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The Argentine Banking and Exchange Rate Crisis of 2001: Can We Learn Something New from Financial Crises?

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"The Argentine Banking and Exchange rate crisis of 2001: Can we learn something new from Financial Crises?"[1]

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Abstract

After more than ten years under a Currency Board regime, successful in abating inflation and ensuring macroeconomic and financial stability, in January 2002, the country was forced to abandon the "Convertibilidad" and moved to a floating exchange regime.
Is this twin crisis different from those experienced by Argentina in 1995 or earlier in the 1980's? A remarkable difference from past experiences was the apparent strength of the Argentine Financial System, as a consequence of deliberate and systematic process of reforms that put its regulatory framework close to those of developed countries. However, the crisis revealed two sources of financial fragility ´probably underestimated during the good times. First, the combination of a currency board regime and highly dollarized banks' balance sheets implied a solvency risk for the financial system in case the economy had to adjust to a shock either trough a nominal devaluation or a deflationary process. The other hidden risk for the financial system was the non regulated exposure of banks to sovereign risk.

Using a dynamic panel data model we study the behavior of individual banks' deposits during the prolonged twin crisis suffered by Argentina since November 2000. Our aim was to determine if this event could have been a "sun spot" phenomenon, i.e. a random event not related to the real economy or the consequence of a change in economic agents perception about the trend of the Argentine economy., i.e. an increase on aggregate risk.

Our results strongly favour the second hypothesis. "Macro fundamentals" like devaluation risk, the EMBI spread, the change in international reserves and the change in industrial production, played an important roll in explaining the behavior of deposits during the crisis. On the contrary , banks' "fundamentals" did not help to explain the dynamics of deposits in this crisis, with the exception of a leverage ratio. We also introduced the interest by individual banks on deposits, to test if depositors took it as an indicator of banks' strength, flying more intensely from banks that paid higher interest rates to retain deposits. The results for the complete sample period confirm this intuition. The share of government debt holdings in banks' portfolio was also significant for one of the sub periods of the sample, confirming that banks that were large lenders of the government were subject to a more intense run.

1. Introduction

After more than ten years under a Currency Board regime that was successful in abating inflation and ensuring macroeconomic and financial stability, in January 2002, Argentina abandoned the "Convertibilidad" and moved to a floating exchange rate regime, in the middle of the probably most deep political and institutional crisis experienced by the country in years.

Are these twin crises different from the Tequila crisis of 1995 or those suffered by Asian countries in 1997, or the ones experienced by Argentina and other Latin American countries during the 1980's?

A strikingly distinguishable feature of the 2001 Argentine crisis was the apparent strength of the Argentine Financial System. After the adoption of the "Convertibilidad" in 1991, Argentina implemented a deep financial reform including a financial liberalization. At the same time, strong prudential regulations were introduced, putting the Financial System close to Basle recommendations. The country benefited from those reforms, being nearly immune to financial contagion during the Asian and the Russian crisis.

The main purpose of this paper is to determine the nature of the banking crisis of 2001 analyzing the behavior of daily changes in individual bank's deposits. We estimate a dynamic panel data model to study what drove the dynamics of deposits. To what extent the run was caused by the perception of depositors of an increasing aggregate risk rather than a run on a particular kind of banks, probably more exposed to currency risk than others because of the composition of their balance sheets or because of their ownership (being foreign banks probably perceived less vulnerable than domestic). We also want to asses determine if those banks that were large lenders of the Argentine government were subject to a more intense withdrawal than others.

The paper is organized as follows: In section 2 we revise the literature on banking crisis, in section 3 we briefly describe the main features of the banking crisis during the different sub-periods we have identified. In section 4 we describe the model to be estimated and present the econometric results. Section 5 concludes.

2. Bank panics in the literature

A considerable amount of theoretical and empirical research has been devoted to explain the phenomenon of bank panics[2]. Most of the theoretical developments on this field ground on the seminal paper of Diamond and Dybvig (1983). These authors model banking crises as random self-fulfilling processes in which individual liquidity needs are fed by a kind of misperception of economic agents about other agents' needs, which can eventually lead to a bad equilibrium in which everybody run on banks.

There is also an alternative theoretical explanation that could probably be of more empirical relevance for the Argentine 2001 crisis. In this view bank panics unchain because of an increase on aggregate risk. Models in this vein were developed by Wallace (1980, 1988), Jacklin and Bhattacharya (1988), Chari and Jagannathan (1988)

[2] For a detailed and good discussion on the main developments in this field see Freixas and Rochet (1998) Chapter 7.

and more recently Hellwig (1994) . Recently, Chang and Velasco (2000, 2001) and Kawamura (2002) have developed models in this direction, extending this argument to an open economy facing "financial illiquidity" as a possible explanation for recent international crisis as those of Asia in 1997 or Brazil in 1999.

A paper by Allen and Gale (1998) is particularly appealing for the Argentine ongoing crisis. In their model bank panics are optimal. They are the natural response of economic agents to an increase on aggregate risk due to a reduction on asset value because of, for example, a downturn in economic activity. In this sense, the anticipation by a leading indicator of an imminent recession induces to a deposit withdrawal as a response to an expected fall in firms' asset prices, deteriorating bank's portfolios. Thus, bank panics are caused by a solvency rather than a liquidity problem. A more recent paper by Allen and Gale (2000) is also illuminating for the understanding of the 2001 Argentine banking and currency crises. They construct an asset pricing model that adequately describes the phenomenon of asset price bubbles in which banking crises are the result of an increase on some asset prices whose supply is fixed (as can be the case of real estate and stocks) fueled by a rapid increase on bank lending. Their model emphasizes the roll of financial liberalization in creating asset price bubbles. It adequately replicates the dynamics of financial liberalization stories that ended in asset price collapses, banking crisis and, in some cases, currency crises, like those of Scandinavian countries in late 1980's and early 1990's or that of Mexico in 1995.

Another possible source of a banking crises is that of contagion. New interest on this phenomenon as a mechanism through which shocks to a particular country ,or say bank, can spread internationally or to the whole banking system in different ways, have raised because of the recent financial crisis on emerging markets. This was the case of the Mexican crisis of 1995 or the Asian crises of 1997. There is a sun spot explanation of "contagion" in which there are some equilibriums that lead to a widespread effect of an idiosyncratic shock. On the other hand, contagion could be explained by any positive correlation among real shocks in different countries or banks.

While a wide number of empirical analysis have been developed on contagion, little effort seems to have been devoted to provide a theoretical explanation for the "contagion phenomenon". A recent paper by Allen and Gale (2000) develops a model in which contagion appears due to real links between banks or, in their case, regions. Those links can transform small shocks in one region into a widespread crisis.

A large number of empirical papers test the presence of contagion in recent emerging markets crises. For the Argentinean case, Schumacher (1996) uses a binary choice model to study the Tequila crisis and finds that while contagion effects were not substantial**,** there is evidence of the presence of market discipline during this crisis. On the other hand D'Amato et al. (1998), study the Tequila banking crisis of 1995, looking at the dynamics of individual bank deposits during this episode testing for alternative hypotheses and find evidence of contagion between group of banks.

Our guess here is that rather than being a sun spot phenomenon, or a bank panice spread to the financial system through contagion effects, this banking and currency crisis is of the second type, i.e. one related to an increase on perceived aggregate risk. We test the validity of this hypothesis using econometric analysis to study the behavior of individual bank deposits. We ask several questions that could help to understand what drove the crisis: (i) Was the dynamics of deposits explained by movements on macroeconomic fundamentals? (ii) Were individual banks' fundamentals important in explaining the behavior of deposits, i.e., did market discipline work, in the sense that

differences in individual banks' strength explain differences in deposit dynamics? (iii) Is there any evidence of a flight to quality form banks perceived as more weak or risky to those perceived as more solvent or healthy or probably more safe because of being foreign owned or to big to fail? (iv) Is there any evidence of contagion effect among bank groups?

3. The Argentine 2001-2002 crisis. A new phenomenon or rather more of the same?

In January 2002, Argentina abandoned the "Convertibilidad" and moved to a floating exchange rate regime in the middle of probably the most deep political and institutional crisis experienced by the country in years. The abandoning of the Currency Board was just the last step of an agonic process in which the economy, being immersed in a deep and prolonged recession since the second half of 1998, gradually lost access to international financial markets and suffered during 2001 a banking crisis that the government unsuccessfully tried to repress by putting restrictions on deposit withdrawals until it finally declared default on its debt.

