Financial Globalization and Banking Crises
In Emerging Markets

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ABSTRACT

Bank crises in emerging economies have been a feature of the recent global crisis, and their incidence has increased in the post-Bretton Woods era. This paper investigates the impact of financial globalization on the incidence of systemic bank crises in 20 emerging markets over the years 1976-2002 using measures of *de facto* and *de jure* financial openness. An increase in foreign debt liabilities contributes to an increase in the incidence of crises, but foreign direct investment and portfolio equity liabilities have the opposite effect. A more liberal *de jure* capital regime lowers the incidence of banking crises, while a regime of fixed exchange rates increases their frequency. The results of the econometric analysis is consistent with the experience of East European and central Asian emerging markets, which attracted a relatively large proportion of capital flows in the form of debt in recent years and have been particularly hard hit by the global financial crisis.

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1.   Introduction

The global crisis that began in 2007 has led to renewed interest in the effects of financial globalization. The crisis was largely confined to the United States and Western Europe during the period of 2007 through September 2008. However, after the failure of Lehman Brothers, the U.S. government takeover of "Fannie Mae" (Federal National Mortgage Association) and "Freddie Mac" (Federal Home Mortgage Corporation) and its rescue of the American Insurance Group, the distress in financial markets spread worldwide in the last quarter of 2008. Capital flows slowed and in some cases reversed, as worried firms and investors reallocated their money to safer venues. The ensuing economic contraction extended outside the original group of crisis countries to include the emerging markets and developing economies.

However, the experience of the emerging markets has been far from uniform. While the economies of Asia and Latin America suffered from a precipitous fall in their exports, their financial sectors were largely able to weather the turbulence due to the intervention of domestic regulators and central banks. Financial sectors in the countries of East Europe and the Commonwealth of Independent States (CIS), on the other hand, collapsed in response to a falloff in foreign capital flows despite official efforts. The impact of financial globalization on domestic financial stability, therefore, appears mixed.

This record is consistent with results reported in the professional literature. Empirical analyses which have examined the effect of capital controls on banking crises, for example, generally find no evidence of any linkage of financial globalization and the occurrence of banking crises. Bordo et al. (2001) reported a negative and significant relationship between

capital controls and bank crises for 21 countries during the period of 1880-1997; however, when the empirical analysis was done for the post-1973 period alone, the coefficient on the capital controls variable was not statistically significant. Eichengreen and Arteta (2002) found that capital account liberalization had no influence on the incidence of banking crises in 75 developing countries over the period of 1975-1997. Similarly, Edwards (2007) in a study of 163 countries during the years 1970-2000 concluded that banking crises occurred irrespective of the degree of capital mobility.[1]

This paper revisits this issue with a different perspective. We investigate the impact of both *de facto* and *de jure* financial globalization on the incidence of banking crises in emerging markets during the period of 1976-2002. We concentrate on the experience of emerging markets because they have been most vulnerable to banking crises.[2] We then consider more recent data on capital flows to emerging markets to compare the different types of capital flows that have predominated in different regions and their repercussions during the recent crisis.

The next section of the paper discusses how financial globalization could contribute to banking crises in emerging markets. Section 3 describes the data utilized in the empirical analysis. The fourth section reports the results for the empirical analysis of the determinants of

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[1] Angkinand, Sawangnoenyuang and Wihlborg (2008) and Shehzad and De Haan (2009) investigate the impact of financial liberalization on banking crises using updated versions of the financial liberalization index presented by Abiad and Mody (2005). Both papers present the results of estimations of the disaggregated index, including the impact of capital account liberalization, and both report no evidence of a significant impact of capital deregulation.

[2] Husain, Mody and Rogoff (2005) present evidence that emerging markets experience more banking and twin crises than do upper-income or developing economies.

bank crises, and the following section reports the results of several tests of robustness. Section 6 presents data on recent capital flows to emerging markets, and shows how these areas have differed in the types of foreign capital they attracted and their response to the global crisis. The final section summarizes the results and derives some policy implications.

2.   Analysis

Banks are well-suited as intermediaries to deal with the problems associated with asymmetric information in the financial sector. Since banks do not need to share information, they have an incentive to spend resources on obtaining information which they can use in making loans and setting rates. Consequently, firms can obtain finance at terms they deem reasonable. Banks can also monitor compliance with the conditions of a loan agreement.

These bank activities are particularly important in emerging markets which do not have well-established financial markets or other external sources of finance for firms. In the absence of securities markets, firms rely on domestic banks for external credit. Foreign capital may provide an alternative supply of funds, but investment has been shown to be tied to domestic savings (Aizenman, Pinto and Radziwill 2007). Gathering information is more difficult and costly in these countries, which reinforces the domestic banks' advantage in these activities.

Bank crises, therefore, have particularly severe consequences in emerging markets, since they interrupt the flow of savings to those sectors dependent on the banks. Firms which can not obtain short-term credit or face high borrowing costs may fail and economic activity declines. The decline in investment expenditures which follows bank crises contributes to the persistence of their impact (Joyce and Nabar 2009). In the most serious cases, such as Mexico in 1994-95,

East Asia in 1997-98 and Argentina in 2001-02, the banking crises are accompanied by currency crises which exacerbate the situation and result in twin crises (Kaminsky and Reinhart 1999).

Mishkin (2006) describes the circumstances which lead to a banking crisis in an emerging market. Some of these features are shared with upper-income countries, while others are unique to the emerging markets. A deterioration in the banks' balance sheets usually antedates a crisis, as the banks make speculative loans, often in response to government pressure. A rapid rise in domestic credit to the private sector may be a sign of a lending "boom" and "overborrowing" that follows financial deregulation and capital inflows (Gourinchas, Valdés and Landerretche 2001; McKinnon and Pill 1996).

