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Policy in an Economy with Balance Sheet Effects

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15.1 Introduction

The 1990s have witnessed several balance-of-payments crises. In contrast to the crises of previous decades, in which government deficits took center stage, these new crises have been twin currency and banking crises, in which bank lending has taken center stage.

The blame for these new crises has been laid at the feet of the policies that have been implemented in emerging markets during the last decade. Frequently, financial liberalization and banks' privatization have led to lending booms and asset price inflation episodes that have resulted in crises. It has been argued in some policy quarters that this has occurred because financial liberalization has been inevitably associated with bailout guarantees, which have encouraged overinvestment and excessive risk taking.[1] Furthermore, it has been suggested that fixed exchange rates have exacerbated the problem by inducing agents to borrow in foreign currency on an unhedged basis. This paper will question these views.

Even if we accept that bailout guarantees are the inevitable consequence of financial liberalization and banks' privatization, it does not follow that the liberalization policies of the early 1990s were doomed to fail.[2] I will argue that neither financial liberalization, the exchange rate regime, nor bailout guarantees were the main villains; rather, the culprit was the lack of an appropriate regulatory framework in the financial sector.

1. Bailout guarantees are deemed necessary either because many firms face a severely credit-constrained environment or because of political pressures.

2. I would like to emphasize that I am not defending policy measures enacted simply to mask corruption.

In the course of my argument I will make a distinction between "systemic" and "unconditional" bailout guarantees. The former are granted only if a critical mass of agents defaults. The latter are granted on an idiosyncratic basis whenever there is an individual default. I will argue that if authorities can commit to granting only systemic guarantees, and if the other parts of the regulatory framework work efficiently, then financial liberalization policies will induce higher long-run growth in a credit-constrained economy. In this environment, crises are thus not the inevitable consequence of bad policy, but simply bad draws that need not happen. The risk of bad draws is the price that must be paid in order to attain faster growth in a credit-constrained environment. In contrast, if guarantees are granted on an unconditional basis or if the regulatory framework is inefficient, the monitoring and disciplinary role of banks will be nonexistent. Therefore, financial liberalization will simply lead to overinvestment and corruption. Liberalization in such an economy will surely end in crisis.

This paper makes five main points. First, systemic bailout guarantees are a second-best instrument to promote investment in emerging economies. Severe enforceability problems make bank credit practically the only source of external finance for firms in the nontradables sector. In this environment, many profitable investment projects cannot be undertaken because agents are credit-constrained. Guarantees promote investment because they ease borrowing constraints and provide an implicit subsidy. In contrast to deposit insurance schemes, systemic bailout guarantees are only granted if a critical mass of agents goes bust. Thus, they do not eliminate the monitoring role of banks.

Second, risky debt plays a useful role in promoting investment. The subsidy implicit in systemic bailout guarantees can be cashed in only if there exist some states of the world in which there is a systemic crisis. In the absence of exogenous shocks that bankrupt many agents, there must be endogenous expected volatility. Lending booms and risky dollar debt can generate this endogenous volatility by making the economy vulnerable to self-fulfilling crises. Clearly, an economy might evolve along the transition path without experiencing any crisis. In fact, the likelihood of crisis must be small. Otherwise, systemic bailout guarantees might have the unintended effect of drastically reducing productive investment.

Third, a consequence of the previous point is that if prudential regulation tries to eliminate all risk in the banking system, it might block the investment-enhancing effect of systemic bailout guarantees. In contrast, a very important role of prudential regulation is prevention of fraudulent activities. If not accompanied by a concurrent improvement in prudential regulation, bank privatization and other reforms that improve the contracting environment among private agents might not improve social welfare. This raises the issue of why many emerging countries have failed to improve their regulatory frameworks; I suggest that in some cases it has been due to political causes.

Fourth, the forces that generate boom-bust cycles are independent of the exchange rate regime. In particular, systemic bailout guarantees can induce the adoption of risky debt structures in fixed as well as in flexible exchange rate regimes. Guarantees may appear under different guises and need not be explicit. The precise form the bailout takes will depend on the regime. For instance, under fixed rates the bailout rate is mostly determined by the amount of reserves authorities are willing to use in order to defend the currency. In contrast, in a pure floating regime the bailout may take the form of direct transfers to agents.

Fifth, in the event of a crisis the amount of nonperforming loans increases dramatically. If they are recognized, the most likely outcome is that the government will have to take over the banking system, make a once-and-for-all bailout payment, and incur a huge fiscal cost up front. This will increase government debt and, probably, interest rates. On the other hand, if only a small share of nonperforming loans is recognized, the up-front bailout and fiscal cost will be low. However, this strategy might lead to evergreening and generate perverse incentives. Over time the problem might grow and the credit crunch might last longer, as the experiences of Japan and Mexico have shown.

The structure of the paper is as follows. The next section presents some stylized facts. Section 15.3 presents the conceptual framework. Section 15.4, which is the main part of the paper, analyzes the issues raised above. Finally, section 15.5 concludes.

15.2   Stylized Facts

Typically, during the 1990s crises were preceded by real exchange rate appreciation and by lending booms, during which bank lending grew unusually rapidly.[3] During these lending booms, emerging economies became fragile because a significant amount of banks' short-term liabilities were denominated in foreign currency on an unhedged basis. Meanwhile, banks lent mainly to firms in the nontradables sector. Much of this lending was guaranteed by governments—at least implicitly.

Twin banking and currency crises often occurred in the absence of any major external shock and came as a surprise to financial markets. In these episodes, a small incipient reduction in capital inflows was followed by a significant real exchange rate depreciation. Because debt was largely denominated in foreign currency, the depreciation has induced widespread bankruptcies and a collapse of new lending. In most countries, rescue packages were designed to support the banking system and to bail out foreign lenders. Nevertheless, these countries still experienced sharp and long-lasting credit crunches.

3. Real appreciation has been particularly severe in Latin America. See Corsetti, Pesenti, and Roubini (1999). Eichengreen, Rose, and Wyplosz (1995); Gourinchas, Landerretche, and Valdés (2001). Kaminsky and Reinhart (1999); Sachs, Tornell, and Velasco (1996); and Tornell (1999).

A puzzling pattern is that the contraction in the growth rate of bank credit that typically develops in the aftermath of crises is quite pronounced and persistent. In contrast, although growth in aggregate GDP and in deposits declines initially, it recuperates rather quickly. This puzzle can be explained by two additional stylized facts, which we will emphasize throughout this paper. First, the milder decline and faster recovery of aggregate activity in the aftermath of a crisis masks an asymmetric performance between different sectors of the economy. Whereas tradables (T) sectors suffer a very mild decline, nontradables (N) sectors suffer a very deep and persistent recession.

Second, the banking system is typically strongly exposed to the N sector. Because the real depreciation had a "balance sheet" effect mainly in the N sector, entrepreneurial wealth in the N sector is drastically reduced. This, in turn, keeps the growth rate of bank credit depressed, despite the fast resumption of growth in aggregate gross domestic product (GDP) and deposits—that is, a credit crunch.

These stylized facts are illustrated in figures 15.1 through 15.3. These figures depict the evolution of the real exchange rate, bank credit and deposits, GDP, and the ratio of nontradables to tradables production for six emerging economies: Argentina and Mexico, which suffered a crisis in 1995; Korea, Malaysia, the Philippines, and Thailand, which experienced a crisis in 1997; and Chile, which experienced a severe crisis in the early 1980s but not during the 1990s, and so can be considered as a benchmark.

15.3   Conceptual Framework

In order to address the policy issues we have raised, it is necessary to understand the context in which policy rules were designed and the underlying imperfections they were supposed to counteract. In order to do this, one needs a conceptual framework that can explain the basic features of the boom-bust cycles experienced by emerging economies during the 1990s. This paper will use the model developed by Schneider and Tornell (2000) to make such an evaluation.

To explain some of the stylized facts that we have described, "third-generation" crises models have looked to financial market imperfections as key fundamentals. The models are typically based on *one of two* distortions: either bad policy, in the form of bailout guarantees, or bad markets, in the form of an imperfection that induces balance sheet effects, such as asymmetric information, or the imperfect enforceability of contracts.[4] Schneider and Tornell (2000) consider an economy that is *simultaneously* subject to

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4. See Aghion, Bachetta, and Banerjee (2000); Bernanke, Gertler, and Gilchrist (1999); Burnside, Eichenbaum, and Rebelo (2000); Caballero and Krishnamurthy (1999); Calvo (1998); Corsetti, Pesenti, and Roubini (1999); Krugman (1998); and McKinnon and Pill (1998).
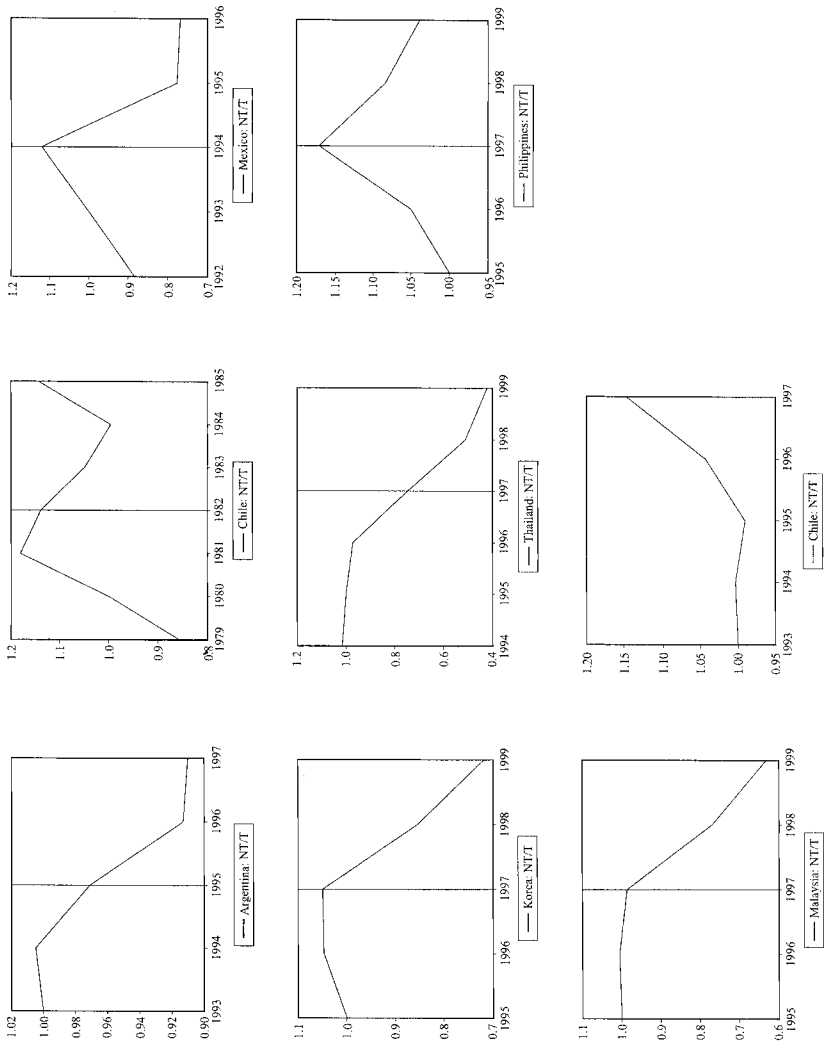
Fig. 15.1   Ratio of nontradables to tradables

