

# IMF Working Paper

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## Can Emerging Market Central Banks Bail Out Banks? A Cautionary Tale from Latin America

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## IMF Working Paper

Monetary and Capital Markets Department

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Authorized for distribution by Karl Habermeier

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#### Abstract

This paper investigates whether developing and emerging market countries can implement monetary policies similar to those used by advanced countries during the recent global crisis—injecting significant amounts of money into the financial system without facing major short-run adverse macroeconomic repercussions. Using panel data techniques, the paper analyzes episodes of financial turmoil in 16 Latin America during 1995–2007. The results show that developing and emerging market countries should be cautious because injecting money on a large scale into the financial system may fuel further macroeconomic instability, increasing the chances of simultaneous currency crises.

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## I. INTRODUCTION

The recent financial crisis in mature markets has put the role of central banks in financial stability in the spotlight. In the large advanced economies, central banks played an active role to prevent the collapse of their financial systems. Central banks initially provided aggregate liquidity in money markets without expanding their balance sheets as they were able to mop up excess of liquidity. Later, they granted large amounts of financial support to individual illiquid—and even insolvent—banks and reserve money eventually increased. Central banks provided assistance not only to banks, but also to nondepository institutions, arguing that the former are no longer the only financial intermediaries that pose a systemic risk. However, despite extensive monetization, these policies did not fuel inflation pressures. Moreover, the U.S. dollar appreciated—whereas the British pound and the euro depreciated gradually with respect to other currencies without causing macroeconomic instability. Thus, expansionary monetary policy seems to have been a “free lunch” from a macroeconomic perspective.<sup>2</sup>

Against this background, a new paradigm is emerging that favors an active monetary policy to cope with financial crises. While generous financial assistance to troubled banks has been mostly circumscribed to the advanced economies during the global crisis, emerging markets and developing countries may also adopt this policy in the future to cope with financial distress. But, can all emerging markets and developing countries implement similar policies to tackle banking crises with such little cost in terms of macroeconomic stability?

This paper argues that emerging markets and developing countries should be cautious when using central bank money to cope with financial crises as large scale monetization may cause further macroeconomic unrest.<sup>3</sup> To provide support to this claim, we analyze episodes of financial turmoil in 16 Latin American countries during 1995–2007, review their main macroeconomic repercussions, perform empirical analysis, and distill relevant lessons. The main conclusion is that pouring money into the financial system to confront banking crises tended to fuel macroeconomic and financial instability as it increased the chances of a simultaneous currency crisis.

Our analysis is subject to some caveats. First, the financial assistance provided by multilateral institutions—most typically from the IMF—to some countries at the time of the crises is not

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<sup>2</sup> From a microeconomic perspective, large-scale central bank support to financial institutions has created moral hazard because this is likely to relax markets’ discipline when measuring risks in the future. From the depositors’ viewpoint, they act under the logic that the government implicitly guarantees most or all deposits as a result of extensive financial support or banks’ bailout. Thus, depositors will just seek the highest return to their investments, without paying attention to the riskiness of the banks’ portfolios and, in general, without gathering information of banks’ solvency situation.

<sup>3</sup> Although banking and financial crises may have slightly different meanings—as the latter also includes nonbank financial institutions—we use both terms interchangeably in this paper, given that banks comprise the bulk of the financial system in Latin America.

factored explicitly into the paper. This financial support strengthened the external position of the crisis country, discouraging attacks against the domestic currency. Second, the soundness of the banking system is not incorporated in the analysis either. This caveat is particularly relevant when it comes to crises triggered by external shocks, as healthy financial institutions can better resist the adverse impact of the shocks. For the purpose of drawing lessons for the future, it is also important to note that, during most of the period of analysis, central banks in Latin America lacked credibility as this has only been developed during the last 10 years by a handful of central banks. Credible central banks can better mitigate the uncertainty that typically is associated with events of financial distress and that fosters capital outflows.<sup>4</sup>

Despite its importance, the role of central banks in episodes of financial turmoil in emerging markets and developing countries has been marginally addressed in the literature.<sup>5</sup> While the multiplication of banking crises in recent decades motivated a large number of studies, they are rarely focused on the reaction of monetary policy and its macroeconomic effects on the dynamics of the crises.<sup>6</sup> More recently, in the wake of the world financial turmoil, the role of central banks in advanced countries has been extensively examined and, today, there is a lively debate about the scope of central banks' involvement on macroprudential policies. Similar studies in developing and emerging market countries continue to receive scant attention, but it is becoming a topic of increasing interest among policy makers.

By stressing the perils of providing large-scale support to financial institutions, this paper seeks to contribute to the discussion about the appropriate central bank response to financial crises in developing and emerging market countries. It belongs to the family of studies about balance of payment crises pioneered by Krugman (1979), emphasizing the link between banking and currency crises (third generation models) from an empirical perspective. In particular, our paper highlights the impact from banking to currency crises, identifying the adverse effects of injecting central bank money in large scale as the key driver of currency crises. Thus, our paper also belongs to the "twin crises" literature popularized by Kaminsky

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<sup>4</sup> See Canales and others (2010) for an analysis of the role played by central banks in Brazil, Chile, Colombia, Mexico, and Peru during the recent world financial crisis.

<sup>5</sup> Only a few studies examine this important issue. See, for example, Dziobek and Pazarbaşıoğlu (1997), who analyze the management of banking crises, including the role of central banks, and more recently Jácome (2008), focused on Latin America.

<sup>6</sup> These studies have primarily stressed the identification of early warning indicators, the dynamics of banking crises and their aftermath on a country or regional basis, and the link between banking and currency crises. See for example the comprehensive work on early warning indicators by Goldstein and others (2000); Collyns and Kincaid (2003) on the dynamics of banking crises; and Kaminsky and Reinhart (1999) on the link between banking and currency crises. From a microeconomic standpoint, studies mostly addressed issues such as the government response to banking crises and their fiscal cost, the role of supervision and regulation in explaining banking crises' eruption and contagion, and the nature of financial restructuring. See for instance the review on how governments managed banking crises by Hoelscher and Quintyn (2003); the analysis by de Juan (1996) on the microeconomic roots of banking crises; and Calomiris and others (2005) for a taxonomy of resolution mechanisms applied to cope with banking crises.

and Reinhart (1999). The empirical nature of our paper complements the theoretical work initially laid out in Velasco (1987) and, with some variations, later addressed by Chang and Velasco (1999). Closely related empirical work has been developed in Tanner (2001 and 2002), examining the effects of monetary policy in general—not induced by banking crises—on currency crises.

The rest of the paper is organized as follows: Section II discusses briefly how central banks confronted crises episodes in Latin America during the last two decades; Section III analyzes the macroeconomic repercussions associated with the provision of large-sale central bank support to tackle financial crises and tests empirically the main argument of our paper for the 1995–2007 period; and Section IV concludes.

## **II. THE RESPONSE OF CENTRAL BANKS AND ITS MACROECONOMIC IMPACT**

Latin America has a long and painful history of banking crises. Recurrent episodes of financial turbulence became a key source of macroeconomic instability up to the mid-2000s. Specifically, Latin America had 28 systemic banking crises from 1970 to 2007, which is a disproportionate number compared with other regions in the world, except for Africa.<sup>7</sup> Systemic banking crises were more frequent in the wake of the debt crises of the early-1980s, and during the mid- and late-1990s and the early-2000s, following episodes of terms of trade deterioration and/or of capital outflows.

More recently, since 1990, only Chile and Panama have been immune to events of financial instability, with a number of countries affected more than once (Argentina, Bolivia, Dominican Republic, Ecuador, Guatemala, and Paraguay). In the rest of this section we focus our analysis on episodes of financial turmoil in Latin America from the early 1990s onwards, stressing first key characteristics of these events, and then reviewing the modalities of central bank involvement and their macroeconomic repercussions.<sup>8</sup>

### **A. Brief Stylized Facts**

We start by identifying the episodes of financial distress and crises. We consider both full-fledged banking crises and also small idiosyncratic episodes. Thus, we include the well known banking crises in Argentina, Ecuador, Dominican Republic, Mexico, Uruguay, and Venezuela, and also some small crises, which are almost unknown in the banking crisis literature. In addition, we also include events of significant financial distress, which were tackled at an early stage and, hence, did not turn into full-fledged banking crisis although they involved the closure of several banks—like Colombia and Peru during the late-1990s and

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<sup>7</sup> See Laeven and Valencia (2010).

<sup>8</sup> Previous systemic banking crises that hit various countries in the region have been extensively analyzed. See for example Sundararajan and Baliño (1991) and Rojas-Suarez and Weisbrod (1995).

Argentina in the mid-1990s. In all these events at least one institution was intervened and/or closed, received central bank financial assistance in an amount that exceeded the impaired bank's equity, or was subject to resolution. The table in the Appendix offers a brief identification of each of these crises with an explanation of the facts underlying these events.

