

## Capital Inflows, Liquidity and Bubbles

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Policymakers in Emerging Market economies (EMs) are facing a serious dilemma: while their economies are currently benefiting from a surge of capital inflows, they fear a replay of the 1990s and early 2000s when their economies underwent costly Sudden Stops (of capital inflows). A serious concern is that a capital-inflow episode could give rise to "bubbles," i.e., an artificial or transitory increase in some asset prices (typically in the real estate sector) that could go bust as a result of unpredictable external contagion or liquidity shocks, and trigger major credit disruption. This note will provide some support for the conjecture that there is a connection between capital inflows and bubbles. In a nutshell, the argument will be that a capital-inflow episode enhances the liquidity of some of the receiving-economy's assets, which in turn fosters larger flows and higher asset prices: liquidity creates wealth. However, liquidity may suffer a major setback as capital flows collapse (a Sudden Stop), potentially causing a severe impact on output and employment. These effects can occur even in the case in which Sudden Stop does not give rise to net capital *outflows*.

### *The Logic behind the Conjecture*

Firstly, a few words about *liquidity*. A liquid asset's salient property is being easily *salable* (see Menger (1892)). A prime example of salability is *cash*. Cash (particularly in the form of *fiat money*) is a good example to drive home the fact that *intrinsic* value is not a necessary condition for a liquid asset to fetch a positive price in terms of other intrinsically valuable commodities – illustrating the fact that *liquidity creates wealth*.

Salability is not a property that *per se* enhances utility or production. To take advantage of salability individuals and firms have to sell the asset. Therefore, liquidity is a property that can only exist in a social environment, it is an eminently *social good*, i.e., a good that enhances utility or production because it improves social interaction or, in the usual jargon, facilitates market transactions. Salability itself is facilitated by the existence of a market in which there is

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<sup>1</sup> I wish to thank Sara Calvo and Pablo Ottonello for very valuable comments.

always an eager buyer for an eager seller.<sup>2</sup> These are familiar facts which, however, bear repeating to make the following discussion more self-evident.

A capital-inflow episode is defined as a situation in which capital *flows* to a given economy rise sharply relative to its recent past, and stay high for a considerable period of time. It should be clear that the emphasis is on *flows* not *stocks*. This may reflect adjustment costs and the likely fact that the news about attractive investment opportunities spread by word of mouth. This feature will play a central role in the ensuing discussion. Savvy investors are likely to be the first ones to identify potentially attractive investment projects, which will be initially reflected in larger capital inflows. This is eventually picked up by market analysts and transmitted -- with a lag -- to the less well-informed investors through specialized newsletters and newspapers' financial columns. As less well-informed investors join the bandwagon, flows are likely to rise, increasing domestic asset prices in the receiving economy even further.

I will now turn to the core of my argument. Rational early investors realize that, as news spread, there will be a queue of eager new investors. This will likely raise expectations of capital gains, but that is not the point that I would like to stress. The first investors to arrive are subject to high liquidity risk because salability cannot be ensured unless there is a critical mass of potential investors who are familiar or eager to become familiar with the assets in question. But as the news keeps spreading, the liquidity effect will start to kick in. The key point that I wish to emphasize is that early arrivers realize that their new assets have become more easily salable, more liquid, and for that reason alone more valuable. Hence, it is conceivable that capital inflows *per se* increase asset prices further than would be accounted for by standard "fundamentals" alone. The evidence shown in Figure 1 is in line with this logic. The solid lines depict gross capital inflows and outflows around Systemic Sudden Stops for a 1980-2004 sample of EMs that suffered major output loss during financial crisis (more than 4% from peak to trough). Towards the peak of capital inflow episodes both gross inflows and outflows exhibit a sharp increase, suggesting a revolving-door pattern consistent with enhanced salability.