Sources: Central Banks

Note: The tradables and nontradables sectors are proxied by manufacturing and construction, respectively.
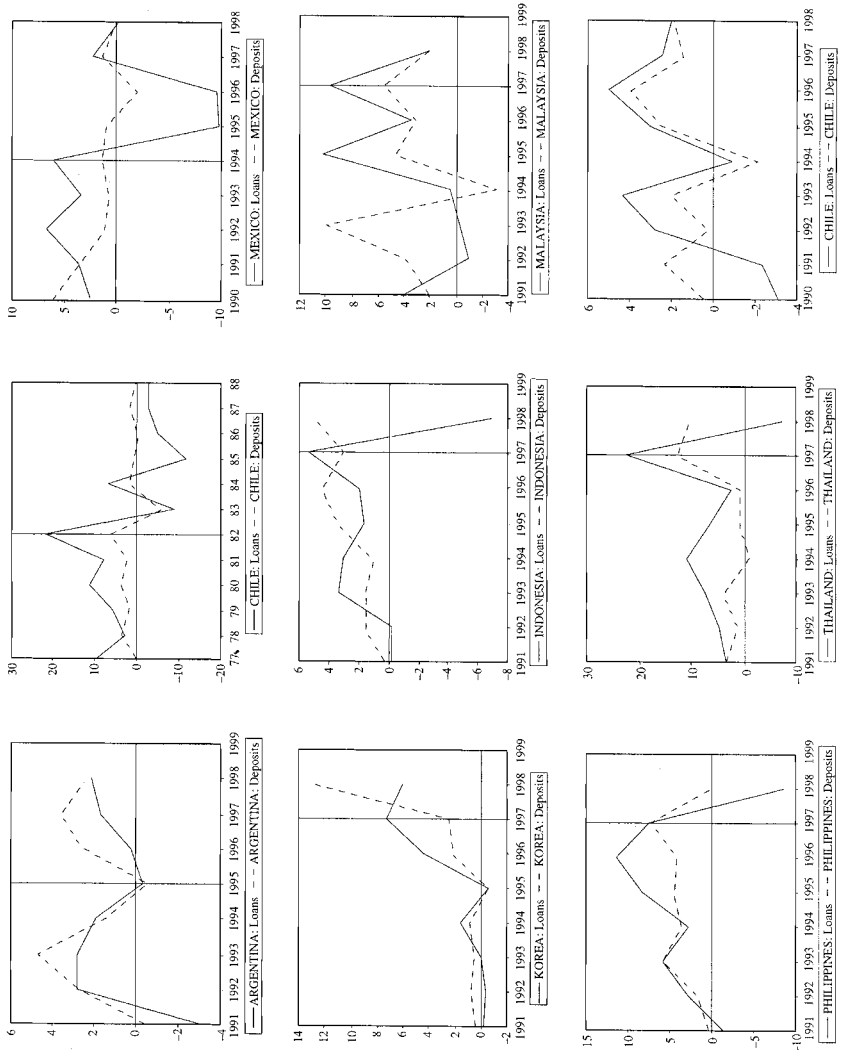
Fig. 15.2   Changes in banks' loans and deposits

Source: International Financial Statistics of the International Monetary Fund, line 22d, 24 and 25.

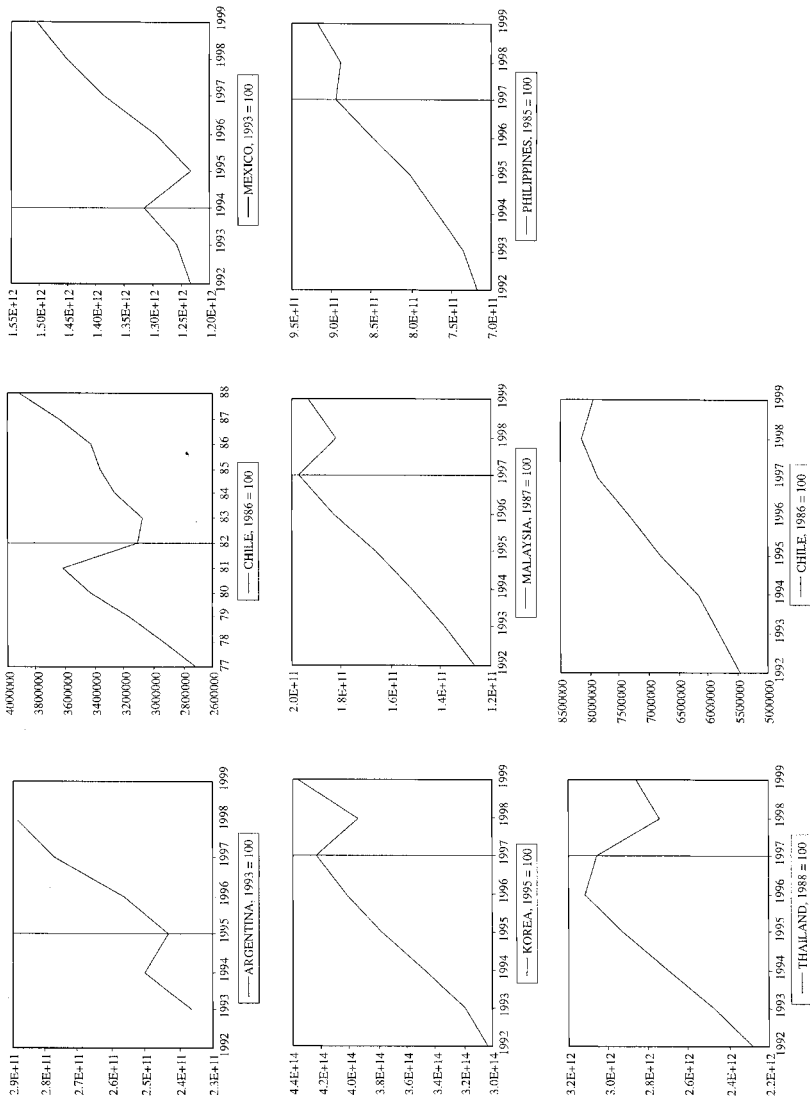*Note:* Loans and deposits are measured as percentages of GDP.

Fig. 15.3 Real GDP, units of domestic currency
Source: International Financial Statistics of the International Monetary Fund

these two distortions: systemic bailout guarantees and the imperfect enforceability of contracts. They show that the *interaction* of the two distortions generates a coherent account of a *complete* boom-bust episode and explains the stylized facts described in the previous section. Thus, this framework will prove useful in addressing the policy issues the paper has raised.

This section presents some elements of the Schneider-Tornell model that will be useful in addressing the policy issues raised in the introduction. The model considers an economy with enforceability problems in financial markets that exhibits underinvestment, especially in the N sector. The introduction of systemic bailout guarantees can increase investment and growth by relaxing borrowing constraints. However, this comes at the cost of making the economy vulnerable to self-fulfilling meltdowns. Systemic bailout guarantees induce agents to switch from safe debt to risky foreign currency–denominated debt, generating aggregate real exchange rate risk.

Consider an economy with a T sector and an N sector. Agents in the T sector can be financed in international capital markets. In contrast, bank credit is the only source of external finance for agents in the N sector. Agents in the N sector demand T goods for consumption and produce nontradables using only nontradables as inputs according to a linear production technology: $q_t = \theta I_t$. Agents in the T sector are endowed with T goods and consume both T and N goods.

In order to model the debt-denomination decision, allow N-sector agents to issue either "risky debt" or "safe debt." Risky debt is denominated in T goods (foreign currency) on an unhedged basis, whereas safe debt is denominated in N goods. Thus, it has no real exchange rate risk.

N-sector financing is subject to two distortions: enforceability problems and bailout guarantees. Consider first an economy in which only enforceability problems are present, as in standard financial accelerator models. High enforceability problems imply that lenders will limit the amount they lend regardless of what the interest rate is. As a result, the amount of credit available to a firm will be determined by the level of its internal funds. If investment has a sufficiently high rate of return, an N-sector firm will borrow as much as it can. As a result, the credit multiplier becomes an investment multiplier. One can show that

$$(1) \qquad\qquad p_t I_t^s = m^s(h) \cdot w_t,$$

where w_t is internal funds (denominated in T goods) of a representative N-sector firm; $p_t = p_t^N/p_t^T$ is the inverse of the real exchange rate; $m^s(h)$ is the investment multiplier, which is decreasing in the degree of the enforceability problem (indexed by $1/h$); and I_t is physical investment by the N sector. Although safe debt is more expensive than risky debt, in the presence of bankruptcy costs, issuing safe debt is individually optimal. Thus, in the absence of exogenous shocks, the economy will not exhibit fragility to meltdowns. Under no circumstances will firms go bust.

