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International Liquidity Management Problems in Modern Latin America: Their Origin and Policy Implications

by

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Abstract

Despite significant progress in macroeconomic stabilization and structural reform, Latin America still experiences substantial macroeconomic instability due mostly to terms of trade shocks and capital flow “sudden stops.” The paper employs a simple theoretical model and empirical evidence to justify an international liquidity management strategy in the face of both real and financial shocks. Two key ingredients are identified. First, the paper argues that the weak links to international financial markets can trigger excess volatility and sudden withdrawals of international liquidity. Second, underdeveloped financial markets with limited size and liquidity can further aggravate the contractions induced by external financial shocks. The imperfection of domestic financial markets makes the economy too vulnerable to external shocks as investors do not value international liquidity enough, creating less international collateral than is socially optimal. The paper concludes with two sets of policy recommendations. If the private sector is already facing the socially efficient prices in deciding its international liquidity position, the decentralized equilibrium is efficient given structural constraints, and the government should limit its actions to alleviate these constrains. The second set of policies concentrate on the time and then manner in which the government should attempt to “force” the private sector to increase its international liquidity position.

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I. Introduction

Despite the significant economic and institutional progress experienced by the main economies of the region over the last decade or so, Latin America still experiences substantial macroeconomic instability. Replacing the chronic domestic imbalances of the past, much of this instability stems from the occasional but sharp tightening of a country’s access to international financial markets; what Guillermo Calvo has so appropriately dubbed “the sudden stop.”

Facing this scenario, both the private as well as the public sectors are compelled to design an appropriate international liquidity management strategy. Unfortunately, while at the microeconomic level ---i.e., given prices--- this is not a daunting task, there is still very limited understanding of its macroeconomic counterpart. In this paper I attempt to shed some light on this issue, drawing from some of my recent theoretical and applied work in this area. Since this is a policy conference, however, I go further and --somewhat “irresponsibly”--- make a series of conjectures on the impact of international liquidity management considerations on the desirable features of macroeconomic policy.

I develop the argument of the paper by addressing three sequential questions: (a) Why is there a need for decentralized and centralized international liquidity management? (b) What are the types of structural and macroeconomic policies that a government should pursue, even if the private sector is using the socially-efficient prices in deciding its international liquidity position? and (c) When and how should the government attempt to “force” the private sector to increase its international liquidity position?

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3 Calvo (1998).
4 The essence of the conceptual framework is an adaptation of that in Caballero and Krishnamurthy (1999, 2000a, 2000b). The examples and applications are mostly from Caballero (1999a,b,c); while some of the policy lessons owe to Caballero (2000), a background paper prepared for the report on “Dealing with Economic Insecurity in Latin America,” by the Latin America Regional Studies Program of the World Bank. These papers can be downloaded from http://web.mit.edu/caball/www.
Since the “sudden stop” problem is primarily a financial one, the analysis in this paper builds on the presence of financial frictions. While some of the latter are undoubtedly a part of the new global economy -- in particular the greater flexibility and options for capital as well as the highly-leveraged nature of many of these investors – I chose to emphasize domestic weaknesses since these are probably easier to remedy and account for a substantial part of the problem. There are two of these weaknesses that are widely observed in emerging economies and play a central role in my analysis: (i) weak links with international financial markets, and (ii) underdeveloped domestic financial markets. Together, they justify and complicate the problem of international liquidity management.
II. Why do we need an international liquidity management strategy?

The view portrayed in this paper links the answer to this question to the two financial deficiencies highlighted above. I build the story sequentially ---one ingredient at a time--- as this will clarify the different nature of the policy questions asked in sections III and IV, as well as the particular deficiencies that give rise to them. Let me start with that which is most directly connected ---it is indeed a necessary ingredient--- to the need for international liquidity management: Weak links with international financial markets.

**Ingredient 1: Weak links with international financial markets**

These are simply financial constraints, possibly time-varying, that limit the public and private international borrowing (broadly understood) of emerging countries. The evidence for this is substantial. Just to highlight a few dimensions of this problem, consider, e.g., the path of an index of sovereign spreads for Latin America’s largest economies over the second half of the 90’s illustrated in Figure 1. The large surge in these spreads around the Mexican and Russian crises starkly illustrates the massive withdrawal of much-needed foreign support for Latin American assets.

