

Comments

Jeffrey A. Frankel: I applaud the approach of this paper. When finance experts writing on the subject of volatility are unable to explain why market prices go up or down, they are sometimes content to identify time periods or places when volatility is high. Caballero, in contrast, first summarizes his earlier theoretical work and then tries to relate it to recent events in three case studies (namely, Argentina, Mexico, and Chile). This is a worthy challenge for any theorist.

I agree with the opening observation that desirable economic reforms do not necessarily lead to a decline in fluctuations. They may in fact lead to an increase in volatility, particularly in the case of financial liberalization. The United States, for example, suffered regular financial and economic collapses during its historical phase of high-growth industrialization, which involved much sharper falls in output than we would be prepared to tolerate today. (The paper skirts around the hypothesis that in the presence of an underdeveloped domestic financial system, international financial integration can be harmful on net.)

I also agree with the recurrent theme that international financial markets in practice fail one of their prime assignments, namely, smoothing fluctuations, and that this failure is acute in the case of emerging markets. But I have some quibbles. One of the pieces of evidence that Caballero offers is figure 18, which shows that Chile's GDP is sensitive to the world price of copper and that this sensitivity is greater than that of Australia's GDP to the price of coal. However, copper represents a substantially higher share of Chile's economy than does coal in the Australian economy. Furthermore, one should look for evidence of smoothing in countries' consumption, rather than in their GDP. But no matter. The point is correct: financial markets do not allow developing countries to smooth out fluctuations in their living standards as they should.

The situation is worse than this, however. Not only are net capital inflows inadequately countercyclical, they are actually procyclical.

Caballero refers to “Latin America’s small current account deficits, relative to a neoclassical benchmark,” but the problem is not just that the region’s current account deficits are small: they move in a direction that destabilizes consumption relative to output rather than the reverse. The money floods in to finance current account deficits in boom times, and rushes out during recessions. Worse still, the evidence is mounting that these variations in capital flows are actually the origins of the economic fluctuations, at least in a proximate sense. One could readily attribute the crises that surfaced in Mexico in 1982 and 1994 to bad macro policies (particularly in the first crisis), to bad luck in terms of local political instability (particularly in the second case), and to increases in U.S. interest rates (in both cases). The crises that surfaced in East Asia in 1997, however, had no such evident proximate causes, even if one holds that their deeper origins lay in structural flaws in their economies. Capital flows *were* the crisis.

My final point on this issue is that the small size and procyclical nature of net capital inflows is not just a problem of developing markets. It is also a phenomenon of industrialized countries with highly developed financial markets. The fact that trade balances go into deficit in expansions and surpluses in recessions is one of the most robust empirical regularities of open-economy macroeconomics. One must therefore assess the evident failure of the theoretical paradigm—namely, the so-called neoclassical benchmark—that models current accounts simply as the outcome of intertemporal optimization.

Who is to blame for these crises? It has become customary to speak of three generations of models of speculative attacks. The first-generation models point to overly expansionary macroeconomic policies, but as Caballero points out, “The most traditional macroeconomic maladies of the emerging world—such as chronic fiscal imbalances and monetary gimmicks—are gradually being left behind.” It was particularly difficult to implicate overly expansionary macroeconomic policies in the East Asian crises. The third-generation models of speculative attacks blame banks and other so-called crony capitalists who partake of moral hazard. I agree with Caballero’s implication that this is part of the story, but not the whole story: “If not only misbehavior and corruption, then what else?” This leaves the villains of the second-generation models: namely, speculators and other participants in international financial markets that are prone to multiple equilibriums. Herd behavior and panics can bring about a crisis even without a change in fundamentals.

When capital inflows turn sharply to capital outflows, it is difficult to disentangle the roles of domestic versus foreign residents. The author offers one small piece of evidence that could be interpreted as pointing the finger at foreign residents: equity prices for large companies, counterintuitively, are more volatile in emerging markets than are prices for small companies. I would offer a stronger piece of evidence, albeit still far from conclusive, that points the other way. At the time of the December 1994 Mexican peso crisis, the price of a basket of stocks in Mexico City turned down sooner and more strongly than the New York–traded price of the country fund that consisted of the identical basket of stocks.¹