Let us introduce the second distortion: bailout guarantees. As mentioned in the introduction, one should distinguish two types of bailout guarantees: unconditional and systemic. The former are granted whenever there is a default by an individual borrower (e.g., deposit insurance), whereas the latter are granted only if a critical mass of borrowers goes bust. Clearly, if all debt were covered by unconditional bailout guarantees, then the enforceability problem would become irrelevant and borrowing constraints would not arise in equilibrium. Because a lender would be bailed out in the case of an idiosyncratic default, he does not have incentives to limit the amount of credit he extends to an individual borrower. Hence, in order for bailout guarantees not to neutralize the effects of enforceability problems, and for borrowing constraints to arise in equilibrium, it is necessary that some part of banks' liabilities be covered only by systemic bailout guarantees.

As we shall see, systemic bailout guarantees provide an implicit subsidy that eases borrowing constraints. However, this subsidy can be cashed in only if there are some states of nature in which a critical mass of borrowers goes bust. In the absence of exogenous shocks that bankrupt a critical mass of borrowers, the introduction of systemic bailout guarantees will have an effect only if there is aggregate endogenous risk.

15.3.1   Bailout Guarantees and Risky Debt Denomination

The first main result is that the *interaction* of systemic bailout guarantees and enforceability problems might generate aggregate endogenous risk. This is because there is a self-reinforcing mechanism at work. On the one hand, if there is sufficient real exchange rate risk, it is individually optimal for an N-sector agent to issue risky T debt (i.e., borrow in foreign currency on a short-term and unhedged basis). On the other hand, if *many* N-sector agents gamble by denominating their debt in T goods, exchange rate risk might be endogenously created, as the economy becomes vulnerable to *self-fulfilling meltdowns* of the banking system. If the amount of T-denominated debt is high, a real depreciation can severely squeeze cash flow or even bankrupt banks altogether. Because they face binding borrowing constraints, they then must curtail lending to the N sector. Weak investment demand from the N sector for its own products in turn validates the real depreciation. The systemic credit risk created by the banking system thus induces endogenous exchange rate risk.[5]

Real exchange rate variability can make risky T debt cheaper than safe N debt. As an illustration, suppose that tomorrow's real exchange rate can take on two values: an appreciated one that leaves every firm solvent ($\overline{p}_{t+1}$),

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5. There are several ways in which agents can adopt risky projects. However, risky debt denomination (borrowing in dollars to finance nontradables activities) is a wonderful "coordinating device." Because debt denomination is easily observed, agents can implicitly collude to cash in the subsidy implicit in the bailout guarantee.

and a depreciated one that makes a majority of N-sector firms go bust ($\underline{p}_{t+1}$). Because lenders constrain credit to ensure that borrowers will repay in the no-crisis state, it follows that in the no-crisis state debt is repaid in full and there is no bailout. Meanwhile, in the crisis state there is bankruptcy, and each lender receives a proportion F of what he or she was promised. Because the probability of crisis is $1 - \alpha$, interest rates on T goods–and N-good–denominated debt (ρ_t and ρ_t^n, respectively) satisfy

(2) $$(1 + \rho_t)\,[\alpha + (1 - \alpha)F] = 1 + r,$$

$$(1 + \rho_t^n)\,[\alpha\bar{p}_{t+1} + (1 - \alpha)\underline{p}_{t+1}F] = 1 + r,$$

where r is the world interest rate. If we set $F = 1$, interest rates are given by

(3) $$1 + \rho_t = 1 + r,$$

$$1 + \rho_t^n = \frac{1 + r}{\alpha\bar{p}_{t+1} + (1 - \alpha)\underline{p}_{t+1}}.$$

Because $\bar{p}_{t+1} > \underline{p}_{t+1}$, we can see that T debt is cheaper than N debt for all positive bailout rates ($F > 0$): the interest rate as well as the expected repayments per unit debt is lower for T debt. We can see directly from equation (2) that $\rho_t < \rho_t^n$. Because debt is repaid with probability α, expected repayment per unit debt is $\alpha(1 + r)/[\alpha + (1 - \alpha)F]$ for T debt and $\alpha(1 + r)/[\alpha + (1 - \alpha)F\frac{p}{\bar{p}}]$ for N debt.

The fact that T debt is cheaper than N debt does not imply that agents will always be willing to issue T debt: T debt in the books might lead a borrower to go bust. One can show that when there are no guarantees ($F = 0$) it is optimal for an agent to choose a safe plan that never leads to bankruptcy. However, if crises are rare events (α is large), bailouts are generous (F is large), and there is enough real exchange rate variability

(4) $$\frac{\theta\bar{p}_{t+1}}{p_t} > 1 + r > h > \frac{\theta\underline{p}_{t+1}}{p_t},$$

then it is individually optimal to choose a risky plan that leads to bankruptcy in the crisis state. Because the bailout agency will pay part of the promise in the bad state, it is desirable for an agent to shift as much of the payment as possible into the bad state. This is achieved precisely by denominating all debt in tradables. Because lenders must break even, switching from N to T debt always shifts some of the debt burden from the good to the bad state, making the borrower better off.

An important implication of the preceding results is that systemic bailout guarantees may alleviate the "underinvestment" problem usually associated with borrowing-constrained economies. They permit high leverage with debt denominated in T goods and faster credit growth. As we have seen, the presence of guarantees induces N-sector agents to issue T debt. Because the real exchange rate is expected to appreciate in the no-crisis state

(i.e., eq. [4] holds), this allows agents to reduce the expected value of debt repayments, measured in terms of nontradables.[6] This reduction, in turn, permits agents to borrow more at each level of internal funds. Therefore, at a given point in time, the investment multiplier is greater than that of an economy that features only enforceability problems (m^s). In fact, one can show that in the presence of bailout guarantees ($F > 0$) the value of investment by the N sector is

$$(5) \qquad p_t I_t = m^r(h, F) \cdot w_t, \qquad m^s(h) < m^r(h, F) \; if \; F > 0.$$

Thus, the N sector grows faster than it would if guarantees were absent.

15.3.2   Endogenous Real Exchange Rate Risk

When is it that the existence of T debt generates real exchange rate risk? To answer this question, consider the determination of the equilibrium real exchange rate ($1/p_t$). This price equalizes aggregate demand and the (predetermined) supply of nontradables (θI_{t-1}). The aggregate demand for N goods has two components: the demand by the T sector, $d^T(p_t)$, and the investment demand by the N sector for its own goods (I_t). Thus, p_t is determined by

$$(6) \qquad \theta I_{t-1} = d^T(p_t) + I_t(p_t, b_{t-1}, b_{t-1}^N),$$

where b_{t-1} and b_{t-1}^N are the amounts of T debt and N debt carried over from the last period. Because at a given point in time supply is given, the key to having multiple equilibria is a backward-bending aggregate demand curve. This is impossible if N-sector firms have only N debt. In this case, price changes lead to variations in both firms' revenues and their debt payments. In fact, profits (measured in nontradables) are completely insulated against price movements. The upshot is that as long as firms are solvent, demand slopes downward and there is a *unique* equilibrium real exchange rate.

Multiple equilibria are possible only if N-sector agents have T debt. In this case, real exchange rate movements affect revenues but not the debt burden. Thus, it becomes important to distinguish between insolvent and solvent firms. For real exchange rates more depreciated than a cutoff level $1/p_t^c$, all N firms go bankrupt because revenues do not cover the debt burden. As a result, internal funds collapse. Total demand in this range is downward sloping. In contrast, for real exchange rates more appreciated than $1/p_t^c$, a further real appreciation is accompanied by a *more than proportional* increase in internal funds. The reason is that revenues increase the debt burden remains the same. Equivalently, part of the debt burden measured in terms of nontradables is inflated away. Consequently, investment demand *increases*.

It is apparent that if the balance sheet effect is strong enough to make

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6. Below I discuss the conditions under which equation (4) holds along the equilibrium path.

aggregate demand "bend backward," as in figure 15.4, multiple market-clearing real exchange rates, and hence self-fulfilling twin crises, can exist. With identical fundamentals, in terms of supply and debt, the market may clear in one of two equilibria. In a solvent equilibrium (point B in fig. 15.4), the price (the reciprocal of the real exchange) is high, inflating away enough of firms' debt (measured in nontradables) to allow them to bid away a large share of output from the T sector. In contrast, in the crisis equilibrium of point A, the price is low to allow the T-sector and bankrupt N-sector agents with little internal funds to absorb the supply of nontradables. Expectations determine which of these two points is reached. Fundamentals determine only whether the environment is fragile enough to allow two equilibria.

15.3.3   Equilibrium Dynamics

We have seen that, in the absence of bailout guarantees, managers will not be inclined to issue T debt. In the model, the only source of uncertainty is the sunspot. Furthermore, multiple market-clearing prices, which are crucial for a sunspot to matter, exist only if debt is denominated in tradables. It follows that, in the absence of bailout guarantees, there cannot be an equilibrium in which prices depend on the sunspot. Instead, in economies without bailout guarantees, equilibria must be "safe," and firms are always solvent.

Consider now an economy in which systemic bailout guarantees are present. Will the economy exhibit risky lending booms, which allow for faster growth (financed by cheap T debt) but may end in self-fulfilling twin crises? To address this question we need to establish the existence of *sunspot equilibria* along which crises can actually occur with positive probability (i.e., $1 - \alpha > 0$).[7] That is, we need to construct an equilibrium price process by making the sunspot select among market-clearing prices, such that the resulting return distribution encourages firms to issue enough T debt to validate the price process.

Recall that there are two mechanisms at work. On the one hand, if there is enough T debt, there are two possible market-clearing prices, of which the lower price bankrupts firms and hence triggers a bailout. On the other hand, agents will choose T debt if there is enough real exchange rate variability. The question is whether these two mechanisms can be elements of one consistent dynamic story.