The root cause of these crises is not very different than in the recent financial crises in the advanced countries. The story that better describes the origin of Latin American banking crises is the well known "boom and bust cycle." Latin America had liberalized financial markets during the late-1980s and early-1990s and this encouraged growing capital inflows, attracted also by increasing macroeconomic stability. As a result, real interest rates declined and the domestic currencies appreciated, all of which fostered a credit boom. Unfortunately, financial liberalization was not coupled with better financial surveillance and enforcement capacity of bank regulators. Thus, the combination of financial liberalization, capital inflows, and loose financial supervision, laid the ground for the development of a variety of new and risky financial transactions. This cycle of credit expansion only lasted until successive shocks hit Latin America starting in the mid-1990s, which triggered massive capital outflows. These resulted in liquidity and credit crunches in many countries, bringing to the forefront significant deficiencies in the quality of banks' assets and leading eventually to banking crises. In some episodes, rather than a real shock, external contagion from within and outside the region triggered financial crises. Thus, like recently in the advanced countries, the combination of a credit boom, fueled by financial liberalization, and lax prudential supervision, ended up in financial crises.

Underlying the described "boom and bust cycle," a number of macroeconomic features could have made Latin American countries more prone to banking crises, in particular to systemic crises. In general, most countries that suffered systemic banking crises in the region were emerging market economies, exhibited financial dollarization, and featured a weak fiscal stance.<sup>9</sup> Emerging markets proved to be more vulnerable to recurrent external financial shocks, such as the "Tequila effect" in 1995, the Asian crisis in 1997 and 1998, and the Russian and Brazilian currency crises in the late 1990s, which triggered capital outflows. Financial dollarization—in an environment of lax supervision—may have worked as an aggravating factor because financial systems are more likely to develop balance sheet mismatches that fuel liquidity shortages and solvency problems as currencies depreciate. In turn, in countries where the public debt was denominated in foreign currencies, a large depreciation eventually led to banking, currency, and sovereign debt crises.

### **B. The Menu of Central Banks' Responses**

In the recent history of financial instability in Latin America, central bank financial support was often used intensively to cope with banking crises. In many cases, a lack of appropriate

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<sup>9</sup> See Jácome (2008).

institutional foundations to effectively address banking problems forced the central bank to step in, in order to prevent the collapse of the payments system.<sup>10</sup> In some cases, it may also have been that in the absence of central banks' autonomy, governments induced them to monetize banking crises to avoid using—or at least postponing in the short-term—tax payers' money to fund the cost of resolving the crises.

At the beginning, central banks recycled liquidity through an intensive use of standing facilities, thus allowing troubled banks—unable to raise funds in the interbank market or elsewhere—to access liquidity. However, this was only possible for as long as illiquid banks had available appropriate assets, typically central bank and government paper, to pledge as collateral or to sell them to central banks under repurchase agreement operations. From then on, central banks' financial assistance was provided via traditional lender-of-last-resort (LLR) facilities, namely short-run loans at a penalized interest rate following an explicit request from ailing banks. Beneficiary institutions were required to submit collateral such as eligible private sector loans, or real assets, depending on the regulations in each country. The borrower bank was sometimes required to accept a stabilization program aimed at overcoming its liquidity problems and pay back central bank loans.

As the crises unraveled, other forms of central bank financial assistance were also deployed. In addition to providing limited LLR, central banks followed three broad courses of actions to tackle banking crises: (i) supplied enhanced LLR—in an amount that exceeded the impaired banks' equity; (ii) granted financial assistance to support bank resolution and restructuring; and (iii) funded payments of deposit insurance/guarantees. Extensive financial assistance was used not only to cope with large or systemic crises, but also to confront idiosyncratic events. From another angle, central banks' assistance typically supported bank depositors and not directly borrowers from impaired banks—as happened during the 1980s banking crises in various countries in the region.<sup>11</sup>

In practice, most central banks stretched LLR provisions to assist financial institutions suffering not only liquidity, but also solvency problems. Typically, central banks were legally empowered to expand financial assistance but, in a few cases, legislation required a qualified majority of votes in central bank governing bodies or demanded the executive branch to approve extra financial assistance to troubled banks. These resources were provided in exchange for valuable collateral, and hence, impaired banks were bounded by the availability

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<sup>10</sup> Most Latin American countries modernized central bank and financial institutions legislation during the 1990s (see Carstens and Jácome, 2005). However, while the former focused on enhancing central banks' autonomy to abate inflation, the latter was basically aimed at liberalizing financial markets with the purpose of fostering economic growth, without providing a suitable framework to cope with major banking problems.

<sup>11</sup> In those crises, central banks provided long-term subsidized lines of credit to back the financial system's rescheduling of loans, sectoral lines of credit under soft financial conditions, and preferential exchange rates for foreign currency liabilities, just to mention a few. See Baliño (1991) on Argentina and Velasco (1991) on Chile.



of good assets—although in few cases, as the crisis worsened, the central bank eventually relaxed the quality standard of the assets pledged as collateral.<sup>12</sup> Central banks injected money—beyond limited LLR assistance, as defined above— even in cases of small and idiosyncratic crises, like in Dominican Republic (1996), Guatemala (2001), and Honduras (1999).

In a number of countries, central bank money was also used to support bank restructuring and resolution.<sup>13</sup> This policy typically aimed at cleaning the troubled banks' balance sheet and at easing its subsequent rehabilitation or purchase by another bank. For instance, central banks issued securities and swapped them for nonperforming assets of the impaired bank directly or through a bank restructuring institution (Bolivia 1999, El Salvador, Mexico, among others). They also issued securities to be used in purchase and assumption operations (P&A) (Nicaragua), or simply extended credit to the acquiring institution to pay deposit withdrawals following P&A (Brazil).

Lastly, central banks were also required to pay insured deposits on behalf of deposit insurance institutions or government guarantees, and to withstand a run on deposits. They were required to directly pay deposit insurance and blanket guarantees (Ecuador 1999, Venezuela), advance money to deposit insurance institutions when these lacked sufficient resources to honor their commitment (Honduras), or simply, finance all deposit withdrawals from troubled banks (Bolivia 1994, Costa Rica, Dominican Republic 2003, Guatemala 2001, Paraguay 1995).

Underlying the intensive use of central bank money in Latin America was the lack of an appropriate institutional framework aimed at preventing and managing banking crises. As Jácome (2008) highlights, countries in the region lacked legal provisions to effectively adopt early corrective actions, deposit insurance mechanisms were inexistent or poorly funded in most countries, and effective bank resolution instruments were inexistent. Against this background, most countries resorted to the intensive use of central bank money, which was eventually conducive to a disorderly unfolding of banking crises. In practice, as financial distress escalated, central bank money was increasingly used in an effort to contain financial instability, but this was primarily diverted into capital outflows, thereby fostering currency depreciations.

Alternatively, in a few episodes of financial distress, an appropriate institutional framework helped authorities to react quickly and effectively. Central bank money was provided only in limited amounts, and thus, financial contagion was contained and macroeconomic instability averted. For instance, Argentina in 1995, and Colombia and Peru in 1999, handled financial

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<sup>12</sup> For example, during the financial crisis in the Dominican Republic in 2003.

<sup>13</sup> To a great extent, these decisions are similar to those adopted in some advance economies during the recent crisis—like the Bank of England's support to Northern Rock Bank and the Federal Reserve's assistance to depositary and nondepositary institutions (such as Bear Sterns and AIG).

turbulence without allowing it to turn into full-fledged financial crises. In those countries the central bank law imposed limitations on the provision of LLR—in terms of the amount and the maturity of the loans. Therefore, LLR was used initially when banking crises erupted as part of a broader financial safety net, but the bulk of the crisis response relied on bank resolution measures, primarily P&A operations. Brazil and Nicaragua were also relatively successful as they relied on bank resolution measures. In addition, in Brazil, Colombia, and Peru, the government designed a comprehensive strategy that included incentives to restructure debts and carry out bank mergers and acquisitions. The five countries could only follow these strategies provided they had in place—or managed to rapidly approve—appropriate institutional arrangements. Also, in some of these countries (Argentina 1995, Peru), strong macroeconomic foundations and sound financial systems, contributed to avert a major banking crisis, thereby limiting resolution costs and side effects. In Colombia and Nicaragua, the timely financial support of the IMF had a similar beneficial impact.

### C. Macroeconomic Repercussions

As in several advanced economies during the recent financial crisis, the Latin American countries injected central bank money in large scale during periods of systemic crises.<sup>14</sup> A number of central banks more than doubled their balance sheets during the first two years of their crisis, like the increase observed in various advanced countries, during the recent crisis (Table 1). However, while in the latter group of countries the monetization of banking crises served to mitigate the economic downturn and did not fuel inflation, in Latin America similar policies induced macroeconomic disarray.

