	0.0013***	0.0009***	0.0004	0.0015***	0.0018***	0.0012***	0.0041***
<i>by maturity</i>							
short (less than one)	0.0005***	0.0005***	0.0004***	0.0005***	0.0008***	0.0002*	0.0014***
medium (one to five)	0.0011***	0.0016***	0.0020***	0.0017***	0.0003**	0.0003	0.0002
long (over five years)	0.0006***	0.0003	0.0005*	0.0001	0.0004***	0.0009***	0.0004**

Notes: * Regression coefficients against trend variable, 1 (1984 Q1) through 87 (2005 Q3). All regressions include a constant and are estimated by OLS with White's correction of heteroskedasticity. ***1%, ** 5% * 10% significance

Determinants of Volatility

Extant studies on the determinants of capital flows have focused on the role of external and internal factors contributing to financial crises. On the external side, there have been a number of usual suspects leading to boom-bust cycles in emerging market financing: (1) the low interest rate environment in the U.S. in the 1990s which caused the expansion of global liquidity; (2) technical innovations that facilitated frequent trading and short-term investments; and (3) BIS capital adequacy regulation which encouraged short-term lending. With respect to the internal factors, as Vegh, Kaminsky, and Reinhart (2004) point out, business cycles in the host country matter a great deal to the ebb and flow of foreign capital. They show that, in emerging economies, capital flows as well as fiscal and monetary policies tend to be procyclical. Capital inflows are associated with expansionary macro policies, capital outflows with contractionary macro policies. Calvo and Vegh (1999) demonstrate that inflation stabilization programs based on pegged exchange rate systems are successful in attracting large capital inflows initially, only to be followed by sudden reversals when the credibility of the arrangements is questioned due to a wide range of reasons, such as political instability or government spending. Kaminsky and Reinhart (1999) relate boom and bust cycles of emerging market financing to bank fragility in receiving countries.

Despite a plethora of studies on the determinants of capital flows into emerging economies, however, there are few empirical works that directly deal with capital flow volatility itself. One such effort is Alfaro, Kalemli-Ozcan, and Volosovych (2004). The authors ran cross-country regressions using 97 countries for the annual

span of the period 1970-2000 to figure out determinants of capital flows volatility.¹⁷

They note increasing volatility, especially for debt flows, in the 1990s and confirm the trend found in this study:

The volatility of FDI has diminished over the last 30 years. The same pattern is observed for portfolio equity flows, although these flows remain more volatile than FDI flows. On the other hand, the volatility of debt flows increased.... As expected, the volatility of each component of net flows of capital is lower for the industrialized countries than for the developing countries.

For the determinants of the volatility of different forms of capital flows, they find that macroeconomic policies such as the inflation rate and income level (GDP per capita) have a first-order effect in explaining the high volatility of capital flows. They interpret this as a strong suggestion that richer countries with lower levels of inflation tend to experience lower levels of uncertainty in terms of net flows of external capital. These findings are born out by the OLS regression results for the volatility of U.S. bank emerging market claims in *Table 2.7*. The estimated panel equation for all U.S. commercial bank claims in 13 emerging market countries is of the following form:

$$Volatility_{it} = \beta_0 + \beta_1 Time_{it} + \beta_2 Crisis_{it} + \beta_3 MACRO_{it} + \beta_4 US_t + \alpha_i + \varepsilon_{it}$$

The dependent variable is the measure of volatility (three-quarter rolling standard deviation of quarterly changes in U.S. bank claims divided by the average claims over

¹⁷ The volatility measure is calculated as the standard deviation of corresponding net flows (FDI, portfolio equity, debt flows) per capita over the sample period divided by the average of the absolute values of the average gross inflows and gross outflows of capital per capita over the sample period.

the same period) for U.S. bank emerging market claims. $Time_{it}$ is the trend variable with 1 for 1984 Q1 through 87 for 2005 Q3 for 13 sample countries. $Crisis_{it}$ is a (0,1) dummy variable for the quarters in financial crisis for each country. The data for the crisis dummy is from the World Bank (2003) and provided in Appendix D. The first vector of variables, $MACRO_{it}$, contains seven variables based on macroeconomic indicators of 13 sample countries: (1) current GDP in billions of U.S. dollar; (2) real GDP per capita in thousands of U.S. dollars; (3) average real GDP growth rate; (4) average consumer price inflation (CPI) rates; (5) the volatility of real interest premium (real lending rate in host country minus real lending rate in the U.S.); (6) financial sector development (private credit from the financial sector divided by GDP); and (7) openness (share of export plus import volume divided by GDP). The second vector of explanatory variables, US_t , includes two variables based on U.S. macroeconomic situations at the time of lending: (1) U.S. real GDP growth rate; and (2) volatility of the U.S. real lending rate. Volatility measures for explanatory variables are obtained in the same way as the volatility for U.S. bank claims. Lastly, to represent unobserved differences in each country that is fixed over time, country fixed effect, α_i , is introduced and F-statistics for the fixed effects are reported in *Table 2.7*.

Table 2.6 first provides summary statistics for the variables included in the model. As shown, within-country variations account for a substantial part of the movement of each variable, justifying the introduction of country fixed effects that incorporate the heterogeneity in each country that does not change over time, such as the rule of law and degree of corruption. Fixed effects regression will eliminate unobservable

differences across countries, thus minimizing endogeneity bias that stems from the unobservable inter-country differences in omitted variables (Dranove 2006).

Table 2.6 Summary statistics for model variables

Entire sample (13 emerging market cos.)	Number of observations	Mean	Std.Dev.	Std.Dev. (within)*	Std.Dev. (between)**	Min.	Max.
Volatility (U.S. bank claims)	1131	0.098	0.117	0.100	0.063	0.001	0.931
GDP (billions)	1131	258.3	289.9	181.8	234.9	16.4	2234
GDP per capita (thousands)	1076	6.836	4.074	2.528	3.304	0.770	21.44
GDP growth	1131	4.788	4.667	4.083	2.352	-13.1	17.9
U.S. GDP growth	1131	3.296	1.458	1.458	0	-0.2	7.2
Inflation (%)	1131	77.74	351.2	314.1	163.6	-1.4	3079
Volatility (U.S. interest rate)	1131	0.093	0.068	0.068	0	0	0.311
Volatility (Interest premium)	1012	0.911	1.356	1.284	0.4649	0	9.909
Financial development (%)	893	51.43	39.22	17.64	36.07	8.127	165.9
Openness (%)	1076	62.57	40.60	16.40	39.08	12.35	228.8

Notes: Financial Development measures the share of private credit from financial institutions over GDP. Openness refers to the share of export and import volume over GDP. *Within-country standard deviation refers to variations over time within each sample county. **Between-country standard deviation refers to variations that are fixed over time between 13 different countries (six Latin American, seven Asian).

Table 2.7 reports the results of this exercise, encompassing 13 emerging economies (six in Latin America, seven in Asia) over the quarterly period of 1984 Q1 through 2005 Q3. For the 13 emerging market claims as a whole, the trend coefficients for volatility are positive and significant across regions. Even after introducing the country fixed effects along with macroeconomic indicators for the host economy (GDP, GDP per capita, GDP growth, inflation rate, volatility of real interest rate differentials between the U.S. and host countries, share of private credit,

and openness) and the U.S. economy (GDP growth and volatility of real interest rate), the trend remains positive and, for the most part, significant. The trend coefficient gets smaller with the control variables, however. The coefficients for GDP, GDP growth, inflation, financial sector development, and openness of the economy are positive and significant, while GDP per capita and volatility of interest premium have negative and significant values. With the country fixed effects, unexpected results for volatility of interest premium and financial sector development of the host economy lose their statistical significance. In sum, U.S. bank claims tend to be more volatile for a larger economy with a higher inflation rate, especially when the economy is liberalized and reliant on trade.

Across Latin America and Asia, however, regional differences stand out. For Latin American claims, the volatility of U.S. bank claims is explained away by the inclusion of control variables. GDP and inflation, as well as the volatility in interest premiums, explain much of the volatility in U.S. bank claims, when financial sector development and openness of the economy on average are associated with less volatile bank claims. This conventional result stands in contrast to the case in Asia, where the volatility trend gets bigger with the control variables. Interestingly, the coefficients for crisis dummies have negative and significant signs in Asia, growing larger with the inclusion of country fixed effects. This odd result might reflect the inherent difficulties in identifying the actual timing of capital flow reversals during financial crises in emerging economies, often taking place in a matter of weeks, if not in days.

Table 2.7 Fixed-effects regression for volatility, emerging market claims

Dependent Variable: Volatility of U.S. bank claims in emerging economies, 1984 Q1 – 2005 Q3									
(Dependent Variable)*1000	All samples (13 cos.)			Lat. America (6 cos.)			Asia (7 cos.)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Trend	1.46*** (8.93)	1.20*** (5.61)	0.37* (1.93)	0.68*** (10.1)	0.78*** (5.40)	0.21 (1.01)	2.12*** (7.99)	2.19*** (4.41)	3.17*** (3.39)
Crisis (dummy)		-0.39 (-0.06)	-7.88 (-1.06)		-2.86 (-0.54)	6.92 (1.32)		-28.0** (-1.99)	-45.9*** (-2.85)
GDP (billions)		0.03** (1.99)	0.09*** (3.00)		0.03* (1.91)	0.18*** (5.56)		-0.05 (-1.01)	-0.51*** (-2.81)
GDP p/c (thousands)		-4.02*** (-3.02)	0.67 (0.30)		-2.45* (-1.84)	3.01 (1.55)		-3.37 (-1.54)	17.9*** (2.82)
GDP growth (%)		1.10** (2.10)	0.30 (0.57)		0.55 (1.20)	-0.03 (-0.06)		0.67 (0.52)	-2.81 (-1.58)
U.S. GDP growth (%)		0.63 (0.45)	1.31 (0.95)		1.89 (1.52)	0.93 (0.78)		2.91 (1.09)	7.82** (2.51)
Inflation (%)		0.03*** (4.96)	0.02*** (4.07)		0.01*** (2.77)	0.02*** (3.62)		-0.47 (-0.78)	-0.40 (-0.60)
Volatility of U.S. real interest rate		25.1 (0.59)	31.1 (0.76)		-11.0 (-0.31)	-0.64 (-0.02)		116.4 (1.47)	29.3 (0.38)
Volatility of interest rate premium		-2.98** (-1.98)	-1.24 (-0.75)		3.61*** (3.51)	2.83** (2.18)		-14.8*** (-3.45)	-12.2*** (-2.90)
Financial Development (%)		0.56*** (4.28)	-0.01 (-0.07)		-0.01 (-0.06)	-0.94*** (-3.46)		0.56*** (2.74)	-1.04* (-1.87)
Openness (%)		0.57*** (4.89)	1.46*** (4.27)		-0.29 (-1.55)	-0.56** (-1.99)		0.34* (1.87)	0.00 (0.00)
<i>Country fixed effects</i> (<i>F-stats</i>)			5.07***			9.59***			4.22***
<i>Number of obs.</i>	1131	816	816	522	418	418	609	398	398
<i>R</i> ²	0.09	0.31	0.35	0.14	0.18	0.29	0.13	0.33	0.39

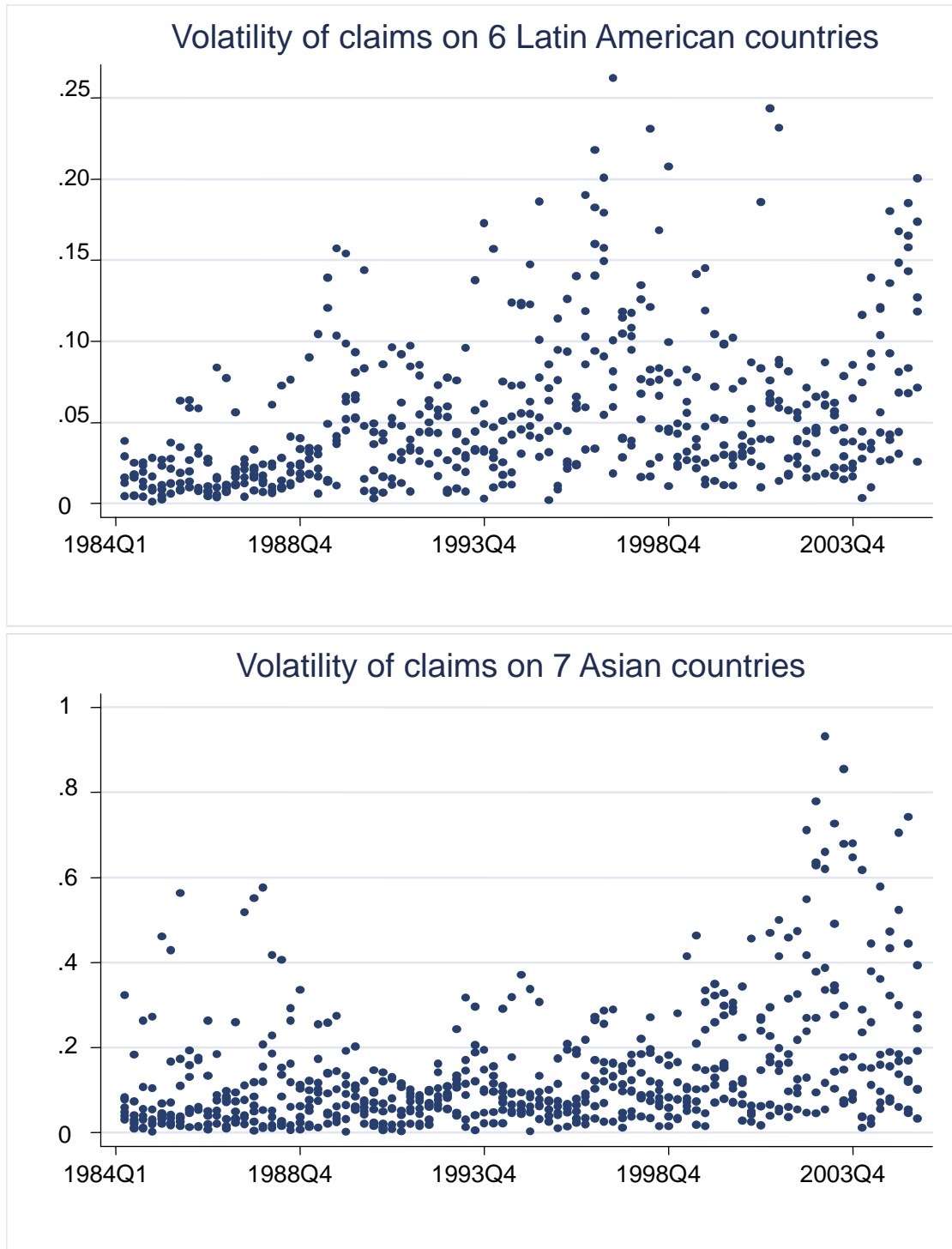
Notes: Financial Development measures the share of private credit from financial institutions over GDP. Openness refers to the share of export and import volume over GDP. All regressions include a constant and are estimated by OLS with White's correction of heteroskedasticity. ***1%, ** 5% * 10% significance.

At the same time, it also brings to attention that a marked increase in volatility of U.S. banks' Asian claims took place after 2000, when financial crises in Asia concentrated in 1997-1999 period (*Figure 2.10*). *Figure 2.11* depicts a divergent path in volatility of claims across the sample countries in Latin America and Asia. U.S. bank claims in Asia have higher volatility in general, with an average of 0.137 when the average volatility for Latin America is at 0.053. In the case of Asia, the volatility of U.S. bank claims gets much higher toward the end of the sample period, whereas, in the case of Latin America, the volatility shows a more gradual upward trend. Peculiarities of the volatility in Asian claims are further witnessed by unexpected signs for other control variables as well. Unlike the case in Latin America, GDP and the volatility of real interest premium have negative and significant signs, while GDP per capita and U.S. GDP growth have positive and significant signs. In other words, U.S. bank claims in Asia tend to get more volatile when the U.S. economy grows, for relatively smaller economies with higher level of income such as Taiwan and Thailand.¹⁸ Moreover, the volatility of real interest premium has a negative sign, strongly suggesting that real returns on bank claims do not explain the volatile trend of U.S. bank claims in the region. Together, the usual suspects for volatile U.S. bank investments in emerging economies play only a limited role in explaining the trend of growing volatility over time. As *Table 2.7* demonstrates, the trend is explained away with other control variables in the case of Latin American claims, while it is somewhat reinforced after the inclusion of control

¹⁸ The average volatility for Taiwan during 1984 Q1 - 2005 Q3, which incidentally escaped the Asian financial crises, stands at 0.15, while the same measure for Indonesia, the hardest-hit country from the 1997 financial crisis in terms of GDP loss, is at 0.08.

variables in the case of Asian claims.

Figure 2.11 Trend of volatility in U.S. bank claims, country samples



A pooled sample of Latin America and Asian countries points to GDP, inflation rate, and openness variables as major determinants of the volatility in U.S. bank emerging market claims. Even after the model specification, however, the trend coefficient remains positive and significant at the 10% level, leading one to suspect the existence of other major determinants of volatility not included in the model. To fill this loophole, this study looks at the other end of the equation, regulatory changes in the U.S. that provided a common backdrop to individual banks' investment decisions concerning emerging market economies.

The U.S. domestic backdrop to this increasing trend of volatility in U.S. bank emerging market lending is a natural place to turn for an answer. For one, the data overview in the beginning of this chapter clearly demonstrates that it was cross-border lending from U.S. banks that drove the pull-out from emerging economies. Local claims of U.S. bank branches and subsidiaries in emerging economies increased tremendously over the past twenty years. Since local claims are, by definition, extended by the bank offices set up in host countries and governed by local regulations, they are much less susceptible to changes, economic or institutional, stemming from within the U.S.

Secondly, the U.S. banking sector has been going through a historic transformation in its regulatory environment during this period, unmatched in its depth and breadth by regulatory changes in Japan or in Europe. Hence, it offers a unique, distinctive setting in which the particulars of U.S. bank emerging market lending — i.e. rising volatility — can be tested against the regulatory developments in the U.S. To look into the potential linkages, however, we must first see what

actually took place in U.S. banking regulation and how it affected the banking sector in general.

Chapter 3 Universal Banking: American Style

The American banking industry suffered a great deal in the 1980s. Internationally, it was reeling from the impact of the debt crises in Latin America. Domestically, the troubles with savings and loan associations (S&Ls) defied the existing regulatory forbearance and necessitated a drastic restructuring whose cost amounted to \$30 billion for the 205 banks that were sold or liquidated (Kane 2004). Perhaps more significantly, Japanese banks surpassed their American counterparts in size of both their assets and market capitalization during this period. For the next decade, however, the American banking industry pulled off a truly remarkable turnaround, which not only brought it back to dominance in global markets but also transformed its very way of business (The Economist 2003). Surrounding this turnaround were two undercurrents of the institutional landscape that converged toward the direction of American-style universal banking: (1) consolidation of the banking industry; and (2) diversification of banking activities.

Consolidation of the U.S. banking industry over the past twenty years has been nothing short of remarkable (*Figure 3.1*). Mega-banks were born, only to be merged with each other. In January 2004, J.P. Morgan Chase regained second place in the banking hierarchy by purchasing Chicago's Bank One for \$58 billion in shares (The Economist 2004a). Following another big merger of \$47 billion between Bank of America and FleetBoston in October 2003, an environment was created in which the three giants (Citigroup, J.P. Morgan Chase, and Bank of America) were distinct

from other banks by any plausible measure — geographic coverage, asset size, or market capitalization. In answering why, after decades of so little change, the industry began a dramatic consolidation in the 1980s, the Brookings Institution (1995) traced it to two major factors: (1) the extraordinary number of major regulatory changes, from deposit deregulation in the early 1980s to the relaxation of branching restrictions later in the decade; and (2) the clearly identifiable innovations in technology and applied finance, including improvements in information processing and telecommunication technologies, the securitization and sale of bank loans, and the development of derivative markets. A decade later, Jones and Critchfield (2005) confirmed the analysis and noted,

The transformation of the banking industry is ongoing and the number of banking organizations continues to decline.... In two areas — banking activities and branching — legislative and regulatory efforts were particularly important for the consolidation trend: restrictions on permissible banking activities were relaxed, and geographic limitations on branching were removed.... There can be no doubt about the influence of deregulation on the merger wave as it unfolded in the U.S.

Figure 3.1 Consolidation of U.S. banking industry



Source: Jones and Critchfield (2005)

Concurrent with the consolidation of the industry, another transformation — the diversification of banking activities — has been ongoing, no doubt with dynamic interactions between the two phenomena. Through a gradual and often tedious deregulation process over the course of the past twenty years, age-old barriers separating commercial banks, investment banks, insurance firms, and securities firms have been all but eliminated, paving the way for universal banking. Banks are now free to have, for example, a selective hedge fund, under little supervision, under the same financial holding company as their banking operations. In turn, there is a near consensus view in the industry and academia alike that “advantages of universal banking are best achieved within the context of large-scale banking, where transactions and information costs of syndications are minimized” (Calomiris 2000).

Hence, in order to understand the implications of U.S. banking deregulation, and ultimately its impact on U.S. bank emerging market exposure, it is imperative to elaborate on the common backdrop to the consolidation and diversification of the industry: U.S. banking deregulation.

U.S. Banking Deregulation

Historically, nowhere among industrial countries have restrictions on financial activity been stricter than in the U.S. The Banking Act of 1933, known as the Glass-Steagall Act, prohibited commercial banks from issuing, underwriting, selling, or distributing any type of corporate securities. During the Great Depression, over 9,000 banks — 26% of the total — failed. Congressional sponsors of the Banking Act perceived that banks' involvement in securities activities facilitated the Great Depression. The sponsors were also motivated by concerns that combining lending activities and security and insurance underwriting presented a potential for conflicts of interest and moral hazard that was detrimental to investors. The so-called “separation doctrine” focused on the undue risks from non-banking activities that could jeopardize the special trusteeship falling on institutions that engage in the lending of depositors' money (Corrigan 1982). In accordance with these concerns, Section 20 of the Act stated that commercial banks were prohibited from being affiliated with any organization “engaged principally” in underwriting or dealing in securities. To circumvent the regulations, banks increasingly formed holding companies to which banks would be sold. These holding companies acquired non-bank subsidiaries such as investment banks and used bank resources to engage in these activities.

The Bank Holding Company Act of 1956 closed this loophole by stipulating that

non-bank companies owned by bank holding companies must be engaged in activities “closely related to banking,” whose boundaries were to be defined by the Federal Reserve. The 1956 Act prohibited banking companies from engaging in insurance activities as well, but provided an exception for national banks in places with a population of less than 5,000 (Barth *et al.* 2000). By the 1970s, post-war financial stability restored confidence in financial institutions and reduced the number of bank failures. For example, by 1934, the number of bank failures had declined to 61, but, beginning in 1943, for the next three decades they numbered less than 10 per year (Yeager *et al.* 2005). In turn, existing restrictions on geography and activity of banks came to be questioned. A number of government studies were released that called for deregulation and a greater reliance on market forces (Benston 1990).