Suppose that the future demand for N goods is high enough that agents will be able to repay their debts. Then one can prove that if bailouts are generous enough, initial funds of the representative agent are large enough, and the horizon is long enough, then there exists a certain time interval in which

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7. It is technically simpler to focus on unanticipated crises, but this is conceptually unsatisfactory for several reasons. First, only if crises are anticipated can one rationalize this fragility as a result of risky debt denomination. Second, only if crises are anticipated can one make the point that growth is faster with bailout guarantees.
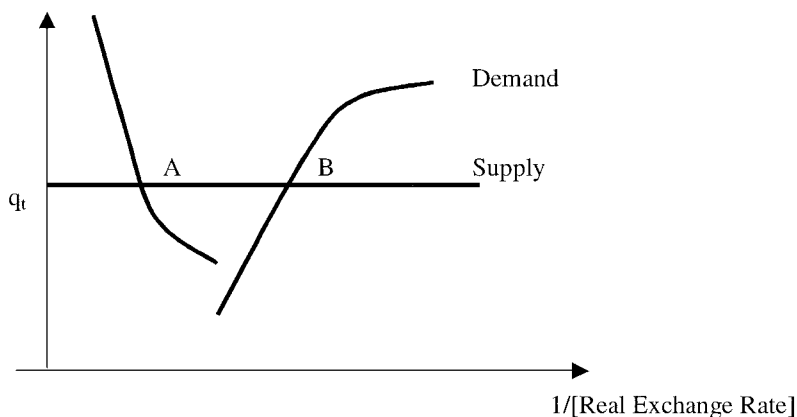
Fig. 15.4   Equilibrium in the nontradables' market

the sunspot can matter and self-fulfilling crises can be anticipated. During this time interval a crisis must be a rare event in order for an equilibrium to exist.

Along the equilibrium path, as long as no crisis has occurred, there is a self-reinforcing feedback between lending and real exchange rate appreciation, which explains the other stylized facts described in the previous section. Because N goods are demanded for investment by the N sector itself, both output and the relative price of nontradables increase during the boom. Furthermore, because debt is denominated in T goods, a real appreciation (a relative price increase) reduces the debt burden measured in terms of nontradables. This increases N-sector agents' cash flow. For constrained agents, this translates into more lending through a balance sheet effect. More lending, in turn, permits more investment in N goods. In order to close the circle, note that if the investment increase is greater than the higher output, the real exchange rate must appreciate in order to eliminate the excess demand for nontradables.

A crisis occurs when the bad state of the sunspot is realized. The result is a real depreciation and widespread bankruptcies in the N sector. This depletes the internal funds of the N sector. Thus, its investment drops and can only gradually recover (due to the financial adjustment costs mentioned above). At the same time, demand by the T sector jumps up. Again, this highlights the asymmetric patterns followed by the N sector and the T sector.

To highlight the fact that, although systemic bailout guarantees might induce faster economic growth by easing borrowing constraints, they increase the likelihood of a crisis, consider two economies, A and B. The only difference between these economies is that A has systemic bailout guarantees.

Then there is a sunspot equilibrium in which A and B behave identically up to a certain time, after which the N sector in economy A grows faster and exhibits higher leverage along the lucky path, as long as a crisis does not occur. However, A experiences a crisis and subsequent recession with positive probability, whereas B does not.

15.3.4   Necessary Ingredients for Boom-Bust Cycles

A key point of Schneider and Tornell (2000) is that the *interaction* of contract enforceability problems and bailout guarantees creates the fragility required for self-fulfilling crises. If there were no guarantees, firms would not be willing to take on price risk to claim a subsidy. Costly enforceability of contracts would still imply that the N sector could grow only gradually, and balance sheet effects would play a role during the lending boom. However, there would be no force that makes a boom end in a crisis. Alternatively, if there were only guarantees but no enforceability problems, then there would not be any balance sheet effects that make demand backward-bending, a necessary condition for a sunspot to matter.

Lending booms that feature fragility cannot occur in just any economy with bailout guarantees and enforceability problems. It is also necessary to have a future increase in the demand of the T sector for nontradables. Otherwise, the N sector would not be able to repay the accumulated deficits it runs during the lending boom. Backward induction then indicates that the sequence of returns that supports the lending boom would collapse. This suggests that the boom-bust episodes are more likely to occur during a transition period (for instance, following a far-reaching reform or a natural resource discovery).

Even during a transitional period, *the likelihood of a self-fulling crisis is not a free parameter.* If crises were not rare events, either borrowing constraints would not arise, or they would not be binding in equilibrium if they did arise. In either case, credit would not be constrained by internal funds, and balance sheet effects would not exist in equilibrium. Clearly, if this were the case, crises could not occur. If the probability of crises is not small enough, enforceability problems do not generate borrowing constraints.

15.4   Policy Evaluation

An emerging economy is an economy in which the future is much brighter than the present but profitable investment projects cannot be undertaken because the private sector is small (i.e., entrepreneurial wealth is low) and the amount of external financing is severely limited. The reforms of the late 1980s liberalized trade and financial markets in many emerging markets. These reforms also significantly reduced the role of the state in the economy. Suddenly, the future looked much brighter than before, and the

private sector much smaller than was desirable. Unfortunately, legal and judicial reform could not be implemented as easily as the other reforms. As a result, many of the institutions that support the provision of external finance in developed economies did not flourish in emerging markets.

The policy problem then became one of better promoting the fast development of the private sector in an environment in which external finance to the domestic sector is constrained by internal funds of firms, and credit and investment are too low relative to investment opportunities. One is tempted to say that if a government had had the appropriate information and correct incentives, the optimal policy would have been to transfer resources to those in the population with better entrepreneurial skills and to let them make the investing decisions. Of course, we now know that this is wishful thinking. After many failed experiments of this sort during the last century, we now know that either governments do not posses the appropriate information, or crony capitalism and rampant corruption take over.

Since direct made-to-measure government transfers are not feasible, during the 1990s governments had to design second-best policies to foster the development of the private sector. Many countries made the decision to privatize the banks and allow them to be the means through which resources would be channeled to the nascent private sector. The issues described in the introduction should be analyzed from this perspective.

If financial liberalization and bank privatization are implemented in a context of unconditional bailout guarantees and a lax regulatory framework, then they will clearly lead to corruption and crisis. However, if appropriate regulation is put in place and authorities are committed to grant bailouts only in a systemic fashion, then one might argue that, when taking into consideration the distortions that exist in emerging markets there is a sense in which these policies are second-best instruments for fostering the private sector's growth. We would like to emphasize that we are not defending some policy measures that simply mask corruption. Those are clearly indefensible.

Consider the two-sector economy described in section 15.3. Firms in the T sector can easily obtain financing in international capital markets, either because they can pledge their export receivables as collateral or because they are closely linked to firms that can secure their debt. In contrast, firms in the N sector must rely more heavily on domestic bank credit. Furthermore, because emerging markets face acute enforceability problems, firms in the N sector face severe borrowing constraints that limit their ability to undertake profitable projects. As a result, the growth rate of the economy is kept below its potential. It follows that a policy maker whose objective is to maximize social welfare must design second-best policies that will ease borrowing constraints and increase investment in the N sector. Because the N sector and the T sector compete for productive resources, and because any

policies to support the N sector have implicit fiscal costs, the optimal support level for the N sector cannot be arbitrarily large.[8]

15.4.1 Policies During a Boom

Systemic versus Unconditional Bailout Guarantees

We have seen that in the presence of severe enforceability problems in financial markets, credit is constrained by internal funds. As a result, profitable investment projects will not be undertaken, especially in the N sector. Thus, over the medium run, growth will be significantly lower than its potential. This indicates that systemic bailout guarantees might actually play a socially beneficial role. Systemic bailout guarantees provide an implicit subsidy that reduces the cost at which firms can fund themselves and increases the credit multiplier. This increases investment and growth at each level of internal funds. In the absence of better instruments to promote investment and growth of the N sector, systemic bailout guarantees are a second-best instrument for making transfers to this sector. We would like to emphasize that this mechanism uses the information and monitoring capacity of banks.

Consider the generosity of bailout guarantees (F) as the policy instrument.[9] An increase in F induces an increase in the investment multiplier in equation (5), which in turn leads to a higher growth rate of the N sector. Therefore, in an emerging economy it is optimal to set F higher than zero in order to reduce the underinvestment problem. However, there are tradeoffs. First, the greater F is, the greater the contingent fiscal cost; second, the greater F is, the greater the share of resources allocated to the N sector at the expense of the T sector. Therefore, the level of F should not be set too high. There is an interior optimum.

Three points should be emphasized. First, if banks in a given country play no monitoring role and are prone to fraud, systemic bailout guarantees will not be socially beneficial. Second, systemic bailout guarantees do not curtail the discipline faced by either individual banks or firms, because they are granted only if a critical mass of agents defaults. At the same time, systemic bailout guarantees generate an investment subsidy only if the banks' portfolios are risky, that is, only if there exist states of nature in which there is systemic crisis. In the absence of large exogenous shocks, this means that some risk must be endogenously generated by the banking system in order for guarantees to be effective in promoting investment (the paper addresses this issue below). Third, systemic bailout guarantees imply that the govern-

8. The fiscal costs associated with bailout guarantees are typically paid by domestic taxpayers, not by international organizations. Jeanne and Zettelmeyer (2000) show that in most cases the IMF has been repaid the loans it made to crisis countries in order to bail out lenders.

9. As shall be discussed below, there are several ways in which systemic bailout guarantees can be implemented.

ment can credibly commit not to bail out individual agents in the case of idiosyncratic default.