Salability of a given asset may be enhanced by increasing the liquidity of another set of assets in the same economy or region. This externality is due, among other things, to the fact that salability depends on expectations about macroeconomic policy. The expectation that, for example, the government will impose controls on capital outflows may seriously impair the salability of assets from that economy. Thus, investors have incentives to learn about

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<sup>2</sup> Liquidity, which until recently was discussed within a select group of researchers concerned about fundamental issues, like endogenous money and arbitrage irregularities, has now gained center stage. One reason is the realization that standard *fundamentals* are unable to explain some key phenomena associated with financial crises -- like the strong impact of Lehman's collapse as central banks seemed to abandon the playing field -- and the sudden reversal of financial markets when central banks decided to come back to contain the panic wave. Useful references to the literature can be found in Allen and Gale (2009) and Shin (2010).

macroeconomic (and, of course, also political) aspects. However, once an investor spends resources to learn about those aspects, the same information could be applied to assess other investment projects in the same economy or region. An implication of this is that policies that give greater incentives to “look into” a given economy or region may trigger higher capital inflows directed to projects which are not necessarily those that formed part of the initial “bait.”<sup>3</sup> This type of contagion across asset classes in a given economy or region will be relevant for the later discussion about monetary policy during a capital-inflow episode.

Moreover, if governments and the academic establishment miss the connection between capital inflows and liquidity booms, there might be a tendency to attribute most of the rise in real estate prices, for example, to structural reform or greater policy credibility, spreading a similar view across the population at large.<sup>4</sup> This may give rise to larger capital flows and greater optimism. Actually, there exists some compelling evidence that *net* capital inflows tend to shoot up before Sudden Stop (see shaded bars in Figure 1).

However, if for some reason there is a stop in capital inflows -- without necessarily the flow becoming negative -- asset prices could collapse because, on impact, their salability would be impaired. The markings of bubble creation and destruction are certainly here! Notice that as assets become more liquid, they will attract short-horizon investors (*hot capital*), because of the salability factor. Thus, hot capital may be a *consequence* of capital inflows, not the other way around as is usually portrayed in policy debates. The boom-bust liquidity cycle need not be linked to irrationality. It could be generated by recession in advanced economies pushing capital out of their shores, a situation resembling current events -- or any major event that obstructs the credit market within advanced economies.

In a perfect-foresight environment, agents would know exactly the timing of the liquidity collapse and will try to pull out their funds before it happens. This logic shows that, unless irrationality prevails, under perfect foresight the process of liquidity destruction is likely to be gradual and, as a result, less damaging than the sudden stop episodes of the last quarter of a century (see Calvo and Reinhart (2000)). That leads me to conclude that for the boom-bust framework discussed above to be able to rationalize actual sudden stop episodes, the bust must have a *large unanticipated component*.<sup>5</sup> This is unlikely to be an appealing theory for crises involving normal goods (an episode of overinvestment, for example) under rational expectations, because the theory would attribute the critical part of the drama to *deus ex*

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<sup>3</sup> Calvo (2008) argues that the creation of Brady bonds may have given incentives for the capital-inflow episode that started at the beginning of the 1990s.

<sup>4</sup> These types of optimistic rationalizations were highly popular in EMs until crises erupted in the second half of the 1990s, as well as in the US until the subprime crisis.

<sup>5</sup> Interestingly, Calvo, Izquierdo and Mejia (2008) define Sudden Stop as a period in which the decline in capital inflows has a large unanticipated component.

*machina*, exogenous factors. But the situation is very different for social goods like liquid assets: social goods are more likely to give rise to *multiple equilibria* because their market value depends on social agreement or convention. This is a well-known phenomenon in the theory of bank runs, for example. A bank run destroys liquidity of bank deposits. It can happen in the spur of a moment and need not involve deterioration of standard fundamentals (see Diamond and Dybvig (1983) and Allen and Gale (2009)).

The above bust scenario is not compelling for the case of cash because experience clearly shows that the relative price of cash in terms of local goods and services (e.g., cash/cpi ratio) does not collapse overnight unless there is a major real catastrophe. It is unlikely to be caused by a plain-vanilla liquidity shock. But, as I will argue, cash is not representative of the many other liquid assets that circulate in an economy, particularly assets whose liquidity is enhanced during a capital-inflow episode.