Table 3.1 Watersheds in U.S. deregulation of banking activities

April 13, 1987	The Federal Reserve Board allowed commercial bank holding companies to establish separate Section 20 securities affiliates as investment banks, as long as the revenue generated from the affiliates' ineligible securities activities amounted to no more than five percent of the total revenues they generated.
January 18, 1989	The Federal Reserve Board authorized five bank holding companies to underwrite corporate debt upon demonstrating adequate capitalization and formation of the appropriate subsidiaries
September 20, 1990	The Federal Reserve Board granted corporate equity underwriting powers to J.P. Morgan.
September 29, 1994	Congress passed the Riegle-Neal Interstate Banking and Branching Efficiency Act, which allowed interstate branching.
December 20, 1996	The Federal Reserve Board increased the limit on security-underwriting revenue earned by bank holding company subsidiaries to 25 percent.
October 31, 1997	The Federal Reserve Board lifted numerous bank holding company firewalls that limited information flows and dual employment across subsidiaries.
November 4, 1999	United States Senate and House of Representatives passed the Gramm-Leach-Bliley Financial Services Modernization Act of 1999 by votes of 90 to 8 and 362 to 57 respectively.
November 12, 1999	President Clinton signed the Gramm-Leach-Bliley Financial Modernization Act of 1999.

Sources: Roten (2001) and various newspapers

Subsequently, many studies established that the securities activities of commercial banks were not liable for the banking crises during the Great Depression (White 1986; Benston 1989; Puri 1996; Kroszner and Rajan 1994). In the wake of technological advances that made the restrictions obsolete, U.S. authorities embarked on a gradual relaxation of the two distinct historical limitations on banks: bans on branching and

non-banking activities (*Table 3.1*). A period of deregulation culminated in the passage of the Gramm-Leach-Bliley Act of 1999. Appendix B discusses various features of the Act.

Table 3.2 places this evolution of U.S. banking regulation in the context of parallel developments in other financial centers. There are two major aspects of so-called “universal banking.” The first is the ability to mix traditional banking with securities and insurance activities, such as issuing, underwriting, and brokering. The second part involves relationship banking, whereby banks acquire shares in industrial firms and, in turn, develop ties with the firms in which they have equity stakes. On both fronts, universal banking has been the norm for European banks. German universal banks, for example, have been able to deal with any type of financial product while forging close ties with the industrial firms. At the other end, both aspects of universal banking have been denied to U.S. banks until recently, as previously described in this chapter. Interestingly, the Japanese banking environment falls in between the U.S. and European cases and is briefly described in *Box 3.1*.

Statutory limits notwithstanding, Japanese banks created an elaborate network of cross-shareholding to form several groups of large firms, called *keiretsu*. At the center of the *keiretsu* were banks and other financial institutions, such as trust banks or insurance companies, which lent to other members of the *keiretsu* and held their shares. In fact, strong ties between banks and firms were the hallmark of financing of large Japanese corporations (Hoshi 2000).¹⁹

¹⁹ For instance, in 1984, Japanese commercial banks held 20.5% of outstanding corporate equity in Japan, while domestic U.S. banks held only 0.2% of the outstanding equity of U.S. firms (Banerji *et al.* 2002).

Table 3.2 Regulation of broad banking, international comparison

Country	Securities ^a	Insurance ^a	Commercial bank ownership of commercial firms ^b	Commercial firm ownership of commercial banks ^b
Before GLB Act (1997)				
Germany	Unrestricted	Unrestricted	Permitted	Unrestricted
France	Unrestricted	Permitted	Permitted	Unrestricted
UK	Unrestricted	Permitted	Unrestricted	Unrestricted
Japan	Restricted	Prohibited	Restricted	Restricted
US	Restricted	Restricted	Restricted	Restricted
After GLB Act (2005)				
Germany	Unrestricted	Unrestricted	Permitted	Unrestricted
France	Unrestricted	Permitted	Permitted	Unrestricted
UK	Unrestricted	Permitted	Unrestricted	Unrestricted
Japan	Permitted	Restricted	Restricted	Restricted
US	Permitted	Permitted	Restricted	Restricted

Definitions: ^a Unrestricted – A full range of activities in the given category can be conducted directly in the bank; Permitted – A full range of activities can be conducted, but all or some must be conducted in subsidiaries; Restricted – Less than a full range of activities can be conducted in the bank or subsidiaries; Prohibited – The activity cannot be conducted in either the bank or subsidiaries. ^b

Unrestricted – 100 percent ownership permitted; Permitted – Unrestricted, but ownership is limited based upon bank's capital; Restricted – Less than 100 percent ownership; Prohibited – Prohibited.

Sources: Barth, Caprio, and Nolle (2004). Institute of International Bankers. 2006. *Global Survey*.

As such, the changes U.S. banks have experienced in their regulatory environment have been greater than those of their counterparts in other industrial countries.

Transformation has not taken place without debates on the pros and cons of deregulation. The survey of literature in Appendix C strongly points to overall benefits for the industry and consumers. At the same time, even those in favor of deregulation seem to acknowledge that there are real dangers of conflicts of interest

and undue risk-taking for banks engaged in non-traditional activities. The arguments for and against universal banking are both plausible in theory and have respective followings. Ultimately, it is up to the empirics on specific banking activities. The linkage between deregulation and emerging market lending, then, has to be based on the findings of deregulation's impact on domestic banking performance.

Box 3.1 Deregulation of Japanese Banking Industry

In Japan, the range of services offered by banks has been strictly limited until recently. Starting in 1993, the Japanese government embarked on a complex series of measures to reform its financial system. In 1993, the Financial System Reform Act (FSRA) allowed Japanese commercial banks to underwrite certain types of securities. In the aftermath of the depression of the 1990s, the Japanese government adopted a more ambitious financial deregulation package, namely the Big-Bang financial reform, staggered from April 1998 to March 2001: On April 1, 1998, a 50-year old ban on financial sector holding companies was lifted; in 1999, securities companies and trust banks were allowed to enter each other's businesses through subsidiaries; in 2001, insurance companies were included, so that securities companies, trust banks, and insurance companies were allowed to enter each other's businesses through subsidiaries (Patrikis 1998). The range of permissible securities and insurance products that banks can sell is still limited, however, with the expansion subject to further authorization by the Financial Services Agency (FSA).

Impact of Deregulation on Banking Activities

Over the course of continual banking deregulation, the U.S. banking industry underwent marked changes in its market structure. Following the wave of consolidation, larger banks' share in assets, deposits, as well as the number of banking offices across the country, rose steadily and significantly. *Table 3.3* summarizes the trend. From 1985 to 2003, total banking assets have grown by 127%. The asset size of the average bank increased from roughly \$270 million to over \$1 billion. The assets held by the top 25 organizations rose 367%; these banks' market share increased from 28% in 1985 to 58% in 2003. Over the same period, assets held by small community banks increased only 19%; these banks' share dropped from 26% to 14%. The assets held by midsize banks increased only 42%; their market share dropped from 46% to 29%. Similar shifts took place in terms of deposits and the number of banking offices. The top 25 banks' share in deposit rose from 25% to 53%, while their share in the number of banking offices soared from 9% to 33%.

A closer look at the changing asset composition during this period elucidates a source of expansion of the top 25 banks' activities (*Table 3.4*). These banks' holdings of securities, such as mortgage-backed securities, nearly doubled as the share of their total assets, while the share of loans and other assets stagnated, if not fell. Against the industry total, the share of the largest banks' traditional assets such as loans and leases doubled while the share in securities nearly *quadrupled*. This phenomenon was largely confined to the largest banks. The shares of community and midsize banks in securities declined from 39% to 17%, and 50% to 36% during the same period respectively.

Table 3.3 Banking assets, deposits, and offices (1985-2003)

Year	Percentage of Assets			Percentage of Deposits			Percentage of Offices		
	Community Banks	Midsize Banks	Top 25 Banks	Community Banks	Midsize Banks	Top 25 Banks	Community Banks	Midsize Banks	Top 25 Banks
1985	25.89	46.06	28.05	29.19	45.73	25.08	47.29	43.67	9.04
1986	24.28	47.84	27.88	27.60	47.37	25.03	45.10	43.81	11.08
1987	23.33	48.56	28.11	26.62	47.77	25.61	43.99	44.11	11.90
1988	22.35	49.77	27.88	25.49	48.74	25.78	42.52	43.98	13.49
1989	22.53	48.12	29.35	25.68	47.40	26.92	42.27	43.87	13.86
1990	22.61	46.02	31.37	25.42	45.38	29.20	41.55	41.71	16.74
1991	23.18	42.55	34.27	25.72	42.34	31.94	41.38	39.70	18.91
1992	23.40	40.58	36.02	26.31	40.39	33.30	41.74	38.32	19.95
1993	22.02	39.23	38.75	25.36	39.10	35.54	40.70	37.95	21.36
1994	20.24	38.20	41.57	23.81	38.25	37.94	39.13	37.12	23.75
1995	18.97	37.37	43.66	22.75	38.09	39.16	38.28	37.89	23.83
1996	18.42	34.50	47.08	22.08	35.22	42.71	37.93	35.39	26.68
1997	17.06	33.04	49.90	20.84	34.30	44.86	36.90	35.49	27.61
1998	15.86	29.61	54.53	19.57	31.18	49.24	35.56	33.89	30.56
1999	15.25	30.10	54.65	18.81	31.05	50.14	35.12	34.03	30.85
2000	14.61	30.41	54.97	18.07	32.12	49.82	35.17	34.24	30.59
2001	14.53	28.77	56.69	17.98	29.59	52.42	35.02	32.32	32.66
2002	14.27	28.29	57.44	17.55	29.23	53.22	34.61	32.80	32.58
2003	13.55	28.78	57.67	16.72	29.75	53.53	33.70	33.50	32.80

Notes: Community banks are defined as banking organizations (bank and thrift holding companies, independent banks, independent thrifts) with aggregate bank or thrift assets of less than \$1 billion (in 2002 dollars). The top 25 banks are the 25 largest banking organizations, measured in terms of the banking industry assets they controlled at the indicated time. Midsize banks consist of all remaining banking organizations.

Source: Critchfield *et al.* (2004).

Table 3.4 Share of different assets for top 25 banks

	as percent of own total assets			as percent of industry total		
	1985	1994	2003	1985	1994	2003
Loans and leases	64.5	59.2	57.9	30.1	39.6	55.7
Securities	8.3	14.5	15.5	11.2	28.2	47.6
Other assets	27.2	26.2	26.6	39.7	61.7	73
Total assets	100	100	100	28.1	41.6	57.7

Source: FDIC Banking Profiles. (various issues).

Long denied access to the securities market, large money-center banks in the U.S. dramatically expanded their trading activities in securities, tailoring their business

models to embrace trading activities with fee income. How does this characteristic of banking activities relate to the risk and return profile of a banking organization? White (1986) observes that banks engaging in securities activities such as stocks and bonds tend to have a higher return. However, he finds that the return's variance tends to be higher as well. In their seminal work on universal banking in the U.S., Saunders and Walter (1994) describe and analyze the risks from combining securities and insurance business with traditional loan-making. They show that, compared to commercial banking alone, returns from combined commercial and investment banking (and other activities, such as mortgage banking, insurance, and real estate investment) would be significantly higher, although risk would be higher as well. Together, they suggest that bank returns have clearly improved with new banking powers. At the same time, the increased returns seem to be associated with higher variance (volatility) from new risks of non-bank activities. In other words, many studies provide evidence that combining banking and non-bank activities has the potential of reducing risk via diversification. However, an increasing number of them point out that some non-bank activities tend to increase bank risk; that the returns to diversification quickly diminish; and that any risk reduction achieved via diversification can be undone and is often outweighed by taking on other volatile activities, such as trading in securities or increasing financial leverage (DeYoung and Roland 2001).

With respect to potential risk-reduction, Wall, Reichert, and Mohanty (1993) constructed synthetic portfolios based on the accounting rates of return earned by banks and by non-bank financial firms. Their results suggest that, had banks been

able to diversify into small amounts of insurance, mutual fund, securities brokerage, or real estate activities, they could have experienced higher returns and lower risk between 1981 and 1989. Laderman (1998) simulated mergers between bank holding companies and various non-banking financial firms between 1970 and 1994 and concluded that by offering “modest to relatively substantial amounts” of life insurance or casualty insurance underwriting, a bank holding company could reduce both the standard deviation of its return on assets and also its probability of bankruptcy. Cornett *et al.* (2002) report that the establishment of Section 20 subsidiaries, which were used to undertake investment banking operations, are associated with an increased return on assets, but no change in firm risk.

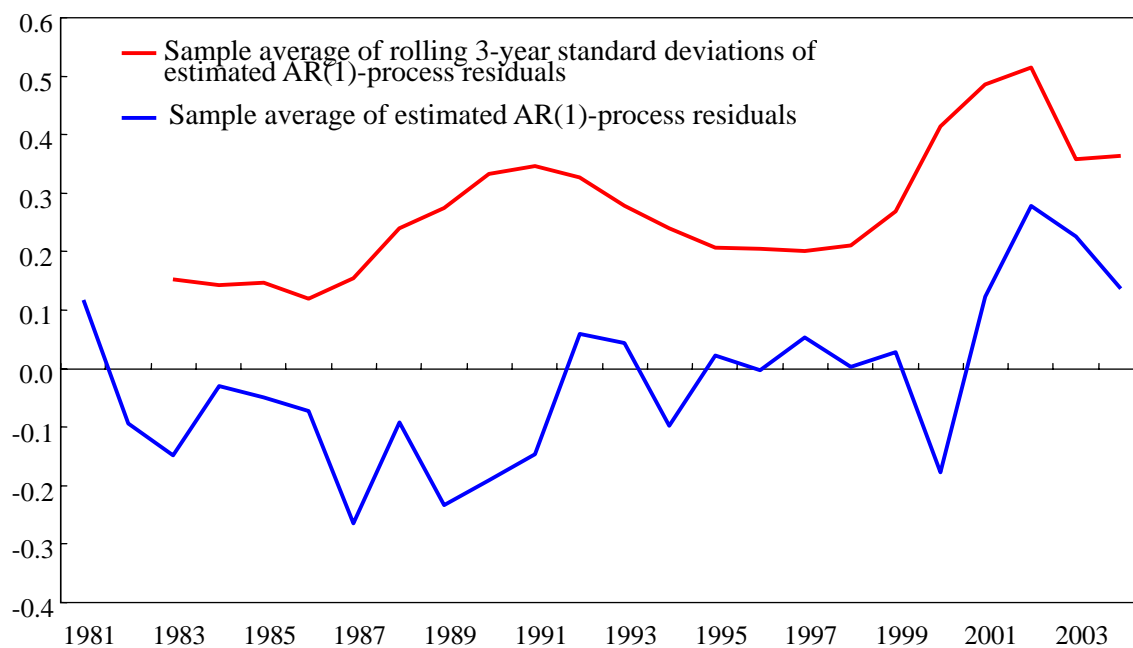
On the other hand, Demsetz and Strahan (1995) found that, although bank holding companies tend to become more diversified as they grow larger, this diversification does not necessarily translate into risk reduction, because these firms also tend to shift into riskier mixes of activities and hold less equity. Roland (1997) found that abnormal returns from fee-based activities were more volatile than abnormal returns from lending and deposit-taking. Kwan (1998) compared the accounting returns of Section 20 securities affiliates to the accounting returns of their commercial banking affiliates between 1990 and 1997 and found that securities affiliates tended to be riskier (*i.e.*, have more volatile returns over time), but not necessarily more profitable, than commercial banking affiliates. In fact, DeYoung and Roland (2001) refute the conventional wisdom in the banking industry that earnings from fee-based products are more stable than loan-based earnings and that fee-based activities reduce bank risk via diversification. By employing individual bank level data from 1988 to 1995, the

authors find that as the average bank tilts its product mix toward fee-based activities and away from traditional lending activities, and engages in more off-balance sheet activities following deregulation and competition from non-bank financial firms, their earnings tend to fluctuate more via higher leverage and revenue volatility. DeYoung and Roland (2001) argue that this volatility in earnings reflects the low switching cost of fee-based activities compared to relationship-based lending, higher operating leverage due to greater reliance on fixed inputs like labor, and higher financial leverage due to little or no capital requirements. Further, Stiroh (2004) finds that a greater reliance on non-interest income, particularly trade revenues, is associated with more volatile returns and lower risk-adjusted profits. Stiroh (2005) notes that, especially in the years since passage of the GLB Act, the locus of risk has shifted off of the balance sheet and onto the non-interest income such as securitization income, *i.e.*, gains from loan sales. Consequently, diversification benefits exist for bank holding companies that expand into non-bank activities, but these gains are typically more than offset by increased exposure to more volatile activities (Stiroh and Rumble 2005). Indeed, Rajan (2005) clearly shows in *Figure 3.2* the increasing earnings volatility in U.S. banking institutions since 1980 and explains,

Technology helped spur deregulation, which in turn created a larger market in which technologies could be utilized, creating further technological advances. Both forces have come together to spur institutional change. For example, not only has there been an enormous amount of bank consolidation but also the activities of large banks have undergone change.... As traditional risks such as mortgages or loans can be moved off bank balance-sheets into the balance-sheets of investment managers (e.g. mutual funds, hedge funds), banks have an incentive to originate more of these risks. Thus they will tend

to feed rather than restrain the appetite for risk... However, banks cannot sell all risk. In fact, they often have to bear the most complicated and volatile portion of the risks they originate, so even though some risk has been moved off their balance-sheets, they are being reloaded with fresh, more complicated, risks.

Figure 3.2 S&P 1500 banks: earnings volatility



Source: Rajan (2005)

The red line in *Figure 3.2* represents the earnings (net income) volatility, derived from the AR(1)-process residuals, over the past twenty five years. Not only is there an upward trend, but there seems to exist upward shifts after the major deregulation initiatives in the U.S. — Section 20 affiliates in 1987 and the GLB Act in 1999. This interesting coincidence paves the way for subsequent investigations in Chapter Four and enters as a catalyzing factor between deregulation and banks' emerging market lending volatility.

Chapter 4 Linkages

Against the backdrop of a remarkable transformation in U.S. banking deregulation, U.S. bank emerging market exposure has been associated with greater volatility over time. However, efforts to relate these two concurrent developments have been conspicuous by their absence. They have been mostly analyzed as distinct phenomena, driven by separate dynamics. As Dahl and Shrieves (1999) point out, the empirical analysis of international expansion by U.S. banks has been mostly approached from the perspective of locational incentives, such as macroeconomic factors in host countries, the extent of foreign investment opportunities, and the severity of regulations. These studies help understand the determinants and certain trends in the international activities of U.S. banks. However, they are often limited by the fact that home-country influences on international activities are overlooked. If banks are managed and operated on a consolidated worldwide basis, the extent of investment opportunities in the U.S. will certainly affect the patterns of investment internationally.²⁰ This chapter establishes the connection between the key outcomes of banking deregulation — consolidation and diversification — with the volatility of emerging market lending by U.S. banks. Before addressing *how* the relationship comes about, however, it is essential to ask *if* there indeed is an apparent link between the two.

²⁰ Benston (1990), among others, encapsulates the enlarged domestic opportunities created by deregulation such as underwriting and advisory business previously denied to commercial banks.

Temporal Association

Did a series of banking deregulation steps in the U.S. have an impact on the volatility of emerging market claims? *Table 4.1* summarizes and compares the average and variations of volatility before and after the major deregulation initiatives in the U.S. The sample period, 1984 Q1 through 2005 Q3, is divided into three periods: (1) pre-deregulation (before 1987 Q2), (2) early deregulation (1987 Q3 to 1999 Q4); and (3) full deregulation (after 2000 Q1). Two points in time indicate landmark changes in the U.S. banking deregulation: (1) the introduction of Section 20 securities affiliates (April 1987); and (2) the passage of GLB Act (December 1999). In every single case, be it regional total or country sample, there was an increase in average volatility after the two major deregulation initiatives.

This pattern persists regardless of the size of variations in each period. For example, the average volatility measure increases from 56.5 to 82.4 (pre- to early deregulation for 13 emerging market samples), 57.8 to 63.7 (early to full deregulation for six Latin American samples), and 88.3 to 103 (pre- to early deregulation for seven Asian samples) when standard deviation in each case changes from 86.4 to 75.2, 46.5 to 47.4, and 107 to 87.7, respectively. Thus, it is hard to argue that the increasing volatility in each period was brought about solely by the existence of influential outliers.²¹ It is noteworthy that a choice of dates, seemingly random except for specific changes in U.S. banking deregulation, produces a pattern of increasing volatility. However, does each deregulation initiative exert influence beyond the general trend witnessed in the preceding period?

²¹ Since the variances are different and tend to get bigger for each period, the homoskedasticity assumption cannot apply. Accordingly, all regressions are estimated by OLS with White's correction of heteroskedasticity.

**Table 4.1 Summary statistics for volatility, before & after
U.S. banking deregulation initiatives**

(Measure of volatility)*1000	Number of observations	Mean	Std.Dev.	Min.	Max.
Volatility of U.S. bank emerging market claims (regional total)					
Pre deregulation	14	8.99	3.61	2.50	16.9
Early deregulation	50	27.9	20.0	2.73	82.4
Full deregulation	23	52.0	24.5	11.5	105
Volatility of sample emerging market claims (13 countries)					
Pre deregulation	182	56.5	86.4	0.96	562
Early deregulation	650	82.4	75.2	2.09	576
Full deregulation	229	158	174	3.33	931
Volatility of U.S. bank Latin American claims (regional total)					
Pre deregulation	14	9.00	5.00	0.97	17.3
Early deregulation	50	30.7	22.1	1.43	93.0
Full deregulation	23	43.3	25.8	4.01	102
Volatility of sample Latin American claims (6 countries)					
Pre deregulation	84	19.4	16.7	0.96	83.5
Early deregulation	300	57.8	46.5	2.09	262
Full deregulation	138	63.7	47.4	3.33	243
Volatility of U.S. bank Asian claims					
Pre deregulation	14	28.7	13.3	4.80	59.9
Early deregulation	50	44.2	34.7	11.6	168
Full deregulation	23	114.3	85.5	19.4	334
Volatility of sample Asian claims (7 countries)					
Pre deregulation	98	88.3	107	1.39	562
Early deregulation	350	103	87.7	2.11	576
Full deregulation	161	239	201	11.1	931

Notes: G-10 countries include Canada, France, Germany, Italy, Japan, and the United Kingdom. The six Latin American countries are Argentina, Brazil, Chile, Colombia, Mexico, and Venezuela. The seven in Asia include China, Taiwan, Indonesia, Korea, Malaysia, Philippines, and Thailand. Together they hold over 90% of U.S. bank claims in each region.