The experience of Mexico during the 1990s illustrates, in a rather sharp manner, the policy dilemma faced by reformers. Several critics have pointed to the "false rosy expectations" generated by the government in the early 1990s and the promises of bailout guarantees as the culprits in the Tequila crisis. Certainly, in hindsight this is true, a policy maker would say. However, at that time the policy seemed a sensible one. It was a way to avoid low growth and bottlenecks in the N sector that would otherwise have limited the overall future growth of the economy. Moreover, from a political standpoint the development of the private sector encouraged by the policy had the added virtue of creating new power bases that would block attempts by statist groups to return to the old ways. It was a way to ensure the continuity of the reforms.

An important issue has not yet been discussed is unconditional bailout guarantees, which are granted whenever an individual debtor defaults. Deposit insurance is a prime example. If all guarantees were unconditional, the discipline in the banking system would disappear and guarantees would not play the investment-promoting role described above. However, if unconditional bailout guarantees are granted to small bank depositors, they may play a socially beneficial role. This policy avoids bank-runs generated by burgeoning rumors but does not impinge negatively on the market discipline faced by an individual bank because small depositors typically have very little information regarding the bank's portfolio. As is the case in the United States, market discipline should be imposed by noninsured bank debt, the interest rate of which should serve as an indicator of a bank's health.

The Role of Risky Dollar Debt

As mentioned above, systemic bailout guarantees have only investment-enhancing effects in the presence of risk. In the absence of large exogenous shocks, some endogenous volatility must be present if the policy is to be effective. Therefore, outlawing risky dollar debt could undo the investment-enhancing effects of systemic bailout guarantees. Thus, if the conditions of a country call for bailouts as a second-best policy to promote the growth of the private sector, then risky debt (or another way to generate endogenous volatility) must also be allowed. Of course, this does not mean that banks should be allowed to have outrageously risky portfolios. It merely means that a naive policy of outlawing risky dollar debt is not correct from a normative perspective.

Because systemic bailout guarantees can only be cashed in states of the world in which a critical mass of borrowers goes bust, they are effective in increasing investment only if an important sector of the economy is vulnerable to a meltdown. It is only during such a meltdown that the bailout

agency makes payments to lenders. Thus, the expected value of the subsidy is determined by the likelihood of the crisis and the generosity of the bailout. The greater the expected value of the subsidy, the lower the interest rates that lenders are willing to accept. Clearly, bank portfolios cannot be outrageously risky, because the likelihood of crisis must be quite small in order for the mechanism identified in this paper to be operative. Otherwise, firms would not find it profitable to borrow and invest in the first place! Note, however, that small is not the same as zero. In the absence of major exogenous shocks, fragility must come from within the system. This is precisely the role of risky debt denomination. As explained above, if a majority of borrowers has unhedged debt, the economy as a whole can become vulnerable to self-fulfilling crises. Furthermore, dollar debt is a wonderful coordinating device, because it can be observed by others. It plays the same role as the real-estate buildup on an uninsured basis in catastrophe-prone areas. The principle that "if everyone else does it, then I am safe" reigns.

From a positive perspective, it is also impossible to outlaw dollar short-term debt. Many firms need such debt in order to carry out their international transactions. Because it is impossible to distinguish what part of dollar debt is used by a given firm to finance international transactions, it is not feasible to enforce a law that forbids dollar debt for uses other than international trade. This lesson has been painfully learned by many countries that have tried to implement dual exchange rates and then were faced with rampant misinvoicing of imports and exports.

In conclusion, the degree of banks' and firms' portfolio riskiness should be strictly regulated. However, risky debt should not be outlawed altogether. It is neither socially optimal nor practically implementable.

The Role of Lending Booms and Asset Price Inflation

During a lending boom credit grows unusually fast, and, as many observers have pointed out, monitoring effectiveness declines. Thus, it is less likely that unprofitable and white elephant projects will be detected and stopped. At the same time, firms in emerging markets have a very low level of external finance, especially in the N sector. Thus, a lending boom is a mechanism by which faster growth can be attained. In fact, the lending boom is a transitional phase ignited by deep economic reforms that make the future much brighter than the present.

Stopping a lending boom, as for example by increasing reserve requirements, would interrupt the policy of promoting the growth of the private sector. However, allowing the lending boom to continue unchecked increases the debt burden of the economy, which makes it more vulnerable to crises. Hence, it is not clear ex ante at which point a lending boom should be stopped.

It is interesting to note that although crises typically are preceded by lending booms (Tornell 1999), the converse is not true. Gourinchas, Lan-

derretche, and Valdes (2001) find that for a large panel of countries the probability that a lending boom will end in a crisis is quite small. That is, in the majority of cases, lending booms end with soft landings. Furthermore, theoretically lending booms can only develop if the probability of crisis is small, and they are expected to end with a soft landing if they last long enough (see Schneider and Tornell 1999, 2000).

Clearly, India has not experienced lending booms of the magnitude as the ones experienced by Korea. Moreover, India has not suffered currency crises as deep as those endured by Korea. Certainly, this does not mean that over the last half century the Indian economy has performed better than Korea's. Of course, in hindsight, Korean performance could have been improved on the margin. However, we should beware of fine-tuning policies designed to look great ex post.

Prior to several crises it has been observed that some assets, such as real estate, experience a steep price inflation, which is followed by a price collapse at the time of crisis. Because real estate is used as collateral, there is a close link between lending and asset price inflation during a boom. Thus, implementing policies that would stop asset price inflation will also reduce the growth of credit. Clearly, it might be dangerous to leave asset price inflation unchecked. However, some degree of inflation might be desirable as a tool to ease borrowing constraints.[10]

What Are the Effects of Reforms That Improve the Contracting Technology in Financial Markets?

During the last decade several countries privatized their banks, liberalized their financial markets, and implemented legal reforms that facilitated contracts between private agents. Unfortunately, in several cases these reforms have led to an increase in fraud instead of economic growth (see Tornell 2000). The lack of a concurrent improvement in prudential regulation is often cited as being responsible for this lackluster outcome. Given that the regulatory framework cannot be improved by decree, the question arises as to whether such reforms should be implemented regardless of the regulatory framework.

To address this issue it is important to note than there is a *nonlinearity* in the relationship between the degree of contract enforceability and the desirability of financial-sector reforms. This paper will argue that such reforms are socially beneficial only if contract enforceability is very low or if the reforms are radical enough to eliminate balance sheet effects.

An improvement in the financial markets' contracting technology has the effect of increasing credit at each level of internal funds. In terms of equations (1) and (5), it means a reduction in the parameter h and an increase in

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10. Schneider and Tornell (1999) study the interplay between asset prices and lending along a boom.

the investment multipliers m^s and m^r. In the extreme case, if contracts are not enforceable and the legal system is nonfunctional, it will be almost impossible for creditors and lenders to establish a bilateral debt agreement. With certainty, borrowers would divert funds and default. As a result, credit to the N sector will be almost nil, and the economy will not be fragile to crises. In this environment the introduction of systemic bailout guarantees would obviously not induce greater investment, as suggested in the previous section. Thus, in these extreme circumstances, privatization of the banking system and reforms that improve the contractual environment are clearly socially beneficial.

Consider now the other extreme, in which it is possible to implement legal reforms that reduce the enforceability problem to such a level that even small firms in the N sector may enter into bilateral agreements with foreign lenders. Clearly, in this extreme case, borrowing constraints will not be an issue. As a result, firms could borrow up to the level determined by profitability and technological conditions. Therefore, it is socially beneficial to bring the enforceability of contracts to a level where the majority of domestic firms and banks do not face borrowing constraints. Moreover, if this were the case, there would be no role for systemic bailout guarantees. Even if they were put in place, they would be irrelevant!

However, what if contract enforceability (h) is at an intermediate level? Would privatization and financial reforms that improve private contracting unambiguously be socially beneficial? The answer is no. A concurrent improvement in prudential regulation is essential. Recall that it is not socially optimal to increase credit to the N sector indefinitely at the expense of the T sector. There is an interior optimum. Taking as given the generosity of bailouts (F), an improvement in contract enforceability ($1/h$) eases borrowing constraints and increases the credit multiplier. However, it does not eliminate borrowing constraints and balance sheet effects altogether. As a result, such an improvement in private contracting might induce more fragility than is socially desirable. Clearly, if one could fine-tune the generosity of bailout guarantees, one could envision some tradeoff. Unfortunately, systemic bailout guarantees are more often than not determined by political forces. Either they exist or they do not.

Another way of stating this argument is that, after some point, a further improvement in contract enforcement will only serve to permit borrowers and lenders to better collude in ripping off the bailout agency and tax payers. Instead of enhancing the rate of growth of the economy, it will simply facilitate the adoption of white elephant investment projects that mask theft, or it might make it easier to design fraudulent lending schemes. If not accompanied by improvements in the regulatory framework, reforms that simply improve contractual arrangements marginally might have the unintended effect of fostering crony capitalism.

The Role of Prudential Regulation

The previous discussion highlights the need to improve prudential regulation concurrently with privatization and financial reforms. There are two levels at which the regulatory body should act. First, it should ensure that the banking system does not undertake more risk than is socially desirable. As discussed in the previous section, a risky debt profile might be necessary in order for the subsidy implicit in systemic bailout guarantees to have the desired effect of increasing credit and investment. However, this does not mean that anything goes. Appropriate regulation must determine the financial ratios in accordance with the situation of a given country. Blindly applying the Basel accord requirements does not make sense, because the level of riskiness induced might be greater than is appropriate for the country in question.

The second level at which the regulatory body should act is in minimizing the extent of fraudulent schemes and the adoption of white elephants. The more efficient the regulatory agency is in blocking these manifestations of crony capitalism, the more likely it is that systemic bailout guarantees will induce fast and sustainable economic growth, and the greater the social payoff associated with reforms that improve contractual enforceability. In the absence of a strong and independent regulatory agency, it becomes important to consider whether the ownership of banks should be strictly separated from ownership of industrial corporations. We will discuss this below.

Reforms that permit better bilateral private contracting should go hand in hand with improvements in regulatory capacity. However, it seems that here lies one of the greatest bottlenecks faced by emerging markets. More often than not, regulatory agencies fall prey to those they regulate. We now know that this is a political distortion that cannot be eliminated by decree.