**Figure 1: Latin American Sovereign Spreads**

![Figure 1: Latin American Sovereign Spreads](image)

*Note: the time series is an average of Argentina, Brazil, Mexico, and Venezuela.*
Table 1: The Volatility Premium

<table>
<thead>
<tr>
<th></th>
<th>S&amp;P rating</th>
<th>Moody’s rating</th>
<th>Spread average</th>
<th>Spread variance</th>
<th>Variance of spread changes</th>
</tr>
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<tr>
<td><strong>Argentine Sovereign Bonds</strong></td>
<td>BB-</td>
<td>B1</td>
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<td>2.25</td>
<td>0.36</td>
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<tr>
<td></td>
<td>BB</td>
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<td>5.11</td>
<td>3.10</td>
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<tr>
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<tr>
<td></td>
<td>BB</td>
<td>B1</td>
<td>4.59</td>
<td>4.12</td>
<td>1.76</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td></td>
<td></td>
<td>4.66</td>
<td>3.36</td>
<td>1.63</td>
</tr>
<tr>
<td><strong>U.S. Corporate Bonds</strong></td>
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<td>0.07</td>
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<tr>
<td><strong>Average</strong></td>
<td></td>
<td></td>
<td>3.59</td>
<td>1.44</td>
<td>0.48</td>
</tr>
</tbody>
</table>

Notes: Spread average means average over bond lifetime (or starting at earliest date available in Datastream). Argentine Sovereign Bonds: ARGENTINA-PAR G/R 93-23, ARGENTINA 11 3/8% 97-17, ARGENTINA 11% 96-06, ARGENTINA 8 3/8% 93-03.
U.S. Corporate Bonds: FRUIT OF THE LOOM 7% 81-11, MAXUS ENERGY CORP. DEB 8 1/2% 89-08, SEA CONTAINERS 12 1/2% 93-04 (B), SEA CONTAINERS 12 ½% 92-04 (A), AK STEEL HOLDING CORP. 10 3/4% 94-04, CLARK OIL REFINING 9 1/2% 92-04, BETHLEHEM STL.CORP. DEB 8.45% 86-05, TRSP.MARITIMA MEXICO 9 1/4% 93-03.
Source: Bond data from Datastream.

Moreover, while less than prime corporate assets in the U.S. also suffered during the Asian and Russian crises, the rise in their premia was substantially smaller. This difference can also be appreciated over longer time intervals. Table 1, for example, compares the performance of several Argentine sovereign bonds with that of several U.S. corporate bonds of equivalent rating. The table reports the average spreads of these instruments over U.S. Treasury instruments, as well as the variance of these spreads and that of their changes. The evidence illustrates that, relative to U.S. corporate bonds, Latin American bonds pay a higher spread and their returns are substantially more volatile.\(^5\) Moreover, the spread-premium is probably a result of this “excess volatility” that mostly comes from episodes when financial markets tighten for emerging markets. Latin American countries. See Caballero (1999c) for evidence in Mexico.
American bonds look “illiquid” from the point of view of spreads and volatility, despite the fact that their volume is often much larger than that of the specific U.S. corporate bonds described in the table.

*A simple model.* Connecting this ingredient to an external crisis due to international liquidity shortages is straightforward. I do this by sketching a model that is slightly richer than is needed at this point, for it explicitly considers a domestic financial market, but that will allow me to bring in the second ingredient later on with very little additional investment.

It is not too farfetched to think about an emerging economy’s timeline in the terms described in Figure 2. Date 0 corresponds to “normal” times, when investment, planning and prevention are all very relevant. A significant part of this planning has to do with anticipating and preventing a crisis in the perhaps not too distant future at date 1. Date 2 represents the future, always brighter than the present, but a significant obstacle is that the country – both its sovereign as well as its corporations — often fails to persuade foreign financiers that they will share in that bright future if they help to avert the crisis (weak international financial links).

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6 Moreover, many of the business cycle recessions as opposed to deep crisis episodes occur at date 0, when domestic policy makers attempt to prevent a deep crisis at date 1.
Figure 3 describes the elements creating a crisis driven entirely by insufficient external resources, but with a perfectly functioning domestic financial system. We can think of a crisis as a time when, (a) a significant fraction of firms or economic agents are in need of financing to either repay debt or implement new investments needed to save high return projects, and (b) on net, the economy as a whole does not have enough assets and commitment to obtain the external resources it needs. Loosely, I refer to these assets and commitment as “collateral,” which needs not be interpreted literally as pledged assets but as the resources that are likely to be recouped by a lender. In order to make things as stark as possible, imagine that distressed firms have no assets of value to foreigners, but that the high date 2 return on their investment if successfully maintained, $A_n$, is fully pledgeable to other domestic agents. To be concrete, think of $A_n$ as the value of a building (nontradeable) delivered at date 2, and assume that absent a crisis the discount of future flows is simply zero, the international discount rate. The mass of these projects is one.
Other domestic firms and investors (or foreign specialists) have assets, $A_t$, that are “good collateral” to foreigners. For example, U.S. T-bills, the present value of exports as well as other domestic assets --like telecoms-- that may be deemed more transparent and trustable by foreign investors. As it is highly unlikely that foreigners would be willing to provide financing equivalent to the full value of these assets --due to a sovereign problem, for example-- assume that one unit of $A_t$ only secures a loan of $\lambda_t$ date 1 resources.\(^7\) Much of the policy discussion later on has to do with increasing the value of this parameter.