A rise in domestic interest rates can raise the cost of borrowing, which affects the cash flow and profits of private sector borrowers.[3] If adverse selection exists, credit-worthy firms withdraw from the credit markets, leaving behind the more risky firms which are willing to pay the higher rates. The banks may respond by rationing credit. If there is also an increase in uncertainty, possibly due to political events, it becomes more difficult to assess the relative riskiness of investment projects. A number of political assassinations in Mexico in 1994, for example, raised fears regarding the country's political stability.

Another factor which can contribute to a financial crisis is a decline in asset prices, such as stock prices. Such a fall lowers the market valuation of the net worth of firms, which makes banks more reluctant to lend to them. Moreover, all these circumstances—the increase in borrowing costs and uncertainty, and the decline in asset prices—increase the incentive for firms to engage in risky activities in order to restore their profitability.

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[3] The rise may be precipitated by an increase in foreign interest rates. See Di Giovanni and Shambaugh (2008) and Frankel, Schmukler and Servén (2004) for evidence of these linkages.

Bank crises can also reflect fiscal imbalances. In many emerging markets, banks have been pressured by governments to purchase their bonds to finance budget deficits. If subsequent concerns about repayment result in declines in the bonds' prices, the banks' balance sheets and their ability to supply credit weaken. The situation of the banks deteriorates in the case of sovereign default.

Financial globalization can affect the likelihood of a banking crisis or its severity through several channels.[4] On the one hand, the entry of foreign banks in the domestic markets can contribute to more efficiency through increased competition and their introduction of financial innovations (Claessens, Demirgüç-Kunt and Huizinga 2001). Integration with global financial markets may also induce the domestic authorities to implement regulatory and economic policies and institutional reforms which contribute to financial stability. The ability to withdraw their funds gives domestic savers an incentive to monitor the activities of the local banks, and induces the banks to avoid risky lending which could cause the depositors to pull out.

On the other hand, financial flows to emerging market can exacerbate a weak financial situation.[5] Reinhart and Rogoff (2009: 157) point out that "One common feature of the run-up to banking crises is a sustained surge in capital inflows." Domestic borrowers, including banks, which obtain funds from abroad usually borrow in a foreign currency such as the dollar to give foreign investors some reassurance about the value of their investments. If a speculative attack against the domestic currency is successful, however, the cost of repaying debt denominated in a foreign currency rises. Domestic firms unable to repay their obligations may be forced to shut down, which brings about a slowdown in economic activity.

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[4] Prasad et al. (2003) provide an overview of the potential benefits of financial globalization.

[5] See Chang and Velasco (2000, 2001) for recent models of banking crises in open economies.

A domestic banking crisis is also intensified if it is accompanied by a "sudden stop," i.e., an outflow of capital. Calvo and Reinhart (2000) point out that the incidence of nonperforming loans increases after an outflow as real interest rates rise due to higher country risk premiums. Banks subsequently cut back on their lending activity, which contributes to a protracted downturn. In an international crisis such as the Asian crisis, contagion may lead to the transmission of these shocks across borders (Caramazza, Ricci and Salgado 2004; Claessens and Forbes 2001; Kaminsky and Reinhart 2000).

Henry (2007) points to the boom-bust cycle that seems to follow capital account liberalization, but raises three cautionary points. First, crises occur in countries with capital controls as well as those which liberalize. Second, the length of the period of time between capital liberalization and the occurrence of financial crises makes assigning causation to the former difficult. Third, analyses of capital account liberalization often do not distinguish between the different types of capital flows, and in particular, debt flows versus equity. Our empirical analysis is designed to investigate the impact of the different forms of capital flows on bank crises.

3.   Data and Methodology

We investigated the incidence of bank failures in a sample of 20 emerging markets over the period of 1976-2002. In choosing the countries to be included in the analysis, we used the Standard & Poor's Emerging Market Index, the Morgan Stanley Capital International Emerging Market Index and the IMF's International Capital Markets Department's list of emerging

markets. The countries in our sample appeared on at least two of those three lists.[6] The countries are Argentina, Brazil, Chile, Colombia, Egypt, Hungary, Indonesia, Israel, Korea, Malaysia, Mexico, Morocco, Peru, Philippines, Poland, Sri Lanka, Thailand, Turkey, Venezuela and Zimbabwe.

The dates of the bank crises in our sample come from the data base first compiled by Caprio and Klingebiel (1996). The most recent versions of the data appear in Caprio, Klingebiel, Laeven and Noguera (2005) and Laeven and Valencia (2008). This database is widely used in cross-national studies of banking crises, and is the basis of Reinhart and Rogoff (2009)'s dating of banking crises.[7]

Table 1 lists the years of systemic banking crises for each country in our sample. There are a total of 30 separate crises. Several countries had more than one crisis episode, with Argentina accounting for four. Figure 1 shows the number of countries with crises over each year of the sample period. It exhibits a rise during the debt crisis of the 1980s, and a subsequent decline towards the end of the decade. The number of crises rose again at the time of the Mexican crisis and then again during the Asian crisis.

For the panel analysis of the determinants of bank crises using annual data we relied on the past literature on banking crises (Demirgüç-Kunt and Detragiache 1998, 2001; Domaç and Martinez Peria 2003; Eichengreen and Rose 2001; Glick and Hutchison 2001; Honig 2006; Noy 2004; Rossi 1999; Von Hagen and Ho 2007), and in particular Demirgüç-Kunt and Detragiache's

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[6] Since we estimated models with fixed effects, we excluded countries such as Pakistan and South Africa that did not experience banking crises.