In the case of banks, at the time of privatization a significant part of de facto nonperforming loans are passed on to the new owners. These invisible nonperforming loans typically reflect past hidden fiscal deficits or political payoffs. At the time of privatization, it is politically expedient not to recognize them and to pass them on to the new owners. This has two implications. First, the true capitalization of the newly privatized banks is lower than what the standard ratios indicate. Second, if the privatizers are also the regulators, there is a strong reason for regulators to oversee some future malpractices of the banks: bankers help regulators hide some nonperforming loans to begin with. Both implications make it more likely that the recently privatized banking system will engage in excessively risky lending and even in fraudulent activities.

Even if the capture of regulatory agencies is not a issue, one must still worry about regulatory forbearance and evergreening. Regulators have in-

centives to consider the negative shocks that hit banks' balance sheets as being more transitory than they actually are. Doing so avoids forcing banks either to recapitalize or else seek fiscal resources to cover the gap. Because such actions are politically costly, it is always better to ignore the problem at least for the time being. Thus, with the acquiescence of regulators, banks capitalize the past-due interest of de facto nonperforming loans. These loans now become evergreen accounts. Obviously, this is an explosive situation: the capitalization of banks will have to be confronted at some point in the future. In more perverse situations, evergreen accounts reflect political favors to specific powerful groups.

The Federal Deposit Insurance Corporation Improvement Act (FDICIA) implemented in the United States in 1991 has several elements that might be effective ways to improve the regulatory framework in emerging markets. This law makes sanctions to banks mandatory and thus lessens political pressure on regulators. It also includes a prompt corrective action clause, according to which a bank's problems must be solved before effective capital becomes negative. Sanctions are applied in stages that depend on the level of effective capital. These sanctions include restrictions on dividends payouts, limits on assets' growth, and the revocation of management rights. Furthermore, new capital must be injected by owners before effective capital becomes negative. With this law, the resolution of a bank does not imply fiscal costs. International organizations could focus attention on this area.

The Role of Foreign Banks

During the last decade, the share of the domestic banking system owned by foreigners has increased spectacularly. The accepted wisdom is that foreign ownership of banks brings three main benefits to an emerging market. First, foreign banks improve the banking practice and increase know-how. Second, since the size of the private sector in emerging markets is too small to permit such a separation, the existence of foreign banks makes it easier to separate ownership of banks from ownership of industrial corporations. As we discussed earlier, in the presence of a weak regulatory framework this separation might reduce the likelihood of fraudulent schemes between lenders and borrowers.

Third, in case of a systemic crisis, parents of foreign subsidiaries will inject the resources necessary to withstand a run. Note, however, that in general foreign subsidiaries are legally separate entities from the parents. Thus, subsidiaries can declare themselves bankrupt during a crisis without affecting the parent company. Reputation considerations are frequently invoked to defend the notion that resources would be transferred by the parent in case of a crisis. This argument is far from obvious, because in case of a systemic crisis all parent banks can refuse to support their subsidiaries (by invoking some sort of force majeure clause) without losing reputational capital vis-à-vis the other major international banks.

Bailout Guarantees and the Exchange Rate Regime

Systemic bailout guarantees can be implemented in several ways. The particulars will, of course, depend on the exchange rate regime. A nice feature of Schneider and Tornell's framework is that the effects of guarantees and the forces that generate boom-bust cycles are independent of the exchange rate regime or monetary policy rule. This feature permits us to study how guarantees affect the economy under different regimes.

With fully flexible exchange rates, the mechanism is literally the same as the one considered in section 15.3. If agents are highly leveraged and have risky dollar debt, the economy is vulnerable to self-fulfilling crises in which there is a severe real depreciation, and several agents in the N sector, suffering from balance sheet effects, are unable to repay their debts. As a result, creditors are paid a proportion F of the contracted payment. This bailout payment can be financed by an international organization or by an increase in future taxes to the rest of the economy. The real depreciation can arise by either a nominal depreciation, a change in nominal prices, or a combination of both.

Consider the other extreme of a fixed exchange rate regime. In the case of an attack the central bank can defend the currency by either running down reserves or increasing the interest rate. If the attack is successful, the reduction in reserves constitutes a bailout payment to bank creditors that withdraw their funds and convert them into foreign currency. Thus, any defense policy has associated with it a bailout rate F. Clearly, the bailout rate need not be 100 percent, because reserves might not suffice to cover all the liabilities of the banking system. We should add that the bailout can be complemented by an explicit transfer, as in Mexico during the Tequila crisis. Again, the real depreciation can come about through a combination of a nominal depreciation and a change in nominal prices.

In the real world we observe a mixture of both regimes. However, it should be clear that the forces at work are essentially the same in both regimes.

15.4.2   Policy in the Aftermath of Crisis

Bailing Out Borrowers versus Bailing Out Lenders

Once a crisis has erupted and a severe real depreciation has taken place, the main objective should be to contain the meltdown and to minimize the number of bankruptcies, because inefficient bankruptcy procedures generate deadweight losses. Productive assets are inefficiently liquidated, and human capital networks are destroyed. Furthermore, reputational capital in credit markets, which takes a long time to build, is destroyed (Wyne 2000).

Typically, bailouts are granted to lenders, not to borrowers. However, bailing out lenders does not save borrowers from being decapitalized and

suffering bankruptcy. Therefore, despite the occurrence of generous bailouts, credit crunches have developed in the aftermath of crises during the 1990s. This has been reflected in three regularities. First, depositors' bank runs have seldom been observed in the crises of the 1990s. Second, in the aftermath of crises the growth rate of bank loans has typically remained below the growth rate of deposits. Because the value of collateral collapses, banks shift their portfolios toward others assets, such as government securities. Third, the interest rate spread has typically remained above its pre-crisis level after GDP growth has returned to its trend.

Ex post, extending some type of bailout to borrowers might avoid bankruptcies and ameliorate the credit crunch. This policy, however, might not be possible to implement because the fiscal cost might be enormous. Furthermore, it has perverse incentives effects. First, many borrowers that have the ability to pay might simply refuse to do so. Because it is extremely difficult to distinguish liquid and illiquid borrowers during a generalized crisis, it is basically impossible to implement a borrowers' bailout policy that discriminates among different types of borrowers. Second, market mechanisms might be blocked, as borrowers and lenders might delay the resolution of certain loans.

Piecemeal versus All-at-Once Bailouts

In the aftermath of a crisis the share of nonperforming loans increases spectacularly. Both regulators and banks have incentives to underreport the true share of nonperforming loans. This way, bank owners need to inject less capital, and the government needs to spend less fiscal resources up front. In contrast, reporting the true nonperforming loans might force a takeover of several banks by either the government or other banks. As a result, bank owners will lose their franchises, and government officials will face political criticism for their failure to regulate the banking system appropriately.

Thus, bankers and regulators have incentives to believe that negative news is more transitory than it actually is and to make predictions about the banks' portfolios that are more optimistic than is warranted by the facts. The effect of this misperception is an evergreening of banks' balance sheets. That is, there is a tendency for banks to classify as performing those loans that are actually never going to be repaid and for regulators to turn a blind eye to this mistake. The problem with evergreening is that it generally leads to an increase in the share of nonperforming loans over time. This is because interest is not repaid and because banks have incentives to undertake very risky projects that might have negative expected net present value. Banks might even have incentives to extend outright fraudulent loans.

Evergreening has two negative effects on the economy as a whole. First, the fiscal cost of the bailout grows over time, and it might even grow faster

than GDP. Second, the credit crunch suffered by small nontradables firms will be deeper and more persistent, because banks will have more incentives to engage in risky activities than to lend to firms with low internal funds (Krueger and Tornell 2000 analyze the Mexican case).

The alternative policy is to recognize at once all nonperforming loans. Because it is unlikely that bank shareholders will be able to come up with the necessary capital, the government will have to take over all the liabilities of the banking system. This policy implies that government debt must increase by several percentage points of GDP in a single year. This is politically very costly. However, the evergreening alternative is likely to be more costly socially, as the experience of Japan and Mexico has shown.

Interest Rate and Exchange Rate Responses to Crises

In the standard Mundell-Fleming model, when there is a capital outflow the needed improvement in the current account can be attained with a real depreciation and with no output costs. According to this view, a depreciation induces a shift of resources from the N sector to the T sector and makes the economy more competitive in world markets. As a result, growth resumes quite rapidly after the depreciation.

The Mundell-Fleming framework and traditional balance-of-payments crisis models are not appropriate for explaining these new boom-bust episodes because the banking system plays no essential role in these models. Once we move into a world in which bank lending is essential and debt is denominated in foreign currency, the traditional policy recommendation becomes invalid. As we have seen, allowing the real exchange rate to depreciate in order to close the external gap has perverse effects. Because domestic firms have dollar-denominated debt but revenues denominated in domestic currency, a real depreciation will make some domestic firms unable to repay their debts and bankrupt them. This, in turn, will make the problem even worse. Capital flight will increase, the real exchange rate will depreciate even further, and more firms will go bust. This vicious circle will generate a meltdown of the domestic sector of the economy.

In this situation an increase in interest rates might not be such a bad idea, but does it actually work? It is unclear from both an empirical and a conceptual perspective. In a sample of seventy-five countries over the period 1960–97, Kraay (2000) finds no evidence that interest rates systematically increase during failed speculative attacks, nor that raising interest rates increases the probability that an attack will fail. Basurto and Gosh (2000) find that, for the case of Indonesia, Korea, and Thailand in the aftermath of the 1997 crisis, there is little evidence of a perverse effect of a monetary tightening on the exchange rate.

From a conceptual perspective, an interest rate hike is effective in stemming a crisis only if such an increase does not bankrupt a critical mass of

firms. If a critical mass of firms goes bust because the firms are unable to meet their debt service, then the investment demand will collapse and the real exchange rate will have to depreciate in order to clear the market for nontradables. The end result will be the same as that described above.

