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Episodes of Large Capital Inflows and the Likelihood of Banking and Currency Crises and Sudden Stops

Davide Furceri,

Stéphanie Guichard,

Elena Rusticelli

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EPISODES OF LARGE CAPITAL INFLOWS AND THE LIKELIHOOD OF BANKING AND CURRENCY CRISES AND SUDDEN STOPS

ECONOMICS DEPARTMENT WORKING PAPER No.865

by Davide Furceri, Stéphanie Guichard and Elena Rusticelli

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ABSTRACT/RÉSUMÉ

Episodes of Large Capital Inflows and the Likelihood of Banking and Currency Crises and Sudden Stops

This paper provides an empirical investigation of the relationship between surges in capital inflows and the probability of subsequent banking, currency and balance-of-payment crises. Using a panel of developed and emerging economies from 1970 to 2007, it is shown that a large capital inflow episode increases substantially the probability of having a banking or a currency crisis in the two following years. The effect is especially large for the case of balance-of-payment crises. The paper also finds that the effect of large capital inflows is different depending on the type of flows characterising the episode. In particular, large capital inflows that are debt-driven significantly increase the probability of banking, currency and balance of payment crises, whereas if inflows are driven by equity portfolio investment or FDI there is a negligible effect. This means that structural reforms that modify the composition of capital flows towards a lower share of debt are likely to reduce the financial vulnerabilities to large capital inflows. At the same time, however, structural reforms may also increase the overall size of capital flows.

JEL classification: E44; E51; F1; F34.
Keywords: Capital flows; banking crises; financial crises; sudden stops.

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Épisodes d'entrées massive de capitaux et risqué de crises bancaires et de changes et d'arrêt brutal du financement extérieur

Ce document présente une étude empirique de la relation entre les fortes entrées de capitaux et la probabilité de crises bancaires, financière ou de balance des paiements ultérieures. Les résultats obtenus sur un panel d'économies développées et émergentes de 1970 à 2007 suggèrent que les épisodes de fortes entrées de capitaux ou «mannes» augmentent fortement la probabilité d'avoir une crise bancaire ou une crise de change dans les deux années suivantes. L'effet est particulièrement grand pour les crises de balance des paiements. Le document montre également que l'effet des mannes de capitaux est différent selon le type de flux de capitaux qui les caractérisent. En particulier les mannes de dette augmentent de manière très significative la probabilité de crise bancaire, de change et de balance des paiements, alors que les mannes d'investissements de portefeuille en actions et de l'IDE ont un effet négligeable. Cela signifie que les réformes structurelles qui modifient la composition des flux de capitaux vers une plus faible part de la dette sont susceptibles de réduire la vulnérabilité financière associée aux larges entrées de capitaux. Toutefois, les réformes structurelles risquent aussi d'augmenter le montant total the flux de capitaux.

Classification JEL : E44 ; E51 ; F1 ; F34.
Mots-Clés : Flux de capitaux ; crises bancaires ; crises financières ; arrêt brutal des entrées de capitaux

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EPISODES OF LARGE CAPITAL INFLOWS AND THE LIKELIHOOD OF BANKING AND CURRENCY CRISES AND SUDDEN STOPS

by

Davide Furceri, Stéphanie Guichard and Elena Rusticelli[1]

1. Introduction

1. Global financial integration in principle allows for better international allocation of saving and investment, but also increases vulnerabilities associated with international capital flows. Indeed, while global financial integration generally supports long-term income growth, it can also make macroeconomic management more difficult because of the increased risks of overheating, credit and asset price boom-and-bust cycles and abrupt reversals in capital inflows. The global financial crisis has also demonstrated that the financial transmission of shocks across countries is now faster and more complex than in previous decades.

2. While there is no clear consensus in the literature regarding the link between financial globalisation and financial crises,[2] there is a conventional perception that episodes of large capital inflows increase the fragility of the financial system and the risk of abrupt reversals in capital inflows. Episodes of large capital inflows, or "bonanza" episodes, may increase vulnerabilities and financial risks via several channels. First, bonanza episodes may be associated with large exchange rate appreciations which may lead to *Dutch disease* situations. At the same time, a bonanza episode may make an abrupt reversal of such flows more likely, which may in turn cause lasting output contractions, especially in the presence of a fixed exchange rate regime. Large capital inflows may also lead to upward pressure in asset prices, increase the exposure of the economy to foreign liabilities, and fuel foreign-financed credit booms, which may

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1. The authors are members of the Macroeconomic Analysis Division of the OECD Economics Department. They would like to thank colleagues of the OECD Economic Department and in particular Rudiger Ahrend, Jens Arnold, Romain Duval, Jorgen Elmeskov, Jean-Luc Schneider, Cyrille Schwellnus and Dave Turner for helpful discussions, suggestions and support and to Diane Scott for assistance in preparing the document. The views expressed in this paper are those of the authors and do not necessarily represent those of the OECD or its member countries.

2. Demirgüç-Kun and Detragiache (1998) find that banking crises are more likely to occur in liberalized financial systems. In contrast, Glick and Hutchinson (2001) find little evidence that capital account liberalisation by itself affect vulnerabilities to banking crises. Similarly, Edwards (2005) finds no evidence that countries with higher capital mobility tend to have a higher incidence of balance of payment crises. Glick *et al*. (2006) find that capital account openness reduces the probability of currency crises.

subsequently turn to burst when capital flows are reversed. These arguments have generally been supported by the empirical literature.[3]

3. The purpose of this paper is to contribute further to the literature on the relation between large capital inflow episodes and financial vulnerabilities by analysing how such episodes affect the likelihood of banking, currency and balance of payment crises, given the strong interconnection and ambiguous direction of causality between the different types of crisis.[4] The paper also analyses whether the composition of inflows on FDI, equity portfolio or debt influences the effect of large capital inflow episodes. This is important to understand which type of flows are associated with the highest financial vulnerabilities, and is relevant from a policy point of view given that particular structural settings are likely to affect the composition of these flows (Furceri *et al*. 2011).

4. Using a panel of developed and emerging economies from 1970 to 2007, the results suggest that episodes of capital inflow bonanza increase the probability of banking, currency and balance of payment crises. In particular, a large capital inflow episode almost doubles the probability of having a banking or a currency crisis in the two following years. The effect is even bigger for the case of balance-of-payment crises. In addition, the effect of bonanza episodes on the probability of crisis varies depending on the type of flows: debt bonanza episodes significantly increase the probability of banking, currency and balance-of-payment crises, whereas bonanza episodes in equity portfolio investments or FDI have a negligible effect. This means that structural reforms that modify the composition of capital flows toward a lower share of debt may help contain financial vulnerabilities associated with capital inflows.[5] However, at the same time as reducing their riskiness structural reforms may also increase the overall magnitude of capital inflows.

5. The remainder of the paper is organised as follows: section 2 describes the definition and construction of large capital inflow episodes and sudden stops and uses these as the basis of a descriptive analysis. Section 3 presents the empirical methodology used to analyse the relation between banking, currency and balance-of-payment crises and episodes of large capital inflows. Section 4 discusses the results. Section 5 summarises the main findings.

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3. See Reinhart and Reinhart (2009), Caballerro (2010) and Cardarelli *et al.* (2010) for recent papers on the relation between episodes of large capital inflows and financial crises; Edwards (2007) and Agosin and Huaita (2009) for sudden stops; Eichengreen (2003) for recent essays on capital flows and currency crises.

4. A variety of theoretical model have been constructed to explain the linkages between banking, currency and balance of payment crises. One chain of causation runs from balance of payment and currency to banking crises (Stoker, 1994; Miskin, 1996). According to these models external shocks can be transmitted to the banking system which may become in distress when large devaluation occurs and large share of bank liabilities are denominated in foreign currency. Another way of causation runs from banking to balance of payment and currency crises (Velasco, 1987). Banking crises lead to large output contractions that are followed by large currency devaluation and a drop in capital inflows. Finally, a third family of models stipulates that banking and external crises have common causes. An example is the dynamic of an exchange-rate based inflation stabilisation plan (Kaminsky and Reinhart, 1999).

5. Furceri *et al*. (2011) find that growth supportive structural policies, while attracting more net inflows, can modify their composition towards sources of financing that are usually seen as more stable. For example, more competition-friendly product market regulation, less stringent job protection, higher institutional quality and greater capital account openness are associated with a larger component of foreign direct investment (FDI) inflows and a smaller share of debt.

2. Large capital inflow and sudden stop episodes

2.1. Defining large capital inflow and sudden stop episodes

Large capital inflow episodes

6. Following Cardarelli *et al.* (2010) episodes of large capital inflows are determined based on deviations of the *net* capital inflows-to-GDP ratio from its historical trend. Since the overall volatility of net foreign capital inflows can differ across countries, the episodes are defined as sudden and large movements relative not only to the trend experienced by each specific country during that period, but also to the volatility that the country experiences in general. For this purpose a Hodrick-Prescott filter (with a smoothness parameter of 6.25) is applied to estimate the trend of the series for 112 countries over a sample period from 1970 to 2009.[6] The normalisation of net inflows by GDP is a way to take into account the relative magnitude of the inflow surge given the size of the country as well as the macroeconomic fluctuations it is likely to experience.

7. Overall, an episode of large net capital inflow for a country i at time t is identified when E_{it} equals 1 according to the following rule:

$$E_{it}=\begin{cases}1 \; if \; TDev_{it} > \sigma_{TDev_i} \; and \; \frac{NF_{it}}{GDP_{it}} > 1\% \\ 0 \; otherwise\end{cases} \qquad (1)$$

where NF_{it} is the net capital inflow and $TDev_{it} = \frac{NF_{it}}{GDP_{it}} - trend_{it}$ is the deviation from the historical trend and σ_{TDevi} is the standard deviation of detrended *net* capital inflows in country *i*. Therefore, each episode is identified as a sequence of years in which this criterion is met. When between two episodes there is only one year in which E_{it} equals 0 and the corresponding net capital inflows-to-GDP ratio is positive, then the two episodes are combined together in one single episode.

8. This approach identifies 268 episodes from 1970 to 2009 (see Table 1 for a detailed list of these episodes). The majority of episodes were very short and lasted just one year but one-quarter lasted for three years or more (Figure 1). One-quarter of episodes took place in countries that were member of the OECD. In one-fifth of the episodes, mostly in non OECD countries, additional net capital inflows amounted to more that 40% of GDP. The acceleration of financial globalisation in the 2000s was not marked by an increase in the number of episodes, likely reflecting a simultaneous increase in both global inflows and outflows not necessarily reflected in exceptional net inflows. It is only in the years just before the recent crisis that the number of episodes increased dramatically (and one-third were still ongoing in 2009) (Figure 2).

9. In order to test whether the composition of inflows during a large capital inflow episode affected the likelihood of a crisis, distinct episodes for debt (*i.e.* debt portfolio investments plus other investments), equity portfolio and FDI *gross* inflows have been defined in the following way:[7]

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6. Very low-income countries for which capital flows are mostly foreign aid and can be very large and volatile as a share of GDP are excluded from the sample. Countries reporting gaps in the series of capital inflows have not been included in the sample, in order to avoid arbitrary data interpolations.

7. Because the focus is on the composition of the inflows and the way they may affect the receiving economy, the focus is now on gross inflows instead of net flows.

$$E_{it} = \begin{cases} 1 \; if \; TDev_{it} > \sigma_{TDev_i} \; and \; \frac{F_{it}}{GDP_{it}} > \overline{\frac{F_{it}}{GDP_{it}}} \\ 0 \; otherwise \end{cases}$$

where in this case F_{it} represents debt, equity portfolio or FDI gross inflows and $\overline{\frac{F_{it}}{GDP_{it}}}$ is the average over the whole sample. Most of these episodes coincide with a large net capital inflow episode, but not necessarily as one component may be compensated by a weak or negative evolution of the other types of inflows (Tables 2 to 4). The number of episodes identified for debt, equity portfolio and FDI gross inflows is 98, 101 and 164, respectively.

Sudden stop episodes

10. A "sudden stop" is generally defined as a large and unexpected fall in a country's net capital inflows. While by definition a large capital inflow episode ends if capital inflows as ratio to GDP return to their historical trend, large capital inflow episodes can also end more abruptly with a sudden stop (see Mauro and Becker, 2006). Sudden stops may also occur in the absence of previous large inflow episodes (this may for instance be the case of large capital flights following a *coup*). In contrast to large inflow episodes, the focus of sudden stops is not on the level of net capital inflows (NF_{it}) relative to their long term trend but on a substancial decline from the previous year. Thus, an episode of sudden stop SS_{it} is defined by reference to the annual *change* in capital flows as follows:

$$SS_{it} = \begin{cases} 1 \; if \; \Delta \frac{NF_{it}}{GDP_{it}} < \overline{\Delta \frac{NF_{it}}{GDP_{it}}} - \sigma_{\Delta \frac{NF_{it}}{GDP_{it}}} \; and \; \left| \Delta \frac{NF_{it}}{GDP_{it}} \right| > 5\%, \; whenever \; E_{it} = 0 \\ 0 \; otherwise \end{cases}$$

11. The joint condition ensures that those countries typically characterised by little volatility in capital flows only experience a sudden stop episode when the contraction is substantial (greater than 5%) as a share of GDP (Agosin and Huaita, 2009). Similarly to how large capital inflow episodes are defined, whenever two sudden stops are separated by only one year of negative change in the net capital inflows, the two episodes are combined together. Overall, 236 episodes of sudden stops have been identified (Figure 1).