[7] Reinhart and Rogoff (2009: 10) refer to the Caprio and Klongbiel data as "authoritative, especially in terms of classifying banking crises into systemic versus more benign categories."

(2005) survey, for our choice of control variables. Table 2 reports the mean values of the variables and their standard deviations. We include the rate of real GDP growth (YGR), which is expected to lower the incidence of financial crises. The inflation rate (INF), which reflects macroeconomic volatility and should have the opposite effect, is calculated as the natural log of one plus the change in the Consumer Price Index. We also enter real GDP per capita (Y/POP) which has been negatively linked to banking crises in studies with data from both developed and developing economies.[8] We lagged these domestic variables in order to minimize feedback from the crisis to the control variables.[9]

In addition, we use lagged values of financial variables. We utilize bank credit to the private sector scaled by GDP (BCPS/Y), which reflects increased lending activity in the economy. We also include the ratio of broad money to the foreign exchange reserves of the central bank (M2/RES), which is an indicator of a country's vulnerability to a foreign sector crisis and could increase the probability of a banking crisis.

We also used measures of each country's actual trade or financial openness. We measure the former with the traditional measure of exports and imports scaled by GDP (XM/Y), and the latter by foreign assets and liabilities also scaled by GDP (FAL/Y). The latter measurement is based on the data of Lane and Milesi-Ferretti (2007), who assembled a dataset for the stocks of

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[8] We did not include the real interest rate as these data are often not reported in emerging markets. There were no interest data available for over 40% of our observations.

[9] Among other researchers who used lagged values are Domaç and Martinez Peria (2003), Eichengreen and Arteta (2002) and von Hagen and Ho (2007). It is possible that the lagged values reflect expectations of future bank crises. But given the rapidity of financial events, it is unlikely that a bank crisis would not occur until the year following the change in expectations.

gross foreign assets and liabilities for 145 nations during the period of 1970-2004. We also used their data on foreign assets (FA/Y) and liabilities (FL/Y), and the components of the latter, foreign direct investment (FDIL/Y), portfolio equity (FPEL/Y) and debt investments (FDL/Y).

There is a difference between the two indicators of openness: the trade variable measures flows while the financial variables are stock measurements. We used the lagged value of trade openness in the empirical analysis since a flow variable could change in response to a bank crisis. However, we use the contemporaneous values of financial openness since these stock measurements change slowly over time. But we also test the robustness of the results in Section 5.

For a measure of *de jure* capital openness, we use the Chinn-Ito (2008a, 2008b) measure of capital controls (CAP).[10] The Lane and Milesi-Ferretti data measure *de facto* financial integration, while the Chinn-Ito measure is based on the *de jure* regulatory environment in 182 countries over the period of 1970-2006. The index is based on data reported in the IMF's *Annual Report on Exchange Arrangements and Restrictions* on the existence of multiple exchange rates, restrictions on the current and capital accounts and requirements to surrender export proceeds. The Chinn-Ito index is the first principal component of these four indicators, and ranges in value from -1.8 in the case of full control to 2.6 in the case of complete liberalization.

In addition, we utilize the exchange rate regime classification developed by Reinhart and Rogoff (2004) to develop an indicator of fixed exchange rate regimes. Their classification system, which is based on market data rather than official statements, ranges from 1 for countries without a separate legal tender through various arrangements of pegs and crawling bands to

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[10] See Quinn, Schindler and Toyoda (2010) for a comparison of the properties of the different types of capital openness measurements.

freely floating rates, denoted by 13. There are separate categories for freely falling rates and dual markets with missing data. We defined FIX as an indicator for fixed exchange rates which takes the value of one if the Reinhart and Rogoff system indicates a pegged or crawling peg or band less than or equal to 2%.[11] The most recent available data covers 165 countries from 1946-2007.

We also defined a contagion variable, CONTAG, which takes the value of unity when another country in the area also has a banking crisis. The country groups used to calculate this variable, and the sources of the other data series, are reported in the Appendix.

In the empirical analysis we were interested in the determinants of the onset of a banking crisis. Therefore, we used a binary variable which took the value of one in the first year of a crisis as the dependent variable. We deleted the following years of the crisis from the data, as well as the first year following the crisis, to minimize the impact of the crisis on the right-hand variables.

Studies of discrete events such as banking crises use logit or probit estimation models. We used a conditional fixed-effects estimation to account for unobservable differences among the countries in our sample (Chamberlain 1980). We also included time dummies to account for year-specific shocks.

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[11] This definition corresponds to categories 1 through 8 in the Reinhart and Rogoff (2004) classification system.

4. Determination of Banking Crises

Table 3 reports the results of the initial estimations of the determinants of bank crises (we suppress the coefficients of the time dummies).[12] Equation 3.1 reports the results for the lagged control variables. The coefficient of real economic growth is negative, as expected, and significant at the 5% level. Bank crises are more likely to occur when the economy is slowing down. In addition, the amount of bank credit to the private sector has a positive effect on banking crises which is significant at the 5% level, consistent with the hypothesis that crises follow lending "booms." Kaminsky and Reinhart (1999) also found that financial crises are preceded by a slowdown in economic activity and an increase in credit relative to GDP. Inflation has a negative positive coefficient which is significant at the 10% level.

The two indicators of trade and *de facto* financial openness are added in equation 3.2, and neither coefficient is significant. The inflation variable, however, is now significant at the 5% level; bank crises are more likely to occur in the wake of periods of high inflation. The domestic credit variable falls in significance as the foreign assets and liabilities variables are added. This may be due to the impact of financial globalization on domestic credit, since capital flows contribute to the growth of domestic credit. Mendoza and Terrones (2008: 14) in their study of credit booms report: "…in emerging economies we find that over 50 percent of credit booms were preceded by large capital inflows."