**Table 1. Expansion of Central Banks' Balance Sheets during Banking Crises**

(Total assets in selected advanced and Latin American countries, Index numbers)

	Advanced countries			Latin American countries			
	T	T +1	T + 2	T	T +1	T + 2	
United States	100	103	252	Argentina	100	233	256
United Kingdom	100	131	305	Dominican Rep.	100	190	258
Bank of Japan	100	110	116	Ecuador	100	162	503
ECB	100	132	178	Mexico	100	154	235
Sweden	100	106	333	Uruguay	100	222	184
Switzerland	100	120	207	Venezuela	100	194	282

T corresponds to the pre-crisis year and T+1 and T+2 to the first and second years of the crises.

Source: International Monetary Fund's International Financial Statistics for the advanced countries and central banks' websites and annual reports for the Latin American countries.

<sup>14</sup> Characterizing this group of banking crises as systemic fits both definitions laid out by Demirguc-Kunt and Detragiache (1998) and by Laeven and Valencia (2010).

Some of the largest cases of central bank support to financial institutions are those of Argentina (2002), Dominican Republic (2003), Ecuador (1999), Mexico, Uruguay, and Venezuela.<sup>15</sup> In Argentina (2002), the monetary assistance extended to financial institutions exceeded 8 percent of GDP, and was mostly provided to public banks; although private banks, including few foreign institutions, also received central bank support.<sup>16</sup> Central bank assistance reached a peak of nearly 20 percent of GDP in Dominican Republic (2003).<sup>17</sup> Ecuador is another example of excessive reliance of financial safety nets on central bank financial assistance as the Central Bank of Ecuador (BCE) provided extended LLR and also paid a limited guarantee of deposits. Later the BCE discounted government bonds issued to pay a blanket guarantee. As a result, the BCE injected nearly 12 percent of GDP by end-1999.<sup>18</sup> The Bank of Mexico provided financial assistance in domestic and foreign currency, directly and through the Banking Fund for the Protection of Savings (FOBAPROA), in an amount close to 10 percent of GDP by end-1994. Financial assistance to impaired banks by the Central Bank of Uruguay exceeded 10 percent of GDP by mid-2002. In turn, the Central Bank of Venezuela (BCV) also funded deposit withdrawals, extending credit to a host of financial institutions, directly or through the Guarantee of Deposits Fund (FOGADE), hitting nearly 10 percent of GDP at some point in 1995.<sup>19</sup>

In nonsystemic crises monetization also took place, but in smaller amounts, and hence, central banks managed to mitigate the adverse macroeconomic effects. Bolivia and Paraguay in the mid-1990s, and Guatemala in the late-1990s and early-2000s, are cases in point. In this group of countries, in addition to providing liquidity assistance, the central bank honored most or all withdrawal of deposits fearing the possibility of contagion. However, since the crises were small, central banks managed to mop up the expansion of liquidity.

The short-run effect of providing large-scale financial assistance was to constrain central banks' ability to conduct monetary policy.<sup>20</sup> Financial support was so large that mopping up excess liquidity proved to be very difficult as it would have required raising interest rates to a very high level. This is because in the wake of the crisis, the interbank money market became segmented between banks perceived as solid and, hence, liquid, and banks perceived as weak and, hence, illiquid. Thus, as central bank financial assistance served to withstand deposit

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<sup>15</sup> The numbers in this section correspond to the total central bank credit provided at the peak of the crises (see Jácome, 2008), which are different than the numbers used in the empirical section that refer to annual increases.

<sup>16</sup> Among public banks, Banco Nación and Banco Provincia de Buenos Aires (with 28 percent market share) were the main beneficiaries of the central bank support, receiving loans as large as about 4.5 and 3 times their net worth, respectively, whereas loans to Banco Galicia, the largest domestic private institution, more than tripled its net worth.

<sup>17</sup> The central bank extended LLR to three private banks, including Baninter—the third largest bank in the system—which received financial support equivalent to 10 times its net worth or close to 15 percent of GDP.

<sup>18</sup> The blanket guarantee was introduced in the midst of the crisis and was delivered by discounting government bonds through the Agency of Deposits' Guarantee at the BCE.

<sup>19</sup> The BCV loans benefited initially to Banco Latino, until it was closed. However, this triggered contagion and, hence, the BCV expanded financial assistance both directly and indirectly via FOGADE institutions.

withdrawals from weak banks, “flight to quality” took place toward solid banks or simply turned into capital outflows. To avoid the latter, the central bank would have to offer a very high interest rate that is consistent with the accelerated pace of depreciation. Therefore, in practice, as central bank’s financial assistance soared, reserve money also boomed (Figure 1)—except in those crises where central banks provided loans in foreign currency directly, or when international reserves declined simultaneously due to central banks’ interventions in the foreign exchange market, which offset monetary expansion. Despite the large financial assistance, macroeconomic uncertainty prevailed and, hence, sound and stable banks hoarded excess liquidity as a precautionary measure to prevent a possible slowdown in the recuperation of credits and the acceleration of bank runs, and possible contagion. As a result, sound banks did not lend to financial institutions facing liquidity shortages.

Also, short-term interest rates moved higher despite the increase in reserve money (Figure 2). Banks suffering a liquidity squeeze were typically charged higher interest rates in the interbank market, and also by the central bank. At the same time, they raised deposit rates to increase the return offered to depositors with the expectation of discouraging the continuation of deposit runs. At a systemic level, interest rates soared, reflecting the expectation of a currency depreciation and, as a result, a likely acceleration of inflation. Altogether, high interest rates undermined troubled banks’ solvency position due to the increase in their funding costs and because higher interest rates made it more difficult to recover loans.

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<sup>20</sup> Injecting large amounts of central bank money also generated long-run adverse effects on the conduct of monetary policy. Provided the assets received as collateral were only partially recovered, central banks losses materialized over time. This, in many cases, wiped out central banks’ capital, thereby undermining their operational autonomy, as central banks feared that the costs associated with monetary operations would erode their already weak financial position. Yet, many governments in the region have been reluctant to replenish central banks’ capital (see Stella and Lonnberg, 2008).

Figure 1. Monetization of Banking Crises and Base Money<sup>1/</sup>  
(Percentage change)

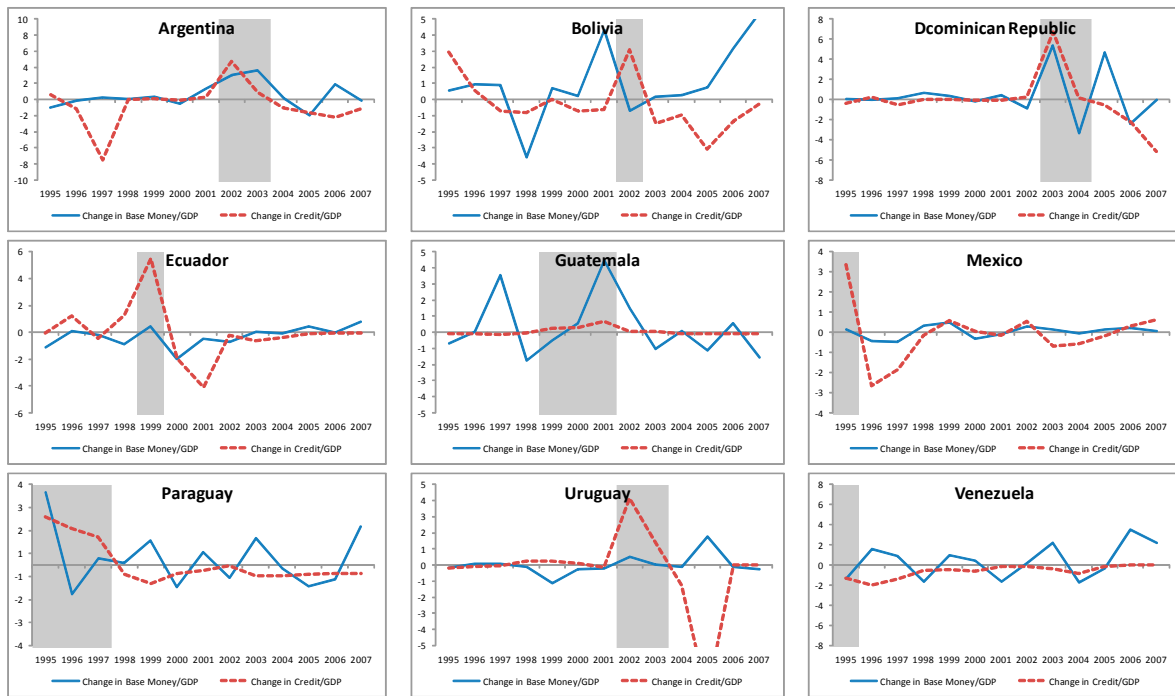
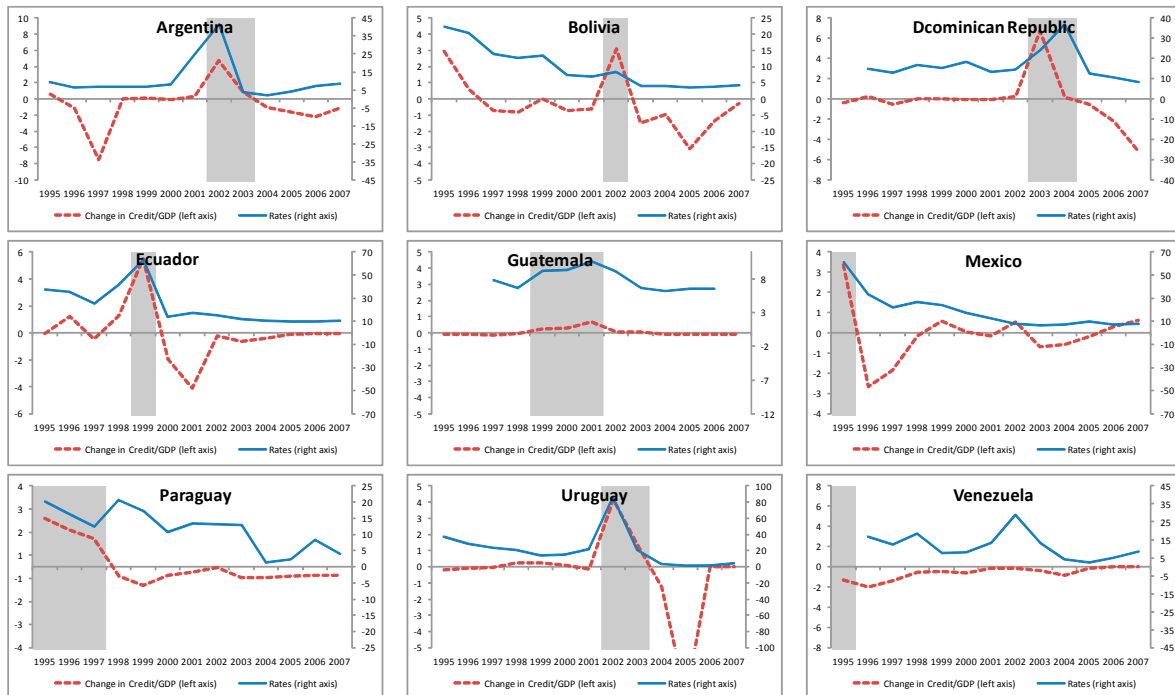