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\(^7\)Thus, in addition to binding microeconomic incentive problems, there may be sovereign risk associated to many of these assets, especially in the event of crises. The latter affects foreigners’ valuation of these assets even when they acquire the private control rights.
Domestic financial markets are essentially the place where up to $\lambda_t A_t$ resources are made available to the distressed firms, who have assets $A_n$ to pledge in exchange. When the economy’s pledgeable resources are greater than the needs of distressed firms, arbitrage keeps the internal cost of funds $L$ equal to the international interest rate (normalized to one here), all distressed firms are able to borrow funds, and only a fraction of domestic collateral $A_n$ needs to be pledged. This is the case in panel (a) of Figure 4. In this simple example, where all projects have the same high return, the domestic demand for international liquidity by distressed firms is flat up to the point where all projects are fully refinanced. The supply, on the other hand, is flat at the international interest rate until international collateral $\lambda_t A_t$ runs out, where it becomes vertical. When the aggregate needs of distressed firms are greater than pledgeable resources, competition among distressed firms transfers all of their private surplus (return above the international interest rate) to the domestic suppliers of international liquidity. Panel (b) illustrates this fire sale of domestic assets. The fraction of projects financed is $\lambda_t A_t < 1$, and the discount of domestic collateral jumps from one, the international level, to $L = A_n > 1$. 

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**Figure 4: Fire Sales**

(a) Equilibrium with adequate international collateral

(b) Fire Sales

- Limited number of profitable projects
- Scarcity of international collateral limits the transfer of funds to distressed firms
- A decline in the quality of a country’s international collateral can cause a fire sale
The most direct shock conducive to a fire sale and crisis is indeed a sudden loss in the international appeal of a country’s assets. This can be due to country-specific factors as well as to changes and shocks in the segments of international financial markets relevant for the country. The turmoil after the Russian crisis in October 1998 is a prototypical example of the latter.

**Figure 5: Excess Sensitivity and Chile**

(a) Growth and copper price  
(b) Present value effect of terms of trade shocks

Sources: growth from IFS, copper prices (London Metal Exchange) from Datastream.

But shocks need not come directly from external financial factors to reflect the weakness of financial links. Panel (a) in Figure 5 plots the paths of the spot price of copper from the London Metal Exchange and Chile’s quarterly GDP growth. The resemblance is stark, with the only important exception being the 1990 growth slowdown and its recovery episode which had a purely domestic origin. Panel (b) documents the excessive sensitivity of Chile’s GDP response to copper prices by plotting the annuity value of the expected present value impact of the decline in copper prices, as a share of GDP. It is

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8 The present value effect is computed assuming an AR(4) process for the spot price of copper, a constant growth rate for copper production (7%) and a fixed discount rate (7.5%).
apparent from this figure (the different scales in the axes, in particular) that fluctuations in GDP are an order of magnitude larger than a smoothing model would dictate.9

**Figure 6: Copper Prices and Chile’s Current Account**

![Graph of Copper Prices and Chile’s Current Account](image)

*Source: INE and Banco Central de Chile.*

The view portrayed in this paper identifies the fundamental problem as one of weak links to international financial markets. Panel (a) of Figure 6 reinforces this conclusion, illustrating the *positive* correlation between the current account deficit and the price of copper, opposite to what one would predict from standard smoothing arguments. The “tequila” crisis of 1995 appears to be the exception that proves the rule as the high copper price gave the Chilean economy enough “liquidity” to ride through the crisis and experience fast domestic growth despite the large international credit crunch experienced by emerging economies.10 This is confirmed in panel (b), which demonstrates that Chile used a large fraction of the “liquidity” given by the high price of copper to offset the

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9 The price of copper has trends and cycles at different frequencies, some of which are persistent (see Marshall and Silva 1998). But there seems to be no doubt that the sharp decline in the price of copper during the current crisis was mostly the result of a transitory demand shock brought about by the Asian crisis. As the latter economies have begun recovering, so has the price of copper. I would argue that conditional on the information that the current shock was a transitory demand shock, the univariate process used to estimate the present value impact of the decline in the price of copper in figure 5, overestimates the extent of this decline. The lower decline in future prices is consistent with this view. The variance of the spot price is 6 times the variance of 15-months-ahead future prices. Moreover, the expectations computed from the AR process track reasonably well the expectations implicit in future markets but at the very end of the period, when liquidity premia considerations may have come into play.