In equation 3.3 we replace foreign assets and liabilities with foreign assets scaled by GDP and foreign liabilities scaled by GDP, since the two variables may have different impacts. The

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[12] The estimated coefficients in a logistic regression measure the impact of a change in the independent variable on the odds ratio, i.e., the ratio of the probability of the occurrence of an event relative to the probability of its non-occurrence.

latter variable is negative and significant at the 5% level; an increase in foreign liabilities is associated with a greater incidence of bank failures. The impact of financial globalization, therefore, depends on whether a country increases its stock of assets or liabilities.

In equation 3.4, we replace foreign liabilities with its three components each scaled by GDP: foreign direct investment, portfolio equity and debt (bonds and bank lending). The foreign debt variable has a positive coefficient which is significant at the 1% level, while foreign direct investment and portfolio equity liabilities have negative coefficients which are significant at the 10% level. The pseudo R^2 rises from 0.499 in the previous equation to 0.639.

These results indicate that the type of foreign liability that a country incurs has an impact on whether foreign liabilities promote or hinder the incidence of banking crises, as Henry (2007) suggested. Foreign debt liabilities raise the probability of such a crisis, while there is evidence that foreign direct investment or portfolio equity liabilites lessen its likelihood. What could account for the difference in the effects of the various forms of financial globalization on bank crises? First, short-term debt flows can be reversed, leaving domestic banks and firms without funding. FDI can not be reversed as easily, and foreign holders of domestic equity must arrange for the sale of their shares if they want to divest. Second, debt and interest payments must be repaid unless there is a rescheduling of the debt. The holders of foreign direct investment liabilities and portfolio equity accept the risk that profits and dividends depend on domestic economic conditions. Third, those firms which are financed by foreign firms may be able to receive additional financing from their parents when domestic funds are not available. These firms may also be less vulnerable to a domestic economic contraction.

In Table 4, we extend our analysis to include the *de jure* capital openness regime. We include the control variables and the three financial liability variables which were significant in

the former table: foreign direct investment, portfolio equity and foreign debt. We did not include the trade openness variable as it was not significant in the previous table or in any other specifications we tested. The foreign debt liability variable is always significant at the 1% or 5% level, and the portfolio equity liability variable rises to 5% significance in three equations.

First, we add the Chinn-Ito measure of capital regulatory openness on a lagged basis and also the lagged indicator of a fixed exchange rate regime, based on the Reinhart-Rogoff measure. Both coefficients are significant at the 5% level, and the pseudo-R^2 rises to 0.687. The capital control measure has a negative coefficient, which implies that countries with more open capital regimes are less likely to have bank crises.[13] This may indicate that capital regulatory mobility induces governments to enact policies to forestall bank crises. This result differs from those reported in some of the papers cited in the Introduction of this paper. On the other hand, Figure 1 demonstrates that the largest number of crises occurred in the early 1980s, before the wave of capital deregulation that occurred in many of these countries.

The positive coefficient on the fixed exchange rate indicator is consistent with the view that countries defending pegged exchange rates are more susceptible to financial crises. Fisher (2001) claimed that such crises were the result of an inconsistency between increased capital flows following capital market deregulation with existing exchange rate pegs. In equation (4.2) we examined the interaction of the two regime variables, but the interactive variable was not significant and the two regime variables lose significance.

In equation 4.3 we added a fiscal variable, the lagged value of government consumption scaled by GDP. The coefficient is positive and significant at the 10% level, and the pseudo-R^2

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[13] Glick and Hutchison (2005) and Glick, Guo, and Hutchison (2006) report that countries with less restrictive capital controls are less prone to speculative currency attacks.

rises to 0.759. Increased government spending, therefore, may exert an influence on the incidence of bank crises, which is consistent with the analysis reviewed in Section 2.

In equation 4.4 we added the current account scaled by GDP. Its coefficient is negative and significant the 5% level, while the financial globalization variables retained their significance. Bank crises are be more likely when a country has a current account deficit. The deficits can be financed by private capital inflows, which can be reversed.

In equation 4.5 we added a contagion variable. This variable takes the value of one when another country in the geographic area had a bank crisis.[14] It has a positive coefficient which is significant at the 10% level. This result, however, is ambiguous since it may reflect the impact of a crisis in the domestic economy on its geographic partners. The contagion variable is not significant when its lagged value is substituted.

The results for the determination of bank crises, therefore, indicate that a slowdown in economic growth, an increase in inflation and an expansion of bank credit precede the outbreak of a banking crisis. The evidence regarding financial openness is more mixed. Financial integration can lead to a higher probability of a crisis if the integration takes the form of debt liabilities, but foreign direct investment and portfolio investment have the opposite effect. A more open capital account regulatory regime is associated with a lower likelihood of a banking crisis.

Bonfiglioli (2008) also investigated the linkages of *de jure* and *de facto* financial integration on the probability of a banking crisis. She found that *de jure* openness was not a significant determinant of systemic banking crises, although it was of borderline crises. *De facto*

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[14] The areas are defined in the Data Appendix.

integration as measured by the Lane and Milesi-Ferretti data had no impact on the incidence of these crises, although it affected currency crises.

Our results have an interesting similarity to those reported by Kose, Prasad and Terrones (2009) in their study of the impact of financial openness on total factor productivity (TFP) growth. They also used the Lane and Milesi-Ferretti data on foreign assets and liabilities, and they disaggregated foreign liabilities between FDI with portfolio equity as one variable and foreign debt liabilities as another. In their results they found that FDI and equity liabilities raised TFP growth while debt liabilities reduced it. They also investigated the impact of *de jure* openness, and when they used the Chinn-Ito measure found some evidence that it had a positive impact on TFP growth. Our results may provide an explanation for these findings, as we would expect bank crises to hinder productivity growth.