A key external influence on the financial fortunes of emerging market countries is the U.S. interest rate. Caballero notes that interest rates in Argentina, Brazil, Mexico, and even Chile are more volatile than the U.S. corporate interest rate. But again, the situation is worse than that, because the Federal Reserve is often the source of the fluctuations. When the U.S. central bank raises the Fed Funds rate, interest rates tend to rise worldwide, and the increase is higher in Latin America than within the United States. The author neglects this factor in his description of the origins of the Mexican peso crisis.² Similarly, he overlooks political factors that contributed to the Mexican crisis, including the Chiapas uprising in January 1994 and assassinations of PRI leaders, which scared investors; the election timetable, which encouraged the authorities to sterilize reserve outflows (or to do more than sterilize, in the case of M2); and the change in personnel with the new administration in December 1994, which may have led to the so-called botched devaluation.

Let us now turn to the implications for policy, which are divided into long-run structural solutions and short- or medium-run macroeconomic policy. In addition to the usual proposals for strengthening the international financial architecture (for example, banking supervision and corporate governance), Caballero tentatively includes the issue of Chilean-style capital controls in his list of structural solutions. I agree with the appraisal that under certain conditions, such penalties on short-term inflows into emerging markets can play a useful role in changing the com-

1. However, the country fund statistics suggest that the subsequent contagion to the rest of Latin America does indeed come via New York. See Frankel and Schmukler (1996, 1998).

2. In countries with a flexible exchange rate, such as Mexico more recently, interest rates can actually be even more sensitive to the U.S. Federal Reserve funds rate than they are in countries that use currency boards or dollarization to tie their monetary fates rigidly to the United States, as do Argentina and Panama (Frankel, 1999, table 1.)

position of capital inflows, even if they have little effect on the total inflow and even if financial markets increasingly find ways around them. However, such controls should not be used permanently, nor should they, as many have suggested, play a continuous role that diminishes gradually as financial markets develop. Rather they should be used episodically, via a temporary activation at a specific stage in the boom-bust cycle. When instruments such as sterilized intervention and appreciation are not helping to control large short-term capital inflows and when it is still not clear whether the inflows are going to finance high-return investment, it may be appropriate to try a year or two of Chilean-style penalties as a way of playing for time. In this view, capital controls are a tool of short-term macroeconomic policy, not a structural solution. In making such recommendations, one must be wary of the danger that sanctioning capital controls will encourage their indiscriminate use, for example, by policymakers seeking protection from the international consequences of their own unsound policies.

Finally, Caballero favors contingent rules for fiscal policy, labor contracts, and the exchange rate. In the case of the exchange rate, he presumably has in mind an escape clause that specifies what kind of external event will trigger a devaluation. While he recognizes that such contingent rules must be simple and easily verifiable if they are to work, in my judgment this makes the proposal impractical in most cases. The idea behind contingent rules is to specify in advance that changes will be linked, in particular, to exogenous changes in the terms of trade. This would work in Chile, for example, with a bond issue indexed to the price of copper and in Mexico to the price of oil, and I am not sure why this long-standing proposal has met with so little successful implementation.³ It would be an efficient means of risk sharing, and it would make private sector burden sharing automatic: in the event of a collapse in the terms of trade, the authorities would not encounter the usual excruciating difficulties of convincing bankers or bondholders to allow “voluntary” rollovers or stretch-outs.

Contingent rules are less practical, however, in the case of most other countries, where a single mineral commodity with an exogenously determined, easily verified price does not occupy such a large share of exports as it does in Chile. They are also less effective with regard to budget rules, labor contracts, and exchange rate regimes, since the typical player has a lower level of understanding of the issues than does a finance specialist.

3. For example, Lessard and Williamson (1985).

Even highly skilled economists cannot agree on whether the recent crises were caused by exogenous shifts in the terms of trade, domestic policy failure, or other factors. We cannot even agree on the causes after the fact, let alone in the heat of the moment. Was the 1982 international debt crisis caused, in part, by a fall in international commodity prices? Then why did it originate in Mexico, a commodity exporter? Was the 1997 East Asian crisis caused, in part, by a fall in international prices of semiconductors and other manufactured products? If so, what are the corresponding products that increased in relative price? I do not know the answer to these questions, and that is the point. If we don't know the answers, then contingent rules are not easily verifiable. There is never a single agreed-upon measure of the terms of trade. When the central bank devalues, it will always point to circumstances beyond its control, and many in the markets will always consider the devaluation a failure of the government's will to abide by its commitment. Moreover, every country that devalues, regardless of the cause, exhibits a deterioration in its terms of trade by most measures.