To see if there indeed has been any significant change around the time of major banking deregulation initiatives, a regression with dummy variables for each

deregulation period has been conducted for each regional total of U.S. bank emerging market claims.

$$Volatility_t =$$

$$\beta_0 + \beta_1 Time_t + \beta_3 Earlyderegulationdummy + \beta_4 Time * Earlyderegulationdummy_t + \varepsilon_t$$

$$Volatility_t =$$

$$\beta_0 + \beta_1 Time_t + \beta_3 Fullderegulationdummy + \beta_4 Time * Fullderegulationdummy_t + \varepsilon_t$$

Simultaneously, a joint F-test for dummy and interaction variables has been conducted to see if there was a structural change between the two periods. *Table 4.2* reports the outcome of this exercise. The results indicate there indeed were structural breaks in the pattern of volatility after each important deregulation initiative.

Table 4.2 Test results for structural changes

< Volatility in Emerging Market Claims >

➤ **Impact of early deregulation (1987 Q3 –)**

➤ Sample period: pre- (1984 Q1 – 1987 Q2) vs. early deregulation (1987 Q3 – 1999 Q4)

➤ Result: Structural shift peaks in **1989 Q3**

$$\hat{V}_t = 0.0869Time_t + 0.5758D_t X_t - 6.4856D_t + 8.7777$$

$$p = (0.53) \quad (0.03) \quad (0.43) \quad (0.00), \quad R^2 = 0.39$$

$$\hat{V}_t = 0.0869Time_t + 8.7777 \text{ (1984Q1–1989Q2)}, \quad \hat{V}_t = 0.6627Time_t + 2.291 \text{ (1989Q3–1999Q4)}$$

$$p = (0.54) \quad (0.00), \quad (0.00) \quad (0.77)$$

Joint F-statistics for dummy and interaction variables: $F(2, 60) = 5.99$, $\text{Prob} > F = 0.0043$

< Volatility in Emerging Market Claims >

➤ **Impact of full deregulation (2000 Q1 –)**

➤ Sample period: pre- and early (1984 Q1 – 1999 Q4) vs. full deregulation (2000 Q1 – 2005 Q3)

➤ Result: Structural shift peaks in **2001 Q3**

$$\hat{V}_t = 0.4935Time_t - 1.8398D_t X_t + 162.1D_t + 6.2725$$

$$p = (0.00) \quad (0.00) \quad (0.00) \quad (0.00), \quad R^2 = 0.54$$

$$\hat{V}_t = 0.4935Time_t + 6.2725 \quad (1984Q1 - 2001Q2), \quad \hat{V}_t = -1.3462Time_t + 168.4 \quad (2001Q3 - 2005Q3)$$

$$p = (0.00) \quad (0.00), \quad (0.06) \quad (0.00)$$

* Joint F-statistics for dummy and interaction variables: $F(2, 83) = 6.42$, $\text{Prob} > F = 0.0026$

< Volatility in Latin American Claims >

➤ **Impact of early deregulation (1987 Q3 –)**

➤ Sample period: pre- (1984 Q1 – 1987 Q2) vs. early deregulation (1987 Q3 – 1999 Q4)

➤ Result: Structural shift peaks in **1989 Q1**

* Joint F-statistics for dummy and interaction variables: $F(2, 60) = 12.89$, $\text{Prob} > F = 0.0000$

➤ **Impact of full deregulation (2000 Q1 –)**

➤ Sample period: pre- and early (1984 Q1 – 1999 Q4) vs. full deregulation (2000 Q1 – 2005 Q3)

➤ Result: Structural shift peaks in **2001 Q3**

* Joint F-statistics for dummy and interaction variables: $F(2, 83) = 5.48$, $\text{Prob} > F = 0.0058$

< Volatility in Asian Claims >

➤ **Impact of early deregulation (1987 Q3 –)**

➤ Sample period: pre- (1984 Q1 – 1987 Q2) vs. early deregulation (1987 Q3 – 1999 Q4)

➤ Result: Structural shift peaks in **1988 Q2**

* Joint F-statistics for dummy and interaction variables: $F(2, 60) = 5.18$, $\text{Prob} > F = 0.0084$

➤ **Impact of full deregulation (2000 Q1 –)**

➤ Sample period: pre- and early (1984 Q1 – 1999 Q4) vs. full deregulation (2000 Q1 – 2005 Q3)

➤ Result: Structural shift peaks in **2002 Q3**

* Joint F-statistics for dummy and interaction variables: $F(2, 83) = 22.65$, $\text{Prob} > F = 0.0000$

Notes: Dependent variable = (Volatility)*1000. All regressions are estimated by OLS with White's correction of heteroskedasticity.

Several structural breaks can be found in the volatility of U.S. bank emerging market claims after the introduction of the Section 20 affiliates in 1987 Q2. In 1989 Q3, about two years after the initiative, the most pronounced shift occurred with the highest F-statistics during the span of pre-and early deregulation period. Provided that U.S. banking deregulation indeed had a real impact on the volatility of emerging market exposure, it is natural to expect a time lag between deregulation and its impact on the volatility measure, given the fact that regulatory deregulation began with the Section 20 initiative and moved forward in earnest throughout the 1990s. *Box 4.1* further discusses potential reasons for this lagged response. After full legislative action was completed with passage of the GLB Act in 1999 Q4, one can witness another upward shift, starting from 2001 Q3. Again, it took place after a time lag of approximately two years following passage of the GLB Act. Both of these structural breaks are statistically significant at the 1% level.

These shifts are not unique to the volatility in emerging market claims as a whole. Similar patterns are manifested in the volatility of Latin American and Asian claims during the same period. For the Latin American claims, within two years of the introduction of the Section 20 affiliates, one can observe a pronounced upward structural break in 1989 Q1. It took less time for a similar shift to take place in Asia in 1988 Q2, about one year after the Section 20 initiative. Comparing the F-statistics between these two regions suggests that the shift was more severe in Latin America than in Asia for the early deregulation initiatives. The opposite is true for the impact of full deregulation in 1999 Q4. Although pronounced shifts in the volatility trend are again witnessed within two years of passage of the GLB Act,

starting in 2001 Q3 for the Latin American claims and 2002 Q3 for the Asian claims, F-statistics is much bigger for Asia (22.6) than Latin America (5.48). It clearly points to the dramatic ascent of volatility in U.S. bank Asian claims after 2002 Q3.

Box 4.1 Potential reasons for the two-year lag

- Behavioral response to regulatory changes

Any impact banking deregulation has on emerging market lending cannot materialize immediately, especially when it is the repercussions from deregulation measures, not the measures themselves, that exert influence on emerging market lending.

- Effective dates of legislative changes

To facilitate adjustments by various stakeholders, legal provisions of specific deregulation initiatives often take time to become effective. The Riegle-Neal Interstate Banking and Branching Efficiency Act, for example, was passed in September 1994, with its provisions taking effect in March 1995. The key provisions of the Gramm-Leach-Bliley Act also had an adjustment period. The provision facilitating affiliations among banks, securities firms, and insurance companies became effective 120 days after enactment. The Securities and Exchange Commission (SEC) provisions became effective 18 months later.

- Initial rush after major deregulation initiatives

Despite the usual lagged response to regulatory and legislative changes, those who chose to take advantage of these deregulation initiatives seem to have done so relatively quickly. For example, the majority of banks established Section 20 affiliates in the two years between 1987 to 1989, shortly after the Federal Reserve first allowed banks to expand their activities by establishing these separate securities affiliates (Cornett *et al* 2002).

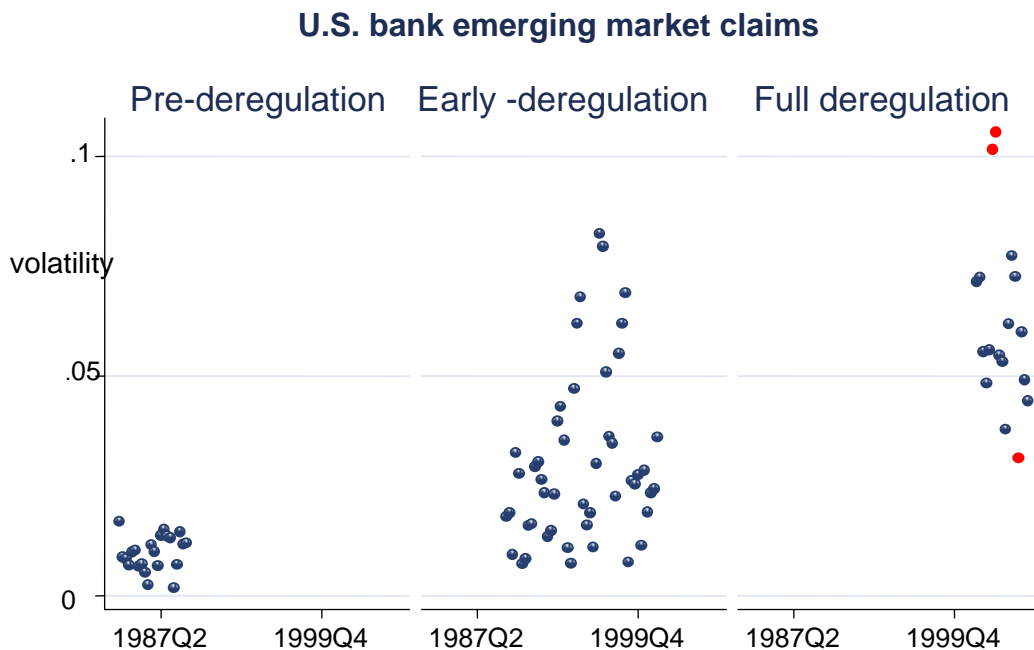
It is hard to reconcile this observation with the conventional idea that volatility would be mostly explained by the onset of financial crises in emerging economies.

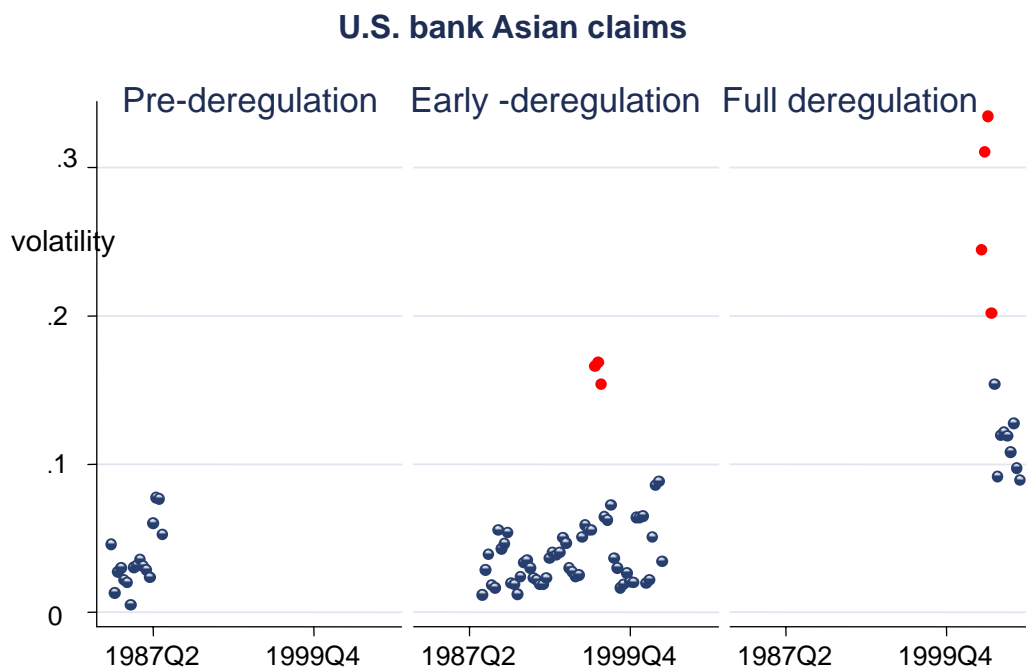
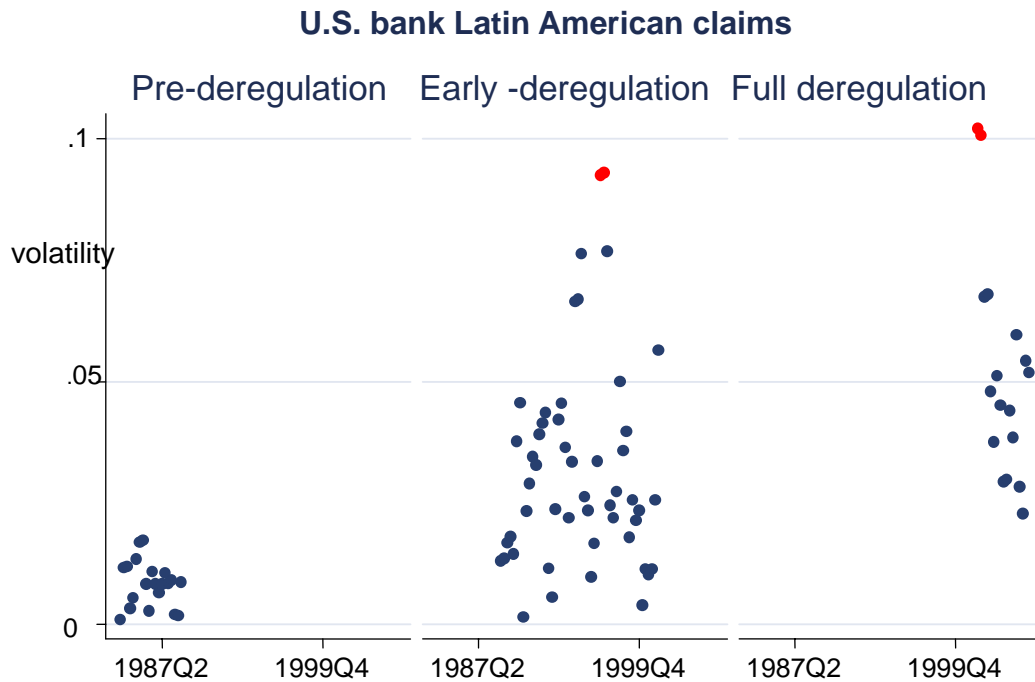
After the Asian crisis of 1997-99, hardly any Asian countries experienced financial crises of such magnitude. If anything, the financial turmoil in Argentina and Brazil in 2001-02 is more noteworthy. Against this backdrop, *Table 4.2* shows that U.S. bank lending became more volatile after each U.S. banking deregulation initiative, albeit after a time lag of about two years, with a bigger impact on Latin American claims after the early deregulation and on Asian claims after full deregulation.

Figure 4.1 graphically illustrates distinct patterns of volatility before and after the structural shifts during each period. The timing of significant shifts in volatility coincides with the major deregulation initiatives in 1987 Q2 and 1999 Q4, with a time lag of approximately two years. Whether one examines emerging market, Latin American, or Asian claims, a comparison between each period of deregulation clearly demonstrates how, after a structural upward shift at the beginning of each period, the trend looks widely different from the previous period. This characteristic in the volatility of capital flows bears a remarkable similarity across the regions of Latin America and Asia. This common feature, however, stands in sharp contrast to the changing share of claims for each region over the same period. For example, at the end of 1984 Q1, the share of claims in Latin America and Asia accounted for 21% and 8%, respectively, of the total claims. As of 2005 Q4, the regional share for Latin America and Asia changed to 7% and 8%, respectively. The size of the claims in dollar terms dropped from \$73 billion to \$46 billion for Latin America and increased from \$29 billion to \$56 billion for Asia. Although the claims for emerging economies as a whole also decreased from \$138 billion to \$116 billion, a directional change among different parts of emerging economies is clear. In fact, there is a

statistically significant negative correlation (-0.71) between U.S. claims in Latin America and Asia after 2000. U.S. bankers were pulling money out of Latin America and investing in Asian countries at the same time that the volatility of U.S. bank lending had been experiencing similar structural shifts in both regions. Indeed, the volatility measures for U.S. bank claims on sample countries experience similar patterns of increasing volatility (*Table 4.1*), coupled with spikes after the important deregulation initiatives. The volatility measures for the claims in seven Asian countries, for example, had structural breaks in 1988 Q4 and 2002 Q3 after early and full deregulation initiatives.

Figure 4.1 Structural shifts in the trend of volatility





What explains this unique commonality in the volatility trend across regions?

Given the temporal association between U.S. banking deregulation and volatile

lending into emerging economies, it is natural to seek a dynamic through which banking deregulation imparts unique commonality to the volatility of U.S. bank claims in emerging economies over the past twenty years. Regardless of varying situations individual U.S. banks faced in their emerging market investments, all of them had to go through a fundamental transformation in business environment at home over the past twenty years. As noted, the transformation epitomized by the consolidation in the banking industry stemmed in part from banking deregulation in the U.S. (Jones and Critchfield 2005). Although the impact of deregulation on industry consolidation is well documented, its potential spillovers onto international activities of banks are seldom brought up.

Before proceeding, however, it is important to verify that the changes in the volatility trend is not determined by a few influential outliers. To repress the potential sway by outliers, Cook's D test has been used to eliminate any influential outliers.²² As a result, three observations have been deleted from the volatility of total emerging market claims, four from the volatility of Latin American claims, and seven from that of Asian claims. The deleted data points are marked with red signs in *Figure 4.1*. Even with the exclusion of these influential outliers, the average volatility remains on the rise as one moves from the pre-, to the early, to the full deregulation period (*Table 4.3*). It is noteworthy that the increasing trend persists even when the variation gets smaller. For example, the volatility for emerging market claims have larger standard deviation in the early deregulation period than in

²² Cook's D test is used to identify the data points that have high influence on the trend coefficients for the equation, $Volatility_{it} = \alpha_0 + \alpha_1 Time_{it} + \varepsilon_{it}$. It detects an observation whose dependent-variable value is unusual given its values on the predictor variables. The conventional cut-off point of $4/n$, n being the number of observations in the data, have been followed.

the full deregulation period, highlighting a genuine shift in volatility between the two periods not dictated by the existence of a few outliers.

Table 4.3 Summary statistics for volatility, without influential outliers

(Measure of volatility)*1000	Number of observations	Mean	Std.Dev.	Min.	Max.
Volatility of U.S. bank emerging market claims (regional total)					
Pre deregulation	14	8.99	3.61	2.50	16.9
Early deregulation	50	27.9	20.0	2.73	82.4
Full deregulation	20	47.9	19.3	11.5	77.4
Volatility of U.S. bank Latin American claims (regional total)					
Pre deregulation	14	9.00	5.00	0.97	17.3
Early deregulation	48	28.1	18.4	1.43	76.8
Full deregulation	21	37.8	19.1	4.02	68.0
Volatility of U.S. bank Asian claims					
Pre deregulation	14	28.7	13.3	4.80	59.9
Early deregulation	47	36.6	17.6	11.6	77.3
Full deregulation	19	80.9	39.6	19.4	153

Furthermore, even with the filtered data, structural shifts in the volatility trend stand before and after major deregulation initiatives. There is no change in the timing of these shifts for the emerging market claims. For the Latin American claims, structural breaks take place in 1989 Q1 and 2001 Q2, the same result for the early deregulation period and one quarter earlier than the result for full deregulation in *Table 4.2*. For the Asian claims, structural breaks are witnessed in 1988 Q2 and 2002 Q3, again the same result with the original data in *Table 4.2*. Thus, the temporal association between U.S. banking deregulation initiatives and the volatility in U.S. bank claims remains valid after having deleted a number of influential outliers.

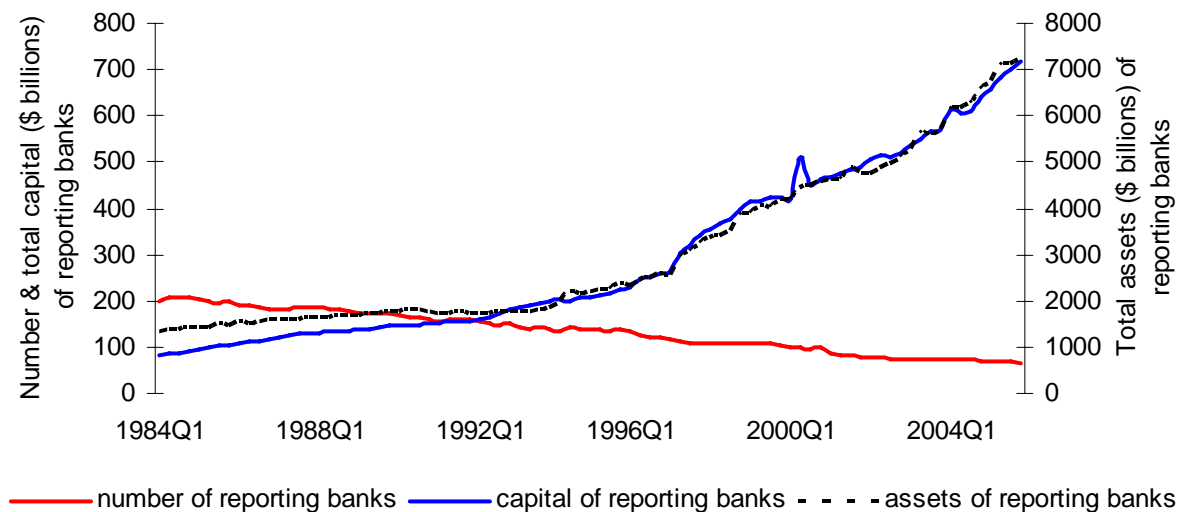
It not only buttresses the relevance of the findings so far, but also justifies the use of the original data in its entirety since the so-called outliers are themselves the result of important developments in emerging market financing, such as the Asian financial crisis in 1997-99 and the Argentine default in 2002 Q1, both of which are classified as outliers by Cook's D test.

Consolidation & Bank Lending Volatility

Due to the wave of consolidation in the U.S. banking industry over the past twenty years, the number of reporting banks to the FFIEC database has been decreasing as well. The number of reporting banks plunged from 198 in 1984 Q1 to 67 in 2005 Q4, losing nearly two-thirds of its initial total. The loss in numbers notwithstanding, the size of the banking industry in terms of its total capital and assets has been on the solid rise over the same period. Total capital jumped nearly ten-fold from \$80 billion to \$700 billion while total assets quintupled from \$1,340 billion to \$7,150 billion (*Figure 4.2*). At the same time, large money-center banks strengthened their position vis-à-vis smaller banks in the U.S. market. Their share increased from 40% to 49% in total industry capital and 44% to 57% in total assets over this period. Given the fact that the number of money-center banks has fallen from nine in 1984 Q1 to four in 2005 Q4, a handful of giant banks came to dominate the industry.²³

²³ The top nine banks in 1984 consisted of Bank of America, Citibank, Chase Manhattan Bank, Manufacturers Hanover, Morgan Guarantee, Chemical Bank, Continental Illinois, Bankers Trust, and the First National Bank of Chicago. Through subsequent mergers, in 2005, four banks qualified as the top banks in the FFIEC database: Citigroup, Bank of America, JP Morgan Chase, and Taunus Corp (the U.S. affiliate of Deutsche Bank).