Banking and currency crises

12. In addition to the obvious risk of a sudden stop, surges in capital inflows may lead to a banking crisis as large inflows may make the domestic financial system more fragile and favour lending booms and boom-bust cycles. The unwinding of excessive currency appreciation triggered by large net inflows may also result in a currency crisis.

13. Data for banking and currency crisis episodes are taken from Laeven and Valencia (2008), where the starting dates of banking crises are based on a combination of quantitative indicators measuring banking sector distress, such as a sharp increase in non-performing loans and bank runs, with a subjective assessment of the situation. In particular, this database extends and builds on the banking crises database of Caprio *et al.* (2005) and covers the universe of systemic banking crises for the period 1970-2007. Currency crisis episodes are identified when a currency has a nominal depreciation of 10% in one year and 30% overall, following Frankel and Rose (1996).

2.2 Descriptive analysis of crises associated with large capital inflows

14. An initial descriptive analysis of the relationship between large capital inflow episodes and the likelihood of financial crises in the following three years is reported in Table 5. The descriptive statistics

reported in the first column of the table suggest that in the three years after the end of a large capital inflow episode, the probability of having a banking crisis, currency crisis and sudden stop are 9%, 13% and 58%, respectively. With the possible exception of banking crises, these probabilities represent a substantial increase compared to the unconditional probability of banking crises, currency crises and sudden stops, which are 7%, 6% and 20%, respectively. The results of the descriptive analysis also suggest that the relationship between crises and large capital inflow episodes is much stronger for debt flows. Restricting the sample to OECD countries only, the probability of having a banking crisis, currency crisis and sudden stop are 11%, 12% and 42% respectively after a large capital inflow episode (Table 5, panel b).[8]

3. Empirical methodology

15. The descriptive analysis has shown that large capital inflow episodes are often followed by banking and currency crises or balance-of-payment crises (sudden stop episodes). This section analyses this relationship more formally.

16. In particular, the probability of the occurrence of a crisis (banking or currency crisis or sudden stop) between time t+1 and t+2 is analysed to determine how it is influenced by a previously occurring large capital inflow episode ended at time t. For this purpose, the probability that a crisis will occur between time t+1 and t+2 is estimated against a dummy variable that indicates the end of an episode of large capital inflow and a set of control variables. The dependant variable is a crisis dummy that takes the value equal to one if the country experienced a crisis between time t+1 and t+2 and zero otherwise, and it is estimated for a panel of between 50 and 100 countries depending on the specification[9] from 1970 to 2007, by pooled Probit with robust standard errors. Country fixed effects are not included as this would require omitting from the panel all countries that never experienced a crisis. Since several countries (especially OECD countries) did not experience a financial crisis over the period under investigation, this would significantly reduce the estimation sample.[10] In addition, this will introduce a sample selection bias in the analysis. In the same way, time fixed effects would also reduce the sample size in the analysis of banking and currency crises, whereas they did not significantly change the results when included in the Probit equation for sudden stops.

17. The choice of explanatory variables reflects previous findings in the literature on the determinants of banking and currency crises. Several of these variables have been previously used in the analysis of balance of payment crises and sudden stops. In particular, the set of regressors includes macroeconomic controls and institutional variables (descriptive statistics and sources are reported in Table 6).

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8. Restricting the sample to G20 countries only the probability of having sudden stop is lower (20%) and consistent with the fact that larger countries are less vulnerable to this type of crisis while the probability of banking and currency crises is higher.

9. The number of countries changes according to the specifications and the control variables investigated. While the baseline equation is estimated on a panel of 70 countries (Table 7, column I), the number of countries across the different specifications ranges from 51 (Table 7, column VII) to 93 (Table 7, column VI). The baseline equation for the probability of sudden stops (Table 11, column I) includes 101 countries, whereas for the other specifications the range goes from 92 (Table 11, column VII) to 99 (Table 11, column V).

10. An alternative strategy would be to estimate the probability of crises using country random effects, which would be equivalent to estimating the Probit over the full sample. The random effects estimates are, however, biased when country effects are correlated with those explanatory variables that do not vary much over time such as population, openness, capital account openness, regulatory quality and financial liberalisation.

18. The set of macroeconomic variables consists of:

- Short-term interest rates capture the bank cost of funds. An increase in short-term interest rates negatively affects banks profitability to the extent that banks cannot simultaneously increase lending rates. When interest rates are passed on lending rates, it may also affect banks balance sheets via an increase of non-performing loans. Last, short-term interest rates are also a key factor in the relative remuneration of foreign investors.

- Inflation is an indicator of macroeconomic mismanagement which negatively affects the economy and the banking system as well as the perception of risks.

- GDP growth: previous episodes of banking crises often follow periods of sustained and excessive growth (Furceri and Mourougane, 2009). At the same time, crises also tend to occur when the macroeconomic environment is weak and characterised by low or negative growth (Calomiris and Gorton, 1991).

- Openness and the size of the economy (population) are both indicators of the vulnerability of an economy to external shocks (Rodrik, 1998, Furceri and Karras, 2007). The literature is mixed on the direction of the impact of trade openness on vulnerabilities to sudden stops. On the one hand, a country that is highly integrated into world markets is more exposed to external shocks (Calvo *et al.*, 2004). On the other hand, if the export/GDP ratio is structurally high so that export earnings are high, then it should be easier to cope with a sharp fall-off in international financing so that the country is less vulnerable to sudden stops (Sachs, 1985; Edwards, 2004; Martin and Ray, 2006).[11]

- Foreign exchange reserves (expressed as share of GDP) and high net foreign asset-to–GDP ratios may serve as a buffer for banking, currency and balance of payment (sudden stop) crises.

- The foreign debt-to-export ratio, represented here by total liabilities divided by exports, is a measure of external viability and captures the ability to support the overall external debt burden (Calvo *et al*., 2004; Cavallo and Frankel, 2007).

- Credit growth when excessive may finance an asset price bubble that may cause a crisis when it bursts. Credit booms are indeed often associated with sudden stops (Eichengreen *et al*., 2006).

- Banking concentration: economic theory provides conflicting predictions about the relationship between the concentration and competitiveness of the banking industry and banking system fragility. On the one hand, some theoretical arguments suggest that a concentrated banking sector with a few banks is less prone to financial crises than a less concentrated banking sector with many banks. First, concentrated banking systems may enhance market power and boost bank profits. High profits provide a ‘‘buffer’’ against adverse shocks and increase the charter or franchise value of the bank, reducing incentives for bank owners and managers to take excessive risk and thus reducing the probability of systemic banking distress (Hellman *et al.*, 2000; Besanko and Thakor, 1993; Boot and Greenbaum, 1993; Matutes and Vives, 2000). Second, it may be substantially easier to monitor a few banks in a concentrated banking system than to monitor lots of banks in a diffuse banking system. On the other hand, in concentrated banking system, less competition can lead to less credit rationing, larger loans and higher probability of

11. See Cavallo and Frankel (2007) for a literature review and new empirical results supporting a negative relationship).

crises (Beck *et al.*, 2006). The empirical evidence is also not conclusive (Allen and Gale, 2000, 2004; Beck *et al.*, 2006).

- Countries with a higher level of financial depth (proxied by the ratio of total private credit to GDP) tend to be more exposed to banking crises. At the same time, a well-developed financial market can increase the resilience of an economy by working as a buffer to idiosyncratic shocks (Wang and Wen, 2009).

19. In addition to these variables, a set of structural variables is also considered:

- Capital account openness: countries with higher capital account openness may be more resilient since they benefit from higher international risk-sharing (Kose *et al*., 2007) and there is some weak empirical evidence to support this.[12] However, premature capital account liberalisation is believed to have played an important role in fomenting financial crises experienced by various emerging markets over recent decades. Also, capital controls are likely to reduce the probability of sudden stops. First some controls are explicitly directed at skewing the composition of inflows towards the least volatile sources. Second, controls on outflows limit the speed and magnitude of subsequent outflows as well as domestic capital flights. The measure of capital account openness used here is the Chinn-Ito index computed using principal components extracted from disaggregated capital and current account restriction measures documented in the IMF Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER).For details on the measure see Chinn and Ito (2006, 2008).

- Regulatory quality: higher regulatory quality is likely to be positively correlated with the effectiveness of prudential supervision of the banking system (Beck *et al.*, 2006). Regulatory quality is taken from the World Bank Governance Indicators (2010) and captures perceptions of the government ability to formulate and implement sound policies and regulations that permit and promote private sector development. An increase in the index implies an increase in the quality of regulation.

- Financial liberalisation (index proposed by Abiad *et al*., 2008) softens financing constraints and improves risk-sharing. It may also have a positive impact on the functioning and development of financial systems, and on corporate governance, and therefore indirectly reduce the probability of banking crises. At the same time, financial liberalisation by contributing to an excessive rise in domestic credit and possibly fuelling asset price bubbles may increase the likelihood of financial crises.[13]

20. Both surges and sudden stops tend to be bunched, i.e. through contagion they can take place in several countries at the same time or in short sequence (Agosin and Huaita, 2009; Edwards, 2007). A dummy variable of contagion indicating a sudden stop occurring in at least ten other countries in the same year or the year before has been also considered in the regressions related to sudden stops.

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12. Glick *et al.* (2006) find that capital account openness reduces the probability of financial crises. Edwards (2005) finds no evidence of a relationship between financial openness and the incidence of external crises. Bonfiglioli and Mendicino (2004) find that the adverse effects of banking crises are weaker for countries with open capital accounts.

13. See Kaminsky and Reinhart (1999) and Aizenmann and Pinto (2006) for a survey. Recently, Angkinand *et al.* (2010) find an inverted U-shaped relationship between financial liberalisation and the likelihood of a financial crisis, showing that the relation depends strongly on the strength of capital regulation and supervision.

21. There is a strong argument for reverse causality from crisis episodes to some of the control variables described above. For example, after the occurrence of a financial crisis, credit growth, GDP growth, interest rates and inflation are all likely to fall. To address this issue all the control variables are only considered before the window of years over which the probability of a crisis is considered. Another possible approach to handle this problem is to delete from the dataset all the observations between time t+1 and t+2 for the variables where the risk of reverse causality is strong (Demirgüç-Kunt and Detragiache, 1998). However, the major shortcoming of this approach is that it would significantly reduce the number of observations.

4. Empirical results

22. This section reports, in turn, results relating to the probability of banking crises, currency crises and sudden stops and their relationship with preceding large capital inflow episodes. Finally, the dependence of these results on the form of the capital inflow is considered in more detail.

4.1 Episodes of large capital inflows and the probability of banking crisis

23. The effect of large capital inflow episodes as well as the macro control variables and institutional variables on the probability of the occurrence of a banking crisis over a two-year window is reported in Table 7 which presents the marginal coefficient estimates that are computed at the sample mean. These estimates illustrate the economic magnitudes of the relationship between each explanatory variable and the probability of a banking crisis evaluated at the sample mean. The sign of the estimated coefficients for each explanatory variable indicates whether an increase of that explanatory variable increases or decreases the probability of a crisis and provides an approximation of the impact of a marginal change in the explanatory variable on the probability of a crisis.[14]

24. The results confirm the hypothesis that episodes of large capital inflows significantly increase the probability of a banking crisis. For example, the results in the first column of Table 7 suggest that a large capital inflow episode increases the probability of having a banking crisis in the two following years by about 4 percentage points. Since the unconditional probability of the occurrence of a banking crisis at any point in time for this specification is only 5%, the results imply a near doubling in the probability of a banking crisis. The significance of the effect is robust across all the specifications, with the magnitude of the effect ranging from 2% (column VIII) to 7% (column IX). The effect is significant for both OECD and non-OECD countries, and not statistically different between the two groups (Table 8). There is also robust evidence that higher short-term interest rates increase the probability of a banking crisis and a higher level of foreign reserves and of banking concentration reduces this probability.[15]

25. Differences in institutional quality across countries and over time also seem to significantly affect the probability of banking crises (Table 7); an increase in capital account openness and financial liberalisation are both associated with a lower probability of banking crises. In particular, a one standard deviation increase in the indicator of capital account openness is associated with a reduction in the

14. The estimated coefficients do not strictly indicate the magnitude of the impact of a marginal change in the explanatory variable on the probability of a crisis (P). Instead, the coefficients reflect the effect of a marginal change in an explanatory variable on ln[(P)/(1-P)], so that the magnitude of the impact on the probability of a crisis depends on the slope of the cumulative distribution function computed at a given value of the dependent variable. Nevertheless, given the magnitude of most of the estimated coefficients they are a close approximation to P.