In contrast, if an interest rate hike simply induces a reduction in absorption but does not induce generalized bankruptcies, then an immediate crisis might be avoided. The question then arises as to whether the time of reckoning will not simply be pushed forward. Will higher domestic interest rates simply induce foreign investors to exploit arbitrage opportunities during a short period until central bank reserves are depleted? Will higher domestic interest rates make several firms insolvent and lead them to bankruptcy in the near future? It is necessary that the answers to these questions be in the negative in order for an interest rate increase to avoid a crisis. Clearly, the specific situation of a country will determine the correct mix of exchange rate depreciation and interest rate increase.

15.5   Conclusions

This paper has argued that even if bailout guarantees are an inevitable consequence of financial liberalization and bank privatization, it does not follow that the liberalization policies of the late 1980s and early 1990s were doomed to fail. We argue that financial liberalization policies can induce higher long-run growth if they are accompanied by an appropriate regulatory framework.

The reforms of the late 1980s liberalized trade and financial markets in many emerging markets. These reforms also significantly reduced the role of the state in the economy. Suddenly, the future looked much brighter than before, and the private sector much smaller than was desirable. Unfortunately, legal and judicial reform could not be implemented as easily as the other reforms; as a result, many of the institutions that support the provision of external finance have not yet developed in emerging markets. Therefore, most firms in these economies have been severely credit constrained.

The introduction of systemic bailout guarantees into such credit-constrained economies eases borrowing constraints and permits higher investment and higher growth. However, this comes at the cost of higher vulnerability to crises, because systemic bailout guarantees induce agents to adopt risky debt profiles. In fact, systemic bailout guarantees lead to higher growth only if the economy becomes vulnerable to crises, so that there exist some states of the world in which the implicit subsidy can be cashed in. It is important to note that the likelihood of a crisis must be small in order for investment and growth to increase.

Clearly, not every bailout-guarantee scheme will lead to higher growth. It is essential that authorities can commit to refrain from granting bailouts on an idiosyncratic basis. Furthermore, an efficient regulatory framework

must be in place to ensure that banks perform their monitoring and screening role efficiently and to avoid corrupt banking practices.

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Comment   Charles W. Calomiris

Aaron Tornell's paper might be retitled "Learning to Love Twin Crises." In essence, Tornell derives conditions under which government policies that promote anticipated bailouts, moral hazard in lending, and credit-driven boom and bust cycles might be better than a laissez-faire policy of benign neglect. The essential idea of the paper—that imperfect capital markets can provide a rationale for bailouts—is not entirely new. Economists and politicians frequently defend bailouts on the static, ex post grounds that in the presence of imperfect capital markets, bank failures and a collapse of corporate balance sheets make it very hard for efficient capital allocation to occur. The logic of this static approach runs as follows: Firms with positive net present value projects may be in scarce supply. If those firms are not creditworthy (because of their high postcrisis debt burdens or because the insolvent or weakened banks on which those firms must rely for credit cannot themselves raise funds), then efficient financing of positive net present value projects may not occur. Bailouts that relax credit constraints on borrowers or their banks thus have a positive side: they keep funds flowing to efficient users that otherwise would not receive funding (in the absence of government interventions).[1]

Tornell's analysis, which is founded on Schneider and Tornell (2000), however, is more interesting than the standard ex post, static argument for bailouts, for several reasons. First, he makes explicit the role of hard currency borrowing and nontradable goods in connecting intrinsic macroeconomic risk and financial fragility in developing countries. Second, Tornell's focus is on ex ante bailout policy. He argues that a policy of anticipated bailouts may be desirable because it promotes greater lending *before* the cri-

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1. This line of static reasoning can be supported by models of imperfect capital markets (e.g., Leland and Pyle 1977; Stiglitz and Weiss 1981; Calomiris and Hubbard 1990) and by empirical evidence, much of which pertains to the U.S. experience during the Depression (Fisher 1933; Bernanke 1983; Calomiris and Mason 2001).

sis. Third, while many advocates of bailouts neglect or underestimate the role that bailouts play in causing crises, Tornell, in contrast, assumes that bailouts will be anticipated and that bailout policies themselves will *cause* twin crises to occur. The novelty of Tornell's paper is that it shows that, notwithstanding the fact that bailouts cause and are known to cause costly twin crises, anticipated bailouts may still be worthwhile as a "second-best" means of addressing capital market imperfections.

Let me begin by commenting on the proposition that bailout policies cause twin crises to occur in developing economies. The primary mechanism linking banking collapse and currency collapse (the two elements of twin crises) operates through the effect of bailouts on government debt burdens and the resulting pressure to increase the supply of money. Government payments to failed financial institutions can so weaken government finances that the only viable currency policy in the wake of a bank bailout is depreciation. A secondary linkage (which I will return to below) is also important: currency markets are a convenient means for desperate banks to take on risk as a resurrection strategy. As the economy weakens, insolvent or weak banks increase their exposure to exchange rate risk intentionally on the off chance that depreciation can be avoided (an outcome that would deliver substantial profit to them). Protected banks' and firms' decisions to increase their exchange rate risk exposure in the presence of bailouts also increase the potential fiscal costs of twin crises.

Historical evidence clearly supports the view that foreseeable bailouts, and the fiscal links that connect bank risk and exchange risk, cause severe twin crises. In the past two decades, government protection of failed banks has been nearly ubiquitous. At the same time, there have been scores of twin crises throughout the world. That experience has been unprecedented. For example, in the three decades prior to World War I, anticipated bailout policies were very rare, as were twin crises, and the countries that experienced a simultaneous collapse of banks and exchange rates during the pre–World War I era were precisely those that had established bailout policies.[2]

Argentina in 1890 is the clearest historical case in which a twin crisis was caused by an anticipated bailout in the wake of an adverse terms-of-trade shock. State-guaranteed, bank-issued mortgages (cedulas) were traded in the London capital market in the years before the crisis and enjoyed essentially the same yield as Argentine government debt. Banks profited by borrowing at the government rate and lending at higher interest rates (thus pocketing the difference). The spread earned by the lender increased with the riskiness of the mortgage and thus encouraged lenders to originate risky mortgages. The exchange rate collapse during the Argentine crisis of 1890 reflected the magnitude of increased government debt as the holders of government guarantees sought relief from the government.

2. See Calomiris (2001) for a review of the pre–World War I experience.

In Italy in 1893, the simultaneous failure of banks and depreciation of the currency similarly reflected the fiscal costs the government bore from protecting the banking sector. The extent of promised protection in Italy was less than in Argentina, and the extent of banking and exchange rate collapse was also less. In other countries (e.g., Australia in 1893 and Russia and Norway in 1900–91), substantial banking collapse occurred with few or no government bailouts of banks, and exchange rates remained fixed.

An interesting feature of the Tornell paper is the distinction it draws, in theory, between conditional bailout policies (state-contingent policies that address credit-market imperfections) and unconditional bailouts. Tornell shows that the economic benefit of bailouts is to reduce the contractionary effect of *system-wide risk* on the supply of credit in developing economies. There is little ex ante gain from providing bailouts for individual firms during normal times, and therefore firms and banks that fail during normal times should not be protected.

How could Tornell's state-contingent rule be implemented? In theory, one could come close with a two-part policy that (a) insures bank deposits (and perhaps even some of bank stock value, by putting in place a policy of state-contingent government recapitalization of failed banks, as described in Calomiris 1999) and (b) requires protected banks to hold sufficient capital, so that government insurance of deposits and capital would only be drawn upon if aggregate bank losses are large.

It is tempting to conclude from this theoretical discussion that confining protection to a narrowly defined set of macroeconomic states by establishing an appropriate mix of bank or borrower protection and capital standards would enable one to expand the supply of credit but limit the moral-hazard costs of protection, and thus provide a useful subsidy for lending to productive activities at little social cost. In fact, however, I am extremely skeptical of the practicality of that conclusion for several reasons.

First, it is very difficult to construct a capital standard for banks that ensures that banks do not abuse the government safety net by holding insufficient amounts of capital (relative to the amount the regulator would want them to hold, and reflecting the risk position of the bank). Capital is difficult to measure because the value of nonmarketable assets held by banks is hard for regulators to gauge in real time, and risk is also difficult to measure. Furthermore, the incentives of regulators to measure capital and risk and to punish violations of capital standards can be weak or perverse, which also serves to undermine the effectiveness of these rules. That is not to say that the problem is hopeless, but in the vast majority of countries (largely for political reasons) there is little immediate prospect of establishing a credit capital standard (for a review, see Calomiris 1999; Shadow Financial Regulatory Committee 2000).

Second, Tornell's model imagines that the extent of the systematic risk is exogenous and that increased risk corresponds to increased productive

lending. In reality, however, decisions about the *extent, timing,* and *type* of systematic risk are *endogenous* to protected banks' and firms' choices (e.g., choices about foreign exchange risk exposure) in ways that can make the benefits of protection lower and the costs higher than those imagined in the model.

With regard to the type of systematic risk firms choose, it is possible that much of the protection offered by the government will be used to subsidize useless or negative present-value activities. Some firms, for example, will take on exchange rate risk, not because they must borrow in foreign currency, but because it is the easiest way to increase risk quickly when one is engaging in a "resurrection" strategy. Furthermore, the creation of protection for banks entails the creation of rents, and those rents typically will be distributed through political competition. Thus, protection will be captured by cronies and used to support the risks of the powerful, who in general are not necessarily the most productive.

With regard to the extent of systematic risk, state-contingent protection will itself substantially increase the endogenous choice of "factor loadings" on systematic risks by individual firms, and those loadings can suddenly *increase* in the wake of adverse shocks that firms face. As noted above, weak or insolvent firms often undertake to increase their risk in response to a recessionary shock. The reason is that the "put option" value of protection increases as the firm's capital shrinks (in the wake of an adverse shock), which encourages firms to adopt resurrection strategies. If risk is a choice variable that can be increased very quickly (via exchange rate swaps, for example), then the frequency and social costs of state-contingent protection can be much larger than the model contemplates, even though in the years prior to the crisis the expected subsidies were relatively small (as were the social benefits from increased lending as the result of the expected subsidies). In other words, in order to be more realistic, the Tornell model needs to add a middle period to its dynamics—a period in which firms may choose to add risk after adverse shocks have occurred and in pursuit of objectives that are not necessarily socially desirable.