5.   Robustness

We tested the robustness of our results in several ways which are reported in Table 5. First, we changed the number of years after a bank crisis which are excluded from the data from one to two to ensure that our results do not reflect the impact of the crisis on the determinants. The results in Equation 5.1 are similar to those reported above.

Second, we substituted instrumented values (IV) of the three *de facto* financial globalization variables, based on their previous values and lagged output and inflation. In the results in equation 5.2, the foreign debt variable retains its significance, while the remaining two types of foreign capital do not. As the latter two variables were only significant at the 10% level in some cases when the contemporaneous values were used, it is not surprising that they lose significance when the instrumented values are utilized.

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Third, we tested the robustness of the exchange rate regime finding in two ways. In equation 5.3, we substitute the original Reinhart-Rogoff data (RR) for the binary indicator which we constructed. This variable is negative and significant, which confirms that increases in the flexibility of an exchange rate regime lower the probability of a banking crisis.

In equation 5.4 we substituted the indicator of a fixed exchange rate regime presented by Klein and Shambaugh (2008) (KLSH). They consider a country as having a fixed exchange rate regime if its month-end bilateral exchange rate with the currency of a base country remains within a band of plus or minus 2% over the course of a year. In equation 5.3 the coefficient of this binary variable is positive and significant at the 11% level, thus lending some support to our reported result.

We also tested other variables to determine if they should be added to the analysis. We utilized the components of a country's stock of foreign assets (FDI assets, portfolio equity assets and debt assets) as possible determinants, but none of these was significant. Similarly, we introduced the U.S. Treasury bill rate and the growth rate of the OECD countries to determine if external factors were responsible for the bank crises, but these did not appear to have an impact. Finally, we lagged the control variables by two years and added these to the model, but none was significant.

6.   Recent Experience

The recent global crisis which originated in the fall of 2008 spread rapidly through the rest of that year and the first half of 2009. The global economy began to recover in the second half of 2009, but the resumption of growth was uneven across different regions. The IMF (2009), for example, found that emerging and developing economies were further ahead on the road to

recovery than the advanced economies. However, the IMF (2009: xiv) also reported, "Many countries in emerging Europe and the Commonwealth of Independent States have been hit particularly hard by the crisis, and developments in these economies are generally lagging those elsewhere."

The IMF (2009: 76) explained that "Emerging Europe has been hit particularly hard by the drop in capital inflows. This led to major contractions in the Baltic economies, Bulgaria, and Romania…" The Fund noted that Bosnia, Hungary, Latvia, Romania and Serbia were in IMF programs, while Poland had qualified for the newly-instituted Flexible Credit Line. Similarly, "The economic fallout of the global crisis on the CIS (Commonwealth of Independent States) has been intense and is weighing heavily on the region's economic outlook." The IMF attributed the decline in economic activity in the lower-income CIS states to the cessation of foreign funding. Countries borrowing from the IMF included Armenia, Belarus, Georgia and the Ukraine.

An investigation of capital flows to emerging markets in the years before the crisis reveals differences in the types of capital that flowed to these economies (Tables 6, 7 and 8).[15] FDI accounted for about one-third of the capital flows to emerging markets in Europe and central Asia by 2006, but approximately one-half of the flows to Asia and Pacific area countries as well as Latin America and the Caribbean. The proportion of capital flows consisting of debt, on the other hand, rose to 59.7% of the flows to Europe and central Asia, but only 29.8% in Asia and the Pacific region and a relatively minor 2.6% in Latin America and the Caribbean. The emerging markets in Europe and central Asia, therefore, attracted relatively more foreign capital in the form of debt than the other areas, which made them more vulnerable to outflows.

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[15] We omitted data for the Middle East and North African countries as many of these are oil exporters, and the Sub-Saharan African nations as most of these are developing economies.

The risk of a reversal of the debt flows was noted by Felices, Hoggarth and Madouros (2008). In an analysis of the sustainability of capital flows to emerging market economies, they concluded that recent flows were less likely to be reversed than those which occurred before the East Asian and Russian crises of 1997-98. They pointed out that the emerging markets had attracted more FDI in the current decade than they had in the previous period, and had issued more government debt in their domestic currencies. However, the authors also pointed out that countries in Central and East Europe had attracted large foreign-currency debt inflows, and that the demand for these assets could drop in response to a slowdown in the global economy or a reversal of the tolerance for risk.

This conjecture regarding the greater potential for reversal when inflows consist of debt is consistent with econometric results reported by Sula (2009). He investigated the effects of capital inflows to 38 emerging market economies between 1990 and 2003. Sula (2009) reported that capital flows dominated by private loans and portfolio flows are more likely to cause a sudden stop than do flows consisting of FDI.

Recent developments, therefore, are consistent with the econometric results reported in the previous sections of this paper. Those emerging markets with relatively more debt experienced more distress during the worldwide financial crisis, and their financial fragility left them more susceptible to economic contractions. Other areas which had attracted more capital in the form of foreign direct investment and portfolio equity also suffered from the global downturn but recovered more quickly.

7.   Summary

Bank crises take place in emerging markets when there is a slowdown in output, an increase in inflation and following a boom in bank lending to the private sector. But our results demonstrate these crises are not a purely domestic phenomenon, and the type of foreign liability a country incurs before a crisis also has an impact. Crises are more likely to occur when a country has accumulated external debt liabilities On the other hand, there is some evidence that foreign direct investment and portfolio investment within a country contribute to a smaller incidence of these crises. A more open capital account regulatory regime lowers the likelihood of a bank crisis occurring.