The author is on the right track: we need more research into what sorts of rules and contracts are verifiable by the person in the street. However, the act of writing down an exogenous disturbance term in a theoretical model does not mean that the model and disturbance are necessarily knowable and observable in the real world.

Enrique G. Mendoza: This interesting article by Ricardo Caballero should be read carefully by anyone interested in understanding the causes of the excess macroeconomic volatility of emerging markets in recent years, particularly in Latin America. The paper's main argument is that accounting for the high volatility displayed by emerging market economies requires a careful reexamination of the major distortions that result from the severe financial frictions affecting these economies.

In emphasizing the role of the financial sector, this paper adds to the growing body of research that emphasizes financial frictions and financial transmission channels in explaining modern capital markets crises of the kind inaugurated by the Mexican crash of 1994.¹ As one crisis after another repeated the same message over the last six years, the lesson was learned painfully that in the context of the global financial market created in the 1990s, these financial factors were the key causes of capital market

1. See Calvo and Mendoza (1996).

crises, instead of the traditional explanations of currency crises based on sticky prices or fiscal slippage. Several of the larger events through which this message was conveyed are easy to recall. Mexico, 1994: a managed exchange rate regime collapsed despite a fiscal surplus for the general government and under the weight of a massive run on short-term, dollar-denominated debt by international investors. Korea, 1997–98: in the aftermath of the financial crisis, export volumes fell for several months despite the massive devaluation of the won as Korea's trade credit lines were severely curtailed. Russia, 1998: the default on government bonds triggered a domino effect of massive margin calls through the world's financial system, causing the demise of the U.S. hedge fund Long-Term Capital Management and forcing U.S. monetary authorities to lower interest rates when domestic indicators suggested otherwise.

The framework that Caballero proposes for examining the role of financial frictions in generating macroeconomic volatility in Latin America was developed in previous joint work with Arvind Krishnamurthy.² In this important work, they take the discussion of financial frictions in emerging markets crises beyond the superficial debate of episodes and circumstances to formalize some of the key issues at hand. They make a major contribution to recent work that seeks to develop analytical frameworks for understanding financial transmission channels in the developing world and for deriving their policy implications.

The paper fits into a body of literature that can be traced back in spirit to Mackinnon's classic work on financial repression. Some early finance studies that deal with default risk in the context of sovereign borrowing, like the classic work of Eaton and Gersovitz, are early efforts at developing models of credit frictions for developing countries.³ In the context of the emerging markets crises, Calvo was among the first to raise the red flag about the potentially devastating role that financial imbalances could play shortly before the Mexican crisis, in his comments to Dornbusch and Werner.⁴ Over the last couple of years, several articles have addressed issues related to financial frictions and credit constraints similar to those Caballero examines.⁵

2. Caballero and Krishnamurthy (1999).

3. Eaton and Gersovitz (1981).

4. Calvo (1994); Dornbusch and Werner (1994).

5. See, for example, Paasche (1999); Schneider and Tornell (1999); Edison, Luangaram, and Miller (1998); Calvo (1999); Calvo and Mendoza (2000); Mendoza (2000).

The growing list of contributions to this literature reflects the fact that our understanding of the transmission mechanism of financial frictions in emerging markets is at a very early stage of development. These initial efforts have benefited enormously from recent developments in macroeconomics and finance dealing with financial and informational frictions.⁶ In particular, Kiyotaki and Moore describe a framework that provides useful background to that of Caballero and Krishnamurthy.

The gaps in our understanding of the financial transmission mechanism in emerging markets have at least two important dimensions. The first relates to the incompleteness of the theory *per se*: different approaches can be used to explain how the frictions originate and how they influence the economy. There are models with margin requirements that are occasionally binding in the short run but nonbinding in the long run, models with permanently binding collateral constraints, models with occasionally binding participation constraints, and models with asymmetric or costly information. The second dimension relates to the scarce evidence on how the alternative modeling strategies fare when confronted with the data. Work still needs to be done to produce well-informed answers to questions concerning the fraction of the business-cycle regularities of a typical emerging market that can be accounted for by financial frictions, for example, or the social welfare losses associated with these frictions. Similarly, Caballero raises complex questions on the link between credit frictions and lack of credibility.