Are these twin crises different from the Tequila crisis, or those suffered by Asian countries in 1997, or the ones experienced by Argentina and other Latin American countries during the 1980's? As pointed by Chang and Velasco (1998), the 1997 crisis in Asian countries, rather than being a new phenomenon, shared common characteristics with, for example, the Chilean crisis of 1982 and the Mexican crisis of 1994: market–oriented economic reforms, trade and financial liberalization, deregulation and privatization of public enterprises. They also point out that financial fragility, due to inadequate bank regulation and supervision was a main common weakness shared by almost all these experiences.[3]

A strikingly distinguishable feature of the Argentine case is, however, the apparent strength of the Argentine Financial System previous to the crisis. After the adoption of "Convertibilidad" in 1991, Argentina implemented a deep financial reform including a financial liberalization. At the same time, strong prudential regulations were introduced putting the Financial System close to Basle recommendations. The country benefited from those reforms, being nearly immune to financial contagion during the Asian and the Russian crises. Under macroeconomic stability, the financial liberalization induced a rapid credit growth, which fueled not only a consumption boom, but also high investment growth.

However, the ongoing crisis revealed that two potential risks for the financial sector and the whole economy were underestimated during the good times of the "Convertiblidad". First, financing to the private sector, which was mainly in dollars, was funding private sector domestic borrowers, mainly involved in non-tradable activities. A real exchange rate misalignment, corrected either by a deflation or a nominal devaluation could severely hurt the solvency of no-tradable sector borrowers, making them unable to repay their bank debts.

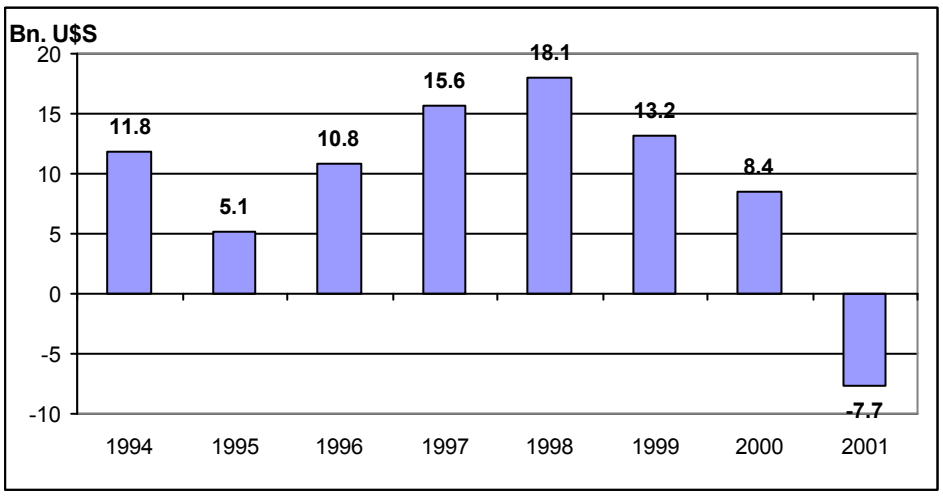
The second source of fragility for the financial system was the lack of adequate regulation on government debt holdings by banks, either in the form of loans or bonds.

[3] See Diaz, A. (1985), for an illuminating and detailed description of the Chilean and Uruguayan cases.

Under a currency board regime that put restrictions on government financing, the regulation of this risk on banks' portfolios was particularly relevant.

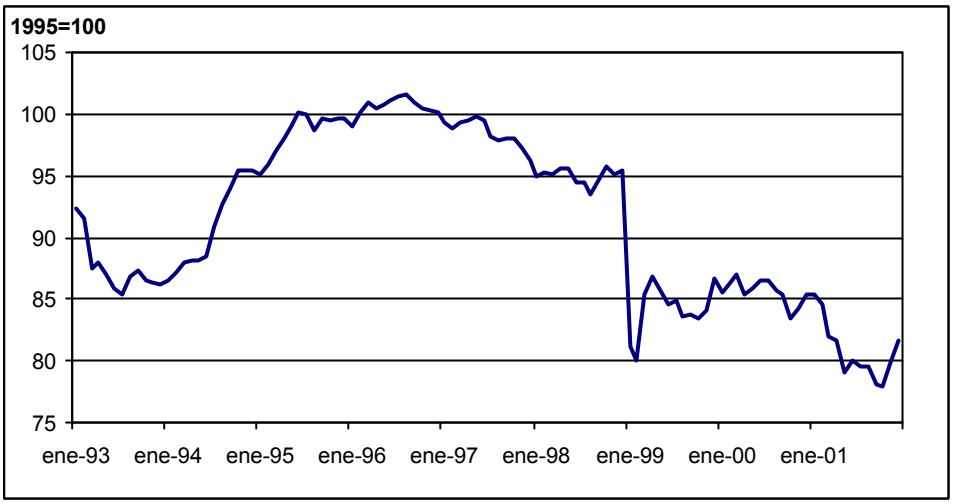
The reversal on capital flows to emerging markets after the Asian and Russian crises and the devaluation of the Brazilian real in January 1999 unchained a prolonged recession. After two years of economic downturn, real appreciation of the peso and persistent deterioration on fiscal revenues, doubts emerged about the Government's capability of honoring its debt. The perceived devaluation risk also increased, as the economy proved to be unable to adjust to different financial and real shocks. It also became clear that the combination of a Currency Board regime and highly dollarized banks' balance sheets implied a solvency risk for the financial system in a devaluation scenario, that began to be perceived as more probable. This risk was underestimated during the "good times" in which the economy grew steadily, fueled by capital inflows, favorable terms of trade and a currency relatively devalued vis a vis that of Brazil (Argentina's main trade partner in the region) (Figures 1 and 2). This was one of the main reasons why the Tequila crisis did not develop as a twin crisis. All participants, foreign and domestic investors, the government, the Central Bank and even Multilateral Financial Institutions assigned a nearly zero probability to the event of a devaluation. Moreover, the success of the economy on rapidly surpassing the Tequila episode converted the Argentinean "Convertibilidad" into a kind of paradigmatic case frequently invoked as an example to be followed.

Figure 1: Capital Inflows



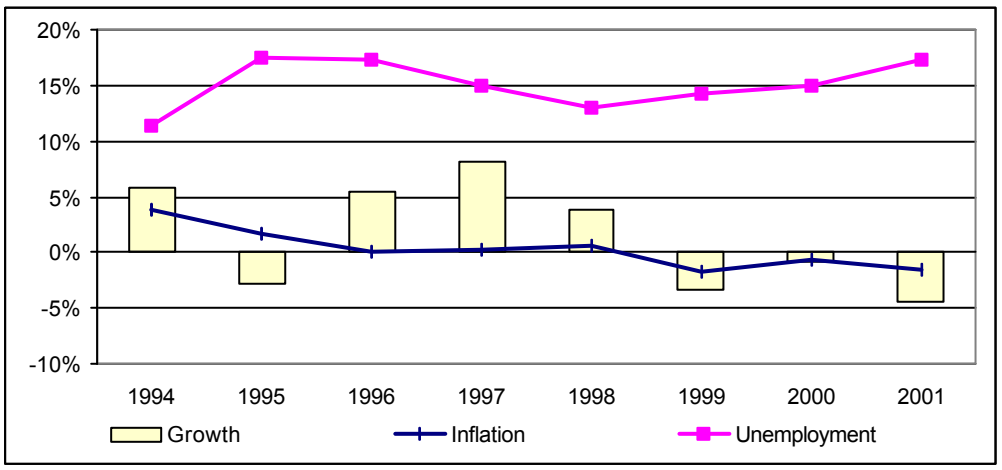
Several shocks slowly began to undermine the generalized "optimistic" perception about Argentina's economic trends, which worked for several years coordinating participants in a kind of virtuous circle, which finally revealed to be fragile. Successive shocks to international financial markets, the Asian crises of 1997 and Russia in 1998 increased international investors' risk aversion and led to a reversal in capital flows to emerging markets. A recession unchained in Argentina in the third quarter of 1998 and deepened after the Brazilian devaluation of January 1999.

Figure 2: Multilateral Real Exchange Rate



As the economy proved to be unable to adjust to this change in relative prices (Figure 3) through deflation and increasing unemployment, the fiscal position deteriorated and confidence of both external and internal investors weakened. A devaluation of the currency and a default on government debt began to be perceived as more probable events, as reflected on currency and country risk indicators (Figure 4).

Figure 3: Economic Growth, Inflation and Unemployment



A clear indication of how much higher was the perceived macroeconomic risk in this crisis compared to Tequila is the completely different behavior of banks' short term foreign credit lines compared to this previous episode (Figure 5). While in Tequila short term foreign credit lines worked as an important source of bank financing, in the ongoing crisis the deepening in deposits fall was accompanied by a decline, rather than an increase in banks' financing through short term foreign credit lines. The conventional knowledge assessment that head offices of foreign owned banks would act as LOLR of their local offices was not confirmed by the empirical evidence.