Figure 2. Monetization of Banking crises and Short-Term Interest Rates<sup>1/</sup>  
(Annual percentage rates)



Sources: International Financial Statistics, IMF, and central banks' websites.

<sup>1/</sup>The monetization of banking crises is measured by the percentage change in central banks' claim on banks.

As noted above, in many countries, as central banks' financial assistance surged, so did the demand for foreign currency, leading to exchange rate pressures. While in some crises "flight to quality" took place and depositors kept holding domestic currency, in others, typically in dollarized economies and during systemic episodes, depositors chose to shift to foreign currency assets in order to preserve the value of their savings in anticipation of a likely depreciation of the currency. Eventually, large depreciations materialized in systemic crises (Figure 3). For instance, local currencies depreciated more than 50 percent in only three months in Ecuador (1999), Mexico, Uruguay, and Venezuela, whereas in Argentina (2002) the value of the U.S. dollar quadrupled with respect to the peso as the country exited the currency board. Countries with super-fixed and fixed exchange rate regimes—like Argentina (1995) and El Salvador—could preserve exchange rate stability at the cost of losing international reserves, provided the financial turbulence was not sufficiently strong to make the peg unsustainable like in Argentina in 2002.

When the enhanced demand for foreign currency put pressure on the exchange rate, central banks intervened by selling dollars in the foreign exchange market to moderate the depreciation trend. International reserves then declined, in particular when the run on deposits and the shift to foreign currency denominated assets was strong (Figure 4). In a number of crises, where a soft peg regime was in place, the erosion of international reserves did not last very long. Self-fulfilling expectations of a large currency depreciation turned into a speculative attack against the domestic currency and, hence, the central bank was forced to abandon the peg before international reserves were exhausted, thereby triggering a balance of payments' crises. Argentina and Uruguay in 2002, as well as Ecuador in 1999 and Mexico in 1994, illustrate this type of crises.

These dynamics fueled a vicious cycle. The attack on the domestic currency also put upward pressure on interest rates. While the sharp currency depreciation directly hit the balance sheets of unhedged market participants in financially dollarized economies, higher interest rates adversely affected illiquid financial institutions. As a result, the solvency of banks was weakened and the liquidity squeeze paved the way for additional central bank support, reinstating the conditions for further currency depreciations. In some cases, the latter triggered a vicious circle of large central bank financial support—exchange rate depreciation—additional central bank financial support—and further exchange rate depreciation. With the aim of breaking this negative loop and to avoid a potential financial meltdown, some governments eventually took administrative measures. These withdrawals included capital controls (Venezuela) and different forms of limitations on deposit from banks (Argentina and Uruguay in 2002, and Ecuador in 1999). In other crises, financial instability lost momentum and eventually subsided as countries received significant financial support from multilateral institutions, like in Dominican Republic 2003 and Mexico in the mid-1990s.

Figure 3. Monetization of Large Banking Crises and Exchange Rate Depreciation<sup>1/</sup>  
(Percentage change)

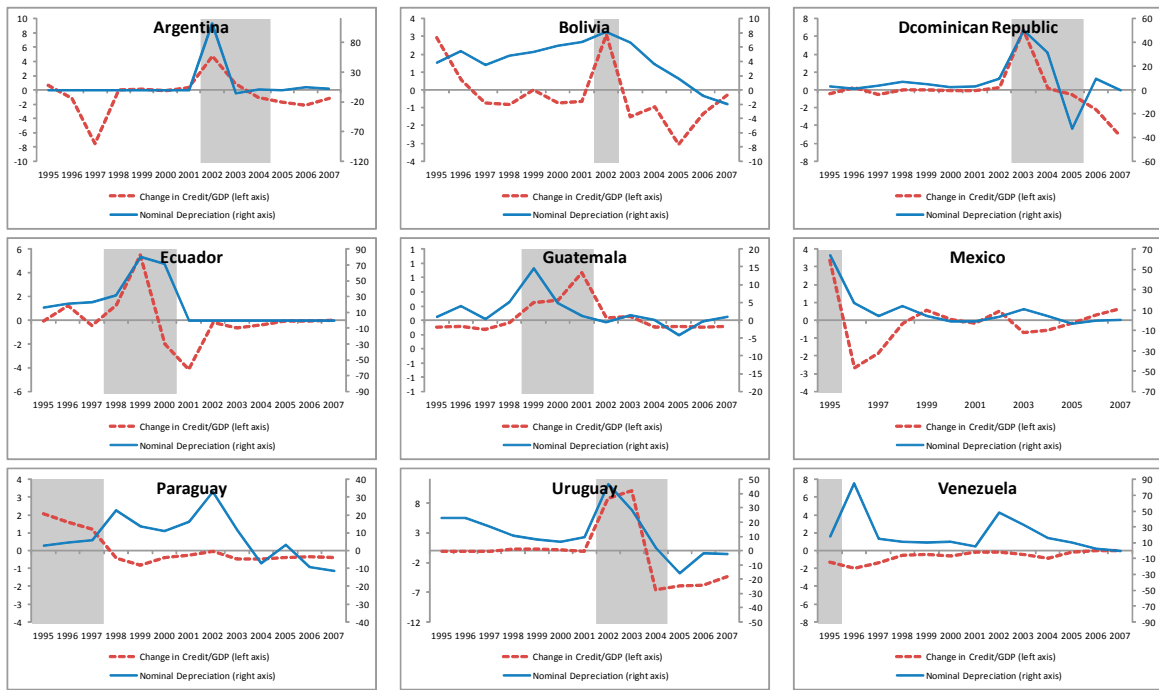
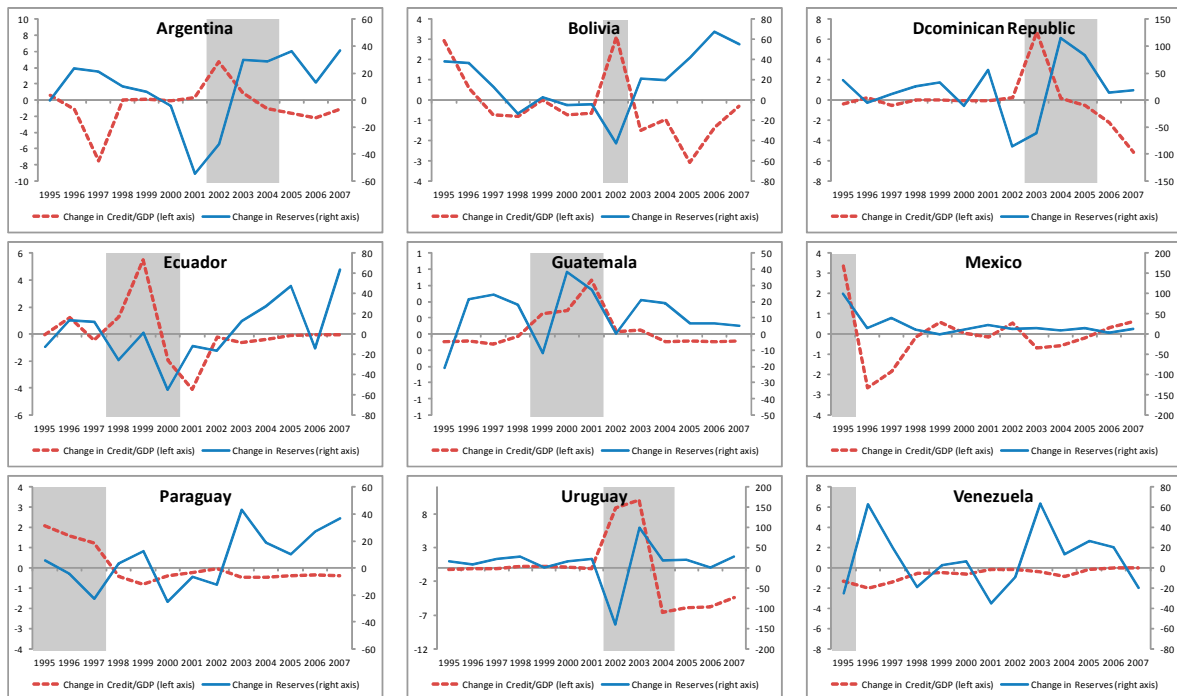