15. The results of banking concentration are in line with the recent empirical evidence in the literature (Beck *et al.* 2006). In addition, bank concentration is not correlated with large capital inflow episodes suggesting that bank concentration do not affect the probability of a large capital inflow episode.

probability of a banking crisis of about 1½ percentage points overall and countries the least open to capital flows (in the lowest quartile of the distribution) have a probability three times greater of facing a banking crisis after a large capital inflow episode. A one standard deviation increase in the indicator of financial liberalisation is associated with a reduction in the probability of a banking crisis of about 2½ percentage points and those countries with the least liberalised financial systems (in the lowest quartile of the distribution) have double the probability of facing a banking crisis after.[16] Nevertheless, it is important to recognise that these results do not allow any inference to be drawn as regards the effect of financial liberalisation or capital account openness on the probability of a banking crisis *per se*, only on the probability of a banking crisis once controlling for the previous occurrence of a large capital inflow. The distinction is important because it is quite likely that greater financial liberalisation and capital account openness will increase the likelihood of large capital inflow episodes.

26. The fit of the model is satisfactory given the difficulty in modelling systemic crises. The baseline specifications (column I) classifies 73% of the crisis observations accurately and 72% of both crises and non-crises episodes. Across the different specifications reported in Table 7 the number of banking crises (crises and non-crises episodes) accurately specified ranges from 62% (57%) to 85% (85%).[17]

27. As a robustness check, the analysis has been repeated excluding observations corresponding to the *beginning* of a large capital inflows episode, during which the occurrence of a banking crisis may be unlikely, even if not precluded. The results obtained with this approach confirm that large inflow episodes significantly increase the probability of the occurrence of a banking crisis, with an estimated effect significantly larger than the one reported in the baseline. Indeed, considering all observations may give a downward biased estimate of the effect associated with the *end* of a large capital inflow episode may be downward biased.

28. Extending the analysis to consider banking crises in the three years following the end of a large capital inflow episode, the results for the baseline regression reported in the second column of Table 9 still confirm that large capital inflow episodes are one of the main drivers of the occurrence of banking crises. In particular, after a large capital inflow episode the probability of having a banking crisis in the three following years increases by 4 percentage points, which is still a substantial increase given that the unconditional probability of having a banking crisis over a three-year window is about 7%. The other main drivers continue to be short-term interest rates and (low) foreign exchange reserves. The probability of the occurrence of a banking crisis is also found to be weakly correlated with higher GDP growth and inflation in the three years preceding the crises.

4.2 Large capital inflow episodes and the probability of currency crisis

29. The previous analysis has been repeated, but this time examining the probability of a currency crisis. As pointed out in the literature, the determinants of banking crises often coincide with the determinants of currency crises (Kaminski and Reinhart, 1999). Indeed, for many countries in the sample the occurrence of a banking crisis often precedes (or occurs simultaneously with) the onset of a currency crisis (Eichengreen *et al.*, 2003; Reinhart and Rogoff, 2010). The results in the third and fourth columns of Table 9 confirm this view and show that the explanatory variables that are statistically significant in the regression for banking crises are also statistically significant in the regression for currency crises. In particular, after an episode of large capital inflows the probability of having a currency crisis in the two

16. The effect of capital account openness and financial liberalization weakens considerably when account is made for the composition of the flows (FDI versus others), which would suggest that their effect comes to some extent from their impact on the composition of inflows.

17. The number of crises correctly specified is similar to other works such as Beck *et al.* (2006), Barrell *et al.* (2010).

(three) following years increases by 2.5 (4) percentage points, which is still quite substantial given that the corresponding unconditional probability of having a currency crisis in the period over a two (three) year window is about 4% (6%).

30. Higher short-term interest rates and lower foreign exchange reserve are found to increase the probability of a currency crisis, with a larger effect (in absolute value) than for the probability of banking crises.[18] Similarly to banking crises, an increase in capital account openness and financial liberalisation are negatively correlated with the probability of currency crises. In addition, larger countries tend be associated with a higher currency crisis probability.

31. The fit of the model is satisfactory given that 81% of currency crises (71% of crises and non-crises episodes) are accurately identified. Finally, as a robustness check the analysis is repeated using a multivariate Logit model.[19] The results reported in columns V-VIII of Table 9 are qualitatively similar to those presented so far, and confirm that episodes of large capital inflows significantly affect the probability of the occurrence of financial crises.

4.3 Large capital inflow episodes and the probability of a sudden stop

32. The same approach described above has been applied to the relation between large capital inflow episodes and the risk of a sudden stop (Table 11). It shows that episodes of large capital inflows are associated with the likelihood of a fall in a country's net capital inflows (sudden stop) in the following two or three years. Indeed, the probability of the occurrence of a sudden stop increases by 22 percentage points in the two years following the end of a large capital inflow episode (column I in Table 11). In those cases, capital inflows do not just revert to past trend but fall substantially. Moreover, the greater the cumulative capital inflow at the end of the large capital inflow episode, the higher is the probability of experiencing a sudden stop (column VIII in Table 11). The same effect for large capital inflow episodes is confirmed when the sample is split between OECD and non-OECD countries, although the difference in the magnitude is not statistically different between the two groups (Table 12). The contagion dummy was not significant.

33. The role of policies in reducing the probability of a sudden stop is limited, except via their impact on the composition of inflows (see next section). Not surprisingly and contrary to the case of banking and currency crises, a large degree of capital account openness[20] and trade openness is associated with a higher probability of a sudden drop in net capital inflows (column VI in Table 11), however, bigger economies are significantly less exposed to this risk than smaller economies. The level of external indebtedness of a country plays a significant role in the occurrence of a sudden contraction of capital inflows. In particular, countries with a higher level of indebtedness (determined by lower net foreign asset positions) are significantly more likely to experience an episode of sudden stop.[21] Similarly, higher level of the external

18. The finding on interest rate may however reflect some form of reverse causality as countries may hike interest rates to forestall a currency crisis.

19. For application of Logit models on the probability of banking crises see also Cole and Gunther (1993), Gonzalez-Hermosillo *et al.* (1997), and Demirgüç-Kunt (1989), Demirgüç-Kunt and Detragiache (1998, 2002).

20. Similar results have been found by Stiglitz (2002) and Edwards (2007), who show that restricting capital mobility reduces the likelihood of a sudden stop.

21. Similar results appear in Pistelli *et al.* (2008) who find that a higher stock of net foreign assets reduces the probability of sudden stops, although when included as determinants together with the current-account deficit, the latter prevails by increasing the probability of sudden stops.

debt-to-export ratio is associated with a higher probability of a sudden stop.[22] Variables proxying financial liberalisation and financial development do not seem to play a significant role in the likelihood of experiencing a sudden stop in net capital inflows.

34. The same specifications for the probability of sudden stops have been tested on a panel dataset excluding the years of ongoing capital inflow episodes, but there were no significant differences in the results. Robustness checks have been carried out on the baseline regression by considering a multivariate Logit model and extending the analysis to a three-year window (Table 13). The previous results are confirmed. Across the different specifications the number of sudden stops (occurrence and non-occurrence of sudden stops) correctly specified varies from 50% (70%) to 65% (74%).

4.4 The form of capital inflow and the probability of crises

35. The theoretical literature yields a ranking of capital flows, in decreasing order of riskiness: debt, portfolio equity and FDI. In addition, debt and portfolio flows are in general more volatile and therefore more sensitive to sudden stops (Calvo and Reinhart, 2000; Calvo, 2007).[23] The descriptive evidence previously discussed tends to confirm this view showing that the correlation between financial crises and large capital inflow episodes varies according to the form of the capital flows. To test this hypothesis more formally the probability of crises is re-estimated distinguishing large capital inflow episodes by different types of capital inflow.

36. Debt, FDI and equity portfolio inflows generally move in the same direction. Therefore, large capital inflow episodes across different types of inflows tend to occur simultaneously. This makes it difficult to isolate the impact of different types of capital inflow on the probability of crises. To better identify the impact of each form of capital inflow on the probability of crises, two different approaches have been used. First, the effect of the three different type of large capital inflow episode on probability of a crisis is estimated in a single regression and then in separated regressions. Second, the effect of one type of large capital inflow episode on the probability of a crisis is estimated only when there is not an occurrence of a large capital inflow episode for the other types of capital inflow in the two years before, during, or after. For example, the analysis is restricted to large capital inflow episodes driven by debt inflows in which there was no occurrence of large inflows of FDI or equity portfolio investment in the two years before, during, or after.

37. The empirical analysis first considers the probability of the occurrence of a banking crisis two years after the end of a given large capital inflow episode. The results obtained by considering all large capital inflow episodes in the same regression are reported in the first column of Table 10 and suggest that only large debt capital inflow episodes increase the probability of banking crises. In particular, after a large debt-driven capital inflow episode the probability of a banking crisis in the two following years increases by 4 percentage points, which is substantial compared to the unconditional probability of having a banking crisis of about 5% (column I of Table 10). The results still hold when each different type of capital inflow episode is analysed separately (columns II-IV).

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22. The result is in line with all studies considering determinants of sudden stops (Agosin and Huaita, 2009; Calvo *et al*., 2004; Cavallo and Frankel, 2007) and it is consistent with the hypothesis that different countries are able to sustain different level of debts.

23. As argued by Rajan and Bird (2001), a potential criticism of the conventional view regarding differing degrees of stability of various capital flows is that it fails to take into account the complex interactions between FDI and other flows. For instance, a foreign direct investor may hedge the firm's FDI exposure by borrowing domestically and then taking short-term capital out of the country. Hence, a firm may be doing one thing with its assets and a different thing with the manner in which it finances them.

38. The results of the analysis focusing on those episodes that are mutually exclusive confirm that while large capital inflow episodes of portfolio and FDI do not affect the probability of a banking crisis, the probability of facing a crisis in the two years after a large debt-driven capital inflow increases by 7 percentage points (column V). The results still holds when each type of episode is analysed separately (columns VI-VIII).

39. The effect of including the control variables in the regression, although not reported here, is qualitatively similar to that obtained in the previous section. Similar results (not reported here) are also obtained when analysing the probability of currency rather than banking crises. Additional robustness tests -- when a window of three rather than two years is considered and when a multivariate Logit model is estimated -- not reported in detail here, give similar results.

40. Turning to sudden stop episodes, debt and FDI inflows significantly increase the probability of a sudden stop after the end of the large capital inflow episode, with large debt-driven capital inflows having a higher probability of ending in a sudden stop than FDI-driven episodes. In particular, as illustrated in Table 14, the probability of a sudden stop at the end of a large debt-driven capital inflow episode increases by about 20 percentage points, compared to 6-8 percentage points following an FDI large capital inflow episode. Equity portfolio inflow episodes do not have a significant impact on the probability of a sudden stop.

5. Summary and conclusions

41. Overall the results suggest that episodes of capital inflow bonanza significantly increase the probability of crises. In particular, a large capital inflow episode increases the probability of having a banking (currency) crisis in the two following years by about 4 (2.5) percentage points. Since the unconditional probability of the occurrence of a banking crisis at any point in time for this specification is only 5% (4%), the results imply a near doubling in the probability of a banking (currency) crisis. As can be expected, the effect is larger for sudden stops where the probability of the occurrence of a sudden stop increases by 22 percentage points in the two years following the end of a large capital inflow episode, suggesting that net capital inflows instead of reverting to past trend fall substantially after about ¼ of the large capital inflow episodes. Moreover, the greater the cumulative capital inflow at the end of the large capital inflow, the higher is the probability of experiencing a sudden stop. Other factors influencing these crises are inflation (for banking, currency and balance of payment crises), short-term interest rate (for banking, currency and balance-of-payment crises), foreign reserves for banking and currency crises), bank concentration (for banking crises), size of the country (for balance-of-payment crises), trade openness (for balance-of-payment crises), net foreign assets (for balance-of-payment crises) and foreign debt (for balance-of-payment crises).

42. Differences in institutional quality across countries and over time are also associated with differences in banking and currency crises probability, while they do not seem to affect the probability of sudden stops. In particular, in line with Glick *et al*. (2006), it is found that an increase in capital account openness and financial liberalisation reduces the probability of banking and currency crises.