Figure 4: Country Risk

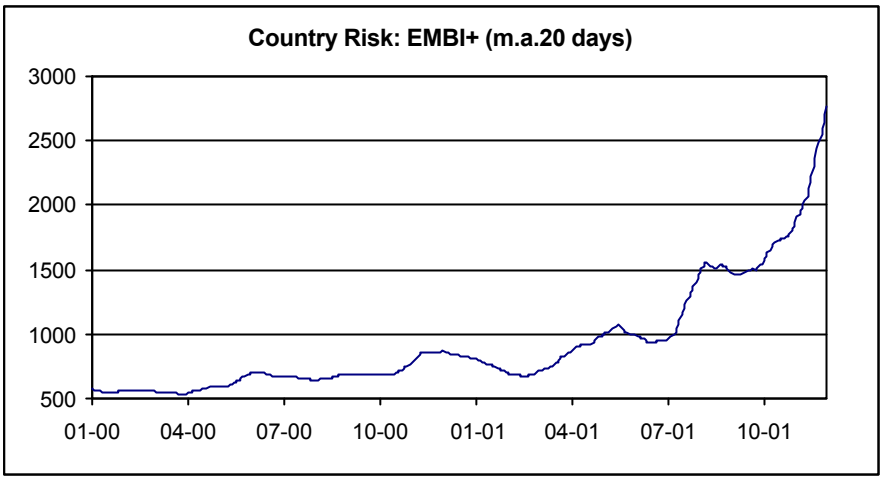
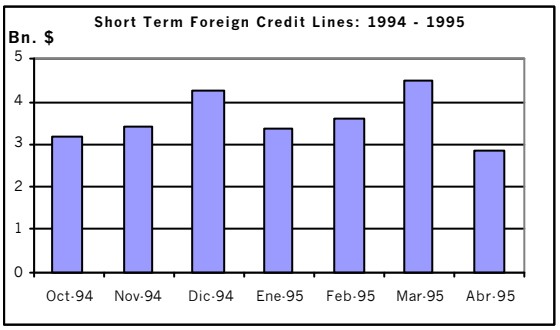
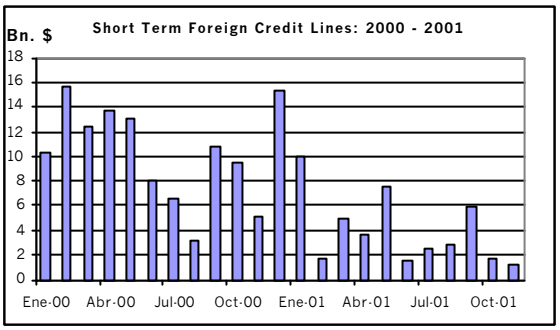


Figure 5: Short Term Foreign Credit Lines





Restricted by the "Convertibilidad" in its financing sources, the government tried unsuccessfully to increase tax revenues[4], a difficult task in the middle of a recession, and began to relay on domestic market financing (i.e. banks, money market funds and pension funds[5]). Although government debt became an increasingly risky asset, this financing was voluntary. In the middle of a prolonged recession that could probably deteriorate the credit quality of domestic private sector borrowers, banks stopped lending to the private sector and increased significantly the weight of government debt (either in the form of bonds or bank lending) in their asset portfolios (Figure 7). This crowding out effect, implied additional financing difficulties for the private sector which contributed to exacerbate the economic downturn (Figure 8).

[4] One of the first measures included in the package adopted by the economic team that took office with President de la Rúa in 1999 was to increase income taxes. The new package was supported by the IMF.
[5] It has to be emphasized that in Argentina Pension Funds are mainly related to banks, contrary to what is the most common pension funds scheme, in which insurance companies are the ones involved on this business.

Figure 6: Devaluation Risk

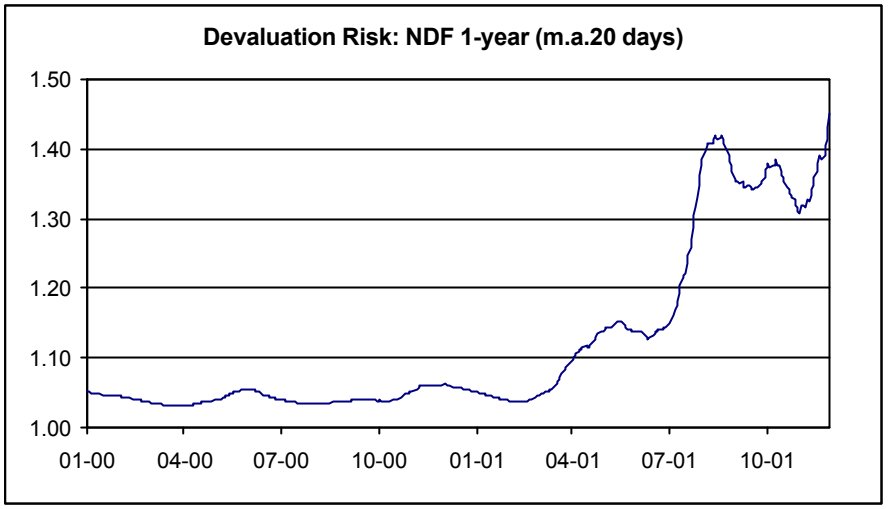
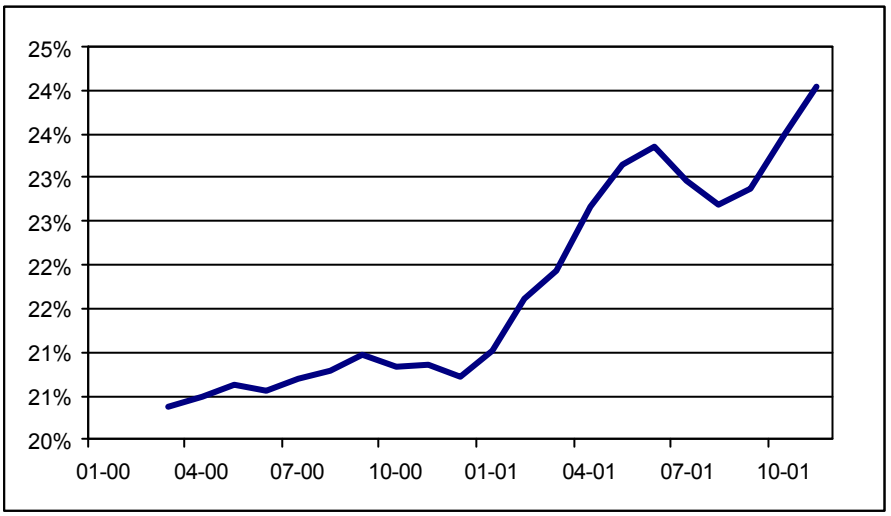
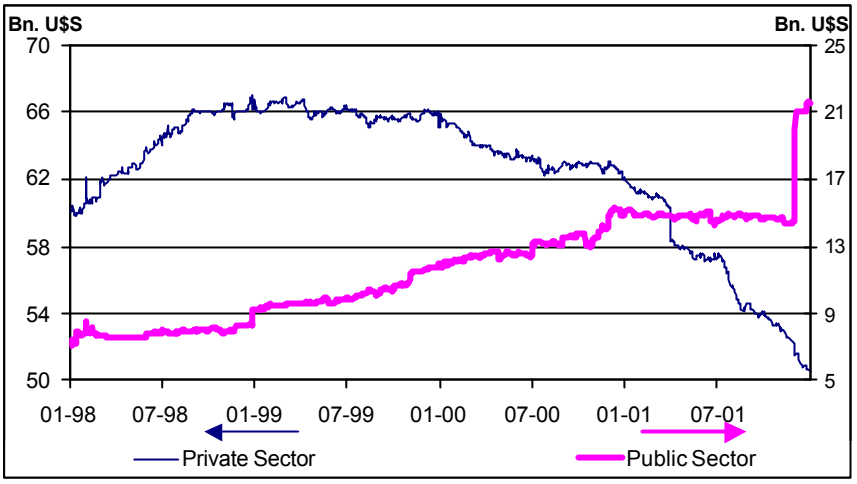


Figure 7: Public Sector Debt (bonds and loans) as % Banks´ Assets (3 month m.a.)