10 Capital flows were high matching the high copper price, but the current account was not. The other exception reflects a domestically induced recession, as it resulted from the monetary tightening implemented at the beginning of the new government to offset the inflationary pressures of the preceding political cycle. Capital flows remained high but ultimately led to the accumulation of international reserves rather than financing a current account deficit.
decline in capital inflows as the current account deficit at normal prices reached its highest level during that year. Most importantly, exactly the opposite occurred during the 1998-99 crisis as the price of copper plummeted (erasing Chile’s liquidity) at the precise time that international financial markets tightened.\footnote{Note that terms of trade were also bad in 1993 and that, consistently, growth slowed down that year as well (see figure 1). However, international financial markets were buoyant at the time so this decline did not come together with a severe credit crunch.}

In order to place this scenario in the context of the model above, assume that international collateral is constituted primarily by claims on tradable goods while domestic collateral represents mostly assets issued by producers of non-tradable goods.\footnote{The international economics literature has long recognized the importance of international collateral and its relation with a country’s tradable sector. See Simonson (1985). Formal models of sovereign debt renegotiation are built around the question of what international lenders can threaten sovereign countries with in the event of default. In this literature, international collateral is typically taken to be some fraction of exports. See Eaton and Gersovitz (1981) or Bulow and Rogoff (1989). Cash revenues from exports can be seized before they make it back into the country. This feature was used by Mexico during the 94-95 crisis when its oil revenues were made part of the collateral backing the liquidity package it received.} An adverse terms of trade shock is simply a decline in the value of traded goods’ assets, $A_t$, which reduces the country’s borrowing capacity and shifts the supply curve to the left in a manner similar to the financial shocks above. A sufficiently large or sufficiently long sequence of terms of trade shocks can significantly reduce a country’s international liquidity, causing a fire sale and corresponding real decline. Needless to say, the extent to which this is likely to happen depends critically on the tightness of external financial markets.\footnote{In isolation, these canonical shocks are not always large enough to justify the observed aggregate volatility created by a crisis, and at times crises occur even without their apparent presence. These features are not in contradiction to the basic premise, for both their presence as well as a high likelihood of them becoming a factor in the near future typically suffice to trigger public and private responses with recessionary consequences. And of course, these responses may indeed prevent larger crises in the near future. I’ll return to this discussion in the policy sections.}

**Ingredient 2: Underdeveloped domestic financial markets.**

Turning to the second ingredient, the development of domestic financial markets is instrumental not only in fostering investment and growth, but also in aggregating resources during distress. Underdeveloped financial markets limit the prompt reallocation of resources, creating wasteful contractions in those markets most affected by shocks or less plugged into the financial system. On the other hand, as financial development rises...
so does leverage, and with it the vulnerability of the financial system to shocks also increases. Many Latin American economies have suffered at both ends: chronic financial repression and underdevelopment and, when moving away from that, large collapse of the banking system.

Most significantly for the purpose at hand, however, it is this domestic underdevelopment that naturally creates externalities that justify macroeconomic policies aimed at changing the private sector’s international liquidity management (as opposed to measures aimed simply to increase the private sector’s access to international liquidity). It is this point that I develop here, after briefly documenting the underdevelopment of most Latin American financial markets. For the latter, consider two basic features of these markets: their limited size and their illiquidity.

Figure 7 highlights Latin America’s size problem. Regardless of how it is measured, and despite significant improvements over the last decade, Latin America’s financial markets and level of financial intermediation are sub-standard. In panels (a) and (b) it is clear that M3, loans, and stock market capitalization, each relative to GDP, fare poorly with respect to OECD economies.

Even when the standard measures of financial depth are at world class levels, there is always evidence of underdevelopment. The dark bars in panel (c) confirm that in terms of stock market capitalization values, Chile is an outlier in the region and fares well compared to more advanced economies. The light bars, on the other hand, reflect that Chile has a very substandard turnover ratio. Panel (d) reports the results of running a simple regression of the absolute value of daily price changes (a measure of volatility) on the change in the fraction of total capitalization traded. Literally interpreted, it reveals that on average an increase in the volume traded, in terms of total capitalization value, is associated with an increase in price volatility that is about ten times larger in Chile than in countries with presumably better developed financial markets.

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14 While excessive churn can be wasteful, it is highly unlikely that Chile's depressed levels are enough to support a solid infrastructure of market makers able to provide optimal levels of immediacy and liquidity. Moreover, one could argue that
We can now return to the model and enrich it to consider financial underdevelopment. The central point to be drawn from this extension is that unlike the case where only ingredient 1 is present, domestic providers of international liquidity are not transferred all of the surplus during crises, and hence they are not given the right incentives to supply this liquidity. When domestic financial markets are imperfect in the sense that distressed firms without direct access to international financial markets do not have the means to fully pledge their returns to other domestics or informed investors, the ex-ante incentive to hoard and supply international liquidity is weakened. Market-making is not a great business in a market with constrained demands. Imperfect domestic financial markets are
captured here by the assumption that only a fraction $\lambda_n < 1$ of a distressed firm’s value can be pledged.