In the context of these gaps in knowledge, the paper seems overly optimistic on an issue that still requires substantial research. In particular, the article seems more confident than one can afford to be at this point on the connection between a specific financial transmission model and the data, and hence on the corresponding policy implications. The paper is also overly optimistic in its assessment of the economic conditions in Latin America. While the region has clearly made enormous progress in implementing economic reforms in the right direction, and these reforms are bearing fruit, it may be a bit early to make statements like, “The pieces of a successful Latin American economic model can be seen scattered among the leading economies of the region,” or “The most traditional macroeconomic maladies of the emerging world . . . are gradually being left behind.”

6. Kiyotaki and Moore (1997); Kehoe and Levine (1993); Aiyagari and Gertler (1999); Bernanke and Gertler (1995).

Although detailing my objections to these remarks is not the focus here, it is worth noting that at least one of the main macroeconomic maladies of Latin America has yet to be addressed: namely, the pervasive and growing income and wealth inequality. In this regard, the region has made little, if any, progress. Radical economic reform has yet to show its ability to help address this problem, and a serious revisionist trend in favor of the populism of the 1970s is emerging in some countries of the region in response to social and political frustration over the situation. (This is paradoxical, however: that wave of populism worsened distributional problems and caused most of the major macroeconomic imbalances that Latin America would so painfully have to address during the lost decade of the 1980s.)

One should resist being too optimistic about Latin America at present both because its history shows a pattern of so-called successful models that eventually collapsed and because the region still has major tasks ahead in developing and fortifying its economic and political institutions. A sense of complacency at this stage could prevent the completion of these tasks. Such was the case for former Mexican president José Lopes Portillo, who stated, just a few months before the 1982 crash, that “Mexicans should prepare to manage their opulence.”

The Caballero-Krishnamurthy Model

The model that anchors Caballero’s paper can be interpreted as a variant of the Kiyotaki-Moore setup, which is modified to consider two layers of collateral constraints. First, foreigners limit their credit to intermediaries (that is, to the lucky individuals with assets or goods that are accepted as collateral in world financial markets) to a fraction λ^T of the discounted liquidation value of intermediaries’ assets. Second, intermediaries limit their credit to domestic distressed firms to the discounted liquidation value of the assets of these firms.

Suppose the collateral constraint binds for intermediaries. At the resulting supply of funds that intermediaries can offer distressed firms, if the collateral constraints of the latter are not binding, life is good and the domestic economy finances all desired projects. On the other hand, if the collateral constraints of distressed firms bind (that is, if the intermediaries’ supply of funds is short of the amount required to finance all profitable projects), then a fire sale of projects takes place until the value of the residual projects clears the domestic credit market.

In a neat twist, the authors also show that if the setup is enriched with even more imperfect domestic financial markets, such that distressed firms can secure credit from intermediaries only for a fraction λ^N of the discounted liquidation value of their assets, there is an externality that acts as a multiplier on the real effects of the credit friction. In particular, distressed firms use less credit, which reduces the expected returns on loans for the intermediaries and their investment in international collateral. Therefore, the collateral that intermediaries can offer to secure lending from abroad shrinks, triggering a negative externality on the supply of funds.

Paasche offers an interesting alternative for internationalizing the Kiyotaki-Moore setup.⁷ His approach is particularly useful for understanding why the data may show contagion through a conventional mechanism such as terms-of-trade changes, although this may be occurring through a collateral-driven financial channel, rather than through a beggar-thy-neighbor effect. Paasche's model considers two satellite countries totally unrelated to each other, but both trading with a third country; it shows how a small productivity disturbance in one of the satellites can trigger an adverse terms-of-trade shock that tightens collateral constraints in the other satellite.

The features and predictions of Caballero's model bear close resemblance to features of the emerging markets crises of the 1990s. He argues that "While the scenario [of financial distress portrayed in the paper] can indeed represent a great source of uncertainty and volatility for a country, it is not clear that there is a role for policy." This statement ought to take into account some caveats, however. First, to date, models with collateral constraints have been used to derive interesting analytical results in highly stylized settings, but their quantitative implications are still largely unknown. Second, since collateral constraints originate in a credit market imperfection, the competitive equilibrium should be inefficient, and hence there would seem to be a role for policy at least in principle (even if at this level of generality it is unclear what kind of policy would improve welfare). Third, both Kiyotaki and Moore and Paasche explicitly lay out the strong assumptions needed for their models to function in a fully dynamic, general equilibrium setting, but this is less clear in the Caballero-

7. Paasche (1999).

Krishnamurthy model. Kiyotaki and Moore obtain as an equilibrium implication of their model that collateral constraints always bind. If this is also the case in Caballero's paper, the shift between binding and non-binding constraints, which is implicit in the fire sales shown in the article's graphs, is useful for explaining the model, but it is not observed at equilibrium (and hence its chances for explaining observed volatility are not very good). In augmenting volatility by means of financial frictions, it seems important to allow for the possibility that the economy can switch back and forth between states of nature in which credit frictions bind and those in which they do not.