43. The paper also finds that the effect of bonanzas is different whether the episodes consist of a large inflow in FDI, equity portfolio investment or debt and suggests that while bonanzas in debt significantly increase the probability of banking, currency and balance-of-payment crises, bonanza in portfolio and FDI have a negligible effect. This is important from a policy point of view given that particular structural policy settings are likely to affect the composition of these flows (Furceri *et al*. 2011). This means that reforms modifying the composition of capital flows toward a lower share of debt are likely to reduce vulnerabilities associated with the financial system.

Table 1. List of net capital inflow episodes

Country	Years	Size (% GDP)		Country	Years	Size (% GDP)		Country	Years	Size (% GDP)		Country	Years	Size (% GDP)	
Algeria	1978	13.2	(s)	Czech Rep.	1995	14.9	(s,b)	Italy	1976	2.6		Philippines	1994-1997	36.7	(s,c)
Antigua & Barbuda	1986-1987	82.3	(s)	Czech Rep.	2002	14.1	(s)	Italy	1980	2.6	(c)	Poland	1995	6.7	
Antigua & Barbuda	2006-007	20.8	(s)	Denmark	1985-1987	17.7	(s)	Italy	1989-1990	6.5		Poland	1998	7.7	
Argentina	1993	8.9	(b)	Denmark	1997	5.0	(s)	Italy	2008	3.5		Portugal	1981-1982	20.1	(s,c)
Argentina	1997-1999	17.5	(s,b,c)	Denmark	1999	4.3	(s)	Jamaica	1984-1985	33.6	(s)	Portugal	1989	6.9	(s)
Aruba	1991	26.2	(s)	Denmark	2009	8.4		Jamaica	1987	10.9	(s)	Portugal	2000-2001	20.5	(s)
Aruba	1999	26.5	(s)	Djibouti	1992	10.0	(s)	Jamaica	2001	18.2	(s)	Romania	1990-1992	10.8	
Aruba	2002	18.2		Djibouti	2007-2008	36.1	(s)	Jamaica	2008	20.7	(s)	Romania	2004-2007	61.4	(s)
Australia	1971	4.3		Dominica	1989-1992	64.2	(s)	Japan	1980	1.8		Russian Federation	2007	7.3	(s)
Australia	1982	6.5		Dominica	1995	10.5	(s)	Japan	2003	1.7		Seychelles	1982	23.0	(s)
Australia	1986-1988	17.5		Dominica	1999	7.9	(s)	Jordan	1978	16.7		Seychelles	1986	16.1	(s)
Australia	1999	7.1		Dominican Rep.	1974	8.2		Jordan	1991	50.0	(s)	Seychelles	1989	14.4	(s)
Australia	2003-2005	20.6		Dominican Rep.	1980-1981	15.1		Jordan	2006	22.4		Seychelles	2007-2009	89.5	
Austria	1975-1977	8.2		Dominican Rep.	1999-2001	18.4	(s,b,c)	Kazakhstan	2006	20.0	(s)	Singapore	1981-1983	44.8	
Austria	1980	3.5		Dominican Rep.	2008	8.9		Korea	1979-1980	17.4		Singapore	1990-1991	16.1	(s)
Austria	1995	3.1		Egypt	1981	8.7		Korea	1996	4.3	(s,b,c)	Slovenia	1997	5.7	
Austria	1998-2000	8.5		Egypt	2005	6.2		Kuwait	1991	352.1	(s)	Slovenia	2001-2002	14.5	(s)
Azerbaijan	2003-2004	65.4	(s)	El Salvador	1978	10.9	(s)	Latvia	2006-2007	55.3	(s)	Slovenia	2008	6.9	(s)
Bahrain	1990	27.3	(s)	El Salvador	1981	5.5		Lesotho	1995-1998	153.5	(s)	South Africa	1995-1997	9.8	
Bahrain	1993-1994	32.6	(s)	El Salvador	1997-1998	14.5		Lithuania	1998	12.8		South Africa	2006-2007	13.1	
Belarus	1997	5.2	(c)	El Salvador	2003	7.0	(s)	Lithuania	2006-2007	31.5	(s)	Spain	1987-1991	23.3	
Belarus	2007-2009	28.8		Equatorial Guinea	1996	121.1		Macedonia	1998	9.6	(s)	Spain	2006-2008	27.9	
Belgium	2008	2.3		Estonia	1997	15.9	(s)	Macedonia	2008	12.5		Sri Lanka	1980-1983	37.8	
Belize	1988	8.7		Estonia	2006	18.2	(s)	Malaysia	1982-1983	26.3		Sri Lanka	1993-1994	18.1	
Belize	2000-2003	80.4	(s)	Fiji	1981	11.3		Malaysia	1991-1996	62.1	(s,b,c)	Sri Lanka	2006	2.4	
Bolivia	1978	9.3	(s,c)	Fiji	1990	6.1	(s)	Malaysia	2004	4.1	(s)	St. Kitts & Nevis	1983	25.9	(s)
Bolivia	1997-1999	35.6		Fiji	2004-2007	37.8	(s)	Maldives	1980-1982	122.2	(s)	St. Kitts & Nevis	1989-1990	67.9	(s)
Bosnia & Herzeg.	2001	17.3	(s)	Finland	1975	7.4	(s)	Maldives	2005-2007	108.9	(s)	St. Kitts & Nevis	2001	16.9	(s)
Bosnia & Herzeg.	2005	16.8		Finland	1987	7.9	(s)	Malta	1972	16.8	(s)	St. Kitts & Nevis	2008	10.8	(s)
Botswana	1976	19.8	(s)	Finland	1990	8.9	(s,b,c)	Malta	1983	8.4		St. Vincent & Grenad.	1997-1998	30.3	
Botswana	1985	11.0	(s)	Finland	1994	4.1	(s)	Malta	1994	17.7	(s)	St. Vincent & Grenad.	2006	3.4	(s)
Botswana	1992	6.7	(s)	Finland	2008-2009	11.9		Malta	1999	11.9		St. Vincent & Grenad.	2008	5.8	(s)
Botswana	2005	4.2		France	1982-1983	3.2		Mauritius	1979-1980	9.8	(s)	Sudan	1979	2.1	(s,c)
Botswana	2008	7.5		France	1989-1990	3.0		Mauritius	1988-1990	13.2		Sudan	1981	2.4	
Brazil	1978	5.7		France	2006	1.8		Mauritius	2000	5.6	(s)	Sudan	1991-1992	9.6	(c)
Brazil	1981	4.9	(s,c)	France	2009	3.5		Mauritius	2008-2009	18.6		Sudan	2005-2006	23.6	(s)
Brazil	1995-1997	7.8	(c)	Gabon	1986-1988	56.6	(s)	Mexico	1981	10.6	(s,c)	Swaziland	1978-1979	47.9	(s)
Brazil	2000	4.6		Georgia	2006-2007	41.1	(s)	Mexico	1991-1993	23.8	(s,b,c)	Swaziland	1998	8.9	(s)
Brazil	2007	6.5		Germany	1992-1995	6.3		Moldova	1994	12.4	(s)	Swaziland	2007-2009	46.5	
Bulgaria	2007-2008	86.0	(s)	Germany	2000	1.5		Moldova	2007-2008	43.8	(s)	Sweden	1989-1990	12.7	(s,b,c)
Cameroon	1983-1987	26.4	(s)	Grenada	1982	17.9		Mongolia	1986-1989	143.9	(s,c)	Sweden	1992-1993	9.5	
Cameroon	2001-2002	8.9		Grenada	2002-2003	60.9		Mongolia	2008	21.8		Sweden	2008-2009	6.5	
Cameroon	2009	7.5		Guatemala	1978	6.2		Morocco	1976-1977	52.4	(s,b)	Syrian Arab Rep.	1994-1996	21.7	(s)
Canada	1976	5.3		Guatemala	1991-1993	20.8		Morocco	1990	7.3		Thailand	1990-1991	22.6	
Canada	1981	5.5	(s)	Guatemala	2000-2002	16.2	(s)	Netherlands	1980	1.3		Thailand	1995-1996	23.8	(s,b,c)
Canada	1987-1989	11.1		Honduras	1977	11.1		New Zealand	1982-1986	51.8	(s)	Trinidad & Tobago	1997-2002	29.0	(s)
Canada	1993	3.5		Honduras	1980	9.2		New Zealand	2005-2006	21.7	(s)	Tunisia	1976-1977	20.5	
Canada	2009	4.0		Honduras	1984	8.6		Nicaragua	1981-1982	31.9	(s,c)	Tunisia	1982-1984	20.9	
Cape Verde	1999	21.9	(s)	Honduras	2004	11.1		Nicaragua	1985	13.5	(s)	Tunisia	1993-1994	16.0	
Cape Verde	2007	20.9		Honduras	2007	10.4	(s)	Nicaragua	1988	9.2	(s,b,c)	Tunisia	2006-2008	20.3	
Chile	1978-1981	49.5	(s,c)	Hong Kong	2000	2.5	(s)	Nicaragua	1999	14.0	(s,b)	Turkey	1993	5.0	(s,c)
Chile	1990	9.1		Hungary	1993-1995	36.7	(s)	Norway	1977	11.0	(s)	Turkey	2005-2007	24.4	
Chile	1994	9.6		Hungary	1999	13.5		Norway	1987-1988	10.6	(s,b)	Ukraine	2005-2007	23.7	(s)
China	1993-1996	21.1	(b)	Iceland	2006-2008	131.3	(s)	Norway	1993	5.6	(s)	United Kingdom	1974	1.6	
China	2004	5.7		India	1994	3.3		Oman	1976	15.2	(s)	United Kingdom	1977	2.3	
Colombia	1981-1982	11.3	(c)	India	2007	7.7		Oman	1986	13.9	(s)	United Kingdom	1987-1989	12.1	
Colombia	1985	6.4		Indonesia	1995-1996	9.8	(s,b,c)	Oman	1998	10.6	(s)	United States	1971	1.0	
Colombia	1993-1997	27.0	(b)	Iran	1991-1993	17.6	(s)	Oman	2007	6.6	(s)	United States	1984-1988	13.5	
Colombia	2007	5.0		Ireland	1980-1982	36.2		Panama	1979	25.0	(s)	United States	2000-2002	13.8	
Congo, Rep.	1994	34.2	(s)	Ireland	1998	5.3	(s)	Panama	1997-1999	37.1	(s)	United States	2005-2006	11.5	(b)
Congo, Rep.	2007	33.3		Ireland	2000	8.2	(s)	Paraguay	1978-1980	31.0		Uruguay	1982	11.8	(s,c)
Costa Rica	1977-1980	39.2	(s,c)	Ireland	2007-2008	16.0	(s)	Paraguay	1997	4.7		Uruguay	2006-2008	30.1	(s)
Croatia	1996-1999	44.5		Israel	1975	14.0	(s,b)	Paraguay	2007	5.9		Vanuatu	1986-1989	49.1	(s)
Cyprus	1982	34.6	(s)	Israel	1982	12.8	(s,c)	Peru	1977	4.7	(s)	Vanuatu	1999	20.3	(s)
Cyprus	1989	9.9		Israel	1997-1999	12.9		Peru	1982	7.3	(s,b)	Venezuela	1978-1979	12.7	(s)
Cyprus	2001	10.0	(s)	Israel	2008-2009	9.6		Peru	1994-1997	32.0	(s)	Venezuela	1991-1993	14.6	(s,b,c)
Cyprus	2006-2008	39.6		Italy	1974	3.7		Philippines	1980-1982	21.6	(s,b,c)	Venezuela	1997-1998	4.0	

Note: The size is the cumulated amount of inflows as share of GDP over the episode. The letters s, c, b indicate whether the episode was followed by a crisis in the three years after the end of the episode. s stands for sudden stop, b for banking crisis, c=currency crisis.

Source: OECD calculations.