Panel (a) in Figure 8 illustrates the scenario just described. Given the date 0 allocations, a decline in $\lambda_n$ reduces the effective demand for international liquidity. While the marginal product curve remains unchanged (dashed line), the effective demand curve (solid line) shifts down as the maximum payment per unit of investment is only $\lambda_n A_n$. As long as pledgeable assets are greater than the opportunity cost of funds (the international interest rate), however, domestic providers will make these loans.$^{15}$

**Figure 8: Excess Vulnerability**

- Imperfect domestic collateral reduces the effective demand for funds
- Lower demand reduces intermediaries’ expected returns for lending
- These lower returns reduce date 0 investment in international collateral
- Less international collateral increases the vulnerability of the economy to bad shocks.

But domestic availability of international collateral will not remain unchanged. In this environment, frictions in the market for domestic assets distort the private returns of
holding domestic and international collateral. The ex-ante equilibrium response to such distortion at date 0 is captured in panel (b), with an inward shift in the ex-ante supply of international liquidity/collateral. Since domestic financial constraints limit the returns received by international liquidity providers below the full return of distressed projects, the incentive to provide such liquidity declines. In so doing, the economy experiences more frequent fire sales and more severe distress in the event of an international squeeze on the country. The economy is in the end made too vulnerable to external shocks as domestic investors do not value international liquidity enough, creating less international collateral than is socially optimal.

In essence, this undervaluation of international liquidity corresponds to a reduced private sector’s incentive to contract insurance against external aggregate shocks. This can take many forms aside from external overborrowing and distorted incentives to produce goods and assets appealing to foreign investors and lenders (international collateral). For example:

i) *Excessive dollarization of external liabilities.* When a country is exposed to sharp international liquidity shortages, it is socially desirable that the private sector contracts its debt contingent on those shocks that generate such shortages. Denominating the external debt in local currency rather than “dollars” is one such contingency. The domestic borrower contracting in pesos trades off a higher interest rate for the insurance against aggregate shocks that depreciate the exchange rate. When international liquidity is undervalued (relative to the second best – not the first best), borrowers will undervalue the latter hedge as well.¹⁶

ii) *Distorted maturity structure.* Long term external debt is like short-term debt plus rollover insurance. When domestic financial markets are underdeveloped, there is less incentive to buy this form of insurance as well, since the holders of the

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¹⁵ Note that a decline in L does not necessarily imply that the domestic interest rate falls relative to the case with better developed domestic financial markets (for given international liquidity). It may imply instead that a larger share of the domestic “loan” becomes uncollateralized.

“insurance policy” that do not experience distress and financial needs at date 1 do not receive the full social return of their guaranteed debt-rollover.\textsuperscript{17}

Unfortunately, the harmful effects of these distorted decisions do not stop here as they are probably leveraged by supply factors. Once the size of the domestic market for international liquidity is reduced by domestic financial underdevelopment, foreign investors’ incentives to become country specialists are reduced as well. And if these specialists face liquidity risks themselves, they are likely to reduce their entry even further if few other specialists are willing to participate.\textsuperscript{18}

Finally, while I have emphasized here the (dynamic) impact of domestic financial underdevelopment on international liquidity shortages, the reverse feedback is also present. International liquidity shortages can reduce effective domestic financial development by, e.g., hurting the banking system. I will spend a few lines in the latter mechanism, as banks play a particularly important role in emerging markets and are especially fragile to international liquidity mismanagement.

**Figure 9: Credit Crunches**

\textsuperscript{17} See Caballero and Krishnamurthy (2000a).

\textsuperscript{18} See Caballero and Krishnamurthy (2000b) for a model of entry and thin markets in determining foreigners’ reluctance to extend contingent credit lines.
Figure 9 illustrates two prototypes of the connection between external constraints and banking problems. Panel (a) shows the severe Mexican credit crunch that followed the “tequila” crisis. Loans, and in particular new loans, imploded early on during the crisis, especially as the currency went into free fall and dragged the already weak balance sheets of Mexican banks with it. The Argentine case during the same episode started from the other side of the banks’ balance sheets. Panel (b) illustrates the path of deposits and loans, indicating that it was not the value of the loans that imploded – perhaps because the exchange rate did not collapse – but that depositors ran for their deposits in order to convert them into dollars as they expected that the tight external conditions would make the convertibility system unsustainable.