Consider an economy in which there is some degree of *price stickiness* (i.e. a situation in which, within certain limits, output supply is demand-determined at predetermined, sticky, local-currency prices). Price stickiness is a widespread practice in many economies, and has been shown to be robust to extreme circumstances, like large devaluation (see Burstein, Eichenbaum and Rebelo (2007)). Hence, price stickiness, plus regulations that make local cash legal tender, is likely to help to prevent a crash in local currency's output value. This implicit guarantee is shared by assets which are protected by a Lender of Last Resort (LOLR), like demand deposits. However, governments are apprehensive to extend cash guarantees on liquid assets that are *non-systemic*, i.e., assets which demise is not likely to cause major damage to the rest of the system. One reason is that cash guarantees, unless subject to costly supervision, may lead to excessive risk-taking by the private sector (*moral hazard*) and eventual loss of government's control on fiscal deficit and money supply. Another closely related reason is that price stickiness could start to unravel as massive bailouts become more likely, giving incentives for *currency substitution* (i.e., the use of a foreign currency as domestic means of payment) – debilitating the cash-resilience mentioned above and seriously compromising the price-stabilization role of the central bank. Consequently, unless the economy is financially underdeveloped, there will likely be a large set of liquid assets that are, in principle, not protected by a LOLR.<sup>6</sup> This observation gains further relevance during a capital-inflow episode in which, as argued above, a mounting liquidity cycle is set in motion, especially if the government does not see the connection between capital inflows and liquidity.

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<sup>6</sup> The qualifier "in principle" is needed because during severe financial crises governments are known to extend LOLR support to many sectors irrespective to ex ante arrangements -- as illustrated by the AIG bailout during the subprime crisis. In EMs those unscheduled bailouts have generated large currency devaluation.

Having provided a rationale for a liquidity boom and bust associated with a capital-inflow/sudden-stop episode, we can now proceed to discuss the impact of each phase of the cycle on the real economy. A liquidity boom increases the relative price of assets that become comparatively more liquid (real estate, say). This, in turn, increases the supply of real estate and reallocates resources away from relatively less liquid investments (manufacturing, say). Word of mouth will likely result in a gradual build-up of the real estate bubble; in contrast, as argued above, a bust could be large and sudden. Therefore, while during the build-up period the attendant resource reallocation may not cause major disruption, the situation may be quite different when the bubble bursts. This can be seen even in the case in which there are no financial ramifications. All it takes for trouble in the real sector to arise is for resource reallocation to be time-consuming. In that case, resources will be pushed out of the real estate sector to be eventually reabsorbed in manufacturing. In the transition, however, unemployment may rise (and/or real wages fall precipitously) until manufacturing goes back to its pre-bubble equilibrium (assuming the good scenario in which the cycle does not bring about loss of total factor productivity).

A more relevant and interesting case arises when the liquidity bust impairs the credit channel. To illustrate, consider the case in which capital inflows take the form of external credit lines to the domestic banking sector. Banks may start lending to the real estate sector, timidly at first, but become emboldened later on as credit flows persist because, as noted, liquidity of real estate investments rises. Houses go on the market to be swiftly picked up by eager buyers, feeding the credit/liquidity frenzy. When the "music stops," though, real estate investments become instantly less liquid and prices collapse. Borrowers' incentives to repay their loans subside and, all of a sudden, domestic banks realize that they face a mountain of non-performing loans. Even if loans keep being serviced on a regular basis, banks will have less incentives to lend (e.g., if they follow a Value at Risk strategy, see Shin (2010)). Therefore, the liquidity bust will give rise to a Domestic Credit Sudden Stop (DCSS).<sup>7</sup> This is likely to dry up Working Capital credit to small and medium enterprises, having a severe effect on real wages and/or employment. Problems are less acute if domestic banks are not directly involved in the capital-inflow process (for empirical evidence and discussion, see Raddatz (2010) and Shin (2010)). However, banks are unlikely to get through unscathed in a liquidity crisis because collateral values are bound to fall. In the US, for example, prior to the subprime crisis households and small firms borrowed against their real estate. But even if banks turn out to be unscathed, DCSS can arise from the fact that the *flow* of bank deposits tends to rise during a capital-inflow episode and fall sharply (in real terms) during a Sudden Stop.

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<sup>7</sup> Following the methodology in Calvo, Izquierdo and Mejia (2008), DCSS could be defined as a fall in domestic credit *flow* exceeding two standard deviations, the latter based on historical statistical moments. Empirical evidence shows a high correlation between Sudden Stop and DCSS.

## *Some Policy Implications*

This section will highlight some implications prompted by the approach put forward in this note. In particular, I will discuss the ability of some central policy options to help to offset the liquidity cycle. But I will not attempt to present a thorough analysis of these options.