Table 2. List of debt inflow episodes

Country	Years	Size (% GDP)		Country	Years	Size (% GDP)		Country	Years	Size (% GDP)		Country	Years	Size (% GDP)	
Algeria	1979	8.1	(s)	Finland	2000	17.2		Lithuania	2006-2007	34.4	(s)	St. Vincent & Grenad.	1980	10.5	
Australia	1988	6.8		Finland	2009	23.2		Luxembourg	2005-2006	957.2		St. Vincent & Grenad.	1987	11.2	
Australia	2003-2006	42.5		France	1990	8.9		Macedonia	2005	8.2		Swaziland	1978	13.9	(s)
Austria	1999-2000	42.2		France	2005-2007	65.6		Macedonia	2009	7.6		Swaziland	1982-1983	23.3	(s,c)
Austria	2005-2006	49.5		Georgia	2007	7.2	(s)	Maldives	1992	7.8		Swaziland	1996	6.2	(s)
Belgium	2007	46.8		Germany	1998-1999	24.4		Maldives	2005-2007	85.6	(s)	Swaziland	2008	6.2	
Bolivia	1977-1978	22.0	(s,c)	Germany	2007	15.0		Malta	1998	62.6		Sweden	1989-1990	32.2	(s,b,c)
Bosnia & Herzeg.	1999	17.0	(s)	Grenada	1981-1983	30.1		Malta	2007	127.7		Sweden	1998	13.6	
Botswana	1975	37.3	(s)	Hong Kong	2007	86.3		Mauritius	2007	43.0		Sweden	2007	20.4	
Cameroon	1980	9.0		Hungary	1985	7.2		Moldova	1994	16.5	(s)	Switzerland	1999-2000	84.9	
Cameroon	1983-1984	15.8	(b)	Hungary	1993	7.3	(s)	Moldova	2007-2008	18.7	(s)	Switzerland	2007	68.2	
Canada	1976	7.0		Hungary	2006-2008	42.5	(s)	Netherlands	1998	26.3		Syrian Arab Rep.	1992-1994	34.1	(s)
Canada	1981	11.6	(s)	Iceland	2005-2007	432.2	(s)	Netherlands	2001	29.6		Thailand	1991-1996	53.2	(s,b,c)
Canada	2009	7.0		Indonesia	1983	6.7		Netherlands	2006-2007	68.8		Trinidad & Tobago	1979	8.0	
Chile	1978-1981	45.8	(s,c)	Iran	1993	7.2	(s)	Norway	2000-2002	35.0		Tunisia	1977-1978	18.3	
Croatia	1997	10.5	(b)	Ireland	2004-2007	454.7	(s)	Norway	2006-2007	55.4	(s)	Tunisia	1994-1996	18.6	
Croatia	2003	14.4	(s)	Israel	1978-1982	78.5	(s,c)	Portugal	1982	8.0	(s,c)	Ukraine	2007	19.7	(s)
Czech Rep.	1994-1995	27.1	(s,b)	Italy	1973	6.7		Portugal	1997	15.8		United Kingdom	2004-2007	198.0	
Djibouti	1992	7.7	(s)	Italy	1981	6.1		Portugal	2000-2001	45.9	(s)	United States	2004-2007	43.2	
Dominica	1982-1984	23.5		Italy	1998-1999	21.2		Romania	2007	12.2	(s)	Uruguay	2001	10.5	(s,b)
Equatorial Guinea	1989	8.2	(s)	Italy	2005-2006	26.1		Russian Federation	2007	10.5	(s)	Uruguay	2003	11.5	
Estonia	1997	20.7	(s)	Kazakhstan	2006	29.6	(s)	Spain	1993	13.3		Vanuatu	1985	66.3	
Estonia	2004-2007	77.6	(s)	Korea	1995-1996	13.4	(s,b,c)	Spain	2000	15.5		Venezuela	1976-1979	29.2	(s)
Fiji	1981	7.2		Korea	2006-2007	19.1	(s)	Spain	2005-2006	48.3					
Finland	1990	10.1	(s,b,c)	Latvia	2006-2007	74.1	(s)	St. Kitts & Nevis	1983	24.2	(s)				

Note: The size is the cumulated amount of inflows as share of GDP over the episode. The letters s, c, b indicate whether the episode was followed by a crisis in the three years after the end of the episode. s stands for sudden stop, b for banking crisis, c=currency crisis.

Source: OECD calculations.

Table 3. List of FDI inflow episodes

Country	Years	Size (% GDP)		Country	Years	Size (% GDP)		Country	Years	Size (% GDP)		Country	Years	Size (% GDP)	
Antigua & Barbuda	1980-1982	52.5	(s)	Czech Rep.	2005	9.3		Latvia	2006-2007	16.4	(s)	Poland	2004-2007	19.8	
Antigua & Barbuda	2005-2007	90.3	(s)	Denmark	1999-2000	32.2		Lesotho	1995-1998	125.6	(s)	Portugal	2000-2003	17.3	
Argentina	1999	8.5	(s,b,c)	Djibouti	2007-2008	46.2	(s)	Libya	2007	6.5	(s)	Portugal	2006	5.6	
Aruba	1991	21.2	(s)	Dominica	1987-1989	30.3		Lithuania	1998	8.2		Romania	1998	4.8	
Aruba	1999	26.9	(s)	Dominica	1995	24.1	(s)	Lithuania	2006	6.1	(s)	Romania	2004-2006	24.4	(s)
Australia	2002-2004	12.0		Dominica	2008	15.1		Luxembourg	2002	524.9		Russian Federation	2007-2008	8.7	
Australia	2007	4.8		Dominican Rep.	1970	4.8		Luxembourg	2009	371.5		Seychelles	1976	12.9	
Austria	2005-2007	45.0		Dominican Rep.	1999-2001	14.5	(s,b,c)	Macedonia	2001	13.0		Seychelles	2007-2009	82.9	
Azerbaijan	2003-2004	86.1	(s)	Dominican Rep.	2008	6.3		Malaysia	1974	5.7		Singapore	1988-1990	39.1	
Bahrain	1991-1992	31.7	(s)	Egypt	1979	6.7	(b)	Malaysia	1991-1993	24.4		Singapore	1999-2001	55.5	(s)
Bahrain	1996	33.6		Egypt	2005-2007	24.2		Maldives	2007-2008	19.3	(s)	Singapore	2004-2007	71.8	
Bahrain	2006	18.4		El Salvador	1998	9.2		Malta	1999-2000	38.9		Slovenia	2002	7.2	(s)
Belgium	2007-2008	42.1		El Salvador	2007	7.4		Malta	2003	20.1		South Africa	2001	6.1	
Belize	1989	5.1		Equatorial Guinea	1996	145.2		Malta	2006	29.3		Spain	2000-2002	17.1	
Belize	2004-2005	21.9	(s)	Estonia	1998	10.4		Mauritius	2000	5.8	(s)	Spain	2007-2008	9.3	
Belize	2008	14.0		Estonia	2005	21.2		Mauritius	2007	4.5		St. Kitts & Nevis	1983	22.5	(s)
Bolivia	1997-2002	58.6	(s)	Fiji	1990-1992	14.0		Mexico	2001	4.8		St. Kitts & Nevis	1989-1990	59.2	(s)
Bosnia & Herzeg.	2007	13.6	(s)	Fiji	2004-2007	37.6	(s)	Moldova	2000	9.9		St. Kitts & Nevis	2000	29.5	
Botswana	1979-1980	26.1		Finland	1998-2002	29.4		Moldova	2007-2008	23.9	(s)	St. Vincent & the Grenad.	1994	19.3	
Botswana	2002-2003	21.5		Finland	2007	5.2		Mongolia	2008-2009	30.9		St. Vincent & the Grenad.	1997-1998	59.5	
Brazil	1999-2000	10.0		Gabon	2004	4.5		Morocco	2003	4.6		St. Vincent & the Grenad.	2008	27.4	(s)
Bulgaria	2006-2007	57.9	(s)	Georgia	2006-2007	32.3	(s)	Namibia	1991	4.8		Swaziland	1979	13.5	(s)
Cameroon	2002	5.5		Germany	2000	11.1		Namibia	1995	4.4		Swaziland	1987-1989	26.5	
Canada	2000	9.1		Grenada	1987-1988	16.9		Namibia	2008-2009	9.8		Swaziland	1998	9.8	(s)
Canada	2007	8.3		Grenada	1998	14.3		Netherlands	1998-2001	48.7		Swaziland	2002	7.8	
Cape Verde	1999	9.1	(s)	Grenada	2003	18.6		Netherlands	2007	16.0		Sweden	1999-2000	32.1	(s)
Cape Verde	2006-2008	40.1		Grenada	2007-2008	45.8	(s)	New Zealand	1984-1985	11.3	(s)	Switzerland	2000	7.9	
Chile	1987	4.3		Guatemala	1988	4.2		New Zealand	1993-1995	15.3		Switzerland	2006-2007	18.5	
Chile	1999	12.0		Honduras	1999-2000	9.8		New Zealand	2000	7.5		Thailand	1998-2001	18.6	
China	1993-1997	26.5	(b)	Honduras	2004-2007	25.9	(s)	New Zealand	2006-2008	11.6		Trinidad & Tobago	1976	5.3	
Colombia	1997	5.2	(b)	Hong Kong	2000	36.6	(s)	Nicaragua	1997-2000	27.9		Trinidad & Tobago	1994	10.4	
Colombia	2005	7.1		Hungary	2007-2008	93.1	(s)	Nicaragua	2008	9.8		Trinidad & Tobago	1997-1998	29.5	
Congo, Rep.	1999	22.9		Iceland	2005-2007	73.0	(s)	Norway	1999	4.3	(s)	Tunisia	1982	4.2	
Congo, Rep.	2007	34.5		Ireland	1999-2003	92.8		Oman	1975	5.1	(s)	Tunisia	2006-2008	21.3	
Costa Rica	1998	4.3		Israel	2000	6.5		Oman	2005-2007	17.3	(s)	Ukraine	2005-2007	21.2	(s)
Costa Rica	2006-2008	20.7	(s)	Israel	2006	10.5		Panama	1980-1982	20.5		United Kingdom	1998-2000	19.3	
Croatia	1999-2001	18.4	(s)	Jamaica	1999-2003	30.5		Panama	1997-1998	23.9	(s)	United Kingdom	2005-2007	21.3	
Croatia	2007	8.5		Jamaica	2008	9.8	(s)	Panama	2006	14.9		Uruguay	2005-2008	23.8	(s)
Cyprus	1999-2002	37.7	(s)	Jordan	2000	10.8		Paraguay	1998	4.3		Vanuatu	1991-1996	81.0	(s)
Cyprus	2008	15.5		Jordan	2005-2007	55.0		Peru	1994-1996	18.3	(s)	Venezuela	1997-1998	12.7	
Czech Rep.	1999-2002	39.7	(s)	Kazakhstan	2001	12.8		Poland	1999-2000	9.8					

Note: The size is the cumulated amount of inflows as share of GDP over the episode. The letters s, c, b indicate whether the episode was followed by a crisis in the three years after the end of the episode. s stands for sudden stop, b for banking crisis, c=currency crisis.

Source: OECD calculations.

Table 4. List of equity portfolio inflow episodes

Country	Years	Size (% GDP)		Country	Years	Size (% GDP)		Country	Years	Size (% GDP)		Country	Years	Size (% GDP)	
Argentina	1993	2.4	(b)	Finland	1998-2000	22.3		Kazakhstan	2006	3.4	(s)	South Africa	2006	5.7	
Australia	1971	1.9		France	1999-2000	7.2		Korea	1999-2000	5.2		Spain	1989	1.6	
Australia	1993-1994	4.7		France	2005-2006	7.1		Korea	2003	2.2		Spain	1998-2000	6.6	
Australia	1998-1999	5.5		Georgia	2006	1.8	(s)	Korea	2009	3.1		Swaziland	1985	0.5	(s)
Australia	2003	2.6		Germany	1998	2.6		Lithuania	2000	1.1		Swaziland	1988-1989	2.0	
Austria	2000	1.8		Germany	2001	4.1		Lithuania	2005	0.5	(s)	Swaziland	2008	1.5	
Austria	2004-2006	7.7		Germany	2007	1.8		Luxembourg	2005	731.8		Sweden	1993-1994	5.2	
Belgium	2008	1.7		Hong Kong	1999-2000	64.8	(s)	Macedonia	2006-2007	3.5		Sweden	2000	7.3	(s)
Botswana	1978	0.7		Hong Kong	2007	21.1		Malta	2000	1.7		Switzerland	1985-1986	10.9	
Botswana	1996	0.6		Hungary	1997-1999	5.8		Mauritius	1996-1997	1.6		Switzerland	1996	3.8	
Brazil	1993-1994	2.8		Hungary	2004	1.5		Mauritius	2007	0.7		Switzerland	2000	3.5	
Brazil	2007	1.9		Iceland	2004-2006	9.8	(s)	Mexico	1991-1993	6.0	(s,b,c)	Switzerland	2008	4.9	
Brazil	2009	2.4		India	1994	1.7		Morocco	1994	0.8	(s)	Thailand	1989	2.0	
Canada	1993	1.7		India	2007	2.7		Morocco	2004	1.0		Thailand	1993	2.1	
Canada	2000	3.3		Indonesia	1993-1994	2.2	(s,b)	Namibia	1994-1996	3.9		Thailand	1997	2.6	(c)
Canada	2004	2.7		Irel&	1998-2002	312.7		Namibia	1999	1.2	(s)	Thailand	2005-2006	5.4	(s)
Canada	2009	1.7		Irel&	2006	72.5	(s)	Netherlands	1999	7.4		Tunisia	1981-1984	3.8	
Chile	1990	1.2		Israel	1983	2.8	(c)	Netherlands	2005	13.0		Ukraine	1998	0.5	
Chile	1993-1994	4.0		Israel	2000	3.2		Norway	2005-2006	6.3	(s)	Ukraine	2007	0.5	(s)
Chile	1997	2.1		Israel	2004-2006	7.5		Poland	1998	1.0		United Kingdom	1999-2000	19.9	
Chile	2005	1.3		Italy	1996-1998	2.7		Poland	2004	0.7		United States	1999-2001	4.4	
Chile	2008	1.1		Italy	2004-2006	1.9		Portugal	2003-2004	10.3		United States	2007	2.0	
Croatia	2006-2007	1.6		Italy	2009	1.0		Romania	1997	0.6		Venezuela	1994-1997	5.0	
Czech Rep.	1993	3.3	(s,b)	Japan	1991	1.4		Russian Federation	2002	0.8					
Czech Rep.	2003	1.2		Japan	1999	2.4		Russian Federation	2007	1.4	(s)				
Estonia	1999	4.1		Japan	2003-2005	7.1		South Africa	1997-1999	16.9					

Note: The size is the cumulated amount of inflows as share of GDP over the episode. The letters s, c, b indicate whether the episode was followed by a crisis in the three years after the end of the episode. s stands for sudden stop, b for banking crisis, c=currency crisis.