The basic model is easily extended to include a banking sector that replaces the domestic credit chains discussed above. For example, in order to capture a Mexican-style credit crunch, let banks make loans to firms funded at date 0 by issuing debt to foreigners. At date 1, domestic holders of international assets mortgage them and deposit the proceeds in the banking system that in turn intermediates new loans to distressed firms. Banks are subject to capital adequacy standards such that the ratio of the market value of capital to loans must be at least $\alpha$. When banks are unconstrained, the economy is equivalent to that described above with perfect domestic financial markets and weak financial links. Once adequacy standards bind, however, the supply curve for internal funds becomes backward bending as bank capital is eroded by higher interest rates that in turn lower asset prices.

Panel (a) of Figure 10 illustrates that this fire sale of assets may sharply reduce the banking sector’s lending capacity, creating a credit crunch. Frictions in the banking sector are actually more serious than those described in undeveloped financial markets above. Constrained banks become a financial bottleneck as excess domestic resources are not properly channeled to distressed firms, wasting otherwise good international collateral. While the contraction in loan supply causes the increase in interest rates, the collapse in asset prices amplifies the impact of the crisis by deepening the credit crunch caused by distressed banks’ balance sheets. Panel (b) demonstrates that the feedback between asset
prices and feasible intermediation can easily bring about the possibility of multiple equilibria.

**Figure 10: Bank Capital Crunches**

- (a) Equilibrium with binding leverage standards
- (b) Multiple equilibria with binding leverage standards

- Banks must hold sufficient capital against date 1 loans to distressed firms
- Higher interest rates reduce the value of date 0 loans, increasing market leverage
- Binding leverage standards require banks to reduce date 1 lending as interest rates
III. Policies for a “well behaved” private sector

Paralleling the sequential introduction of the central ingredients to justify an international liquidity management strategy, I discuss the policy aspects of this strategy in two steps. In the first one, which in its purest form corresponds to the case where only the first ingredient is present, I address the following question: *What are the types of structural and macroeconomic polices that a government should pursue, even if the private sector is using the socially-efficient prices in deciding its international liquidity position?*

If the private sector is doing the best the central planner could do, were it to face the same collateral (financial) constraints as the private sector does, then effective policy must seek to relax these constraints. Technically, in this case the decentralized equilibrium is constrained efficient, and the government can only improve things if it can move the economy from the second toward its first best.

There are two generic strategies to attempt such improvement: (i) structural reforms in financial markets and the contractual environment; (ii) use efficiently any commitment that the government may have (and the private sector doesn’t) and is valuable to international investors and lenders.

The lists below are not meant to be exhaustive but simply illustrative of the nature of the policies that are required in each instance. Starting from the structural reforms to the contractual environment and financial markets, it seems relevant to mention three complementary fronts:

i) *Institutions.* By now there is widespread consensus on a series of general recommendations to improve external financial links, which can be found in most “international financial architecture” pamphlets. These recommendations include norms of transparency and accountability; banks’ sound practices for supervision, settlement, accounting and disclosure; aggregate risk management; and a series of
related measures and practices aimed at improving the country’s contractual environment and corporate governance.19

ii) Fostering Integration Synergies. But it takes more than change in regulation and supervision to achieve the desired goal. A good example of this observation is the case of Chile. While Chile has and continues to make substantial progress in ensuring an appropriate legal environment as it relates to businesses, its limited size and very unequal wealth distribution makes progress on the corporate governance front difficult especially when considering its natural or “structural” ownership concentration. This hints at an important synergy in fostering a much deeper integration with international financial markets: not only is good corporate governance needed to succeed on integration, but also integration may be an essential ingredient to achieve good corporate governance as well. It is for this reason that I find capital flows taxation, while justifiable on static second best ground, potentially very harmful. A more reasonable recipe, I believe, is as follows: if the country’s institutions are so far off the ideal ones that the decentralized equilibrium is very unstable, taxing capital inflows contingently may be justified. But if that is not the case, it may well pay off to bear the additional risk in exchange for a faster development of financial links and markets.20

iii) Institutional Investors. Fostering and nurturing the development of well supervised institutional investors is an efficient mechanism to delegate the enforcement of good corporate governance standards to the private sector, as these institutions often ponder such factors in their investment decisions.

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19 TIAA-CREF, one of the largest institutional investors in the U.S. has made public that it simply does not invest in claims issued by companies with poor corporate governance standards. (See pages 10-11 in May 1999 issue of “Participant,” TIAA-CREF’s quarterly news and performance magazine.) Among its requirements are that: (i) a company’s board consist of a substantial majority of independent directors (i.e. no significant personal ties, current or past); (ii) a company’s board must obtain shareholder approval for actions that could alter the fundamental relationship between shareholders and the board; (iii) companies must base executive compensation on a “pay for performance” system, and should provide full and clear disclosure of all significant compensation arrangements. It does not take an in-depth knowledge of Latin American corporations to realize that very few of them would make it into TIAA-CREF’s good corporate governance list.