These are difficult problems to deal with in dynamic, general equilibrium models because of the endogenous nature of the borrowing constraints resulting from financial frictions. In models with collateral constraints, debt is constrained not to exceed the expected liquidation value of assets, which depends on expected asset prices one period ahead in the future. In general equilibrium, asset prices are forward-looking objects that represent the discounted value of the future stream of dividends on the assets, but with binding credit constraints the discount rate itself is endogenous. The discount rate is the inverse of the exogenous world risk-free rate if the constraint does not bind, but it falls to an endogenously determined level when the constraint binds (since the effective interest rate is higher than the world interest rate). Seen from this perspective, the Kiyotaki-Moore model's features of perfect foresight with regard to equity prices and a collateral constraint that is always binding represent non-trivial simplifications.

In principle, it seems straightforward to enrich collateral constraint models by adding uncertainty, thus capturing the possibility of switches between binding and nonbinding constraints. In fact, the Kiyotaki-Moore model allows for idiosyncratic shocks at the level of each borrower that vanish in the determination of asset prices, but in this case the collateral constraint always binds. Considering instead aggregate uncertainty raises serious difficulties related to the specification of contingent claims markets and to the solution of a rational expectations equilibrium for asset prices.⁸

Despite the insightful analytical results from studies like those of Kiyotaki and Moore, Paasche, and Caballero and Krishnamurthy, the lack

8. See Kiyotaki and Moore (1997).

of an operational quantitative adaptation of the collateral constraints framework (particularly one in which credit constraints can switch from binding to nonbinding depending on the state of nature) makes it difficult to gauge how much more macroeconomic volatility results from this particular credit friction relative to others, and relative to the traditional sources of volatility documented in the paper. This limitation also hampers the ability of the models to address policy issues because the policies that would emerge are likely to be distortionary per se, which requires policymakers to conduct cost-benefit welfare comparisons of mixes of credit-friction-induced and policy-induced distortions in order to evaluate policy options.

Some of the issues discussed above can be further illustrated with a simple example developed by Mendoza.⁹ The example sketches a dynamic, general equilibrium model of excess volatility of equity prices and international capital flows based on an open economy variant of Aiyagari and Gertler's closed economy model of margin requirements.¹⁰

Consider a small open economy in which a margin requirement limits the ability of domestic agents to leverage their positions in the equity of domestic firms. The small open economy faces aggregate uncertainty, and world markets of contingent claims are incomplete. The margin requirement is similar to a collateral constraint, except that it imposes a borrowing constraint determined by a fraction of the current liquidation value of assets, instead of the discounted expected value one period ahead. Domestic agents trade their equity with foreign securities firms that specialize in the equity of the small open economy, but informational or institutional disadvantages (relative to domestic agents) result in an adjustment cost to foreign securities firms when they alter their portfolios. If the stochastic stream of dividends is assumed to be exogenous to saving behavior, equity-price determination, and portfolio decisions (but not vice versa), some illustrative results follow. In particular, the model supports switches between states of nature with and without binding margin requirements in equilibrium. If the margin requirement is not binding, equity prices equal fundamentals prices, and portfolio positions are maintained. However, if the state of nature is such that the margin constraint binds, domestic agents unload their assets in a fire sale, and when they do

9. Mendoza (2000, appendix).

10. Aiyagari and Gertler (1999).

so they deal with foreign traders that are willing to purchase those assets but at a discount over the fundamentals price. The discount reflects the partial-adjustment nature of the foreign traders' portfolio decisions, which in turn is the result of the informational and institutional frictions they face. In the absence of these frictions, they would purchase the assets sold by domestic residents instantaneously and at an infinitesimal discount, and asset prices would remain at the level of the fundamentals price.