Source: OECD calculations.

Table 5. Percentage of large capital inflow episodes followed by sudden stops, a banking crisis or currency crisis in the next three years

a) All countries

		Large capital inflow episodes			
		Net inflows	Portfolio	Debt	FDI
Episodes of crisis (in the next 3 years)	Sudden stops	58	20	52	40
	Banking crises	9	4	9	4
	Currency crises	13	3	10	1
	No crises	38	76	46	62

b) OECD countries

		Large capital inflow episodes			
		Net inflows	Portfolio	Debt	FDI
Episodes of crisis (in the next 3 years)	Sudden stops	42	13	37	25
	Banking crises	11	4	9	0
	Currency crises	12	2	9	0
	No crises	56	87	65	78

Note: The percentage sum to more than 100 because a large capital inflow episode can be followed by more than one form of crisis.

Source: OECD calculations.

Table 6. Descriptive statistics

Variables	Number of observations	Mean	S.D.	Number of countries	Source
Inflation (GDP deflator)	3945	50.9	472.8	124	IFS
Bank concentration	1627	0.7	0.2	107	Beck *et al.*(2010)
Short-term rates	2515	21.2	262.1	84	IFS
GDP growth	4162	11.3	28.5	126	WDI
Trade openness	3866	85.0	49.9	122	WDI
Population (log)	4689	15.3	2.1	124	WDI
Foreign reserve(as share of GDP)	4014	0.1	0.2	126	IFS
Credit (as share of GDP)	3224	0.5	0.4	110	Abiad *et al.* (2008)
Net foreign assets (as % of GDP)	3940	-14.0	113.9	126	L&M
Foreign debt-to-exports ratio	3659	3.2	6.7	120	IFS

Source: L&M=Lane and Milesi –Ferretti (2009). WDI= World Bank Development Indicators (2010).IFS=IMF International Financial Statistics (2010).

Table 7. Probability of banking crises

	I	II	III	IV	V	VI	VII	VIII	IX
Inflow episode dummy	0.044 (2.89)***	0.026 (2.15)**	0.026 (2.14)**	0.029 (2.25)**	0.027 (2.19)**	0.033 (2.50)**	0.031 (2.35)**	0.018 (1.63)*	0.067 (3.06)***
Inflation (% points per annum)	0.0001 (1.58)	-0.00001 (-1.37)	-	-0.00001 (-1.20)	-0.00001 (-1.51)	-	0.0001 (1.52)	0.0003 (1.84)*	0.0001 (0.81)
Short-term rate (% points)	0.0005 (2.52)***	0.0001 (1.99)**	0.0001 (1.91)*	0.0001 (1.80)*	0.0001 (1.94)**	0.0002 (2.22)***	0.0005 (2.51)***	0.00003 (0.45)	0.0004 (1.85)*
Growth (% points per annum)	0.0008 (1.83)*	0.0002 (0.75)	0.0003 (0.76)	0.0003 (0.82)	-	0.0001 (1.24)	0.0007 (1.74)*	0.0001 (0.95)	0.001 (2.40)**
Openness (% of GDP)	0.0001 (0.61)	0.0001 (0.43)	0.0001 (0.42)	-0.0003 (-1.88)	0.0001 (0.44)	-0.0003 (-2.04)**	0.0001 (0.61)	0.00003 (0.36)	0.0003 (0.90)
Population (logged)	0.002 (0.41)	0.009 (3.20)***	0.009 (3.21)***	-	0.009 (3.22)***	-	-0.0006 (-0.13)	-0.0006 (-0.19)	-0.005 (-0.66)
Foreign exchange reserve (as share of GDP)	-0.208 (-3.30)***	-0.138 (-3.06)***	-0.137 (-3.05)***	-0.125 (-2.93)***	-0.135 (-3.00)***	-0.140 (-3.24)***	-0.219 (-3.88)***	-0.208 (-3.30)***	-0.261 (-2.35)***
Credit growth (% per annum)	0.032 (0.53)	0.086 (1.46)	0.087 (1.48)	0.080 (1.36)	0.082 (1.34)	-	0.044 (0.78)	0.040 (1.14)	0.187 (2.18)***
Credit (as share of GDP)	0.014 (1.03)	-0.005 (-0.43)	-0.005 (-0.42)	0.0001 (0.01)	-0.006 (-0.49)	-	0.026 (1.99)**	0.007 (1.08)	0.0001 (0.75)
NFA (% of GDP)	-0.0001 (-0.64)	0.00004 (0.49)	0.00004 (0.46)	0.00005 (0.65)	0.00005 (0.56)	-	-0.00002 (-0.25)	0.00001 (0.35)	0.0001 (0.76)
Bank concentration	-0.056 (-1.66)*	-	-	-	-	-	-0.067 (-2.22)**	-0.041 (-1.84)*	-0.085 (-1.94)*
Kaopen (index)	-	-	-	-	-	-	-0.011 (-3.22)***	-	-
Regulatory quality (index)	-	-	-	-	-	-	-	-0.002 (-0.68)	-
Financial liberalisation(index)	-	-	-	-	-	-	-	-	-0.145 (-3.03)***
Number of observations	854	1847	1853	1849	1847	2081	839	413	623
Number of crises	41	79	79	79	79	96	40	13	38
% crises (crises and non-crises) correctly classified	73 (72)	63(61)	62(61)	66(57)	62(60)	70(60)	70(70)	85(85)	74(70
Pseudo R^2	0.11	0.06	0.06	0.04	0.05	0.05	0.14	0.37	0.13
Chi-square	47.42***	48.35***	45.86***	35.63***	46.32***	33.01***	65.44***	47.11***	37.66***

Note: The dependent variable takes the value equal to one if a banking crisis occurred over [t+1, t+2] and zero otherwise. All the explanatory variables are expressed at time t. ***,**,* denote significance at 1%,5%,10%, respectively.

Table 8. Probability of banking crises

	Probit		
	All sample	OECD	Non-OECD
	I	II	III
Inflow Episodes	0.044 (2.89)***	0.040 (2.19)**	0.026 (1.61)*
Inflation	0.0001 (1.58)	0.0005 (0.87)	0.0001 (1.07)
Short-term rate	0.0005 (2.52)***	0.001 (1.03)	0.0003 (1.86)*
Growth	0.0008 (1.83)*	0.001 (1.41)	0.0006 (1.47)
Openness	0.0001 (0.61)	-0.001 (-1.81)*	0.0003 (1.88)*
Pop (log)	0.002 (0.41)	-0.019 (-2.09)**	0.003 (0.85)
Foreign exchange reserve (as share of GDP)	-0.208 (-3.30)***	-0.021 (-0.19)	-0.270 (-4.32)***
Credit growth	0.032 (0.53)	-0.046 (-0.89)	0.075 (0.83)
Credit (as share of GDP)	0.014 (1.03)	0.057 (2.53)**	0.019 (1.20)
NFA (% of GDP)	-0.0001 (-0.64)	-0.0001 (-1.09)	0.0001 (0.14)
Bank concentration	-0.056 (-1.66)*	-0.052 (-1.09)	-0.067 (-2.13)**
Number of observations	854	303	551
Number of crises	41	14	27
% crises (events) correctly classified	73(72)	79(76)	70(66)
Pseudo R^2	0.11	0.23	0.14
Chi-square	47.42***	41.45***	42.56***

Note: The dependent variable takes the value equal to one if a banking crisis occurred over [t+1, t+2] and zero otherwise. All the explanatory variables are expressed at time t. ***,**,* denote significance at 1%,5%,10%, respectively.

Table 9. Probability of banking and currency crises

	Probit				Logit			
	Banking		Currency		Banking		Currency	
	[t+1,t+2]	[t+1,t+3]	[t+1,t+2]	[t+1,t+3]	[t+1,t+2]	[t+1,t+3]	[t+1,t+2]	[t+1,t+3]
	I	II	III	IV	V	VI	VII	VIII
Inflow Episodes	0.044 (2.89)***	0.039 (1.94)**	0.025 (2.19)**	0.040 (2.74)***	0.038 (3.00)***	0.027 (2.46)**	0.021 (1.98)**	0.034 (2.80)***
Inflation	0.0001 (1.58)	0.0002 (1.77)*	0.0001 (1.47)	0.0001 (1.61)*	0.0001 (1.98)**	0.0001 (1.99)**	0.0001 (1.65)*	0.0001 (1.79)*
Short-term rate	0.0005 (2.52)***	0.0009 (2.87)***	0.0004 (2.42)***	0.0007 (2.95)***	0.0004 (2.64)***	0.0004 (2.67)***	0.0003 (2.31)**	0.0005 (2.56)***
Growth	0.0008 (1.83)*	0.001 (1.83)*	0.0002 (0.73)	0.0003 (0.86)	0.0008 (2.00)**	0.0007 (2.06)**	0.0003 (0.91)	0.0004 (1.10)
Openness	0.0001 (0.61)	0.0001 (0.49)	0.0002 (1.27)	0.0004 (1.82)*	0.0002 (0.71)	0.0002 (0.71)	0.0002 (1.09)	0.0004 (1.60)*
Pop (log)	0.002 (0.41)	0.006 (1.01)	0.010 (2.90)***	0.017 (3.85)***	0.002 (0.45)	-0.0002 (-0.04)	0.009 (2.62)***	0.015 (3.56)***
Foreign exchange reserve (as share of GDP)	-0.208 (-3.30)***	-0.217 (-2.84)***	-0.200 (-4.04)***	-0.259 (-4.08)***	-0.179 (-3.12)***	-0.190 (-3.75)***	-0.181 (-4.06)***	-0.234 (-4.13)***
Credit growth	0.032 (0.53)	0.101 (1.19)	0.041 (0.77)	0.045 (0.62)	0.020 (0.35)	0.029 (0.58)	0.025 (0.45)	0.027 (0.37)
Credit (as share of GDP)	0.014 (1.03)	0.028 (1.59)	-0.014 (-1.51)	-0.016 (-1.27)	0.013 (1.02)	0.023 (1.99)**	-0.014 (-1.56)	-0.016 (-1.35)
NFA (% of GDP)	-0.0001 (-0.64)	-0.0002 (-1.30)	-0.0001 (-0.92)	-0.0001 (-1.33)	-0.00005 (-0.57)	-0.00001 (-0.13)	-0.0001 (-0.72)	-0.0001 (-1.05)
Bank concentration	-0.056 (-1.66)*	-0.059 (-1.62)*	0.008 (0.37)	0.012 (0.40)	-0.055 (-1.65)*	-0.063 (-2.24)**	0.010 (0.47)	0.012 (0.40)
Number of observations	854	854	854	854	854	854	854	854
Number of crises	41	57	36	52	41	57	36	52
% of crises (crises and non-crises) correctly identified	73(72)	68(69)	81(71)	77(72)	71(73)	68(71)	64(82)	75(73)
Pseudo R^2	0.11	0.12	0.11	0.19	0.11	0.11	0.16	0.18
Chi-square	47.42***	46.26***	47.42***	63.05***	47.42***	46.85***	52.15***	62.66***

Note: The dependent variable takes the value equal to one if a banking crisis occurred over [t+1, t+2] and zero otherwise. All the explanatory variables are expressed at time t. ***,**,* denote significance at 1%,5%,10%, respectively.