Figure 4. Monetizing Banking Crises and International Reserves<sup>1/</sup>



Sources: International Financial Statistics, IMF, and central banks' websites.

<sup>1/</sup>The monetization of banking crises is measured by the percentage change in central banks' claim on banks.

In general, as financial turbulence escalated, monetary policy no longer fulfilled its primary role of preserving price stability. This is because central banks put at the forefront the goal of containing the banking crisis and preserving financial stability. However, the large use of central bank money to cope with banking crises and its effect on the exchange rate eventually fueled inflation. In small and open economies, like the Latin American countries, the transmission mechanism from money to prices generally passes through the exchange rate, because of the direct impact of depreciation on the price of tradable goods. So as the excess money supply increased, the exchange rate depreciated and inflation accelerated (Figure 5). In some countries, where the exchange rate peg was abandoned in the midst of the financial crisis, there was exchange rate overshooting and inflation soared.

The impact of the monetization of banking crises on economic growth was also negative. There are at least two channels through which injecting large amounts of central bank money could affect growth in the short-run: an exchange rate channel and an indirect interest rate channel, although they may operate in opposite directions. Provided the central bank can hold inflation below the rate of nominal depreciation, a real exchange rate depreciation materializes and, thus, exports may increase, thereby fostering economic growth. On the other hand, there is a negative impact on economic growth because the sustained exchange rate depreciation also induces an increase in domestic interest rates, which, in turn, fosters a decline in credit demand. Furthermore, because of the dislocation of money markets resulting from financial distress, and since sound banks hoarded excess liquidity as a precautionary measure against possible contagion, chances are that the availability of credit disappears. In financially dollarized economies, exchange rate depreciations immediately hit unhedged bank borrowers—they suffered a sudden and sharp decrease in net wealth—which not only damages banks' balance sheets, but also undermines aggregate demand and, hence, economic activity.

Against this background, the vast majority of countries in our sample that suffered large crises also experienced an economic contraction, as real GDP shrunk by at least 3 percent (Figure 6). While large nominal and real depreciations boosted economic growth in the medium term, in the short run, as the crises unraveled, economic activity was almost frozen and plunged because credit market collapsed as a result of the uncertainty associated with the deterioration of the countries' macroeconomic and financial conditions.



Figure 5. Exchange Rate Depreciation and Inflation  
(Percentage change)

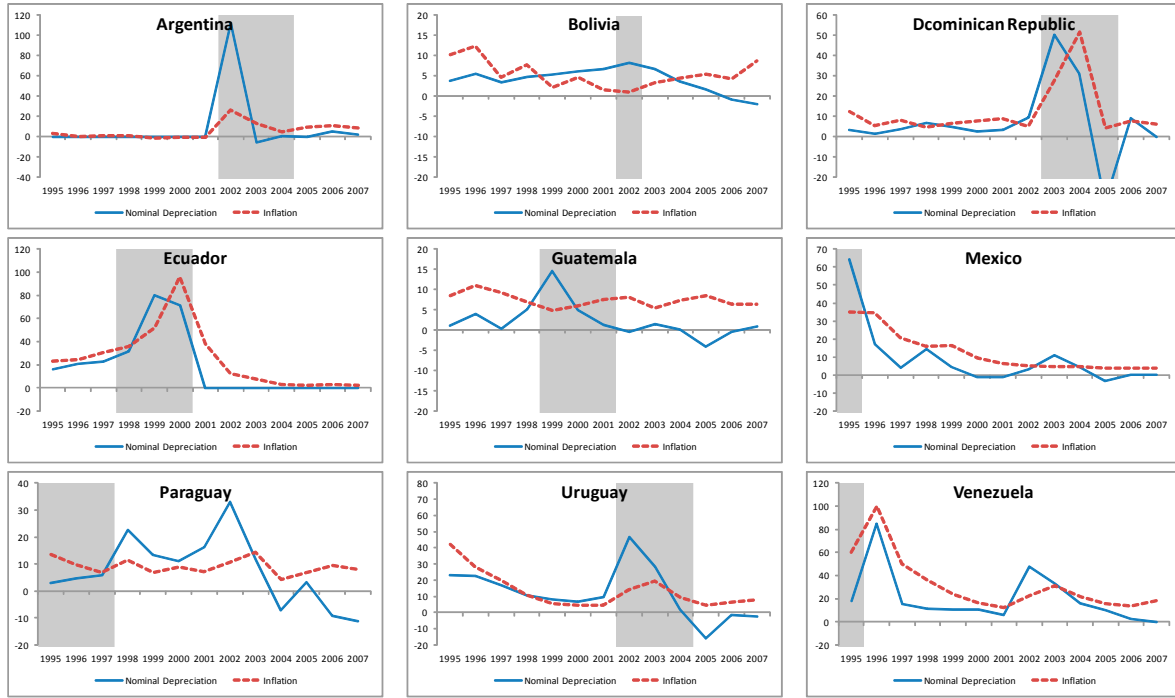
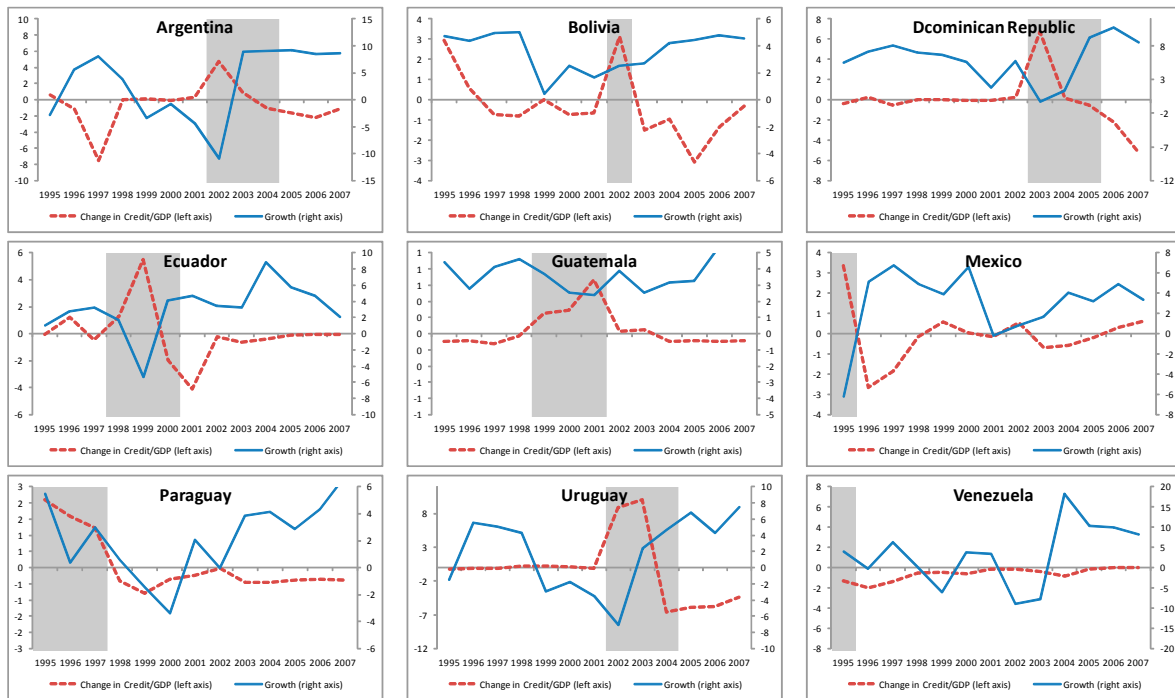


Figure 6. Monetization of Banking Crises and Economic Growth<sup>1/</sup>  
(Percentage change)



Sources: International Financial Statistics and IMF.