A correction of the real exchange rate misalignment, through either a deflation or a devaluation of the currency implied a solvency problem for the financial system, since 63% of credit to the non-financial domestic private sector (whose income were mostly in pesos) was dollar denominated. The high proportion of government debt in hands of the banks also implied a solvency risk for the financial sector, given the inability of the government to restore confidence and regain access to international markets' financing. Depositors' confidence on the financial sector weakened as they realized that many of the banks would become insolvent in case of a devaluation and or a default on government debt.

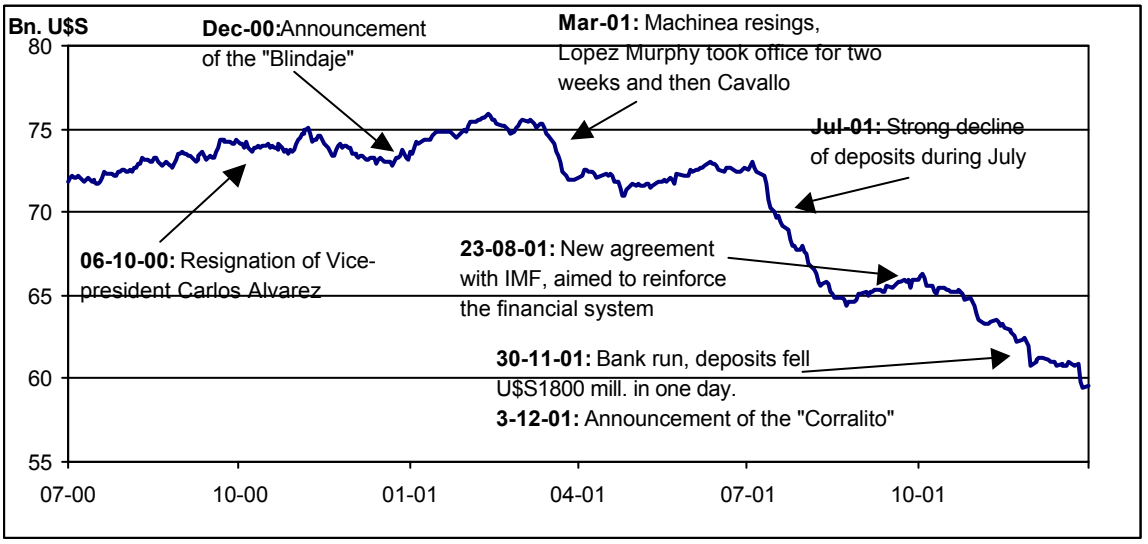
Figure 8:Banks' loans to the Private and Public Sector



3.1. Some relevant features of the crisis

By the time the "Convertibilidad" had been abandoned, in January 2002, international reserves at the Central Bank were 42% lower than those of December 2000, and the banking system had lost around 19% of private sector deposits (Figure 9). Contrary to the Tequila episode, an external shock that generated a sudden shift in expectations leading to a sharp but quick fall in deposits and reserves, this crisis evolved through a slowly but persistent erosion of confidence of both domestic and foreign economic agents, as they continued to receive persistent and systematic signals that the economy was unable to recover from the deep recession it entered by the end of 1998.

Figure 9: Total Private Sector Deposits



The crisis developed through several episodes. We study here the period between July 2000 and November 2001 in which we identify four sub-periods of deposit withdrawals. We consider the November 2000 deposit fall as the initial episode of the crisis, that evolved slowly with ups and downs, until a kind of inconvertibility was declared at the

end of November 2001, the so called "Corralito"[6]. It must be said that the crisis has not been solved at the moment this paper is written, but after the implementation of the "Corralito", the deposit dynamics is noisy, reflecting the effects of withdrawal restrictions, asymmetric pesification and the persistent intend by depositors to avoid them in order to preserve their assets' value. We do not analyze these figures here and restrict our analysis to the above mentioned period.

Figure 9 gives a detail description of the four episodes. The first one was unchained by a political event, the resignation of vice president Carlos Álvarez in October 2000. This first period goes from the 7th of November 2000 to the 13th of December 2000. The announcement of a rescue package, that assured the funds necessary to cover financial needs during 2001 transitorily alleviated the fiscal situation and stopped deposit withdrawals.

The second episode took place between the 12th of February 2001 and the 29th of March 2001. The failure of the rescue package in restoring confidence reflected on a pronounced widening of sovereign debt spreads. In March 1st the Economy Minister Machinea resigned and Minister Lopez Murphy took office for a short period of time. He announced a fiscal adjustment which was not supported by the "alliance" in power and had to resign. Minister Lopez Murphy was followed by Dr. Cavallo.

After Minister Cavallo took office he implemented several measures aiming to improve the fiscal position of the government, which was particularly critical, given the scarce external market financing and the deepening of the recession, that persistently eroded tax revenues. A tax on financial transactions was introduced, which was very easy to collect and difficult to avoid, in order to increase tax collection. In addition, in an attempt to recover confidence the government instrumented a debt swap with holders of government debt, known as the "Megacanje"[7]. But in July fiscal deficit figures indicated that further reductions on government expenditure were needed given the sharp decline on tax collection and the lack of external financing. The government then announced a zero deficit policy and decided to lower nominal wages of public employees by 13%. On the other hand, the government gave signals of the intention of making the "Convertibilidad" scheme more flexible by introducing a fixed peg to a currency basket that included the dollar and the euro. But these announcements were imprecise and generated increasing uncertainty. In addition, several changes were introduced to Central Bank's liquidity policy, which was originally designed with a prudential purpose. By using it as a tool of monetary policy , these changes weakened confidence on the banking system.

In July, a much deeper bank run unchained. Two main features of the macroeconomic situation are probably relevant in explaining the change of attitude of domestic agents. First, the Government lost access to international financial markets and the only source of financing were the domestic banking system and pension funds. On the other hand, the recognition of an overvaluation of the currency by the economic authorities increased uncertainty about the future course of exchange rate policy, given the ambiguity of the announcements.

By the end of August the economic team negotiated a financial aid from the IMF of U$S 8 billions to support the financial system. In fact, $4 billions went to the Central

[6] Due to the bank run of the 30th November 2001, the Government imposed strong restrictions on deposit withdrawals. These restrictions were tightened during the crisis and are still at work.

[7] In June a debt swap was implemented that extended the maturity of some bonds in exchange of a higher interest rate.

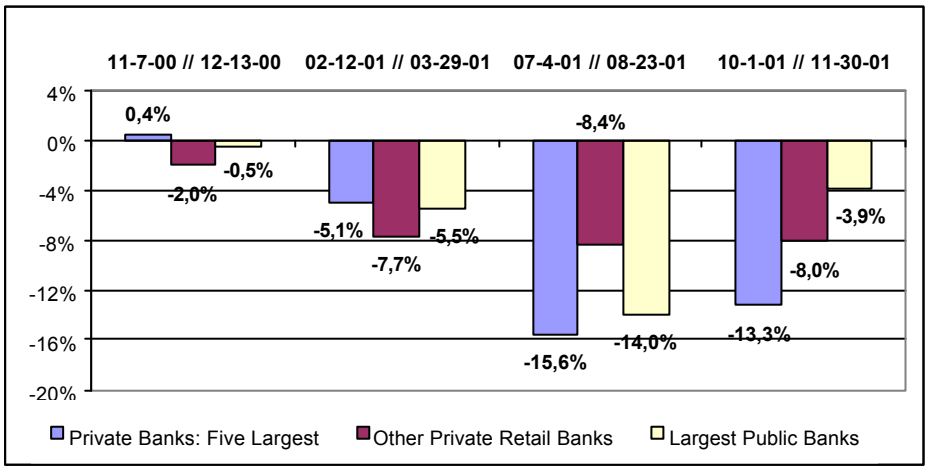
Bank to reinforce international reserves while, at the same time, the contingent repo program -designed to provide liquidity to the financial system in case of a systemic liquidity crisis- was triggered. These announcement transitorily stopped the deposits withdrawal and even reversed its trend, until the first days of October in which the release of tax collection figures reveled a significant monthly decline (-11%) and the EMBI spread reached a historical peak of 1850 basic points. This was the beginning of the final episode that ended the 30th of November 2001 with the imposition of the so called "Corralito", a kind of deposits inconvertibility which was tightened afterwards.