Table 10. Probability of banking crises explained in terms of different types of capital inflow episodes

	I	II	III	IV	V	VI	VII	VIII
Debt episodes	0.043 (2.68)***	0.043 (2.61)***	-	-	-	-	-	-
FDI episodes	-0.020 (-0.92)	-	-0.001 (-0.05)	-	-	-	-	-
Portfolio episodes	-0.021 (-1.11)	-	-	-0.021 (-1.00)	-	-	-	-
Debt-only-episodes	-	-	-		0.067 (2.99)***	0.068 (2.97)***	-	-
FDI-only- episodes	-	-	-		0.002 (0.10)	-	0.017 (0.87)	-
Portfolio-only-episodes	-	-	-		-0.006 (-0.29)	-	-	-0.009 (-0.41)
Number of observations	821	821	1238	821	821	821	1238	821
Number of crises	37	37	53	37	37	37	53	37
% crises (crises and non-crises) correctly identified	76(67)	78(67)	64(61)	73(64)	76(67)	76(67)	62(60)	76(64)
Pseudo R^2	0.16	0.15	0.08	0.12	0.17	0.17	0.12	0.12
Chi-square	47.66***	39.65***	34.21***	31.49***	49.57***	46.14***	33.32***	28.15***

Note: The dependent variable takes the value equal to one if a banking crisis occurred over [t+1, t+2] and zero otherwise. All the explanatory variables are expressed at time t. ***,**,* denote significance at 1%,5%,10%, respectively. Controls variables as reported in the first column of Table 1 are included but not reported.

Table 11. Probability of a sudden stop

	I	II	III	IV	V	VI	VII	VIII
Inflow Episodes	0.220 (9.50)***	0.224 (9.68)***	0.218 (9.36)***	0.217 (9.41)***	0.236 (10.29)***	0.150 (5.53)***	0.267 (4.92)***	0.19 (7.58)***
Inflation	-0.0002 (-0.76)	-	-0.0004 (-0.87)	-0.0003 (-0.77)	-0.00001 (-0.17)	-0.0001 (-0.60)	-0.001 (-0.63)	-0.00006 (-0.47)
Short-term rate	-0.00004 (-0.16)	-0.0002 (-0.77)	0.0001 (0.20)	-0.00001 (-0.04)	0.00001 (0.01)	-0.00001 (-0.04)	0.0001 (0.15)	-0.00009 (-0.50)
Growth	-0.0005 (-0.71)	-0.0004 (-0.68)	-0.0005 (-0.79)	-	-0.00006 (-0.16)	-0.0006 (-1.08)	0.001 (0.94)	0.0002 (0.29)
Openness	0.0005 (2.15)**	0.0005 (2.14)**	0.0009 (4.95)***	0.0005 (2.20)**	0.0004 (1.87)*	0.0004 (1.76)*	0.0003 (0.89)	0.0004 (1.25)
Pop (log)	-0.017 (-3.53)***	-0.017 (-3.65)***	-	-0.017 (-3.55)***	-0.020 (-4.29)***	-0.017 (-3.59)***	-0.020 (-2.70)***	-0.036 (-4.70)***
Foreign exchange reserve (as share of GDP)	0.025 (0.46)	0.021 (0.38)	0.021 (0.36)	0.021 (0.40)	0.013 (0.25)	0.015 (0.27)	-0.124 (-1.18)	0.008 (0.06)
Credit growth	-0.104 (-0.78)	-0.102 (-0.77)	-0.069 (-0.54)	-0.106 (-0.79)	-	-0.186 (-1.37)	-0.192 (-0.95)	0.077 (0.58)
Credit (as share of GDP)	0.040 (0.17)	0.004 (0.17)	-0.008 (-0.33)	0.005 (0.19)	-	-0.017 (-064)	-0.036 (-0.53)	0.035 (1.26)
NFA (% of GDP)	-0.0003 (-2.05)**	-0.0003 (-2.02)**	-0.0004 (-2.71)***	-0.0003 (-2.08)***	-0.0003 (-2.13)**	-0.0003 (-1.98)**	-0.00004 (-0.17)	-0.0003 (-1.48)
Foreign debt-to-exports ratio	0.013 (2.19)**	0.013 (2.16)**	0.013 (2.20)**	0.013 (2.28)**	0.012 (2.50)**	0.009 (1.48)	0.012 (1.20)	0.023 (3.88)***
Kaopen	-	-	-	-	-	0.014 (2.36)**	-	-
Regulatory quality	-	-	-	-	-	-	0.016 (0.59)	-
Financial liberalisation	-	-	-	-	-	-	-	-0.071 (-1.45)
Cumulative sum of capital inflows	-	-	-	-	-	0.005 (4.10)***	-	-
Number observations	1833	1838	1835	1833	2044	1791	483	1201
Number of crises	246	248	246	246	292	239	65	136
% crises (crises and non-crises) correctly identified	58(72)	57(72)	53(73)	57(72)	54(72)	62(74)	50(73)	65(70)
Pseudo R^2	0.12	0.12	0.11	0.12	0.12	0.14	0.11	0.14
Chi-square	159.69***	162.38***	151.66***	160.22***	187.24***	154.78***	39.99***	114.79***

Note: The dependent variable takes the value equal to one if a sudden stop occurred over [t+1, t+2] and zero otherwise. All the explanatory variables are expressed at time t. ***,**,* denote significance at 1%,5%,10%, respectively.

Table 12. Probability of a sudden stop

	Probit		
	All sample	OECD	Non-OECD
	I	II	III
Inflow Episodes	0.220 (9.50)***	0.180 (5.64)***	0.231 (5.43)***
Inflation	-0.0002 (-0.76)	0.00005 (0.04)	-0.0006 (-0.96)
Short-term rate	-0.00004 (-0.16)	0.003 (1.54)	0.000001 (0.00)
Growth	-0.0005 (-0.71)	-0.0003 (-0.35)	-0.0005 (-0.73)
Openness	0.0005 (2.15)**	0.0002 (0.51)	0.0006 (2.27)**
Pop (log)	-0.017 (-3.53)***	-0.030 (-3.93)***	-0.012 (-2.15)**
Foreign exchange reserve (as share of GDP)	0.025 (0.46)	0.562 (2.52)***	0.022 (0.36)
Credit growth	-0.104 (-0.78)	-0.285 (-1.84)*	0.202 (0.87)
Credit (as share of GDP)	0.040 (0.17)	0.046 (1.14)	-0.027 (-0.75)
NFA (% of GDP)	-0.0003 (-2.05)**	0.0001 (0.45)	-0.0005 (-2.80)***
Foreign debt-to-exports ratio	0.013 (2.19)**	0.009 (1.19)	0.009 (1.22)
Number of observations	1833	633	1200
Number of crises	246	73	173
% crises (events) correctly classified	58(72)	70(68)	62(73)
Pseudo R^2	0.12	0.15	0.12
Chi-square	159.69***	72.27***	116.44***

Note: The dependent variable takes the value equal to one if a sudden stop occurred over [t+1, t+2] and zero otherwise. All the explanatory variables are expressed at time t. ***,**,* denote significance at 1%,5%,10%, respectively.

Table 13. Probability of a sudden stop

	Probit		Logit	
	[t+1,t+2]	[t+1,t+3]	[t+1,t+2]	[t+1,t+3]
	I	II	III	IV
Inflow Episodes	0.220 (9.50)***	0.248 (8.01)***	0.197 (9.96)***	0.232 (8.31)***
Inflation	-0.0002 (-0.76)	-0.00003 (-0.89)	-0.0002 (-0.69)	-0.00003 (-0.81)
Short-term rate	-0.00004 (-0.16)	-0.0003 (-1.19)	-0.00002 (-0.11)	-0.0003 (-1.14)
Growth	-0.0005 (-0.71)	0.0002 (0.25)	-0.0004 (-0.81)	0.00004 (0.06)
Openness	0.0005 (2.15)**	0.001 (3.27)***	0.0004 (2.22)**	0.001 (3.28)***
Pop (log)	-0.017 (-3.53)***	-0.024 (-3.92)***	-0.016 (-3.56)***	-0.022 (-3.82)***
Foreign exchange reserve (as share of)	0.025 (0.46)	0.007 (0.10)	0.019 (0.39)	0.008 (0.11)
Credit growth	-0.104 (-0.78)	0.145 (0.83)	-0.112 (-0.89)	0.140 (0.78)
Credit (as share of GDP)	0.040 (0.17)	0.004 (0.12)	0.002 (0.11)	0.003 (0.12)
NFA (% of GDP)	-0.0003 (-2.05)**	-0.0004 (-2.08)**	-0.0003 (-1.84)*	-0.0004 (-2.05)**
Foreign debt-to-exports ratio	0.013 (2.19)**	0.021 (2.19)***	0.011 (2.01)**	0.019 (2.54)***
Number of observations	1833	1792	1833	1792
Number of crises	246	356	246	356
% crises (events) correctly classified	58(72)	58(67)	57(73)	57(68)
Pseudo R^2	0.12	0.10	0.12	0.10
Chi-square	159.69***	168.95***	157.41***	163.38***

Note: The dependent variable takes the value equal to one if a sudden stop occurred over [t+1, t+2] and zero otherwise. All the explanatory variables are expressed at time t. ***,**,* denote significance at 1%,5%,10%, respectively.

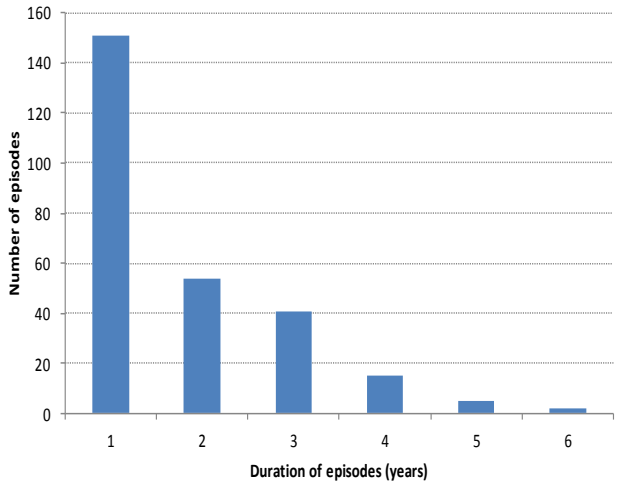
Table 14. Probability of a sudden stop and episodes of large capital inflow: Debt vs.FDI vs. Equity Portfolio

	I	II	III	IV	V	VI	VII	VIII
Debt episodes	0.191 (4.61)***	0.19 (4.61)***	-	-	-	-	-	-
FDI episodes	0.053 (1.16)	-	0.060 (1.56)*	-	-	-	-	-
Equity Portfolio episodes	-0.025 (-0.56)	-	-	-0.010 (-0.22)	-	-	-	-
Debt episodes –only	-	-	-	-	0.199 (4.76)***	0.198 (4.73)***	-	-
FDI episodes –only	-	-	-	-	0.063 (1.40)	-	0.082 (1.73)*	-
Portfolio episodes -only	-	-	-	-	-0.012 (-0.38)	-	-	-0.010 (-0.14)
Number of observations	1079	1079	1811	1085	1079	1079	1811	1085
Number of crises	134	134	244	136	134	134	244	136
% crises (events) correctly classified	61(67)	63(67)	56(64)	60(63)	60(67)	62(67)	57(64)	60(63)
Pseudo R^2	0.09	0.09	0.05	0.06	0.09	0.09	0.05	0.06
Chi-square	75.01***	73.35***	76.77***	54.94***	75.82***	73.61***	77.33***	54.88***

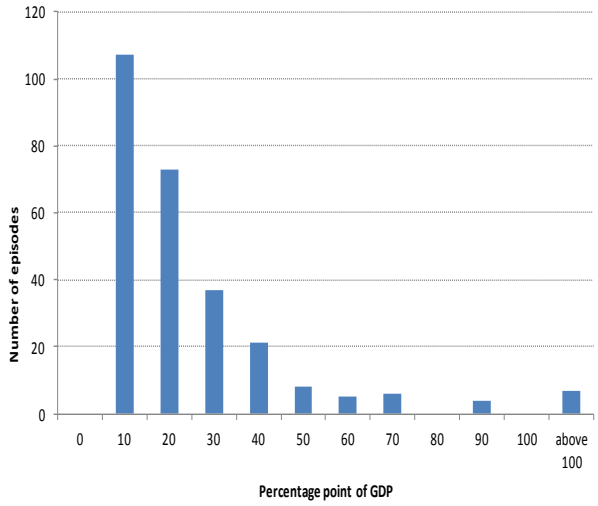
Note: The dependent variable takes the value equal to one if a sudden stop occurred over [t+1, t+2] and zero otherwise. All the explanatory variables are expressed at time t. ***,**,* denote significance at 1%,5%,10%, respectively. Controls variables as reported in the first column of Table A.13 are included but not reported.