Figure 4.2 Number and size (capital & asset) of FFIEC reporting banks



Where does this trend of consolidation stand relative to the parallel developments in U.S. banking deregulation? First, when the rate of consolidation, measured by the log difference of the number of banks, is pitted against the milestones in banking deregulation over the same period, a clear pattern of accelerating consolidation emerges. As in the previous section, the sample period is divided into three periods: pre-deregulation (before 1987 Q2); early deregulation (1987 Q3 to 1999 Q4); full deregulation (after 2000 Q1). In the succeeding period of further deregulation, consolidation intensified.

Table 4.4 Quarterly percentage changes in number of reporting banks

$\Delta \ln$ (no. of banks)	No. of obs.	Mean	Std.Dev.	Min.	Max.
Pre-deregulation	13	-0.66	2.20	-2.65	5.56
Early deregulation	50	-1.16	2.32	-6.72	5.19
Full deregulation	23	-1.79	2.69	-11.1	2.06

Second, expanding asset size of the reporting banks left their external claims shrunk in relative terms, particularly for emerging market cross-border claims. Total external claims of the reporting banks doubled from \$350 billion to \$660 billion during 1984 Q1 to 2005 Q3 (*Table 2.1*). Its share in total bank assets decreased from 26% to 9% over the same period, however. For emerging market claims whose growth stagnated from \$140 billion to \$115 billion, the fall was much more dramatic, 10% to 1% of the total assets of the reporting banks. Consolidation of the U.S. banking industry in effect created fewer banks with a much smaller share of their assets devoted to emerging market exposure. Enlarged domestic opportunities created by broader banking powers such as underwriting, trading, and advisory services could have pushed U.S. banks away from risky loans into emerging economies and, at the same time, made readily reversible short-term lending.

This presumption is reinforced by the fact that local claims in emerging economies from the same banks increased more than ten times during the period, from less than \$20 billion in 1984 to \$196 billion in 2005 (*Table 2.1*). In contrast to the restrictions on their domestic activities, U.S. banks have long been permitted to engage in non-banking activities through separate foreign subsidiaries with fewer constraints than domestic subsidiaries in terms of how they structure these operations.

Thus, banks with foreign subsidiaries enjoyed greater freedom in different lines of non-banking business long before deregulation at home. With better profit margins in emerging economies, this could have facilitated a physical presence in emerging economies that was much harder to cut back despite changing incentives at home.²⁴

Consolidation in the U.S. banking industry owes much of its evolution to successive deregulation. In turn, reduction in both the number of banks and the share of emerging market claims in total assets are important by-products of industry consolidation. Are these by-products related to the increasing volatility of U.S. bank emerging market claims? U.S. bank emerging market lending has not been a point of contention for or against banking deregulation in the U.S. As such, U.S. banking deregulation has no apparent bearing on the increasing volatility of U.S. bank emerging market exposure. Its potential impact, if any, has to be exerted through trickle-down effects such as industry consolidation.

As a result of consolidation, a handful of money-center banks increasingly control the total claims in emerging economies. *Table 2.1* from chapter 2 lists the changing share of money-center banks in U.S. bank cross-border exposure over time. The share has increased from 64% in 1984 Q1 to 80% in 2005 Q4. Furthermore, this has to be put in context: the number of money-center banks in the database shrunk from nine in 1984 Q1 to four in 2005 Q4. These four banks (Bank of America Corp., Taunus Corp., J.P. Morgan Chase, and Citigroup) have also led the rest in terms of their volatile investment patterns. *Table 4.5* illustrates the phenomenon. There is an apparent discrepancy between big U.S. banks (money-center banks) and small U.S.

²⁴ Claessens, Demirgüç-Kunt, and Huizinga (1998) report that, in emerging market countries, foreign banks tend to have bigger margins and profits than local banks, whereas the reverse is true in developed countries.

banks. In almost every category, big money-center banks are driving up the trend in volatility for all banks. The trend coefficients for claims by money-center banks are on average 20-25% larger than those for all reporting banks. By sharp contrast, smaller banks diverge from the overall trend and, in many occasions, such as lending to private non-bank entities, show decreasing volatility over time.

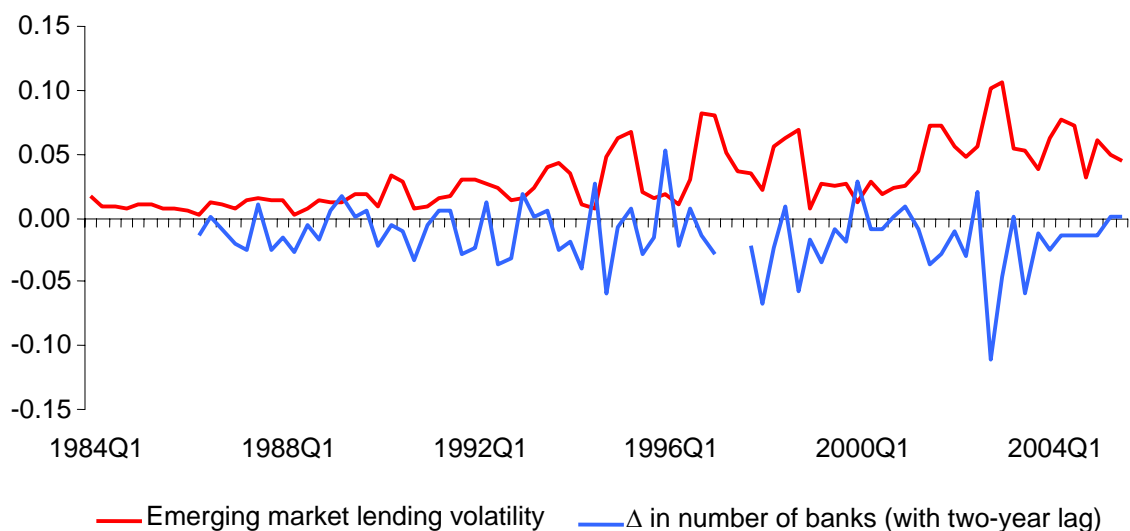
Table 4.5 Trend coefficients[†] for lending volatility, by size of banks

ALL BANKS	All	Developed economies			Emerging economies		
		Total	G-10	non G-10	Total	Lat. America	Asia
All	0.0004***	0.0003***	0.0003***	0.0003***	0.0006***	0.0005***	0.0012***
<i>by type</i>							
Banks	0.0009***	0.0010***	0.0010***	0.0012***	0.0007***	0.0010***	0.0007***
private non-banks	0.0004***	0.0006***	0.0007***	0.0005***	0.0003***	0.0004***	0.0006***
public sector	0.0013***	0.0009***	0.0004	0.0015***	0.0018***	0.0012***	0.0041***
<i>by maturity</i>							
short (less than one)	0.0005***	0.0005***	0.0004***	0.0005***	0.0008***	0.0002*	0.0014***
medium (one to five)	0.0011***	0.0016***	0.0020***	0.0017***	0.0003**	0.0003	0.0002
long (over five years)	0.0006***	0.0003	0.0005*	0.0001	0.0004***	0.0009***	0.0004**
MONEY-CENTER BANKS	All	Developed economies			Emerging economies		
		Total	G-10	non G-10	Total	Lat. America	Asia
All	0.0004***	0.0002**	0.0003**	0.0005***	0.0008***	0.0007***	0.0016***
Banks	0.0009***	0.0010***	0.0010***	0.0016***	0.0019***	0.0030***	0.0019***
private non-banks	0.0005***	0.0006***	0.0007**	0.0007***	0.0003***	0.0006***	0.0005***
public sector	0.0015***	0.0011***	0.0003	0.0020***	0.0021***	0.0012***	0.0048***
short (less than one)	0.0004***	0.0002	0.0004**	0.0006***	0.0010***	0.0002	0.0016***
medium (one to five)	0.0015***	0.0022***	0.0023***	0.0024***	0.0003*	0.0005*	0.0002
long (over five years)	0.0010***	0.0010***	0.0012***	0.0009**	0.0004***	0.0010***	0.0006***
SMALLER BANKS	All	Developed economies			Emerging economies		
		Total	G-10	non G-10	Total	Lat. America	Asia
All	0.0006*	0.0007	0.0009*	0.0011**	0.0000	0.0001	(0.0007)**
Banks	0.0009**	0.0011**	0.0016***	0.0020***	0.0000	(0.0002)	(0.0006)**
private non-banks	(0.0006)**	(0.0012)***	(0.0015)***	(0.0004)	(0.0003)	0.0000	(0.002)***
public sector	0.0010	0.0026	0.0024	0.0033	0.0004	0.0011***	(0.0008)
short (less than one)	0.0009**	0.0013**	0.0018***	0.0023***	(0.0006)**	(0.0004)**	(0.0009)*
medium (one to five)	0.0004**	0.0006*	0.0006	0.0010**	0.0002	(0.0000)	0.0001
long (over five years)	0.0007*	0.0002	0.0003	(0.0017)*	0.0007**	0.0009**	(0.001)***

Notes: [†] Regression coefficients against trend variable, 1 (1984 Q1) through 87 (2005 Q3). Negative numbers are in parentheses. All regressions include a constant and are estimated by OLS with White's correction of heteroskedasticity. ***1%, ** 5% * 10% significance

Further, there is an interesting relationship between the rate of consolidation and the volatility of emerging market lending. *Figure 4.3* plots quarterly percentage changes in the number of reporting banks (after a two-year lag) against the same banks' emerging market lending volatility over 1984 Q1 through 2005 Q3. There is a negative correlation significant at the 1% level. It clearly illustrates that, as the number of banks changes, the volatility of U.S. bank emerging market claims fluctuates in a similar fashion to an opposite direction, albeit with a time-lag. Does it merely reflect a spurious correlation? It is highly likely that there exist the omitted variables that are correlated with the consolidation trend, making the percentage change in the number of reporting banks an endogenous variable correlated with the disturbance term. In many econometric analyses, an instrumental variable (IV) is employed to rectify this endogeneity problem.

Figure 4.3 Percentage change in the number of reporting banks vs. emerging market lending volatility



To use deregulation as an instrument, it needs to meet the usual requirements for such a use — *relevance* and *validity*. An instrument needs to be correlated with the suspected endogenous variable at hand (*relevancy*) and uncorrelated with the disturbance term from the original equation (*validity*). While the relevancy condition is easily tested with potential instruments, the validity condition cannot be easily tested. Since consolidation of the banking industry is likely to be correlated with some omitted variable in explaining the volatility of emerging market lending, the exogenous policy variable — deregulation of the U.S. banking industry — is a natural candidate for such an instrument. Deregulation, if it affects the volatility of emerging market lending beyond temporal association, is likely to do so through trickle-down effects such as industry consolidation.

Debates on the U.S. banking deregulation in Appendix C suggest why the banking consolidation, with a small number of giant banks dominating the industry, could result in riskier and more volatile investments into emerging economies.

Consolidation of the banking industry is essentially an outcome of increased competition.²⁵ However, as better performers grow larger through synergies from multiple activities, often the problem of conflicts of interest intensifies.²⁶ Ironically, remedies to deal with conflicts of interest – such as new risk management system and more transparency – may also end up increasing volatility of lending into emerging economies. Persaud (2000) shows how the increasing use of the daily earnings at risk (DEAR) model, while perfectly rational from the standpoint of the individual

²⁵ Stiroh and Strahan (2002) find the link between a bank's relative performance and its subsequent market share growth strengthens significantly after deregulation as competitive reallocation effects transfer assets to better performers.

²⁶ White (2004) acknowledges that synergies from multiple activities and conflicts of interest are a package deal. Walter (2003) notes that the bigger and broader the financial intermediaries, the greater the agency problems associated with conflicts of interest.

bank, can work to increase overall volatility.

The DEAR estimates the future distribution of daily returns based on past measures of market correlation and volatility. Both rising volatility and rising correlation will increase the potential loss of the portfolio, increasing DEAR....When DEAR exceeds the limit, the bank reduces exposure, often by switching into less volatile and less correlated assets.

Daily publication of statistics can also accelerate and intensify the spread of any bad news that may break, with declining asset values and increasing volatility as sophisticated positive feedback mechanisms (Williamson 2005). With the reduced number of banks having claims on emerging economies, there is increasingly less room for actions by others that can mitigate the volatile lending by giant banking institutions.

In fact, when deregulation dummies are used as instrumental variables, a clear picture emerges in which deregulation raises the volatility of U.S. bank emerging market lending via consolidation in the number of banks making investments into emerging economies. That deregulation, by legally permitting the geographical and functional expansion of existing banking organizations, contributed to the consolidation of the banking industry in the U.S., has been supported by numerous existing studies summarized in Chapter Three. *Table 4.6* shows the effects of deregulation dummies on the percentage change in number of reporting banks. Given that structural breaks in the trend of volatility came about after an approximately two-year time lag in *Table 4.2*, two deregulation dummies — deregulation (1989 Q3 to 2005 Q3) and full deregulation (2002 Q1 to 2005 Q3) — start two years after important milestones in U.S. banking deregulation — the

introduction of Section 20 affiliates (1987 Q2) and the passage of GLB Act (1999 Q4).

Table 4.6 Effect of deregulation on industry consolidation

Independent variables	Dependent Variable: $\Delta \ln$ (no. of banks) with two-year lag	
	(1)	(2)
Deregulation dummy (1989 Q3 –)	-0.29** (-2.13)	-1.27*** (-3.76)
Full deregulation dummy (2002 Q1 –)	-0.92*** (-3.91)	-1.16*** (-4.19)
Trend		0.00 (0.96)
Crisis (dummy)		-0.19 (-0.84)
GDP (billions)		0.00 (0.39)
GDP p/c (thousands)		0.12 (1.54)
GDP growth (%)		0.05** (2.37)
U.S. GDP growth (%)		-0.28*** (-4.02)
Inflation (%)		0.00* (1.73)
Volatility of U.S. real interest rate		-10.8*** (-8.06)
Volatility of interest rate premium		-0.09 (-1.32)
Financial Development (%)		-0.01 (-1.53)
Openness (%)		0.00 (0.47)
Country fixed effects (F-statistics)		0.34
F-test (p-value)†	12.86*** (0.000)	12.16*** (0.000)

Notes: T-statistics in parenthesis. All regressions include a constant and are estimated by OLS with White's correction of heteroskedasticity. ***1%, ** 5% * 10% significance. †F-statistic is for a test of the hypothesis that the deregulation dummies jointly have no effect.

Column (1) of *Table 4.6* shows that, while deregulation has a negative and significant effect on the percentage change in the number of reporting banks, full

deregulation has a negative effect over and above the entire deregulation period. Moreover, in column (2) of *Table 4.6*, when other control variables for the volatility are included, coefficients for deregulation dummies remain negative and significant, with F-test rejecting the null hypothesis of “no joint effect of deregulation dummies” at the 1% level. Accordingly, it is *relevant* to use deregulation dummies as instruments to see if consolidation contributed to the increasing volatility of U.S. bank emerging market lending.

For deregulation to be a *valid* instrument, it should be uncorrelated with the disturbance term from the original regression with the volatility on one hand and consolidation on the other. In other words, deregulation needs to be outside the volatility “production function” (Levitt 1997). As emphasized in the introduction of this study, as well as surveyed with literature on the effects of deregulation in Chapter Three, nowhere in the debates on the pros and cons of banking deregulation has the issue of emerging market lending volatility entered the picture. U.S. banking deregulation was largely a domestic affair, although often buttressed by concerns about the international competitiveness of U.S. banking organizations (Hammond and Knott 1988; Kroszner and Strahan 2000).

The result of the exercise is reported in *Table 4.7*. When the percentage change in the number of reporting banks is regressed with conventional control variables in OLS, it loses its statistical significance. However, in the 2-Stage Least Squares (2SLS) model with the deregulation dummies as instruments, the coefficients turn significant. The large and significant differences in estimated coefficients suggest that the consolidation variable is indeed endogenous. More importantly, the results

strongly suggest that deregulation, via consolidation of the banking industry, negatively affected the volatility of U.S. bank emerging market lending.

Table 4.7 OLS & 2SLS estimates of emerging market lending volatility

Dependent Variable: Volatility of U.S. bank claims in 13 emerging economies, 1984Q1 – 2005Q3						
Independent variables	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS	(5) OLS	(6) 2SLS
Trend	1.58***	0.34	1.24***	0.95***	0.31	-0.05
Δ ln (no. of banks) with two-year lag	-2.66	-78.7*	-1.33	-18.0**	-1.47	-17.5**
Crisis years (dummy)			0.03	0.19	-8.54	-8.42
GDP (billions)			0.03*	0.03*	0.08**	0.10***
GDP p/c (thousands)			-3.79***	-3.27**	1.96	3.07
GDP growth (%)			1.40**	2.27**	0.58	1.36*
U.S. GDP growth (%)			0.05	-2.51	1.26	-1.26
Inflation (%)			0.03***	0.03***	0.02***	0.03***
Volatility of U.S. real interest rate			-1.36	-169*	5.79	-156*
Volatility of interest rate premium			-3.28*	-4.89**	-1.38	-2.97
Financial Development (%)			0.56***	0.48***	-0.14	-0.25
Openness (%)			0.59***	0.63***	1.61***	1.69***
Country fixed effects (F-statistics)					4.90***	3.31***
<i>Number of obs.</i>	988	988	717	717	717	717
<i>Instruments</i>	None	Deregulation dummies	None	Deregulation dummies	None	Deregulation dummies

Notes: Financial Development measures the share of private credit from financial institutions over GDP. Openness refers to the share of export plus import over GDP. All regressions include a constant and are estimated by OLS with White's correction of heteroskedasticity. ***1%, ** 5% * 10% significance.

Not only did the number of reporting banks fall as a result of industry consolidation, but the share of emerging market claims (in total assets) of these reporting banks experienced a drastic downfall as well. In *Table 4.8*, the share of

emerging market claims in total assets of reporting banks is used as an additional control variable. As noted, the share has been dramatically decreasing over the past twenty years, from the 10% to the 1% level. Since the volatility of emerging market lending has been increasing during the period, the two variables move in opposite directions. This divergence is manifested in the first column of *Table 4.6*.

Table 4.8 Share of emerging market claims vs. lending volatility

(Dependent Variable: emerging market lending volatility)*1000	Period of Deregulation			All samples (13 countries over entire period)		
	Pre	Early	Full	(1)	(2)	(3)
Trend	-0.91	0.49*	2.35**	1.07***	1.19***	0.68**
Share of emerging market claims	-62.6***	-80.1***	-304***	-74.9***	-0.64	46.5**
Crisis (dummy)					-1.03	-11.1
GDP (billions)					0.03*	0.11***
GDP p/c (thousands)					-4.07**	-0.29
GDP growth (%)					1.13**	0.36
U.S. GDP growth (%)					0.48	0.42
Inflation (%)					0.03***	0.02***
Volatility of U.S. real interest rate					20.0	21.1
Volatility of interest rate premium					-2.72*	-1.01
Financial Development (%)					0.57***	-0.08
Openness (%)					0.58***	1.44***
Country fixed effects (F-statistics)						5.32***
<i>Number of obs.</i>	169	637	299	1118	807	807
R^2	0.16	0.09	0.04	0.13	0.31	0.36

As elaborated in the previous section, successive periods of deregulation witnessed the growing volatility of U.S. bank emerging market claims. Against this trend, the share of emerging market claims in total bank assets maintains a consistent

negative association with the volatility measure. The negative coefficients grow ever larger in each succeeding period of deregulation. Due to the opposite direction in which each variable is heading, an increase in the share of emerging market claims in total banking assets is associated with a decline in volatility in each period in the first column. However, this negative correlation between the two variables is turned on its head when additional control variables are included in the equation. In the second column, conventional determinants of lending volatility from *Table 2.7* have been regressed against the volatility measure, with and without country fixed effects. Even without country fixed effects, the coefficient for the share of emerging market claims loses its statistical significance, as shown in column (2) of the second group of columns. When unobserved differences in each country are controlled with country fixed effects, the coefficient for the share of emerging market claims turns positive, significant at the 5% level. Thus, each percentage increase in the share of emerging market claims in total banking assets is positively associated with greater volatility. The so-called “Calvo-Mendoza problem” stipulates that, for institutions whose holdings of cross-border loans and securities are small relative to their total assets, it is not cost-effective to acquire detailed knowledge of country fundamentals. And, such institutions become susceptible to country-specific rumors (Calvo and Mendoza 2000). As the level of the share of emerging market claims declines, incremental gains in the share seem to increase the volatility of such claims, after controlling for other variables.

Diversification & Bank Lending Volatility

Another obvious outcome of banking deregulation has been the diversification of banking activities in the U.S. Long denied access to non-banking business, U.S. banks dramatically increased their holdings of securities upon the lifting of regulatory restrictions. In fact, the largest banks nearly doubled their holdings of securities, such as mortgage backed securities, as the share of their own total assets (*Table 3.4*). With the opportunities for new lines of business, however, the potential for abuse has been continually raised by critics. As emphasized in Appendix C, the possible extension of public safety nets and bigger risks associated with fee-based non-banking activities remain important points of contention regarding U.S. banking deregulation over the past twenty years.

Opponents to deregulation have argued that allowing banks to expand their activities into securities and insurance would extend the safety net and add to the subsidy, and, as a consequence, encourage moral hazard by encouraging banks to take on excessive levels of risk. Although there is little disagreement about the positive impacts of U.S. banking deregulation in generating benefits to consumers of new, cheaper products and more efficient financial transactions, the survey of literature in Chapter Three strongly suggests that banks indeed have taken on more risk over time and demonstrate greater volatility in their earnings streams, partly as a result of diversifying their business activities.