The effect of financial globalization, therefore, on the domestic financial sector is not a simple phenomenon. Opening the capital account can confer benefits if it leads to equity flows to the domestic economy. But an increase in debt can have adverse consequences, particularly if there is a fixed exchange rate or it finances a current account deficit.

The results of this research largely confirm the recommendations of recent studies of the optimal sequencing of capital account liberalization, such as those of Ishii and Habermeier (2002) and Prasad and Rajan (2008). These studies acknowledge that financial liberalization may leave a country more vulnerable to financial crises. They recommend that financial markets and institutions should be developed, prudential regulations enacted and macroeconomic stability achieved before capital flows are deregulated. Inflows of foreign direct investment should be liberalized first, followed by other long-term flows. Full liberalization of all capital inflows should follow an assessment of the impact of the deregulation that has taken place, and should be accompanied by monitoring of potential vulnerabilities in the financial sector.

The most recent events in Europe confirm the need for prudence in moving towards financial globalization. There are concerns about the ability of several nations to meet their debt obligations, and European banks hold significant amounts of this debt. The Bank for International Settlements, for example, has estimated that European banks hold $189 billion of Greek private and public debt.[16] In May 2010, the European Central Bank suspended a rule which prevented it from accepting bonds from Greek banks as collateral in order to allow them to maintain access to its lending facilities. Banks in advanced economies are not immune from crises, as Reinhart and Rogoff (2009) point out, and sovereign debt may emerge as cause of a new wave of bank failures.

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[16] "Greece and European Banks," *Financial Times*, May 3, 2010.

Table 1

Crisis Dates

Country	Systemic Banking Crises
Argentina	1980-1982, 1989-1990, 1995, 2001-2002
Brazil	1990, 1994-1999
Chile	1976, 1981-1983
Colombia	1982-1987, 1998-2001
Egypt	1980-1983
Hungary	1991-1995
Indonesia	1997-2002
Israel	1977-1983
Korea	1997-2002
Malaysia	1997-2001
Mexico	1981-1991, 1994-2000
Morocco	1980-1982
Peru	1983-1990
Philippines	1983-1987, 1997-2002
Poland	1992-1995
Sri Lanka	1989-1993
Thailand	1983-1987, 1997-2002
Turkey	1982-1985, 2000-2002
Venezuela	1994-1995
Zimbabwe	1995-1996

Sources: Caprio, Klingebiel, Laeven and Noguera (2005), Laeven and Valencia (2008)

Table 2

Summary Statistics

Name	Mean	Standard Deviation
BC/Y	63.107	39.410
CAP	-0.331	1.376
FA/Y	23.911	17.286
FAL/Y	86.960	40.272
FDI/Y	11.236	11.507
FDL/Y	49.263	22.253
FL/Y	63.048	27.176
FPEL/Y	2.470	4.495
INF	0.281	0.499
M2/RES	365.811	3422.016
XM/Y	56.877	32.467
Y/POP	3377.695	3420.053
YGR	3.974	4.586

Table 3

Determinants of Bank Crises:
De Facto Financial Integration

	(3.1)	(3.2)	(3.3)	(3.4)
YGR(-1)	-0.171**	-0.155**	-0.137*	-0.137
	(0.071)	(0.071)	(0.075)	(0.109)
INF(-1)	1.738*	2.149**	2.329**	4.368**
	(0.985)	(1.039)	(1.020)	(1.714)
Y/POP(-1)	-0.000	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
BCPS/Y(-1)	0.041**	0.035*	0.032	0.029
	(0.017)	(0.019)	(0.020)	(0.031)
M2/RES(-1)	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
XM/Y(-1)	-	0.008	0.005	0.060
		(0.024)	(0.024)	(0.042)
FAL/Y	-	0.023	-	-
		(0.016)		
FA/Y	-	-	-0.068	-
			(0.048)	
		-		
FL/Y	-		0.074**	-
			(0.031)	
FDIL/Y	-	-	-	-0.252*
				(0.129)
FPEQ/Y	-	-	-	-0.452*
				(0.253)
FDL/Y	-	-	-	0.159***
				(0.052)
χ^2	67.38***	70.01***	75.1***	92.38***
Pseudo-R^2	0.4478	0.4652	0.4991	0.6393
Observations	373	373	373	353

Note: Equations estimated with conditional logit and time dummies. Constants not reported. Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 4

Determinants of Bank Crises:
De Jure Capital Account Regime

	(4.1)	*(4.2)*	*(4.3)*	*(4.4)*	*(4.5)*
YGR(-1)	-0.123	-0.125	-0.173	-0.220	-0.338
	(0.107)	(0.105)	(0.171)	(0.135)	(0.265)
INF(-1)	3.698**	3.731**	2.903	2.978	6.045*
	(1.612)	(1.605)	(2.126)	(1.871)	(3.324)
Y/POP(-1)	-0.001	-0.001	0.002	0.002	0.005*
	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
BCPS/Y(-1)	0.053	0.055	0.053	0.064	0.100
	(0.038)	(0.039)	(0.048)	(0.044)	(0.065)
M2/RES(-1)	0.000	0.000	0.001	-0.000	-0.001
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
FDIL/Y	-0.253*	-0.258*	-0.325*	-0.353**	-0.514*
	(0.136)	(0.135)	(0.175)	(0.176)	(0.264)
FPL/Y	-0.697**	-0.747*	-0.760*	-0.795**	-1.518**
	(0.347)	(0.383)	(0.435)	(0.404)	(0.742)
FDL/Y	0.205***	0.214***	0.186**	0.183**	0.402**
	(0.068)	(0.073)	(0.085)	(0.091)	(0.197)
CAP(-1)	-1.930**	-1.452	-3.916**	-2.888**	-6.163**
	(0.904)	(1.432)	(1.751)	(1.315)	(2.948)
FIX(-1)	3.149**	2.443	6.677**	4.664**	6.841*
	(1.424)	(2.152)	(3.350)	(2.153)	(3.824)
CAP(-1)*FIX(-1)	-	-0.683	-	-	-
		(1.692)			
GC/Y(-1)	-	-	0.556*	-	-
			(0.319)		
CUR/Y(-1)	-	-	-	-0.338**	-0.403
				(0.170)	(0.281)
CONTAG	-	-	-	-	5.850*
					(3.515)
χ^2	94.78***	94.95***	98.12***	96.36***	103.46***
Pseudo-R^2	0.6869	0.6880	0.7585	0.7330	0.7870
Observations	332	332	303	307	307