In the above example two ingredients (namely, the urge to participate in a fire sale, which is triggered by the margin requirements, and the downward-sloping asset demand curve of foreign traders, which is induced by informational frictions) are required for equilibrium equity prices to sink below fundamentals and cause excess volatility in prices and capital flows. Unfortunately, without imposing additional structure into the problem to allow the distortions from margin requirements and trading costs to have permanent effects, equity prices can only deviate from fundamentals in the short run. In the limiting distribution that represents the model's stochastic steady state, the credit friction is unlikely to have large effects.

Caballero's paper raises an interesting question regarding the potential connection between the credibility of economic policy, particularly monetary and exchange rate policy, and credit frictions. The framework of the small open economy just described can be altered to shed some light on how this connection might work.¹¹ Consider a small open economy without equity trading, but in which agents face a credit friction in the form of a liquidity requirement, according to which lenders require borrowers to finance a fraction of their current expenses and debt obligations out of current income and liquid asset holdings. (Think of this as the standard mortgage qualification guidelines mandated by the institutions that secure mortgage markets, like Fannie Mae and Freddie Mac in the United States.) Domestic money is a non-interest-bearing asset that is held for transactions purposes; it could enter directly in utility or as a means to economize transactions costs. The monetary policy environment is that of a noncredible, managed exchange rate regime, which could be described by a regime-switching, two-point asymmetric Markov chain in terms of the depreciation rate of the currency. In one state the managed exchange rate regime

11. See Mendoza (2000) for details.

continues; in the other it is replaced with a floating exchange rate regime in the form of a constant rate of depreciation of the currency (that is, perfect inflation targeting).

The competitive equilibrium of the economy described above is distorted by both the lack of credibility of the exchange rate regime, represented by the probability of switching to the floating exchange rate regime, and the shadow value of the liquidity requirement in the states of nature in which this requirement binds. With the appropriate specifications of preferences and technology, this model can be set up so that its quantitative implications can be examined using the same numerical methods applied in modern business cycle theory. When this is done calibrating the model to Mexican data, the combined distortions of lack of credibility and credit frictions entail large social costs in excess of 9 percent of the trend level of consumption per capita.¹² The effects of the credit friction on the economy's long-run business cycle are small, however. As in the case of the margin requirement, the liquidity requirement does not bind in the limiting distribution that describes the stochastic steady state of the economy, and hence real variables, except for the external accounts, display similar business cycle patterns as they would without a credit friction. If one considers economic fluctuations off the stochastic steady state, in contrast, the real effects are large. In particular, the negative effects of abandoning the managed exchange rate regime are significantly larger in the presence of credit frictions when the liquidity constraint switches from nonbinding to binding as the exchange rate regime collapses. In these cases, the model reproduces several of the features of the "sudden stops" phenomenon typical of recent capital markets crises, as defined by Calvo.¹³

Results like these suggest that the term *economic collapse* is better than *economic fluctuation* in referring to the real effects of credit frictions in the context of capital markets crises in the developing world. That is, the circumstances generating the big kick from credit frictions are not very common, such that measuring the effects of credit frictions using the moments of long samples of smoothly detrended data can be misleading. This view is consistent with the observation that in many of the recent

12. Mendoza (2000).

13. Calvo (1999).

crises in Asia and Latin America, sharp recessions were followed by quick recoveries (a phenomenon that Martin Wolf calls the Mexican Wave).¹⁴

Country Case Studies

Caballero uses three country cases to document evidence in favor of the role of credit frictions. I now turn to two of these cases, namely, Mexico and Chile.

In the case of Mexico, the picture of the weak international financial links is somewhat less bleak than the paper argues. NAFTA and the integration of the financial system to global markets have played a key role in allowing the large industrial sector—which enjoys access to what Caballero calls international collateral—to grow rapidly and operate independently of the severe problems of the domestic financial system. Once past the convulsion of Mexico's 1994–95 crash, these industries weathered the emerging markets crises that followed almost without problems. Even when portfolio flows dried up (seemingly for good) in the aftermath of the Russian crisis, these industries continued to receive outside financing that switched to foreign direct investment (FDI). Total inflows into Mexico have remained large and stable since 1996, but the composition changed dramatically to mostly FDI.