A closer look at the source data of *Figure 3.2* reveals temporal shifts in U.S. bank earnings volatility over time (*Figure 4.4*).²⁷ When the annual data is plotted against

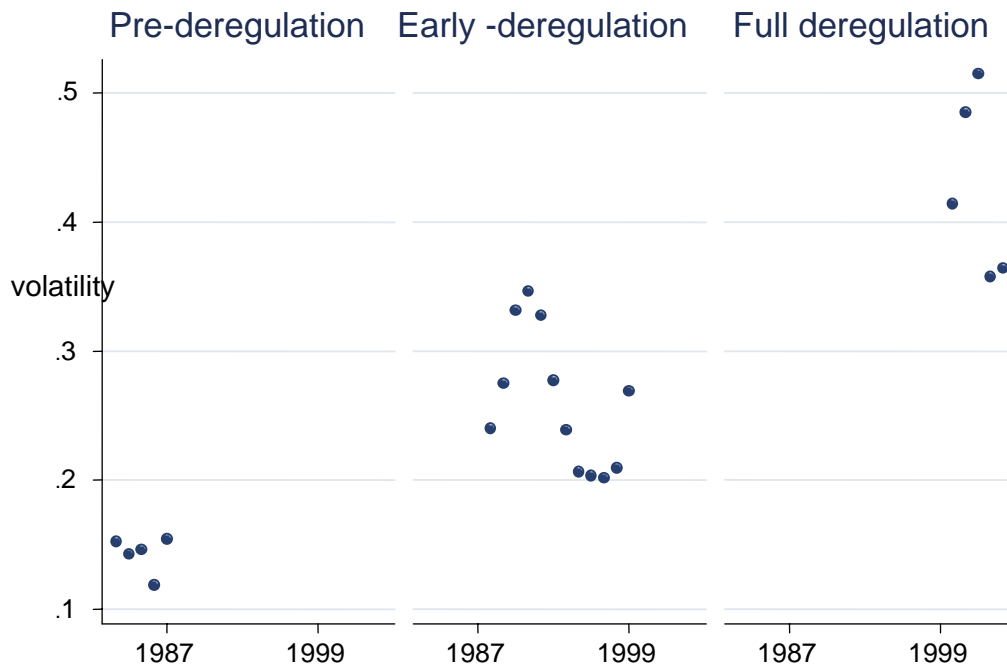
²⁷ Ioannis Tokatlidis of the International Monetary Fund (IMF) generously provided the raw data.

each period of gradual banking deregulation — pre-deregulation (1984-1987), early deregulation (1988-1999), and full deregulation (2000-2005) — an unmistakable pattern of upward shifts is noticeable in *Figure 4.4*. Not only is there a significant break in the trend of earnings volatility for early and full deregulation, but every single data point in each period has a higher value than those in the previous period. Although there is a mismatch in the frequency of data (annual earnings data versus quarterly claims data), a similar trend of volatility is evident in both measures. Compared to the temporal association between deregulation and the volatility of U.S. bank emerging market claims, where structural shifts took place after a time lag of approximately two years, the shifts in U.S. earnings volatility seem to have immediately followed the deregulation initiatives in each period.

Again, are these patterns simply a matter of coincidence? Is it possible to see if the pattern of volatility in U.S. bank earnings *leads to* a similar movement in U.S. bank emerging market claims? In other words, is there a way to verify the existence of temporal causality between the volatility of bank earnings and bank emerging market claims? As noted previously, there are a number of important studies establishing a link between banking deregulation and earnings volatility. One such finding is that important characteristics of banking deregulation, such as the dealing of mixed financial products by commercial banks, are shown to increase bank earnings volatility (DeYoung and Roland 2001). Given such findings in previous studies, one can argue that U.S. banking deregulation, via higher earnings volatility, in turn led to the trend of increasingly volatile U.S. bank emerging market claims. For this argument to be valid, however, there needs to be strong evidence showing temporal

causality between the earnings and lending volatility beyond the simple temporal association demonstrated so far.

Figure 4.4 Trend of volatility for S&P 1500 bank earnings



Source: Datastream and IMF staff estimates

The “Granger Test” statistically detects the direction of *causality* when temporarily there is a lead-lag relationship between two variables. A standard statistics textbook notes,

In a regression of Y on other variables (including its own past variables) if we include past or lagged values of X and it significantly improves the prediction of Y, then we can say that X (Granger) causes Y.” (Gujarati 1995). More specifically, if X causes Y and Y does not cause X, it is said that unidirectional causality exists from X to Y. If X does not cause Y, and Y does not cause X, then X and Y are statistically

independent. Lastly, if X causes Y and Y causes X, it is said that feedback exists between X and Y. It is no more than an F-test for the restricted regression (without lagged X variables) and the unrestricted (with lagged X variables).

$$Y_t = \alpha + \sum_{i=1}^n \beta_i Y_{t-i} + \sum_{j=1}^n \gamma_j X_{t-j} + \mu_{1t} \quad , \quad X_t = \alpha' + \sum_{i=1}^m \lambda_i X_{t-i} + \sum_{j=1}^n \delta_j Y_{t-j} + \mu_{2t}$$

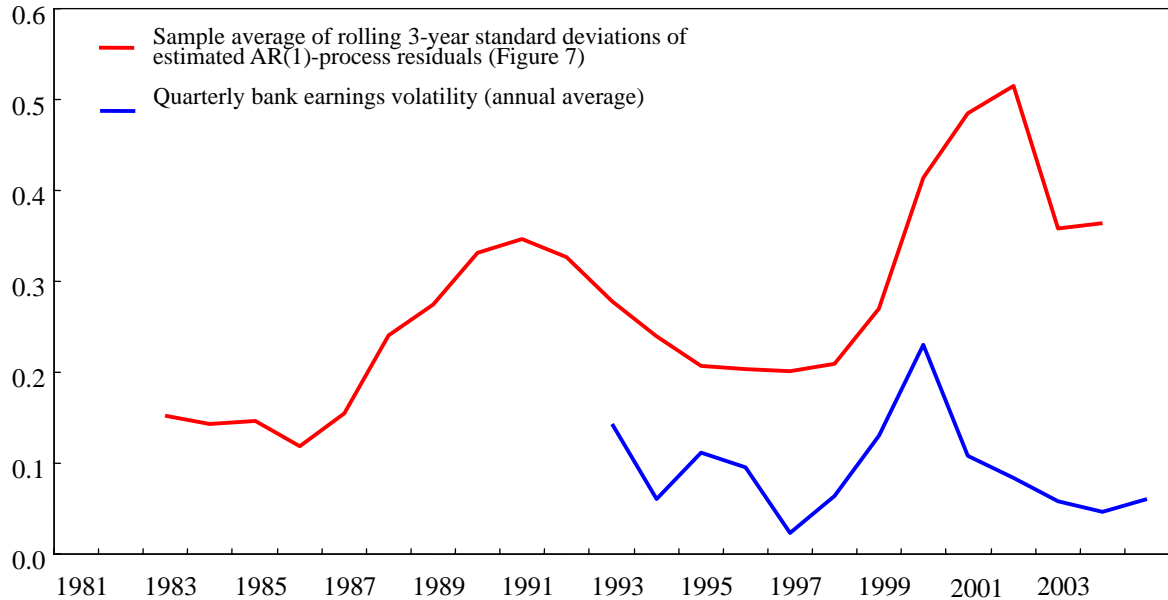
In order to conduct the Granger test, several conditions have to be met. First, since the test is a form of Vector Autoregression (VAR), where the dependent variable is explained in terms of its own lagged values as well as the lagged values of explanatory variables, it is critical to have the data with the same frequency — be it monthly, quarterly, or annual. Second, all the variables included should be jointly stationary. If this is not the case, the data has to be transformed appropriately (*e.g.*, first-differencing). Harvey (1990) further notes, “The results from the transformed data may be unsatisfactory. The usual approach adopted by VAR *aficionados* is therefore to work in levels, even if some of these series are non-stationary. In this case, it is important to recognize the effect of unit roots on the distribution of estimators.” Thus, a test of stationarity — the “Dickey-Fuller” test — should precede the actual Granger test. Third, and perhaps most importantly, the Granger-causality test is very sensitive to the number of lags used in the analysis and the direction of causality often depends critically on the number of lagged terms included. Thus, the right choice of lag length needs to be explained in advance.

As noted, the raw data used in *Figure 4.4* are annual figures and cover only the 88 banking institutions listed in the S&P 1500. They reflect a trend in U.S. bank

earnings volatility similar to the volatility in U.S. bank emerging market claims. To verify a causal link between the two variables, however, quarterly data on U.S. bank earnings are needed. The Federal Deposit Insurance Corporation (FDIC) issues quarterly banking profiles whose data on U.S. commercial bank earnings (net income) date back to 1992 Q2. They cover total earnings from over 11,400 U.S. commercial banks in 1992 Q3 to 7,526 banks in 2005 Q4. The “bank earnings volatility” was calculated using the identical method from the volatility in U.S. bank overseas claims. In *Figure 4.5*, the annual average of the measure is produced and plotted against the volatility measure used in *Figure 3.2*. Although there is a slight difference in methodology and coverage, the two measures demonstrate a similar trajectory over the past 12 years.

<p>Bank Earnings Volatility = three-quarter rolling standard deviation of quarterly changes in U.S. bank earnings divided by average bank earnings over the same period.</p>

Figure 4.5 Juxtaposition of bank earnings volatility against Figure 3.2



Like bank claims, quarterly U.S. bank earnings data suffer from a unit root problem and are non-stationary in nature. When the data are transformed to measure volatility, however, the bank earnings volatility measure escapes from a unit root problem, in the same way the volatility measure from the bank claims data turns out to be stationary. *Table 4.9* summarizes the results of the “Dickey-Fuller” tests on the volatility measures of both U.S. bank overseas claims (1984 Q1 to 2005 Q3) and bank earnings (1993 Q1 to 2005 Q3). All the test statistics are bigger than the 5% McKinnon Critical Value in absolute terms, meaning that one can reject the null hypothesis of non-stationarity at the 5% level. The stationary nature of both volatility measures enables the Granger test between the two. For the following Granger test, the lag length between four to eight quarters has been initially assigned

to reflect the apparent time lag from the dummy tests for structural shifts in lending volatility and earnings volatility. In *Figure 4.1*, it has been shown that there exist structural breaks in volatility around 2001 Q2 and 2002 Q1 for emerging market claims. In *Figure 4.4*, for bank earnings volatility, a structural break can be witnessed in 2000. *Table 4.10* reports the Granger test results.

Table 4.9 Dickey-Fuller unit root test results

----- Interpolated Dickey-Fuller on Volatility of U.S. Bank Overseas Claims -----				
Grand Total				
	Test Statistic	1% Critical Value	5% Critical Value	Number of obs = 86 10% Critical Value
Z(t)	-3.481	-3.530	-2.901	-2.586
MacKinnon approximate p-value for Z(t) = 0.0085				
Developed economies				
	Test Statistic	1% Critical Value	5% Critical Value	Number of obs = 86 10% Critical Value
Z(t)	-3.950	-3.530	-2.901	-2.586
MacKinnon approximate p-value for Z(t) = 0.0017				
Emerging economies				
	Test Statistic	1% Critical Value	5% Critical Value	Number of obs = 86 10% Critical Value
Z(t)	-3.656	-3.530	-2.901	-2.586
MacKinnon approximate p-value for Z(t) = 0.0048				
Latin America				
	Test Statistic	1% Critical Value	5% Critical Value	Number of obs = 86 10% Critical Value
Z(t)	-3.687	-3.530	-2.901	-2.586
MacKinnon approximate p-value for Z(t) = 0.0043				
Asia				
	Test Statistic	1% Critical Value	5% Critical Value	Number of obs = 86 10% Critical Value
Z(t)	-2.924	-3.530	-2.901	-2.586
MacKinnon approximate p-value for Z(t) = 0.0427				
----- Interpolated Dickey-Fuller on U.S. Bank Earnings Volatility -----				
	Test Statistic	1% Critical Value	5% Critical Value	Number of obs = 50 10% Critical Value
Z(t)	-2.974	-3.580	-2.930	-2.600
MacKinnon approximate p-value for Z(t) = 0.0374				

Table 4.10 Granger-causality tests for volatility

Null Hypothesis		F-Statistics				
<Total Overseas Claims>						
“Bank earnings volatility does not Granger-cause volatility of bank overseas claims”	<u>Lag 4</u>	<u>Lag 5</u>	<u>Lag 6</u>	<u>Lag 7</u>	<u>Lag 8</u>	
	0.15	0.47	0.40	0.49	0.82	
	<u>Lag 9</u>	<u>Lag 10</u>	<u>Lag 11</u>	<u>Lag 12</u>	<u>Lag 13</u>	
	1.13	1.02	0.77	0.83	0.82	
“Volatility in bank overseas claims does not Granger-cause bank earnings volatility”	<u>Lag 4</u>	<u>Lag 5</u>	<u>Lag 6</u>	<u>Lag 7</u>	<u>Lag 8</u>	
	0.77	0.65	0.84	0.74	0.74	
	<u>Lag 9</u>	<u>Lag 10</u>	<u>Lag 11</u>	<u>Lag 12</u>	<u>Lag 13</u>	
	0.64	0.49	0.70	0.80	0.77	
<Developed Market Claims>						
“Bank earnings volatility does not Granger-cause volatility of bank overseas claims”	<u>Lag 4</u>	<u>Lag 5</u>	<u>Lag 6</u>	<u>Lag 7</u>	<u>Lag 8</u>	
	0.03	0.25	0.44	0.56	0.80	
	<u>Lag 9</u>	<u>Lag 10</u>	<u>Lag 11</u>	<u>Lag 12</u>	<u>Lag 13</u>	
	0.86	0.86	0.71	0.56	0.67	
“Volatility in bank overseas claims does not Granger-cause bank earnings volatility”	<u>Lag 4</u>	<u>Lag 5</u>	<u>Lag 6</u>	<u>Lag 7</u>	<u>Lag 8</u>	
	0.53	0.73	0.84	0.75	0.86	
	<u>Lag 9</u>	<u>Lag 10</u>	<u>Lag 11</u>	<u>Lag 12</u>	<u>Lag 13</u>	
	0.75	0.54	0.59	0.62	0.66	
<Emerging Market Claims>						
“Bank earnings volatility does not Granger-cause volatility of bank overseas claims”	<u>Lag 4</u>	<u>Lag 5</u>	<u>Lag 6</u>	<u>Lag 7</u>	<u>Lag 8</u>	
	1.55	1.30	2.13*	2.65**	2.96**	
	<u>Lag 9</u>	<u>Lag 10</u>	<u>Lag 11</u>	<u>Lag 12</u>	<u>Lag 13</u>	
	3.29**	2.51**	2.49**	3.07**	2.49*	
“Volatility in bank overseas claims does not Granger-cause bank earnings volatility”	<u>Lag 4</u>	<u>Lag 5</u>	<u>Lag 6</u>	<u>Lag 7</u>	<u>Lag 8</u>	
	0.72	0.60	0.62	0.40	0.32	
	<u>Lag 9</u>	<u>Lag 10</u>	<u>Lag 11</u>	<u>Lag 12</u>	<u>Lag 13</u>	
	0.77	0.77	0.43	0.53	0.44	

Notes: *Reject the null hypothesis at 10% level, **Reject the null hypothesis at 5% level.

From *Table 4.10* emerges a clear direction of causality for emerging market claims of U.S. banking institutions. With the 6- to 13-quarter lag, one can safely

reject the null hypothesis, “bank earnings volatility *does not* Granger-cause volatility of bank emerging market claims,” at the 5% level. With the same lag length, however, it is not possible to reject the reverse causality, “volatility in bank emerging market claims does not Granger-cause bank earnings volatility.” Interestingly, the model loses its power for emerging market claims when two variables are lagged over 14 quarters, as is the case with 1 to 3-quarter lag. There seems to be a specific window of time during which this relationship materializes. The estimated F-statistics reach the highest level with the 9-quarter lag, rejecting no causality assumption at nearly the 1% level.

Direction of causality	F-Statistic	P-Value of F	Decision
Earnings volatility→Lending volatility	3.29	0.0101	Reject
Lending volatility→Earnings volatility	0.77	0.6424	Do not reject

The existence of uni-directional causality from earnings to claims volatility is unique in emerging market claims. Neither the volatility measure for total overseas claims nor that for developed market claims exhibits any causality with bank earnings volatility. The above evidence successfully establishes a link between U.S. earnings volatility and emerging market claims and substantiates a major argument of this study: *when U.S. bank earnings get volatile, after a time lag of approximately two to three years, those same banks’ emerging market claims get negatively affected with higher volatility.*

Since it is often hard to establish Granger-causality with transformed variables (*e.g.*, volatility measure) that satisfy the stationarity condition, the uni-directional

causality from bank earnings to emerging market claims deserves further elaboration. Specifically, what type of emerging market claims, inter-bank exposure, or public sector lending, for example, demonstrate this unique phenomenon? Is exposure to Asia different from exposure to Latin America in terms of absorbing the impact of volatile bank earnings in the U.S.? With the available data, it is possible to dissect U.S. bank emerging market claims and to compare different components of emerging market claims in light of this unique linkage. *Table 4.11* summarizes the outcome of this exercise.

Table 4.11 Granger-causality tests for volatility, by type and region

ALL U.S. BANKS	F-Statistics for the null hypothesis “Earnings volatility does not cause lending volatility”								
	<u>Lag 4</u>	<u>Lag 5</u>	<u>Lag 6</u>	<u>Lag 7</u>	<u>Lag 8</u>	<u>Lag 9</u>	<u>Lag 10</u>	<u>Lag 11</u>	<u>Lag 12</u>
To All Recipients	1.55	1.30	2.13*	2.65**	2.96**	3.29**	2.51**	2.49**	3.07**
<i>by type</i>									
to banks	0.32	0.64	1.44	1.24	1.37	1.21	1.31	1.14	2.22*
to private non-banks	1.52	2.32*	2.92**	3.40***	2.78**	2.88**	3.07**	2.62**	1.81
to public sector	0.77	0.77	0.68	0.82	1.04	1.01	0.89	0.77	1.23
<i>by maturity</i>									
short (less than one)	1.46	1.67	1.85	2.03*	1.85	2.54**	2.24*	2.84**	2.63**
medium (one to five)	1.74	1.81	1.35	0.51	0.55	0.86	0.77	1.25	1.02
long (over five years)	0.41	0.58	0.45	0.44	1.17	0.80	0.82	0.71	0.65
<i>by region</i>									
to Latin America	1.41	1.76	2.11*	1.83	2.07*	1.89	1.62	1.45	1.19
to Asia	1.08	1.03	0.81	1.12	2.18*	2.11*	2.49**	2.03*	1.92

Notes: *Reject at 10% level, **Reject at 5% level. No case of reverse causality with statistical significance has been found.

For different types of emerging market claims, the Granger test points to claims on private non-banks as the main driving force behind the unique temporal causality between the two volatility measures. Uhlmann (2002) argues that private non-bank

claims on emerging economies can be the riskiest category from the lender's point of view, not only because they seldom have guarantees from local government in times of trouble, but also due to the fact that borrowers often do not have adequate financial infrastructure at home. Thus, one could argue that banks, faced with a volatile earnings stream, have incentives to deal with their private non-bank claims with no guarantees first.

Furthermore, a substantial shift away from inter-bank and public sector claims matched the rise in private non-bank claims in emerging economies over the past twenty years. The relative share of private non-bank claims (from 28% in 1984 to 46% in 2005) has skyrocketed while inter-bank claims (31% in 1984 to 21% in 2005) and public sector claims (41% in 1984 to 31% in 2005) declined (*Figure 2.1*). From this remarkable stride in volume, private non-bank claims presumably came to dominate the movement in entire emerging market claims.

Examining the different maturities of claims in *Table 4.11*, one can see that short-term claims react to the changing volatility of bank earnings. It is no surprise that medium- to long-term claims simply have longer contracts to abide by before action is taken. Also, in size terms, short-term claims, or those with maturities of less than one year, still dominate U.S. bank emerging market claims, as described in the data overview section of Chapter Two (*Figure 2.1*). The share increased from 55% in 1984 to 73% in 2005. This stands in sharp contrast to the dwindling shares of medium-term claims (31% in 1984 to 20% in 2005) and long-term claims (14% in 1984 to 7% in 2005). This in part represented a response to the problems in Asia and elsewhere, as lenders sought to lessen default risk by preferring short-term exposure.

It is natural, then, that the effect of bank earnings volatility is reflected on the volatility of short-term claims, which in turn aggravated the vulnerability of emerging economies.

Lastly, examining claims across regions, one can see that claims in Latin America and Asia do show temporal causality with bank earnings. It is interesting to note that the claims in Latin America tend to have shorter reaction time (shorter lag length) than those in Asia, while Asian claims show more sustained temporal causality with U.S. bank earnings. Together, the above findings can be roughly summarized as follows: increasing volatility of U.S. bank earnings had a causal effect on short-term private non-bank claims in their emerging market exposure, with the chain effect taking its toll earlier in Latin America than in Asia.

Determinants of Volatility: Revisited

This analysis has so far demonstrated: (1) the temporal association between U.S. banking deregulation and the volatility of emerging market claims; (2) the dominance of mega-banks created out of consolidation in explaining the volatility of U.S. emerging market claims; (3) the temporal causality between the volatility of bank earnings and emerging market claims. Together, they suggest an important missing element in explaining the trend of increasingly volatile emerging market claims of U.S. banks over the past twenty years: U.S. banking deregulation initiatives that made domestic bank earnings more volatile.

To successfully verify this linkage, however, one needs to test the outcome of the analysis against other control variables that are shown to have explanatory power on

the volatility measure (*Table 2.7*). For 13 emerging market sample countries, the trend in the volatility of U.S. bank claims remains positive and significant after the inclusion of conventional explanatory variables, although its size and t-value get smaller with additional control variables. This baseline result is summarized in the far-left column of *Table 4.12*.

To the right of the baseline result is the outcome of the country fixed-effects regression with (0,1) dummy variables for deregulation with a two-year time lag: (1) the lagged dummy variable for deregulation (1989 Q3 to 2005 Q3) has a positive and significant coefficient when regressed against the volatility measure; (2) the lagged dummy variable for full deregulation (2000 Q1 to 2005 Q3) has a positive and significant coefficient, whose size is nearly two times as large as that for the deregulation dummy. This indicates that the volatility measure intensified its rising trend with the full-fledged deregulation initiatives; (3) two dummy variables for U.S. banking deregulation are added onto the baseline equation for emerging market lending volatility. If the coefficients for these dummies remain positive after the inclusion of other control variables, they reinforce the temporal association between the deregulation initiatives and the volatility of emerging market claims.

$$Volatility_{it} = \beta_0 + \beta_1 Time_{it} + \beta_2 Crisis_{it} + \beta_3 MACRO_{it} + \beta_4 US_{it} + \alpha_i \\ + \beta_5 Deregulationdummy_{it} + \beta_6 Fullderegulationdummy_{it} + \varepsilon_{it}$$

The result confirms the existence of this relationship. Not only does the coefficient for the full deregulation dummy remain positive and significant, but that for the trend variable loses its statistical significance (*Table 4.12*). The increasing trend of volatility is explained away by the addition of dummies for banking deregulation.

The impact of full deregulation dominates this dynamic. In the process, the coefficient for the deregulation dummy, after a two-year time lag, no longer has a significant sign, while the full deregulation coefficient, again after a two-year time lag, has the positive and significant sign at the 5% level. The direction and size of coefficients for the other control variables remain virtually unchanged, suggesting a direct impact of full deregulation initiatives on the trend of volatility itself. This finding substantiates the broad temporal analysis presented in Chapter Two and highlights the importance of U.S. banking deregulation initiatives relative to the conventional variables in explaining the volatility of U.S. bank emerging market claims.