3.2. A first descriptive approach to the dynamics of deposits

As a first approach to the dynamics of deposits we studied the change in deposits by bank groups looking for differences in their performance, which could be an indication of flight to quality or contagion effects. Figures 10 and 11 show how the deposits fall distributed among the main groups of banks operating at the Argentine banking sector[8]

Figure 10:Change in Private Sector Deposit fall by bank groups

(according to size)

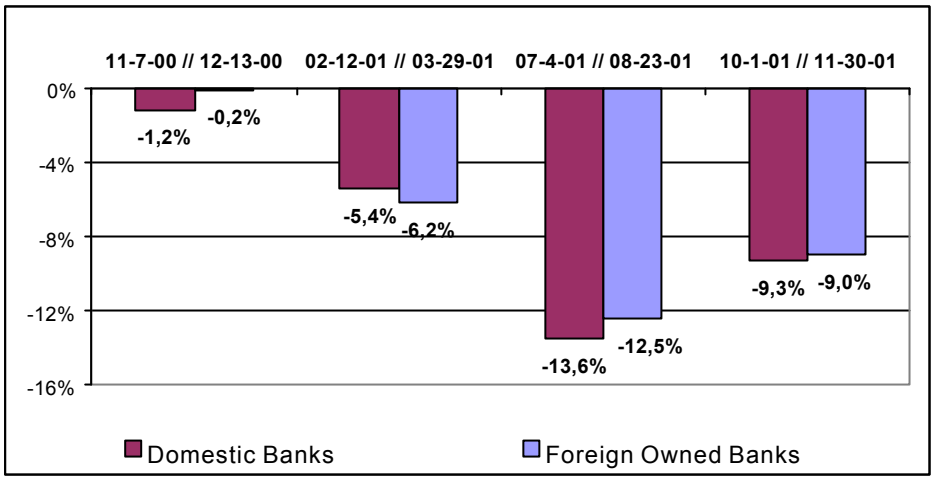


In the first period, 11.08.00 – 12.13.00, private sector deposits at the financial system fell 0.67%. If we compare between foreign and domestically owned financial institutions it can be seen that domestic banks lost more deposits than foreign. The smallest private banks were the ones that lost the most. Thus, the dynamics of deposits during this first period give some indication of a kind of "flight to quality" effect.

[8] Our analysis excludes wholesale banks, both domestically and foreign owned, as well as public provincial banks and non banks because they do not fund their activity mainly with deposits. In the specific case of public provincial banks, there was another reason, the poor quality of information. We classify retail private banks according to their size in two groups: the five largest and others. A second criterion to differentiate banks was their ownership, differentiating two groups: domestic and foreign banks. We consider the three largest public banks as another group.

Figure 11: Change in Private Sector Deposit fall by bank groups

(according to ownership)



The fall in deposits during the second episode, 02.12.01 – 03.29.01 was more intense than in the first period (-5.82%) but was rather similar according to the behavior of groups classified by size. The smallest private retail banks were the group that lost the most, followed by the large public banks and the five largest retail banks. If the criterion is ownership, foreign owned banks lost more than domestic ones. Thus, average daily figures by bank group indicate that depositors flew more intensely from the smallest financial institutions, probably perceived as weaker compared to large banks (Tables 1 and 2).

Table 1: Average daily change in Private Deposits by bank groups

(according to size)

	From 11/08/00 to 12/13/00	From 2/14/01 to 3/28/01	From 7/04/01 to 22/08/01	From 10/03/01 to 11/30/01
Private Reatail Banks: Five Largest	0,012%	-0,118%	-0,312%	-0,224%
Other Private Retail Banks	-0,055%	-0,179%	-0,167%	-0,136%
Largest Public Banks	-0,015%	-0,127%	-0,279%	-0,067%

In the third period, 07.04.01 – 08-23-01, 13.02% of total private sector deposits flew from banks, suffering the most intense withdrawal of the whole period. But in this case the largest banks of the system were the ones that suffered the most significant decline. Deposits at the five largest banks fell by 16% while private sector deposits at the largest public banks declined 14%. The smallest private banks suffered less withdrawals (11.8% and 8.3% respectively). Although foreign banks suffered less deposits

withdrawals, the difference with respect to domestic banks is small. Figures by bank groups show that the dynamics of deposits during this episode was completely different form the two previous: The flight of depositors was more intense and depositors flew from large financial institutions.

Table 2: Average daily change in Private Deposits by bank groups

(according to ownership)

	From 11/08/00 to 12/13/00	From 2/14/01 to 3/28/01	From 7/04/01 to 22/08/01	From 10/03/01 to 11/30/01
Domestic Banks	-0.032%	-0.126%	-0.271%	-0.158%
Foreign Owned Banks	-0.005%	-0.144%	-0.250%	-0.152%

Finally, in this last period, in which total private sector deposits fall 9.15%, the five largest banks experienced the deepest fall (13.3%). Deposit at the rest of the private banks fell 8%, while the largest public banks lost only 3.9%.

Summing up, it appears that during the first two episodes the smallest financial institutions suffered a deeper fall, probably because of being perceived weaker than larger banks. The depositors behavior reversed in the two last episodes, where depositors flew more intensely form the largest banks of the system. The increasing exposure of large banks to public sector debt is probably an explanation of this behavior. In the next section we use econometrics to try to answer some of the questions raised in section 2.

4. Empirical Analysis

As mentioned in section 2, our perception is that the present crisis in Argentina was due to an change on aggregate macroeconomic risk rather than one based on the perception of weak fundamentals of specific banks. In this sense, the phenomenon we deal with here was unchained by an increase in macroeconomic risk, more specifically by an increasing perception of private agents that a default on government debt was inevitable and that a devaluation of the currency was needed to correct the real appreciation of the Argentine peso, which seemed extremely slow and painful if not impossible under the "Convertibilidad". This event differs from the Tequila crisis, which developed as a systemic crisis in which specific bank fundamentals played a significant role in explaining the dynamics of deposits and there was a flight to quality from small and weak financial institutions to others perceived as stronger.

To determine to what extent this crisis was a bank run based on aggregate risk rather than one based on a weakening of individual banks which spread through contagion effects, we estimated a dynamic panel data model for daily changes on individual banks' deposits. The model includes bank fundamentals that intend to give account of the perceived risk of individual financial institutions, as well as macro variables reflecting market perception about aggregate risks, i.e. default risk and currency risk. Our estimation strategy was to estimate a model for the whole sample which includes all the ups and downs of the crisis, giving a wide view of the process and leading to

general results. On the other hand, we estimated models for the four episodes intending to capture the particular features of each one.

To estimate our model we use the Arellano-Bond method, which is based on a GMM estimator, given the characteristic of the model: (i) it contains individual effects (ii) it includes the lagged dependent variable (iii) it contains non strictly exogenous variables. The Arellano-Bond method requires for the parameters to be identifiable the strict exogeneity of some of the regressors, conditional on the unobservable individual effects.[9] Our "macro fundamentals" fulfill this condition. While the use of the Arellano-Bond method ensures consistent estimation, the atypical structure of our panel which is larger in T(time) than in N (individuals), adds a gain in efficiency.

Our strategy was to proceed in two directions. On the one hand, we estimated a weekly version of the model for the whole period (July 2000-November 2001) that allowed for wider variability in the data by including periods of ups and downs in deposits. It also permitted to include in the model a business cycle indicator, the change in industrial production. On the other hand we estimated models using daily data for the four bank run episodes described in 3.2 in order to capture the particular features of each episode, given the intuition provided by the descriptive analysis.

We estimate the following model for the change on individual banks' deposits:

$$\Delta dep_{it} = \sum_{h=1}^{H} {}_h \Delta dep_{it-h} + \sum_{j=0}^{J} {}_j r_{it-j} + \sum_{k=1}^{K}\sum_{l=0}^{L} {}_{kl} X^k_{it-l} + \sum_{m=1}^{M}\sum_{s=0}^{S} {}_{ms} W^m_{t-s} + u_{it} \quad (1)$$

with

$$u_{it} = {}_i + {}_t + e_{it}$$

Where Δdep_{it} (Dep Change) is the weekly change in individual banks deposits calculated as $log\ dep_t - log\ dep_{t-1}$ as explained by:

(i) its own past, given the dynamic characteristics of the model.

(ii) The *interest rate on time deposits* (Dep Int Rate), which is introduced as a predetermined variable that varies across individuals and time. Our hypothesis here is that, among other things, this interest rate gives information about how risky a bank is compared to others, that is, financial institutions that are in a weaker position have to pay higher interest rates on time deposits to attract investors. Since there is a strong reason to consider it as endogenous, i. e. banks which are loosing deposits will try to attract funds paying higher interest rates, we introduce it as a predetermined variable. That is, we assume that

$$for\ bank\ i, with\ i = 1,....,n, for\ all\ t = 1,....,T,\ in\ (1)\quad Cov(r_{it}, u_{it+s}) = 0 \quad for all\ s > 0$$

For each bank, the interest rate paid on deposits can be influenced by past changes on deposits, but its contemporaneous value can be considered as independent of current changes.