Some of the most dramatic evidence on the interaction between capital flows, credit frictions, and asset prices in Latin America is not found in the stock market, as emphasized in Caballero's paper, but in the real estate market.¹⁵ This factor clearly played an important role in the 1994 crash of the Mexican banking system. Mexican banks were already vulnerable in 1993.¹⁶ This growing banking fragility reflected the fact that real estate prices peaked in late 1992 and began to decline in 1993, and thus decreasing prices caused the new credit-card-style mortgages (the so-called Mexican mortgages) to yield mortgage values in excess of property values. Banks had been aggressive and reckless in taking on credit risk. The paper's assertion that "banks had little expertise in the analysis of credit risk" is difficult to defend: these banks designed and pushed risky new loans like the Mexican mortgages, lowered down payments, and relaxed

14. Martin Wolf, editorial, *Financial Times*, 8 August 1999.

15. Guerra de Luna (1997, 1998) provides data that illustrate this relation dramatically, both in Latin America and elsewhere.

16. Calvo and Mendoza (1996).

credit conditions, well aware of the risk implicit in these actions. A moral hazard argument more clearly explains their behavior: the banks acted on implicit guarantees provided by the government, which were indeed executed throughout 1994 and with the conversion of non-performing loans into public debt through Fobaproa (Mexico's bank savings protection fund).¹⁷

With regard to Mexican exchange rate and monetary policy, the paper makes an excellent point in noting the difficulties that resulted from the chronic lack of credibility of Mexican monetary policy. However, the view that Mexico has a flexible exchange rate regime (in the pure textbook sense) can be called into question on the basis of Calvo and Reinhart's fear of floating.¹⁸ Moreover, given the very high pass-through to domestic prices of changes in the exchange rate, as mentioned in the paper, it follows from the definition of the real exchange rate that a policy based on a seemingly floating exchange rate combined with inflation targeting can be made to work as a policy for targeting the rate of change of the real exchange rate.

Finally, some comments on Chile. Caballero deserves a lot of credit for taking the position that the evolution of Chile's terms of trade has played a key role in the performance of the Chilean economy. Calvo and Mendoza also take this position because like Caballero, we find it to be consistent with several features of the Chilean data.¹⁹ Chilean economists have been surprisingly unwilling to consider the idea, but the evidence seems very strong. However, Caballero's work does lead to one important revision to the argument linking terms-of-trade shocks and economic activity: terms-of-trade shocks may have such marked effects on the Chilean economy because of important financial multiplier effects.²⁰

The paper's statement that Chile is more financially developed than the other countries in Latin America deserves further clarification. In particular, a broad definition of financial development may not generate as favorable an outcome as when one considers only Chile's higher ratio of market capitalization to GDP. This indicator ignores some subtle differences between Chile and the other countries in the region. For example,

17. See Calvo and Mendoza (1996).

18. Calvo and Reinhart (2000).

19. Calvo and Mendoza (1999).

20. Paasche (1999) also supports this conclusion.

Chile's export base is far more specialized than Mexico's or Brazil's. Copper and minerals related to copper extraction still make up about half of Chile's exports, while Mexico's oil exports are less than 10 percent of total export revenue. If Mexico were still as specialized as Chile, it would not have experienced the smooth shift to financing via FDI and retained earnings of the export sector. Caballero's observation that Chile displays excess sensitivity to terms-of-trade shocks due to weak financial links suggests a similar point. Moreover, Chilean financial markets are far more illiquid and have much smaller turnover ratios than those in Argentina, Brazil, and Mexico.

Chilean financial markets also still feature the very large presence of tightly controlled institutional investors (namely, the private pension funds). Until very recently, these funds were only allowed to hold a very small amount of foreign securities, and even today their foreign holdings are only about 12 percent of their portfolios. They are also subject to strange regulations like the one requiring that the returns of each fund not deviate by more than a given margin from the average of all of them (which seems a recipe for herding behavior). In addition, the financial system retains distortions such as the existence of the large Banco del Estado and the quasi-fiscal deficit of the Central Bank on account of the bad loans purchased in the aftermath of the 1983 banking crisis.

The above comments are quite minor relative to the magnitude of the task at hand for Caballero's paper and the related literature. The integration of financial transmission mechanisms into the analysis of capital markets crises and the business cycle of emerging markets is a research program in its infancy, but its paramount relevance has already placed it as one of the central themes of international macroeconomics. In this context, this article provides critical first steps into exploring the interaction between credit frictions driven by collateral constraints and the sharp fluctuations in credit, international capital flows, and economic activity observed in the emerging markets crises of the 1990s.

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