The Granger-causality test established a lead-lag relationship between the bank earnings volatility and the lending volatility in *Table 4.10* and *Table 4.11*. Again, there is a time-lag of approximately two years before earnings volatility granger-cause the lending volatility. The far-right column of *Table 4.12* tests this finding against the baseline model with other control variables. First, bank earnings volatility after a two-year lag has a positive and significant coefficient when regressed against the lending volatility alone. The size of the coefficient, when compared with the similarly constructed volatility measures for real interest rates in the U.S. and interest premiums between the U.S. and the host country, is remarkably large. Second, the trend coefficient turns *negative* and significant at the 1% level when the bank earnings volatility measure is regressed with the other control variables. The coefficient for bank earnings volatility remains positive and significant at the 1% level, strongly suggesting its unique role in turning the baseline result upside down.

The coefficients for other control variables experience changes with the bank earnings data. Interestingly, the financial development of a host country, measured by the share of private credit from financial institutions over GDP, generates an expected negative sign for its coefficient. The income level of a host country and U.S. GDP growth turn out to have a positive sign, resembling a regression outcome for the Asian claims reported in *Table 2.7*. Thus, with bank earnings volatility as an additional explanatory variable, U.S. bank claims on average get more volatile for larger economies with higher income and an open trade regime with less developed financial systems, especially when the U.S. economy is expanding. The fit of the model, R-squared, improves substantially from 0.33 to 0.43 by controlling for the bank earnings volatility. Third, the lagged full deregulation dummy as well as the bank earnings volatility is added on top of the baseline equation. With the bank earnings data, the full deregulation dummy loses its significance, while the other results stand.

$$\begin{aligned} Volatility_{it} = & \beta_0 + \beta_1 Time_{it} + \beta_2 Crisis_{it} + \beta_3 MACRO_{it} + \beta_4 US_{it} + \alpha_i \\ & + \beta_5 Deregulationdummy_{it} + \beta_6 Fullderegulationdummy_{it} \\ & + \beta_7 Bankearningsvolatility_{it} + \varepsilon_{it} \end{aligned}$$

The outcome in *Table 4.12* reinforces the previous analysis of the links between U.S. banking deregulation and the volatility of emerging market claims of U.S. banking institutions. At the same time, it establishes a linkage through which U.S. banking deregulation leads to more volatile exposure in emerging economies — volatile U.S. bank earnings. The existing studies on international activities of U.S. commercial banks suffer from an unbalanced emphasis on the changing economic and

regulatory environments in host countries, when the U.S. banking industry has undergone transformations not matched by any previous developments (Benston 1990, Dahl and Schrieves 1999, Jones and Critchfield 2005). This phenomenon is generally attributable to the fact that the analysis on the consequences of U.S. banking deregulation on bank behavior is only in its infancy, mostly limited to the domestic implications of such initiatives. Particularly, existing findings, such as Goldberg (2001), that argued that U.S. banks were not the major source of financial disruptions in emerging economies seem to have waned attention away from any potential linkage. Although this lack of attention is understandable, it fails to capitalize on the historic opportunity of U.S. banking deregulation as a major explanatory event in approaching the issue of volatile bank lending to emerging economies.

Utilizing U.S. banking deregulation as a common background for banking activities in general, the above findings fill this crucial gap by focusing on the impact of snowballing financial deregulation on the increasing volatility of U.S. bank emerging market exposure. In this regard, the lump-sum coverage in *Table 4.12* of emerging economies across different destinations of U.S. bank investment (Latin America and Asia), is useful to infer an overall influence of U.S. banking deregulation on overseas investments. Nevertheless, each region has its idiosyncratic features, geographic and historical, when it comes to its relationship vis-à-vis U.S. banking institutions. It stands to reason, then, to see if the outcome of *Table 4.12* withstands the discrepancies in regional backgrounds.

Table 4.12 Regression of volatility for emerging market claims, revisited

Dependent Variable: Volatility of U.S. bank claims in emerging economies, 1984 Q1 – 2005 Q3									
(Dependent Variable)*1000	Baseline Result (<i>Table 2.7</i>)			+ Deregulation dummies			+ Bank earnings volatility		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Trend	1.46***	1.20***	0.37*			0.00		-2.21***	-3.26***
Crisis (dummy)		-0.39	-7.88			-6.20		-21.9	-19.8
GDP (billions)		0.03**	0.09***			0.10***		0.12*	0.14**
GDP p/c (thousands)		-4.02***	0.67			-0.54		22.6**	20.6**
GDP growth (%)		1.10**	0.30			0.34		-0.16	-0.25
U.S. GDP growth (%)		0.63	1.31			1.54		11.1**	9.25*
Inflation (%)		0.03***	0.02***			0.02***		-0.25	-0.47
Volatility of U.S. real interest rate		25.1	31.1			14.9		55.8	83.9
Volatility of interest rate premium		-2.98**	-1.24			-0.93		-5.22	-5.10
Financial Development (%)		0.56***	-0.01			0.14		-2.04**	-1.88**
Openness (%)		0.57***	1.46***			1.47***		3.03***	3.35***
Deregulation dummy (2 year lag)				46.3***		7.53			
Full deregulation dummy (2 year lag)					94.9***	32.7**			26.3
Bank earnings volatility (2 year lag)							292***	255***	185*
Country fixed effects (F-statistics)			5.07***	23.6***	23.5***	4.98***	14.2***	6.08***	6.33***
<i>Number of obs.</i>	1131	816	816	1131	1131	816	546	398	398
<i>R</i> ²	0.09	0.31	0.35	0.29	0.36	0.36	0.33	0.43	0.43

Notes: Financial Development measures the share of private credit from financial institutions over GDP. Openness refers to the share of export plus import over GDP. All regressions include a constant and are estimated by OLS with White's correction of heteroskedasticity. ***1%, ** 5%, * 10% significance.

Table 4.13 repeats the same exercise as *Table 4.12* for the U.S. banks' Latin American claims during the period 1984 Q1 through 2005 Q3. As previously noted in discussing the baseline result in *Table 2.7*, Latin America fits *a priori* expectations about the volatility of U.S. bank international lending. As summarized in the far-left column of *Table 4.13*, the volatility of U.S. bank claims in the region is mostly explained away when controlled for other variables such as GDP, inflation, financial sector development, and the openness of the host economies, as well as the volatility of real interest premiums.

The results stand even with the dummies for U.S. banking deregulation in the second column: First, when the lagged (0,1) dummy variable for banking deregulation (1989 Q3 to 2005 Q3) is regressed with country-fixed effects against the volatility measure alone, it has a positive coefficient with significance at the 1% level. Second, when the lagged (0,1) dummy for full deregulation (2003 Q1 to 2005 Q3) is regressed with country-fixed effects against the volatility measure alone, it also has a positive coefficient. But it has a size (13.6) less than one-third of the coefficient for the deregulation dummy (41.9) and is significant at the 5% level. This indicates that the impact of banking deregulation was concentrated in the early deregulation period of the 1990s, with lesser effects later on after full deregulation in 1999 Q4. Third, when the deregulation dummies are added on top of the baseline equation, the importance of early deregulation on Latin American claims manifests itself. With no particular changes in the coefficients for other control variables, other than the openness of the host country losing its significance, the dummy coefficient for full deregulation turns negative, highlighting a strong surge in volatility in the early

deregulation period relative to the movement after full deregulation.

The far-right column of *Table 4.13* incorporates the bank earnings volatility in the equation. The trend coefficient remains insignificant throughout as with the deregulation dummies. There are some noteworthy features: First, the bank earnings volatility, when regressed against the lending volatility alone, does not show a significant relationship. Second, when it is regressed with other control variables as in the baseline scenario, however, it has a large positive coefficient significant at the 1% level. Interestingly, the coefficient for the volatility of the U.S. real interest rate produces a very large positive coefficient as a result. It strongly suggests that there exists a correlation between the volatility measures of the U.S. real interest rate and the lagged bank earnings when explaining the lending volatility to Latin America. Third, the combined result from adding the bank earnings volatility with the full deregulation dummy, both with a two-year time lag, confirms the separate exercises.

Table 4.13 Regression of volatility for Latin American claims, revisited

Dependent Variable: Volatility of U.S. bank claims in Latin America, 1984 Q1 – 2005 Q3									
(Dependent Variable)*1000	Baseline Result (<i>Table 2.7</i>)			+ Deregulation dummies			+ Bank earnings volatility		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Trend	0.68***	0.78***	0.21			0.28		-0.52	0.35
Crisis (dummy)		-2.86	6.92			7.84		0.46	3.38
GDP (billions)		0.03*	0.18***			0.16***		0.19***	0.16**
GDP p/c (thousands)		-2.45*	3.01			-2.59		-1.88	3.58
GDP growth (%)		0.55	-0.03			-0.18		0.62	0.43
U.S. GDP growth (%)		1.89	0.93			1.91		9.68***	11.1***
Inflation (%)		0.01***	0.02***			0.01***		0.88**	1.08***
Volatility of U.S. real interest rate		-11.0	-0.64			35.0		198.2***	182.5***
Volatility of interest rate premium		3.61***	2.83**			2.27*		2.67	2.80
Financial Development (%)		-0.01	-0.94***			-0.96***		-0.77	-1.57
Openness (%)		-0.29	-0.56**			-0.38		-0.60	-1.09
Deregulation dummy (2 year lag)				41.9***		12.0*			
Full deregulation dummy (2 year lag)					13.6**	-22.1***			-28.8**
Bank earnings volatility (2 year lag)							-61.7	104**	166***
Country fixed effects (F-stats)			9.59***	2.74**	2.28**	8.58***	3.06**	4.92***	4.98***
<i>Number of obs.</i>	522	418	418	522	522	418	258	222	222
<i>R</i> ²	0.14	0.18	0.29	0.17	0.03	0.31	0.04	0.31	0.33

Notes: Financial Development measures the share of private credit from financial institutions over GDP. Openness refers to the share of export plus import over GDP. All regressions include a constant and are estimated by OLS with White's correction of heteroskedasticity. ***1%, ** 5%, * 10% significance.

For the Asian claims of U.S. banks, *Table 4.14* repeats the same exercise. The characteristics of the volatility in U.S. bank Asian claims are distinct from those for Latin American claims. First of all, U.S. bank claims in Asia have higher volatility in general than the volatility for claims in Latin America. In the case of Asia, the volatility of U.S. bank claims gets much larger after full deregulation, whereas in the case of Latin America, the surge concentrated during the early deregulation period. Furthermore, the volatility trend gets larger with the control variables in the baseline result in the far-left column, reproduced from *Table 2.7*. Secondly, the coefficients for conventional control variables have unexpected signs. Unlike previous exercises in *Table 4.12* and *Table 4.13*, the volatility of real interest premium has a negative and significant sign of its own, for example. This rather odd result is perhaps due to the fact that Asia enjoyed an overall stable interest rate environment, unlike that of Latin America, where small changes in the direction of real interest rates were less of a motivation for U.S. bank investments in the region. Despite the idiosyncratic features of volatility in Asian claims, however, it ironically epitomizes the effect of U.S. deregulation on lending volatility.

In the center column of *Table 4.14*, two dummy variables are added on the baseline equation. As a result, the trend coefficient, although it grew even larger with other control variables in the far-left column, starts to get smaller and loses some of its statistical significance. Moreover, in the far-right column with the lagged bank earnings volatility, the increasing trend is finally explained away and loses its significance. Furthermore, the coefficient for the bank earnings volatility remains positive and improves the fit of the model at the same time, with substantially higher

R-squared value.

Whatever the differences across regions, the important role played by U.S. banking deregulation in aggravating volatile lending to emerging economies persists. The evidence illustrated thus far strongly suggests that U.S. banking deregulation supplies a crucial missing element in explaining U.S. lending volatility in emerging economies. Divergent trends in Latin America and Asia broadly converge after the introduction of deregulation dummies, with an earlier impact on the Latin American claims than on the Asian claims. With the addition of bank earnings volatility, the remaining differences are washed away, with no more increasing trend found in either region. The explanatory power of the variables related to banking deregulation survives the test. In fact, it solves the conundrum of increasing volatility in the presence of conventional control variables.

Table 4.14 Regression of volatility for Asian claims, revisited

Dependent Variable: Volatility of U.S. bank claims in Asia, 1984 Q1 – 2005 Q3									
(Dependent Variable)*1000	Baseline Result (<i>Table 2.7</i>)			+ Deregulation dummies			+ Bank earnings volatility		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Trend	2.12***	2.19***	3.17***			1.55*		0.97	-2.76
Crisis (dummy)		-28.0**	-45.9***			-28.6*		-62.7***	-40.5
GDP (billions)		-0.05	-0.51***			-0.33*		-0.76***	-0.70***
GDP p/c (thousands)		-3.37	17.9***			9.08		43.5***	38.0***
GDP growth (%)		0.67	-2.81			-0.63		0.61	0.57
U.S. GDP growth (%)		2.91	7.82**			3.28		36.5***	29.0**
Inflation (%)		-0.47	-0.40			-0.00		-1.19	-1.61
Volatility of U.S. real interest rate		116.4	29.3			-8.66		17.9	116.7
Volatility of interest rate premium		-14.8***	-12.2***			-11.3***		-23.0***	-22.5***
Financial Development (%)		0.56***	-1.04*			0.02		-2.58**	-2.18*
Openness (%)		0.34*	0.00			0.52		2.61**	3.47***
Deregulation dummy (2 year lag)				50.1***		-8.77			
Full deregulation dummy (2 year lag)					164***	91.4***			92.8***
Bank earnings volatility (2 year lag)							574***	589***	340*
Country fixed effects (F-stats)			4.22***	21.8***	24.2***	3.98***	13.1***	9.51***	10.9***
<i>Number of obs.</i>	609	398	398	609	609	398	294	182	182
<i>R</i> ²	0.13	0.33	0.39	0.19	0.36	0.42	0.24	0.51	0.52

Notes: Financial Development measures the share of private credit from financial institutions over GDP. Openness refers to the share of exports plus imports over GDP. All regressions include a constant and are estimated by OLS with White's correction of heteroskedasticity. ***1%, ** 5%, * 10% significance.

Chapter 5 Conclusions and Policy Implications

The volatility of U.S. bank lending to emerging economies has increased during the past twenty years. This finding is noteworthy in its own right. Systemic financial crises, such as the Latin American debt crises of the 1980s and the Asian/Russian/Brazilian crises of the 1990s, overwhelmed each period of emerging market financing with global implications. Emerging market financial crises in the 2000s, most notably the Argentine default of 2002, reminded leaders of the ever-present danger of another bust, but had more limited, regional impact than previous crises. In fact, compared to Russia's default in 1998, the contagion effects on other countries of the Argentine default were much more muted (Blustein 2005). In general, the impact of successive shocks on developing-country debt have been milder in recent years than in the late 1990s, when risk premiums were typically raised more steeply and interruptions to capital-market access were frequent and prolonged. For example, the average of the peaks in the developing-country risk premium during the crises in Turkey (2000), Argentina (2001), and Brazil (2002) was about 900 basis points, much lower than the average of about 1,550 basis points during the Mexican (1994) and Russian (1998) crises (World Bank 2004). Nevertheless, U.S. bank lending has become more volatile in the 2000s, regardless of the regional destination of its loans, be it Asia, Latin America, or particularly Eastern Europe.

And, the issue of volatile bank lending is not going away, either. More recently,

there has been a renewed surge in private capital flows to emerging economies, aided by stable macroeconomic situations on the receiving end and the yearning for higher returns in the face of rock-bottom interest rates in the U.S. and many other industrial countries.²⁸ *Table 5.1* shows that the surge has been concentrated in Asia and Eastern Europe. Despite its decreasing share of total private capital flows to emerging economies, bank lending occupies an integral part of emerging market financing.²⁹ Over time, the size of bond and equity financing exploded, and bond financing alone overtook the size of bank lending to emerging economies in the 2000s. Nonetheless, for each region bank, lending accounts for a bulk of gross private capital inflows, less so for traditional destinations of private capital flows (Asia and Latin America) than the new destination (Europe). As a precaution against banks' renewed appetite for emerging market assets, the most recent *World Economic Outlook* (2006) notes,

The most recent surge reflects to a large part lending by banks in advanced economies to Emerging Europe and Central Asia and to a lesser extent a revival of private debt flows to East Asia, notably China... In the event of a reversal, fixed exchange rates — which remain widespread in the region — might be difficult to maintain. Floating the exchange rate would help to restore external balance, but would weaken balance sheets, as a sharp depreciation would increase the burden of the private sector's foreign currency debts, a process illustrated by earlier experience elsewhere....

²⁸ Until June 2004, when the Federal Reserve started a series of .25 percentage point increases in Federal Funds Rate (FFR), the U.S. maintained a 50-year low level of 1% FFR for nearly a year.

²⁹ Over the past twenty years, portfolio equity flows accounted for less than 6% of all net inflows (including FDI and bank loans of all types) to emerging economies. By contrast, FDI has been more than seven times as large and net debt flows — public and private combined — almost nine times as large (IMF 2006).

Furthermore, even if private debt inflows did not reverse but “only” fell back to historical averages, this would still imply a substantial decline in net external financing, and could force sharp adjustments on many economies.

Table 5.1 Emerging market financing: portfolio equity and debt flows

	1980- 1989, averages	1990- 1999, averages	2000	2001	2002	2003	2004	2005
Gross inflows								
All emerging economies	20.6	143.5	236.6 (.46)	170.1 (.41)	150.2 (.46)	208.7 (.39)	297.5 (.39)	428.8 (.38)
Asia	9.2	65.6	107.3 (.44)	74.6 (.39)	69.1 (.47)	99.2 (.38)	135.8 (.36)	170.1 (.35)
Latin America	6.0	43.7	67.6 (.40)	53.3 (.35)	33.1 (.38)	43.1 (.24)	53.7 (.34)	87.3 (.24)
Africa	1.4	5.3	9.4 (.83)	7.1 (.68)	7.0 (.65)	10.9 (.51)	11.7 (.63)	11.3 (.70)
Middle East	1.2	9.3	15.2 (.56)	11.6 (.48)	10.9 (.64)	8.9 (.72)	22.6 (.51)	56.4 (.64)
Europe	3.1	19.6	37.1 (.52)	23.5 (.50)	30.0 (.43)	46.6 (.44)	73.7 (.42)	103.7 (.38)
Bonds	4.2	63.3	80.5	89.0	64.2	99.8	134.9	187.0
Equities	0.3	13.0	46.2	11.5	16.6	27.7	45.1	78.1
Loans*	16.3	67.1	109.9	69.6	69.4	81.1	117.5	163.6

Note: *The syndicated loan data are limited to loans issued by at least three financial institutions working together. They are limited to a maturity of at least one year and for an amount more than \$1 million, thus do not include short-term inter-bank lending. In parentheses are the share of syndicated loans in total financing.

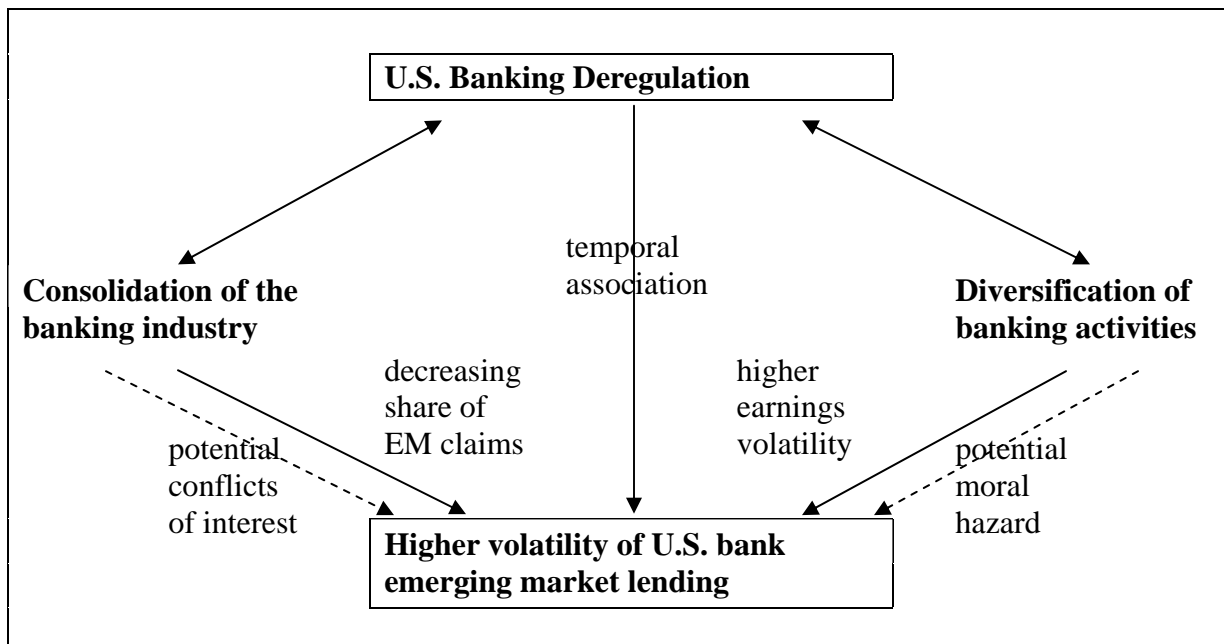
Source: IMF, *International Capital Markets* (2000). IMF, *Global Financial Stability Report* (2006).

Findings: Unintended Consequences

To explain the across-the-board, increasing volatility of U.S. bank emerging market claims, this study turns to the supply side of the equation: the deregulation in

the U.S. banking sector that imparted this commonality to their banks' investment patterns to emerging economies. In so doing, it unveils the linkages through which U.S. banking deregulation ratcheted up the volatility of U.S. bank lending into emerging economies. It starts with the detection of a particular feature of U.S. bank emerging market lending that warrants further attention — increasing volatility over time. Unlike bank lending from Europe or Japan, U.S. bank lending exhibited the unique feature of increasing volatility over time, regardless of its destination. By looking into domestic push factors that could have contributed to this characteristic, this study identified a temporal association between important deregulation initiatives in the U.S. banking industry and the volatility of emerging market lending by U.S. banks during the same period. This association was then explained by the linkages between the major outcomes of deregulation — consolidation of the banking industry and diversification of banking activities — and the increased volatility of lending into emerging economies. *Figure 5.1* illustrates the major findings of this study.

Figure 5.1 Schematic illustration of the findings & line of arguments



The incentives and constraints that creditors in industrial countries face have inevitable effects on the form and magnitude of lending to borrowers in emerging economies. Blustein (2005) superbly illustrates how misaligned incentives in U.S. financial institutions poured easy money to Argentina only to cut back *en masse* following the crisis. On the sell-side, there were familiar conflicts of interest at work because those analysts touting the Argentine miracle in the 1990s were working at firms raking in fees selling Argentine bonds. On the buy-side, the system of evaluating fund managers against an index such as the EMBI-Plus forced them to design their investment portfolios not too far off the index. Argentina, at its peak in late 1998, accounted for 28.8% of the index. Not surprisingly, money managers did not dare be too far underweight on the country.