(iii) The X^k variables, which are the exogenous individual banks fundamentals, that intend to capture to what extent depositors were able to discriminate between

[9] See Arellano and Bond (1991).

banks depending on their health in terms of their solvency, liquidity, profitability and net wealth. Variables in this group vary across individuals and time, although with a lower frequency (monthly) than the dependent variable, since the data to construct the ratios are basically balance sheet variables. These fundamentals include:

The *ROE* calculated as 12 month cumulative interest and non interest income, net of operative and financial costs, to equity. (ROE)

A *leverage* ratio calculated as the ratio of net liabilities to net wealth. (Leverage).

The ratio of *non performing loans to total loans*, as an indicator of the credit quality of banks loan portfolios. (NPL)

A ratio *of risky assets to total assets*, where risky and total assets are those considered by the capital requirement regulation for the calculation of capital requirements. (RiskRatio)

The ratio of *government debt to total assets*. This variable includes banks' public bond holdings as well as lending to the national, provincial and municipal governments. Although it is not a variable traditionally considered as a "fundamental" we include it , given the role played by banks as main financing source of the government. (Pub Debt)

(iv) The W^m variables are the "macro fundamentals" that account for changes on aggregate risk. Except for the industrial production index (Ind Prod), which has a monthly frequency, the macro fundamentals are introduced in a weekly frequency and for this reason, can only be included in the the model for the whole period. The list of variables included in the set is the following.

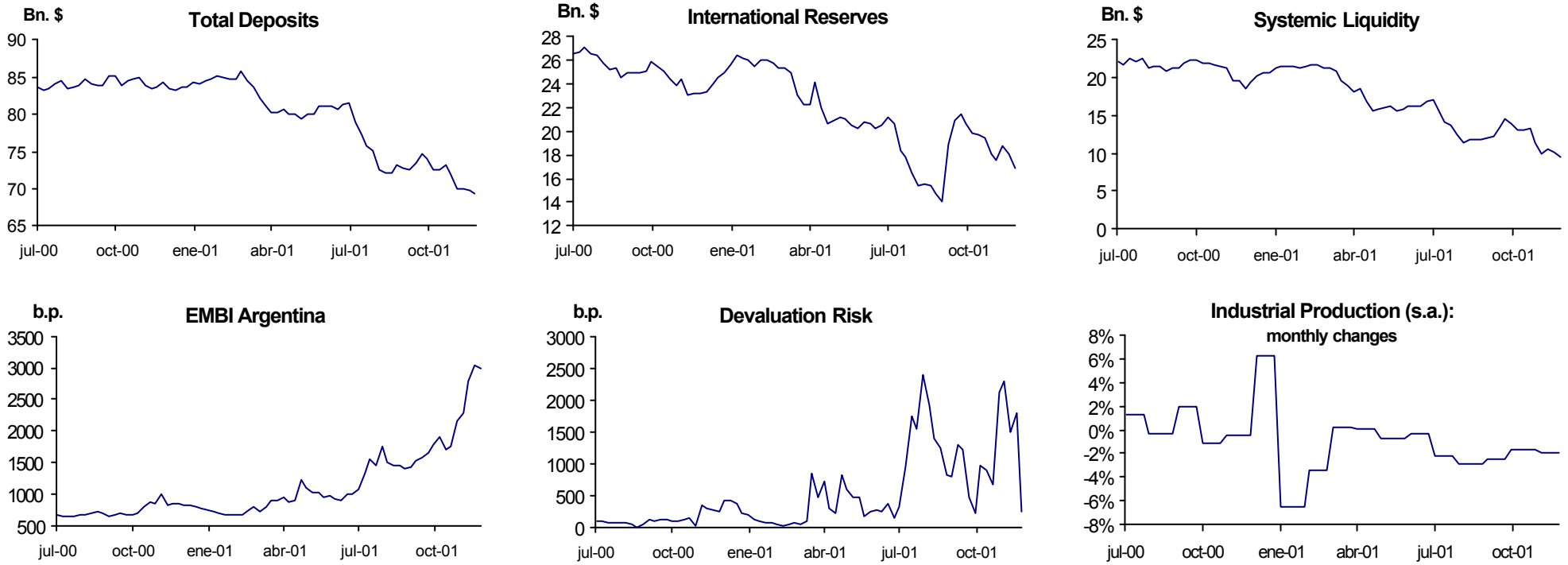
The *change on Central Bank international reserves.* (IntRes Change)

The *EMBI spread* as a measure of changes on perceived country risk. (EMBI)

Devaluation risk measured by the spread of the average interest rate on peso denominated deposits and the interest rate on dollar denominated deposits. (Deval Risk)

Aggregate liquidity of the Financial System, given by total liquid assets that banks have to hold to fulfill the liquidity regulations of the BCRA. There were regulatory changes over this period. At the beginning, the BCRA reduced liquidity requirements to provide liquidity to financial institutions. In June 2001, liquidity requirements were replaced by reserve requirements for sight deposits. (SysLiq Change).

Figure 12: Macro Fundamentals



4.1. A model for the complete period with weekly observations

We first estimated a model for the whole sample, July 00 –November 01. This long period includes sub periods of ups and downs in deposits. The model was estimated with daily data with a weekly span. Given that high frequency data implies high noise, we considered variables significant at the 15% level.

Table 3:Whole Sample Period – Weekly Observations[10]

```
Arellano-Bond dynamic panel data                Number of obs      =      1931
Group variable (i): entidad                     Number of groups   =        28

                                                Wald chi2(15)      =   2906.48

Time variable (t): time                         min number of obs  =        68
                                                max number of obs  =        69
                                                mean number of obs =  68.96429
```

One-step results

Dep change	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
Dep change						
LD	-.1283631	.0341867	-3.75	0.000	-.1953679	-.0613584
Dep Int rate						
D1	-.4983505	.1963032	-2.54	0.011	-.8830978	-.1136033
Deval Risk						
LD	-.1318845	.0326713	-4.04	0.000	-.195919	-.0678499
IntResChange						
LD	.0535516	.0224936	2.38	0.017	.0094648	.0976383
L2D	-.0540206	.0184976	-2.92	0.003	-.0902753	-.0177659
L3D	.0232782	.0134214	1.73	0.083	-.0030272	.0495836
L4D	.0296751	.0172512	1.72	0.085	-.0041366	.0634867
IndProd(-1)						
D1	.1192296	.0705454	1.69	0.091	-.0190368	.2574961
IndProd(-2)						
D1	.1624724	.0966866	1.68	0.093	-.0270298	.3519746
IndProd(-3)						
D1	.1340928	.0774039	1.73	0.083	-.017616	.2858015
Nov00 Mult	-.3772997	.2115558	-1.78	0.075	-.7919414	.037342
Mar01 Mult	-.8265629	.0823339	-10.04	0.000	-.9879343	-.6651914
Jul01 Mult	-.5062182	.1310918	-3.86	0.000	-.7631535	-.2492829
Nov01 Mult	-.4438332	.1331075	-3.33	0.001	-.7047191	-.1829473
Asymmetry	-.5285568	.0506961	-10.43	0.000	-.6279193	-.4291942
Constant	-.0015683	.000551	-2.85	0.004	-.0026483	-.0004883

Two-step results

```
Sargan test of over-identifying restrictions:
         chi2(284) =    14.68     Prob > chi2 = 1.0000

Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -1.22   Pr > z = 0.2240
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -0.37   Pr > z = 0.7082
```

Table 3 shows the results of a parsimonious version of our model after several simplifications on a general model including all the variables described above and a larger lag structure. The model was simplified based not only in the individual significance of the variables but also on the evidence of some multicolineality due to

[10] D1 indicates the contemporaneous value of the variable, LD is the first lag, L2D is the second lag, and so on.

strong correlation among some of the macro variables (see Appendix A). All the variables in this final model are significant at 10% level.

The results give strong evidence that individual banks' micro fundamentals do not contribute to explain the behavior of deposits, except from the interest rate. Its negative coefficient confirms the hypothesis that those banks which paid higher interest rates were subject to higher deposit withdrawals, probably because of being perceived as more risky.

On the contrary, the "macro fundamentals" are very significant in explaining the dynamics of deposits by bank. Devaluation risk, measured by the spread of peso to dollar interest rates as well as the change in international reserves are very significant and have the correct sing. An even stronger result is that the lagged values of the change in the industrial production index, a variable that gives account of the cyclical position of the economy, is also very significant (up to the third lag) and has a negative sign. These results support our hypothesis that this crisis, contrary to Tequila, was driven by a perception of increasing macroeconomic fragility rather than caused by the belief of individual banks' weaknesses spread to the whole financial system through contagion effects. The change in industrial production could be thought as a leading indicator of a future downturn in asset prices in the sense of Allen and Gale (op. cit.).