- Capital Controls. A popular policy option is taxing short-term capital inflows. The effectiveness of this policy is questionable because implementation is hard and the private sector has numerous ways to bypass these regulations (see Magud, Reinhart and Rogoff (2011)). Moreover, unless capital *outflows* are also subject to controls, a Sudden Stop could trigger capital outflows by domestic residents fueled by savings that never took the form of capital inflows, or by reversing inflows that took place before the rule was put into effect (see Calvo (2010 a)). Given these limitations, it is advisable to focus on a critical lever of the liquidity/credit mechanism, namely, domestic banks – and attempt to stabilize items from banks' balance sheet that exhibit high volatility. Salient examples are domestic banks' non-deposit liabilities, especially short-term credit lines with international banks, and off-balance-sheet obligations (See Raddatz (2010); South Korea has been moving in that direction). Bank regulation is an imperfect art. Therefore, regulators should also keep track of symptoms that might reflect the existence of an unusual liquidity boom. An example would be a dramatic surge in domestic credit. Recent research shows that periods of high credit growth are leading indicators of future crises (see Schularick and Taylor (2009)). Thus, a complementary line of defense is to slow down credit expansion by increasing reserve requirements. This policy should be supplemented with tight credit market monitoring to make sure that those regulations are not offset by disintermediation.
- International Reserves. These are eminently liquid assets which are salable around the world. They are the natural medicine against Sudden Stop. The IMF is now offering less expensive alternatives (e.g., Flexible Credit Line). The optimal level of reserves is still an open issue. My current research (with A. Izquierdo and R. Loo-Kung) suggests that the optimal reserve level strongly depends on *global* risks, which are hard to evaluate ex ante. Recent experience, however, shows that international reserves are highly effective in protecting some critical sectors (e.g., the export sector) from the effects of Sudden Stop (for a discussion of Brazil's experience in this respect, see Martins and Salles (2010)). A drawback is *moral hazard*: the private sector may take the government's implicit guarantee into account and increase its exposure to credit denominated in terms of foreign currencies. Thus, reserve accumulation might have to be accompanied by measures that limit such exposure, especially in sectors that are likely to be beneficiaries of central bank's largesse in case of crisis, like Brazil exporters.

This may call for a radical change in the way central banks operate. Since the new tasks are politically charged, it may be advisable to keep them outside the central bank.

- Gross International Reserves. It is not unusual for governments to accumulate international reserves by borrowing (i.e., issuing public debt), an operation that goes by the name of “sterilized intervention.” This type of operation is typically associated with an attempt to prevent currency appreciation without fueling domestic inflation.<sup>8</sup> However, the liquidity approach discussed here suggests an entirely different motivation. Sterilized intervention is a swap by which the government in question acquires a highly liquid asset in exchange for a less liquid one, a feature that is reflected in the interest differential between these assets (higher on the less liquid asset), even when both assets are denominated in the same currency. Leaving aside the subprime episode, US Treasury obligations, for example, comprise assets that are unlikely to suffer liquidity impairment during EM Sudden Stops. Thus, gross international reserves could help to partially offset the credit drought associated with such episodes, at least in the short run. This establishes a possible liquidity-prompted rationale for sterilized intervention. However, its optimality is still an open issue.
- Monetary Policy. The dominant paradigm in monetary theory ignores the liquidity issues discussed here.<sup>9</sup> According with such paradigm, higher policy interest rate will make alternative investment projects less attractive. This would not necessarily lower capital inflows but it could help to redirect them away from the domestic credit market. The liquidity approach sheds some doubts about this conclusion. Suppose, in line with previous discussion, that liquidity is enhanced by the size of capital inflows. Thus, a hike in the policy interest rate may be counterproductive, because it increases the set of attractive liquid assets during a capital-inflow episode, *enhancing* the liquidity of other investment projects, as argued above.
- Current Risks. It is important not to miss a central but subtle point, namely, that a Sudden Stop -- which according with the above arguments could trigger a domestic liquidity meltdown -- involves a fall in capital *inflows*. Thus, a Sudden Stop does not call for the flows to go into *negative* territory. This observation is relevant in the present circumstances. The apparent decoupling of EMs is, in principle, a welcome development because it goes in the direction of redressing Global Imbalances (large US current account deficit). Thus, the boom in real estate prices that is already taking place in several EMs could be interpreted as a natural outcome of the rebalancing process. It would be hard to disagree with the logic behind that point of view. However, this does

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<sup>8</sup> This labeling is likely behind the popular presumption that China engages in “neo-mercantilist” practices.