<sup>1/</sup>The monetization of banking crises is measured by the percentage change in central banks' claim on banks.

### III. EMPIRICAL ANALYSIS

The literature has provided three groups of theories explaining the linkages between currency and banking crises, as outlined by Kaminsky and Reinhart (1999):

- One group of models emphasize that the causation runs from balance-of-payments problems to banking crisis. For example, an initial external shock, such as an increase in foreign interest rates, coupled with a commitment to a fixed parity, will result in the loss of reserves, which typically lead to a credit crunch, increased bankruptcies, and financial crisis. In financially dollarized economies, if a devaluation occurs, banks' balance sheets could be directly weakened if they are exposed to foreign currency risk. Even if there is no mismatch between assets and liabilities denominated in foreign currencies, banks are hurt because they are typically exposed to credit risks if a large proportion of borrowers are unhedged;
- A second group of theories point to the opposite causal direction—financial-sector problems give rise to the currency collapse. These models highlight that when central banks finance the bailout of troubled financial institutions by printing money, the implications are similar to the classical model of a currency crash prompted by excessive money creation *à la* Krugman (1979)—where domestic credit creation in excess of money demand growth leads to a loss of reserves, and ultimately to a speculative attack against the currency that forces to abandon the fixed exchange rate regime. Velasco (1987) extended Krugman's model to explicitly incorporate the financial system with the aim of linking banking and currency crises. Specifically, Velasco's model lays out an economy where the excessive creation of money is directed not to finance the fiscal deficit but to deliver the implicit or explicit guarantee provided by the government of the financial system's liabilities. Therefore, what triggers the crisis is not only the explicit fiscal deficit but also the implicit fiscal deficit resulting from contingent liabilities;
- A third family of models argues that currency and banking crises have common causes, for example financial liberalization combined with moral hazard incentives may fuel a lending boom involving both foreign and domestic credit expansion that eventually leads to a banking and currency crisis (McKinnon and Pill, 1996, 1998).

This section focuses on the second group of models and checks for statistical evidence of the link between monetizing banks' distress and external instability in Latin America over 1995-2007. We test the hypothesis that as central banks injected money in response to an escalation of the distress in the banking system, chances of having a currency crisis increased.

### A. First Look at the Data

Our sample consists of 16 Latin American countries that experienced some degree of financial distress during 1995-2007.<sup>21</sup> We do not extend this period to avoid the aftermath of the global financial crisis. We first provide summary descriptive statistics for the key variables in our analysis (Table 2). To scale central banks' financial assistance, we use the change in central bank claims on depositary institutions as a ratio of GDP. In turn, to obtain an idea of the performance of the external accounts, we use the annual changes in international reserves and the nominal exchange rate (local currency per U.S. dollar). The statistics are calculated for the entire period and for episodes of credit expansion.

**Table 2. Summary Descriptive Statistics**

(Annual observations, 1995–2007)

	Full sample		
	$\Delta$ Credit to banks / GDP <sup>a/</sup>	% $\Delta$ in international reserves <sup>b/</sup>	% $\Delta$ in nominal exchange rate <sup>c/</sup>
Mean	-0.2	17.4	10.2
Median	-0.1	12.9	5.0
Standard deviation	1.7	35.2	23.6
Minimum	-11.2	-75.2	-27.8
Maximum	6.7	215.3	206.5
Num. of obs.	208	208	208
	Episodes of credit expansion <sup>d/</sup>		
Mean	1.0	13.4	15.2
Median	0.4	6.7	5.6
Standard deviation	1.5	45.9	32.4
Minimum	0.0	-75.2	-8.7
Maximum	6.7	215.3	206.5
Num. of obs.	66	66	66

Sources: International Financial Statistics and staff calculations.

<sup>a/</sup> Measured through central bank claims to depositary institutions, International Financial Statistics, row 12e.

<sup>b/</sup> Corresponds to row 1.1.d in the International Financial Statistics.

<sup>c/</sup> Corresponds to row rf in the International Financial Statistics. The positive sign corresponds to currency depreciations and vice versa.

<sup>d/</sup> Defined as episodes where central bank claims on banks increased.

We then compute bi-variate correlations among the three variables analyzed before plus time series for real exchange rates, inflation, and growth. Table 3 shows the results with p-values

<sup>21</sup> These countries are Argentina, Bolivia, Brazil, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Paraguay, Peru, Uruguay, and Venezuela.

in parenthesis, referred to the full sample of years in the upper triangle and to the episodes of credit expansion in the lower triangle. The results show the expected signs and statistical significant correlations for almost all relevant pairs of variables, in particular, for the increase in central bank claims on banks and nominal—and real effective—currency depreciation for the full sample, with a stronger correlation for the monetization episodes. Depreciation is strongly correlated with inflation, as expected. We also found a negative association of central banks' financial assistance and economic growth for both samples. However, the expected negative correlation with respect to the change in international reserves is only significant in the full sample.

**Table 3. Pair-wise Correlations Between Selected Variables**

(Annual observations, 1995–2007)

	$\Delta$ in central bank claims on banks / GDP	Nominal depreciation ( $\Delta$ %)	Real effect. Depreciation ( $\Delta$ %)	% $\Delta$ in international reserves	Growth	Inflation
$\Delta$ in central bank claims on banks/GDP		0.27 (0.00)	0.28 (0.00)	-0.14 (0.00)	-0.28 (0.00)	0.04 (0.54)
Nominal depreciation ( $\Delta$ %)	0.69 (0.00)		0.71 (0.00)	-0.18 (0.00)	-0.50 (0.00)	0.67 (0.00)
Real effective depreciation ( $\Delta$ %)	0.50 (0.00)	0.86 (0.00)		-0.11 (0.13)	-0.41 (0.00)	0.06 (0.38)
% $\Delta$ in international reserves	0.01 (0.94)	-0.10 (0.45)	-0.09 (0.48)		0.24 (0.00)	0.03 (0.64)
Growth	-0.46 (0.00)	-0.67 (0.00)	-0.58 (0.00)	0.23 (0.06)		-0.15 (0.00)
Inflation	0.61 (0.00)	0.68 (0.00)	0.30 (0.00)	0.23 (0.07)	-0.29 (0.00)	

Source: Staff calculations.

P values in parenthesis, referred to the full sample of years in the upper triangle and to the episodes of credit expansion in the lower triangle.

## B. Panel Data Regressions

The regression analysis supports the idea that large central bank assistance to impaired banks tends to induce instability in the foreign exchange market. To conduct the regressions, we used data covering 16 Latin American countries, with annual observations for the period 1995-2007. The data is obtained primarily from the IMF's International Financial Statistics, supplemented with information from central bank websites as required.

## The empirical model

Our econometric model can be summarized as follows:

$$\Delta NXR_{it} = \alpha + \beta_1 \Delta NXR_{it-1} + \beta_2 \Delta C_{it} + \gamma Z_{it} + \mu_i + \lambda_t + v_{it} \quad (1)$$

Where the subscript  $i$  denotes the  $i$ th country ( $i=1, \dots, 16$ ), and the subscript  $t$  denotes the  $t$ th year ( $t=1995, \dots, 2007$ ). The approach includes country fixed effects ( $\mu_i$ ) to take account of unobserved heterogeneity among countries. The estimated equation also includes a full set of time dummies ( $\lambda_t$ ) to take account of global shocks such as shifts in oil prices or the global business cycle.  $\Delta NXR$  is the percentage change in the nominal exchange rate;  $\Delta C$  is the change in central bank credit to the banking system as a percent of GDP; and  $Z$  is a set of control variables, as follows:

- First, we control for weak macroeconomic fundamentals at the beginning of the crises. To this end, we use as a proxy variable the public debt to GDP ratio, lagged one period, which is a measure of successive fiscal deficits over time. We expect a positive relationship with respect to currency depreciations in line with Krugman-type models (first generation). The rationale for this control variable is that when economic agents perceive that a country has accumulated over time large fiscal deficits and, hence, the debt to GDP ratio is high, they may anticipate higher inflation down the road, and this may encourage them to shift their financial assets to dollars to protect their savings. We use data on public debt and not of fiscal deficits directly because the former allows us to get consistent and stable series across countries for more than a decade, as opposed to fiscal deficit numbers, which are subject to frequent revisions and are not always calculated uniformly across countries.
- Second, we control for the external financial strength of the country at the beginning of the crises, and measure it through the ratio of international reserves to expanded money supply (IR/M2), lagged one period. In an environment of financial distress a small stock of international reserves may encourage speculative attacks against the domestic currency. We measure the stock of international reserves in relative terms, with respect to  $M_2$ , because this definition of money supply gives an idea of the amount of short-term assets that are likely to suddenly shift to foreign currencies. Thus, the lower is this ratio the higher are the chances of a run against the domestic currency.
- Third, the lagged dependent variable allows us to distinguish the effect of the change in central bank credit to the banking system from that of normal exchange rate dynamics.
- Finally, we control for terms of trade (TT). For developing countries whose primary commodities dominate their exports, fluctuations in world commodity prices should explain a large share of the movements of their terms of trade. Thus, for these

countries, movements in their exchange rates are affected by movements in the prices of their commodities, the so called “commodity currency” (see Chen and Rogoff, 2002, and Cashin, Cespedes, and Sahay, 2002).