Dummy variables were used to control for group effects and slope changes. The group effect were not significant in this case, probably due to non systematic behavior among groups during the whole period. The multiplicative dummies controlling for slope were very significant and have the expected signs, capturing the dramatic changes of slope for the previously mentioned periods. We also introduced a multiplicative dummy variable, controlling for asymmetries in the behavior of the dependent variable. This dummy takes the value of the change in deposits in $t-1$ if the change in t is positive, and cero otherwise. The sign of this dummy is negative, indicating that when deposits increase the autoregressive process is less persistent. This result is interpreted as a signal that depositors are more worried about the past trend in deposits when they are falling than when they are growing.

The model passes the Sargan test of over-identification and the second order autocorrelation test, indicating that the GMM estimators are consistent.

Summing up, in this model for the whole sample, devaluation risk, the change in international reserves and industrial production are main factors driving deposit dynamics, supporting our hypothesis.

4.2. Modeling bank run episodes

In this section we study the particularities of the four bank run episodes in which the crisis evolved until the "Corralito" was imposed on November 30th. Bank group figures (see Table 1) suggested that depositors behavior was not homogeneous between the different sub –periods. Our aim here is to obtain an insight of the particular characteristics of each episode as the crisis developed.

Thus we estimated equation (1) using daily data on individual banks' change in deposits for the sub-periods described above.

The results of the estimation are presented in Tables 4 to 7 for the different sub-periods. The model for the first period is presented in Table 4, the only significant micro fundamental is the leverage ratio. Contrary to the results obtained for the whole period,

the interest rate on deposits was significant with a lag structure, but with a positive sign, giving evidence that during this first period, paying higher interest rates helped banks to retain deposits. The macro fundamentals, including devaluation risk, the change in international reserves and systemic liquidity are all significant and have the expected sign. The only dummy variable that was significant in this period is the one that controls for asymmetries. Taking into account that deposits' fall in this first period was insignificant compared to the following episodes, the fact that the interest rate has a positive impact on the change in deposits suggests that economic agents confidence on the financial system had not been completely eroded yet.

Table 4 - First Period – Daily Observations

from 11/08/00 to 12/13/00

```
Arellano-Bond dynamic panel data                Number of obs      =       476
Group variable (i): codent                      Number of groups   =        26

                                                Wald chi2(19)      =   4516.75

Time variable (t): time                         min number of obs  =         8
                                                max number of obs  =        20
                                                mean number of obs =  18.30769
```

One-step results

Dep Change	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
Dep Change						
LD	-.6459734	.1135328	-5.69	0.000	-.8684935	-.4234533
L2D	-.6454655	.1170926	-5.51	0.000	-.8749628	-.4159681
L3D	-.4677003	.0933925	-5.01	0.000	-.6507462	-.2846543
L4D	-.3981674	.0925531	-4.30	0.000	-.579568	-.2167667
L5D	-.3034846	.0920131	-3.30	0.001	-.4838269	-.1231423
Dep Int Rate						
D1	.0727898	.203079	0.36	0.720	-.3252377	.4708173
LD	.3516222	.189353	1.86	0.063	-.0195029	.7227472
L2D	.3068665	.1546592	1.98	0.047	.00374	.6099929
L3D	.2983707	.1359794	2.19	0.028	.031856	.5648854
Deval Risk						
D1	-.2226788	.1342032	-1.66	0.097	-.4857122	.0403545
LD	-.3918897	.1566555	-2.50	0.012	-.6989289	-.0848506
L2D	-.4389779	.2520321	-1.74	0.082	-.9329517	.054996
L3D	-.2577236	.1427089	-1.81	0.071	-.5374279	.0219807
IntRes Change						
LD	.1612177	.0942067	1.71	0.087	-.0234239	.3458594
L2D	.2369829	.1122355	2.11	0.035	.0170053	.4569604
L3D	.1593973	.0970687	1.64	0.101	-.0308538	.3496485
SysLiq Change						
D1	.0957938	.0484035	1.98	0.048	.0009247	.1906629
Leverage(-2)						
D1	-.0108463	.0060503	-1.79	0.073	-.0227047	.0010121
Asymmetry	-.2397502	.1583844	-1.51	0.130	-.5501779	.0706775
Constant	-.0010456	.0004382	-2.39	0.017	-.0019044	-.0001867

Two-step results

```
Sargan test of over-identifying restrictions:
         chi2(158) =     1.74     Prob > chi2 = 1.0000
Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -1.85   Pr > z = 0.0650
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   1.13   Pr > z = 0.2573
```

The model for the second period (Table 5) is a bit different. In this case the interest rate was not significant and the only individual bank variables that are relevant in explaining the change in deposits are the government debt ratio and again, the leverage. With respect to the macro fundamentals the only one that continues to be significant is devaluation risk. In this model the dummy variable for the five largest retail banks is significant and positive indicating that this group lost less deposits than the average, giving some evidence of a flight to quality.

Table 5 - Second Period – Daily Observations

from 02/12/01 to 03/30/01

```
Arellano-Bond dynamic panel data                Number of obs      =       870
Group variable (i): codent                      Number of groups   =        30

                                                Wald chi2(10)      =   1267.20

Time variable (t): time                         min number of obs  =        29
                                                max number of obs  =        29
                                                mean number of obs =        29
```

One-step results

Dep Change	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
Dep Change						
LD	-.3166915	.100053	-3.17	0.002	-.5127918	-.1205913
L2D	-.2707788	.0432734	-6.26	0.000	-.3555931	-.1859645
L3D	-.1859552	.0421635	-4.41	0.000	-.2685941	-.1033162
L4D	-.1891614	.0534959	-3.54	0.000	-.2940115	-.0843113
Deval Risk						
LD	-.0660656	.0366936	-1.80	0.072	-.1379838	.0058526
L2D	-.0406485	.0328709	-1.24	0.216	-.1050743	.0237772
Pub Debt(-1)						
D1	-.1835882	.0624535	-2.94	0.003	-.3059948	-.0611816
Leverage(-2)						
D1	-.0122093	.0048107	-2.54	0.011	-.0216381	-.0027805
Private5	.0009426	.0005402	1.74	0.081	-.0001163	.0020014
Asymmetry	-.6215962	.1088128	-5.71	0.000	-.8348654	-.4083269
Constant	-.0004793	.0003554	-1.35	0.178	-.0011758	.0002173

Two-step results

```
Sargan test of over-identifying restrictions:
        chi2(112) =    19.88     Prob > chi2 = 1.0000
Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
        H0: no autocorrelation   z =  -2.19   Pr > z = 0.0288
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
        H0: no autocorrelation   z =   0.47   Pr > z = 0.6397
```

In the third period (Table 6) the interest rate is again significant and positive and the leverage ratio is also relevant. Our interpretation is that this leverage ratio can be considered as a measure of the perceived solvency of banks. As the quality of banks assets deteriorated due to increasing devaluation and default risk, those bank with a higher leverage would be in a weaker position. With respect to the macro fundamentals, once again devaluation risk persist to be significant. In this case the change in systemic liquidity is also relevant. Contrary to the previous episodes, the group that lost the less were the largest public banks.

Table 6 - Third Period – Daily Observations

from 07/04/01 to 08/22/01

```
Arellano-Bond dynamic panel data                Number of obs      =       723
Group variable (i): codent                      Number of groups   =        28

                                                Wald chi2(11)      =   1845.87

Time variable (t): time                         min number of obs  =         1
                                                max number of obs  =        30
                                                mean number of obs =  25.82143
```

One-step results

Dep Change	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
Dep Change						
LD	-.3469842	.0661647	-5.24	0.000	-.4766646	-.2173038
L2D	-.1826099	.068657	-2.66	0.008	-.3171752	-.0480446
L3D	-.1346133	.0452388	-2.98	0.003	-.2232798	-.0459469
L4D	-.1065248	.0284041	-3.75	0.000	-.1621959	-.0508537
Dep Int Rate						
D1	.0964243	.0492484	1.96	0.050	-.0001008	.1929493
Deval Risk						
LD	-.032269	.0123976	-2.60	0.009	-.0565679	-.0079701
SysLiq Change						
D1	.0689191	.0456031	1.51	0.131	-.0204613	.1582995
LD	.0392999	.0231812	1.70	0.090	-.0061344	.0847342
Leverage(-2)						
D1	-.0174148	.0095049	-1.83	0.067	-.036044	.0012145
Public	.0008227	.0004893	1.68	0.093	-.0001364	.0017817
Asymmetry	-.718663	.0936064	-7.68	0.000	-.902128	-.5351979
Constant	-.0011876	.0002985	-3.98	0.000	-.0017726	-.0006026

Two-step results

```
Sargan test of over-identifying restrictions:
         chi2(241) =    20.71     Prob > chi2 = 1.0000
Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -1.66   Pr > z = 0.0978
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =   1.17   Pr > z = 0.2435
```

Finally, in the four period (Table 7), neither the interest rate nor the micro fundamentals were significant. This is a strong result indicating that the crisis evolved to a more systemic process not related to particular bank characteristics. On the other hand, the macro fundamentals continued being relevant to explain deposit behavior. In this case devaluation risk is measured by NDF. This is the only period in which the EMBI spread was significant. Both group effect variables were significant indicating that while the largest private banks were the ones that lost the most, the largest public banks lost the less.