In practice, therefore, it is unlikely that protection will result in a net social benefit because of endogenous choices by firms and banks to undertake very risky and very wasteful projects and to substantially increase unproductive risks in the midst of a recession. These choices have been visible in the major crises observed recently. Mexican banks' speculative swap transactions in 1994–95 are one example; wasteful transfers to Korean *chaebol* or to unproductive Russian banks or crony capitalists in Indonesia are other examples. The devastating twin crises in these and scores of other countries over the past twenty years (Chile in 1982–83 was arguably the first major case) typically were preceded by years (sometimes decades) of wasteful capital allocation by protected banks.

Studies of the effects of financial protection on economic growth, macro-

economic stability, and financial depth have uniformly concluded that increases in ex ante protection are associated with lower economic growth, less financial depth, and greater financial and economic instability (for a review, see Beim and Calomiris 2001, chap. 7). These adverse effects of protection on growth and financial depth are clearly at odds with the predictions of the Tornell model.

What kinds of alternatives to bailout policies should be considered in light of the practical problems with implementing such protection? One possibility (call it the "mercantilist" approach) is to grant monopoly rights to certain merchants to overcome capital scarcity. This can be a way to create "capital" in the form of charter value, which can help mitigate financial constraints. This was a popular and successful means for promoting conquest and development used by European sovereigns in the seventeenth and eighteenth centuries. Like bailout policies, this approach entails large social costs (inefficient monopolistic pricing and the concentration of political power) that may outweigh any gains from capital market improvements.

A second option would be to go in the opposite direction—to encourage, and perhaps even subsidize, foreign entry by banks and other firms into the domestic economy on a competitive basis. Global firms are better diversified and have greater access to capital markets. Tornell is right to object that subsidiaries of international banks may still be subject to local risks (because they are chartered as independent entities), but their costs of capital are much lower than those of domestic banks because they can raise capital in international equity markets. This advantage is substantial and important, even if foreign subsidiaries remain legally independent. Furthermore, I do not believe that large global banks would abandon their subsidiaries lightly, even if they became insolvent. Finally, given that foreign subsidiaries are unlikely to be protected by local governments, they maintain sufficient capital and risk controls so that they are much less likely to fail. For these reasons, I think the potential gains from the relaxation of capital-market constraints resulting from free foreign entry are very large.

A third alternative approach would be to develop a means to hedge national risk (e.g., via the gross domestic product derivatives contracts imagined by Shiller 1993), and to rely on these new hedges to insulate domestic firms and domestic banks in developing countries from country-specific macroeconomic risks that produce severe exogenous shocks. In essence, these prospective innovations would provide the means for countries to undo the consequences of borrowing in hard currency. In fact, if such hedges were costlessly available, it would be possible for all lending to occur in local currency and for lenders to use derivatives to insulate themselves from local macroeconomic shocks.

Of the possible alternative approaches, I think the second option (encouraging foreign entry) has the most immediate promise. It is, of course,

not politically viable in many countries, where protection of rent-seeking cronies or nationalistic sentiment would not permit such an approach.

To the extent to which we are stuck with bailouts as a policy option because of political constraints on international diversification, our efforts should focus on ways to limit the adverse incentives that magnify the social costs of bailouts. In particular, I have argued elsewhere that creating effective, clear, and credible rules to guide bailout policies would make bailouts less frequent and less costly and protection of banks more incentive-compatible. These rules would include credible loss-sharing arrangements for recapitalizing banks and reforms to bank capital standards that encourage greater use of market signals in the regulatory process (Calomiris 1999; Shadow Financial Regulatory Committee 2000).

To the extent that these improvements are feasible, it may someday be possible to reap some of the social gains from anticipated bailouts that the Tornell model envisions. However, we should consider alternative policies (especially free foreign entry) that solve capital-market imperfections in a simpler and more robust way. Moreover, before we can even contemplate the potential benefits of limited, state-contingent bailouts, we must put in place the institutional infrastructure, which is currently lacking, that would make such benefits possible. It would be unfortunate if a reader of the Tornell paper saw it as a justification for existing bailout policies (which operate without necessary and elusive complementary institutional reforms), which it is not; it is important to emphasize that in the real world bailout policies do much more harm than good.

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Discussion Summary

Anne O. Krueger said that the intuitive argument of the paper was that there was some distortion in the economy that would lead to a lower investment level and result in a lower growth rate unless we do something to correct it, such as instituting government bailout guarantees. However, she said, the right question is how to correct the distortion and achieve the "first-best" situation rather than focusing on choices of second-best policies. She pointed out that this is different from the strategy that first accepts the existence of the bailout guarantee policy, then tries to mitigate its consequences and make it a better bailout. Krueger conjectured that the first-best policies are the ones that reduce the bailout and achieve the growth rate, as by giving an across-the-board subsidy to investment through tax policy or giving investment tax credits directly. She suggested that the lessons of the Asian crisis are that governments must find a structure or a set of incentives to prevent nonhedged foreign exchange exposure, which tends to intensify crises. Indeed, she said, it is possible to find a way that borrowing could only be conducted in domestic currency throughout the world, which would remove the interaction between the domestic and international crises.

Paolo Pesenti praised the paper for providing a welfare analysis for the presence of government bailout policy. In the paper, bailout guarantee stems from a need to partially offset the borrowing constraints, and the government ends up with a "Goldilocks" bailout policy: not too much, nor too little, but just right! It may sometimes lead to crises, but ex ante it maximizes over the trade-off between higher growth and potential crisis outcomes. However, he said, if it was really possible to commit to such an instrument, why couldn't the government think of other ways to lift the borrowing constraints by designing policies that are less "dangerous" and more efficient in addressing the original distortion problem, such as, for instance, free entry of foreign banks, as suggested by Charles W. Calomiris? *Jaume Ventura* also expressed the similar view that the bailout guarantee policy is second best, not the first-best policy.

Ventura pointed out that the bailout policy was perceived as a solution to the underinvestment problem in the paper, but that the paper did not adequately address the reasons for the underinvestment, that is, whether it was relative to the perfect information case or due to some kind of external problems. He said that if the underinvestment problem is a result of the lack

of perfect information but there is no externality, then we cannot do anything about it. He suggested that the author devote more discussion to the source of underinvestment, especially the externality of it.

Ventura also commented on a common assumption that the nontradables sector cannot borrow from and sell to foreigners in the paper. He gave an example—Spanish utility companies' buying from Latin America—to show that this assumption seems to be empirically faulty. He inquired about the exact role this assumption plays in the model and the alternative assumptions, asking, if it is a shortcut for other assumptions, what they are. *Enrique G. Mendoza* followed up on this issue. It is important to look at the real exchange rate facts to think of them as a disciplining device and to determine how to model them. The experiences of the emerging market are striking and differ from those of the developed countries. First, the fluctuation in real exchange rate is not the same as the fluctuation in the tradables-sector price vis-à-vis the nontradables-sector price. Second, one would have thought, from the standard theory, the nontradables-sector prices meant the prices of haircuts and services, but this, he said, turns out not to be the case. In Mexico, there is a large bias toward one particular sector, that is, the cost of housing. One of the capital-market reports from the IMF that examines the Asian countries also discussed this phenomenon. Thus, the change of real exchange rate in these countries has a lot to do with the change of housing as an asset market.

Michael P. Dooley commented on whether the government can credibly commit to whom to bail out ex ante. He said that the government chooses whom to bailout and whom not to, and that the investors who are bailed out in cases of crisis are the ones that pose the biggest threat to the government. Investors, knowing that, will only lend to people who would be bailed out in crises. This implies that the government cannot credibly commit to whom to bail out ex ante: the market will make its own judgment.

Sebastian Edwards agreed with this view and gave the Chilean case as an example. According to him, after the massive bailout following the Chilean banking crisis in 1977, the authorities (Pinochet) made a public announcement that there would be "no more bailouts." However, when the debt crisis of 1982 erupted in Chile, the government could keep its promise only with respect to domestic investors: the American bank creditors threatened the government with the cutting off of all trade credits to Chile, and they eventually were bailed out by the government.

Aaron Tornell said that in the 1970s researchers had worked on the first-best policy questions, such as how better to transfer resources to the right agents in the economy. However, consider a country such as Mexico that had the objective to grow rapidly but could not raise enough financing from abroad. Moreover, the government did not know to which investors to give transfers, and the investment subsidies were not well implemented. It was against such a background that the government chose to use banks as a

means to make (implicit) transfers to entrepreneurs and implemented the guarantees through the fixed exchange rate regime, hoping this might boost the economy. Tornell said that he was not defending the bailout policies, agreeing with the opinion of Dooley and others that one cannot fine-tune these policies. The paper focused only on the welfare implication of policies that provide implicit bailout guarantees. The paper shows that these policies can increase investment at the cost of a higher risk of currency crises.

On the implementation of the bailout guarantee policies, Tornell said that there is a systemic problem, and the challenge is how to design a mechanism that will advance the rule-based resolution of crises. He said that the specific ways to implement these policies proposed by Charles W. Calomiris would probably achieve this goal.

On the welfare aspects, Tornell said that it is very important that regulators be able to exclude, at the outset, white elephant and connected projects. The outright corruption is an obviously concern, and one should make sure that it does not happen.

Finally, Tornell answered the question regarding the role played by the nontradables sector. He said that in Mexico, firms in tradables sectors could borrow quite easily on foreign markets via commercial papers and equities. However, small and medium-sized firms in nontradables sectors are the main clients of banks, and they have suffered a credit crunch greater than the GDP growth. Thus, there is a large asymmetry between the tradables and nontradables sectors, and policy makers are wondering how to improve the productivity in nontradables sectors.

V

Overview