The findings in this study add one more dimension to the supply-side dynamics: banking deregulation in the U.S. leading to increasingly volatile bank lending to emerging economies. The most interesting aspect of this argument lies in its unexpectedness and, at the same time, general applicability. After all, the process of deregulation, regardless of the industry in which it takes place, is in itself a remarkable phenomenon beyond the control of any particular actor. Following their research into the deregulation of the airline, trucking, and telecommunications industries, Derthick and Quirk (1985) famously observed,

As adopted by commissions and courts, policy change came in fits and starts, with no predictable schedule or end point... As the uncoordinated result of separate cases in separate forums, such policy change also contained no careful balancing of interests or equities, but rather imposed burdens on particular firms and industry segments almost randomly. Most importantly, policy change by commissions and courts, instead of subsiding, accelerated.

That random assignment of burdens generated by U.S. banking deregulation seems to have inflicted collateral damage in one particular component of emerging market financing — higher volatility of U.S. bank lending. To be clear, this study, while highlighting the negative nature of such an outcome, neither argues nor proves that the increasing volatility of U.S. bank lending to emerging economies has been the defining feature of recent financial crises. Still, the findings are troublesome, because bank lending remains a major source of funding for many emerging economies (*Table 5.1*), and the U.S. is the second biggest source of such funding among industrial countries.³⁰

³⁰ At the end of March 2006, U.S. banks had consolidated claims on developing countries in the

Since financial deregulation has shown the tendency to snowball, picking up momentum as it progresses (Hammond and Knott 1988), unheeded externalities from deregulation could magnify, especially when coupled with the innate vulnerabilities of emerging economies to bank flows that have time and again brought ambitious emerging economies to their knees. Given the intertwined nature of the findings in this study, it is natural to seek a remedy that is international and systematic, all the more so if the unexpected nature of such repercussions renders impractical relevant discussions on the issue in the place where it originates — the U.S. It is not only hard, but practically unreasonable, to imagine that U.S. regulators would tailor their domestic banking policies to stable the supply of funds to emerging economies.

Policy Implications

Throughout the course of historic banking deregulation in the U.S., debates on potential risks posed by banking deregulation raised issues that guided the actual policy. These issues provided the main points of contention around which the direction of policy changes toward deregulation has been set. The GLB Act, for example, epitomized a series of compromises between competing interests. The adoption of the unique financial holding company structure in *Figure B.1* was the outcome of a compromise between the U.S. Congress, Treasury Department, and the Federal Reserve. To reduce the likelihood that risks taken by non-banking subsidiaries would be transmitted to the parent bank, certain activities that were deemed close to banking were housed in bank subsidiaries, while other activities, such

amount of \$356 billion, only next to the U.K. banks (\$348 billions) among BIS reporting banks from twenty-four different industrial countries (BIS Consolidated Banking Statistics).

as merchant banking, were housed in subsidiaries of the holding company. This complex regulatory structure, illustrated in *Figure B.2*, reflects the compromise between those in favor of regulatory consolidation, similar to the unitary supervisor structures that exist in the U.K. and Japan, and those arguing for “functional regulation” and “regulatory competition” among different agencies. As a result, legacies of overlapping mandates over different kinds of financial services institutions continue, despite the emergence of the Federal Reserve as the main supervisor of financial holding companies.

For another example, the potential curtailment of the Community Reinvestment Act (CRA) became a major obstacle as the intense negotiations between Congress, the Treasury Department, and the Federal Reserve inched the GLB Act toward passage (Barth *et al.* 2000). The CRA of 1997 required banks and insured depository institutions to make credit available to all segments of their communities, including small businesses and low- and moderate-income neighborhoods. Many studies since passage of the CRA have found that bank consolidation in the U.S. reduced small business lending substantially due to the relationship-based characteristics of small business lending (Berger *et al.* 1995 ; Berger and Udell 1996; Peek and Rosengren 1998; Strahan and Weston 1998). Partly as a result of these concerns, further deregulation of banking activities and ensuing consolidation in the industry were considered to have a negative impact on small business, relationship-based lending. On the other hand, many industry lobbyists argued that compliance with the CRA, including frequent reporting requirements, presented unwarranted burdens on the industry, especially when various regulatory hurdles in the CRA complicated the

process of mergers and acquisitions with smaller banks (Department of Treasury 2000).

In the end, the GLB Act required that “financial holding companies and banks with financial subsidiaries will not be allowed to engage in any new activities or make any new acquisitions unless each of the insured institutions in the company received at least a ‘satisfactory’ ratings in its prior CRA exam” (Barth *et al.* 2000), while at the same time relaxing reporting requirements for smaller banks with less than \$250 million in assets.

The findings in this study of the relationship between deregulation and emerging market bank lending notwithstanding, nowhere in the debates over the various deregulatory initiatives in the U.S. was the issue of volatile emerging market lending even brought up. As far as U.S. banking deregulation is concerned, its spill-over effects on emerging market lending have been a non-issue. Without a perceived problem, it is only natural that there have been no serious discussions on the topic. Given the relative size of emerging market claims in the asset class of the U.S. commercial banks (1%), the lack of attention on the topic from U.S. stakeholders is understandable. However, it is not as easy to accept what have essentially been futile attempts to mitigate boom and bust cycles of international bank lending at the international level. Given the near unanimous view on the inherent volatility of bank flows in emerging market financing, numerous ideas have been proposed, only to be blocked on the grounds of impracticality or competing priorities. *Table 5.2* summarizes the achievements to date in the new international financial architecture towards crisis prevention and better resolution in emerging economies.

Summary of reforms Actual policy reforms have taken place in four broad areas related to emerging market financing: (1) standard setting activities; (2) IMF reforms; (3) bond restructuring; and (4) the new Basel capital accord. By far the most progress has been made on new standards and codes at the international level. Demand for more transparency was a clear outcome of the financial architecture debate, which in turn resulted in more benchmarks against which the performance of an emerging economy can be evaluated. The IMF is at the center of this effort, since the work of other bodies comes together in the context of IMF surveillance and is published in its “Reports on the Observance of Standards and Codes” (ROSCs). The role of the IMF in directly dealing with crises through its “catalytic financing” has been scrutinized and is evolving as well. The debate on how the IMF should structure its lending practices and curtail the moral hazard inherent in any bail-out operation is far from settled. In practice, “IMF and the G-7 have preferred to dole out their funds in a series of programs that try to catalyze the voluntary restoration of market confidence” (Roubini and Setser 2004).

Table 5.2 Reforms in the new international financial architecture

Standards and Codes	<p>A set of international standards of minimum best practices has been developed, covering the whole range of the financial system -- data dissemination, banking supervision, insurance supervision, securities regulation, bankruptcy, corporate governance, accounting, auditing, payment and settlement, market integrity, fiscal transparency, and the transparency of monetary and financial policy. The Financial Stability Forum, a group at the Bank for International Settlements in Basel, was created in 1999 to oversee these efforts by different international organizations, from the IMF to BIS.</p>
IMF Lending Facility	<ul style="list-style-type: none">• The Supplemental Reserve Facility (SRF), a special lending window designed to provide very large amounts of financing for a very short term in the event of sudden capital outflows, was created after the crisis broke out in Thailand in 1997. It was used in Korea (1997) and subsequently in Brazil (1998), Turkey (2000), Argentina (2001), and Uruguay (2001).• The Contingent Credit Line (CCL), which provides exceptional access to large financial resources upon prequalification, was introduced in 1998. However, no member country ever applied for prequalification for fear of raising investor concerns. The facility was phased out in 2003.
Basel II Framework	<p>The Basel Committee on Banking Supervision (BCBS) finalized the revised accord in June 2004, and the EU began the process of implementation in 2007. Due to the Quantitative Impact Study, however, its implementation in the U.S. has been postponed until (at least) 2009.</p>
Bond Restructuring	<ul style="list-style-type: none">• Mexico's 2003 decision to introduce Collective Action Clauses (CACs) into its New York law bonds in line with the G-10 recommendation started a series of such sovereign bond issues by Brazil, Guatemala, and South Africa. There was little price penalty against the inclusion of CACs and the use of CACs has become a market standard.• The adoption of CACs in new sovereign bond issues will not change the terms of existing international bonds without the provision (\$200 billion), and the IMF predicts that it will take another 10 years for 80 percent of the entire stock of external-law bonds to include CACs

Source: Williamson (2000, 2005); Dobson & Hufbauer (2001); World Bank (2004); Roubini & Setser (2004).

More directly on the creditor side, the new Basel Capital Accord — the Basel II framework — improved upon weaknesses in the original 1988 Accord, which notoriously encouraged risky short-term exposure of industrial banks in emerging economies. In the new Accord, for example, the lower risk-weights for short-term inter-bank loans were rectified, and larger banks will be subject to a 20% risk weight for all inter-bank lending regardless of maturity. However, the effect of the new accord in taming the boom-bust cycle of international bank lending is far from clear. In fact, many critics argue that, due to higher risk weights for emerging market assets and cyclic assessments of the risks, the new risk assessment models could discourage bank lending to emerging economies in general and amplify the procyclicality of the lending.³¹

Last, but certainly not least, the official proposal for the adoption of Collective Action Clauses (CACs)³² in sovereign bonds finally materialized in early 2003 when the government of Mexico issued its sovereign bonds under New York law with the provision. From then on, the use of such clauses has been rapidly accepted and become the norm in sovereign bond issues in international capital markets. The proposal for CACs was first made by Eichengreen and Portes (1995) and then taken up by the Rey Report (Group of 10 1996). International bondholders vigorously resisted adoption on the grounds that any measure making sovereign restructuring easier would increase the borrowing costs for emerging market countries. It was

³¹ Critics also argue that the Accord may also accelerate the process of disintermediation, encouraging an increasing proportion of lending to originate from financial institutions not subject to the regulatory requirements of the Accord (World Bank 2004).

³² Collective action clauses (CACs) enable a qualified majority of bondholders to make decisions that become binding on all holders of a particular bond issue, thereby encouraging a more orderly and prompt restructuring of distressed bond debt. The use of CACs in bonds governed by U.K. and Japanese law has been a longstanding practice. However, bonds issued under New York law, which account for a large share of developing country bonds, do not have this provision (Williamson 2005).

only after Anne Krueger, the then-first deputy director of the IMF, proposed the creation of the Sovereign Debt Restructuring Mechanism (SDRM) — an international bankruptcy system for countries — in November 2001 that private investors realized CACs were a lesser evil and dramatically changed their attitudes to fend off the SDRM proposal. Whatever the motivations, many economists seem to think this is a move in the right direction, although its effect will certainly be a gradual one, since it will take many more years to replace many old-style bonds requiring unanimous approval for changes in payment terms (Williamson 2005; Blustein 2005).

Missing out on bank lending Despite a few notable improvements, making headway on international financial reform has been fraught with difficulties. Even the Basle II Accord, the most obvious reform on the creditor side, is facing formidable hurdles since the U.S. postponed its implementation upon the results of the Quantitative Impact Study and strong opposition from smaller banks.³³ Moreover, when it comes to taming the volatility of international bank lending, a near consensus view on the problem was not enough to bring about actual policy changes. As *Table 5.3* illustrates, cross-border bank runs accompanied nine out of the fourteen emerging market crises after Mexico's (1994). In six of those nine cases, rollover of inter-bank loans, voluntary or coercive, happened regardless of the misgivings on investors' part. The two most successful cases of crisis resolution — in Korea (1997) and Brazil (1998) — involved the comprehensive rollover of bank credits.

³³ Contrary to the basic intention, the study indicated “material reductions” in the aggregate minimum required capital for the large banks under the new system. Smaller banks, following on these results, reinforced their opposition on the grounds that the accord would work to larger banks' advantage.

Table 5.3 Debt dynamics & Creditor burden-sharing after crisis

Crisis country	Cross-border bank run	Default or coercive restructuring of sovereign bond	Default on private sector's external debt	Private Sector Involvement (PSI)
Mexico (1994)	No	No	No	No PSI
Korea (1997)	Yes	No	Some	Coercive on inter-bank loans
Thailand (1997)	Yes	No	Some	Coercive on some inter-bank loans
Indonesia (1997)	Yes	No	A lot	Coercive on some inter-bank loans
Malaysia (1997)	Yes	No	No	No PSI
Russia (1998)	No	Yes, domestic and external debt	No	Default on GKO
Brazil (1998)	Yes	No	No	Inter-bank rollover
Ecuador (1998)	Yes	Yes, domestic and external debt	Yes	Coercive default and debt reduction
Pakistan (1998)	No	Yes, external debt	No	Restructuring of external debt, no reduction
Ukraine (1998)	No	Yes, external debt	No	Restructuring of external debt, no reduction
Turkey (2000)	Yes	No	No	Inter-bank rollover
Argentina (2001)	Yes	Yes, domestic and external debt	A lot	Full default on domestic & external debt
Uruguay (2001)	Yes	Yes, domestic and external debt	No	Restructuring of external debt
Brazil (2002)	No	No	No	Voluntary inter-bank rollover

Source: Roubini and Setser (2004).

Why then cannot a remedy be devised at a systemic level that explicitly makes the

process less painful and, in turn, enhances market discipline for risky investors? It is certainly not a dearth of ideas that is at issue. From capital surcharge (Truman 2001) to rollover option with a penalty (Buiter and Sibert 1999) to forward-looking provisioning (Ocampo 2003), convincing proposals on curtailing volatile bank lending abound. According to Roubini and Setser (2004),

The focus on bonds has deflected attention away from the risks posed by the rolloff of external bank lines, even though short-term bank lending is often a bigger problem than long-term bonds. Neither the IMF nor the G-7 seem to have seriously considered making a real commitment by the banks to maintain their exposure a part of Brazil's recent rescue package... At times, the short-term creditors of a crisis country will need to refrain from exercising their option to exit in order to give the country a better chance of emerging from its crisis. Institutional innovations like rollover options could help.

A monitored rollover arrangement *ex ante* for cross-border bank exposure level appears to be one eminently reasonable way to tackle the problems in bank lending. The resistance to such systemic remedies for volatile bank flows seems almost inevitable at the same time. After all, despite the apparent enthusiasm of U.S. Treasury Secretary Paul O'Neill for the SDRM from the IMF, Undersecretary John Taylor quashed it declaring, "the decentralized approach... makes much more sense and is much more workable" than Krueger's plan (Blustein 2005). The right mix of policy incentives for its success is beyond the scope of this study, given its legal ramifications. However, a systemic approach should carry more weight since a substantial portion of the volatility in bank lending is an unintended by-product of

domestic deregulation in industrial countries, with no apparent debates and remedies on the problem in these countries. This study, by establishing linkages between U.S. banking deregulation and the volatility of U.S. bank emerging market claims, argues that this indeed has been the case. For creditors such as the U.S., a decentralized national initiative in dealing with bank lending volatility would thus be an unlikely, albeit desirable, turn of events.

As any serious policy prescriptions to emerging market financial crises to date demonstrate, reforms by borrowers are as important as reforms by lenders. Putting too heavy a burden on lenders' shoulders would undoubtedly create another set of problems, with negative consequences, such as reduced overall liquidity available for the borrowers in emerging economies. At the very least, however, those in emerging economies are by now fully aware of the dangers inherent in short-term bank loans as a form of external financing. Further, the vast bulk of the international action up to now has been in reforming the policies of debtors (Williamson 2005).³⁴ Reforms by lenders, despite a few recent breakthroughs, remain muted by comparison and are quickly being shelved by the improving situations in many emerging economies. The findings in this study further demonstrate that the stepped-up efforts by borrowers alone will not solve the problem. A systemic approach in dealing with volatile bank lending is warranted and necessary to square the circle, especially when the problem gets inadvertently made worse by the domestic regulatory changes in lenders' home markets.

³⁴ Demand for external finance in emerging economies has been diminished by the desire to limit vulnerability in times of trouble. As a result, many emerging economies run current account surpluses and accumulated unprecedented level of reserves, while increasingly corporations are reluctant to borrow in foreign currency. Overall, these adjustments have resulted in significant improvements in the external liability positions of developing countries, which have been a factor in recent credit rating upgrades (World Bank 2004).

Appendix A. Comparisons on Capital Flows Data³⁵

Data on different types of capital flows to emerging economies come from three sources: the International Monetary Fund (IMF); the Institute of International Finance (IIF); and the World Bank (WB). Different sources give somewhat different pictures of capital flows in emerging economies depending on each source's classification method. *Tables A.1* through *Table A.3* reorganize each database closely in line with the IMF balance of payments classification methods. Despite obvious compatibility problems, this exercise reveals some useful insights about important aspects of capital flows. There are three main differences between the data sources: (1) how they treat net capital outflows by residents of the emerging market economies; (2), the scope of the category, "bank loans and other debt (net);" and (3) the treatment of interest payments (on "bank loans and other debt (net)") and profit remittances (on "foreign direct investment (net)").

Table A.1 Net capital flows to emerging economies (IMF, \$ billions)

Net Flows^a	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total
Emerging markets											
Total private capital inflows	47.7	123.8	119.3	181.9	152.8	193.3	212.1	149.2	64.3	68.3	1,312
Bank loans and other debt^b	11.9	55.6	32.7	11.5	-35.5	55.4	16.3	-57.6	-104	-71.8	-85
Portfolio investment^c	17.4	36.9	51.1	113.6	105.6	41.2	80.8	66.8	36.7	21.6	571
Foreign direct investment	18.4	31.3	35.5	56.8	82.6	96.7	115	140	131	118.5	826
Net official flows	26.6	36.5	22.3	20.1	1.8	26	-0.9	24.4	41.1	9.4	207

Notes: ^a Net flows equal to disbursements minus principal repayments. ^b "Other debt" includes trade credits and loans; currency and deposits; and other assets and liabilities. ^c Net portfolio investment includes both equity securities and debt securities (bond and notes, money market instruments, financial derivatives).

Sources: IMF *World Economic Outlook* (2000). IMF *International Capital Market* (1999).

³⁵ Appendix A draws on my work in "World Capital Markets: Challenge to the G-10" (Dobson and Hufbauer 2001).

Table A.2 Net capital flows to emerging economies (IIF, \$ billions)

Net Flows	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total
Emerging markets											
Total private capital inflows	42.2	72.9	122	185	165	231	328	266	148	149	1,708
Bank loans and other debt^a	12.4	17.7	33.7	22.7	40.3	101	116	35.6	-58.8	-40.5	280
Portfolio investment^b	14.0	31.8	56.8	118	59.1	53.3	122	115	77.1	45.6	692
Foreign direct investment	13.8	23.4	31.1	44.3	65.2	76.8	91.7	115	118	139	718
Net official flows	39.3	37.0	36.8	27.1	28.8	37.9	7.6	38.9	52.8	11.9	318

Notes: ^a“Bank loans and other debt” refers only to commercial bank activities. ^b The IIF classification of debt securities depends on the identity of holder. If a bank is a holder, they are classified under “bank loans and other debt.” If a non-bank financial institution is a holder, they are under “portfolio investment.” Sources: IIF *Capital Flows to Emerging Market Countries*, various issues.

Table A.3 Net capital flows to emerging economies
(World Bank, \$ billions)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total
Panel 1: Net flows											
Emerging markets											
Total private capital inflows	59.2	82.6	136	202	223	271	325	324	220	228	2,071
Bank loans and other debt	31.1	29.9	64.7	48.7	60.6	98.9	82.7	74.9	-6.1	-17.1	468
Portfolio investment	3.9	18.3	25.1	87.7	73.3	66.9	112	79.1	55.2	52.6	574
Foreign direct investment	24.1	34.4	46.1	66.0	88.8	105	131	170	171	192	1,028
Net official flows	27.7	27.2	23.5	25.0	13.2	21.2	3.0	13.9	23.5	25.6	204
Panel 2: Net-net flows^a											
Emerging markets											
Total private capital inflows	-6.2	15.9	73.3	137	147	177	222	211	96.2	87.3	1,160
Bank loans and other debt	-12.1	-10.6	30.8	15.8	24.0	52.6	31.7	20.2	-63.8	-81.4	7
Portfolio investment	-0.7	10.5	17.2	78.1	59.2	45.5	89.3	52	24.3	18.3	394
Foreign direct investment	6.6	16.0	25.2	43.1	63.9	78.5	101	139	135.7	150	759
Net official flows	7.5	5.8	1.2	1.2	-12.4	-9.3	-28	-14.9	-4.5	-6.2	-60

Notes: ^a Net-net flows subtract interest payments from “bank loans and other debt (net),” profit remittances from “foreign direct investment (net),” in panel 1.
Sources: World Bank *Global Development Finance* (2000).

Treatment of resident outflows In *Table A.1* (IMF Table), capital outflows such as net lending or acquisition of assets abroad by emerging market residents are offset against inflows from abroad. Neither *Table A.2* (IIF Table) nor panel 1 of *Table A.3* (WB Table) reflects such outflows. This differing treatment of resident outflows creates a startling difference in the apparent magnitude of “total private capital flows (net)” over the 1990s. The decadal totals differ by between \$400 billion (*Table 1* vs. *Table 2*) and \$760 billion (*Table 1* vs. *Table 3*). The big differences are in “bank loans and other debt (net).” The differences in this category explain, on average, more than 80% of the gap. Residents of emerging markets place a considerable amount of money abroad, and how this money is recorded importantly affects the measure of “total private capital inflows (net).”

Scope of “bank loans and other debt (net)” In *Table A.1* (IMF Table) and *Table A.3* (WB Table), “bank loans and other debt (net)” includes items such as loans, trade credits, currency and deposits, and kindred assets and liabilities, whether placed by banks or other financial institutions. “Portfolio investment (net)” includes both equity securities and debt securities (bonds and notes, money market instruments, and financial derivatives). By contrast, “bank loans and other debt (net)” in *Table A.2* (IIF Table) only covers commercial bank activities. The approximately \$200 billion difference between decadal totals in “bank loans and other debt (net)” between *Table A.2* (IIF Table) and *Table A.3* (WB Table, Panel 1) stems from holdings by non-bank financial institutions of currency, trade credits, and other debt instruments.

Treatment of interest payments and profit remittances In both *Table A.1* (IMF Table) and *Table A.2* (IIF Table), “interest payments” are not subtracted from “bank loans and other debt (net).” Likewise, “profit remittances” are not subtracted from “foreign direct investment (net).” In *Table A.3* (WB Table), however, these payments and remittances are subtracted from Panel 1 (net flows) to generate Panel 2 (net-net flows). Thus, the cumulative size of “interest payments” and “profit remittances” can be seen by comparing the two panels of *Table A.3*. For “bank loans and other debt,” the difference between Panel 1 (net) and Panel 2 (net-net) figures add up to a decadal magnitude of \$460 billion. The decadal gap between “foreign direct investment” in both panels totals about \$270 billion.

Appendix B. The Gramm-Leach-Bliley Act of 1999

The Gramm-Leach-Bliley (GLB) Act eliminated the Glass-Steagall Act of 1933's proscriptions against banking, insurance, and securities firms entering each other's businesses.³⁶ The GLB Act also repealed the parts of the Bank Holding Company Act of 1956 that separated commercial banking from the insurance business. Before these newly authorized activities can be conducted, however, a bank holding company must qualify as a financial holding company (FHC) with the Federal Reserve. For the existing bank holding companies that elect to be FHCs, qualification requirements must be met before they can engage in broad banking.³⁷ These financial holding companies may exercise activities "financial in nature" as long as the Federal Reserve and the Treasury Department determine that the activity does not pose a substantial risk to the safety and soundness of banks (Yeager *et al.* 2005). *Figure B.1* shows the organizational structure of a financial holding company.