All these models pass the Sargan test of over-identification restrictions and the second order autocorrelation test, indicating that the GMM estimators are consistent.

Table 7 - Fourth Period – Daily Observations

from 10/03/01 to 11/30/01

```
Arellano-Bond dynamic panel data                Number of obs      =      1110
Group variable (i): codent                      Number of groups   =        30

                                                Wald chi2(11)      =   1803.60

Time variable (t): time                         min number of obs  =        37
                                                max number of obs  =        37
                                                mean number of obs =        37
```

One-step results

Dep Change	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
Dep Change						
LD	-.220858	.0449721	-4.91	0.000	-.3090017	-.1327143
L2D	-.2720538	.0722088	-3.77	0.000	-.4135805	-.130527
L3D	-.1026443	.0657284	-1.56	0.118	-.2314697	.026181
L4D	-.1261124	.0349455	-3.61	0.000	-.1946042	-.0576205
L5D	-.055883	.0250947	-2.23	0.026	-.1050676	-.0066984
EMBI						
LD	-.1818074	.0622165	-2.92	0.003	-.3037494	-.0598653
Non Del Fwd						
D1	-.0229458	.0064318	-3.57	0.000	-.0355519	-.0103397
IntRes Change						
L4D	.0792465	.024183	3.28	0.001	.0318488	.1266443
Private5	-.0009237	.0004354	-2.12	0.034	-.0017771	-.0000703
Public	.0008638	.000426	2.03	0.043	.0000288	.0016988
Asymmetry	-.4179107	.1254384	-3.33	0.001	-.6637654	-.1720559
Constant	.000331	.0005169	0.64	0.522	-.0006822	.0013441

Two-step results

```
Sargan test of over-identifying restrictions:
        chi2(143) =    16.20     Prob > chi2 = 1.0000
Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
        H0: no autocorrelation   z =  -2.20   Pr > z = 0.0281
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
        H0: no autocorrelation   z =   1.37   Pr > z = 0.1700
```

Common features among the four periods are that macro variables are the main explanation of deposit changes while micro fundamentals do not appear to contribute to explain the crisis dynamics. In particular, devaluation risk is persistently very significant. Another relevant feature is that the asymmetry dummy variable correctly captures the different intensity of the autoregressive process of deposits dynamics according to the deepness of the fall in each episode.

Concluding, the results for the whole sample are confirmed by those obtained for the different sub-samples.

5.Conclusions

We studied the dynamics of individual bank deposits during the twin crisis suffered by Argentina since November 2000. Our aim was to determine to what extent this event had the characteristics of a “sun spot” phenomenon -i.e. a random event not related to the real economy- or, it was the consequence of a change in economic agents perception

about the trend of the Argentine economy.-i.e. an increase on aggregate risk. We were interested on determining if the highly dollarized loan portfolios of banks, as well as the large proportion of public debt in banks´ asset portfolios, induced depositors to massively run on banks as they perceived that their solvency was worsening.

The empirical results strongly favour the second hypothesis. Macro fundamentals and in particular devaluation risk and the change in industrial production, as a leading indicator of future banks' solvency problems played an important roll in explaining the behaviour of deposits during the crisis. On the contrary, banks' micro fundamentals" did not help to explain the dynamics of deposits, except for a leverage ratio.

We think that our findings support the assessment that the regulatory framework built up during the 1990 had non trivial weaknesses. The currency board regime favoured the perception that debtors would be permanently protected against devaluation risk, inducing a high dollarization of banking sector assets. On the other hand, the combination of a currency board regime and a deposit insurance system that did not discriminate between both, domestic and foreign currency, also favoured dollarization of deposits. The need of regulations to control for the implied solvency risk by generated by the high dollarization of banks' assets was underestimated. More strict regulations on banks' government debt holdings, preventing for excessive default risk taking by financial institutions, were also necessary. given the financing restrictions imposed to the government by the " Convertibilidad".

Although it is perhaps early to intend to build policy lessons from the present experience of Argentina, there are some policy recommendations appear quite straightforward: First, a key element to allow for a deepening of the banking system is to develop attractive financial instruments in the domestic currency. Second, given that financial systems are subject to currency risk, independently of the exchange rate regime adopted, regulations must control for this risk. Possible recommendations for a good regulation design could be, in our opinion: (i) regulations must make depositors aware of the higher risk involved in foreign currency deposits, since the Central Bank does not have policy instruments to act as a LOLR in this case, (ii) restrictions must be introduced on bank lending in foreign currency, discouraging excessive growth of foreign currency financing and ensuring a matching between currency denomination of loans and banks' borrowers income (iii) the sovereign debt risk of banks' asset portfolios must also be controlled.

Latest experiences of emerging market crises and, more specifically, the present Argentinean crisis, made clear that financial liberalization policies must be accompanied by regulations that widely control for banks' risk, and prevent excessive credit expansion. Emerging market economies, probably because of a lack of domestic savings to sustain growth, are very dependent on capital inflows. In this sense banking systems in emerging markets face particular risks not shared by those of mature economies. As a consequence, the regulatory standards for emerging economies' banking systems need to be revised in light of recent experiences, including this of Argentina and might probably depart in some aspects from those of developed countries.

Appendix A: Spearman Correlations

First Period - Daily Observations from 11/08/00 to 12/13/00

Observations = 26

	Dep Change	EMBI	Deval Risk	Non Del Fwd	IntRes Change	SysLiq Change
Dep Change	1					
EMBI	-0,251	1				
Deval Risk	-0,132	-0,154	1			
Non Del Fwd	0,034	0.692***	-0,081	1		
IntReq Change	0,049	-0.339*	0,155	-0.380*	1	
SysLiq Change	0,064	-0.428**	0,116	-0.304	0.796***	1

Second Period - Daily Observations from 02/12/01 to 03/30/01

Observations = 34

	Dep Change	EMBI	Deval Risk	Non Del Fwd	IntRes Change	SysLiq Change
Dep Change	1					
EMBI	-0,284	1				
Deval Risk	-0,286	0.840***	1			
Non Del Fwd	-0.362**	0.945***	0.875***	1		
IntRes Change	0,246	-0.498***	-0.390**	-0.439***	1	
SysLiq Change	0,198	-0,244	-0,181	-0.183	0.508***	1

Third Period - Daily Observations from 07/04/01 to 08/22/01

Observations = 35

	Dep Change	EMBI	Deval Risk	Non Del Fwd	IntRes Change	SysLiq Change
Dep Change	1					
EMBI	-0.117	1				
Deval Risk	-0.047	0.522***	1			
Non Del Fwd	0.083	0.587***	0.255	1		
IntRes Change	0.428***	-0.279*	-0.016	-0,047	1	
SysLiq Change	0.583***	-0.211	-0.015	-0,027	0.796***	1

Fourth Period - Daily Observations from 10/03/01 to 11/30/01

Observations = 43

	Dep Change	EMBI	Deval Risk	Non Del Fwd	IntRes Change	SysLiq Change
Dep Change	1					
EMBI	-0.289*	1				
Deval Risk	-0.156	0.378**	1			
Non Del Fwd	-0.226	0.636***	-0.041	1		
IntRes Change	0.257*	-0.342**	0.111	-0,045	1	
SysLiq Change	0.521***	-0.309**	-0.055	-0,066	0.697***	1

Whole Sample Period - Weekly Observations

Observations = 74

	Dep Change	EMBI	Deval Risk	Non Del Fwd	IntRes Change	SysLiq Change
Dep Change	1					
EMBI	-0.228*	1				
Deval Risk	-0.355***	0.843***	1			
Non Del Fwd	-0.217*	0.978***	0.856***	1		
IntRes Change	0.275**	-0.283**	-0.198*	-0.301***	1	
SysLiq Change	0.457***	-0.163	-0.132	-0.151	0.771***	1

*** Indicates statistical significance at 1%, ** at 5% and * at 10%.

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