### Panel Unit Root Tests

The panel unit root tests for the variables used in our empirical model suggest that all series are stationary. We performed the Levin-Lin-Chu (2002) test, which assumes that all panels have the same autoregressive parameter. The results are reported in Table 4.

**Table 4. Panel Unit Root Tests—Levin-Lin-Chu**

H0: Panels contain unit roots	Statistic	Conclusion
$\Delta$ NXR	-8.7***	I(0)
$\Delta$ Claims	-9.5***	I(0)
IR/M2	-3.0***	I(0)
Debt/GDP	-5.3***	I(0)
TT	-1.9**	I(0)

Source: Staff calculations.

\* Significant at 10 percent; \*\* significant at 5 percent; \*\*\* significant at 1 percent.

### Results

Several econometric specifications of panel data are estimated, including pooled ordinary least squares (POLS), random effects (RE), and fixed effects (FE). The results support the main argument of the paper, namely that enhanced monetization of banking crises tends to create pressures on the exchange rate (Table 5). For the fixed effects and the full 1995-2007 sample, all the estimated coefficients for the change in central bank claims on banks have the expected sign and are statistically significant—at least at the 5 percent level—to explain nominal depreciations. The results hold even when we include the control variables mentioned above (columns 1 through 7). The results also highlight that fiscal conditions have the expected effect on exchange rate, although not in all specifications. Finally, terms of trade are important determinants of exchange rate fluctuations consistent with the commodity currency hypothesis. Similar results were obtained when pooled ordinary least squares and random effects estimators were used (columns 8 and 9).

Numerically, the results suggest that, on average, an annual increase of 1 percentage point in the ratio of credit to GDP provided by central banks to banks, leads domestic currencies to depreciate about 2.5 percent in one year. While the size of the coefficient is small, this is not surprising because it is average for the full sample, which consists of periods of both expansion and contraction of central bank credit to banks.

**Table 5. Panel Regressions of Changes in Nominal Exchange Rates Due to Changes in Central Bank Claims**

Estimator	FE	FE	FE	FE	FE	FE	FE	RE	POLS
Dependent Variable	$\Delta$ NXR	$\Delta$ NXR	$\Delta$ NXR	$\Delta$ NXR	$\Delta$ NXR	$\Delta$ NXR	$\Delta$ NXR	$\Delta$ NXR	$\Delta$ NXR
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Predetermined Variables									
L. $\Delta$ NXR		0.10*	0.11**	0.10*	0.09	0.08	0.10	0.14*	0.14*
		(0.06)	(0.05)	(0.05)	(0.07)	(0.06)	(0.07)	(0.08)	(0.07)
$\Delta$ Claims	2.28**	2.30**	2.27**	2.56**	2.26**	2.57**	2.94*	2.31**	2.31**
	(0.96)	(1.03)	(1.02)	(1.19)	(1.02)	(1.18)	(1.42)	(1.16)	(1.10)
L.IR/M2			-0.09			-0.12	-0.25	0.03	0.03
			(0.21)			(0.22)	(0.23)	(0.07)	(0.06)
L.Debt/GDP				0.04		0.06	0.08*	0.02	0.02*
				(0.04)		(0.05)	(0.04)	(0.02)	(0.01)
TT					-0.06*	-0.09*	-0.13**	-0.05**	-0.05
					(0.04)	(0.04)	(0.05)	(0.03)	(0.03)
Constant	13.00***	9.96**	12.45	6.85	16.97***	18.19	25.11*	11.55**	11.55*
	(3.63)	(3.88)	(7.94)	(5.98)	(5.61)	(12.43)	(12.96)	(5.85)	(5.95)
Year Dummies	√	√	√	√	√	√		√	√
Observations	208	208	208	207	208	207	207	207	207
R-squared	0.26	0.29	0.29	0.29	0.29	0.31	0.20	0.29	0.29
Number of countries	16	16	16	16	16	16	16	16	16

Source: Staff calculations.

### Robustness checks

In this section we present an additional series of robustness checks that address econometric issues that may arise in estimating equation (1), namely we use (i) System Generalized Method of Moments (System GMM) estimators; (ii) bias-corrected least-squares dummy variable (CLSDV) estimators; (iii) the NEER instead of bilateral exchange rate vis-à-vis U.S. dollar, and (iv) using a different definition of the variable of interest. The results are consistent with those discussed above.

#### *System GMM estimators*

Two potential econometric issues may occur when estimating nominal exchange rate equations. First, some independent variables are likely to be endogenous to the exchange rate. Second, we introduce the lagged dependent variable as a right hand side variable. With a fixed-effect estimator this variable is, by construction, correlated with the error term and therefore endogenous. We overcome these issues by using System GMM estimators.

The usual method of dealing with the country-specific effects, in the context of panel data, has been to work with first-order differences (Anderson and Hsiao, 1981). The GMM estimators allow controlling for both unobserved country-specific effects and potential endogeneity of the explanatory variables. Arellano and Bond (1991) present a first-difference GMM estimator (difference GMM). However, there are conceptual and statistical shortcomings with this estimator.<sup>22</sup> Thus, we use an alternative system estimator (System GMM) that reduces the potential biases and imprecision associated with the usual difference estimators (Arellano and Bover, 1995 and Blundell and Bond, 1998). The alternative estimator combines in one system the regressions in differences and the regressions in levels.

We control for endogeneity by using “internal instruments,” that is, instruments based on lagged values of the explanatory variables. We adopt the assumption of weak exogeneity of the explanatory variables, in the sense that they are assumed uncorrelated with future realizations of the error terms. Thus, the lagged levels of the variables may be used as instruments in the regressions in difference and the lagged differences of the variables could be used as instruments in the regressions in level (“GMM-style” instruments).<sup>23</sup> Terms of trade were considered as strictly exogenous (i.e., can be instrumented by itself as a one-column “IV-style” instrument, see Roodman, 2006). Then the effect of a given variable on the exchange rate is referred to the association between the exogenous component of that variable and exchange rate.

The consistency of the estimator depends on whether lagged values of explanatory variables are valid instruments. The criteria for the selection of instruments are two specification tests (Arellano and Bond, 1991). With the Sargan test, we do not reject the null hypothesis of the overall validity of instruments’ orthogonality conditions (over-identifying restrictions). The second test is about the serial correlation of residuals. First, we reject the null hypothesis of no first-order serial correlation of differenced residuals (AR(1) test) and second, we do not reject the null hypothesis of no second-order serial correlation of differenced residuals (AR(2) test). Thus, the residuals are serially uncorrelated and we conclude that orthogonality conditions are correct. The results are broadly similar to those presented in the previous section (Table 6, column 1).

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<sup>22</sup> The lagged levels are often rather poor instruments for first differenced variables, especially if the variables are close to a random walk.

<sup>23</sup> Given the relatively large number of time periods available, we have restricted the number of lags to a maximum of three to reduce the number of instruments.



**Table 6. Additional Robustness Checks**

Estimator	System GMM	CLSDV	FE
	$\Delta$ NXR	$\Delta$ NXR	$\Delta$ NEER
	(1)	(2)	(3)
L. $\Delta$ NXR	0.46*** -0.05	0.18*** -0.07	
L. $\Delta$ NEER			0.18*** -0.03
$\Delta$ Claims	2.64** -1.08	2.62*** -0.68	2.09* -1.12
L.IR/M2	-0.02 -0.04	-0.1 -0.15	-0.11 -0.22
L.Debt/GDP	0.02 -0.01	0.07 -0.07	0.06 -0.04
TT	-0.06** -0.02	-0.07 -0.05	-0.07 -0.04
Constant	5.13 -4.14		18.98 -11.06
Year Dummies	√	√	√
Observations	207	191	207
R-squared			0.3
No. of countries	16	16	16
ar1	0.0367		
ar2	0.468		
sargan	0.826		

Source: Staff calculations.