20 As of May 2000, Chile opted for permanently removing “taxation” of short term capital inflows, as well for implementing a series of measures to facilitate both the participation of domestic firms in foreign financial markets as well as the participation of foreign investors in domestic markets. At the same time, several measures to improve corporate governance are being actively discussed. From the point of view adopted in this paper, these steps are significant steps forward.
As far as relaxing the private sector’s international financial constraint during crises, consider three important ---and quite different--- areas of improvement:

i) **Fiscal Policy.** Grounded on Keynesian mechanisms, *optimal* fiscal policy over the business cycle is traditionally thought of as being counter-cyclical. Latin American economies, unlike OECDs, typically exhibit the opposite pattern; fiscal deficits are *pro-*cyclical rather than counter-cyclical. This pattern has been interpreted as a seriously sub-optimal policy, and most likely the result of the financial constraints faced by the governments themselves. This assessment may be true but it misses an important point: if external financial shocks are an important source of fluctuations, the economy should distribute the scarce available international resources across domestic economic agents so as to smooth their differences in financial distress. It is highly unlikely that government expenditure, unless used very selectively to solve financial distress in the private sector, is the right place to allocate the marginal dollar.\(^{21}\) Fiscal policy may need to be pro-cyclical after all.\(^{22}\)

ii) **Labor Markets.** Most countries in the region are in need of a modern labor code, and the pervasive income inequality problem that affects them adds a series of additional complications to this task. But for the purpose of this section, the main point to emphasize is the fact that ---leveraged by financial problems--- Latin American economies are exposed to much larger short-term adjustment needs. These are highly unlikely to be accommodated fully -- and to a different degree in different countries-- by exchange rate movements. Thus the new labor code must allow for a more or less automatic recession/crisis-package. I believe, for example, that following the advice of those that argue that temporary contracts have not been effective in Europe, as Argentina did in the recent past, is misguided.\(^{23}\) The European problem is primarily one of lowering structural

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\(^{21}\) This also suggests that fiscal adjustments during crises ought to be done on the expenditure rather than taxes side. And if the latter is unavoidable, they should probably be targeted away from the supply side of the economy.

\(^{22}\) This is an optimal policy argument, as opposed to the more standard one which explains the fiscal pattern in terms of the financial constraints faced by the government itself. Which effect dominates depends on whether the private sector (perhaps a specific sector within it) or the government faces the tightest financial constraints during the crisis.

\(^{23}\) The argument against temporary contracts is not that they don’t create employment, but that they separate even further insiders from outsiders by reducing the pressure on insiders and creating a class of temporary—unskilled—workers.
unemployment, while Latin American economies need also to deal with sharp short-term crises. Thus the Latin American solution should at the very least allow for a contingent relaxation of temporary contracts constraints; this form of hiring should be fostered during crises.

iii) **Sovereign risk and commitment.** A sovereign typically has access to policy options and decisions which may hurt or expand its private sector’s international collateral. On one hand, a highly erratic and discretionary government will probably add sovereign risk to its private sector’s assets. On the other hand, a government firmly and credibly committed to foster foreign investment will probably expand the set of domestic assets that constitute good collateral --- broadly understood--- to foreigners. Similarly, macroeconomic policies should not be aimed at expropriating foreigners in a myopic fashion. This does not mean that there is no space for insurance from foreign investors to domestics, or that the states of the world under which this “insurance” pays can not be linked to, for example, the equilibrium exchange rate. But the macroeconomic rules leading to such aggregate “insurance,” including those which govern the exchange rate, must be made contingent on clearly verifiable observables which are outside the direct control of the country (e.g., the terms of trade and the EMBI+).\(^{24}\)

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\(^{24}\) Such clear rules not only facilitate risk sharing between foreigners and domestics but also help reducing uncertainties which complicate further the response of an economy to a shortage of international liquidity. For example, it is quite clear that a significant component of the recent Chilean recession had to do with the response of the Central Bank to several speculative attacks, which in turn were linked to the uncertainty about the Central Bank and Treasury responses to the tight external scenario. Similarly, the very limited real exchange rate depreciation that was obtained from Mexico’s sharp nominal depreciation during the Russian crisis, may have also resulted from the uncertainty it triggered on future monetary policy.
IV. Policies to offset the private sector’s underprovision

In addition to the previous policies, aimed at moving the economy toward its first best, one ought to ask: *When and how should the government attempt to “force” the private sector to increase its international liquidity position?*

From the perspective of the view portrayed in this paper, the answer to the “when” part of the question is: whenever the second ingredient ---domestic financial development--- is present in a significant manner. In this case, the government will be trying to move the economy from a third to a second best. The main difficulty with the “how” part is that the government will not count with the “cooperation” of the private sector, as the latter will often attempt to offset any centralized international liquidity holding which puts the aggregate of this liquidity beyond that of the decentralized equilibrium without intervention.