Figure 1. Main characteristics of episodes of large capital inflows

a) Duration of episodes

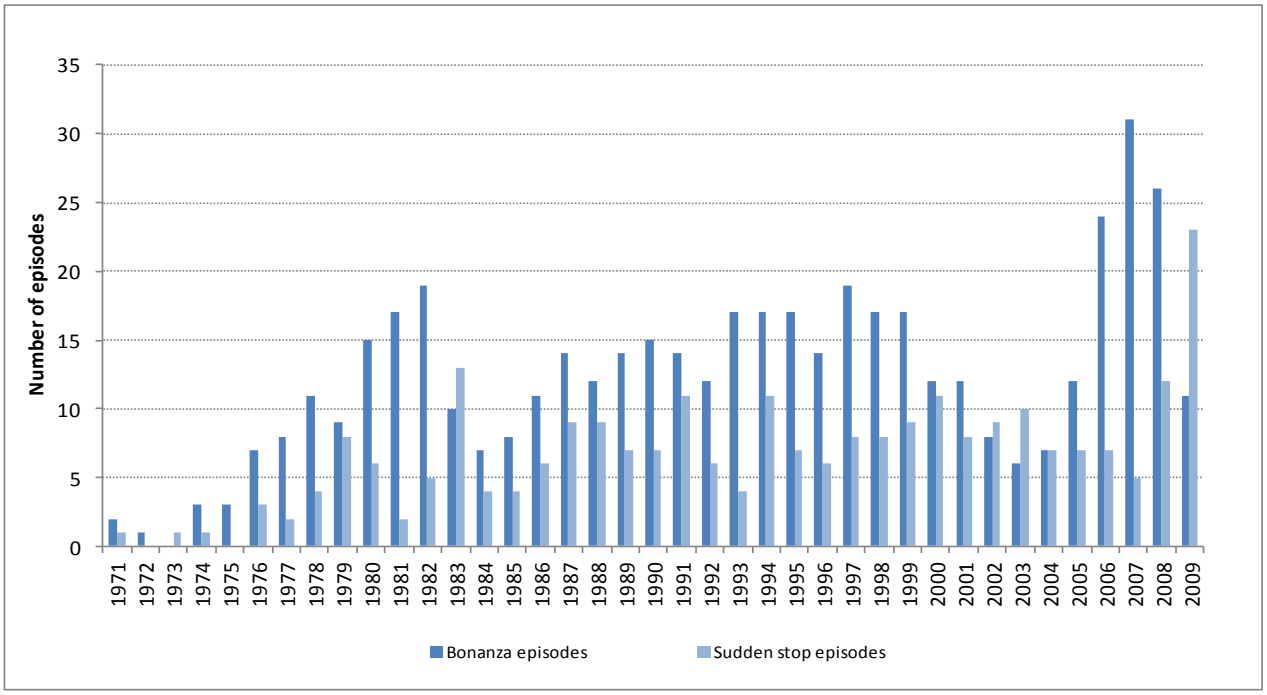


b) Cumulative capital inflow during episodes



Source: OECD calculations

Figure 2. Evolution of number of ongoing large capital inflow and sudden-stop episodes



Note: The number countries for which the data was available to assess the existence of sudden stops increases progressively from less than 50 in the early 1970s, to around 80 in the 1980s and more than 100 since the mid-1990s.

Source: OECD calculations.

BIBLIOGRAPHY

Abiad, A., T. Tressel and E. Detragiache (2008), "A New Database of Financial Reforms", *IMF Working Papers* 08/266.

Agosin, M. and F. Huaita (2009), "Overreaction in Capital Flows to Emerging Markets: Booms and Sudden Stops", *Working Papers* WP295, University of Chile, Department of Economics.

Aizenman, J. and B. Pinto eds. (2006), "Managing Economic Volatility and Crisis", Cambridge University Press.

Allen, F. and D. Gale (2000), "Comapring Financyal Systems. *MIT Press, Cambridge, MA.*

Allen, F. and D. Gale (2004), "Competition and Financial Stability", *Journal of Money, Credit, and Banking* 36 (3 Pt. 2), 433–480.

Angkinand, A. P., W. Sawangngoenyuang and C. Wihlborg (2010), "Financial Liberalization and Banking Crises: A Cross-Country Analysis", *International Review of Finance*, 10, 263-292.

Barrell, R., E. P. Davis, D. Karim and I. Liadze (2010), "Bank Regulation, Property Prices and Early Warning Systems for Banking Crises in OECD Countries", *Journal of Banking and Finance*, 34, 2255-2264.

Beck, T. H. L., A. Demirgüç-Kunt and R. Levine (2006), "Bank Concentration, Competition and Crises: First Results", *Journal of Banking and Finance*, 30. 1581-1603.

Besanko, D. and A. V. Thakor (1993), "Relationship Banking, Deposit Insurance and Bank Portfolio Choice" in Mayer, Colin, Vives, Xavier (eds.), Capital Markets and Financial Intermediation, Cambridge University Press, pp.292–318.

Bonfiglioli, A. and C. Mendicino (2004), "Financial Liberalization, Banking Crises and Growth: Assessing the Links", *Working Paper Series in Economics and Finance* 567, Stockholm School of Economics.

Boot, A. W. and S. Greenbaum (1993), "Bank Regulation, Reputation, and Rents: Theory and Policy Implications" in Mayer, Colin, Vives, Xavier (eds.), Capital Markets and Financial Intermediation, Cambridge University Press, pp.292–318.

Caballero, J. (2010). "Do Surges in International Capital Flows Influence the Likelihood of Banking Crises" University of California Santa Cruz, *Economics Department Working Paper*.

Calomiris, C. W. and G. Gorton (1991), "The Origins of Banking Panics: Models, Facts, and Bank Regulation", NBER Chapters, in Financial Markets and Financial Crises, pp.109-174, National Bureau of Economic Research, Inc.

Calvo, G. and C. Reinhart (2000), "When Capital Inflows Come to a Sudden Stop: Consequences and Policy Options", *MPRA Paper* 6982, University Library of Munich, Germany.

Calvo, G. A., A. Izquierdo and L. F. Mejia (2004), "On the Empirics of Sudden Stops: The Relevance of Balance-Sheet Effects", *NBER Working Paper* No.W10520.

Calvo, G, (2007), "Crises in Emerging Market Economies: A Global Perspective", *Working Papers* Central Bank of Chile 441.

Caprio, G., D. Klingebiel, L. Laeven, and G. Noguera, (2005), "Appendix:Banking Crisis Database" in P. Honohan and L. Laeven (eds.), Systemic Financial Crises: Containment and Resolution, Cambridge University Press.

Cardarelli, R., S. Elekdag and A. Kose (2010), "Capital inflows: Macroeconomic Implications and Policy Responses", Economic Systems, 34 (4), 333-356.

Cavallo, E. A. and J. A. Frankel (2007), "Does Openness to Trade Make Countries More Vulnerable to Sudden Stops, or Less? Using Gravity to Establish Causality", *Working Paper* 618, Inter-American Development Bank.

Chinn, M. and H. Ito (2006), "What Matters for Financial Development? Capital Controls, Institutions, and Interactions", *Journal of Development Economics*, vol. 81(1), 163-192.

Chinn, M. and H. Ito (2008), "A New Measure of Financial Openness", *Journal of Comparative Policy Analysis*, 10 (3) 309-322.

Cole, R. A. and J. W. Gunther (1993), "Separating the Likelihood and Timing of Bank Failure", *Journal of Banking and Finance* 19 (6), 1073–1089.

Demirgüç-Kunt, A. (1989), "Deposit-Institution Failures: A Review of Empirical Literature", Economic Review, Federal Reserve Bank of Cleveland 25 (4).

Demirgüç-Kunt, A. and E. Detragiache (1998), "The Determinants of Banking Crises in Developing and Developed Countries", *IMF Staff Papers* 45 (1), 81–109.

Demirgüç-Kunt, A. and E. Detragiache (2002), "Does Deposit Insurance Increase Banking System Stability? An Empirical Investigation", *Journal of Monetary Economics* 49 (7), 1373–1406.

Edwards, S. (2004), "Financial Openness, Sudden Stops and Current Account Reversals", *American Economic Review*, 94(2), 59-64.

Edwards, S. (2005), "Capital Controls, Sudden Stops, and Current Account Reversals", *NBER Working Paper* 11170, Cambridge, MA.

Edwards, S. (2007), "Capital Controls, Capital Flow Contractions and Macroeconomic Vulnerability", *Journal of International Money and Finance* (26), 814-840.

Eichengreen, B (2003). *Capital Flows and Crises*. MIT Press.

Eichengreen, B., R. Hausmann and U. Panizza (2003), "Currency Mismatches, Debt Intolerance, and Original Sin: Why They Are Not the Same and Why It Matters", *NBER Working Paper* 10036.

Eichengreen, B., P. Gupta and A. Mody (2006), "Sudden Stops and IMF-Supported Programs", *NBER Working Paper* 12235.

Frankel, J. and A. Rose (1996), "Currency Crashes in Emerging Markets: an Empirical Treatment", *Journal of International Economics* 41, 351–366.

Furceri, D. and G. Karras (2007), "Country Size and Business Cycle Volatility: Scale Really Matters", *Journal of Japanese and International Economies* 21(4), 424-434.

Furceri, D. and A. Mourougane (2009), "Financial Crises: Past Lessons and Policy Implications", *OECD Economics Department Working Papers* No.668.

Furceri, D., G. Guichard, and E. Rusticelli (2011), "Medium-Term Determinants of International Investment Positions: the Role of Structural Policies", *OECD Economics Department Working Papers* No.863.

Glick, R. and M. Hutchison (2001). "Banking and Currency Crises: How common are twins?", in R. Glick, R. Moreno and M. Spiegel (eds.), *Financial Crises in Emerging Markets*, Cambridge University Press.

Glick, R., X. Guo and M. Hutchison (2006), "Currency Crises, Capital Account Liberalization, and Selection Bias", *Review of Economics and Statistics*, 88, 698-714.

Gonzalez-Hermosillo, B., C. Pazarbasioglu and R. Billings (1997), "Banking System Fragility: Likelihood Versus Timing of Failure -- An Application to the Mexican Financial Crisis", *IMF Staff Papers*.

Hellman, T., K. Murdock and J. E. Stiglitz (2000), "Liberalization, Moral Hazard in Banking and Prudential Regulation: Are Capital Controls Enough?", *American Economic Review* 90 (1), 147-165.

Kaminsky, G. and C. Reinhart (1999), "The Twin Crises: The Causes of Banking and Balance of Payments Problems", *American Economic Review* 89, 473–500.

Kose, M. A., E. S. Prasad and M. E. Terrones (2007), "How Does Financial Globalization Affect Risk Sharing? Patterns and Channels", *IZA Discussion Papers* 2903.

Leaven, L. and F. Valencia (2008), "Systemic Banking Crises: A New Database", *IMF* Working Paper WP/08/224.

Martin, P. and H. Rey (2006), "Globalization and Emerging Markets: With or Without Crash?", *American Economic Review* 96(5): 1631-1651.

Matutes, C. and X. Vives (2000), "Imperfect Competition, Risk Taking and Regulation in Banking", *European Economic Review* 44, 184–216.

Mauro, P. and T. Becker (2006), "Output Drops and the Shocks that Matter", *IMF Working Paper* 06/172.

Mishkin, F. (1996), "Understanding financial crises: a developing country perspective", *NBER Working Paper*, No.5600.

Pistelli, A., J. Selaive and R. O. Valdés (2008), "Stocks, Flows and Valuation Effects of Foreign Assets and Liabilities: Do They Matter?", Current Account and External Financing, Central Bank of Chile.

Rajan, R. and G. Bird (2001), "Economic Globalisation", World Economics, Economic and Financial Publishing, P.O. Box 69, Henley-on-Thames, Oxfordshire, vol. 2(3), pp.1-18, July.

Reinhart, C. M. and K. Rogoff K (2010), "From Financial Crash to Debt Crisis", *NBER Working Paper* 15795.

Reinhart, C. M. and V. R. Reihart (2009), "Capital Flow Bonanzas: An Encompassing View of the Past and Present" in NBER Macroeconimcs Annual, University of Chicago Press.

Rodrik, D. (1998), "Why Do More Open Economies have Bigger Governments?", *Journal of Political Economy*, 106, 997-1032.

Sachs, J. D. (1985), "External Debt and Macroeconomic Performance in Latin America and East Asia", *Brookings Papers on Economic Activity* 2: 523-573.

Stiglitz, J. E. (2002), "Globalization and Its Discontents", W. W. Norton, New York.

Stoker, J. (1994), "Intermediation and the Business Cycle Under a Specie Standard: The Role of the Gold Standard in English Financial Crises, 1790–1850." Mimeo, University of Chicago.

Velasco, A. (1987), "Financial Crises and Balance of Payments Crises: A Simple Model of the Southern Cone Experience." *Journal of Development Economics*, 27 (1–2), 263–83.

Wang, P. and Y. Wen (2009), "Financial Development and Economic Volatility: A Unified Explanation", *Working Papers* 2009-022, Federal Reserve Bank of St. Louis.

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