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 7. Panel Regression Restricting the Sample to Periods of Credit Expansion**

Estimator	POLS	POLS	LSDV	LSDV
	$\Delta$ NXR	$\Delta$ NXR	$\Delta$ NXR	$\Delta$ NXR
	(1)	(2)	(3)	(4)
L. $\Delta$ NXR	0.09* -0.05	0.08 -0.05	0.11** -0.04	0.10*** -0.03
$\Delta$ Claims	9.03*** -2.4	8.40*** -2.39	8.70*** -2.89	8.50*** -2.48
L.IR/M2	0.02 -0.11	-0.03 -0.09	-0.32 -0.32	-0.38 -0.24
L.Debt/GDP	-0.07 -0.06	-0.09 -0.06	0.22 -0.36	0.17 -0.25
TT	0 -0.12	-0.02 -0.1	-0.07 -0.17	-0.07 -0.13
Constant	-2.31 -14.58	9.53 -12.05	17.73 -23.13	25.38 -23.03
Year Dummies	√		√	
Observations	65	65	65	65
R-squared	0.52	0.42	0.66	0.63

Source: Staff calculations.

### *Bias-corrected least-squares dummy variable estimators*

The bias-corrected least-squares dummy variable (LSDV) estimator could outperform the GMM estimators in terms of bias and root mean squared error (Bruno, 2005), especially for panel data with a small number of cross-sectional units. However, the bias-corrected LSDV estimator does not deal with the potential endogeneity of independent variables.

The results are broadly similar to those obtained with system GMM estimator (Table 6 column 2).

***NEER instead of bilateral exchange rate vis-à-vis U.S. dollar***

Some countries in the sample have fixed exchange rate arrangements, for those countries the dependent variable is a constant and it may not fully capture pressures on exchange rate. For those countries, the NEER provides greater variability of the dependent variable.

The main conclusion of the previous analysis is maintained for NEER exchange rate depreciations. The estimated coefficients for central bank credit remain statistically significant (Table 6, column 3).

***Different definition of the variable of interest***

Finally, we used another definition of the variable of interest. Namely, the monetization of banking crises is measured by the percentage increase in central banks' claim on banks with respect to the average of the previous three years in order to capture the increase in credit with respect to the trend. We estimated the full set of regressions for this variable and, once again, the results were similar (not reported).<sup>24</sup>

**Restricting the sample to periods of credit expansion**

One interesting issue is to investigate the impact of central bank credit to the banking system during periods of financial stress and banking crises. That is, narrowing down the sample to only incorporate events that entailed an expansion of credit. For this sub-sample, the coefficient for credit to the banking system increased significantly, to about 9 percent (columns 1 to 3, Table 7).<sup>25</sup> These results suggest that pressures on the exchange rate rise as central bank financial assistance to impaired banks escalate. According to these estimations, a 5 percentage point increase in credit to banking system would induce on average a 45 percent decline in exchange rate.

**IV. CONCLUDING REMARKS**

The role that central banks played in the industrial world in the recent financial crisis will probably set a new standard for policies of LLR. Injecting large amounts of money to support troubled financial institutions averted a financial meltdown and later, in tandem with fiscal stimulus, mitigated recession trends, without fueling inflation pressures. It is likely that other countries worldwide would be led to implement similar policies in a future parallel scenario.

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<sup>24</sup> The results are available upon request.

<sup>25</sup> For this sub-sample, the equations are estimated by Pooling OLS and LSDV. Because we have irregular panel data, the usual fixed effects estimator and system GMM estimator may not be appropriate.

Based on the Latin American experience, this paper stresses that emerging and developing countries should be cautious if they want to follow the same strategy to tackle financial crises. As opposed to the United States and most European countries, these countries do not issue a reserve currency. This makes them more vulnerable to currency depreciations and volatility in the event of large scale injections of central bank money to cope with banks' distress. While many of these countries have strengthened central bank credibility, improved macroeconomic fundamentals, created buffers to absorb external shocks, and strengthened fiscal institutions, these new conditions have not been fully tested against the effects of simultaneous real and financial shocks, like those that hit the developing world in the past.

Thus, revisiting the recent history of financial crises in Latin America is warranted. Subject to the caveats established above, we found that confronting banking crises using exclusively monetary policy was not effective to avert and manage financial crises. Moreover, expanding central banks' balance sheets tended to exacerbate macroeconomic instability and fueled currency crises.

Alternatively, the roadmap to cope with financial distress in these countries should put bank restructuring and resolution at the forefront. Countries should design a comprehensive strategy to prevent and manage banking crises in which central banks are part of the policy response. Efforts should focus on imposing corrective actions before liquidity and capital shortages become severe, and on implementing bank resolution measures before the crises unfold. Strengthening financial regulation and supervision to keep the pace of the permanent innovation of financial instruments is also a must.

In addition, maintaining strong macroeconomic fundamentals is critical to help reducing the uncertainty that would otherwise invade markets' perceptions and feed financial instability, including attacks on the domestic currency. This is particularly relevant for emerging economies because they are closely integrated to global markets, which makes them more vulnerable to the vagaries of capital flows. Thus, emerging countries should build more resilient economies, in particular, maintaining flexible exchange rates, keeping public finances and debt in check, strengthening international reserves, developing money and capital markets, and reducing financial dollarization.

## Banking Crises in Latin America (1994 – 2008)

<b>Small crises</b>	
Argentina (1995–1996)	From December 1994 to late-1996, about 40 small and medium size banks failed or were acquired or merged (almost one third of total banks) representing about 12 percent of the system.
Bolivia (1994)	Two banks (with a market share of 11 percent of assets) were closed.
Bolivia (1999)	A small bank, with a market share of 4.5 percent of deposits, was intervened and resolved.
Bolivia (2002–2003)	A politically driven financial turmoil undermined systemic liquidity and led to the failure of a medium size bank (7.5 percent market share) that was absorbed by a state-owned institution.
Dominican Republic (1996)	The third largest commercial bank, with a market share of 7 percent of assets, was intervened and taken over by the central bank.
Ecuador (1996)	A large bank, with a market share of 8.5 percent of deposits, was and taken-over by the central bank. A number of financial companies were also intervened.
El Salvador (1998–1999)	A small to medium size institution, with a 5 percent market share, was closed.
Guatemala (1999)	Five banks (9 percent market share) received large financial assistance from the central bank (more than 100 percent and up to 467 percent of equity).
Guatemala (2001)	Three small banks, with a market share of 7 percent of deposits, were intervened and later closed.
Guatemala (2006)	The third largest bank, with 9 percent of deposits, was closed together with a small bank, with 1 percent market share.
Honduras (1999)	A small bank, with 3 percent of total deposits, was closed.
Honduras (2001)	A small bank (3 percent market share) was closed
Honduras (2002)	Two small banks (5 percent market share) were taken-over by the deposit guarantee institution.
Paraguay (1995)	Four banks, with a market share of about 14 percent of total assets, were intervened and closed.
Paraguay (2002)	The third largest bank, with an almost 10 percent market share, was intervened and closed.
Uruguay (1996)	A small to medium size bank was intervened by the central bank and later privatized.
<b>Large crises</b>	
Argentina (2002)	12 private and public banks (40 percent of deposits) received liquidity assistance, and bank resolution was applied to three foreign banks that exited the market.
Brazil (1994–1995)	18 financial institutions (nearly 35 percent market share) were intervened, liquidated, or placed under the Regime of Special Temporary Administration. A comprehensive program of bank restructuring was adopted.
Colombia (1999)	Two small financial institutions were closed and 7 medium-size institutions were put under FOGAFIN control.
Costa Rica (1994)	A state-owned institution, with a 17 percent market share, was intervened and closed.
Dominican Republic (2003)	The third largest bank plus two other small to medium-size banks (20 percent market share) were intervened and resolved
Ecuador (1998)	The first wave of the crisis entailed the closure seven banks and the takeover of a large bank, representing together more than 20 percent deposits' market share.
Ecuador (1999)	The second wave of the crisis involved a number of financial institutions intervened or resolved, with a market share of close to 40 percent of total deposits.
Mexico (1995)	Twelve small and medium-size banks were intervened during 1995–1997 and a group of banks hovering 80 percent of the system received government support.
Nicaragua (2000–2001)	Four out 11 banks (representing about 21 percent market share), were intervened and sold to other financial institutions.
Paraguay (1997–1998)	In 1997, six banks, with a market share of about 22 percent share were intervened and closed between this and the following year.
Peru (1999)	Eight banks were intervened, with nearly 30 percent market share, were intervened and resolved.
Uruguay (2002)	Four private banks were temporarily intervened, closed, and merged in a single bank, two large public banks received financial assistance from the central bank, and one large foreign branch was closed, all of which accounted for about 60 percent market share.
Venezuela (1994–1995)	The second largest bank collapsed in early 1994. Twelve banks were closed or taken over by the State in 1994 and another 4 in 1995, totaling 62 percent market share (measured by deposits).

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