Note: See Table 3.

Table 5
Robustness Tests

	(5.1)	*(5.2)*	*(5.3)*	*(5.4)*
YGR(-1)	-0.110	-0.051	-0.131	-0.180
	(0.108)	(0.088)	(0.114)	(0.123)
INF(-1)	3.707**	2.992**	5.116***	3.564**
	(1.601)	(1.331)	(1.967)	(1.698)
Y/POP(-1)	0.000	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
BCPS/Y(-1)	0.043	0.013	0.057	0.050
	(0.039)	(0.023)	(0.040)	(0.037)
M2/RES(-1)	-0.001	-0.001	-0.001	-0.001
	(0.002)	(0.001)	(0.001)	(0.001)
FDIL/Y	-0.250*	-0.152	-0.248	-0.263*
	(0.137)	(0.120)	(0.159)	(0.145)
FDIL/Y(IV)	-	-0.152	-	-
		(0.120)		
FPL/Y	-0.621*	-	-0.737**	-0.547*
	(0.344)		(0.337)	(0.297)
FPL/Y(IV)	-	0.085		
		(0.136)		
FDL/Y	0.201***	-	0.255***	0.165**
	(0.069)		(0.086)	(0.064)
FDL/Y(IV)	-	0.135**	-	-
		(0.054)		
CAP(-1)	-1.777**	-0.888*	-2.424**	-1.325*
	(0.880)	(0.496)	(0.968)	(0.754)
FIX(-1)	3.048**	1.748*	-	-
	(1.392)	(1.026)		
RR(-1)	-	-	-0.578**	-
			(0.254)	
KLSH(-1)	-	-	-	1.527
				(0.955)
χ^2	90.69***	75.76***	95.18***	90.94***
Pseudo-R^2	0.6821	0.5490	0.6898	0.6590
Observations	314	332	332	332

Note: See Table 3 and text.

Table 6

Net Capital Flows to Europe and Central Asia

	2002	2003	2004	2005	2006	2007	2008 (est)
Net FDI	18.5 (42.3%)	30.5 (34.2%)	55.5 (41.3%)	62.8 (32.7%)	114.9 (36.9%)	154.4 (32.8%)	170.8 (66.0%)
Net Portfolio Equity	3.5 (8.0%)	0.7 (0.8%)	3.6 (2.7%)	8.0 (4.2%)	10.5 (3.4%)	26.4 (5.6%)	-8.4
Net Debt	21.7 (49.7%)	58.1 (65.1%)	75.2 (56.0%)	121.3 (63.1%)	185.9 (59.7%)	290.6 (61.6%)	88.1 (34.0%)
Net Private Inflows	43.7	89.3	134.3	192.1	311.3	471.4	250.5

Note: Figures in top rows are in billions of dollars. Second row shows type of capital flow as percentage of all private capital inflows.

Source: *Global Development Finance 2009*

Table 7

Net Capital Flows to Asia and Pacific

	2002	2003	2004	2005	2006	2007	2008 (est)
Net FDI	66.1 (93.2%)	62.2 (63.9%)	78.1 (50.6%)	114.7 (53.8%)	128.4 (46.2%)	205.2 (52.1%)	232.6 (86.3%)
Net Portfolio Equity	4.8 (6.8%)	20.5 (21.0%)	28.3 (18.3%)	38.1 (17.9%)	66.6 (24.0%)	71.3 (18.1%)	25.4 (9.4%)
Net Debt	-0.5	14.7 (15.1%)	48.1 (31.1%)	60.2 (28.3%)	82.9 (29.8%)	117.2 (29.8%)	11.5 (4.3%)
Net Private Inflows	70.4	97.4	154.5	213.0	277.9	393.7	269.5

Note: Figures in top rows are in billions of dollars. Second row shows type of capital flow as percentage of all private capital inflows.

Source: *Global Development Finance 2009*

Table 8

Net Capital Flows to Latin America and the Caribbean

	2002	*2003*	*2004*	*2005*	*2006*	*2007*	*2008 (est)*
Net FDI	53.0 (97.4%)	42.3 (74.2%)	64.9 (91.9%)	70.8 (62.7%)	71.6 (84.2%)	107.5 (49.8%)	124.8 (93.3%)
Net Portfolio Equity	1.4 (2.6%)	3.3 (5.8%)	-0.6	12.2 (10.8%)	11.2 (13.2%)	29.6 (13.7%)	-6.5
Net Debt	-28.8	11.4 (20.0%)	5.7 (8.1%)	29.9 (26.5%)	2.2 (2.6%)	78.8 (36.5%)	8.9 (6.7%)
Net Private Inflows	25.6	57.0	70.0	112.9	85.0	215.9	127.2

Note: Figures in top rows are in billions of dollars. Second row shows type of capital flow as percentage of all private capital inflows.