<sup>9</sup> In fact, the dominant paradigm assumes that “money” is the only asset that provides liquidity services, even though the central bank controls the interest rate on an, in principle, highly liquid short-term asset. This glaring contradiction has been dealt with by removing “money” from the models and substituting it by sticky prices (in terms of domestic money!).

not prevent the existence of price overshooting on account of the liquidity boom discussed in this note. After prices are pushed up by a liquidity boom, it only takes the expectation that capital inflows will slow down to have a deflationary effect on real estate prices (or any other asset that benefited from the liquidity boom). In absence of external shocks, price deflation may occur in an orderly fashion, but the current international situation is shaky enough that large external shocks cannot be discounted. The shocks can come from the real sector (a spike in oil prices) but, as shown in Calvo, Leiderman and Reinhart (1993), they could also be the result of pure liquidity shocks, like a rise in the US short-term interest rate, for example.<sup>10</sup> In short, global rebalancing gives no strong base for policymakers' complacency.

- Global Policy Coordination. Local solutions, especially if effective, may produce an undesirable global outcome. A case in point is controls on capital inflows. Encouraged by the IMF (see Ostry et al (2010)), many countries have imposed a variety of such controls, going from taxes on short-term ("hot") capital to new bank regulations. If effective, controls in country *j* will keep undesirable capital out of its sovereign space. But this does not solve the global problem because those flows will be redirected to country *i*, and so on -- and a scenario of "competitive capital-control regulations" might be set in place. There is no base to presume that the outcome will be a good one. As controls rise, for example, some of the "good" capital flows may be discouraged. Moreover, and more to the point, the expectation that tighter capital controls will be imposed in the future may stimulate the type of short-term speculative flows that controls are trying to suppress. Therefore, there is a clear need for policy coordination, a new Bretton Woods agreement that will spell out rules for preventing *globally* counterproductive regulations.

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<sup>10</sup> For a model in which a change in the *nominal* interest rate has an effect on the relative price of liquid assets, see Calvo (2010 b).

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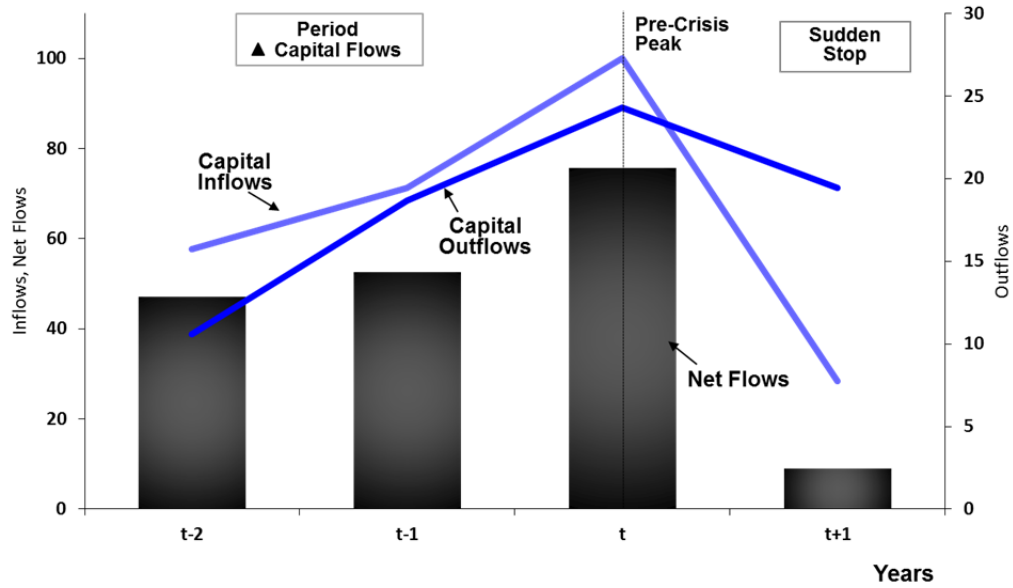
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### Figure 1. Capital Flows to EMs: Dynamics pre-Sudden Stop

(Average episode of 3S Output Collapse, Real USD, Pre-Crisis Peak Capital Inflows =100)



Note: Average of 3S Output Collapses episodes in Calvo, Izquierdo and Mejia (2006). Excludes Peru and South Africa due to data availability. Capital Inflows include Financial Account liabilities and Net Errors and Omissions. Capital Outflows include Financial Account assets. Net Flows is the difference between Capital Inflows and Capital Outflows.