With respect to individual banks, the GLB Act enables them to affiliate with non-bank financial firms through an FHC structure or to set up financial subsidiaries to engage in such activities as securities and insurance underwriting and brokerage activities. Hence, any or all GLB activities may be conducted at the FHC level or in a subsidiary of the FHC other than a bank. With the exception of merchant banking³⁸ and insurance underwriting, GLB activities are also permitted by a subsidiary of the

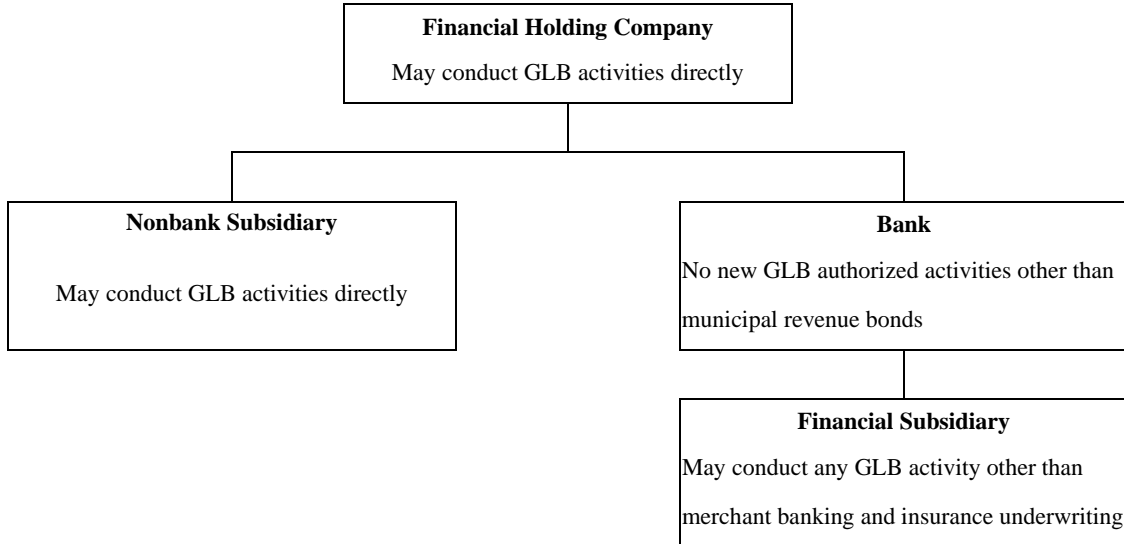
³⁶ The Act is named after Chairmen Phil Gramm (R-Texas), James A. Leach (R-Iowa), and Tom Bliley (R-Virginia) of the Senate Committee on Banking, Housing, and Urban Affairs, House Committee on Banking and Financial Services, and House Committee on Commerce, respectively.

³⁷ The qualification criteria require each related bank to be "well-capitalized" and "well-managed." "Well-capitalized" means that a bank has and maintains capital ratios of at least 5% for the leverage ratio, 6% for the Tier 1 risk-based capital ratio, and 10% for the total risk-based capital ratios. "Well-managed" means a bank has received a satisfactory rating on its safety and soundness examination (Wallegghem 2001).

³⁸ After 2004, the Federal Reserve and the Department of the Treasury had the authority to jointly determine that merchant banking be permitted for a financial subsidiary of a bank.

bank (Wallegghem 2001).

Figure B.1 Structure of a financial holding company by GLB Act



Source: Wallegghem (2001)

Along with the advances made in terms of deregulation, supervisory burdens were consolidated, giving the Federal Reserve the main supervisory role over financial holding companies (*Figure B.2*). The GLB Act subscribes to the principle of “functional regulation,” which holds that similar activities should be regulated by the same regulator. Banking, securities, and insurance regulators examine banking, securities, and insurance activities respectively. Banking agencies examine banks and affiliated companies but are limited in their authority to examine functionally regulated subsidiaries. They are generally directed to use examinations made by federal and state securities and insurance regulators. The GLB Act requires the Securities and Exchange Commission to set general rules for new financial products before seeking to regulate bank sales of such products (Barth *et al.* 2000).

Figure B.2 U.S. Financial Supervision after the GLB Act

Financial institutions and their supervisors			
Retail banking	Wholesale banking	Securities	Insurance
Financial Holding Companies			
<i>Federal Reserve (Fed) = umbrella supervisor</i>			
<ul style="list-style-type: none"> National banks (OCC) State banks: <ul style="list-style-type: none"> Members (Fed) Non-members (FDIC) Cooperative banks (FDIC/Fed) Insured Industrial banks (FDIC) Thrift holding companies (OTS) Savings banks (OTS/FDIC/Fed) Savings and loan association (OTS) Edge Act corporations (Fed) 	Federal Reserve <ul style="list-style-type: none"> National banks Investment banks Financial companies 	Securities and Exchange Commission <ul style="list-style-type: none"> Primary issuers of Securities Stock exchanges Stock brokers Investment advisors Mutual funds Public utility holding Companies 	Regulated by States <ul style="list-style-type: none"> Insurance companies Insurance brokers
Fed: Federal Reserve; OCC: Office of the Comptroller of the Currency; FDIC: Federal Deposit Insurance Corporation; SEC: Securities Exchange Commission; OTS: Office of Thrift Supervision			

However, legacies of overlapping mandates over different kinds of financial services institutions continue. The Federal Reserve shares supervisory and regulatory responsibilities with the Office of the Comptroller of Currency (over national banks), the Federal Deposit Insurance Corporation (over state non-member banks), and the Office of Thrift Supervision. Depending on whether the bank is part of a holding company or conducts securities or insurance activities in an operating subsidiary, other supervisors, such as the Federal Deposit Insurance Corporation

(FDIC) or the SEC, may also have some supervisory authority. At the same time, the insurance industry is regulated at the state level. In this way, the U.S. supervisory system involves multiple supervisors, unlike in the U.K. or Japan, where financial supervision has been consolidated in a single supervisor. As a result, there is an ongoing debate on the effectiveness of different supervisory structures, which is no more than one in a series of debates regarding the relative benefits and costs of the GLB Act.

Appendix C. Debates on U.S. Banking Deregulation

The deregulation of U.S. banking activities was a hotly-debated topic in academic circles leading up to the passage of the GLB Act in 1999. An array of corporate scandals during the period 2001-2003, so soon after this ground-breaking change in the law, caused lingering doubts about the idea of universal banking to resurface in policy circles. In the infamous Enron scandal, Merrill Lynch, JP Morgan, and Citigroup structured and financed off-balance-sheet special-purpose entities such as LJM2 and Mahonia Ltd. that conducted energy trades with Enron. These banks were both lenders to and investors in these special-purpose entities created solely to misrepresent Enron's financials to the market. At the same time, these financial giants performed a range of advisory and underwriting services for Enron, provided equity analyst coverage, and were Enron's principal derivatives trading counterparties (Walter 2003).³⁹ In July 2003, JP Morgan Chase and Citigroup agreed to pay \$192.5 million and \$126.5 million, respectively, in fines and penalties (without admitting or denying guilt) to settle SEC and Manhattan District Attorney charges of financial fraud. The ensuing scandals such as the Citigroup-Worldcom case were a setback for the giant universal banks that advance credit as well as advice. Thus, despite passage of the GLB Act, age-old controversies around the issue of universal banking in the U.S. are yet to be settled, with ongoing debate along the following lines.

³⁹ According to the final report of Enron bankruptcy examiner Neal Batson, both Citigroup and JP Morgan (1) "...had actual knowledge of the wrongful conduct of these transactions;" (2) helped structure, promote, fund and implement transactions designed solely to materially misrepresent Enron's financials; and (3) caused significant harm to other creditors of Enron (Walter 2003).

Advantages Proponents of expanded banking powers have long emphasized potential benefits to banks, including gains in efficiency from the realization of economies of scope, risk reduction through greater diversification, and greater competition, resulting in more options, lower prices, and greater convenience for customers. At least from the academic studies to date, positive effects have seemed to prevail.⁴⁰ For instance, Berger and Udell (1996), Ramirez (1995 and 2002), and DeLong (2001) found expanded banking powers to be associated with lower cost of capital and less stringent cash-flow constraints. Vander Venet (2002) found that unrestricted banks have higher levels of operational efficiency than banks with restricted powers. In terms of diversification, Eisenbeis and Wall (1984) and Kwan and Laderman (1999) argue that, because profits from providing different financial services are not highly correlated, there are diversification benefits from allowing broader powers. Drawing upon a comprehensive cross-country dataset, Barth, Caprio, and Levine (2001) found that greater regulatory restrictions are associated with: (1) a higher probability of a country suffering a major banking crisis; and (2) lower banking sector efficiency. They found no countervailing positive effects from restricting banking activities. More recently, Barth, Caprio, and Levine (2004) examined a much larger group of countries and showed that restricting banking activities is negatively associated with bank performance and stability, as compared to when banks can diversify into other financial activities. Furthermore, they found no evidence that restricting bank activities produces positive results in particular institutional or policy environments, *i.e.*, different supervisory structure or deposit

⁴⁰ Barth, Caprio, and Nolle (2004) provide a good review that focuses on the potential benefits and costs of mixing banking and non-banking financial products.

insurance schemes.

Additionally, Jayaratne and Strahan (1998) and Dick (2006) empirically illustrated that, by opening new avenues for bank takeovers and for bank expansion into new markets, deregulation has unleashed competitive pressure on bank managers, leading to greater efficiency, higher quality, and lower pricing of bank services. Stiroh and Strahan (2002) found the link between a bank's relative performance and its subsequent market share growth strengthens significantly after deregulation, as competitive reallocation effects transfer assets to better performers. The authors emphasized the substantial reallocation of market share toward better banks after deregulation. Indeed, influential academics such as Calomiris (2000) came out in favor of industry consolidation as a means of maximizing the benefits of universal banking. The consolidation of the U.S. banking industry after major deregulation initiatives has been welcomed as an outcome of increased competition.

Potential Disadvantages Arguments against universal banking can be divided into two distinct categories: (1) conflicts of interest; and (2) undue risk-taking. The problem of conflicts of interest lay at the core of the rationale behind the separation of commercial and investment banking in the Glass-Steagall Act. The Report of the Senate Banking and Currency Committee (1933), issued just prior to passage of the Glass-Steagall Act, stated:

Unsound loans were made in order to shore up the price of securities or the financial position of companies in which a bank had invested its own asset. (And) a commercial bank's financial interest in the ownership, price, or

distribution of securities inevitably tempted bank officials to press their banking customers into investing in securities which the bank itself was under pressure to sell.

Over time, the increasing weight of empirical evidence successfully refuted the notion that the securities activities of commercial banks bore direct responsibility for the banking debacle of the Great Depression. For example, Benston (1994) notes that all except ten of the over 9,000 banks that failed during the Great Depression were unit banks, most of which were located in small towns. Kroszner and Rajan (1994) show that the securities commercial banks underwrote performed better than those underwritten by investment banks in the 1930s.⁴¹ In the most comprehensive study on this issue, White (1986) found that “while 26.3% of all national banks failed during 1930-1933, only 6.5% of the 62 banks which had securities affiliates in 1929 and 7.6% of 145 banks which conducted large operations through their bond departments closed their doors.” The author uses information from the income statements of 18 banks operating in financial assets between 1925 and 1932 and concludes that banks operating in financial markets of stocks and bonds had a higher return, although this return’s variance was also higher.

However, in the post-Enron environment, the innate conflicts of interest in financial dealings have been again highlighted and scrutinized with a deeper sense of urgency. A series of scandals so soon after the passage of the GLB Act, and the prominence of conflicts of interest therein, led many to doubt the wisdom of the GLB Act. For example, when the proceeds of a debt issue are used to refinance existing

⁴¹ Kroszner and Rajan show that, partly because commercial banks dealt with older and larger firms, the securities that they underwrote performed better than those underwritten by investment banks.

bank debt, and the underwriter is a commercial bank whose loans are being refinanced, there is a potential conflict of interest. The commercial bank, in its role as underwriter, could try to misrepresent the quality of the security to potential buyers. As such, it has been widely acknowledged that synergies from combining multiple activities and conflicts of interest are a package deal (White 2004). A 2002 survey of corporations with more than \$1 billion in annual sales found that 56% of firms that refused to buy fee-based bank services had their credit restricted or lending terms altered adversely, and 83% of the surveyed CFOs expected adverse consequences should they refuse to buy non-credit services (Association for Financial Professionals 2003). On balance, conflicts of interest seem to be an ever present possibility in any financial system, except in an imaginary one with pure commercial and specialized banks with a single business. Investment banks normally combine operations on capital markets with financial consulting, for example. Universal banks might offer more opportunities for dishonest behavior, but it is more a matter of professional morality than a by-product of universal banking per se (Canals 1997).

Secondly, opponents argue that universal banking offers incentives for increased risk-taking to banks and financial holding companies. Their arguments are based on two related grounds: (1) the inherent risk of combining banking with non-bank activities; and (2) the extension of the public safety net to non-bank activities. On the first point, non-banking financial services may be fundamentally riskier than plain loan making, and banks may be less efficient than those specializing in the provision of these services. Many financial operations encourage agents to take more risks, because their income structure is arranged for additional bonuses to be linked with

profits, even though they do not lose their fixed salary if operations fail. Further, in financial operations that require fast decisions, a great deal of decentralization is required. Once the operations have been executed, the decisions are already irreversible and can only be offset by future operations. Thus, the necessary coordination among the various units of a universal bank could add costs to the operations (Canals 1997). The other point refers to the potential coverage of deposit insurance over non-bank activities, granting an unfair advantage to universal banks over rival non-bank financial firms offering similar products and services. The argument goes as follows: The access to a safety net allegedly creates a net subsidy for commercial banks, which, in turn, they transfer to subsidiaries engaged in nontraditional activities. As a consequence, the extension of the subsidies will encourage them to take excessive risks.

Indeed, many studies on financial crises focus on the question of whether deposit insurance stabilizes or destabilizes the banking system. Arteta and Eichengreen (2000) show that the effects of deposit insurance on financial stability are inconsistent. While stabilizing the banking system by curtailing incentives for bank runs, the protection from deposit insurance creates a moral hazard whereby banks imprudently invest in high-risk assets, expecting external assistance in the case of failures. Depositors do not distinguish among banks according to their asset quality. Demirguc-Kunt and Detragiache (2000) pioneered a study finding a negative relationship between bank stability and deposit insurance in their cross-country econometric analysis.⁴² In addition, different affiliates under the same holding

⁴² The negative impact of deposit insurance on bank stability essentially refers to the moral hazard problem Kane (1989) summarized in the wake of the U.S. savings and loan crisis. “Managers were

company could have all the incentives to move some of their risky funds onto the bank balance sheet, expecting a bailout in hard times by the public safety system. An empirical analysis by Kwast and Passmore (2000) indicates that US bank holding companies operate on much smaller equity-asset ratios than a large range of other financial institutions (e.g., investment banks, life insurance companies). Typically, the bank equity-asset ratios are about half the levels in other institutions. Moreover, the authors detected a tendency for holding companies to move activities that could be performed either by a bank or a non-bank into their bank subsidiaries, implicitly putting it under the protection of the public safety net.

Efforts to identify the net subsidy granted by the deposit insurance scheme have been fraught with technical difficulties in obtaining reliable measures of the regulatory costs born by banks⁴³ (Whalen 1997). Even more difficult is the detection of the alleged spillover of safety-net subsidies into non-bank subsidiaries or affiliates of the commercial banks. There are studies that have examined the returns and risks associated with the non-banking activities permissible for banks and bank holding companies.⁴⁴ These studies indicate that the experience of holding companies in specific non-banking lines of business is not uniform, implying that the

using cosmetic approaches to disguise the magnitude of insolvency; regulators practicing forbearance even though they knew of the deteriorating risk profiles for the institutions for which they were responsible; and legislators increasing deposit insurance without regard for any offsetting changes in supervision.” Subsequently, the Federal Deposit Insurance Corporation (FDIC) Improvement Act of 1991 created “a stronger signal to management and investors by targeting deposit insurance at small depositors only and by risk-weighting the deposit insurance premiums paid by banks to reflect their capital adequacy and bank examiner ratings” (Kane 2004).

⁴³ The Office of the Comptroller of the Currency used a standard option pricing model to measure the gross subsidy accruing from the deposit insurance portion of the safety-net. Under this approach, the median value of deposit insurance, as of June 1996, was four basis points for the top 50 banking companies in the U.S. (Whalen 1997). For 137 listed banks from 12 countries during 1991-1998, the World Bank staff found that the gross safety-net subsidy is increasing over time from two basis points per annum in 1991 to 216 basis points per annum in 1998 (Laeven 2000).

⁴⁴ Boyd and Graham (1986), Gunther, Zea, and Zograf (1994), Kwast (1989), Liang and Savage (1990), Wall, Reichert, and Mohanty (1993), and Wall (1987).

performance effects of particular activities are company-specific, possibly due to differences in management quality. Interestingly, despite the ongoing debates regarding the existence and size of safety-net subsidies, it has been readily assumed in policy circles that the potential leakage of the safety-net subsidy to banking affiliates is real and warrants significant attention. The GLB Act does prohibit FDIC assistance to affiliates and subsidiaries of banks, although it begs the question of whether assistance to a bank might end up helping those affiliates and subsidiaries (Barth *et al.* 2000). In fact, alternatives to allowing “universal banking” whereby commercial banks are free to choose their organizational form were proposed around the adoption of the GLB Act. One such alternative was the “bank subsidiary model,” whereby banks would be required to lodge securities and certain other non-banking activities in separately incorporated subsidiaries of banks. The intended effect of the mandatory bank subsidiary structure, possibly supplemented by some array of firewalls, would be to reduce the likelihood that risks taken by subsidiaries would be transmitted to the parent bank. Another alternative was the “holding company model,” whereby non-banking activities would be required to be conducted in separate subsidiaries of a holding company that could own one or more commercial banks. As in the bank subsidiary model, a variety of firewalls could be imposed to decrease the probability that risk would be transferred from either the parent or its non-banking subsidiaries to any bank affiliates. Among these competing bank structures, the GLB Act struck a compromise between Congress, the Treasury Department, and the Federal Reserve. That is, certain activities deemed close to banking were housed in bank subsidiaries, while other activities such as

merchant banking were housed in subsidiaries of the holding company. All in all, arguments for or against universal banking are both plausible in theory. There seems to be convincing evidence of overall benefits. By contrast, potential disadvantages are far more controversial. Ultimately, it is up to the empirics on specific banking activities.

Appendix D: Data Definitions and Sources

Emerging Economies (FFIEC Database)

Asia (18 countries): China, Taiwan, India, Indonesia, Iraq, Israel, Jordan, Korea, Kuwait, Malaysia, Oman, Pakistan, Philippines, Qatar, Saudi Arabia, Sri Lanka, Thailand, United Arab Emirates, and other Asia.

Latin America (19 countries): Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Paraguay, Peru, Trinidad & Tobago, Uruguay, Venezuela, and other Latin America.

Eastern Europe (9 countries): Bulgaria, Czech Republic, Hungary, Macedonia, Poland, Romania, Russia, Serbia & Montenegro, Slovakia, and other Eastern Europe.

Africa (16 countries): Algeria, Cameroon, Congo (Kinshasa), Egypt, Ethiopia, Gabon, Ghana, Ivory Coast, Kenya, Malawi, Morocco, Nigeria, Senegal, Sudan, Tunisia, Zambia, and other Africa.

Country Sample

The 19 countries in the sample are: Canada, France, Germany, Italy, Japan, and the U.K. from the G-10; Argentina, Brazil, Chile, Colombia, Mexico, and Venezuela in Latin America; China, Taiwan, Indonesia, Korea, Malaysia, Philippines, and Thailand in Asia.

Dependent Variables

- U.S. cross-border bank claims: Amounts owed U.S. banks by foreign borrowers by residence of borrowers. All data are presented on a fully consolidated basis, netting out inter-office transactions and including adjustments to reflect guarantees and indirect borrowings.
Source: FFIEC Country Exposure Lending Survey (CELS).
- Volatility of U.S. bank cross-border lending: three-quarter rolling standard deviation of quarterly changes in U.S. bank claims divided by average claims over the same period.

Explanatory Variables

The set of explanatory variables covers basic macroeconomic variables, including trend and crisis dummies. Kaminsky, Lizondo, and Reinhart (1997) provide a comprehensive review of the empirical consensus on what may cause currency crises, and they emphasize the lack of empirical consensus on what may cause crises.

- Time: trend variable with 1 for 1984 Q1 through 87 for 2005 Q3.
- Crisis: (0,1) dummy variable for the quarters in financial crisis for each emerging market country in the sample. Argentina (1989-1990; 1995; 2001-2005), Brazil (1990; 1994-1999), Chile (1984-1986), Colombia (1984-1987), Mexico (1984-1991; 1994-1997), Venezuela (1994-1995), China (1990-1999), Taiwan (1997-1998), Indonesia (1997-2002), Korea (1997-2002), Malaysia (1997-2002), Philippines (1984- 1987; 1998-2002), Thailand (1984-1987; 1997-2002). Source: Caprio and Klingebiel (2003).
- GDP: current GDP in U.S. dollars of the host. Source: Penn World Tables.
- GDP p/c: real GDP per capita in U.S. dollars of the host. Source: Penn World Tables.
- GDP growth: average real GDP growth rate of the host. Source: IMF.
- Inflation: average consumer price inflation (CPI) rates. Source: IMF.
- Real interest premium: real lending rate in host minus real lending rate in the U.S.
- Openness: share of export plus import volume divided by GDP. Source: IMF.
- U.S. GDP growth: average U.S. real GDP growth rate. Source: IMF.
- Volatility of U.S. real lending rate: three-quarter rolling standard deviation of U.S. real lending rate divided by the corresponding mean.
- Volatility of real interest premium: three-quarter rolling standard deviation of U.S. real lending rate divided by the corresponding mean.
- Financial sector development: private credit from financial sector divided by GDP. Source: Barth, Caprio, and Nolle (2004).
- $\Delta \ln$ (no. of banks): percentage change in number of FFIEC reporting banks. Source: CELS.

- Share of emerging market claims: share of U.S. bank cross-border claims in each sample country divided by the total assets of reporting banks. Source: CELS.
- U.S. bank earnings: U.S. commercial bank net income from 1992 through 2005. Source: Federal Deposit Insurance Corporation Quarterly Banking Profiles.
- U.S. bank earnings volatility: three-quarter rolling standard deviation of quarterly changes in U.S. bank earnings divided by the average earnings over the same period.

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