In what follows I give three examples ---with some of their perils--- of policies aimed at depressing the private sector’s bias against international liquidity hoarding.

i) *Sterilization.* The quintessential monetary policy to deal with this international liquidity management problem, is a sterilized intervention – essentially, the central bank sells public bonds for international reserves – during the capital flows boom. The counterpart ought to be the selling back of these reserves during external crises. Experience and theory suggest that the first half of this policy, the sterilized intervention, is hard and expensive to implement for prolonged periods, and it may even backfire as the private sector reacts perversely to the quasi-fiscal deficit, appreciation, and reserves accumulation at the central bank.\footnote{In Caballero and Krishnamurthy (2000a) a sterilization may backfire if the market for public bonds is illiquid. Essentially, in this case sterilization creates a liquidity mismatch in the Central Bank’s balance sheet (it holds very liquid reserves against}
ii) **Liquidity Ratios.** A closely related measure that works mostly through controlling international liquidity aggregation within the country, is active management of bank reserves and capital adequacy ratios, and possibly international liquidity ratios. The model sketched above hints that the level of these ratios should be increasing with respect to the degree of underdevelopment of financial markets. In order to be effective in managing international liquidity intertemporally, these requirements must be procyclical. There are however two practical problems with such a recommendation, and hence may make this strategy less useful. First, for those countries where the health of the banking system is suspect, weakening standards at the time of crises may make a run more likely – this was a concern in Argentina during the recent crisis. Second, in other cases, especially when the participation of foreign banks is large, the policy may be ineffective during crises since the constraint may not be binding. Figure 11 shows the capital adequacy ratios for different segments of the Chilean banking sector; it is apparent that foreign banks voluntarily withdrew. While there is no doubt that fostering the arrival of solid international banks is a must, it is also important to understand the implications they may have for aggregate liquidity management.

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less liquid bonds) that acts as a free liquidity insurance to the private sector. See Calvo (1991) for a model à la Sargent-Wallace, where the quai-fiscal deficit generated by the sterilization may hurt the credibility of the inflationary target.
iii) **Capital controls** can supplement sterilization or, in principle, slow down capital inflows (perhaps of a targeted maturity) by themselves. But there are at least four caveats to them.

a) If implemented, capital controls (to inflows) should be made contingent on the availability of external flows, lowering them during external crises.

b) Since an important part of the volatility in capital flows seems to be caused by suppliers’ problems (e.g. hedge funds), it may be worth considering requiring liquidity-ratios from them as well. Although as a practical matter, this seems awfully hard to implement and supervise.

c) Also, the domestic “under-insurance” externality is likely to be more pronounced at the short end of the spectrum. Thus, controls should be biased toward reducing short-term capital flows.\(^\text{26}\) Having said this, I must admit concern with the emerging “consensus” that developing economies have excessive short-term borrowing relative to their international reserves. At some level the claim is trivially right—it is impossible to have a liquidity crisis if the country holds more reserves than short-term debt and renewals. At another, figure 12 shows that emerging economies are much more prudent than developed ones along this margin.\(^\text{27}\) Running an economy with all the precautions that “well-behaved” emerging economies do is extremely expensive. Borrowing only long-term (expensive) and holding large amount of reserves would most likely be considered very poor management of an average U.S. corporation. What is important here is to determine how large this ratio is relative to what the country’s institutions and financial markets can support. Putting all emerging markets, regardless of financial development, in the same bag is likely to be unnecessarily burdensome for the most developed of these economies.

d) Most importantly, while the controls described above may be justifiable in terms of static second-best arguments, they are likely to hurt in the medium-run once the endogenous arrival of international market makers and corporate

\(^{26}\) This argument is different from that which sees the problem on “noisy” speculators who concentrate on short term capital flows (see above).
governance improvements are considered (see the discussion of this issue in the previous section).

Figure 12: Precautionary Reserves

(a) Reserves over imports (%)  
(b) Reserves over external debt (%)

Notes: Data for 1997, except Norway data in panel (b) (1993). External debt for developed countries: BPS(IMF). External debt for emerging economies is the sum of debt securities issued abroad, Brady bonds, bank loans, trade credit and multilateral claims. External debt for developed countries is the sum of debt securities and other investment (including loans, deposits and trade credits) according to the IMF classification. Sources: Reserves and Imports: IFS. External Debt for developing countries: Joint BIS, IMF, OECD, World Bank Statistics.

27 The figure has to be interpreted with caution, nonetheless, since an important difference between developed and developing economies is that the latter often have to issue a larger share of their debt in foreign currency.
References