Source: *Global Development Finance 2009*

Figure 1
Systemic Crises Per Year,
1976-2002
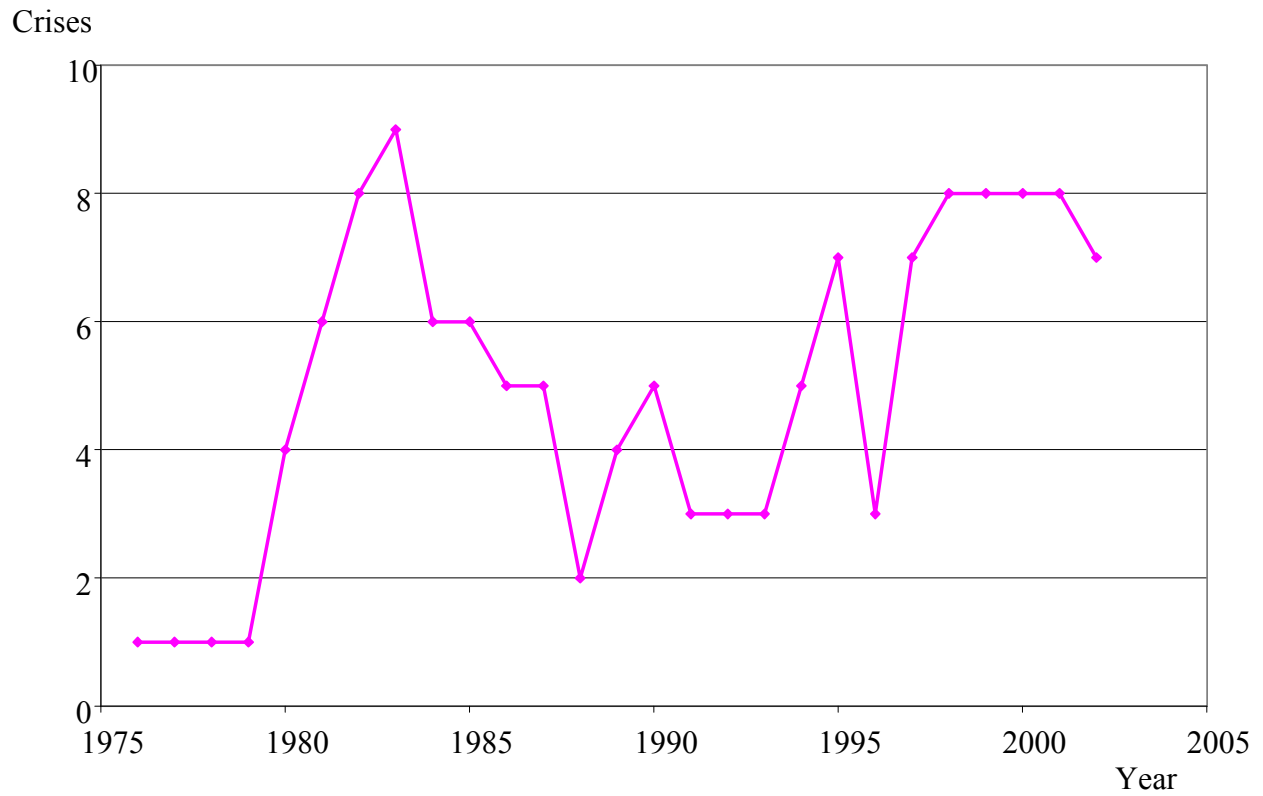
Appendix

Data Sources

Symbol	Definition	Source
SYSCRI1, SYSCRI2	Systemic Bank Crisis	Caprio, Klingebiel, Laeven and Noguera (2005), Laeven and Valencia (2008)
BCPS/Y	Banking Sector Credit to Private Sector (% of GDP)	*World Development Indicators*
CAP	Chinn-Ito Financial Openness	Chinn and Ito (2007, 2008), http://web.pdx.edu/~ito/
CUR/Y	Current Account (% of GDP)	*World Development Indicators*
FIX, RR	Reinhart-Rogoff Exchange Rate Classifications	Reinhart and rogoff 92004) http://www.wam.umd.edu/~creinhar/
INF	Natural log of (1 + CPI Growth Rate)	*World Development Indicators*
FAL/Y	Foreign Assets and Liabilities (% of GDP)	Lane and Milesi-Ferretti (2007),
FA/Y	Foreign Assets (% of GDP)	http://www.imf.org/external/pubs/ft/wp/2006/
FL/Y	Foreign Liabilities (% of GDP)	data/wp0669.zip
FDIL/Y	FDI Liabilities (% of GDP)	
FPEL/Y	Portfolio Equity Liabilities (% of GDP)	
FDL/Y	Foreign Debt Liabilities (% of GDP)	
GC/Y	Government Consumption (% of GDP)	*World Development Indicators*
KLSH	Klein-Shambaugh Exchange Rate Regime Classification	Klein and Shambaugh (2008), http://www.dartmouth.edu/~jshambau/
M2/RES	Money and Quasi-money (% of Reserves)	*World Development Indicators*
XM/Y	Trade (% of GDP)	*World Development Indicators*
Y/POP	GDP per capita (constant 2005 dollars)	*World Development Indicators*
YGR	GDP Growth Rate (%)	*World Development Indicators*

Note: *World Development Indicators* is the online database of the World Bank.

The regions used to construct CONTAG were: Western Hemisphere (Argentina, Brazil, Chile, Columbia, Mexico, Peru, Venezuela); Middle East and Africa (Egypt, Israel, Morocco, Turkey, Zimbabwe); Eastern Europe (Hungary, Poland); Asia (Indonesia, South Korea, Malaysia, Philippines, Sri Lanka, Thailand).

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